

Bringing the HIV epidemic in Nigeria to an end:

**A mixed methods study exploring why HIV
remains an important public health challenge in
Benue State and Nigeria.**

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Abstract

Introduction

Human immune deficiency virus (HIV) remains a global public health challenge, with its burden varying steeply between rich and poorer nations. Despite advances in HIV diagnosis and treatment, certain populations continue to report high HIV prevalence and deaths. The main objective of this research is to explore variables that define HIV epidemiology in Benue State, Nigeria. HIV prevalence in Benue State is above the Nigeria national average of 3.2%.

Methods

An exploratory mixed methods research, incorporating a comparative analysis (of qualitative and quantitative data) and a systematic review (and meta-analyses) in the review of literature. Information generated from the literature review informed the content and direction of the empirical research. Data from qualitative and quantitative exercises were analysed and presented using standard techniques (for example thematic analysis for qualitative data and regression analyses for quantitative data).

Results

There is strong association between HIV burden and multiple deprivation. Variables associated with increased HIV risk in Benue State include female gender and low socioeconomic status. Religion, sex education and, local norms shape local HIV epidemiology through poor risk perception and social cognitive dissonance. Poor risk perception and social cognitive dissonance, in turn, lead to high HIV risk behaviours by reducing preparedness for safer sex practises. There was overwhelming local support for the passage of laws that criminalise deliberate transmission of HIV. Risk for HIV in Benue state vary significantly by places and areas of residence, with residents of rural and Idoma speaking areas being at increased HIV risk.

Using condoms at first sex was significantly associated with lower HIV risk score (coefficient -0.25, $P = 0.012$, CI = -0.4458 - -0.0558). Tendency to stigmatise was significantly lower among those with tertiary education (coefficient = -0.88, $P = 0.017$,

CI = -1.6009 - -0.1580). Predictors of consistent condom use include urban residence (OR = 3.68, P = 0.028, CI = 1.16 - 11.73), HIV knowledge scores (coefficient 1.66, P = 0.001, CI = 0.72 - 2.61) and condom use at first sex (OR = 5.61, P = 0.016, CI = 1.41 - 22.36). Inconsistent condom use was more likely among those who reported not having sex education at home in the past (OR = 0.32, P = 0.001, CI = 0.17 - 0.61). Marital status was not found to be protective against HIV risk in the meta-analysis (OR = 1.44, P = 0.44, CI = 0.57 - 3.63).

Important epidemiological link between general population and known high HIV risk groups (like sex workers and MSM) was found, via Okada men. It was demonstrated, for the first time, that Okada riders may constitute an overlooked high HIV risk group locally – further research is needed to explore this finding.

Conclusion

There is need for comprehensive interventions that address individual and structural variables that influence local HIV epidemiology. The need for increased medication access cannot be overemphasised. Local interventions need to be decentralised, brought closer to the grassroots and, made sensitive to the needs of locals (especially among the older and less educated locals in rural settings). Mobile phone applications and, sex education (as part of schools curriculum), are some of the interventions and policy changes urgently needed. More controversial approaches such as criminalisation of deliberate HIV transmission are worth exploring further due to strong local support for such policies. Further research is needed to explore the relationship between local alcohol consumption and increased HIV risk as well as the role of “Okada men” in local HIV epidemiology.

Dedication

To my mother who never cease to inspire me.

To all who live with HIV today.

To the memory of all that have died from HIV related causes over the years.

Acknowledgement

My unreserved appreciation goes to my supervisors (Professor Mark Stephen Pearce, Dr. Edmund Ong, Dr Katie Brittain and Dr Zaman Shahaduz). Many thanks for your immense support throughout my PhD years. Without your support and guidance, this project may never have been completed. This PhD journey began in the summer of 2012, when the proposed project (designed by the PhD candidate) was discussed with Professor Mark Pearce in his office. It was for the fact that Mark accepted to provide supervision that this project moved from the realm of an idea into reality. "It is not very often that students come to us seeking supervision on projects they have designed" Mark would add. This statement served as a huge motivation to me and would remain in the back of my mind throughout my PhD. Mark constituted the supervisory team for my project and worked tirelessly throughout the project life (having to find a replacement supervisor when one of my initial supervisors, Dr Zaman Shahaduz, left Newcastle University and was no longer available to provide support) to ensure a timely completion. My PhD supervisory team has worked immensely to provide the best support possible. These efforts (in the form of guidance and supervision) have ultimately resulted in the successful completion of this timely and relevant piece of PhD research.

Following conception of this PhD and discussion with Mark, came the funding hurdle. My profound gratitude to Commonwealth Scholarships Commission in the United Kingdom (CSC UK), through Newcastle University, who saw the promise in my candidature as well as the potential impact this project could make to lives far away in Nigeria (and Africa). The CSC UK demonstrated her faith in my potential by funding my research proposal, through the prestigious Commonwealth Scholarships studentship, awarded to me at Newcastle University. Without the support of CSC UK, it would not have been possible for me to fund this piece of research. The CSC UK scholarship offers more than a studentship: it was an unparalleled life changing experience for me. Through this studentship, I have experienced life in the UK in ways that may not have been possible otherwise: I have during my PhD seen the four remaining copies of the Magna Carta Libertatum (the documents that enshrine

democracy, dating back to about 800 years); I have been to the Westminster Palace on the occasion of the birthday of Her Majesty, the Queen of England, HRH Queen Elizabeth II; attended a development module held at the serene Windsor Castle among other exciting experiences. My stipend was never late and funds were always available for field work and conference travels. A big thank you to the Federal Scholarships Board, Nigeria for nominating me for the CSC UK studentship - without this critical step I would never have enrolled on this PhD program as a Commonwealth Scholar. A million thanks to Benue State Ministry of Health for granting necessary approvals and support required for this research.

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Awards, conferences and publications

1. A two part publication in Journal of Human Virology and Retrovirology (JHVRV):
 - a. Oono IP, Ong E, Shahaduz Z, Pearce MS (2015) Understanding the Patterns of Spread of HIV/AIDS in Nigeria: A Systematic Review and Meta-Analysis of Primary Research Articles. J Hum Virol Retrovirol 2(4): 00047a. DOI: 10.15406/jhvrv.2015.02.00047a
 - b. Oono IP, Ong E, Shahaduz Z, Pearce MS (2015) Understanding the Patterns of Spread of HIV/AIDS in Nigeria: A Systematic Review and Meta-Analysis of Primary Research Articles. J Hum Virol Retrovirol 2(4): 00047b. DOI: 10.15406/jhvrv.2015.02.00047b
2. Best poster award, applied epidemiology research day, Institute of Health and society, 2015.
3. Poster presentation at international association of providers of AIDS care (IAPAC) conference, Fort Lauderdale, Florida, United States of America. 2016.
4. Attendance at “controlling the HIV epidemic with antiretrovirals” - an IAPAC conference held at Geneva, Switzerland between 13th and 14th of October, 2016.

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List of abbreviations

ABC – Abstinence, Being faithful to a partner and Condoms

AIDS – Acquired immunodeficiency syndrome

ART – Antiretroviral therapy

CASP – Critical appraisal skills program

CD4+ – Cluster differentiation 4 positive

CDC – Centre for disease control and prevention

CIA – Central intelligence agency

DNA – Deoxyribonucleic acid

FGD – Focus group discussions

FSW – Female sex workers

Gag – Group specific antigen

GNI – Gross national index

HIV – Human immunodeficiency deficiency virus

IDU – Injection drug user (or use)

MPI – Multidimensional poverty index

MSM – Men who have sex with men

NACA – National agency for control of AIDS (Nigeria)

NCCEH – National collaborating centre for environmental health

NGO – Non-governmental organisation

OPV – Oral polio vaccine

PrEP – Pre-exposure prophylaxis

RNA – Ribonucleic acid

SIVcpz – Chimpanzees simian viruses

SIVsmm – Sooty mangabeys, Macaque and Monkey simian viruses

STD or STI – Sexually transmitted diseases (or infections)

TasP – Treatment as prevention

UK – United Kingdom

UNICEF – united Nations Children's Fund

USA – United States of America

WHO – World Health Organisation

CHAPTER 1: Introduction

1.1 What my PhD is about

“Human immunodeficiency deficiency virus (HIV) is a virus that attacks the human immune system and, weakens the ability of human immune systems to fight off infections and other diseases” (1, 2). HIV has claimed over 35 million lives globally, since it was first discovered: it remains a major global public health issue today (3). Great advances have been made in HIV research and intervention in the last decade. These advances have been so effective that HIV is fast becoming a chronic condition and no longer the death sentence it used to be (4, 5). Data from WHO shows that “the global number of deaths from HIV remained stable in the last decade, with about the same number of deaths recorded at the start and close of the decade” (6). There is growing body of literature and scientific evidence in support of the thinking that HIV has moved past the death sentence that it was into a chronic, manageable, condition (4, 5, 7). At a glance, these data suggest that HIV is a disease whose end is in sight. However, country level data suggests otherwise. For example, a comparison of the 10 leading causes of death in the last decade by WHO, reveals stark differences in HIV burden between low and high income countries (Figure 1.1 and Figure 1.2). Whilst HIV did not feature in the list of top 10 causes of death for developed nations, HIV was listed as the second leading cause of death in low income countries (6). It is clear, therefore, that HIV burden is skewed along country income (or wealth) index.

Figure 1.1: Top ten causes of death in low income countries, 2012 (6)

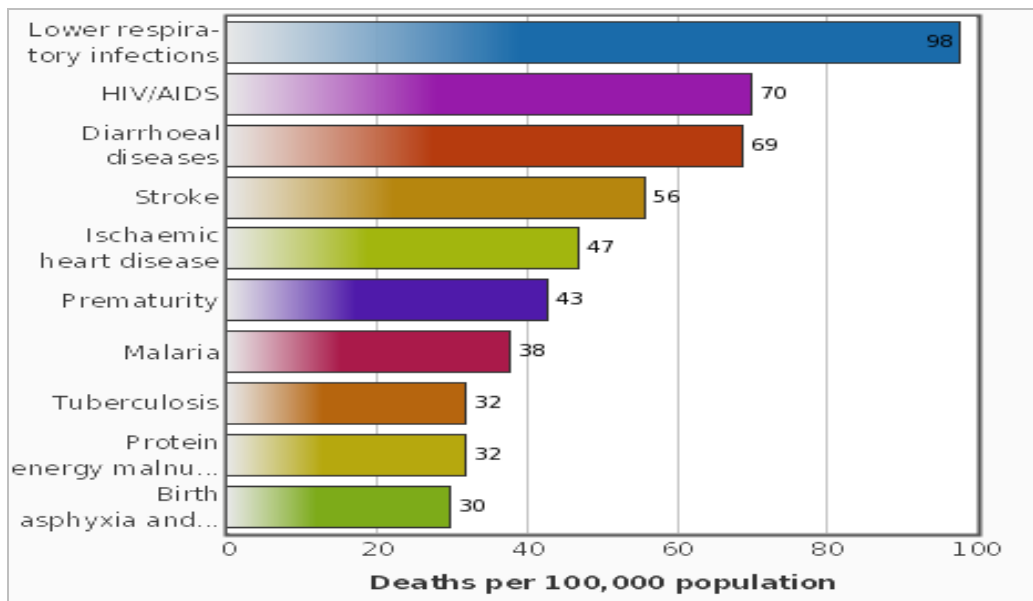
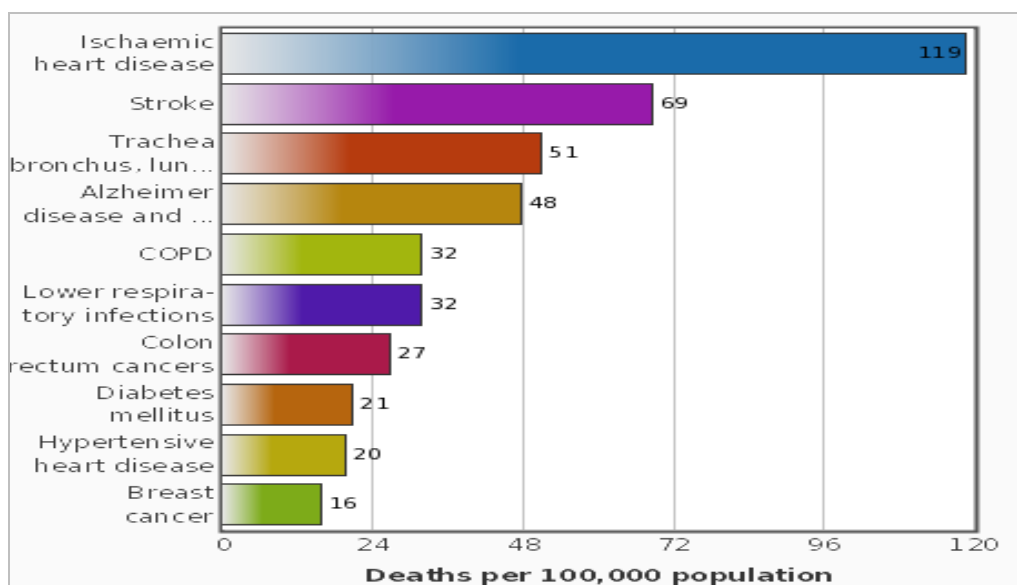


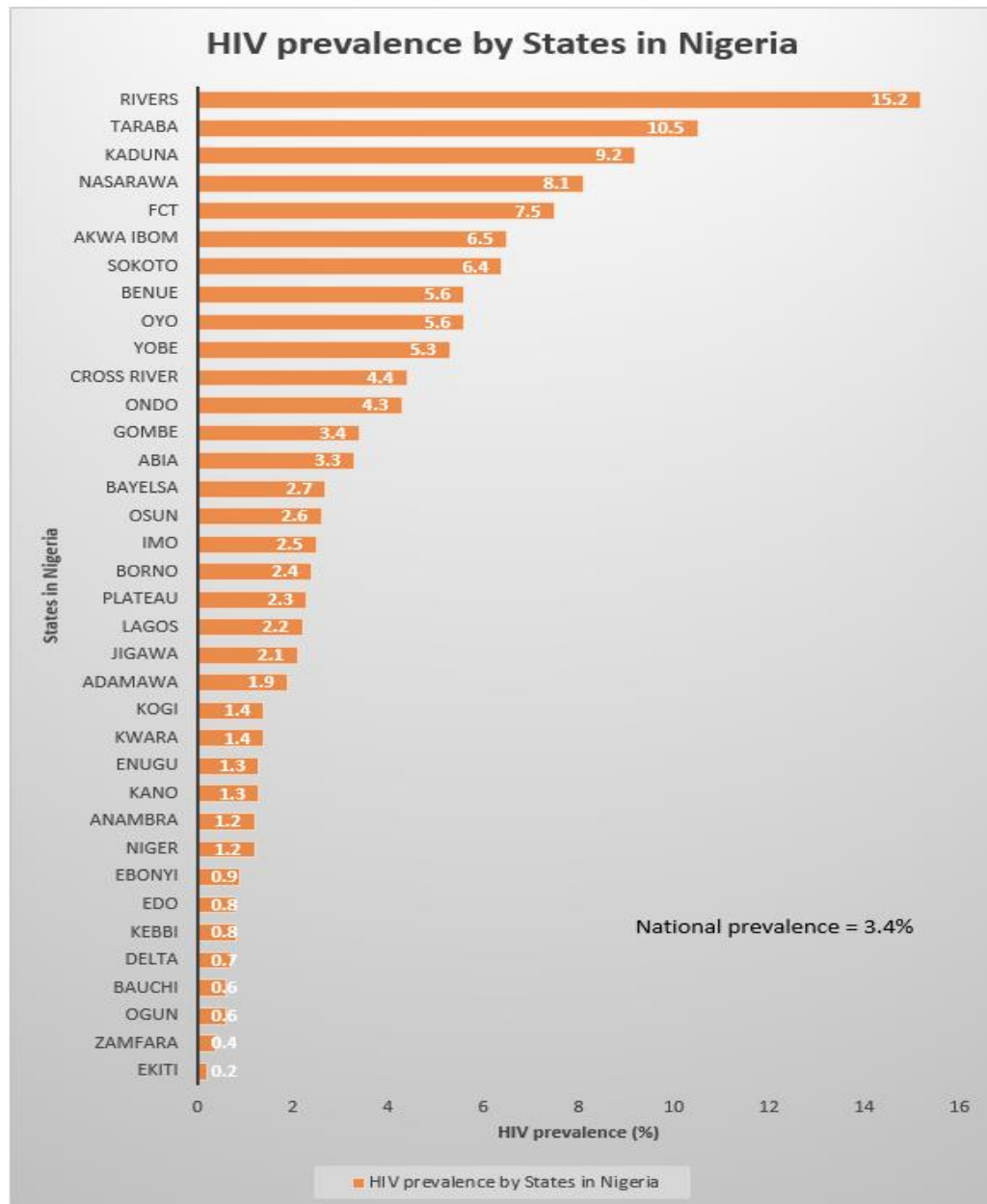
Figure 1.2: Top ten causes of death in high income countries, 2012 (6)



Furthermore, within-country HIV data reveals that defined populations within countries sometimes carry significantly increased prevalence of HIV infection and, as a result, bear disproportionately greater burden of HIV when compared with other local populations within the same country (8, 9). For example, Nigeria, a country located in sub-Sahara of Africa, has huge variation in HIV prevalence across different

regions and States of the country (8, 9). Figure 1.3 gives a cross-section of HIV prevalence and distribution in Nigeria by States (9).

Figure 1.3: HIV prevalence in Nigeria by States of the country in 2015 (9)



Based on the premise that HIV burden reflects wealth disparities between countries, one may not be wrong to think that country level wealth plays an important role in HIV prevalence distribution within and between countries. However, it is more plausible to theorise that wealth (or income) alone cannot account for observed “between-country” and “within-country” variations in HIV prevalence and burden. This

is because there is a plethora of research evidence, in support of the fact that diseases, especially at population level, are almost always multifactorial with multiple environmental and individual influences at play (10-16). Some factors known to play important roles in disease distribution within populations includes inequality, literacy levels, access to healthcare, knowledge, culture and local policies among others (10-16). The fact that recent and widely accepted public health models, attempting to explain health and the determinants of health, incorporate these broader environmental variables (listed above), goes a long way to show how important these variables are in influencing disease(s) in different settings (17, 18).

Understanding why HIV prevalence and HIV burden could vary so distinctly and significantly between populations (at international and local levels) forms the core of my PhD work. Identifying which of these variables is/are important for observed variation in HIV burden, within and between countries, is critical for the design of effective campaigns and advancement of knowledge in the field of HIV research and intervention.

I have chosen to study Nigeria (not only because HIV prevalence vary greatly between her states but) because Nigeria is located in the sub-Sahara of Africa where HIV burden is greatest in the world and, Nigeria is classified as a low middle income country by World Bank (8, 9, 19-21). I have chosen Benue State (in Nigeria) for my empirical research because HIV prevalence in this State is above the Nigeria national average of 3.4% (Figure 1.3).

1.2 Definition of key terminologies:

- 1) HIV is a virus that attacks the immune human system, and weakens its ability to fight infections and other diseases (1).
- 2) AIDS is the final stages of HIV infection, during which the human body can no longer ward off infections or offending organisms. With early diagnosis and effective treatment, most people infected with HIV will not go on to develop AIDS (1).
- 3) “Prevalence”, is a terminology that refers to “the percentage of a population that is living with a particular disease at a given time” (22).

- 4) Viral load is a measure of the quantity of the virus circulating in the blood; an index of HIV progression in people who are living with HIV (23). A high viral load is indicative of a poorly controlled HIV infection.
- 5) CD4 count is a measure of the CD4 cells in the human body. It reflects the health of the immune system and the clinical stage of an HIV infection. A normal CD4 cell count is more than 500 cells per cubic millimetre (mm³) of blood (23).

1.3 Project overview

My research is rooted in grounded theory of research because it seeks to provide theories or explanations for differences in HIV prevalence between communities (24). In the remainder of this section, I have outlined my thesis chapters and provided an overview of what is to be expected in subsequent chapters.

Chapter 2 (The research context) – this chapter provides a detailed scientific and historical backgrounds that are relevant to my research. It describes the study area and the research context (including policy and historical perspectives). This context is needed for in-depth understanding of HIV in Benue State and Nigeria.

Chapter 3 (Literature review methods) – this methods chapter provides details of the methods used in the systematic review and meta-analyses of articles from Nigeria as well as a justification for the choice of this method. It also includes the search strategy for data used in the comparative analyses section of my literature review.

Chapter 4 (Comparative analyses of country level data) – provides in-depth and structured comparative analyses of published data from Nigeria and some countries. This section explores how country wealth, income inequality and literacy can impact on HIV prevalence. It draws a parallel between Nigeria and India; South Africa; USA and the UK, thus adds a global dimension to my research. This section relies heavily on data from World Bank and World Health Organisation (WHO).

Chapter 5 (HIV in Nigeria) – this chapter presents the findings of the systematic review and meta-analyses of primary research articles from Nigeria. Information

gathered from this exercise (the systematic review and meta-analyses) was used in the design of the qualitative arm of this project (Chapter 7).

Chapter 6 (The qualitative methods) – this second methods chapter presents the approaches employed in the qualitative research phase. It also offers a justification for this approach.

Chapter 7 (HIV in Benue State, the micro-environment) – this chapter is the first of two qualitative results chapters. Here, I have reported on identified themes that operate at individual level to produce excess HIV prevalence, hence the term “micro-environment”.

Chapter 8 (HIV in Benue State, the macro-environment) – this second qualitative results chapter focuses on structural themes that predispose locals to HIV. Some themes discussed under this section have strong associations with others discussed in Chapter 7. The relationship between themes in chapters 7 and 8 will be explored in chapter 10.

Chapter 9 (The quantitative methods and results chapter) – this section contains the methods adopted for the quantitative phase of my empirical research. It also contains the results the quantitative analyses. These analyses were carried out to explore the nature and patters of association (if at all any) between variables identified in previous sections of this research.

Chapter 10 (Discussion and conclusion) – this chapter offers some arguments and explanations for patterns and relationships observed in this research. It also seeks to explain the mechanisms that lead to increased local HIV prevalence and concludes with statements about the implications of my research findings for policy makers and future research.

In summary, my research begins with a global perspective and concludes with a local analyses of data generated through fieldwork.

1.4 Research aim

The aim of this research is to investigate the reason(s) behind differential HIV prevalence in different parts of Nigeria.

1.5 Research objectives

- 1) To identify the factors that have led to high HIV prevalence in Benue State, Nigeria
- 2) To describe patterns of relationship between identified factors
- 3) To highlight factors that could be useful in the control of HIV in Benue State
- 4) To define the socio-demographic profile of HIV in Benue State, Nigeria
- 5) To explore the impact of HIV across different socio-demographic strata in Benue state
- 6) To proffer solutions and make recommendations based on observed trends
- 7) To provide information useful for future research

1.6 Research questions

- 1) Why is HIV prevalence in Benue State higher than the national average in Nigeria?
- 2) Why are current national HIV control measures not achieving desired results in Benue State Nigeria?
- 3) What individual characteristics (or demography) are associated with increased risk for HIV infection in Benue State, Nigeria?

CHAPTER 2: The research context

This chapter provides relevant scientific, historic and policy contexts about HIV in Nigeria. It concludes with a brief description of Benue state (the location where data collection activities were undertaken in Nigeria).

2.1 The origin of HIV (theories and counter theories)

It was in 1983 that two French scientists, Françoise Barré-Sinoussi and Luc Montagnier, described the particle (HIV) responsible for the mysterious illness that was claiming lives on a scale best described as a pandemic (25). These scientists would later get a Nobel peace prize for this breakthrough (26). Some reports suggest that HIV may have well been in existence as far back as 1930 (27, 28), but not on the unprecedented scale witnessed in the late 1970's to early 1980's. Exact details as to when and how HIV originated remains a controversial topic. It is popular opinion, among scientists, that HIV is a zoonotic infection, whose origin is traceable to chimpanzees and monkeys in Central and Western Africa (27, 28). This is because the HIV virus has "very strong" similarities with some strains of simian viruses that have been isolated in chimpanzees and monkeys (29, 30). However, simian viruses do not normally cause disease in humans. As a result, it is thought that HIV is a mutant simian virus, with the capability to cause diseases in humans. HIV-1 is thought to have been created after chimpanzees (that are host to SIVcpz) fed on monkeys (hosts to SIVsmm). It is the coming together of these two strains of the simian viruses (occasioned by chimpanzees feeding on monkeys) that is believed to have created the conditions necessary for a new virus (HIV-1) to emerge: a variant of simian viruses with capacity to infect humans and cause disease (31). The explanations for the origins of the second strain of HIV (HIV-2) is slightly different. HIV-2 is believed to have resulted from direct and repeated transfers of SIVsmm between humans and monkeys (27, 31). For these theories to be plausible, there must be an explanation for how these mutated simian viruses made the huge leap from their primate hosts to humans.

The most widely accepted explanation for this primate-to-human leap in the origins of HIV is the thinking that human activities, such as hunting and industrialisation, that brought humans into contact with these mammals in their natural habitats, are to blame: these activities facilitated human infection with the mutated simian viruses by bringing humans in contact with the primate hosts – monkeys and chimpanzees (29).

The accuracy of these accounts have been questioned by a number of theories: some research based, others more like conspiracy theories as they are lacking in any real scientific evidence. For example, SIVcpz infected chimpanzees do not develop immune deficiencies that are almost always the case in humans, despite chimpanzees and humans sharing more than 98% sequence identity in their genome (32). Also, for the first infected human to have successfully transmitted the infection to another, “a number of within species mutations and adaptation must have taken place” (33) to make it possible. “When the conditions needed for SIV to complete the genetic transition from individual human SIV infections to epidemics HIV in humans were examined (by placing the genetic distance from SIV to HIV and, the mutational activity needed to achieve this degree of adaptation to human hosts, in a mathematical model) it was found that the emergence of even one epidemic HIV strain, following a single human exposure to SIV, was very unlikely: the probability of four or more such transitions (HIV-1 group M,O and HIV-2, subtypes A and B) occurring in a short time is vanishingly small” (33). This has led some scholars to the conclusion that “some modern event must have aided the transition of SIV to HIV, as SIV cannot become a zoonosis without the said adaptive mutations” (33). Further limitations to the theory of HIV origin described above includes the lack of plausible explanations to the sudden resurgence of HIV in the 20th century (33), considering SIV have been dated to as far back as 32,000 years ago (34) and the fact that far fewer than expected wild caught chimpanzees harboured HIV-1 cross-reactive antibodies to SIVcpz [the precursor to HIV-1] (32). These recent findings have led researchers to the thinking that there could be unidentified species of reservoir primates that may have infected humans, monkeys and chimpanzees with SIVcpz altogether, as important questions remain unanswered regarding the precise geographical origins of HIV-1 groups M, N, and O and the natural SIVcpz reservoirs that were their source (32). Furthermore, the earliest documented case of HIV was in the early 20th century (27, 28), with the first documented HIV pandemic occurring in

the late 20th century (25). These gaps in the temporal sequence of events in the history of HIV (from mutation through emergence of pandemics), raises further questions about the origins of HIV, the theories explaining the mutations of SIV and the primate-to-human leap of HIV.

It is the lack of conclusive evidence and clarity about the origin of HIV that allows for a number of conspiracy theories on HIV origins to flourish. One of such conspiracy theories about HIV primate-to-human leap, now discredited (35-38) but worthy of mention, has it that HIV have resulted from medical interventions in the 1950's in Africa during which experimental OPV, manufactured using chimpanzee kidneys, were administered to local populations in central and western Africa (32, 39). Many of these conspiracy theories, including one in which HIV is believed to have been created by the USA CIA agency, were summarised in the Times publication titled "The CIA and AIDS" (40, 41). In another controversy, a German scientist (Mr Segal, former director for microbiology at Humboldt University in Germany) argued that HIV was created in Fort Detrick (USA) by the CIA out of a sheep virus which is 60% like the HIV virus (40). Similar claims were made by Dr Leonard G. Horowitz, a Harvard graduate (42), and Cribb Julian (43). Some schools of thought argue that epidemics of HIV witnessed in the 20th century emerged due to unsafe injection practises in Africa in the periods around World War I as well as changes in social structures in colonial cities that in turn led to increased prostitution and sexually transmitted diseases (33, 44).

Whatever stance one takes, one thing remains clear: the debates about the origins of HIV will continue for some time yet as there is no convincing evidence to prove, beyond reasonable doubts, the origins of HIV. What is more important, however, is the need for greater understanding of ways in which HIV transmission can be halted.

2.2 Strains of HIV and their epidemiological relevance

There are two known HIV strains: HIV-1 and HIV-2 respectively. HIV1- is believed to have originated from SIVcpz and SIVsmm whereas HIV-2 is believed to have originated from SIVsmm (27). In terms of geographical spread of HIV epidemics in Africa, HIV-1 (which has subtypes M, N, O and P) is the predominant strain in epidemics in Central Africa: HIV-1 is thought to have originated (in part) from SIVcpz,

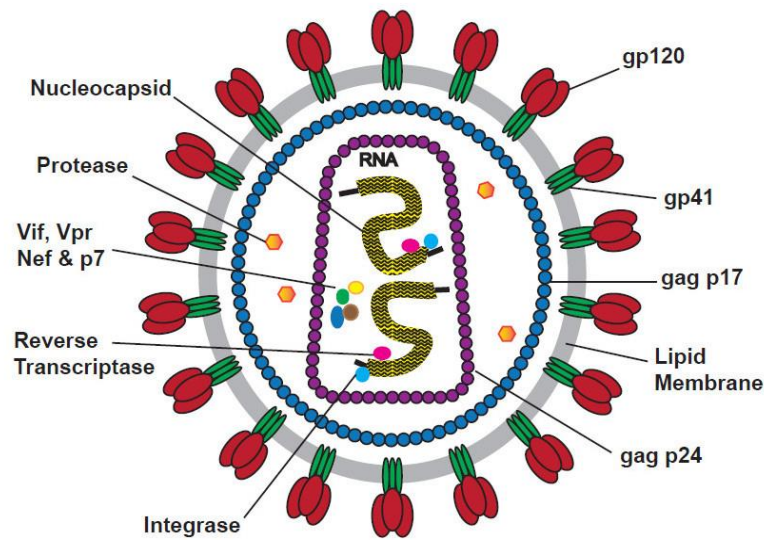
whose primate host (the Chimpanzees) is native Central Africa (45, 46). However, HIV-2 (which has subtypes A and B), which is the rarer of the two HIV strains, has epidemics that are largely confined to West Africa: HIV-2 is thought to have originated from SIVsmm found in Monkeys native to West Africa (47, 48). HIV-2 is also believed to be less infectious compared to HIV-1 (27).

2.3 The molecular structure of HIV

The smallest infective HIV unit (the virion) is shown in Figure 2.1 (49). Important components of the HIV virion are highlighted as follows:

- 1) Glycoprotein 41 and 120 (gp41 and gp120): these are structures on the surface of the HIV virion that facilitates its binding to certain human immune cells (like T helper cells and monocytes) that express a unique set of receptors (CCR5, CXR4 and CD4) on their surfaces. These molecules (gp41 and gp120) on the surface of HIV virions facilitate the entry of HIV virions into host cells, in a step that is critical in the lifecycle of HIV (50, 51).
- 2) The viral polyprotein or matrix proteins (Gag: p17 and p24) are important for replication of HIV within its hosts (52, 53).
- 3) Reverse transcriptase is the enzyme within the virion that helps the viral particle to generate its own DNA using an RNA template (54)
- 4) Integrase is the enzyme that enables the HIV genome to become incorporated into host genome (55, 56)
- 5) Aspartyl protease (an enzyme within the HIV particle) is responsible for the maturation of new virions by cleaving newly generated HIV polyproteins. Without the activities of this enzyme, newly generated virions will not be able to infect other host cells (57, 58).

Figure 2.1: Structure of the HIV virion (49)



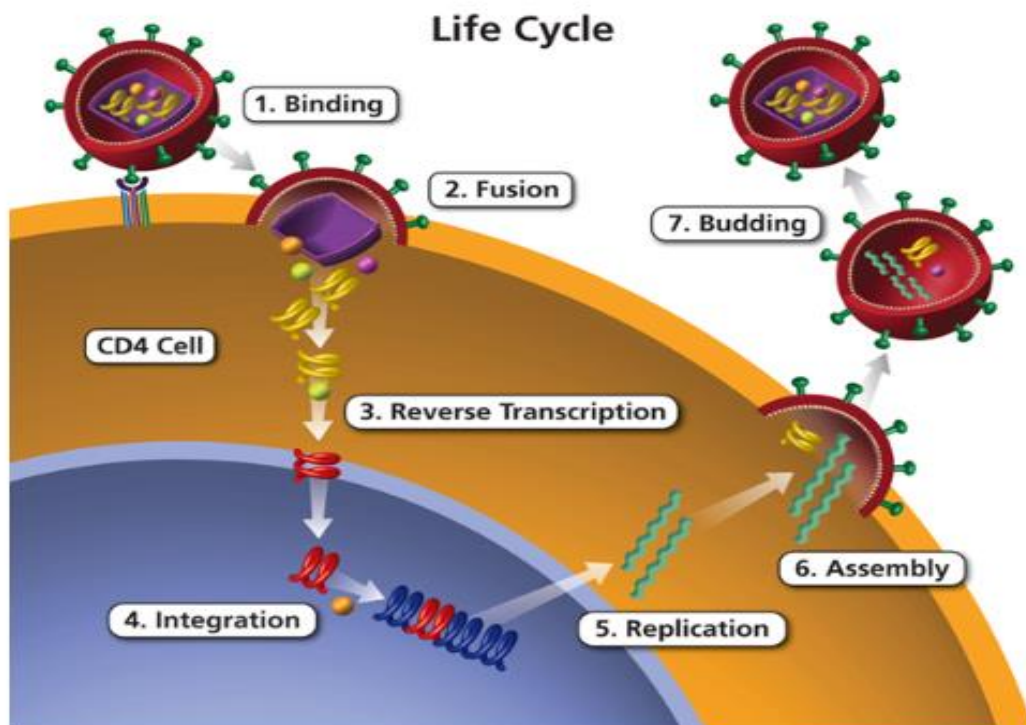
2.4 How HIV causes disease (the pathogenesis)

The damages the HIV virus does to the human immune system, is the result of the processes that leads to the creation of new HIV particles [the HIV lifecycle] (2, 59). Figure 2.2 gives a summary of the processes that leads to the creation of new infective HIV particles or virions (2). It is the understanding of the stages involved in HIV replication that have led to the development of effective HIV medications in use today. Important steps in HIV lifecycle are as follows:

- 1) Binding: the process through which the infective HIV particle becomes attached a human defence cell which expresses CD4 receptors (2)
- 2) Fusion: this is the phase in which the infective HIV virion becomes fused with the host defence cell. This step leads to the release of viral genetic materials (RNA) and viral enzymes (reverse transcriptase and integrase) into the attacked host cell (2)
- 3) Reverse transcription: this is the stage at which the enzyme reverse transcriptase codes viral genome (DNA) from the viral RNA template (2)

- 4) Integration: at this stage the viral genetic code crosses into the host cell's nucleus and becomes integrated into the host DNA with the help of HIV integrase enzyme. By doing so, the infective particle succeeds in taking over the host cell's capacity to replicate (2)
- 5) Replication: at this point the host cell's replication structures are taken over by the HIV virus and used for the replication of viral genome. Transcripts of the viral genome crosses into the host cell cytoplasm where viral proteins are produced. These viral proteins will form the building blocks for the formation of new viral particles or virions (2)
- 6) Assembly: in this is phase, immature viral RNA and proteins move to the surface of the infected host cell in preparation for the next stage (which is budding) (2)
- 7) Budding: at this stage, finished viral units break off the invaded host cell, carrying with it some of the host cell's outer membrane. The HIV bud is then made mature through the activity of the HIV protease enzyme. The action of this enzyme converts the newly created viral particles into active and infectious particles (the virion). This new infective HIV unit is then capable of infecting other host cells that express CD4 receptors and the cycle begins all over again. At the end of this stage, the infected host cell is damaged (2).

Figure 2.2: Life cycle of HIV in hosts and how HIV infection is established (2)



2.5 HIV treatment (medications and current practises)

Medications currently in use for HIV treatment work by interfering with one or more of the stages in HIV replication (outlined in Figure 2.2). These medications are commonly used in what is known as combination therapy for better results. There are, at least, six broad classes of medications in use today:

- 1) Those that interfere with HIV reverse transcriptase enzyme activities
 - a. Non-nucleoside reverse transcriptase inhibitors (NNRTIs), for example Nevirapine and Efavirenz (2, 60)
 - b. Nucleoside reverse transcriptase inhibitors (NRTIs), for example Tenofovir and Abacavir (2, 60)
- 2) Protease inhibitors - medications that block the actions of the viral enzyme protease, for example Darunavir (2, 60))

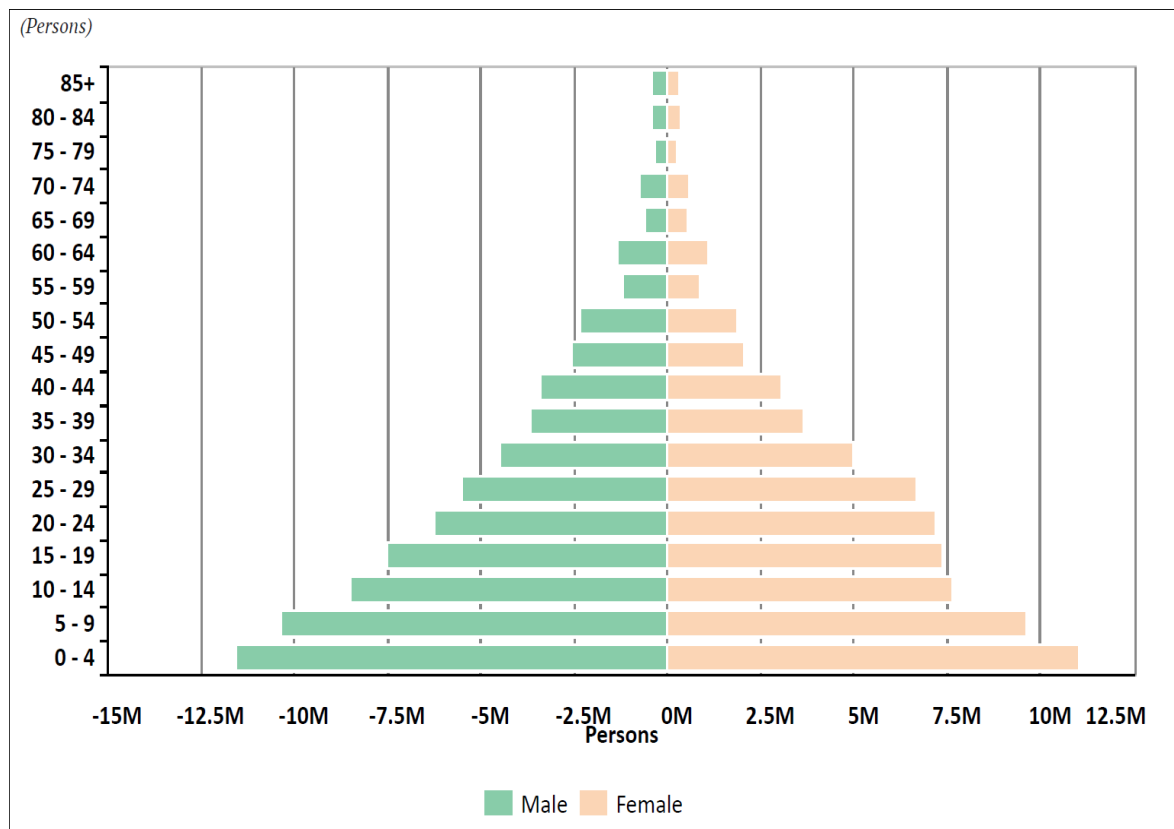
- 3) Fusion inhibitors, for example Enfuvirtide, prevent the fusion phase described in the lifecycle of HIV above (2, 60)
- 4) CCR5 antagonists (CCR5s): This class of HIV medications, for example Maraviroc, act by competing with virions on the CCR5 receptors and preventing binding of HIV virions to host CD4 cells (2, 60)
- 5) Integrase strand transfer inhibitors (INSTIs): this class of medications, for example Dolutegravir and Elvitegravir, work by blocking the activities of the HIV enzyme “integrase” (2, 60)

In the evaluation of HIV treatment success, regular CD4 count and viral load assessments are needed for early detection of treatment failure and monitoring of treatment effectiveness. Early treatment failure detection is important for timely decision on medication regimen switch and for prevention of the transmission of resistant strains (61, 62). Common causes of treatment failures include drug resistance, poor treatment adherence, reduced HIV medication potency, unnecessary regimen switches and pharmacokinetic issues (63) (64). It would be incomplete to discuss HIV treatment options and current practises without mentioning treatment as prevention (TasP) and pre-exposure prophylaxis (PrEP) (65, 66). These two recent trends in HIV treatment and prevention rely heavily on the use of HIV medications for preventing infection among those who are at increased risk for contracting HIV. These two approaches have been shown to decrease HIV transmission to non-HIV positive others and halt disease progression in people living with HIV (65-67).

2.6 Nigeria’s demography in brief

Nigeria is one of the 48 countries in sub-Sahara of Africa. Based on the 2006 national census data, Nigeria has a population of approximately 140 million people, out of which about 49.2% are females (68). This population is projected to have grown to about 180 million in 2015 (20). Figure 2.3 is a population pyramid which describes Nigeria’s population age structure. The broad base reflects high birth rate and a relatively high proportion of young people (Figure 2.3). Whereas, the narrow peak reflects a relatively smaller proportion of older people (Figure 2.3). Life expectancy at birth in Nigeria is estimated at 52.754 years (20).

Figure 2.3: Nigeria population pyramid based on data from the 2006 census (68)



2.7 Nigeria, a brief historical perspective

Present day Nigeria is a hugely diverse country with approximately 521 distinct languages: about 27 of which are endangered or extinct (69, 70). Nigeria is also the most populous country in Africa with a population of about 180 million people inhabiting about 924,000 square Kilometres of land mass (20, 71). Nigeria has not always existed as we know it today. For reasons of clarity, I will describe Nigeria using three important historic time points: pre-colonial, colonial and post-colonial eras respectively.

2.7.1 Pre-colonial “Nigeria” (500BC - 1800)

Scholarly articles have it that the people residing in Nigeria today, lived in smaller units of civilisations in the form of kingdoms, empires or chiefdoms that differ significantly in cultural, religious and leadership structures (72, 73). Nigeria formally came into existence only in 1960. Notable pre-colonial civilisations includes the Nri

kingdom (present day Igbo ethnic group in South-Eastern Nigeria) known for bronze artworks (74); the Nok civilisation (present day Middle-Belt or North-Central region) known for great art works (75, 76) and the Oyo and Ife kingdoms of South-western Nigeria (72, 77). There was also the great Benin Empire (located in South-Western Nigeria) which existed sometime in the 19th century. It is recorded that the walls of the Benin Empire stretched from South-Eastern through to South-Western Nigeria and has been described in contemporary history notes as “four times longer than the Great Wall of China, consuming a hundred times more material than the Great Pyramid of Cheops and the largest single archaeological phenomenon on the planet” at the time (78). The Benin wall also made it into the 1974 Guinness book of world records as the “world’s largest earthwork carried out prior to mechanical era” (79). Much of these civilisations, especially the Benin architecture and civilisation, were burned to the ground and lost during the period of colonialism and slave trade that followed (79). There are several other civilisations (80) in this region that time and space do not allow for inclusion. The bottom line is that the region, known as Nigeria today, is far from a homogenous entity as it is made of people whose identities (social, cultural and political leanings) have been formed over many years prior to contact with Europeans and other civilisations. This heterogeneous cultural melting pot would set the stage for events that occurred later in Nigeria.

2.7.2 Colonial Nigeria (1800-1960)

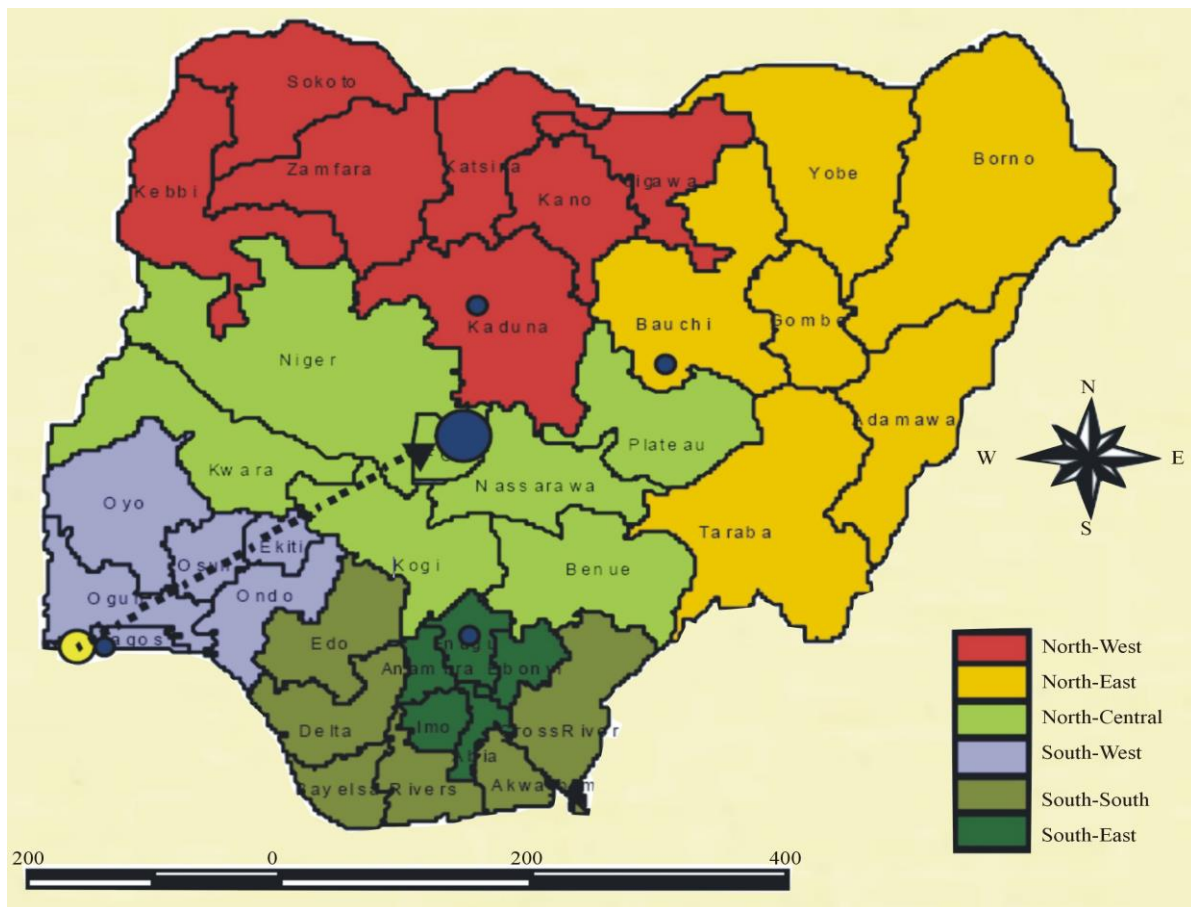
This period in the history of Nigeria is characterised by the coming together of different kingdoms, albeit arbitrarily, under one colonial entity (Nigeria) and the massive exodus of locals in the transatlantic slave trade (73, 81, 82). During this period, Colonial Britain conquered and ruled sections of Nigeria from South through to the North in a sequence that began in the West and ended in the North (82). Critics of British activities, in Nigeria, during this period argue that these sequential gains in territory meant that the land maps (drawn by colonial Britain) to create the country Nigeria, failed to take into account pre-colonial sociocultural, economic and geographic identities that existed prior to the arrival of colonial Britain, an action that would later generate huge tensions and friction between these unique ethnic groups (82, 83). It is also argued, among historians, that the geographic and economic configuration of Nigeria (during this period) cannot be used to make a strong case for

any particular government structure (be it unitary, federal, or confederal), “after all, colonial Britain did not enter into West Africa to create countries, but to trade in the first instance” (82, 84). “Thus, by 1900, the haphazard manner in which the British pursued their interests in the area had resulted in the emergence of three huge bloc of colonial territories (Western, Eastern and Northern bloc), each of which was administered separately and dealt with directly by the home government, even though they occasionally cooperated, especially when the need arose, to mobilize troops to conquer any Nigerian State or community that was seen as posing a serious threat to the consolidation of British authority and the expansion of British commerce” (82). It is documented that “by the end of the eighteenth century, the area that was to become Nigeria was far from a unified country with the orientation of the north and the south entirely different.” (73). This huge regional bloc, divided in history and identities, forms the foundations of upon which present day Nigeria is built.

2.7.3 Post-colonial Nigeria (1960 - present day Nigeria)

Nigeria runs a federal system of government with 36 federating units (or States) and a Federal Capital Territory (FCT) [Figure 2.4]. The structure for the current system of government in Nigeria was laid down in 1950, ten years before Nigeria got her independence from colonial Britain (81). The first signs of how divided the new country (Nigeria) is emerged during this period and during the drafting of the federal constitution: regional leaders were more interested in a federal system that allocates significant powers to regions rather than a central government (85). The desire for a more regional system of government stems from the fact that peoples in Nigeria prefer to project their ethnic identities over national consciousness (86). This is easy to understand given Nigeria’s historical background as highlighted in “pre-colonial” and “colonial” Nigeria above. This rather lackadaisical approach to national issues, that gives front burner position to ethnicity/regional interests, rather than a common national identity, would go on to play important roles in the political and leadership instability (in the form of coups and countercoups and the Nigeria civil war between 1967 and 1970) as well as the corrupt practises that characterise national life in this era (87). As a result, central government is vaguely accountable as citizens show little interest in central government affairs.

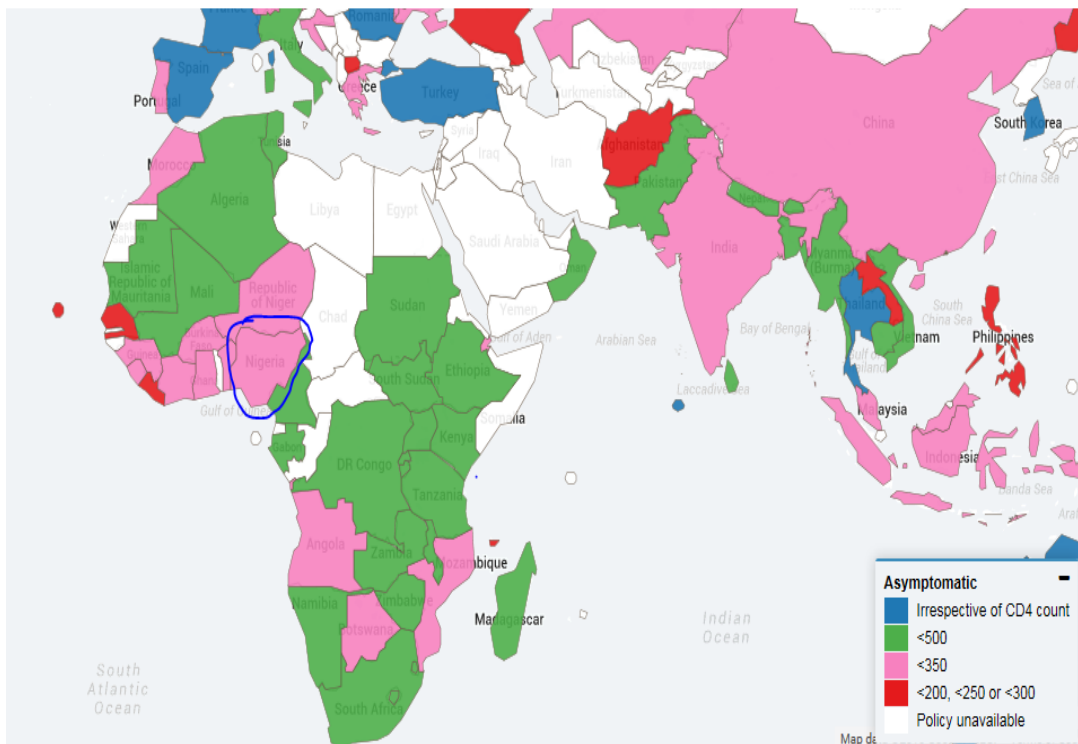
Figure 2.4: Map of present day Nigeria showing her 36 States and six geopolitical regions carved out of the colonial North, South and Eastern bloc (88)



2.8 Relevant local policy context(s)

There are a number of policies in Nigeria that provide important background for the understanding of HIV in Nigeria. First is the HIV medication or treatment policy. Currently, Nigeria practises commencement of HIV medication for newly diagnosed HIV cases only when CD4 count is less than or equal to 350 (89, 90). Figure 2.5 shows countries in Africa, colour coded according to HIV treatment initiation policies - Nigeria is colour coded pink alongside other countries that have similar HIV treatment policies. The implications of this policy and how it affects HIV spread in countries will be further explored in the comparative analyses (under section 4.3).

Figure 2.5: Map showing HIV medication policies in African countries (90).



Another policy worth mentioning is the law which criminalises commercial sex work and homosexual activities in Nigeria (91). The implication of this legal framework is that these two, high HIV risk, groups are exposed to abuse and exploitation from law enforcement agents, their clients and other members of the public as they are not protected by the State legal systems (92-95). There is also no law that criminalises deliberate HIV transmission in Nigeria.

2.9 The Nigeria public healthcare structure

Public healthcare in Nigeria is in three tiers: Primary, secondary and tertiary respectively (96). There is also the private sector which augments the above structure. Healthcare in Nigeria remains poor and needs a lot of restructuring for the attainment of better services and coverage (97).

2.9.1 The primary healthcare (PHC)

Primary healthcare in Nigeria is the responsibility of local authorities or local governments (96). Situated in local government areas, they (PHCs) serve as the first point of contact with healthcare for most Nigerians, especially people residing in villages and rural areas (where the majority of Nigerians reside) (96, 98). Duties of primary healthcare includes immunization, maternal and child health, social and economic development of host communities and preventive medicine: PHCs are designed to bring healthcare close to people in their places of residence and constitutes the first element of a continuing health care process (96) (99).

Criticisms of primary healthcare in Nigeria include poor funding and staffing amongst others (100, 101). As a result, most primary healthcare centres are either non-functional, inoperable and/or underutilised (102). Rural residents, therefore, turn to traditional healers (TH) and traditional birth attendants (TBA), for their health needs. This increased patronage of TH/TBA could have informed government decision to incorporate TH and TBA into the healthcare systems. As a result, the Revised National Health Policy (of 2004), which formally recognises and incorporates traditional birth attendants and traditional healers into mainstream healthcare at primary level, was birthed: this policy stemmed from the practical limitations of primary healthcare services in rural areas, in addition to the problem of sociocultural compatibility (96). Whilst the initiative to recognise and incorporate traditional practitioners into primary healthcare is noble, the biggest drawback with this approach (as far as HIV epidemiology is concerned) remains the significant HIV knowledge gaps and unsafe practises that are widespread among these local practitioners (TBA and TH). Also, traditional medical practices vary greatly from place to place and carry the attendant problem of non-uniformity of practises: the activities of TBA/TH are largely reliant on/and dictated by local norms and belief patterns.

2.9.2 Secondary and tertiary healthcare (hospitals)

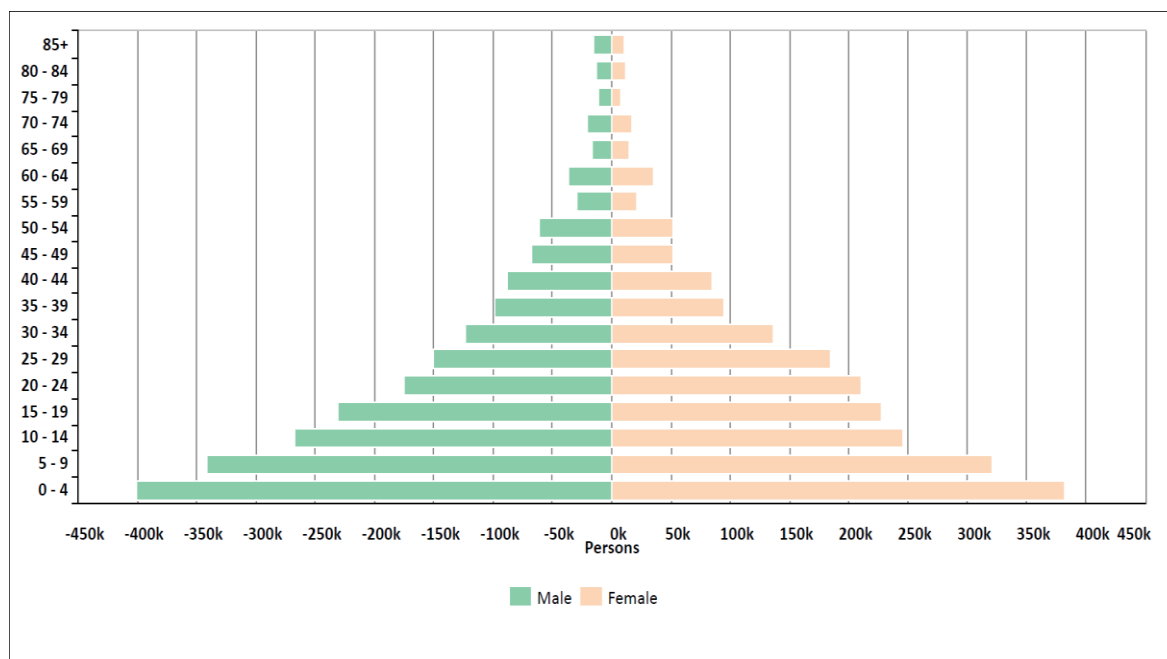
Secondary and tertiary healthcare in Nigeria are grouped together into “hospitals” (96), the main difference being in their funding source. Secondary healthcare facilities are funded or maintained by the State governments whereas tertiary facilities are funded by the federal government. The main objective of hospitals is

curative medicine (and research) as opposed to preventive medicine in PHCs. Hospitals are better funded and have better staffing and facilities compared to PHC. Unlike PHC facilities, hospitals are situated in the cities or urban centres where the more affluent members of society reside (103). The siting and distribution of healthcare facilities implies that individuals who are resident in rural areas are at a disadvantage and are arguably victims of healthcare inequality by virtue of their place of residence (103). The unequal access to healthcare created by virtue of location and the resultant impact shall be explored further in the empirical research stage.

2.10 About Benue State (the empirical research area)

Benue State is the main empirical research site. Located in the North-Central (or Middle-Belt) region of Nigeria, it is home to a number of distinct ethnic groups, notable among which are the Tiv and Idoma speaking communities (the two largest ethnic groups in Benue State). The State is divided into three senatorial districts: A, B and C respectively. Two of the three senatorial districts (A and B) are in the Tiv speaking areas of Benue State while the third (Zone C) is inhabited, predominantly, by Idoma speaking people of Benue State. Further details about Benue could be found on the State website (104). One of the major towns in the Tiv speaking area, Makurdi, is the State capital. Another historically important town in the Benue State, Otukpo, is inhabited by the Idoma people of the State. Otukpo and Makurdi are about 1.5 to 2 hours' drive apart. Benue State (which is also known as food basket of Nigeria because of its huge agricultural potential) has a population of about 5 million, most of whom are either farmers or civil servants (104). Information about religious leanings in Nigeria is largely anecdotal since Nigeria's population commission does not routinely collect this information (83). The two major religious groups in Benue are Christianity and Traditional (indigenous) worshippers with a relatively smaller Muslim group (83, 104). Benue State's demography mirrors the national picture, with about 49.6% female population, a broad base and a relatively narrow peak (Figure 2.6).

Figure 2.6: Demographic structure of Benue State by age (105)



Finally, Benue State serves as an important hub for road transportation between the mainly Muslim north and largely Christian South of Nigeria (it has junctional towns).

2.11 A synopsis of the HIV response in Nigeria (funding and policy trends)

Following the discovery of HIV in Nigeria, in 1986, came a number of programs and policy interventions aimed at reducing local HIV burden (106-110). Initial attempts at curbing HIV in Nigeria were largely coordinated by small pockets of civil society organisations/groups and international agencies with funding significantly provided by international donors (106, 110). About 3.7 million USD was spent on HIV related activities in Nigeria in the year 1996, however, only about 9,756 USD of this amount came from the Nigerian government, the remainder coming from “international donors” (110). As a result, much of the activities were directed and coordinated by these donor groups. It is, therefore, no surprise that critics of initial HIV response in Nigeria opined that, as at the time, “Nigeria has not yet determined the right mix of policies and programmatic approaches for tackling the HIV crisis; the country has muddled through [her HIV response] by basically following trends and approaches recommended or dictated by United Nations agencies (such as the WHO and UNAIDS) and other international organizations that were at the forefront of the

response to the HIV epidemic...” (111). Adeyi. et. al., (106) further argued that governments (local and international) had underestimated the role migration, poverty, gender inequality, conflicts and war play in the spread of HIV.

The first documented HIV response from the federal government of Nigeria was an HIV program called the national AIDS prevention and control program (NACP), launched in 1986, which was essentially a “multidisciplinary committee” on HIV, with short and medium terms plans for HIV control in Nigeria (110). This program, NACP, would later merge with a sexually transmitted diseases (STDs) prevention program to become the national AIDS/STDs preventions program (NASCP) in 1992 (110). Key strengths of the NASCP program include the adoption of a multi-sectorial, multidisciplinary and inter-ministerial approach to HIV control; it was located in the department of primary health care and disease and therefore linked into the primary healthcare system and structures (110). With the inception of this program (NACP) in 1992, one could argue, began the introduction of order and coordination, at national level, of HIV activities in Nigeria. It is no surprise that initial campaigns aimed at controlling HIV in Nigeria were incorporated into STI prevention programmes, given that the prevalent route for HIV transmission in Nigeria is through unprotected heterosexual intercourse (accounting for about 80% of transmission) (19).

However, it would take another five years (about 10 years after HIV was first discovered in Nigeria) for the Nigerian government to approve her first national policy on HIV/AIDS/STIs (according to a government document published by NACA) (106) and, it was not until 2007 (about 20 years after HIV was discovered in Nigeria) that the first national HIV prevention program (NPP) was developed (112). These delays in the development and adoption of key policy documents are a reflection of the weak or slow response of the Nigerian government to what is a public health emergency. These delays also imply that in the intervening periods, HIV activities in Nigeria were not centrally coordinated and lacked any significant government direction and/or leadership.

HIV medications availability and access have remained serious challenges to the fight against HIV in Nigeria. From the late 1980’s (when the first case of HIV infection was reported in a 13 year old girl in Nigeria) until 2006, availability of HIV medications, as well as access, have increased steadily to levels where about one-

third (or 30%) of all those living with HIV and, who are eligible for treatment, have access to HIV medications (108). Much of this increase in HIV medication availability (and access) in Nigeria is credited to the support of international groups like PEPFAR. For example, in 2007, PEPFAR was responsible for over 83% of the medications available in Nigeria with only about 5% provided for by the Nigerian government (108).

Even with this progress in access and availability of medications in Nigeria, the need for HIV medications remains largely unmet and costs of accessing these lifesaving HIV medications remain prohibitive to most Nigerians (113). There has been a steady rise in the number of HIV testing sites across the country, a rise in the total numbers of those on HIV medications, as well as a steady increase in the numbers of sites that offer HIV medications and related services in Nigeria (114, 115), however, there has been no appreciable increase in the proportion of those who need HIV medications that actually have access to them: only an estimated 31% of all those living with HIV (and who are eligible for HIV medications) are currently accessing medications (19), a level reached since 2006. This could be pointer to the fact that more needs to be done to halt new HIV infections rate and/or increase access to medications.

The content and overall directions of HIV policies and programs rolled out since 1986 have been detailed, thorough and needs based: the overarching goal, over the years, remains to make HIV medications available to all that are HIV positive; to conduct more research into HIV (especially among hard to reach groups); to provide for those worse hit by HIV (for example orphaned and vulnerable children) through targeted programs; to increase capacity (through technical and resource development, including provision of equipment); to promote multi-sectorial collaborations and, to encourage decentralisation of interventions so as to bring interventions closer to local populations (106-109). What is lacking, however, is the robust response (especially in funding and political will) needed to translate policies and interventions into measureable action. As a result the major challenges to the fight against HIV in Nigeria, as highlighted in a 2001 government publication include “unstable political climate, lack of political will, commitment and involvement, lack of a coordinated multi-sectoral approach in the fight against the epidemic, over-centralization of

intervention programmes, competing priorities with other developmental needs and poor resource allocation to HIV/AIDS interventions” (106).

The fact that the HIV response in Nigeria relies heavily on existing local health facilities has significant implications for the successes of HIV campaigns in Benue State. At States levels, HIV activities rely on existing local healthcare infrastructures such as primary and secondary healthcare facilities for data generation, administration of medications and execution of campaigns. In a primary research article in which the authors analysed the patterns of healthcare facilities and how this impacts on the HIV response in Benue State, it was found that 93.4% of the healthcare facilities in Benue are primary healthcare facilities with secondary and tertiary healthcare facilities making up 6.3% and 0.2% respectively (116). Also, “specialised HIV services like prevention of mother-to-child-transmission of HIV (PMTCT) and ART were concentrated in the urban areas where secondary and tertiary facilities are predominantly located” (116) and “the population to facility ratio for primary healthcare facilities, secondary healthcare facilities and tertiary healthcare facilities were 2,371:1; 34,413:1; and 1,376,539:1 respectively” (116). The huge reliance of HIV campaigns, in Benue State, on a healthcare delivery structure that is already stretched and overburdened will, without doubts, lead to campaigns that are ineffectual and inadequate. It also implies that the rural areas, where the vast majority of Benue State locals reside, are at a disadvantage owing to the distribution of healthcare infrastructures and HIV services. One may at this point, be able to speculate that differences in the efficiency of local (State) healthcare infrastructures could in fact have informed observed differences in the success of HIV campaigns (and HIV prevalence data) observed in different parts of Nigeria: locations with weaker healthcare systems are less likely to have successful HIV campaigns seeing HIV campaigns are very much reliant on local healthcare facilities (PHC and hospitals).

In concluding this section, it is worth mentioning that in order for the fight against HIV in Nigeria to be effective, there is need for greater government inputs, especially in areas of funding for HIV activities and strengthening of local healthcare facilities/infrastructures.

2.12 The HIV care continuum in Nigeria and Benue State

The number of HIV medication sites have been on the increase in Nigeria from three hundred and ninety three in 2009 to one thousand and fifty seven in 2014 (115). This is significant progress compared to 2002 when there were only twenty five HIV medication centres in eighteen (out of the thirty six) states of the federation (115). Similarly, the number of HIV counselling and testing sites have increased from about one thousand and seventy four in 2009 to eight thousand one hundred and fourteen in 2014 (115). Also, the number of individuals living with HIV who are able to access HIV medications have been on the rise with 747,382 individuals accessing medications in 2014 as opposed to 302, 972 in 2009 (115).

According to international sources, an estimated 3.2 million Nigerians are currently living with HIV (19, 117). A recently published UNAID document revealed that only about 34% of those living with HIV in Nigeria are aware of their HIV status, of which only 88% are on HIV medications, out of which 81% are virally suppressed (19, 117). This picture lags behind the ambitious UNAID “vision 90-90-90” which stipulates that, in the year 2020, about 90% of all who are living with HIV should be aware of their status; and with 90% of those living with HIV on HIV medications and that 90% of those on HIV medications be virally suppressed: Nigeria is signatory to these vision 90-90-90 targets and clearly lags behind these targets (118).

In Benue State, about 1 million people were living with HIV, in 2013 (the year I began this project), according to data from Benue State agency for control of AIDS (BENSACA) and NACA (119, 120). However, only about forty-nine thousand nine hundred and sixty six (49,966) individuals were accessing HIV medications, according to 2013 data from BENSACA (119). The accuracy of HIV data, especially at States and local government levels, are debatable given the weak healthcare systems at State and local levels created by challenges already highlighted in earlier sections (for example “weak monitoring and evaluation systems as well as lack of appropriately designed tools for data collection”) (119). There was no reported State level data on the number of people living with HIV who were virally suppressed in Benue State in 2013.

2.13 HIV data generation in Nigeria (a process overview)

NACA is the national agency tasked with the oversight function of directing, coordinating and monitoring of HIV activities in Nigeria. One of her main duties is the generation of data on HIV activities in Nigeria, through monitoring and evaluation. NACA discharges this duty by interfacing with a number of State level agencies such as states agencies for the control of AIDS (SACA) and local government level agencies (LACA) (109, 114). Other organs in the chain of HIV data generation in Nigeria include civil society organisations (or third sector groups), federal level sectoral agencies such as the ministries (of health, youth and sport, education, women affairs and social development) and private organs (109, 114). Data generated at these levels are fed back to NACA which in turn uses them for the development of national policy documents, guidelines and statements. There are broadly three main HIV data collection processes in Nigeria, classified on the basis of the frequency of data collection and source of data. These three broad categories are routine and non-routine HIV data and second generation surveillance systems (115). Most of the data collection activities utilise a combination of behavioural data collection and serological testing (115).

Routine HIV data are those collected on a continuous and regular basis and at sites like clinics, through registers and clinic attendance (115). Examples of routine HIV data include data from HIV care cards; HIV medication registers; HIV counselling and testing summary forms; orphaned and vulnerable children registers; cohort analysis forms; client intake forms and HIV testing worksheet (115).

Non-routine data on the other hand are collected periodically (say after every one or two year cycle) and are generated through surveillance and surveys. Examples of non-routine HIV data include the following:

1. Sentinel surveillance among antenatal clinic and sexually transmitted infections clinic attendees: this surveillance systems targets antenatal clinic attendees aged between 15 and 49 years. It is conducted every 2-3 years and data gathered through this nationally representative activity is useful for monitoring HIV trends and for estimating HIV prevalence (115).

2. National HIV/AIDS and reproductive health survey (NARHS): this is a population based survey that targets women (between ages 15 and 49 years) and men (between ages 15 and 64 years). It is conducted every five years and generates data on knowledge, behaviour and practices related to the prevention and transmission of HIV and other sexually transmissible infections (115).
3. Integrated biological and behavioural surveillance survey (IBBSS): this survey is conducted every two or three years and targets high HIV risk groups such as injection drug users and commercial sex workers (115).

Finally, second generation surveillance systems are used “for monitoring trends in high HIV risk behaviour, as early warning signs, that are useful for understanding the dynamics of local HIV epidemic. Thus, second generation surveillance uses data from behavioural surveillance and it can also be useful for hypotheses generation” (115). Second generation surveillance systems are, therefore, analyses of data generated through any of the above behavioural surveillance. Examples of second generation surveillance activities include “epidemiology, response and policy synthesis (ERPS)” and “mode of transmission (MOT) analysis” (115).

One major setback with these data collection systems, described above, is their reliance on existing healthcare delivery structures (especially the primary healthcare) for data generation and processing. This is because existing gaps within the healthcare systems, that prevent these healthcare delivery facilities (especially PHCs) from functioning at optimum levels, will invariably impact on the quality of data generated and by implication the success of HIV campaigns. Weaknesses or lapses in existing healthcare structures, that could impact negatively on the quality of data generated through this pathway, include those of shortage of manpower, funding, poor infrastructures and equipment to mention but a few (100, 101, 114, 115). Thus, an effective HIV campaign in Nigeria is one that prioritises the need for an effective and efficient healthcare delivery system (especially at the primary healthcare level) as well as efficient and timely generation of high quality data.

CHAPTER 3: Literature review methods

(Comparative analyses and systematic review)

3.1 An overview

This chapter provides justification for my literature review approach (which combines a comparative analysis and a systematic review) and, outlines the methods adopted in the review process.

3.2 Justification for my literature review approach

I included a comparative review of data and a systematic review of articles from Nigeria in my literature review because of the need for a research work that is timely, up to date, not lacking a global perspective, relevant to the local population and manageable (given my PhD timeline). It is well-documented that wealth and health are strongly correlated, with wealthier nations (and individuals) tending to have better health indices (6, 121). The comparative analysis offers a “between-country” perspective on HIV prevalence (using indices that are comparable at country level), whereas the systematic review provides a “within-country” analysis of HIV prevalence and relied on primary research articles published about HIV in Nigeria (data that may not be directly compared with data from other countries). A systematic review and meta-analysis was included in my PhD work because it has the potential to generate a concise, up-to-date and high quality summary of HIV research publications from Nigeria. A systematic review is also useful for identifying gaps that could be exploited to bring about improvements in current HIV interventions in Nigeria. The rigorous, thorough and transparent nature of systematic reviews makes them superior to other conventional literature review techniques, especially in areas of research where one is likely to encounter a significant volume of research publications, with authors concluding in slightly different directions. This is because systematic reviews (and meta-analyses) take into account more numbers of publications regardless of the direction of conclusion of the authors and as such are less likely to produce biased

conclusions when compared with other conventional literature review techniques. It is, therefore, less likely for a researcher to “cherry pick” articles that support a particular theory when they conduct systematic reviews and/or meta-analyses.

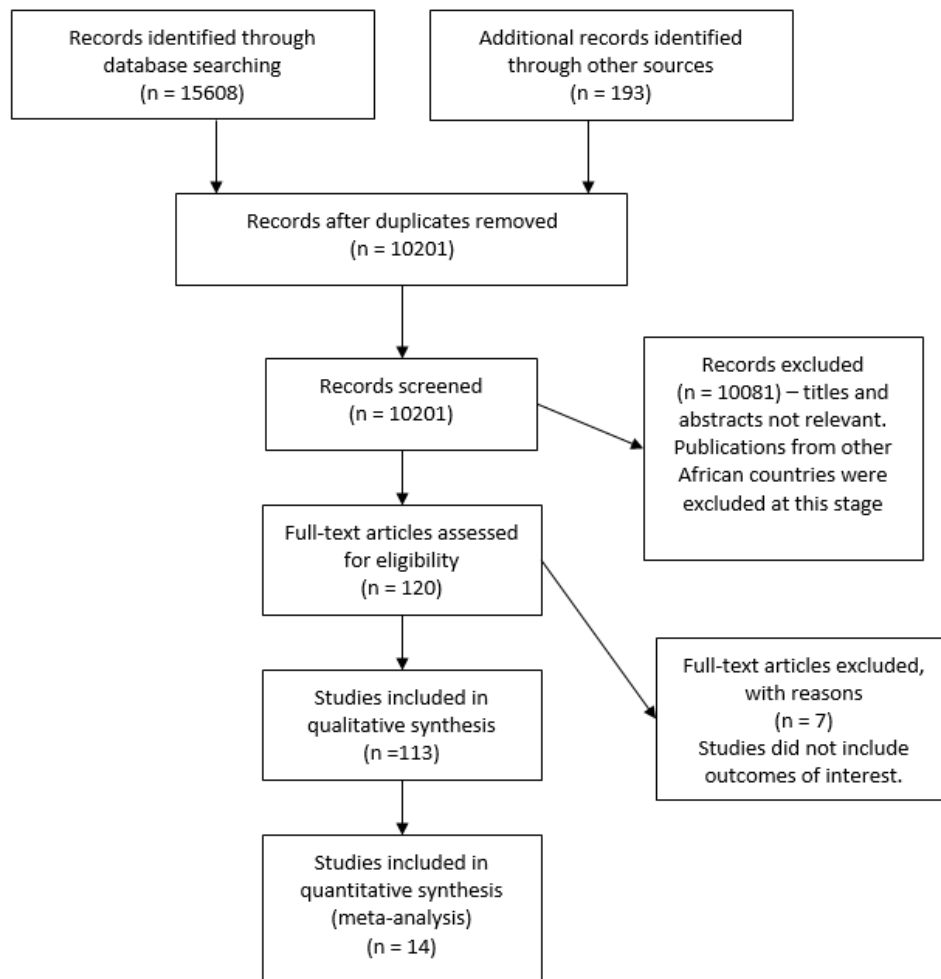
3.3 The search for articles

A number of databases and online sources were searched for relevant publications. Resources searched include MEDLINE; UNAIDS; World Health Organization (WHO); EMBASE; EBM reviews; Cochrane Central Register of Controlled Trials (CENTRAL); PsycINFO; ProQuest (all databases); Scopus; Web of Knowledge (WoK); Google Scholar; Journal of Public health in Africa; African journal of Infectious diseases; African journal of AIDS research; CINAHL (EBSCO); Global health abstract; PubMed; AIDS online; World Bank database. Alerts were set up on databases that have provision for this facility. Articles published from 2003 onwards were included in the search as the focus of this review is to capture recent and relevant trends only. The last search for articles was in the second week of August, 2016. In addition to the databases search, reference lists of relevant publications were searched and in some instances experts were contacted for publications. Interlibrary loan request was used to retrieve relevant articles that were not readily retrievable. The search for articles involved three steps namely:

- 1) A search on relevant databases and online resources
- 2) A search of reference lists of related articles
- 3) A search of grey literature sites

Results of this search (including the number of articles identified) have been included in the systematic review results section. The search strategy used for the search on Medline, has been included as Appendix A. This strategy was modified for use on other databases searched. Figure 3.1 gives a summary of the sifting and articles selection process.

Figure 3.1: Flow diagram showing the publications sifting process (systematic review)



3.4 Selection of articles for inclusion in the systematic review

A protocol (detailing the systematic review process) was designed before the systematic review process began. This protocol was also published on PROSPERO (122). Articles were selected and included in the systematic review and meta-analysis based on the following predetermined criteria:

3.4.1 Types of studies:

All study designs (controlled or uncontrolled) were included in the systematic review. Intervention studies that focused on HIV control in Nigeria, regardless of their theoretical basis (e.g. behavioural, social, educational, internet based approaches),

were included. Studies that explored risk factors for HIV in Nigeria were also included. Case studies, student thesis, commentaries and review studies were excluded.

3.4.2 Type of participants:

Studies conducted in Nigeria, with Nigerian participants only, were included in the systematic review. Multisite studies, that have Nigerians and non-Nigerian participants, were included (provided results were presented separate for the Nigerian population). All studies included in the systematic review were conducted in adult human populations. Adult studies that included adolescent participants were included. All studies selected for inclusion were conducted among interest groups such as the general public, men who have sex with men (MSM), commercial sex workers (CSW), intravenous drug users and people living with HIV.

3.4.3 Types of interventions:

Interventions of interest in this review are those aiming to reduce the burden of HIV at population level or among specific interest groups (for example legislations, mass media campaigns, skills building etc.). The comparison was “no intervention”. Clinical trials and drug interventions were not included in the review, except in studies where the main aim of the authors was to use the new medication to control the transmission of HIV, rather than solely treat those already living with HIV.

3.4.4 Types of outcome measures:

Outcomes of interest include change in HIV infection and prevalence rates, stigma reduction, reduction in mortality, change in HIV knowledge and behaviour, change in CD4 count and STD (or STI) rates. Measures of change include percentages, odds ratio, relative risk and means.

3.5 The quality assessment exercise:

A quality assessment process was necessary for two main reasons: to gain insight into the quality of data in the publications and for a confidence statement. Different appraisal techniques were employed because more than one type of research

designs were included. For cross-sectional study designs I used the NCCEH tool (123); for Case-Control and Cohort studies the Newcastle-Ottawa scale (124) was used; and for Randomised Controlled Trials (RCTs) I used the Cochrane technique for appraisal (125). The NCCEH tool is a robust instrument which incorporates elements of CASP, UK tool (126). Results of the NCCEH tool is presented in statements about the generalisability and validity of study conclusions. The Newcastle-Ottawa tool results is reported on a scale of 1 (low quality study) through 9 (high quality study). The Cochrane tool assesses for likelihood of bias in a study and outcomes of appraisals on this tool is reported as low, high or unclear risk for bias.

Most of the studies reviewed were assessed to be of “low” to “average” quality, and with limited potential for generalisation beyond the local population included. The studies are, therefore, likely to reflect trends in the local area but unlikely to represent other populations not included in them. See table of appraisal of included studies (Appendix B) for details of the assessment process and results. Setbacks observed in the quality assessment process were largely in the methods sections (poorly defined methods for selection of participants, poor reporting, small numbers and poor description of tools used for data collection).

3.6 Data for the structured review (comparative analyses)

Data used for the structured review, which compares Nigeria and a select number of countries (namely India, South Africa, United Kingdom and the United States of America), were derived from searches on databases of recognised groups like World Health Organisation (WHO), World Bank, UNICEF, AVERT and government databases. A table of the data used in these analyses have been included in the appendix section (Appendix C).

3.7 Data handling and management

Publications identified in the search (electronic search, hand searching and reference list search) were sifted by Inalegwu Oono (IO) based on abstracts and titles. In the sifting process, a sifting guideline (developed by IO) was used. The sifting process was vetted by three supervisors (Mark Pearce - MP, Edmund Ong - EO, Zaman

Shahaduz - ZS) who each sifted through a pool of 300 randomly selected articles (titles and abstracts) for comparison and uniformity of decisions. There was good agreement in the sifting process and the criteria were thought to be adequate. Articles remaining after sifting (that met the inclusion criteria outlined earlier in this chapter) were selected for inclusion. Disagreements were resolved following discussions between members of the team (IO, MP EO and ZS) at supervisory meetings. EndNote version X7 software was used for data management (127).

Qualitative data were analysed (thematically) for important themes. Findings of the qualitative analyses are presented in Chapter 5 (under the narrative synthesis section). A table showing main study findings and the codes (and themes) derived from the analyses process has been included in the appendices section as Appendix D. These codes were later used for generating a word cloud (Figure 5.2) which I have included in the narrative synthesis. The word cloud was created by entering themes identified in the qualitative data analyses into Survey Monkey (128).

Quantitative data (numbers, percentages, and risk measures) reported on outcomes of interest, were combined in a number of meta-analyses and the results presented in Forest plots. These data have been summarised and included in the appendices section as Appendix E. Random effects meta-analysis was chosen over Fixed effects, based on the assumption that observed trends are very likely to vary between subjects. Heterogeneity was assessed using I^2 statistic. Significance levels were set at p – value of less than 0.05. Details about the variables explored and meta-analyses results are given in Chapter 5. In cases of missing data, authors of the reviewed publications were contacted for more information. Data extraction was done using a tool designed by IO.

3.8 Chapter summary

In summary, my literature review (which employs a combination of a comparative analyses and a systematic review and meta-analysis) is the minimum required for an up to date and robust assessment of HIV epidemiology in Nigeria. These literature review techniques ensured that both local and international perspectives relevant to HIV epidemiology in Nigeria were captured and explored in great detail. The

techniques outlined above were useful for generating the relevant scientific background required for the empirical phase of my PhD research.

CHAPTER 4: A comparative analysis of country level data

(correlates of HIV burden within countries)

In this section I have reviewed key epidemiological data from a number of low and high income countries and compared those with Nigeria (a lower middle income country). The main objective of this comparative analysis is to identify important country level HIV correlates (with emphasis on human development and social indices such as literacy levels, discrimination and inequality and HIV policies, amongst others), that may be responsible for observed skew in HIV prevalence between (and within) countries. The analysis also adds an international perspective to my literature review. In order to bring the HIV epidemic in Nigeria to an end, an understanding of how HIV activities in Nigeria compares with other countries cannot be overemphasised (a comparative analysis). This exercise has the potential to unveil unique opportunities for improvement and can generate theories about the mechanism(s) through which HIV and poverty are related. It also has the potential to generate themes that could be relevant for the empirical stage of my research. To achieve my set out objective (as outlined above), I have chosen two countries (India and South Africa) that are within similar income classification as Nigeria and two countries (UK and USA) that are classed above Nigeria on the basis of their economies. Income was used as the yardstick for country selection because income was the basis for disease classification by WHO (Figure 1.1 and Figure 1.2) (6) and will thus form a good platform to begin the comparative analysis.

4.1 Exploring the impact of medication coverage, literacy and income inequality on HIV prevalence (India and Nigeria)

India is the second most populous country in the world, with a population of about 1.3 billion people (20). Like Nigeria, India is classed as a lower middle income country (20). The numbers of people (adults and children) living with HIV in India is estimated to be around 2.1 million, in Nigeria this number is roughly 3.2 million (129). Prevalence of HIV is between 0.30% and 0.36% in India (130, 131): Nigeria has an HIV prevalence of between 3.2% and 3.4% (19). It is plausible to think that economic

differences between Nigeria and India, alone, cannot account for differences in burden of HIV between India and Nigeria, seeing that both countries are similar in terms of their income classification. A close look at other indices between the two countries may reveal some reasons why HIV burden could vary so sharply between these two countries.

First, there is significant difference in “antiretroviral coverage” between Nigeria and India. Antiretroviral coverage is a term used to define the numbers of those eligible for HIV treatment that have access to HIV medications. Data from the World Health Organisation global health observatory shows that the levels of antiretroviral coverage in India, a country that produces and exports HIV medications, is about 50% (range of 44-58%) whereas in Nigeria the coverage is only a mere 32% (range of 29-35%) (129). This difference in antiretroviral coverage could partly account for observed differences in HIV prevalence between the two countries (Nigeria and India). Individuals living with HIV who are not on antiretroviral medications are significantly more likely to transmit HIV onto others (67, 132, 133). Thus availability of HIV medications have direct implications for HIV transmission. The above picture is further compounded by low HIV testing rates in Nigeria. In 2012, just 23% of males and 29% of females tested for HIV in Nigeria (19). Another factor that may account for differences in burden of HIV between these two low middle income countries is literacy levels. It is well documented that low literacy levels is associated with poor health outcomes (12-15). The relationship between low literacy and poor health outcomes could be explained by the fact that the same skills gathered through education is needed within healthcare settings for comprehension of medical interventions and compliance (12, 13). Higher literacy levels are often associated with better health outcomes because educated individuals are better placed to understand healthcare processes; have a better experience of using services and are thus more likely to be repeat users of healthcare services (134). For example, health literacy, which is the “ability to read and comprehend prescription bottles, appointment slips, and other essential health-related materials” (134) is intricately tied to literacy. Osborn et.al postulate that a causal pathway exists, linking health literacy to health outcomes and described three distinct points along healthcare delivery that are influenced by health literacy namely: “access and utilization of healthcare; patient-provider relationship and self-care” [15]. They (Osborn et.al)

further argued that limited health literacy is a much overlooked factor in understanding HIV health disparities [15]. The positive association between education and health is well established, with those who are more educated tend to have better health outcomes (as they are more empowered to make healthier lifestyle choices through better incomes and better career options) (135, 136). This association between education and better health outcomes could be mediated, in part, by health literacy. According to World Bank data, in 2009 India had a primary education completion rate (both sexes) of 99.6% whereas Nigeria had a primary completion rate (both sexes) of 73.3% (20). This statistic (primary completion rate), also known as "gross intake rate to the last grade of primary education", reflects the progression of students through the educational structures of both countries as it focuses on those who complete the cycle. Literacy rate (which is the percentage of persons in a given age group who are literate divided into the total numbers of persons in that age group) stands at 62.8% and 48.7% for people aged 15 years and above in India and Nigeria respectively (21, 137). This same index (literacy index) for individuals aged 15-24 years stands at 87.2% for India and 65.3% for Nigeria (21, 137).

Furthermore, India and Nigeria though both classed as low middle income countries, have some subtle but important differences on some of their reported indices of wealth and income inequality. Commonly used indices for measuring country wealth and equitable distribution of wealth within a country are GNI (for country level wealth), the Gini index and national poverty headcount ratios (for inequality). According to 2014 data from the World Bank, Nigeria has a higher GNI per capita (atlas method) of 2,970 USD compared to India (1,570 USD) (20). This GNI values shows that Nigeria has an economy which is better placed to cater for the needs of her population compared to India. However, what matters more in health parlance is a country's wealth spread (or equitable distribution of wealth within a country) (138-141). GNI does not offer any information on wealth spread within a country and this, in fact, is one of the limitations with using GNI as a measure of how well-off people are in a country (142). A well-known and widely used index for estimating wealth spread within a country is the Gini index. The higher the Gini index of a country, the greater the wealth inequality in the same country. In 2009, India had a Gini index of 33.9 compared to Nigeria's 43.0 (20), implying that wealth is more evenly distributed

in India compared to Nigeria. A look at the poverty headcount ratios, national lines (based on 2009 World Bank data), revealed that a smaller percentage of India's population (29.8%) were below national poverty threshold when compared to Nigeria which had 46% of her population below her national poverty line (20).

In concluding, it will be sensible to infer that HIV medication coverage, literacy levels, levels of education and equitable distribution of wealth are environmental factors that influence HIV prevalence between countries (based on the review of data from India and Nigeria above). It is plausible to theorise that HIV burden is higher in Nigeria compared to India because Nigeria lags behind India on these key human development indices.

4.2 Exploring the impact of poverty, discrimination, inequality, and leadership on HIV prevalence (South Africa and Nigeria)

According to 2014 data from World Bank, South Africa, with a population of 54 million, is classed an upper middle income country and has a GNI (atlas method) of 6,800 USD and Gini index of 63.4 (20). South Africa has the highest adult HIV prevalence in Africa [adult prevalence of 18.9% compared to Nigeria's 3.2%] (143), despite being a richer country (based on GNI index). South Africa also has antiretroviral coverage of 45% compared to Nigeria's 32% according to 2014 data from UNAIDS (143). Notwithstanding, HIV constitutes a serious problem in South Africa: South Africa, a country with a total population about a third of Nigeria's population, has an HIV prevalence of at least six times higher than HIV prevalence in Nigeria. If country level HIV profile is only a function of economy and ART coverage, then South Africa (a country a better GNI and antiretroviral coverage compared to Nigeria) should have a lower prevalence of HIV compared to Nigeria. On the contrary, HIV prevalence in South Africa is about six times that of Nigeria.

In 2010, South Africa had 53.8% of her population below national poverty lines (20). This poverty headcount ratio (at national lines) in South Africa is above reported values of 29.8% and 46.0% for India and Nigeria in 2009 respectively (20). Factors such as racial discrimination and the impact of apartheid among others have been cited frequently as root causes of poverty in South Africa (144, 145). In a book written by Klasen (146), it was stated that "South Africa has among the highest levels of

income inequality in the world and compares poorly, in most social indicators, to countries with similar income levels.” This assertion is supported by the fact that South Africa has a Gini index of 63.0 in 2009 compared to Gini indices of 33.9 and 43.0 reported for India and Nigeria respectively in 2008 (20). Klasen (146), further argued that “much of the poverty in South Africa is a direct result of apartheid policies that denied equal access to education, employment, services, and resources to the black population of the country. As a result, poverty has a very strong racial dimension, with poverty concentrated among the African population.” The demography of those infected with HIV in South Africa reveals a telling story about the relationship between socioeconomic structure of South Africa and HIV prevalence distribution. The South African national HIV prevalence, incidence and behaviours survey (2012) reported that the prevalence of HIV in South Africa vary steeply between the country’s population. Prevalence is reported to be highest among the Black African population (15.0%) followed by the mixed-race population (3.1%), then the Indian/Asian population (0.8%) and lastly the White population (0.3%) (147). This document also revealed that the most vulnerable populations are black females aged 20-34 years and black males aged 25-49 years (147). There is a clear and significant excess of HIV prevalence (and burden) among the Black African and mixed-race populations in South Africa based on this report.

Furthermore, South Africa had a period of denial of the existence of HIV rooted firmly in the then government (148, 149). In 2008, Thabo Mbeki (the then president of South Africa) openly declared that AIDS was brought about by the “collapse of the immune system, but not because of a virus” (150). The denial by Mbeki was further supported and encouraged by the position of some proponents of AIDS denialism like Professor Peter Duesberg, a professor of molecular and cell biology at the University of California, Berkeley who became famous for his HIV denial blogs (149). It can be assumed that such blatant denials (not based on scientific facts) is only likely to gain momentum among the less educated populations of any country and by implication the black community in South Africa who are multiply deprived (146, 147). This denial stance, taken by the then South African government, has been widely blamed for the rapid transmission of HIV in South Africa. Similar denials were observed in Nigeria (151, 152), but nothing on the scale witnessed in South Africa.

One argument about higher HIV prevalence in South Africa is the fact that HIV treatment coverage is better in South Africa, compared to Nigeria and, therefore, those living with HIV in South Africa tend to live longer (treatment coverage of 45% and 32% in South Africa and Nigeria respectively) (143). Since prevalence is a factor of number of deaths and new infections it is logical to explore if HIV prevalence in South Africa is indeed a function of the better medication coverage. The remainder of this paragraph is, therefore, devoted to exploring if greater HIV prevalence in South Africa is due to increased life expectancy (brought about by better medication coverage) rather than increased incidence. One explanation for this observation could be that since people living with HIV are living longer in South Africa due to higher medication coverage, there will be a greater pool of people living with HIV who could infect others, hence the observed higher HIV prevalence. However, this argument fails to hold true if those who are on medication are virally suppressed, as research has demonstrated that the chances of HIV transmission is significantly lowered among those who are on treatment and are virally suppressed (67, 153, 154). The fact that India, a country with better ART coverage compared to Nigeria, has a lower HIV prevalence (as demonstrated above) further challenges the thinking that increased medication coverage could be responsible for increased HIV prevalence in South Africa. Another explanation for increased HIV prevalence in South Africa could be that both HIV medication coverage and new infection rates are higher in South Africa compared to Nigeria. During the last 15-year period, South Africa has reported much higher AIDS related death (for all ages) compared to Nigeria, with AIDS related deaths rising to a peak for both nations in the year 2006 when Nigeria recorded 190,000 AIDS related death (for all ages) compared to 330,000 in South Africa (143). Also, during the same 15-year period, HIV medication coverage was consistently greater in South Africa compared to Nigeria (143). Within the same 15-year period, the numbers of new infections (all ages) have consistently remained higher in South Africa compared to Nigeria (143). It would appear that the numbers of new infection (incidence) would have a greater role in the difference in prevalence between the two countries (Nigeria and South Africa). In fact, it was reported in 2015 the numbers of new infections in Nigeria stands at 250,000 compared to 380,000 in South Africa (19, 155).

In summary, HIV in South Africa exemplifies the dangerous roles that a combination of poor leadership, lack of political will, lack of access to wealth and healthcare and discrimination (146) could play in localised HIV transmission. HIV in South Africa also exemplifies how the most vulnerable in societies are usually the ones with the greater burden of HIV (146, 147). In order to address HIV comprehensively, one must seek to address structural and economic factors that disadvantage populations between and within countries by increasing economic opportunities, improving access to healthcare and creating room for upward social mobility.

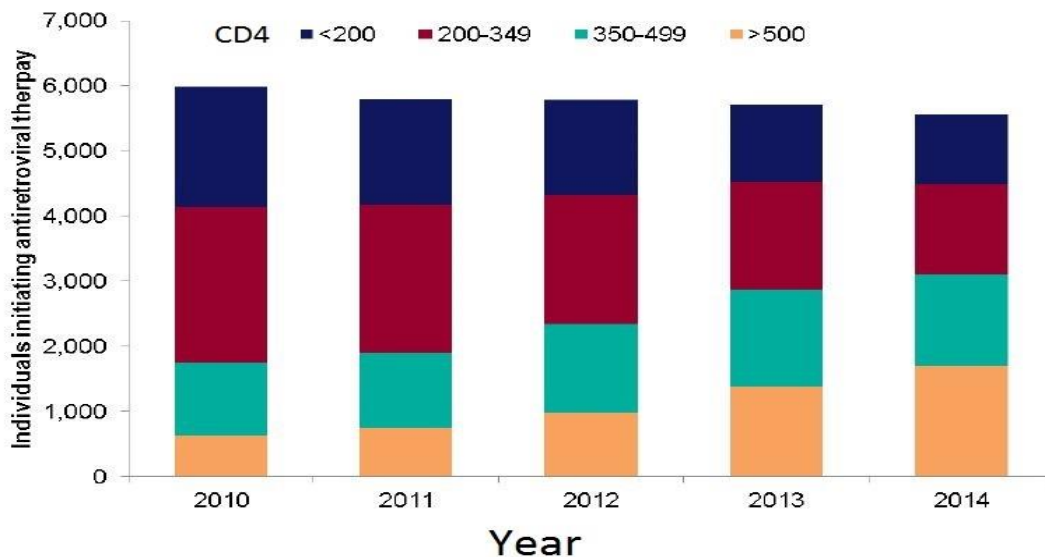
4.3 Exploring the impact of inequality and country policies on HIV prevalence (USA, UK and Nigeria)

The USA is a high income country with GNI of 55,200 USD and Gini index of 40.5 (20). HIV prevalence in the USA is estimated at somewhere between 0.4 and 0.6% with antiretroviral coverage of 37% (156). An HIV prevalence of between 0.4 and 0.6% in the United States is far less than the reported 3.2% in Nigeria (9, 19). Similarly, the United Kingdom is a high income country with a population of 64.1 million, a GNI index of 42,690 USD and Gini index of 34.8 (20). The prevalence of HIV in UK is estimated to be about 0.19% (153, 157) and antiretroviral coverage in the UK is at least 90% (153). One striking difference between these two high income countries (USA and the UK) and Nigeria is the fact that they have far greater GNI indices compared to Nigeria. However, when one considers the differences in wealth distribution (in terms of their Gini indices), Nigeria does not lag, by a great margin, behind the USA (Gini indices of 43.0, 40.5 and 34.8 for Nigeria, USA and UK respectively).

One important difference between Nigeria and these high income countries is in the HIV treatment policies. Prompt diagnosis and early commencement of antiretroviral medications have been shown to reduce viral load to undetectable levels, a factor crucial for halting HIV transmission (67, 153, 154). In the past, the decision about when to commence antiretroviral medications is hugely based on indices such as CD4 count and coinfection with other diseases like tuberculosis. With the realisation that early commencement of antiretroviral medications prolong life and significantly halt HIV transmission, practice have shifted away from the use of CD4 counts as yardstick for commencing HIV treatment to commencement of treatment as soon as

possible and at point of diagnosis (66, 67). The general recommendation by WHO is that newly diagnosed HIV cases and those who stand substantial risk of contracting HIV, need to be started on antiretroviral medications as soon as possible for treatment or prevention (66). In the UK for example, from 2010 onwards, there has been a steady increase in the numbers of persons living with HIV that commenced antiretroviral medications at CD4 count of 500 and above (Figure 4.1). It would appear that strict adherence to CD4 count (and viral load) as a marker for commencement of antiretroviral medication is a policy that is fast disappearing in the UK. A similar pattern has been seen in the USA, where there is a clear shift from the use of CD4 counts (as yardstick for commencing ART) towards commencement of HIV treatment as soon as possible (156, 157). However, in Nigeria, the treatment guideline recommends that antiretroviral treatment should be initiated only when CD4 count is less than or equal to 350 (89). The implication of this policy in Nigeria is that a number of individuals living with HIV, who should be on antiretroviral medications are left out. Upscaling of HIV treatment in the direction of treatment as prevention remains a huge challenge in Nigeria.

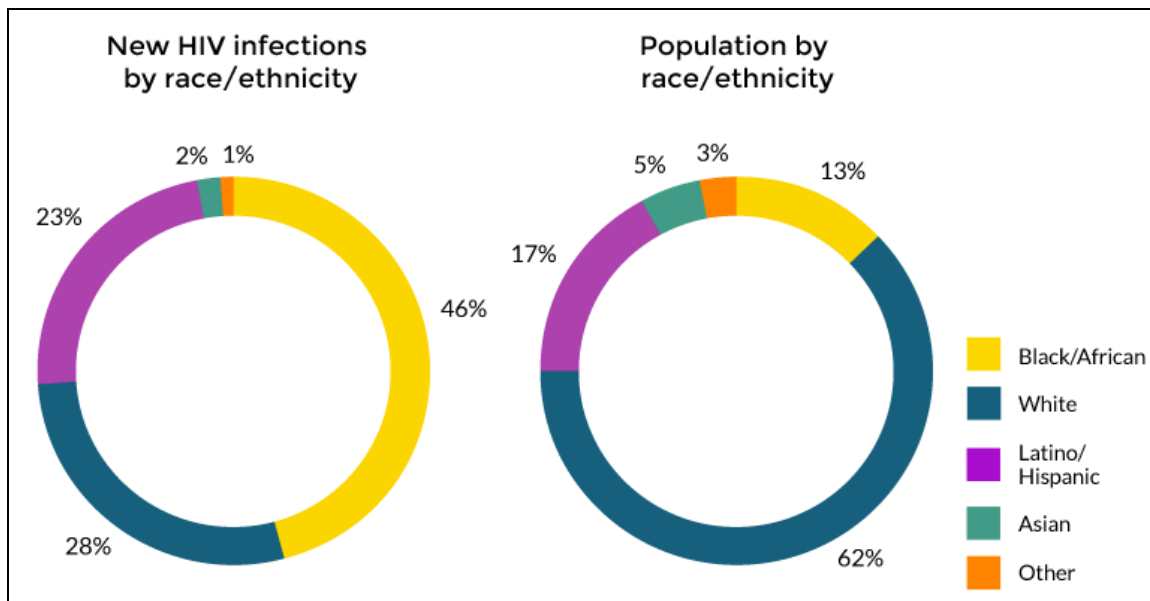
Figure 4.1: Component bar chart showing number of HIV patients starting antiretroviral by CD4 count at initiation the UK, 2010 – 2014 (157)



Furthermore, there are laws in the UK and USA that criminalise intentional transmission of HIV (158-160). In England and Wales, intentional HIV transmission is

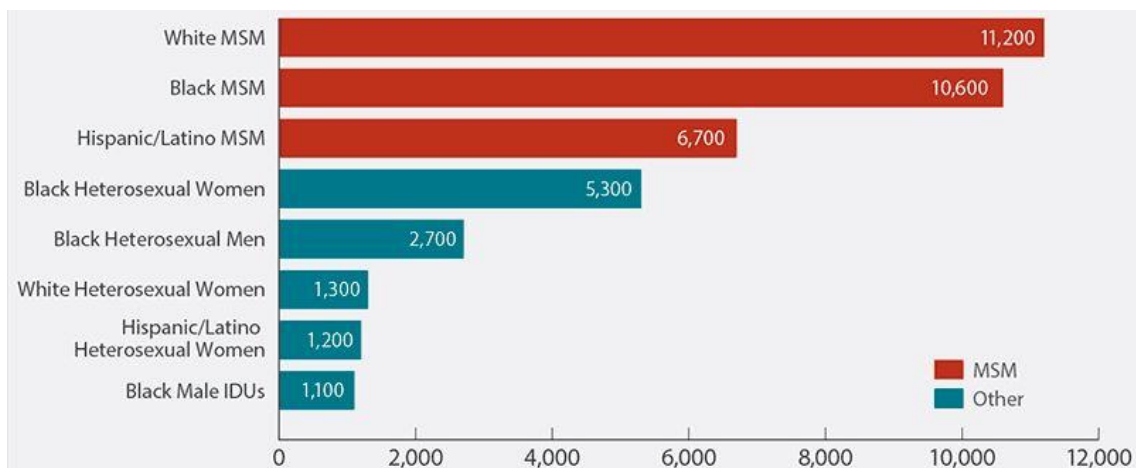
prosecuted under the legal provision “Offences Against the Person Act 1861 (OAPA 1861)” under the section “grievous bodily harm”. Similarly, in Scotland, intentional HIV transmission is punishable under the law “Culpable and Reckless Conduct” (161). In the USA, criminal HIV transmission laws exist largely at States level, though some States do not have HIV specific laws (162). In Nigeria, laws that criminalise deliberate transmission of HIV are not in existence in any of the States nor at federal level. Opinions remain divided about the legitimacy and effectiveness of these laws among scholars, with evidence (or the lack of evidence) of effectiveness of these laws confined, largely, to theories and concepts (163-165). There are arguments against laws that criminalise intentional HIV transmission and one of the most powerful of such arguments opines that laws criminalising intentional transmission of HIV “unjustly target people living with HIV for punishment, and fails to reflect broader shared responsibilities for sexual health and HIV infection” (166). Whilst this argument may be true for societies where there are structures in place to enable individuals who are HIV free to make healthy sexual health choices (for example easy access to HIV medications and good medication coverage, poverty reducing interventions etc.), in a setting like Nigeria where similar structures are lacking and there is widespread ignorance about HIV (167), the benefits of a law that criminalises intentional HIV transmission may far outweigh the demerits of the same law. In Nigeria, laws that criminalise intentional HIV transmission could in fact strengthen existing public health campaigns as it was reported that in 2013 alone, there were 220,000 new infections and reports of intentional HIV transmission (19, 167). According to analyses of HIV burden based on race and ethnicity in the USA, Black/African Americans living in the USA have the highest prevalence of HIV. It is reported that the rate of new HIV infection in African Americans is 8 times that of whites in 2015 (156, 168) (Figure 4.2).

Figure 4.2: HIV burden in the United States of America by ethnicity in 2015 (156)



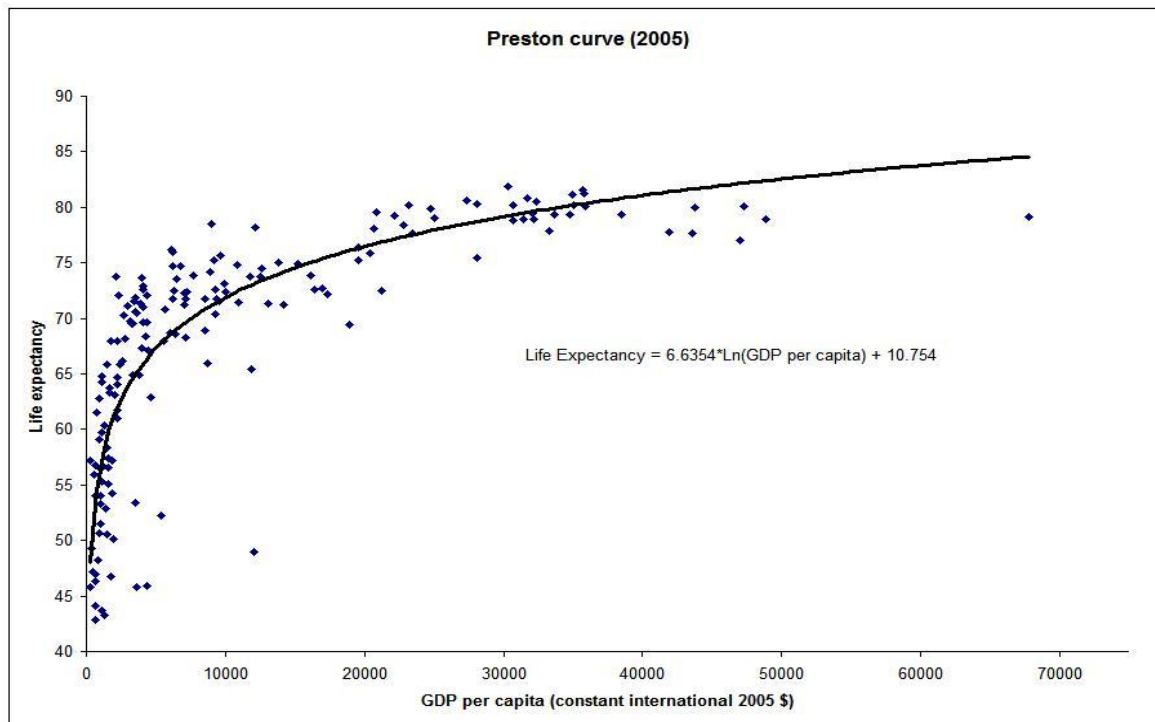
Reasons cited by the CDC for observed differences in HIV burden along race and ethnicity lines in the USA include stigma, discrimination, income inequality, education, and geographic region (169). In the USA, like Nigeria, HIV also shows regional variations. For example higher HIV rates are concentrated more in urban areas with blacks more infected, except in the West where whites account for a greater proportion of diagnoses in 2010 (169). Based on sexual orientation grouping, white gay and bisexual men have the highest prevalence of HIV infection in the USA (168) [Figure 4.3]. The above demography gives credence to the thinking that HIV is a disease which is strongly associated with the socioeconomic status of an individual, with those on the lower end of the socioeconomic ladder being more at risk for HIV. It also suggests that the internal workings of a society determines ones' risk for contracting HIV: it would seem in this case that company (or network) matter more than colour or creed (170). There are a huge array of publications pointing to the significant role social inequality plays in influencing health outcomes (10, 171-173). However, what remains to be understood is how these factors could be modified to improve health outcomes or maximise healthcare spending by governments, in different settings, around the world.

Figure 4.3: Estimates of New HIV Infections in the United States for the Most-Affected Subpopulations, 2010 (168)



Antiretroviral coverage in Nigeria and the USA are not hugely far apart - 32% and 37% respectively (6, 156). Similarly, there is also not a huge difference between Nigeria's Gini index of 43 compared to USA's 40.5 (20). However, the difference in HIV prevalence (between Nigeria and USA) is huge. One could argue that differences in economy between the two countries could have a role in observed difference in HIV burden. This argument is further substantiated by the fact that the USA and the UK (two countries that are closer in GNI values) do in fact have far lower HIV prevalence when compared with Nigeria. This difference in GNI between Nigeria and USA goes to show that absolute wealth may impact directly on HIV burden, in a way which may not be entirely linear and could be dependent on a number of other variables (modifiers). This relationship (between HIV prevalence and GNI) may follow after the pattern similar to that described by Preston (121) in which increases in GDP (a measure of a country's wealth) directly mirrors increases in life expectancy up until a GDP value of about 10,000 USD where further increases no longer translate into dramatic changes in health outcomes (life expectancy) [Figure 4.4]. It is, therefore, plausible to think that increases in a country's wealth as indicated by GNI index and reductions in inequality will lead to dramatic reductions in HIV prevalence, up until a certain point and beyond which further increases in GNI will no longer have as much an impact. Tackling poverty, therefore, is and should be an integral part of any HIV campaign, more so for low and middle income countries like Nigeria.

Figure 4.4: Graph of life expectancy versus GDP per capita based on Preston's work (121)



Another difference in HIV demographics between Nigeria and these high income countries (UK and USA) is the fact that in Nigeria, females are by far the more affected gender (157, 167, 168). Sociocultural structures (such as gender roles and gender inequality) are different between Nigeria and these high income countries (USA and UK), a factor that could have important implications for the skew in HIV burden in Nigeria along gender lines. As demonstrated previously in this chapter, HIV (more often than not) tends to affect the most vulnerable in any society. It implies, therefore, that females are likely the most vulnerable group in the Nigerian society. The role of gender in determination of HIV risk will be explored further in subsequent sections of my thesis (in the empirical phase).

4.4 Data from other countries

To explore how income inequality and country wealth vary with country level data on HIV prevalence and to describe any relationship(s) that may exist between these variables, I have plotted HIV prevalence against income inequality and country wealth for a total of 92 countries, including the UK and USA. Data included in this

analyses (Appendix C) were the most recent country reports for variables of interest (HIV prevalence, GINI and Gini), obtained from World Bank’s databases (20).

Figure 4.5 is a plot of HIV prevalence against country level Gini (a measure of country level income inequality). The data has been log transformed to reduce the degree of skew in the distribution. It is immediately obvious from this plot that HIV prevalence increases as income inequality increases. There is a positive relationship between income inequality and HIV prevalence. To further explore this relationship, linear (brown dotted line on the graph) and quadratic (green dotted curve on the graph) fits were plotted on the graph. It is fair to conclude that the relationship between income inequality and HIV prevalence is non-linear. The public health implications of this will be discussed in Chapter 10 of this thesis.

Figure 4.5: A plot of log most recent HIV prevalence among people aged 15 – 49 years against most recent country Gini, with quadratic and linear fit.

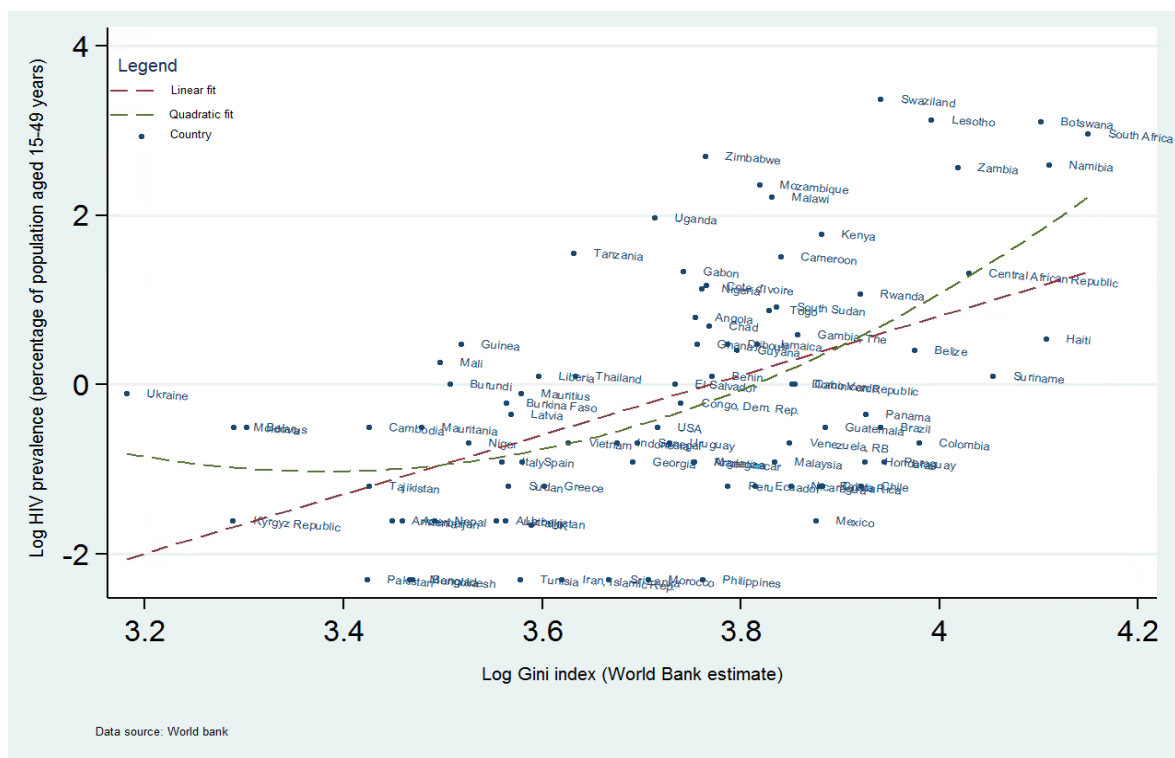
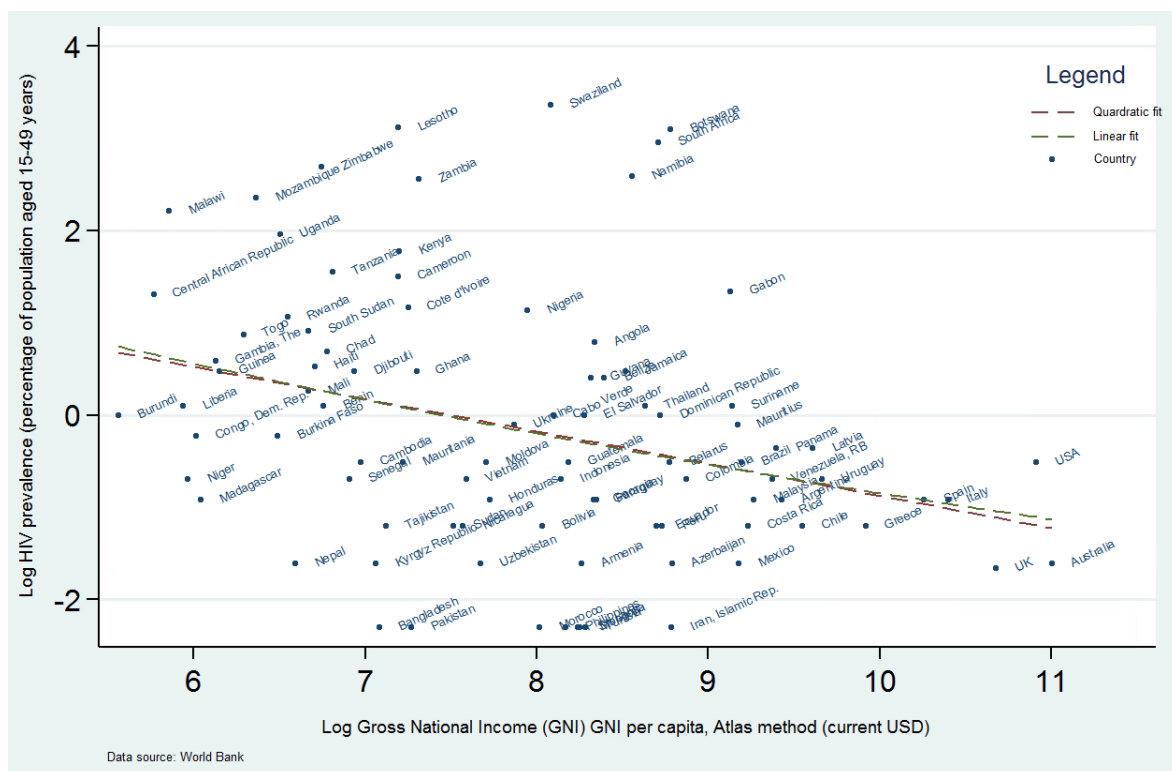


Figure 4.6 shows the graph exploring the relationship between HIV prevalence and gross national income (GNI). I found an inverse relationship between HIV prevalence and country wealth (GNI): countries with greater GNI values (like Australia, UK and USA) have the lowest HIV prevalence whilst countries with lower GNI have greater

HIV prevalence. Surprisingly, it appears that the relationship between HIV prevalence and GNI is linear and with the possibility of an intercept on the X-axis. This is a clear deviation from what I was expecting, as I had initially theorised that the pattern of relationship may follow after one described by Preston for life expectancy and GDP (121). The public health implications of this finding will be explored further in the discussions section of this thesis.

Figure 4.6: A plot of log most recent HIV prevalence among people aged 15 – 49 years against most recent country GNI, with quadratic and linear fit.



In this comparative journey, I have observed that absolute country wealth (GNI), which is a reflection of the capacity of a nation to cater for her citizens is important in HIV prevalence difference between countries. However, other equally important variables include equitable distribution of what is available in a country, government leanings, literacy levels and healthcare policies.

It is worth mentioning that the data used for this analysis are those provided by national governments and are, therefore, subject to limitations of secondary data analysis (such as lack of representativeness, government bias in data reporting and differences in methods for data collection between and within countries). Also, this

analysis is in no way conclusive as the countries included in the analysis vary greatly in their sociocultural and political structure: a more appropriate use of the findings of this analysis will be one that takes into consideration, these unique and varying local contexts.

CHAPTER 5: HIV in Nigeria -The systematic review and meta-analyses results

5.1 Introduction

In this section of my literature review, I have presented results of the systematic review (and meta-analyses) of primary publications from Nigeria, with the aim of identifying and exploring important local variables that determine HIV distribution in Nigeria. This exercise will shed some light on the epidemiology of HIV in Nigeria and identify gaps for future research and intervention. I have chosen to limit my review to Nigeria because of the volume of data to be reviewed should I expand my review to include other parts of Africa and the world. This is also the reason I carried out a focused reviewed of data from a select number of countries to compare with Nigeria (in Chapter 4 above).

5.2 Summary of publications reviewed

One hundred and thirteen publications, relevant to my research question, were identified from the databases and reference lists search and were included in the systematic review. Nine were qualitative (151, 174-181); twelve mixed methods (182-193) and ninety-two quantitative (194-285). Most publications were cross sectional (151, 174-198, 201, 203-220, 223-233, 235, 236, 238-249, 251-267, 269-271, 273, 274, 276-285). There were six case-control studies (202, 221, 222, 234, 237, 250), three cohort studies (199, 200, 272) and two randomised controlled trials (268, 275). All studies reviewed had Nigerian participants only, except for two (195, 237) which had other nationals and migrant populations alongside Nigerians. Most of the studies were carried out in multiple locations within Nigeria: the North-East in 15 publications (178, 182, 191, 197, 211, 212, 214, 215, 225, 233, 239, 241, 269, 276, 279); North-West in 22 publications (151, 179, 182, 197, 201, 204, 211, 212, 215, 220, 225, 228, 235, 238, 239, 241, 255, 259, 269, 275, 277, 281); South-South in 24 publications (182, 193, 194, 197, 203, 210, 212-214, 218, 220, 225, 226, 235, 237, 239, 241, 248, 252, 254, 268, 269, 276, 277); the Middle-Belt (or North-Central) in 26

publications (176, 182, 191-193, 197, 201, 204, 212, 214, 220, 224, 225, 234, 239, 241, 249, 262, 264, 266, 267, 269, 276, 277, 282, 284); South-East in 26 publications (151, 179, 180, 182, 186, 188, 189, 197, 205, 212, 214, 215, 225, 227, 232, 239, 241, 244-246, 260, 261, 263, 269, 276, 278) and South-West in 57 publications (174, 175, 181-183, 185, 187, 188, 190, 191, 195, 196, 198, 207-209, 212, 214-217, 219-222, 225, 229-231, 233, 235, 237, 239-243, 247, 250, 251, 253, 256-258, 264, 265, 269-274, 276, 277, 280, 281, 283). Two of the publications analysed their data using “North” and “South” regional designations (206, 236). Ten publications used data from nationally representative databases (197, 206, 212, 225, 236, 239, 269, 276, 277, 285) whilst the remainder used locally generated data. Research participants were predominantly in the second through to the fourth decades of life. One hundred and five of the articles reviewed were published between 2005 and 2016 (174-178, 180-186, 188-197, 199-228, 230-252, 255-267, 269-285). Figure 5.1 shows the regional breakdown of primary research publications (and by implication the level of HIV research activities) across the six geopolitical zones of Nigeria.

Figure 5.1: Graph showing regional frequency in reviewed publications



A cross section of participants in the reviewed publications revealed that some key sections of the Nigerian community (like religious leaders, traditional medical practitioners, injection drug users, long distance drivers/truckers, hospital staff and community leaders) were underrepresented. A description of the participants in reviewed publications include members of the “general public” (defined largely as rural/urban dwellers, student populations and pregnant women) in fifty-five publications (175, 180, 182, 183, 185, 186, 188, 190, 195, 197, 199-203, 206-208, 211, 212, 216, 218, 224, 225, 228, 230, 231, 233, 234, 236, 238, 239, 241, 242, 245, 246, 252, 257, 260-263, 265-270, 273, 274, 276, 280, 281, 283, 284), people living with HIV in twenty-two publications (176, 181, 184, 193, 194, 198, 204, 226, 227, 232, 243, 244, 248-251, 256, 271, 272, 275, 278, 282), uniform personnel in six publications (187, 210, 221-223, 247), sex workers in five publications (174, 189, 192, 240, 277), men who have sex with men (MSM) in four publications (182, 209, 235, 264), traditional birth attendants and traditional healers in three publications (213, 253, 254), long distance drivers and park workers in three publications (191, 205, 219), hospital staff in three publications (214, 215, 279), migrant populations in three publications (151, 179, 206, 237), religious and local leaders in two publications (186, 259), injection drug users (IDU) in two publications (220, 258) and, mixed population, trainees sailors, media staff, prison inmates and teachers in one publication respectively (177, 178, 217, 229, 255).

From the foregoing, it is obvious that there is relative paucity of publications from certain regions of the Nigeria (especially the North-East). Whilst there were a total of one hundred and thirteen publications relevant to my research question in Nigeria, a breakdown of the research by regions (Figure 5.1) showed that 50.4% of the publications were conducted in only one of the six geopolitical zones of Nigeria (the South West). Furthermore, some key populations (like female sex workers and traditional practitioners) featured only in a few publications. The reason(s) for these observation is unclear. However, the negative implication this observation has for the understanding of HIV epidemiology in regions of Nigeria is difficult to ignore. One of such negative implications is that important views (held by gatekeepers and other stakeholders and unique populations) necessary for an all-round understanding of HIV epidemiology in Nigeria is yet explored in great detail. Another important implication is that the true burden and epidemiology of HIV in some communities

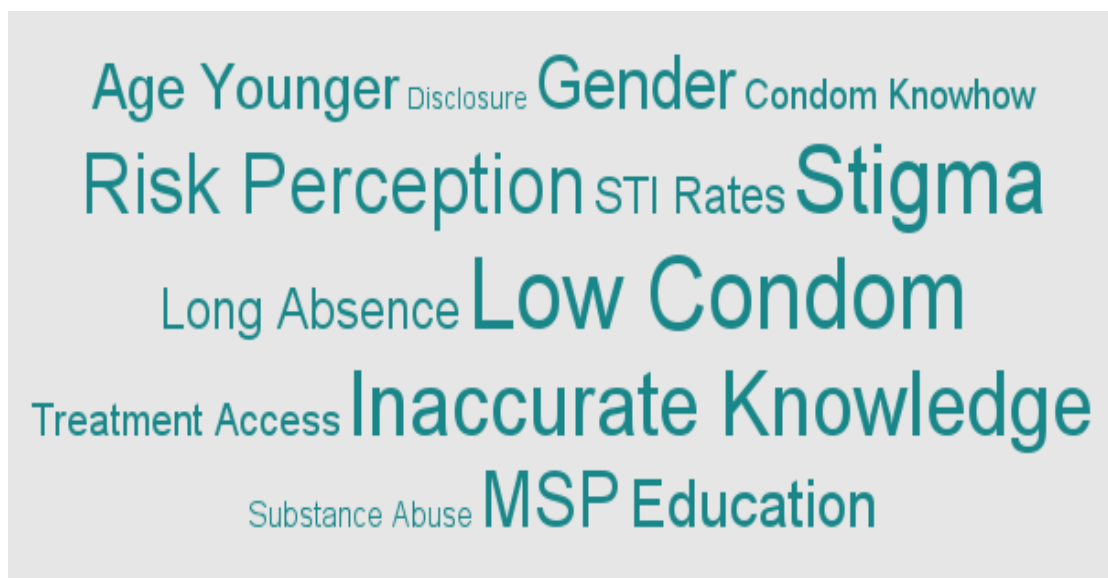
remain poorly defined and understood. In the absence of proper research evidence, interventions (including policies, healthcare resources mobilisation and siting of healthcare facilities) becomes arduous, wasteful and ineffective.

Further details about the demographics of participants in the reviewed publications, namely sources of data in the respective publications; summary of the findings of reviewed publications; interventions suggested or supported by the respective publications; main HIV risk factors identified in the publications and the theme codes used for the cloud analyses (Figure 5.2) have been summarised into the characteristics of included studies table (Appendix F) and the table summarising main findings and themes (Appendix D), respectively. The main HIV risk themes identified in the reviewed publications as well as interventions favoured in the studies will be discussed later in this chapter, in the narrative synthesis section.

5.3 The narrative synthesis:

To provide a concise summary of important HIV epidemiology variables in Nigeria (identified in this systematic review), I have created a word cloud highlighting key HIV themes identified in the systematic review (Figure 5.2). The sizes of the texts in Figure 5.2 are proportional to the frequency of occurrence of the theme, with themes in larger fonts occurring more frequently. Figure 5.2 was created using texts derived from the analyses of qualitative data in the publications reviewed. Important HIV risk(s) described in each of the articles included in the review were coded into texts (Appendix C) that were subsequently analysed and presented in the word cloud (Figure 5.2).

Figure 5.2: Word cloud showing important risk factors for HIV transmission in Nigeria.



HIV themes in detail

It is a universally known fact that condoms are highly effective in preventing HIV and other sexually transmissible diseases, when used correctly and consistently (286). By implication, factors that discourage condom use will invariably increase the risk for HIV transmission. Themes around low rates of condom use featured very strongly in the publications reviewed (184, 194, 197, 205-209, 216, 219-223, 227, 228, 230, 233, 235, 247, 255, 269, 272-274, 278, 282). Low condom use rates is not just found among the general population but also among people living with HIV and high risk groups like commercial sex workers (184, 189, 194, 220, 227, 235, 251, 269, 277, 287). There are two broad implications of low condom use rates for HIV epidemiology in Nigeria. First, there is an increased risk for HIV transmission between members of the general population. Secondly, there is also an increased risk for HIV transmission between low HIV prevalence groups (general population) and known high risk groups (like commercial sex workers). Factors that predict willingness to use condoms include higher educational status (of up to secondary and above), correct perception of HIV risk, history of testing for HIV, higher socioeconomic status, male gender and contraception (184, 197, 208, 223, 230). Being male was reported, in some of the reviewed studies, as a positive predictor of intentions to use condoms (197, 208, 223, 230). This gender difference in condom use, at a glance, suggests that males are more willing to use condoms compared to females. However, Nigeria is a largely

patriarchal society and the seeming lack of willingness in condom use among females (implied in this report) could be a reflection of local social factors: more so that partner resistance has been shown to be an important barrier to condom use for females (288-291). It follows, therefore, that interventions seeking to increase condom use rate in Nigeria must incorporate a significant male component.

In the reviewed publications, factors that discourage condom use include religion, poor knowledge on how to correctly use male condoms, stigma associated with condom use (condom use is considered an indication of being promiscuous and immoral), reduced sexual pleasure, misconception that condoms cause health problems and can fail, and condoms not being readily available (174, 179, 191, 205, 210, 217, 257). In the quote below (obtained from one of the reviewed publications), a young man speaks about how his local society perceives a lady who is seen with a condom. This quote demonstrates the stigma associated with keeping condoms and/or intentions to use condoms, locally.

“If a girl keeps a condom in her room you will feel somehow, you know, like she is a professional [prostitute]” (179)

Other factors that influence condom use include the perception that condoms are a barrier to relationship intimacy and fatalistic tendencies where clients of sex workers would go the extra mile to convince sex workers not to use condoms during sex, claiming “love” and being “boyfriends” as legitimate reasons not to use condoms (174). This trend is enticing to female sex workers, who consider the prospects of getting married as a way out of sex work (an occupation that is high risk for HIV and highly stigmatised). The account of a female sex worker in one of the papers reviewed is included below:

“He said ‘Don’t you love me? I love you and know you’re clean. I believe you don’t have anything in your body. I trust you ... don’t you love me ... you don’t love me? I’m not your client now, I’m your boyfriend ... how can we get married if you continue like this?’ Sometime we use condom, but most time we don’t. I love him and I don’t want this work all my life” (174)

It is well documented that HIV related stigma is a very strong disincentive for willingness to test for HIV, because people living with HIV are stigmatised and face rejection and isolation (292, 293). Stigma associated with HIV as well as stigmatisation of people living with HIV was described in a number of the publications from Nigeria (174-176, 185, 186, 188, 189, 199, 204, 211, 212, 214, 225, 234, 266). Stigmatisation of people living with HIV takes place at different levels within the Nigerian society and plays a significant role in influencing peoples' decisions about utilisation of screening and treatment services. Stigmatisation is often encountered at family and community levels, making it difficult for people who live with HIV to be accepted in their communities. A female sex worker, who narrated her ordeal in one of the reviewed papers, reported that she would face strong stigmatisation from other female sex workers should they ever come to know of her positive HIV status. Social death (the social exclusion that comes with HIV status disclosure) is a real consequence of stigma (quote below).

“If the girls knew ... they would make me die fast. They would kill me before my time. Instead of help they would scandalise the matter. They would stop communicating with me. When HIV comes your friend becomes your enemy. I will be in danger for my life if they know” (174)

Similarly, in another study, the fear of stigmatisation was cited by a lady as the main reason people conceal their status and this in turn, she argued, is responsible for some HIV transmission, through non-disclosure of status to partners.

Stigmatization can lead to concealment of status so that people will not know. This will deny early medical attention. Concealment of status is one of the reasons why the infection cannot be controlled. A lot of people have the disease but do not want to declare publicly their status for these fears” (188)

A local, described in one of the reviewed papers as a “female opinion leader”, believed that the HIV status of a family member should be kept secret as revealing the HIV status of a family member is a regrettable action, capable of bringing stigma on the family (quote below).

“... it is difficult to even come near PLHIV [people living with HIV], let alone trying to help them. If my family member is living with HIV/AIDS, I would never mention it to anybody outside the family. This is because it is a big shame for all the members of the family... it is a big shame for the family that one of their own is suffering from a disease of immoral people, meaning that the entire family members are likely to be immoral people”
(186)

In one study (188), the media was implicated in the processes that lead to stigmatisation of people living with HIV in Nigeria. In this study, the overzealous fear-based approach that characterised initial HIV campaigns in Nigeria was implicated by a traditional leader as reason for HIV stigma (see quote below).

“They [journalists] contributed to this problem. The way they narrated the story of HIV when it started and the picture they showed us still scare us and these have led to the stigma. Before we can accept persons living with HIV/AIDS fully, the media should undo the harm they have created....” (188)

The potential for mass media approaches to effect a reduction in HIV risk is well known (294, 295). However, media approaches that utilise scare tactics, reminiscent of the 1980's HIV campaigns in Britain that utilised tombstone images (296) for HIV prevention campaigns, have been shown to be ineffective and detrimental - chiefly because they encourage HIV stigma and are a huge disincentive for HIV testing (297). In a Cochrane systematic review assessing the impact of mass media interventions aimed at promoting HIV testing, the authors concluded that mass media approaches are effective in promoting HIV testing, but the effects they create are only immediate with no evidence of long term benefits (298). It is, therefore, bad practice if a country were to rely heavily on mass media campaigns and pay little attention to other forms of HIV prevention strategies. Equally bad is when mass media campaigns are infrequent and poorly coordinated.

It will be incomplete to discuss HIV related stigma without highlighting the challenges that exist in defining and assessing both stigma and the effectiveness of interventions aimed at reducing HIV related stigma. It is generally accepted that stigma is a

construct that is hard to quantify and measure (299-301). These challenges alone makes for HIV related stigma research and interventions arduous tasks for researchers and policy makers alike. However, some researchers opine that the picture may not be as gloomy as it may seem, as most forms of stigmatisation do share some commonalities at the core and as such presents the opportunity for further research and understanding of stigma (297). What most researchers seem to agree upon, is the fact that not nearly enough has been done (by way of research and effort) in addressing HIV related stigma (299-301). In the studies reviewed, the tools used for defining and measuring stigma, as well as for assessing impact of stigma reducing interventions, varied greatly and were hardly standardised instruments. The fact that efforts at understanding and addressing HIV related stigma fall short of what is required could be the reason HIV related stigma remains a very important factor in the epidemiology of HIV in Nigeria and many parts of the world today.

There is a lot of debate about whether education (literacy) or knowledge about HIV is more important for HIV risk reduction. Researchers who argue that education is a more important factor in HIV risk reduction propose that education would generally lead to increases in cognitive skills and decision making (among others skills) that are necessary for healthy lifestyle choices (302, 303). Furthermore, proponents of education (literacy) argue that literacy is important for HIV risk reduction because some level of literacy is needed for people living with HIV to understand treatment regimen and adhere to HIV medications (the health literacy argument) (12, 14, 15). These are valid arguments as HIV transmission is partly a function of individual lifestyle choices, as well as adherence to medications for people living with HIV (67, 286). However, the arguments for literacy and education falls short of describing the exact mechanisms through which increases in educational attainments translates into HIV risk reduction. In addition, how much education is actually required for one to achieve the desired outcome (which is a reduction in HIV risk) remains poorly defined. Also, it is unclear if literacy in this context refers to literacy in western education alone or applies to literacy in other forms of education outside of the western model. On the other hand of the argument, are researchers who hold the view that knowledge (of HIV), rather than education, is more important in HIV risk reduction (291, 304-307). It is indeed plausible to think that HIV could very easily be

contracted in a society which is well educated but lacks the correct knowledge about HIV (including knowledge of HIV transmission and local HIV services). Furthermore, HIV knowledge could be communicated in different languages and in different cultural settings in a relatively shorter time when compared to the time needed to “educate” an individual. One downside to the knowledge argument, however, is the assumption that being knowledgeable confers self-efficacy. It has been shown that knowledge does not always guarantee the right actions, a fact that was exemplified in one of the publications reviewed (151). A more robust approach would, therefore, be one that combines both education and knowledge approaches for HIV risk reduction. Inaccurate knowledge about HIV and poor knowledge about HIV services (rather than outright lack of knowledge) appears to be the more important factors when knowledge of HIV was explored in the publications reviewed (174, 182, 183, 185, 186, 195, 201, 202, 207, 213, 217, 231, 239, 250, 252-254, 259, 263). Those who demonstrated outright lack of knowledge, or very poor knowledge of HIV prevention, were traditional healers (TH) and traditional birth attendants (TBA) (213, 253, 254). The general public, on the other hand, failed to recognise that heterosexual contact is the prevailing means through which HIV is contracted – they will rather cite the use of unsterilized materials as being more important in HIV transmission. Outright lack of knowledge demonstrated by TH and TBAs has huge negative implications for HIV control at PHC levels since traditional medical practitioners are a part of the primary healthcare structure of Nigeria, through the revised national health policy of 2006 (96). Another ominous trend observed in the review is that knowledge did not seem to translate into action in most of the studies reviewed. As described in these articles, correct perception of one’s HIV risk is a function of correct HIV knowledge. In some instances correct knowledge of HIV did not translate into safer practices. This disconnect between the knowledge of how HIV is contracted and the steps locals take to protect themselves from contracting HIV is exemplified in the quote below obtained from one of the reviewed papers:

“While both male and female migrants have high levels of knowledge about HIV/AIDS, common responses also suggest some misconceptions about modes of transmission. For example, 46 percent of respondents in Kano and 43 percent in Aba identified sharing barbing instruments (like razors and scissors) as a mode of transmission. While this mode of

transmission cannot be ruled out, these figures reinforce anecdotal data that I collected in numerous discussions about AIDS. These conversations suggest that young people's awareness that HIV can be contracted via sexual intercourse is not the same as recognition that heterosexual intercourse is by far the most likely mode of transmission in Nigeria. I was struck by how frequently migrants said that one of the main ways they protect themselves against AIDS is by having their own barbing and shaving instruments" (151)

In an all-female study, conducted in an all HIV positive population (of which only 20% of the women were married), it was also demonstrated that knowledge does not translate to practise (184). More than half of the participants of the study, despite being aware that HIV could be contracted through unprotected sex, failed to use condoms during sexual intercourse. By implication, they failed to take steps to protect others from contracting HIV.

*"Although a good proportion of **HIV-positive** women were aware that unprotected sex could expose individuals to HIV infection, yet, more than half of them still engaged in unprotected sex showing that knowledge of HIV transmission is not a guarantee to encourage HIV prevention" (184)*

Inability to correctly identify one's risk for HIV (poor risk perception) has been linked to increased risk for contracting HIV and other STIs in a number of HIV research publications (291, 308-310). Poor risk perception and the belief that HIV could be prevented by traditional medicines are other important factors in the epidemiology of HIV in Nigeria identified in this systematic review (182, 187, 216, 234, 236). Poor risk perception, in this case, refers to a phenomenon in which individuals who engage in activities known to be "high risk" for contracting HIV, hold the view that they are at little or no risk for contracting HIV. Those caught in this web (of poor risk perception) tend to project their risk for HIV infection onto "immoral others" (151). Religion, as well as fatalistic beliefs or tendencies, held by participants in the papers reviewed, appear to be an important drivers for this behaviour. In the quote below, a sexually active young man speaks about his risks for contracting HIV. His lack of mention of the heterosexual route in his risk appraisal cannot be overlooked. The heterosexual route for HIV transmission is by far the most important in Nigeria. It is not uncommon

to hear young people in Nigeria refuse to speak about their heterosexual risk, primarily because it is considered socially and culturally inappropriate for a young unmarried person to engage in sex acts.

“HIV can be transmitted through razor blades....you can catch it through a syringe.’ ‘Like I said earlier, it has no cure, that’s why I am worried” (182)

A similar trend was reported in another study in which participants overwhelmingly indicated that they were at risk for contracting STDs, but reported that it was impossible for them to contract HIV.

“Almost all the respondents (96.4%) knew themselves to be at high risk of contracting STDs, while 87.6% felt that it was impossible for them to catch AIDS” (219)

In the quote below, a male participant reported that he is not at risk for contracting HIV because he has only one girlfriend. Whilst the risk for HIV increases with increasing numbers of concurrent sexual partners (170), it does not mean, however, that having one girlfriend is protective and carries no risk at all. Therefore, the understanding that one girlfriend (or being married) is protective is a misconception that stems from lack of proper HIV knowledge and/or information.

“I am not at risk, because if it is one girlfriend that will lead to the risk, but trust and love in her is what is making me say so. Keeping one girlfriend to me is not risky, but keeping [many of] them at random is a big risk” (182)

There is a significant body of evidence in support of the increase in HIV risk that is associated with multiple sexual liaisons (303, 311). The risk for HIV, that derive from having multiple sexual partners, is even greater in a setting like Nigeria where polygyny is socially accepted, condom use is low and HIV prevalence is high. Multiple sexual partnerships featured in a number of the HIV publications from Nigeria (187, 207, 216, 219, 222, 224, 230, 236, 251, 252).

A number of the publications reviewed reported that females have a disproportionately greater risk for contracting HIV compared to their male counterparts (201, 218, 241). While the physiology and anatomy of the female

reproductive system could explain the increased risk for HIV among females, social and behavioural factors that may play a part in this observation include the widely held view that the role of females in relationships is passive: a norm that impacts negatively on the capacity of females to negotiate safer options in sexual relationships (178, 208). Anecdotal evidence supports the belief that a female should be submissive to her male counterpart. Also, the likelihood of a female to use condoms is significantly influenced by the preference of her male partner (288-291). The quote below, from a study in northern Nigeria, describes the socially acceptable role that is expected of a married woman, which is not greatly different to expectations in other parts of the country.

“A woman is expected to obey her husband whatever the circumstance”.

Muslim women leader (178)

A hospital based survey of HIV positive people living in Canada found that one-fifth of the respondents, that have travelled outside of Canada and the United States, were not only less adherent to their medications whilst away on their trips, but also more likely to engage in risky behaviours that encourage HIV transmission when compared with their counterparts who did not travel (312). Similarly, a study conducted in UK concluded that a substantial number of UK-born adults are acquiring HIV infection in countries with generalised HIV epidemics, and in common holiday destinations (mostly from unprotected heterosexual intercourse) (313). It is therefore, apparent that travel does carry some risk for HIV transmission across geographical boundaries. Similarly, long absence from home, frequent travel and movement of people between States in Nigeria were identified as important factors in the transmission of HIV in Nigeria (151, 179, 187, 191, 210, 236). This is especially important for specific groups such as the police, military personnel and long distance truck drivers who share a common denominator – long stays away from home, short stays in different cities and increased high risk behaviour when away from home (191, 205, 210). The risk for intra-city transport workers, on the other hand, stems from HIV knowledge gaps and high risk sexual behaviours. Some of the papers reviewed (151, 179, 187, 191, 235) suggest that movements of people from one place to another (especially between high prevalence and low prevalence areas) play an important role in the transmission of HIV in Nigeria. One of the studies reviewed

(237), highlighted the role of migrant oil workers in the HIV epidemic in Nigeria, linking high risk sexual behaviour among international expatriates with increased risk of HIV transmission within host communities. It is apparent from the above that whilst travel may seem to be the common denominator, increased high risk behaviour (among travelling groups) is to blame. It follows, therefore, that the existence of pockets of high HIV prevalence regions within (and between) countries constitutes significant threat to successes recorded in other parts of the same country (and the world).

Important factors for HIV epidemiology among MSM (a high HIV risk group) in Nigeria include internalised homophobia, high mobility, differential HIV prevalence among MSM in different States, inconsistent condom use and links with female sex partners (196, 209, 217, 235, 264). MSM members who have unprotected sex with sex workers, as well as non-members of the MSM community, have a significant role to play in HIV transmission. They form a link between MSM networks and the general population (or non-MSM networks).

Prompt and uninterrupted access to medications, for people living with HIV, has been shown to reduce the risk for HIV transmission in a number of studies (67, 133, 314). HIV prevention has revolutionised, much thanks to the discovery that HIV viral load levels could be reduced to undetectable amounts with potent HIV medications (67). Issues relating to access to treatment for people living with HIV play a vital role in the transmission of HIV in Nigeria. HIV (treatment and prevention) services are mostly situated in urban centres where those in the higher wealth strata reside (249). This skew in siting of health care facilities pose serious access challenges for those who reside in rural or sub-urban areas (where the vast majority of those in the lower socioeconomic strata live). It is, therefore, no surprise that rural locations are worse off in most of the studies that compared rural and urban dwellers on a number of key indices like education, HIV knowledge, condom use and uptake of voluntary testing and counselling services (188, 206, 207, 236, 246).

Another key player in the transmission of HIV in Nigeria is the reluctance, among people living with HIV, to disclose a positive HIV status to partners (232, 248). This is largely due to the fear of stigmatization and social alienation (or “social death”) that may follow disclosure. Non-disclosure of HIV status is detrimental to efforts aimed at

halting HIV transmission and, as a result, many countries have legislation in place to safeguard against HIV transmission that may result from non-disclosure of HIV status (160). The fear about non-disclosure being an important player in HIV epidemiology is real in Nigeria and is evident in the quote below, obtained from one of the reviewed papers. In this quote, a male participant, who does not routinely use condoms, reaffirmed the practice of non-disclosure.

“I am worried because I have multiple sexual partners and the worse thing is that even if your partner is infected, she won’t tell you until she pass[es] the disease to you” (182)

There is evidence, strongly suggesting, that other sexually transmitted diseases enhance the transmission of HIV (315, 316). The explanation for this observation is that STDs are contracted, in most instances, through the same route as HIV. Furthermore, STDs create sores or breaks on the skin (and mucosal surfaces) which in turn increases the risk for HIV transmission (317). It will, therefore, be plausible to think that low sexually transmitted diseases detection and low STD treatment rates reported in some of the reviewed articles (268, 280) constitute important risk factors for HIV transmission in Nigeria.

Injecting drug use also plays an important role in the transmission of HIV in Nigeria, though only few studies (220, 258) were found that looked into trends among this high risk group. What is known, however, is that the IDU population has higher HIV prevalence rate compared to the general population: female IDUs have a higher seropositive prevalence rate compared to male IDUs and receptive needle sharing is the only method significantly associated with HIV transmission within this population (220).

According to the three major theories of change behaviour (transtheoretical model, planned behaviour theory and social cognitive theory) our environment plays a very important role in the processes that shape our actions (318-322). Variables within our environment that shape our actions exist in the form of norms and cultural values among others. The role of three very important environmental factors (namely religion, culture, and government policies) in shaping HIV transmission in Nigeria, therefore, cannot be overlooked. These factors (religion, culture, and government

policies) were investigated in only a relatively small number of the papers reviewed (178, 188, 198, 237, 259).

Religion, culture, and government policies play hugely significant roles in the epidemiology of HIV in Nigeria as they form the context within which most of the other risk factors identified in this systematic review operate. These factors, therefore, shape the way individuals perceive and respond to HIV in Nigeria. Faith-based organisations, being scantily accepting of measures for prevention of HIV transmission (such as the use of condoms) play a huge limiting role in the containment of HIV epidemic in Nigeria by actively discouraging the use of condoms. Abstinence remains the preferred method in religious circles. Condoms and being faithful to a partner are, therefore, reserved for those in marriage.

Furthermore, condom use is viewed in the largely Muslim North of Nigeria as an act that limits procreation: this makes condom use unpopular in the North. Also, Muslim clerics are less accepting of premarital HIV screening in the North of Nigeria where religion features very strongly among factors that influence uptake of voluntary counselling and testing for HIV (236, 259). It is a widely held norm in most parts of Nigeria that issues relating to sexuality are private and discussions surrounding sexuality ought to be done privately. Similarly, the cultural practice of polygyny, which in some instances is informed by religion (Islam and traditional religions), plays a rather indirect and hugely debatable role in the transmission of HIV (178, 198). In the quotes below, the controversies surrounding how polygyny predisposes to HIV (or not) is laid bare. In the first quote, from a Christian leader, it is argued that polygyny increases HIV risk among those in polygynous relationships because the polygynous man is incapable of meeting the needs (sexual and otherwise) of his wives. However, the Muslim leader (in the quote that followed) argued that there is no increased HIV risk because there is no real need for the woman to seek sexual gratification outside of the home. Whilst it is difficult to know where to draw the line on these arguments, what is known (as established earlier) is that concurrent multiple sexual partnerships (as is the case in polygyny) does have increased risk for HIV transmission (170). More so, when a member of a polygynous network becomes infected with HIV.

“Polygyny predisposes to promiscuity as it will be difficult for the man to take care of many women in all aspects, financial, sexual and any other. If

the women are not taken care of, they will take care of themselves from outside. This will therefore increase the probability of spreading [transmitting] the disease” a Christian minister (178)

“Because women’s desire for sex is less than that of men, they can be patient enough to be satisfied in a polygynous home” male Muslim leader (178)

The next quotes are about culturally acceptable practices within society. In these quotes, it is obvious from the school teacher’s words that HIV prevention talks are not culturally acceptable behaviours locally. This cultural norm comes in the way of HIV awareness and safer sex education in public institutions.

“Secondary school students can definitely get infected with HIV virus. And they need to be taught how to protect themselves. But what will be the fate of the person who does the teaching? If I try it, I will face serious consequences from my community immediately they get to know” (177)

“... Well, you have to understand that this issue is not about what I think about their private lives. I teach them biology, and that’s what I am paid to teach them...” (177)

“In my wildest imaginations, I can’t even try it. I just can’t. My church will send me packing” (177)

In Nigeria, it is illegal to identify as a homosexual or as a commercial sex worker (91, 323-325). These policies and legal requirements drive homosexuals underground and make commercial sex workers vulnerable to abuse and exploitation. The legal framework in Nigeria, as it relates to commercial sex work, also encourages unsafe work environments for commercial sex workers through a loosely regulated sex industry and provides room for stigmatisation of sex workers. It is a well-known research finding, that increased legal protection for commercial sex workers as well as a reduction in discrimination (and stigma) could enhance HIV research and decrease HIV prevalence among this high risk group (94, 95). The following quotes, obtained from interviews with sex workers, highlight how discrimination, extortion and

sometimes physical abuse constitute significant challenges to HIV risk reduction in Nigeria.

“Police say our work is illegal ... that we should go find other jobs. Tell me, is there anyone who wants to do this kind of work all their lives? Many times, when they come here [to raid] they force sex [rape] on us like we are dogs or beat us so much we need to call a doctor. The Police do so many bad things to us, things that are against God’s way and what happens? Not a thing. When they force sex, they won’t use condom. They bring AIDS to us and then say we give it to them” (174)

“As we speak, some places [brothel] do not get this kind of trouble because they are protected ... they pay protection money. Those who don’t pay are the ones in a difficult situation as they are raided all the time. It is better to pay the money and do your business in peace; otherwise, clients will even be afraid to come here” (174)

5.4 Interventions encountered in reviewed studies:

Only seven of the publications reviewed (199, 202, 221, 222, 234, 250, 268) explored effectiveness of common HIV interventions in Nigeria. HIV risk reduction models underpinned most of the interventions assessed in the publications. Interventions featured in the publications were predominantly behavioural change interventions, with one social marketing intervention (234) and one structural intervention (250). It is clear, therefore, that there is a bias towards behavioural HIV prevention strategies in Nigeria. This does not come as a surprise, considering Nigeria is a society with strong religious and cultural leanings. A look at recent trends in HIV intervention would suggest a movement away from traditional models that utilise one of the many fundamental theories (for example behavioural change models) towards a more encompassing approach referred to as “combination prevention” packages and “treatment as prevention” (65, 326, 327). Combination prevention is defined as “rights-based, evidence-informed, and community-owned programmes that use a mix of biomedical, behavioural, and structural interventions, prioritised to meet the current HIV prevention needs of particular individuals and communities, so as to have the

greatest sustained impact on reducing new infections” (327). Treatment as prevention concerns the administration of potent HIV medications to reduce blood levels of HIV to amounts so low that the risk for HIV transmission from one person to another is significantly reduced (65).

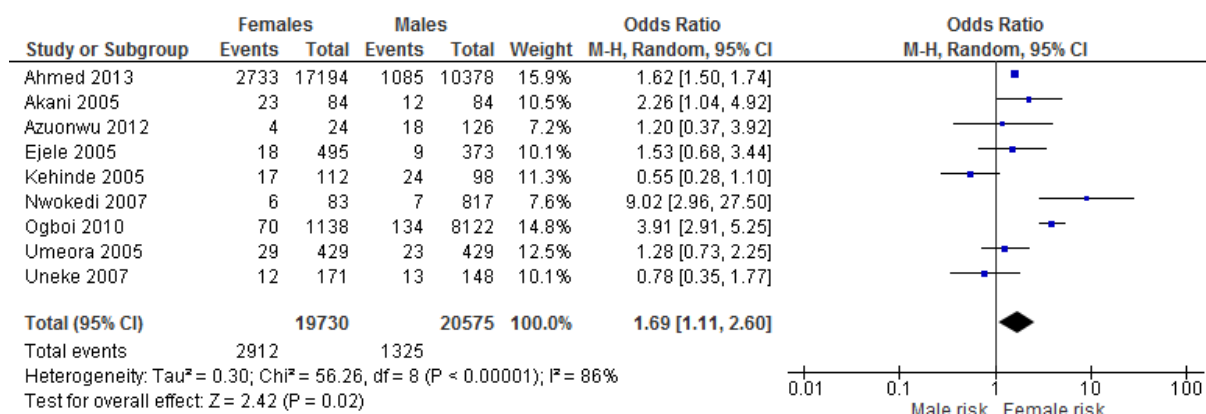
5.5 The meta-analysis

Details of numbers entered into the meta-analyses have been included in the appendices section as Appendix E.

Risk of HIV based on gender:

Random effects meta-analysis of data from 9 publications (201, 203, 210, 218, 238, 241, 260, 261, 280), recruiting a total of 40305 participants, showed there is an increased risk for HIV associated with being female when compared with males (Figure 5.3).

Figure 5.3: Risk for HIV by gender

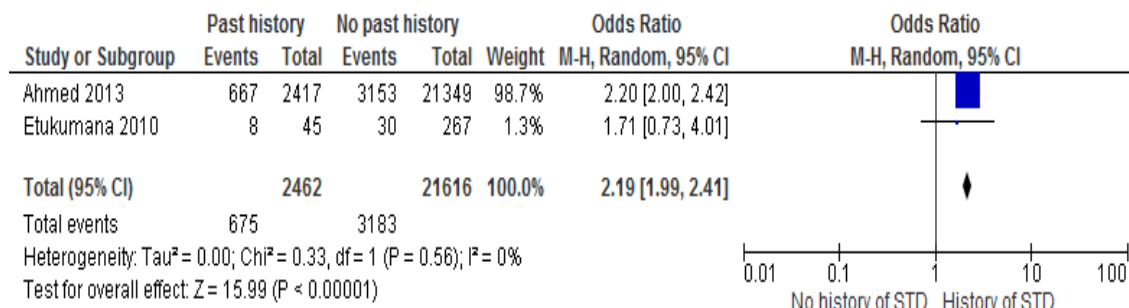


Risk of HIV based on history of STDs:

Similarly, random effects meta-analysis of data from 2 publications (201, 224) including a total of 24078 participants, revealed increased risk for HIV among those with a history of STDs when compared with those who did not report a history of STDs. The implication of this finding is that a past history of an STD is associated with an increased risk (of up to 2.19 folds) for being HIV positive when compared with those who did not report a history of STDs (Figure 5.4). There is a growing number of studies supporting the idea that STDs directly increase the risk for contracting HIV

(67, 262, 314, 315). This review finding add to the growing body of evidence in support of the damaging role undiagnosed (or poorly treated STDs) play in HIV transmission.

Figure 5.4: Risk of HIV by history of STDs



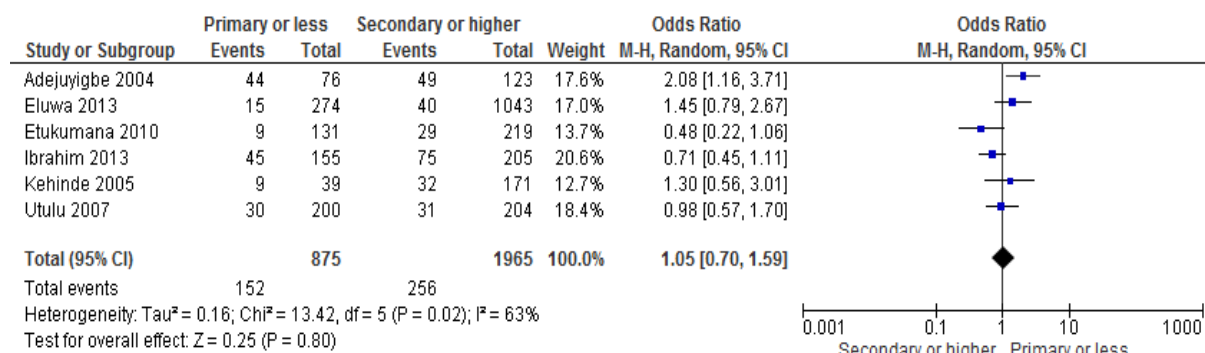
5.6 Other statistical analyses:

In the random effects meta-analyses exploring other variables of interest (education, age and marital status), I did not find any statistically significant trends in the risk for HIV based on these variables. These analyses are presented below:

Risk of HIV based on levels of education:

Primary education or less versus secondary and above: 6 publications (198, 220, 224, 226, 259, 280) recruiting a total of 2840 participants (Figure 5.5). This finding suggests that there is no difference in HIV risk between individuals who have up to primary education and those who have secondary education or above.

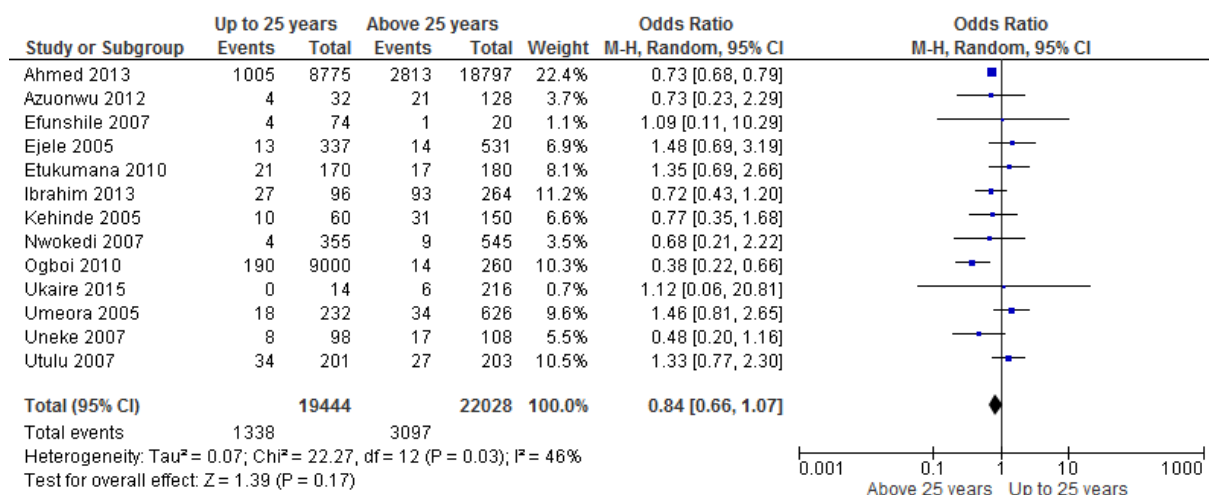
Figure 5.5: Risk for HIV by level of education



Risk of HIV based on age:

Participants 25 years and below versus those above 25 years: 13 publications (201, 210, 217, 218, 224, 226, 238, 241, 260-262, 280, 284) recruiting a total of 41472 participant. This result suggests that there is no significant difference in HIV risk between those who are 25 years or below compared to participants who were above 25 years of age (Figure 5.6).

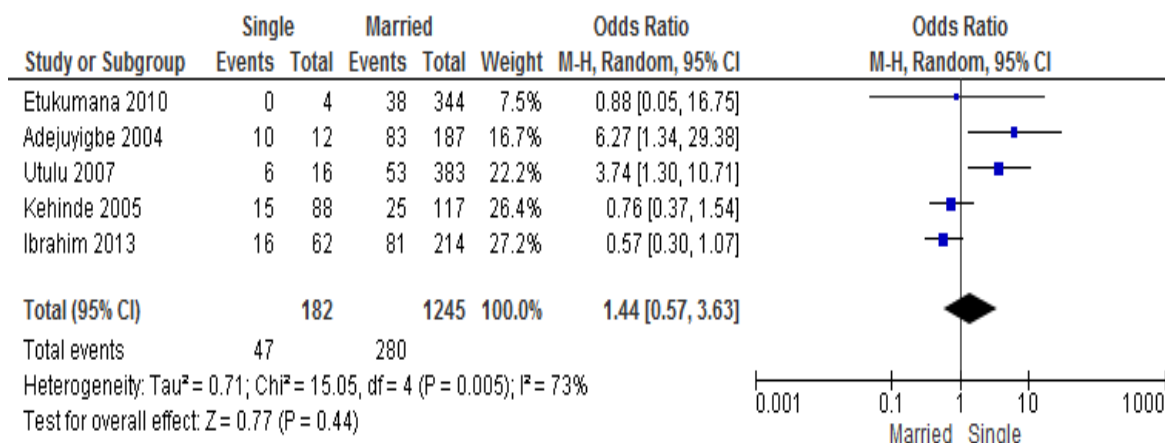
Figure 5.6: Risk of HIV by age in years (random effects)



Risk of HIV based on marital status:

Singles versus married: 5 publications (198, 224, 226, 262, 280) recruiting a total of 1427 participants (OR 1.44, 95% CI 0.57 to 3.63, p-value = 0.44, I² = 73%). This finding suggests that there is no statistically significant difference in HIV risk between married and single individuals in the studies reviewed (Figure 5.7). As seen from the narrative synthesis, HIV is generally thought to be a disease of the immoral and there is the widely held norm that marriage is protective as those in marriage are understood to be in a stable relationship which protects against promiscuous tendencies. However, this finding of no difference in HIV risk between the married and single challenges this norm.

Figure 5.7: Risk of HIV by marital status



5.7 Summary of evidence

Key players in the HIV epidemic in Nigeria are stigma, inaccurate knowledge about HIV, cultural norms, religion, gender issues (in particular the passive role assigned to females in sexual relationships), poor risk perception, poverty and the lack of a robust and well organised HIV response. The HIV picture in Nigeria is one of a generalised epidemic, perceived and understood differently across the country. It is, therefore, plausible to view HIV response in Nigeria as one in which individuals are at different rungs of the behavioural change ladder, as described by the “transtheoretical” model of behaviour change (321, 322, 328). For the purpose of clarity I have grouped these variables (identified in the systematic review) into two broad categories: factors that hamper access to treatment and factors that relate to choices people make. It is important to note that these two broad categories contain variables that are better seen as a spectrum rather than distinct unrelated entities. This is because these variables are interrelated and connected in a complex manner.

Factors that impact negatively on access to interventions: This category includes variables (like poor medication coverage, stigma, poverty, and services siting) that work to hamper access to effective treatment options available locally. The reason I have single out this group is to demonstrate a small but significant finding in the systematic review process: stigma reversal with access to HIV medication. In the systematic review, it became obvious that HIV stigma (which featured very strongly in this group of factors) remains a huge problem in Nigeria. It

was reported, in one of the reviewed publications, that stigma could in fact be reversed with prompt and timely commencement of HIV medications (175). It, therefore, follows that improved access to medication has an added benefit of stigma reduction in addition to the primary benefits of HIV treatment and halting HIV transmission. Making medications available is, by implication, an important component of HIV stigma reduction in Nigeria. There is also the real chance for reversal of negative cultural practices through increased medication coverage. This is because the increased life expectancy and better quality of life that comes with consistent HIV medications use could offer a strong counter narrative to the cultural arguments that HIV is a “curse from God or the result of evil spells cast on an individual by their enemies”. Culture and norms are hard to change but in the face of superior scientific arguments (backed by practical evidence), it is easier to argue for cultural change. Increased medication access thus presents a strong argument and opportunity for cultural change and stigma reduction.

Factors related to individual choices: This second set of factors (which includes for example cultural norms, female gender, stigma, inaccurate knowledge, low condom use and religion among others) are heavily dependent on behaviours of individuals and the choices they make. According to Ottawa charter for health promotion, in order for peoples to attain their fullest health potential, the role of a supportive environment that enable individuals to take control of those things which determine their health is key (329). Biological options (such as HIV medications) are limited in Nigeria. The only practical option, which is widely available, is the use of condoms. However, condom uptake is seriously hampered by social and cultural factors – condoms are perceived negatively as an index of sexual promiscuity. As a result, discussions around the choices individuals make, in a setting like Nigeria where options are few and seriously limited, should be handled carefully as is it could very easily become “victim blaming” (330, 331). Central to most models for behaviour change, such as the TTM, is the understanding that individuals who rightly perceive their risks for a particular illness (in this case HIV) are most likely to engage in healthy behaviours relevant for halting the transmission of such a disease. As a result, factors such as stigmatisation, negative cultural norms, poor risk perception, inaccurate knowledge, risk projection to immoral others and religion that have the capacity to shape how one may perceive and internalise their risks for HIV are

important variables in HIV epidemiology in Nigeria. The exact mechanism(s) through which these factors operate to influence HIV epidemic in Nigeria remains debatable and remains a subject for further research. However, there is no doubt about the limiting role these factors play in the epidemiology of HIV in Nigeria.

The finding that HIV risk also did not vary based on marital status also challenges a widely held norm in Nigeria that “HIV is a disease of the promiscuous and immoral” and asks a lot of questions about the local myth that marriage is protective. The lack of statistical evidence in support of a relationship between HIV risk and a number of variables (age, marital status, and educational attainment) could be due to lack of statistical power to detect a significant difference, if at all there is a true effect to be detected. In the case of educational status, this could imply that higher educational status may not translate to any advantages in HIV knowledge, as argued by some researchers. Further research to explore these insignificant trends is, therefore, needed.

Interventions commonly used in Nigeria are predominantly directed at risk factors for HIV, failing to address factors within the biomedical and structural domains necessary for effective HIV control. Thus, other components of effective interventions such as social support for people living with HIV, biomedical approaches (such as treatment as prevention and pre-exposure prophylaxis) and public health policies that promote healthy behaviours are either non-existent or at infantile stages. Finally, the interventions are hugely reliant on behavioural change communication models (“education for change”). In health behaviour psychology, it is well-known that education does not always lead to behaviour change. There may, therefore, be need for more robust approaches that take into account individual and structural (or environmental) factors that impact on HIV epidemiology in Nigeria.

There are no huge variations in the types of variables that drive HIV epidemiology in different regions of Nigeria. However, there is enough evidence suggesting significant variations in the mechanism through which these variables impact on HIV prevalence. For example, religion and culture are two key variables that shape the HIV epidemic in Nigeria. The predominantly Muslim north of Nigeria is less receptive of measures like premarital HIV screening and condoms (the latter seen as a restriction to conception). Whereas, in the largely Christian south, abstinence is the

most preferred prevention option by church leaders. Other HIV prevention options such as “being faithful to a partner and condom use” are considered exclusive rights for those in marriage. As a result young Nigerians are discouraged from using condoms. It is, therefore, obvious that religion is an important disincentive for condom use and the mechanism through which this happens vary by faith or religious group but ultimately results in one outcome – poor uptake of condoms in Nigeria. There is need for more research on HIV interventions in Nigeria, especially those that seek to explore the implications of increased HIV medication coverage for HIV epidemiology in Nigeria.

CHAPTER 6: The qualitative methods

6.1 Overview of the qualitative methods

This section describes the qualitative approaches adopted in my PhD research. Important themes on HIV in Nigeria, obtained from the systematic review, were explored in unstructured qualitative interviews conducted in Benue State, Nigeria. A combination of focus group discussions (FGD) and in depth (or one-to-one interviews) were used for data collection. Data were collected between February, 2015 and May, 2015.

6.2 Qualitative research theoretical basis

The qualitative arm of this project is an inductive research that utilised methods of constant comparison. I chose an unstructured interview style because I am seeking to provide explanations for the observation that HIV prevalence is higher in certain parts of Nigeria, a process that is inherently exploratory. The decision to analyse qualitative data thematically was because the main objective of this research is to identify themes (and theories) that could provide explanation(s) for increased HIV prevalence in the local area (332, 333). A pragmatic reasoning approach, allowing for inductive and deductive arguments, was adopted in the analyses of my qualitative data because I have set out to identify patterns (if at all any) that could provide explanation for why HIV prevalence vary significantly between populations in Nigeria (334, 335).

6.3 Ethical considerations

It was necessary to obtain ethics approval as my research involved interacting with people. Before data collection, full ethics approvals were obtained from Benue State Ministry of Health and Newcastle University ethics committee. Copies of the ethics approvals have been included in the appendices section as Appendix G and Appendix H respectively.

6.4 Qualitative research approach

The following were the qualitative research tools employed: in my research:

- 1) Focus group discussions
- 2) Interviews and
- 3) Observations

Focus group discussions had between 6-8 participants on the average. It is common practice in qualitative research that focus group discussions have between six and twelve participants (336). Individuals who participated in group discussions were brought together because they share one or more socio-demographic variable(s) (for example age, religion and gender) that could potentially influence group discussions. Interviews on the other hand were held with only one participant in attendance at a time. Interviews were used in instances where privacy is thought to be of paramount importance (for example HIV positive individuals, injecting drug users, uniform personnel and female sex workers). A breakdown of how participants were recruited as well as some characteristics of the qualitative research participants have been summarised into a table in the appendix section (Appendix I and Appendix J). Some pictures taken during interviews have been included in this section (Figure 6.1). The relevance of one of these pictures (top left image in Figure 6.1), taken in a brothel where some female sex workers were interviewed, will be highlighted in the discussions section.

Figure 6.1: Field work pictures showing typical interview settings and qualitative data collection atmosphere



TOP LEFT: PICTURE FROM A BROTHEL WHERE SEX WORKERS WERE INTERVIEWED. **TOP RIGHT:** MALE GROUP INTERVIEW SETTING. **BOTTOM LEFT:** FEMALE GROUP INTERVIEW SETTING. **BOTTOM RIGHT:** GENERAL PUBLIC GROUP INTERVIEW SETTING IN A HOSPITAL SETTING. [PHOTO CREDITS – IO]

6.5 Interview participants – some demographics

Participants in the interviews were all aged 18 years and above. A total of 35 females and 62 males were interviewed. Those interviewed include doctors, nurses, people living with HIV, injection drug users, female sex workers, gay community members, religious leaders (Christianity and Islam), traditional birth attendant, university students, members of Christian and Muslim communities, NGO staff, representative of NACA, “Okada” men, long distance drivers, motor park workers and uniform personnel (police and military). Further details about the demography of respondents have been summarised and included as Appendix J.

6.6 Selection of participants for interviews

Interview participants were selected via purposive sampling. Purposive sampling is a non-probability method for selecting research participants which has been shown to be robust, representative and valid when tested against random probability techniques (337, 338). Considering the need to interview individuals from different sections and groups in Benue State, a “maximum variation purposive sampling” technique (339) was chosen so as to capture a wide range of perspectives and themes on HIV in the local area. Gatekeepers (doctors, community leaders, imams and reverend fathers, non-governmental organizations working with FSW, PLWHA, heads of motor park groups and gay members of society) were contacted ahead of data collection and sent research materials (participant information sheets and flyers) [Appendix K and Appendix L for sample copies]. It was essential to use gatekeepers because of the need to overcome trust issues (especially with FSW, IDU and PLWHA groups) that could prevent access to important groups. Flyers were sent via email, by hand and circulated on social media to ensure maximum reach. Individuals were also approached on a one-to-one level and invited to participate in the research. In one instance, a participant (an IDU) was recruited by talking to other interview participants (gay respondents). In the case of NACA, a written request for interview (dated 19.02.2016) was submitted. Interview request was granted and a representative of the director general of NACA was interviewed on the date scheduled. The divisional police officer in Otukpo was approached for permission to interview some of his staff. This was granted (verbally) and I was allowed to interview police staff on premises and at the convenience of consenting police staff. The “Keeper” to Otukpo prisons was sent flyers and information sheet for access to prison inmates, after which I was informed on the date and time for the prison inmates’ interview.

6.7 Qualitative methods justification

A qualitative arm is needed in this research because it provides context needed for a clear understanding of my research (including the quantitative information generated later in this research) as well as evidence useful for the design of a conceptual framework/theory (340). The decision to use a combination of focus group discussions and in depth (or one-to-one interviews) for data collection stems from the

need to capture how people respond to HIV at individual levels and at group levels (herd behaviour) (341). This approach provides depth and breadth to the interviews and generates a more robust result (342). It is easier to probe specific variables or ideas in in-depth interviews, whereas group interviews are better for scoping new ideas (342, 343). Also, a qualitative arm allowed for sampling of the views of members of populations of interest who are not literate enough to complete surveys: participants that could otherwise have been excluded from my research because they are unable to read and write in local languages and English, and, therefore, not able to complete surveys (344). Furthermore, for practical reasons, it is unethical to bring certain groups together for interviews (for example PLWHA and general population): it was clear from the systematic review and literature review that, HIV is highly stigmatised in Nigeria and the fear of being known to have HIV could have damaging implications for participants who are HIV positive. A qualitative dimension to my research has the potential benefit of allowing me explore an area of understanding about HIV in Benue State that may not have been explored (336, 344). Copies of the interview schedule and the interview question have been included as Appendix I and Appendix M respectively.

Whilst the systematic review provided insight into HIV epidemiology in Nigeria, at country level, the qualitative research was needed to explore local factors in Benue State (the primary research location).

6.8 Design of qualitative interview guide

The content of the interview guide was based on the findings of the systematic review. The interview guide was piloted on a small sample of volunteers in the United Kingdom before it was used for data collection in the field. These volunteers were Africans (and Nigerians) resident or studying in the UK and were selected based on convenience. There was a total of three pilots. The pilot was done to assess if interview questions were appropriate and easy to understand. It also helped build my interview confidence. No significant changes were made to the interview guide afterwards. IO and ZS were responsible for the design of the interview guide. Similarly, an interview schedule, detailing groups and individuals to be interviewed was developed before field work began. This schedule was adjusted on the field as new themes emerged. Copies of the interview schedule and question guide used

during the interviews have been included in the appendices section (Appendix I and Appendix M)

6.9 Interview conduct

Interviews typically lasted between 45 minutes to 1 hour. The longest of the qualitative explorations lasted one hour ten minutes and the shortest lasted 10 minutes (participant needed to leave). Group interviews, on the average, lasted longer than the in-depth (or one-to-one) interviews. Group discussions had an average of about 6-8 participants. Interviews and group discussions were conducted in Nigeria Pidgin English, formal English and, in one instance, Idoma (one of the languages spoken locally). All interviews were held in locations agreed, beforehand, by the researcher (IO) and the interview participant(s). Examples of some locations used for interviews include primary school classrooms (not in use at the selected time of interview), church premises, public relaxation spots (outside peak times), brothels (with chaperone present), offices and homes.

During interviews, participants confirmed that they had read and understood the research information sheet by completing a paper consent form (copy included in appendices as Appendix N). They were also allowed time to ask questions if they needed further clarification. In group interviews, participants were given unique numbers which they used for identifying themselves during discussions. There was no report of harm caused by the interviews. In one instance (an interview with a female sex worker in Makurdi) one of the participants was upset from recounting unpleasant experiences. This interview was paused and she was asked if she needed any further attention, or if she would altogether want to stop further discussions. She was happy to continue and did not indicate any need for further assistance. At the end of the interviews, participants were “debriefed” – this entailed correcting any misconceptions observed during the course of the interview and providing useful information like where to access HIV tests and information. Important observations as well as overall impressions were noted into the interview summary sheet. This sheet provided a quick summary of events and was helpful in keeping me on track throughout the interviews as it offered a quick analyses and summary of my interviews. A copy of the summary sheet is included as Appendix O. Main interview findings as well as notes about the general conduct of interviews were

captured and recorded into the interview summary or exit form (Appendix O) for each interview held as a form of initial analyses of my data.

My role during interviews was to moderate: to ensure all participants are given the opportunity to make contributions and to guide participants along the research goal. I ensured that interferences, from me, were minimal. All interviews were recorded on a digital tape recorder. Recording into a tape recorder was useful for the initial field analyses (as I could play back interviews easily) and for accurate transcription and analyses subsequently.

6.10 Location of interviews

Interviews were conducted in Benue State and Abuja (Federal capital territory). Only one interview was conducted in Abuja (the interview with a representative of NACA in Nigeria) [Appendix I and Appendix J]. NACA is the government agency that oversees and coordinates HIV activities in Nigeria. The remaining interviews (41 in total) were in Benue State. As regards interview type, there were 13 focus group discussions and 29 in-depth interviews altogether (breakdown: 6 focus group discussions in Makurdi; 7 focus group discussions in Otukpo; 14 in-depth interviews in Makurdi and Otukpo respectively and 1 in-depth interview in Abuja) [Appendix I and Appendix J]. In total, ninety-six participants were interviewed over the 3-month period. Interviews in Benue State were carried out in two major towns - Makurdi and Otukpo respectively. These Benue towns (Makurdi and Otukpo) are home to the two largest ethnic groups in Benue State (Tiv and Idoma). These towns are also cosmopolitan, playing host to a number of non-Benue Nigerians resident in Benue State. Otukpo and Makurdi are also major transit towns for truckers and coaches and constitute important hubs for commercial activities in Benue State. Interviews were almost equally split between the two towns: twenty in Makurdi and twenty one in Otukpo.

6.11 Qualitative interview transcription and analyses:

IO was responsible for the analyses under the supervision of Katie Brittain (KB) and Results of the qualitative analyses have been presented in two chapters (Chapters 7 and 8 respectively). The following were the steps/stages employed in the qualitative data analysis process:

1. Stage 1 (data organisation): Interview recordings were downloaded from the tape recorder into an external hard disk storage in preparation for data analysis. Verbatim translation was embarked upon and quotes deriving from interviews were cited using pseudonyms. A quarter of the interviews were transcribed by IO. The remainder were transcribed using a professional transcription group in the United Kingdom (Jacqueline Dobor, JD, transcription services, contracted through Newcastle University institute of Health and Society - IHS). All interviews transcribed by JD services were checked by IO for accuracy. Each transcript was cleaned (read very carefully and compared with recordings for error detection and correction). Transcripts were then imported into Nvivo software (345) for coding. This step was also useful for familiarisation with the transcribed data – helping me to develop a bird’s eye view of my data.
2. Stage 2 (the coding frame): Imported transcripts were read for recurring patterns and a coding framework was developed: this process was guided by the field data and the interview schedule. A coding frame was developed to guide the coding process and it was refined throughout the analysis process. A sample of the coding frame has been included in the appendices (Appendix P). A coding frame is also useful for a consistent and reliable data analysis.
3. Stage 3 (data coding): at this stage, data were categorised and grouped under broad and related themes in preparation for the next stage.
4. Stage 4 (descriptive phase): at this stage, quotes and codes were brought together in ways that best describes the data. This stage is useful for exploring patterns and relationships between identified themes and for theory development.

The validity of the data analysis process was checked by frequent comparisons and discussions, of coding and themes, with my qualitative supervisor (KB).

6.12 Deviations from initial interview plan

During fieldwork, it was observed (from the initial interviews and analyses) that two potentially relevant groups had not been included in the initial list of relevant groups

of individuals to be interviewed – “Okada” riders and injection drug users. The need to interview individuals Okada riders and injection drug users became apparent during interviews with FSW and local NGO staff. As a result, a decision was made in the field to include these groups. “Okada” is a local term used to describe motorcycle taxis in Nigeria. Recruitment of “Okada” men was done at random by selecting one out of every three Okada men found on the street for interview (in Otukpo and Makurdi respectively).

On one occasion there were 10 participants in group discussion (general public group in Makurdi). This decision was made because participants were not willing to be interviewed in two groups, for time reasons (no one wanted to wait). Furthermore, the interview with MSM began as an in-depth interview as only one of the scheduled participants turned up initially. After about half an hour of wait and close to ten minutes of interview, the second MSM participant turned up. As a result there was an in-depth interview section and a group discussion part to the MSM interview. I would later gather that the delay was a decoy by the MSM participants to ensure that I was not an undercover security agent looking to arrest the participants.

CHAPTER 7: HIV Benue State (qualitative results part 1): the individual or micro-environment

In this section, I have presented individual level (micro-environmental) factors that work to shape the epidemiology of HIV in Benue State. Individual choices are important for HIV epidemiology in Benue State, but only if explained in light of broader determinants operational within the local environment. These broader environmental determinants define the choices available to individuals in the first place. As a result, factors presented here have been discussed with the understanding that there are other relevant wider environmental (macro-environmental) factors that have significant modifying and/or confounding influence(s) over these individual level factors and vice versa. Classifying these factors into individual level factors (micro-environmental factors) and wider environmental factors (embedded within the macro-environment) is purely from an intervention perspective: individual level factors are those that could be significantly controlled by interventions aimed at modifying behaviour of locals or members of societies (for example behavioural interventions aimed at modifying knowledge, belief patterns and attitudes) whereas broader determinants are factors that could be controlled through large scale community or nation-wide interventions (such as government legislation and policies). Since these factors are likely to vary between communities, using classifications, as the one above, lends some structure to discussions and can be useful for identifying how subtle differences between communities could impact on health in comparative analyses and research.

The themes presented here are based on data generated from interviews and focused group discussions conducted in Benue State Nigeria between February, 2015 and May, 2015. Factors within the macro-environment will be discussed in the next chapter.

7.1 Poverty

An individual level approach to poverty will provide better insights into how poverty shapes HIV prevalence. The global multidimensional poverty index (MPI) is a robust

international measure of acute poverty (covering over 100 developing countries) which assesses poverty at individual level, using ten indicator variables classed into 3 weighted dimensions: education; health and standard of living (346). The strengths of the MPI is that it measures poverty along multiple indices of deprivation and provides sub-national data on levels of poverty. According to this index (the MPI), 59.2% of people in Benue State are MPI poor (deprived in at least one out of the three weighted dimensions listed above i.e. $K = 33.3\%$); 24.8% are in “severe poverty” (deprived in more than half of the three weighted dimensions i.e. $K \geq 50\%$); 24.8% are “destitute” (deprived in at least one third of the more extreme indicator variables) and 23.4% are “vulnerable to poverty” (or deprived in some of the indicator variables under one of the three weighted dimensions i.e. $K = 20-33.3$) (346). This index gives a clear picture of the poverty situation in Benue and presents a perspective on why poverty could be an important factor in local HIV epidemiology. It was found, from the qualitative interviews, that poverty plays a role in the prevalence of HIV observed in my study location by predisposing locals to high risk behavioural choices created out of the need to make ends meet. Poverty also limits access to available interventions and impacts negatively on how people respond to campaigns targeted at controlling local HIV transmission.

The quote below, from the interview with Dr. John (a medical doctor who attends to people living with HIV), demonstrates how people who are from poor agrarian communities find accessing medical services an uphill task, often having to wait until they sell off their farm produce before they can afford the round trip to and from HIV clinics that are sited long distances from where they reside.

“Some [people living with HIV] come from Vandekiya, some come from many [other distant] places to clinic... It is only [the] day they have money or when they are able to sell their farm produce [that] they can come [to clinic]...” Interview with Dr. John, Makurdi.

Similarly, an interview with a lead NGO worker (Enewa) revealed that some persons living with HIV sell the medications they labour so hard to get (to others who have enough money to pay for them) at the expense of their own health, for poverty reasons. As a result, complications that result from non-compliance such as development of resistant HIV strains, increased risk for HIV transmission, high viral

load, poor quality of life and shortened life expectancy are bound to be higher among the poor who give away their HIV medications in exchange for money. Some people living with HIV fail to access clinics due to lack of transport fare.

“...there are some who due to poverty collect these [HIV] drugs and sell to richer ones” Interview with Enewa, a lead NGO worker, Otukpo.

Furthermore, in the interview with James, an NGO worker in Makurdi, it was found that the demography of people living with HIV attending the clinic where James works suggests people living with HIV come from disadvantaged parts of the town. James also described a situation where these HIV positive individuals he attends to are not able to afford laboratory investigations nor are they able to buy lifesaving medications prescribed at his clinic.

“If you write any drug that goes outside the drugs that are being provided for by the program, they can’t purchase [them]. If you tell them to do a lab investigation that is not supported by the program, they are not able to: so you know that they are poor because they don’t have the money, some of them will even tell you they are looking for what to eat. They can’t even find what to eat [afford food]. Now you get to see that some of these persons, the localities they also come from are actually slums, even if it is within the town, they stay in the slums, they stay in the areas where people of low economic class stay. That is the where they survive, you know. They are just petty traders, poor farmers... small-scale farmers, you know, people doing menial jobs, mechanics, er... traders, hawkers, erm... Okada men, you know, people that ride... motorcycle drivers”. Interview with James, Makurdi.

In another interview with Joseph, a motorcycle taxi operative (a trade known locally as Okada), it was found that teenage/adolescent girls who engage in long hours of petty roadside trading in order to make ends meet constitute soft targets for strangers that could easily exploit these young girls sexually. According to Joseph, these young girls (who by virtue of age are naive and, therefore, not able to negotiate safer sex) could easily contract HIV from engaging in transactional sex with older partners whose HIV status may be unknown to the girls. The principal reason girls, this young,

engage in petty trading and do so during unsafe hours of the day and in vulnerable environments is because of the poverty in their immediate environment.

*“I don’t think the HIV problem is due to culture, because if you look around you will see girls hawking (selling items like peanuts and cakes), some of them are just teenagers and not even adolescent; they are just coming up. They will engage in hawking from morning until about 11 pm or midnight. One sachet of the water they hawk [sells] for about 10 naira (4Pence). In the end what they take home as profit is about 500 naira (1.77 GBP) [an amount that is not enough to provide a decent meal for a small size family]. These teenagers they don’t know what love is, they don’t know all of those things. Some of them will go with advice from their friends to sleep with strangers for money [meaning they] will not go through the pain of hawking, saying ‘they could easily make 500 or 1000 naira in the process (1.77 - £3.54)’. Sleeping with these strangers whom they have no idea what their HIV/AIDS status is, and doing so without condoms, carry a lot of risk for HIV transmission”. **Interview with Joseph (Okada rider), Makurdi.***

Poverty also featured prominently in the interviews with female sex workers. Most of the sex workers interviewed cited poor economic circumstances as reason for engaging in commercial sex work, with most of them indicating the desire to quit commercial sex work the moment they secure an alternative source of livelihood. It has been established, previously, that female sex work carries high HIV risk (due to low condom use rates, high stigma and discriminatory laws) [Pages 49 – 51 and 61]. Below is the account of Ngozi, a female sex worker aged between 20 and 29. Ngozi engages in sex work in order to generate enough funds to support her education:

*“Why I am here is to make some money to help me continue my education otherwise I have to quit [schooling]... let me just give it [commercial sex work] a try [very emotional and almost tearing]. That's all I can say for now”. **Ngozi, a female sex worker, Makurdi.***

Further evidence for the role poverty plays in local HIV epidemiology was found in a focus group discussion with female sex workers in Makurdi. Mfong (a female sex

worker interviewed) revealed that help for a sex worker must include economic interventions aimed at empowering female sex workers rather than interventions (like condom distribution to sex workers) that seek to make sex safer. She argued that government must provide employment opportunities if they are sincere about the fight against HIV in Nigeria and Benue State. This quote from Mfong also goes a long way to highlight the differences in expectations between sex workers and condom based interventions commonly promoted by NGO and government agencies: sex workers believe condom distribution does not in any way address poverty which is the real reason for their exposure to high HIV risk sexual practices.

*“It is the situation of our lives that makes us chose this [female sex work]. If they [Government] must help us, then it must be in these areas... [economic empowerment]. I don't think help for me is supplying me more condoms in this brothel, this is not help. You are killing me! If you [Government] really want to help me [they should] help me [the right way]... teach me how to fish, not how to eat fish. If you want to really help me, start life for me, prevent me from contracting HIV properly by setting up a business for me to run, even if it is a kiosk for the start or a biscuit selling business or even sachet water (‘pure water’) or sweets shop, these are acceptable businesses... You understand, maybe, I may not have joined this female sex work if I had a small business like selling sachet water or biscuits, I will not even have considered being here [doing sex work]. Some of us are interested in going back to school but we don't know what to do. If government really want to help us they should do things like these and not bringing condoms”. **Mfong, female sex worker, Makurdi.***

This view, by Mfong, about lack of start-up funds being the main reason young ladies take to female sex work, as a means of livelihood, was re-echoed in other interviews with female sex workers in Otukpo and Makurdi. It is also evident from the quotes that FSW are not expecting high paying jobs, all they seem to be asking for are decent alternative sources of livelihood.

“If I have an alternative source of income I would not be doing this job. If I get a new job, like today, I will quit this job immediately, even a job that is

*befitting for someone like me who do not have any formal education would do". **Erdoo, female sex worker interview, Otukpo.***

Female sex workers who have taken time to learn trades and handwork are not able to disengage from the sex trade because they lack start-up capital. This was reported in the interview with Hauwa, a female sex worker in Makurdi.

"I learned hairdressing about 3 years ago. Money is the problem. I don't have anyone who will provide the capital I need to start-up. I do not have any brother or father and I currently live with my mother and sisters. So I have to help myself and I do not have any formal education. I will continue to do this as a way of making ends meet until such a time that I could quit".

Hauwa, female sex workers group discussion, Makurdi.

In a group interview with "general public" group, Terwase (a group discussant) stated that high unemployment rates in Makurdi is to blame for soaring levels of HIV prevalence. Terwase states that because there are no real sources of income for young people, locally, they resort to transactional sex to make ends meet.

*"HIV is a big problem around here because [erm] we have a high rate of unemployment... You have a lot of unemployed youth that don't do anything, so because of that they're engaging in a lot of illicit sex. Since the job is not there they engage in such [illicit sex] to get money and at the end of the day you see that the number [of those with HIV] keeps increasing around this particular middle belt region because the unemployed youths are just all over doing nothing" **Terwase, general public interview, Makurdi.***

Similarly, findings from interviews with female Muslim groups and female Christian groups in Otukpo strongly suggest that poverty (which stems from high unemployment rates) play an important role in HIV epidemiology by encouraging prostitution in the local area. Fatima, a group discussant believes very strongly that given the local culture and strict behavioural standards, no lady would go into sex work if there was not a good enough reason (which often is tied to poverty) making her to do so.

“It is not possible for a lady to decide on prostitution as a way of earning a living. It can’t be so. There must be genuine, accurate and hard reasons that have pushed that person [into prostitution]. Nobody in this group will say they would enjoy sex from morning till night. It is not easy. It is not easy for a woman to have sex with about 50 men in a day. It’s not easy, but when poverty comes in, then you need to earn a living so you have to go into this. Though it’s not advised, but sometimes it can happen like that” **Fatima, interview with female Muslim group, Otukpo.**

The quote below underscores the relevance of addressing poor socioeconomic status in the fight against HIV in the local area. There is a strong, undeniable, link between poor socioeconomic status and prostitution, going by the quotes above. In order to address HIV risk that comes from sex work, this link must be broken through creation of gainful employment and economically viable alternatives for young people.

“Some people go into prostitution to earn a living. So, if [HIV] must be prevented they [government] should create more jobs for people... if people have work to do they won’t prostitute for money and it’s when you go into such acts that you [can] easily contract HIV”. **Onyeché, interview with Female Christian group, Otukpo.**

In an interview with a reverend father (a Roman Catholic Church clergy), Reverend Father Emmanuel stated his views that HIV transmission is underpinned by the vulnerability created by poverty. In his argument, he stressed that those who engage in “prostitution” could easily be exploited by rich members of society who have enough resources to exploit, not just one but a chain of sex workers, and by so doing transmitting HIV from one person to another. He also added that the decision to engage in female sex work is mostly unplanned and out of the need to make a living for many. In this discussion, it became clear that those who are poor or even vulnerable to poverty (according to the MPI classification) are exposed to substantial HIV risk.

“Poverty encourages the transmission of HIV because poverty has led so many people into behavioural patterns that they never previously

*considered: they end up on the streets as sex workers... Those who are rich sometimes take advantage of these people [sex workers]. Sometimes for them who are opportune and, who have the money, they take advantage not of one person but a chain of individuals". **Interview with reverend father Emmanuel, Otukpo.***

The same view, above, was expressed in the interview with female members of the Muslim community in Otukpo. It could be inferred that poverty increases HIV risk among sex workers by placing sex workers in a position of vulnerability, where it is near impossible to negotiate safer sex. In the quote below, a participant in the female Muslim group noted that regular girls, who are not sex workers, are forced into transactional sex (with strangers) because of poverty: especially when their parents are not able to meet their needs.

*"Some girls go out to do all those things because their parents are not able to provide for them. So when strange people, for example those rich people from Abuja and elsewhere, come into town with money, it is hard for the girls not to engage in risky sex behaviours. It is not possible to tell the HIV status of these men as they look healthy and our girls and women could easily be deceived because of the rich appearances of these men. So I think poverty could contribute too". **Hajiya, Muslim female interview, Otukpo.***

Commercial sex work (fuelled by high unemployment rates) is an important variable in HIV epidemiology in Benue State. It is plausible to think that vulnerability created by poverty ought to be a key element of any theory or model that seeks to explain the link between poverty and increased risk for HIV. To effectively address local HIV burden, it is important to roll out interventions that improve skills and empower locals to overcome high risk behaviours created by poverty. In concluding this section, it is important to note that the evidence above supports the thinking that the poor are at greater risk for HIV in this local environment: there is very little evidence in support of the reverse (i.e. a scenario where those who contract HIV move into poverty as a result of the negative impact of HIV on their life course and access to opportunity).

7.2 Occupational influences

Benue State is home to a number of military facilities, and functions as a commercial transport hub (used by mini buses, coaches and truckers) that connect the North and South of Nigeria. The impact of military facilities, commercial transport activities and practices of traditional medical practitioners on HIV prevalence locally will be explored in this section.

7.2.1 Commercial sex work and motorcycle taxi drivers (Okada)

It was found that individuals in these two categories of trade (commercial sex work and motorcycle taxi operators) do have increased risk for contracting HIV. As already covered, for those in the commercial sex industry, the main reason for increased HIV appears to be the poverty, demand for unprotected sexual intercourse by rich clients, unfavourable legal frameworks that predispose sex workers to abuse and exploitation from clients and sometimes law enforcement agents. For Okada men, on the other hand, HIV risk stems from misconceptions about the HIV status of female sex workers and increased opportunities for casual sexual encounters with female strangers who engage the services of Okada men. I found a link between the two trades (female sex workers and Okada men) which have not been described in previous literatures. This link is the reason I have grouped the two trades under the heading above. Based on my interviews, a preference for the services of female sex workers was found among Okada men, and this preference stems from a misconception about the HIV status of female sex workers among Okada men (I shall return to this observation in a later part of this section). This behavioural tendency observed among Okada men (i.e. their preference for brothel based sex workers) implies that Okada men may constitute an important epidemiological bridge between the general public (a low HIV risk group) and the high HIV risk group (female sex workers).

In the quote below, Ada (a female sex worker) narrates an experience which is common in the sex workers' interviews. Ada reported that rich men who come to take them out are the ones, who more often than not, demand unprotected sexual intercourse for greater financial incentives. "Sometimes these rich men are willing to pay far more than what we normally get paid if we were to use protection", she

added. “Such offers are difficult to resist because we (female sex workers) are in the female sex industry because of financial difficulties to start with” said another female sex worker, Jane.

“I know definitely some [female sex workers] don’t use condom... yes... the rich men that take us out are the most dangerous people: they ask for sex without condom.” **Ada, female sex worker interview, Otukpo.**

“... some HIV positive clients come to us to deliberately infect us with HIV. These kinds of clients know they are HIV positive and they entice us by offering higher amounts [of money] for unprotected sex. We usually charge our clients about 500 naira [approximately 2 GBP for safer sex]. However, these rich HIV positive clients will bargain to pay sometimes up to 10 times that amount just to engage in high risk sex which could lead to HIV infection. It is tempting when you consider that in one encounter you could make what you would normally make from sleeping with 10 men and if you fail to use your ‘number six’ [common sense] you will fall for the money” **Jane, female sex worker interview, Otukpo.**

In the interview with an NGO worker (Tom) in Makurdi, it was clear that the economic challenges a female sex worker faces plays an important role in her response to HIV messages. Tom, a male nurse who attends to people living with HIV, narrated how he had seen one of his clinic clients on the streets of Makurdi, in an area notorious for prostitution, whilst returning home from work. The following day he coincidentally attended to the same lady at the clinic. In this narrative it is quite easy to see that Tom’s client has made the difficult choice of resorting to prostitution to make ends meet. This choice of occupation exposes her to infection with another strain of HIV and/or STDs. The female sex worker is not only more likely to be infected with HIV but also more likely to have poorer outcomes as well. Also, because the motivation for female sex workers taking up the trade is to overcome economic hardship and ensure “survival” (as demonstrated earlier), they are less likely to insist on safer sex practices, especially if there is a promise of greater financial rewards attached to this. As a result, they (female sex workers) and their clients (especially those who demand sex without protection) are at increased risk for contracting HIV. Below is a quote

from the interview with Tom showing the kinds of pressures sex workers face and why it hard to refuse offers like the ones Jane described above.

*“I once saw a patient, someone whom I was seeing in one of the hospitals, on the road in the evening, around the area where ladies that want to get a “catch” [sex work clients] stay in the evening. I saw her dressed seductively and erm... waiting to get someone that she may pass the night with, you know [what I mean]. I didn’t say anything. She saw me. I passed and didn’t say anything. I came to the clinic the next day and coincidentally she was also at the clinic the next day... she saw me and I didn’t say anything about the previous day because it was not appropriate... I have no rights over her private life. But she walked up to me and said I know you saw me yesterday. I say ah [laughing] are you sure I saw you yesterday? She said yeah, I know you saw me yesterday... but why are you not talking about it? I said no, I don’t have rights over your private life. She said ‘yes, I know. But I have to survive. I have to do this to survive because if I don’t do it I will not eat’”. **Interview with Tom, Makurdi.***

It was also found that female sex workers constitute soft targets for abuse (both physical and verbal) from members of the public and law enforcement agencies (particularly the police) and this is largely because commercial sex work is prohibited in Nigeria. Some female sex workers interviewed reported they were victims of abuses (from members of the public) that include knife injuries, beating and verbal insults. When such cases are reported to the police, they are usually not followed up to ensure the perpetrators are punished. Abuse from law enforcement agencies comes in the form of bribes and extortions. In order for the female sex worker to stay in business and avoid arrest (since the law criminalises sex work), sex workers bribe law enforcement officers who are responsible for enforcing this law. All of the above puts the commercial sex worker in a position where high risk sexual activities (such as unprotected sexual intercourse) are preferred over the low paying safer sex options that involve condom use. Direct questions about rape were asked during interviews with sex workers and it was reported that rape is not one of the challenges they face from local police. Below is a quote from an interview with Ada, a female sex

worker who has experience working in neighbouring Nasarawa State before relocating to Benue:

“... in Keffi [Nasarawa State] the police disturb [us] even if we settle [bribe] them... but here in Benue they do not bother us beyond the bribes... the police make us feel like we are nothing and that is because the government does not know [recognise] us” **Ada, female sex worker interview, Otukpo.**

Other quotes from the interviews demonstrating how commercial sex workers are often subjects of abuse are included below:

“Some of these bad boys in town after they have smoked some hemp or something they will come here to abuse us” **Mary, female sex worker interview, Otukpo. (Mary is widow who resides in the Eastern Nigeria but often travels to Benue for commercial sex work, spending weeks at a time in the brothel where she works and where she was interviewed).**

“... apart from the problems we face from men who insist on not using condoms, we also face challenges from bad boys from the town who come here to fight [physically abuse] us”. **Mfong, female sex worker, Makurdi.**

On the part of Okada men, high HIV risk variables include misconceptions about female sex workers HIV status and increased chance encounters with random girls. In the interview with Johnson, a local and volunteer NGO staff who works with female sex workers, it emerged that Okada men prefer to engage the services of brothel based female sex workers, under the assumption that brothel female sex workers are far less likely to be HIV positive. Johnson further explained that this thinking by Okada men stems from the myth (among Okada men) that brothel based female sex workers are under regular health checks by brothel managers and girls who test positive for HIV are routinely ejected from brothels. While Johnson reaffirmed that HIV tests are frequently conducted by the NGO he works with among commercial sex workers and that many of the female sex workers do test positive, however, the HIV tests are treated with strict confidentiality he added. As a result brothel managers do

not get to know the status of the girls who work in their brothels. This notion among Okada men is, therefore, misleading and dangerous, he reiterated. This finding in addition to random chance encounters with local girls occasioned by the nature of “Okada” work means that Okada men constitute an important epidemiological link between the general public and female sex workers, a link that has implications for HIV transmission locally. It also implies that Okada men may constitute a high HIV risk group.

“... they [Okada men] have a belief that the ladies in hotels/brothels are free of HIV because once they [brothel/hotel based female sex workers] are discovered [to have HIV] they [the female sex workers] will be removed from the hotel, so [Okada men] feel they are safe with them [the female sex workers], they are not scared and er... the truth is let me say about 60 to 70 percent of them [female sex workers] are HIV positive”.
Interview with Johnson (an NGO Support worker who works with FSW), Otukpo.

Another misconception identified in the interview with Aondona, an Okada rider, is the thinking that HIV is only transmitted through blood. Aondona believes that HIV cannot be transmitted, unto a woman, in unprotected sexual intercourse so long as the skin over the penis is intact and without “wound” or breach.

“... When you have sex with a woman without condom, you [can] have HIV through having wound... HIV is a diseases that transfer through blood so it's when you have sex with a lady and you have a wound [on the penis] and your blood go inside the lady... that HIV is going to transfer to that lady.”
Interview with Aondona, Okada rider, Makurdi.

Still on Okada men, in the interview with James (an Okada man based in Makurdi), it was found that random or casual sexual encounters are common among Okada riders (see quote below).

“...there was a time one of my colleague in Okada business was asking me whether there is chance [room] in my house to go and have time [sex] with a lady... a lady he met just that day... I told him my house is occupied

as my wife was there and I can't send her out and put a friend in [my house] with a woman, I can't do such a thing. I apologised for disappointing him and he said I should not worry that he will look for another way out (laughs)..." Interview with James (Okada man), Makurdi.

This increased casual encounters among Okada men further increases their risk for contracting HIV from the general public as well as their chance to spread it to non-positive members of the society. Another key finding from the interviews with sex workers is a trend in which sex workers preferred to work away from the community they originally come from. This could be explained by the fact that sex work is criminalised and highly stigmatised. This interstate mobility of sex workers has implications for both local and between state HIV transmissions. It also reveals how in one setting a sex worker could be leading a life that is different from the sex work identity she puts on once in a different setting (or State). This dual sex workers' identity has implications for HIV transmission as unsuspecting members of the public are less likely to engage in safe sex with a sex worker who takes on a more socially acceptable identity in a location far away from where they practise their sex trade. Below is the account of Ngozi, one of the female sex workers interviewed, who lives in a different state but would often travel to Benue State for sex work on a regular basis to engage in sex work. Ngozi is also a student back in her community in Enugu (a State in the South East of Nigeria) but engages in sex work in Benue State.

"Actually, I was married but got divorced after a little issue with my husband. I am also a student currently on my industrial training [IT] but I have someone providing me cover in Enugu State [whilst I am out here for sex work]". Ngozi, a female sex worker, Makurdi.

Similarly, Ada (a sex worker in Otukpo) stated that all the girls directly involved in the sex trade in the brothel where she works are not from the local area when she was asked about the demographics of those who reside in the brothel. The brothel Ada resides houses at least 30 girls.

"... only 1 of the girls is Idoma and she is from Agila... she is our chairlady [supervisor]" Ada, a female sex worker, Otukpo

7.2.2 Long distance drivers and truckers

As mentioned earlier, Benue is home to a number of important road transportation hubs, linking the North and South of Nigeria. The attitudes and belief of long distance drivers and truckers who often make stops in Benue State would, therefore, be critical for the epidemiology of HIV in Benue. In the interview with a representative of NACA (the foremost body for HIV activities in Nigeria), it was found that a high proportion of long distance drivers and truckers believe that herbal concoctions are able to protect an individual from contracting HIV. This thinking, in addition to reported high risk behaviours observed among truck drivers (who make enough money to be able to indulge in activities that are high risk for HIV transfer) constitute important variables for HIV prevalence in these junctional towns (quote below).

*“We (NACA) conducted a survey recently... that was last year [2014]... it’s a programmatic supported survey within NACA and we looked at junction towns, we tried to look at the transport corridor, North-South corridor and junction towns and from the responses we got from the long distance drivers and allied workers, which includes artisans who work in those locations, a high proportion of them still believe that traditional medicines [or medications] can actually prevent them [long distance drivers and artisans] from contracting HIV”. **Interview with Chuks, NACA representative at Abuja, Nigeria.***

In the interview with Paul, a long distance driver based in Makurdi, it became apparent that high risk behaviours are prevalent among long distance drivers who, based on Chuks’ interview (above), lack the proper mind-set and knowledge about HIV prevention.

*“Back in the days they [long distance drivers] used to go out to clubs... partying, when they have money. So when you are into that [partying] it can lead you to do what you are not supposed to do...” **Interview with Paul, long distance driver, Makurdi.***

One of the high HIV risk activities identified among long distance drivers is unprotected sex with commercial sex workers. The interview below, with a local lead NGO worker by the name Enewa, demonstrates this risk.

*“Benue State also act as a transit between the east, the west and the north. Most of the vehicles pass through Benue State to go to the east even to the south and to the west. The long distance drivers, some of whom may have contracted HIV already, after driving for a long time, of course need a rest and we have the commercial sex workers who are always ready because of the need to make money - they just accept whoever comes to them. And because they [sex workers] actually need this money, [safer] sex negotiation is not there. Just as we said, their trade is to sell their body and [when] the money is there, they find it very difficult to negotiate for [safer] sex... these are some of the issues”. **Interview with Enewa, Otukpo.***

It is, therefore, clear that via a combination of factors (such as poor attitude towards HIV prevention; long stay away from home occasioned by the nature of long distance driving and unprotected sex with commercial sex workers) long distance drivers are at increased risk for transmitting and contracting HIV.

7.2.3 Uniformed personnel (military and police)

Benue State is home to a number of military facilities. In the interview with Jacob (a junior military officer) it emerged that transfers of military personnel, an event that happens frequently, increases the odds for engaging in high risk behaviours among officers who are sent on assignments away from home. This in turn is critical for local HIV transmission he added. This position was also echoed in the interview with a more senior officer (Olu, a colonel in the Nigerian army).

“... you know that most times the military man doesn't always stay with his or her family... you are here today, tomorrow you might be posted elsewhere... the challenges for you to transport your family to where you are posted goes a long way to separate you from your family. So in the absence of your family one may have sexual urge... some [soldiers] that

do not have self-control or who fail to exercise self-control will always find other means of settling their sexual urge. I think there should be a package that allows for soldiers to move with his/her family to avoid that breach". Interview with Jacob, junior military personnel, Makurdi.

The way the military socialise has been implicated in local HIV epidemiology. The quote below demonstrates how "random" girls picked off the streets to attend military parties could form an important link for local HIV transmission between military personnel (a known high HIV risk group) and locals. In this quote, a high ranking officer, Colonel Olu, narrates how measures such as going to get female sex workers or female university students to attend these parties are adopted, on a regular basis, and to the pleasure (and demand) of more senior soldiers:

"... another thing is the way we socialize [in the military], we believe that we are catching fun by going to messes: officer's mess, soldier's mess, sergeant mess, all these kind of places where we relax and during the relaxation we mingle with some coppers ¹. You are also likely to mingle with some girls from town. During tombola [a military social event] some of our big generals will insist that we go and get girls because the gathering will be 'rough' without those girls. By the time you don't find coppers ¹ and you find no one else, you end up going to bring even Benue State university girls or all those girls that stand around the road [commercial sex workers]... so all those kind of things promote the transmission of this deadly disease in the barrack". Interview with Olu, senior military personnel, Makurdi.

1. A copper is a term used to describe a graduate level individual who is enrolled on the mandatory National Youth Service Corp (NYSC) program which lasts for a period of one year.

The main variable identified in the police interviews is frequent transfers, similar to the scenario described by military officers interviewed above:

"...the nature of our job, we are not stationed at a place. Because of the nature of our job we move from place to place and because of the economic situation too... most people don't move about with their family..." Omale, junior police officer, Otukpo.

7.2.4 Traditional birth attendants and traditional healers

A huge number of Nigerians (especially those living in villages and rural areas) rely heavily on the services of TBA and TH. Practises among traditional birth attendants and traditional healers are, therefore, important for local HIV epidemiology. An interview with Ooja (a traditional birth attendant in Otukpo) revealed unsafe practises (at the level of traditional practitioners) that encourage HIV transmission in the local area. Ooja stated that, whilst attending to deliveries of babies, it was common practise not to use any protective equipment. “Occasionally”, she said, “we use polythene bags for protection against diseases” when HIV is suspected.

“... a lot of people still use our services and mainly because they cannot afford hospital bills... initially we don't use anything to protect ourselves [when attending to deliveries]... As we do not have monies to obtain hand gloves all we use now is polythene [bags]... it is because of a disease [HIV] that is in town now that we started using [polythene] bags”. Ooja, traditional birth attendant interview, Otukpo.

In another interview, a participant highlighted how the use of unsterilized equipment in rural areas predisposes to HIV infection. Paul, a group discussant, argued that individuals, who parade themselves as doctors, do not bother to sterilise instruments which they use on more than one person. “They also operate from substandard environments and use expired medications to treat unsuspecting rural dwellers” he added.

“...they call themselves doctors in the village. They use old, unsterilized, scissors to treat. They even treat wound with razors that have been used before and on others [without sterilizing them]”. Paul, Christian male group discussion, Otukpo.

The above picture, described by Paul, is further complicated by the fact that traditional healers have, over time, been able to establish themselves in their local areas as reliable healthcare providers. This position is further substantiated by their incorporation into the primary healthcare systems, giving them some legitimacy among local populations. As a result, messages from groups or individuals who are

not known to local communities are not readily accepted, an action that has implications for HIV campaigns in rural communities. Below are quotes from interviews with Dr John and Mr. John in support of this trend:

“... it’s difficult for you to go and tell them [villagers and those who use the services of TBA/TH] that the person that have been delivering their children for the past 5...10 years is no longer... or does not know anything. The government needs to bring them [TBA/TH] together and train them at least... If you give them adequate training and make them to carry out the counselling and testing, probably they may through that means be able to recruit and bring more people to test, because people trust them and this is because they have been doing this work in their communities for years and people believe they are giving results...”.

Interview with John, Makurdi.

“...some people believe in traditional or herbal medicines and even in this age and time, some guys hardly take other medications outside of herbal mixtures. They believe in this herbal medicines, ‘Agbo’, and everything like that”. ***John, general public interview, Makurdi***

In summary, occupations that play hugely important roles in the epidemiology of HIV in Benue State includes female sex work, uniform jobs (police and military), Okada riders, long distance drivers, traditional healers and traditional birth attendants. The common denominator for HIV risk identified here relates to individual level practises and behaviours that are occasioned by occupational exposures. These factors have implications for HIV transmission for individuals that are into these trades and locals of host communities.

7.3 Deliberate transmission of HIV

Deliberate transmission of HIV relates to the tendency for individuals who are infected with HIV to engage in high HIV risk practices that leads to the transmission of HIV to non HIV positive others. Some reasons identified for this behaviour include frustration associated with difficulty in accessing HIV care, stigma surrounding HIV seropositive status and revenge. In one of the interviews held in Makurdi, the

interview participant, Mr. Idoko (a hotel manager and volunteer HIV awareness campaign staff with a local NGO), spoke about the experiences of a female friend. In his account, Mr Idoko reported that his female friend contracted HIV through unprotected sex with an HIV positive man who refused to disclose his HIV status prior to the sexual encounter. This story underscores the fact that some members of the society would rather not disclose their HIV status, thus putting others at increased risk for contracting HIV:

“I know a lady who phoned to tell me that she is HIV positive... She had unprotected intercourse with an HIV positive man, just once... She later found out that the particular guy she slept with was HIV positive but he didn’t disclose”. **Interview Idoko, a hotel manager and volunteer HIV awareness campaigner, Makurdi.**

The tendency to deliberately pass HIV onto others could be due to the fact that most people feel let down by others from whom they had acquired HIV.

“...some people, mostly females if I will say, feel that because they have acquired the disease from someone else they will also spread [transmit] it to get back at others. This also happens in guys who are carriers of the disease...” **Gloria, university students’ group discussion, Makurdi.**

Challenges and difficulties associated with accessing HIV care was cited as one of the reasons some people living with HIV may want to deliberately transmit HIV. Jane, a participant in the Christian female group discussions, stated that some people living with HIV have vowed to infect others with the virus because of unpleasant experiences they had whilst trying to access HIV care:

“...even those that have it [HIV], due to the frustration they are going through in accessing care, have vowed to get many people involved in this thing, probably out of frustration”. **Jane, Female Christian group discussion, Otukpo.**

Another reason for intentional transmission of HIV frequently mentioned in the group discussions is the care free attitude some individuals have about issues of sexual health. In the quote below, Michael, a participant in one of the group interviews

stated that some individuals make light of HIV by saying “all forms of death are essentially death” and as such death from HIV is seen as nothing more serious than death from other causes. It goes without saying that individuals who nurture this kinds of ideology will be slow to adopt HIV risk reducing lifestyles:

*“I’ve heard people say ‘all death is death’, whether it’s motor accident [road traffic crash], malaria or HIV, if you die you’ve died. So it doesn’t matter [if one dies by HIV or other causes]”. **Michael, general public group discussion, Makurdi.***

*“All death is death is a common slogan among the youth... and this is not so and it is not supposed to be so”. **Okopi, Okada rider, Otukpo.***

Revenge was cited as reason for deliberate transmission of HIV in some of the group discussions.

*“...there is this thing... revenge: HIV positive individuals want to pass it on to others. People living with HIV want other people to feel the pain they have [felt]. Not like they [people living with HIV] are ignorant of what they are doing...”**Michael, general public group discussion, Makurdi.***

It will follow, therefore, that in order to effectively control HIV transmission, the existence of laws prohibiting acts of deliberate transmission of HIV needs to be in place and enforced. However, the challenge with enforcing this law would be the task of making a distinction between HIV transmission that is as a result of individuals not knowing their status and/or not having the right knowledge of how HIV is transmitted and those secondary to intentional transmission. The need for an enabling environment, in which most (if not all) have access to correct HIV knowledge in addition to HIV services is key for the success of this law amongst other challenges that will be discussed later in the discussions section.

7.4 Multiple and concurrent sexual partnerships

Multiple and concurrent sexual partnerships refers to instances where individuals are in more than one sexual relationship at a time. Since HIV transmission is largely

through heterosexual contact in Nigeria, it would be plausible to think that HIV risk will increase with increasing numbers of sexual partnerships. However, absolute numbers may not count any more than how many individuals are involved in a sexual network. An individual who has one sexual partner that in turn has other partners has an increased HIV risk compared to another who has one faithful sexual partner, even though they each have one sexual partners. An “Okada” rider, Mr Aondona, who spends most of the day in Makurdi for work reasons, describes his cell of sexual relationship in the quote below.

“I have a girlfriend... in fact I have 3 of them and, I have sex with all of them. I believe they too have sex with others as I am not with them all the time and they [the girls] are all in Gwer West (Naka)...” Aondona, Okada rider interview, Makurdi.

The above quote demonstrates how each of the three girls in this sex network are at increased risk for HIV, which could be easily transmitted from a member of the cell to others. If the claims of the Okada man (that all three girls have sex with other men) are true, then the network even becomes more complex with the risk for HIV transfer between all members of the cell further increased by a factor that is hard to quantify.

7.5 The notion that HIV does not exist

In some of the interviews, participants revealed that a small section of the local population believe HIV does not exist. The belief that HIV does not exist could impact negatively on how individuals perceive and respond to HIV epidemic in the local area. Excerpts from some of the interviews, demonstrating this trend have been included below:

“You know, some people, sorry to say, don’t believe in this HIV... even when you educate to them they will say there is nothing like HIV” Adakole, Junior Uniform personnel interview, Otukpo.

“...the reason HIV is spreading is because some people do not think it exists...” James, Okada interview, Makurdi.

Such blatant denials of the existence of HIV is critical for HIV control because it impacts on acceptance of interventions and willingness to access care among those who entertain such views.

7.6 Dislike for condoms

It became clear during interviews and group discussions that condom is not a very popular HIV intervention option among a number of individuals (including people living with HIV) in the local area. Reasons cited for the dislike for condom include reduced sexual pleasure and condoms not being 100 percent protective, among others. In the quote below, Ben (an injecting drug user who shares needles) spoke on how he had failed to use condoms in the past and cited reduced pleasure as reason for his dislike for condoms. However, he had a change of attitude when he was faced with the challenge of donating blood to a dying relative and was required to do an HIV test before he could donate blood. After testing negative for HIV, Ben decided to use condoms but still remains an injecting drug user. Ben's experience demonstrates the relationship between HIV testing and willingness to use condoms: those who test negative being more likely to take measures to stay negative.

“Before the day I tested for HIV, I hardly made love with a condom. Why, because I don't enjoy...I don't have the fun [when I use condoms]”. Ben, an injecting drug user who shares needles, Makurdi

Condom use is also not very popular among people living with HIV. Margaret, a person who lives with HIV and who is one of the lead workers at the HIV centre in Otukpo, narrated her experience working with people living with HIV. She describes a scenario where some of her service users (single ladies who are HIV positive) come back to the facility pregnant or with babies, despite being offered condoms previously. She argued that these ladies, who are not married, may be having unprotected sex with unsuspecting male partners, thus exposing their partners to increased risk for contracting HIV.

“... What I discovered here [in this HIV centre] is that women that use this facility come here and are given condoms. Maybe in the next 2, 3 months they will come [to us] pregnant and I ask them do we give you balloon

[condom]? And most of these women are not even married” Margret, person living with HIV and lead worker at HIV Otukpo General Hospital HIV centre.

It did not appear that condoms are popular among people living with HIV interviewed in Makurdi as well.

“... most of [the] people that are within my age bracket don’t use condoms. That is why you see [HIV] is spreading in every nook and cranny of the city”. David, person living with HIV interview, Makurdi.

The practise is not different among Okada riders as Ujah, a participant in a group discussion held with Okada riders in Otukpo, stated that many of his colleagues do not use condoms because condoms reduce the pleasure they derive from sexual intercourse.

“...many do not use the rubber [condom] because they complain that the rubber reduces pleasure. As a result they prefer skin to skin... most of them do not use the rubber...” Ujah, group discussion with Okada riders, Otukpo.

Some interview participants stated that locally available condoms are made from substandard materials that offer no protection against HIV. Others believe that condoms have tiny holes in them that could easily allow HIV transmission during sex: “condoms do not offer full protection” they argued. These widely held misconceptions about condom efficacy were expressed in a number of interviews held across Otukpo and Makurdi. As a result of this perceived lack of effectiveness of condoms, many prefer not to use condoms at all. The quotes below support the fact that condoms are not popular because of perceived reduced efficacy:

“Condom is not 100 percent sure... Most of the condoms we have in all these places... are... made of substandard materials so most times people who use these condoms complain... so many people have contracted HIV, even people who use condoms have contracted it [HIV] because of the... inferiority [poor quality] of the product”. Daniel, discussion with Christian males, Otukpo.

“I’ve seen it mostly in the cases that someone [will] tell you that ‘I was having sex with my girlfriend and in the process the condom broke’, so even the condoms I am seeing nowadays are fake... they are not original”.

Interview with Nkechi, junior uniform personnel, Makurdi.

Others believe, erroneously, that condoms are not as effective as people are made to believe. Gloria, a participant in the all-female university students’ group discussion held in Makurdi, believed that condoms are only about 30% effective.

“They say condom is 100 percent protective, which is not true. Condoms are actually, to me, in my personal view and, from the research that I’ve made about condoms, only about 30 percent effective, which is still a failure in University [grades] sense”. ***Gloria, university females’ group discussion, Makurdi.***

7.7 Lack of sex education at family level

In the interviews, there was strong expression of the role families have to play in shaping the future of individuals and society. It is believed that the training one receives in childhood goes a long way to influence adult life.

“Parents have a primary role to play in the lives of the children which starts from day one. How you bring up your child and what you show him/her to be positive and negative [norms in the society] and how you train him/her to adhere to the positive and abhor the negative goes a long way in shaping the future of the child”. ***Fatima, Female Muslim group interview, Otukpo.***

However, this feeling or belief in the power of nurturing, at the home front, does not seem to cover certain aspects of social life like sex education. When asked about sex education, most interview respondents stated they never had any form of sex education at home or from a family member. In some instances, participants reported the sex education they got were parables that failed to communicate intended messages. Parents either chose to discuss issues of sexual health using vague languages that fail to communicate clearly or chose not to speak about sexual health

issues with their wards altogether. As a result, people turn to less reliable sources (like friends) for information on sexual health.

“Our parents are ashamed of telling us some of these things, I did not get such education. I got it from friends and from media... some young people are just waiting to leave the house so they can test some of the lifestyle they have been hearing about in the media and from their friends who are in universities... as a result of not getting the right information on how to go about all these things, from their parents, they may run into the wrong hands”. **Adole, male university students’ group discussion, Makurdi.**

Gloria, a female participant in the university female students group discussion, revealed that the closest to sex education she received from her mother was a parable demonstrating how an egg (in apparent reference to a girl) should not go playing around a stone (a boy) otherwise “it” (the girl or egg) could be damaged. Such proverbs are totally devoid of any specifics about HIV and STIs and highly unlikely to communicate intended messages. “Sexual health education sound more like messages of doom and hopelessness” some interview participants reiterated.

“The egg does not go close to the stone”. **Gloria, university students’ group discussion, Makurdi.**

Similarly, Jane stated that schools and parents ought to do more in educating young people about HIV

“I think schools and parents should educate their wards and children early enough, because for me, for example, I knew of HIV as at the age of 12. My aunty who works with HALT AIDS gave us that education at that tender age so we knew certain things about HIV and that made us careful. But unlike other homes, they think teaching children about sex and other things would actually pollute their minds, but I don’t think so. I think children should know certain things about sex and how to protect themselves from diseases like HIV and AIDS”. **Jane, University students, discussion, Makurdi.**

In the university males' group discussion, Adakole (a participant in the group discussion), reported that parents are not engaging their wards in sexual health education because of perceived "shame" associated with talking about issues of sexual health with their wards.

"There is nothing wrong with a parent calling his or her child (my son, my daughter) this is what is going on, this is how to protect yourself [from HIV], and this is how to stay away from all these things. I think some of our parents are ashamed. They are ashamed of telling us some of these things, I did not get such education". Adakole, male university students' group discussion, Makurdi

7.8 Poor risk perception

Poor risk perception refers to the tendency for individuals to attribute their risk for HIV to non-heterosexual means despite having the knowledge that HIV is contracted (by a vast majority in Nigeria) through heterosexual contact. In the quote below, Joy (a discussant in a Christian female group discussion held in Otukpo), demonstrates good know of HIV transmission:

"Well, I know HIV/AIDS is a virus, it's a disease, and I also know that it is mostly spread [transmitted] through sex. Although it is harder, it can be transmitted through other means, but the chances are thin. Reason being, if you get a blood of a HIV patient and let's say you get it out, or maybe through a cut with a blade, it doesn't last long, like the virus can't survive outside humans". Joy, Christian female group discussion, Otukpo.

It is no doubt that most participants had good knowledge of the prevalent route HIV is contracted in Benue, which is the heterosexual route. However, it is almost as if the confession that one has a significant risk for contracting HIV equates to being HIV positive or is a confirmation of a reckless and immoral lifestyle. It very quickly became apparent that individuals are quick to blame others or attribute their risk for contracting HIV to things like haircuts, use of unsterilized instruments, manicure and pedicure, blood transfusions and occupational exposures (for healthcare workers). There appear to be an air of denial when individuals were asked about their risk for

HIV: they tend to downplay their heterosexual HIV risk or deflect. In an interview with a group recruited at the outpatient department of a hospital in Makurdi, a nurse (Angela) who volunteered to participate reported that her biggest risk comes from attending to patients in emergency settings.

“...you know we health workers, we are at higher risk of contracting the virus. In short we are just living by the grace of God, because sometimes there are some emergencies you meet, before you will even get a hand glove something has happened”. **Angela, nurse and participant in group discussion, Makurdi.**

Another participant in this group interview, Rebecca, stated that the HIV risk for most girls come from cosmetic treatments like manicure and pedicure in beauty shops.

“...girls that do all this manicure, pedicure stuff, you’re not sure whether those things [cutting instruments used] are sterile”. **Participant in general public group discussion, Makurdi.**

It was a similar story when interviews and group discussions were held in Otukpo as well. Okopi, a participant in one of the focus group discussions held in Otukpo, reported that accidental cut or breach of skin by sharp objects (such as pins and needles) contaminated with an HIV positive blood constitute important route for contracting HIV.

“...sometimes one can just mistakenly stumble into, maybe, a razor blade or pins that someone [with HIV] has already used and disposed unsafely”. **Okopi, male Christian group discussion, Otukpo.**

In the interview with the NACA representative, it became apparent that a significant proportion (40%) of new infections will occur among those who think they have low HIV risk. This could be as a result of individuals failing to appropriately quantify their HIV risk and, therefore, failing to take necessary steps to prevent HIV infection.

“about 40% of the new infections are likely to occur among the general population, specifically among people who perceive themselves to be at low risk of contracting HIV” **Interview with Chuks, NACA representative.**

All of the factors cited (under poor risk perception) by participants are in themselves proven ways by which HIV could be contracted but they are not the most important routes in Nigeria. What is obvious from the interviews is the fact that individuals tend not to be able to correctly identify or speak freely about their own risk for HIV, despite knowing that heterosexual contact is the predominant way through which HIV is contracted in Nigeria. It is as if there exist an unwritten moral code preventing participants from correctly matching their risk for HIV to sex.

In conclusion, it is worth noting that most (if not all) of the factors described in this section do not stand alone. As a matter of fact, they form a part of what is best described as a spectrum, operating in a complex manner to produce increased HIV prevalence in Benue State. Some elements in the micro-environment described above are also embedded within the macro-environment (as root causes, modifiers or end result of this very complex whole). The next chapter presents some of the broader determinants of HIV epidemiology (embedded in the macro-environment) in Benue State. Chapter 8 is, therefore, the other end of this spectrum of interrelated determinants of HIV prevalence in Benue State and without this chapter (Chapter 8) the discussion about HIV in Benue State is incomplete.

CHAPTER 8: HIV in Benue State (qualitative results part 2): Structural and social factors or macro-environment

The macro-environment describes broader environmental themes relevant to HIV epidemiology in Benue State. These broader determinants of HIV epidemiology operate at a level above the individual level variables earlier described and are amenable to community or national interventions (for example health public health policies and poverty eradication programs that impact on the availability of healthy choices for locals). Some of the themes presented here are directly related to some others already highlighted in Chapter 7.

8.1 Government policies and corrupt practices

Criminalisation of commercial sex work by government predisposes sex workers to abuse and exploitation. This law (which provides grounds for corrupt law enforcement officers to extort money from sex workers) encourage HIV transmission by increasing the financial pressures on sex workers who are already from deprived backgrounds. This increased financial pressures, forces sex workers into high risk sexual practices (such as unprotected sex) that have greater financial incentives.

*“...in Keffi [Nasarawa State] the police do disturb, even if [or after] we’ve settled [bribed] them... but here in Benue they do not bother us beyond the bribes... the police make us feel like we are nothing and that is because the government does not know [recognise] us” **Ada, female sex worker interview, Otukpo.***

Another government policy which has negative implications for HIV epidemiology in Benue is the antiretroviral therapy (ART) commencement policy. This policy stipulates that newly diagnosed cases of HIV would only be eligible for ART if CD4 count is less than or equal to 350 cells/mm³ (Figure 2.5) (90).

It is well documented that HIV positive individuals who are virally suppressed are far less likely to transmit HIV to negative partners (67). As a result of this established

scientific fact, the world health organisation (WHO) now recommends ARTs for all persons living with HIV as well as individuals at substantial risk for contracting HIV (66). It is, therefore, no surprise that some HIV care providers have adopted the slogan “ART is effective only if taken”. Making ARTs available in places where they are not routinely available should be the next phase of action in the global fight against HIV. In an interview with the head of an NGO (which caters for over 35,000 people living with HIV in Benue State), it became apparent that initiating HIV treatment at CD4 count of less than or equal to 350 constitutes significant “restriction” to the control of HIV transmission in the local area. This is because the policy excludes individuals who have CD4 above 350 from treatment: people living with HIV that are not on treatment are more likely to infect others (67). In one of my interviews, Tom (who is also a nurse) stated that commencing HIV treatment at diagnosis (as recommended by the WHO) is not widely practised in Nigeria and this, he said, is largely due to the absence of a clear policy statement from government in addition to resource constraints. Mr Tom also cites corruption, at government level, as a major obstacle to early commencement of ARTs.

“We are still being restricted by guidelines... As it is now, we are still practising the issue of CD4 of 350 start treatment though the WHO guideline has actually approved 500. But in fact, like in our programme, we have started [practising] ‘if CD4 less than 500, treat’. But we are still waiting for the guideline from the federal government... up till now they have not really given us any written guideline... we don’t have anything to go by, so guidelines are restricting us in the area of ‘test and treat’. The best thing to do is test and if a person is positive start treatment because it reduces the viral load which in turn reduces the chances of transmission of HIV to others. But unfortunately we are held back, because we don’t have the resources to treat the number of people who are HIV positive in this country and because of government corruption. So actually, treatment is a way of prevention, but up until now we are not looking at it from that point. We are actually looking at what is available. Let’s do whatever we have within this context [of what is available rather than ideal]... if we had a standard of ‘test and treat’, like what is happening in the advanced worlds, it will go to go a long way to help”. Interview with Tom, Makurdi.

The policy above ensures there is a pool of people living with HIV in Benue State who are not virally suppressed and who are able to transmit HIV. The implication of this is an increased risk for HIV transmission to negative partners. It was also found that interventions rolled out by government often fail to reach target groups, mainly due to mismanagement and diversion of resources. In an interview with female sex workers, Jane (one of the sex workers interviewed) reiterated this view. Jane states that she and a friend of hers (who is also a sex worker) were enrolled in a skills and economic empowerment project planned to take place over three months. However, the project did not go beyond the first attendance. She added that the monies meant to run this program were embezzled by those administering the project, leading to an early termination of the intervention.

“Last January, we were invited to Makurdi, myself and an Igbo woman who resides in this brothel, for a training on how to make liquid soap, shampoo, hair dressing, cake baking etc.... We were told the program will span 3 months but following our first visit, the organisers took the monies for the program and used it for their personal needs, this is after we have signed some documents that we have enrolled on the program. They made us sign and then collected the money meant for the program, which they used for their personal needs... that is how the program came to an end after just one attendance...” **Jane, female sex worker interview, Otukpo.**

Personal needs created by poor socioeconomic conditions, appear to take priority over HIV interventions (based upon the quote above).

8.2 Stigma and discrimination

Stigma “is a strong feeling of disapproval that most people in a society have about something, especially when this is unfair” (347). HIV remains a highly stigmatised disease, especially in Idoma speaking areas of Benue State, with people living with HIV facing outright rejection from members of society. Stigma featured prominently in the interviews. The quote below demonstrates that locals understand the damaging impact of HIV stigma on those living with HIV.

“I think HIV is still a very big problem in our society. This is because people that have HIV are still not coming out to identify that they have this disease, because the level of stigmatisation in this society is still very high... people that have HIV still hide”. **Ochayi, male Christian group, Otukpo.**

The next quote, obtained from an interview with a doctor (who provides care for people living with HIV) shows how HIV positive individuals disguise to avoid being identified when accessing HIV services. Non-Muslim clinic attendees would wear hijabs and cover up, like people of Islamic faith, even though they are not Muslims, he added.

“It is just unfortunate that today you weren’t [at this clinic] earlier... You would have seen some persons [living with HIV] putting on hijabs, not because they are Muslims but because they want to mask their identities so no one will know they are attending an HIV clinic. Also, once you offer these people [living with HIV] their medications, they immediately empty the medications into other containers so as to disguise it, you know. Some people that are living with HIV want to be taking the HIV medications but do not want to come here. Encouraging them [people living with HIV] not to come to clinic by having their medications delivered to them at home has it’s drawback as the clinician won’t be able to detect complications on time and offer proper care. So, stigma is the bigger issue, you know”. **Zachariah, medical doctor at HIV clinic Otukpo**

The stigma picture in Benue State is anything but simple and this is because stigma in this area has many layers of determinants and influences that are difficult to categorise and tease apart. For the purpose of clarity and relevance for intervention, I have classed observed stigma variables into two main categories: causes (based on how stigma is created) and types (the different forms of stigma). I have also described how stigma impacts on utilisation of HIV services in the local environment under a separate heading.

8.2.1 Stigma causes:

HIV as a disease of immorality:

The notion that HIV is a disease of immorality is a recurring theme in most of the interviews and stood out as one of the root causes of stigma in this area. It is widely believed that HIV is acquired through immoral acts. As a result, those known to be HIV positive and/or those who openly associate with people living with HIV, often face discrimination and stigmatisation within society. In the interview with a catholic priest (Father Emmanuel) in Otukpo, it was clear that fornication (widely believed to be the immoral act which leads to HIV) is perceived as “the only means through which HIV is contracted”. For the fear and shame of being labelled immoral or an associate of one who is immoral, locals act in ways that are stigmatising towards people living with HIV, by keeping their distance from people living with HIV. Addressing stigma will require community wide interventions as it is embedded in different levels of society.

“People before now were believing that the moment you’re HIV positive it is one and only one means... fornication. So, with that mentality people are afraid. Your family fear that you [people living with HIV] are a shame [disgrace] to the family, your friends, your co-workers and those around you feel the same way. So with that, people fear what HIV is and are afraid to be identified with it. Despite ongoing awareness campaigns, if we’re going to talk about it [HIV]... hardly will you see someone come out and say I am HIV positive and the person would be happy [doing so]”.

Reverend Father Emmanuel, Otukpo.

Reverend father Emmanuel also blamed the HIV fear response, described above, on the way initial HIV awareness campaigns were conducted. He stated that past awareness campaigns presented HIV as punishment from God, messages that have lingered on the minds of Nigerians.

“I think, actually, because of the way the message came into our country. I mean, people were seeing it as a punishment from God. If you commit fornication and adultery automatically God strikes you down with HIV...”

*the first 'parental tape' recorded in the minds of people go a long way into affecting them, up to date". **Reverend Father Emmanuel, Otukpo.***

The thinking that HIV is a disease of immorality was further reaffirmed in the interviews held with Mr. Idoko and Mr Ochube in Otukpo and Makurdi respectively. In these interviews, it was reported that being HIV positive is synonymous with a promiscuous lifestyle.

*"...most people believe that if someone is infected [with HIV] then they must have been sleeping around... she was sleeping around". **Interview Idoko, a hotel manager and volunteer HIV awareness campaigner, Makurdi.***

*"Aside the fact that it is a deadly disease and it kills very fast, what we fear most is the stigmatisation. What people will say about me if I have the disease.... because the picture people paint about HIV is once someone has it, the person is wayward or must have been sleeping around"
Ochube, male Christian group, Otukpo.*

Stigma, which stems from associating "immoral behaviour" and HIV positivity, is so strong in some communities (especially the Idoma speaking areas) that members of such communities shy away from public discourse about HIV for the fear that open HIV discussions would stigmatise local communities and negatively affect the chances of their single girls finding a suitor. An example was cited, in the interview with Tom, of Ogobia (a small community in Idoma speaking area) where it is believed that open discussions about HIV could lead to stigmatisation of the entire community. Members of this community (Ogobia) would prefer to keep discussions about HIV and HIV positivity secret for fear of stigma to their unmarried girls. This attitude towards HIV has important implications for the extent to which HIV awareness campaigns could be effective.

"...in the Idoma speaking areas, there are places that they don't even want you to talk about HIV. A place like Ogobia has a problem of stigma. They feel people stigmatise their daughters and will not marry them if they find

*out there is HIV in their community”. **Interview with Tom, an HIV NGO worker based in Makurdi who also embarks on campaigns in Otukpo***

From the interviews, it became apparent that stigma is more of a problem in Idoma areas compared to Tiv areas. Attempts to explore this difference in stigma revealed that ART coverage, as well as knowing someone who is HIV positive, may play important roles in shaping stigma and the perception of stigma. According to Tom, ART coverage is better in Tiv areas and “almost every family in the Tiv speaking area has had the experience of nursing an HIV positive member”. The views expressed by Mr Tom was reiterated in the interview with David (a person living with HIV in Makurdi) who stated that at least 6 members of his immediate family are living with HIV. This factual approach to HIV discussions in Tiv speaking areas, evident in the interviews with David and Tom, is lacking in the discussions held in Otukpo.

*“There is more stigma in the Idoma speaking area than the Tiv speaking area. Why? It’s because in the Tiv speaking area, almost every family has experienced someone with HIV and or have someone currently on ARTs. As such, stigma is reduced”. **Interview with Tom, an HIV NGO worker based in Makurdi***

*“In my family my wife is positive. My immediate younger brother and his two wives are positive. My older brother is positive as well as my cousin” **David, person living with HIV interview, Makurdi.***

In the interview with James, an Okada rider based in Makurdi, it became apparent that the fear of being labelled immoral and promiscuous constitutes his greatest worry, if he were to test positive for HIV, despite the knowledge that there are medications for treating HIV:

“Even if the person is rich and does good for people but as soon as people realise he has HIV they will start making derogatory comments like ‘he has contacted that disease’... ‘he has contracted the disease and now will be a burden to us’... it is this kind treatment that kill faster [than the HIV]... these comments will make you think deeply... even though there are medications that can prolong life, these words and the way they are

spoken makes you want to die the next day... No one is perfect and anyone can contract this disease... I pray to God not to let me contract this disease as I don't want to die through HIV and I don't want to be linked with the way people contract the disease... this is how I see it" **Interview with James (Okada man), Makurdi.**

HIV as a death sentence:

The thinking that HIV is a death sentence is another factor that fuels HIV related stigma in the local area. It was widely reported in the interviews that HIV is a death sentence: largely because there is no cure for HIV. As a result most people avoid those living with HIV, an attitude which ultimately results in stigmatisation. In the interview with Margaret, a person living with HIV in Otukpo, it was found that once persons in the general population are aware of someone's HIV positive status, they immediately assume that the person living with HIV is "gone" (dead). The notion that HIV is a death sentence is fuelled by local factors such as poor access to medication and low medication coverage.

"Once they have known that somebody is HIV positive the only thing they [members of the public] can conclude is that the person is gone, you [persons living with HIV] are finished, which is not so". **Margret, person living with HIV and lead worker at HIV Otukpo General Hospital HIV centre.**

Similarly, in the interviews with a motor park staff member (Stephen) and a person living with HIV (David), the widely held notion that HIV is death sentence was expressed as the main concern with living with HIV. As mentioned earlier, HIV is perceived as a death sentence because it has no cure. This view was expressed in the interview with Stephen:

"My biggest fear about HIV is that it doesn't have cure so once you contract the disease there is no cure for it... so it's like a death sentence". **Stephen, motor park worker, Makurdi.**

Another reason HIV is perceived as death sentence is the social exclusion that comes with a positive HIV diagnosis. According to interview participants, HIV is

perceived as a death sentence because of the social exclusion and isolation (social death) that often follows an HIV diagnosis. It appears, from the interviews, that “social death” is more pronounced in rural settings.

“In rural areas, when they know you as somebody who is living with HIV, they begin to look at you as somebody who is dying. As a result people will not want to interact with you... this makes it very difficult for people living with HIV in rural areas to make pronouncement about their status”.

David, person living with HIV interview, Makurdi.

Stigmatising attitudes by non HIV positive locals could actually be a coping mechanism: an attempt to protect self. Since being HIV positive is seen by many as a death sentence, non HIV positive individuals may be acting in stigmatising ways and keeping their distance in an attempt to avoid the emotional trauma that comes from losing someone they know to have HIV. This could, partly, explain the reluctance on the part of those who are HIV negative to “associate” with locals who are living with HIV.

“...the reason people are afraid of going close to people living with HIV is because people think associating with those that have HIV can affect them [socially and emotionally]... they know that one day they [people living with HIV] will die... even if they are on medication, death is still not far away and they can die when they [people living with HIV] are not expected to die...” **Onah, Okada rider, Otukpo.**

Similarly, in the quote below, it is evident that the social death that comes with HIV diagnosis is fuelled by the misconception, at individual level, that HIV is a condition that will ultimately result in death and in a relatively short time.

“...there is another misconception... we believe that AIDS is one of the things that easily kill. That is what we believe, that it can easily kill immediately as well. That after a person got to know that he or she is positive, give that person one week... she will just dry up as if she had no hope in life”. **Ene, Female Christian group discussion, Otukpo.**

Furthermore, the widespread belief that HIV is a killer disease (which is a genuine concern, seeing HIV medication coverage is limited in Nigeria) was cited in the interview with Paul, a long distance driver. Paul reported that he was able to overcome his fear for interacting with people living with HIV after he got proper education about how HIV is contracted.

“you know we are humans and anything that is a killer we don’t like... nobody wants to die... even I have that fear in my mind but since some people came round to educate me about it [HIV], I know now that by going closer to [people living with HIV] you cannot just contact the sickness”.

Paul, Long distance driver interview, Makurdi.

Again, the fear that an HIV positive individual is already a dead person was reported as the main reason underpinning stigma in the local area. This fear is expressed in the quote below obtained from one of the focus group discussions held with male Christians in Otukpo. HIV status non-disclosure, described in some of the interviews, could be as a result of HIV related stigma and the fear of social exclusion.

“If you tell someone that you are HIV positive now, in this our society, the way they will look at you is as if you are a dead person walking”. **James, Male Christian group interview, Otukpo.**

HIV was first discovered in Nigeria in 1986 but it was not until 2002 that Nigeria rolled out a national ART program which aimed to make HIV medications more available and affordable through subsidy (114, 348). At the start of this national ART program, there were only 25 centres across the country, with 5000 children and 10,000 adults enrolled on the program (348, 349). The perception of HIV as a death sentence could be explained by HIV deaths recorded during the intervening periods between HIV discovery in Nigeria and when HIV medications became more available and accessible (114). During this period, HIV was pretty much a death sentence. This view was confirmed in the interview with Tom, an NGO worker in Makurdi, who has experience of working and caring for people living with HIV long before ART became more accessible in Nigeria. His account is captured below:

“I’ve been in this area for a long period of time now. The treatment of HIV didn’t start early in this country, so you had a situation where you test people, find out that they are HIV positive but there’s just nothing to do for them. I started HIV work around that time when we didn’t have ARTs everywhere. So... after testing... you can’t do anything for the person beyond giving palliative measures and all those things. In fact some communities were rejecting people [who have HIV]...” **Interview with Tom, Makurdi.**

HIV as a curse from God:

This is another root cause of HIV stigma identified in my research and, it appears to be popular in religious circles. HIV is viewed as a curse from God by many members of the local communities. Those who are HIV positive are, therefore, seen as people that have transgressed against God’s laws and are, therefore, suffering the consequences of their actions. Strict observance of God’s laws and being pious are believed to provide absolute protection from HIV.

“[People] believe that all sickness comes from God, it is either God is punishing you for what you have done or God is allowing for the Devil to just manipulate you”. **John, General public group discussion, Makurdi.**

In the next quote, obtained from the interview with a Muslim community leader and Imam, it was gathered that HIV is seen as a curse from God upon the immoral and adulterous. HIV, according to Rasheed, is a disease that has come in fulfilment of a religious prophesy: “at a time when adultery becomes rampant, an incurable disease will descend on the people”. This narrative also fits nicely into the widely held notion that HIV is a disease of the immoral.

“He [Prophet Mohammed, PBUH] said there will come a time when fornication and adultery becomes rampant, then God will descend on the people a disease or an epidemic, such that the cure will be rare. So we think we are in that period, that time and period [has come]”. **Rasheed, Muslim community leader and Imam, Otukpo.**

Rasheed's view above was echoed in the Christian and General public group interviews. In the quote below, it is apparent that people who are HIV positive are perceived as rebellious (especially to religious injunctions), lacking in self-control and prone to adultery and fornication.

“...when you are religious you have self-control, you are obedient. This obedience and discipline brings you to the level of controlling yourself, abstaining and waiting for the right time [for sex] to come, it keeps you away from worldly things that brings about all those things: prostitution, fornication, adultery and all those stuff... because prostitution is the major way HIV is being spread [transmitted]. So when you have self-control and wait for the right time, and do the right thing, I think the spread of HIV won't be as much as it is now”. **Jacob, General public group discussion, Makurdi**

Poor HIV knowledge:

Poor HIV knowledge was cited, in a number of interviews, as one of the reasons for observed stigma and discrimination. This is because HIV related fear is believed to be the result of inadequate knowledge about HIV. Recall the accounts of Paul (a long distance driver) who stated that his fear for HIV (which prevented him from interacting with people living with HIV) was addressed through HIV education. In one of the interviews, a participant highlighted how poor HIV knowledge underpinned her stigmatising and discriminatory attitudes towards people living with HIV. In this instance, she cited a neighbour (a food vendor) whom her family decided not to buy food from because she was rumoured to be HIV positive. Below is her story:

“We used to have this neighbour years back. It was rumoured that she had the virus [HIV]... she also sells food. So my dad called us together, after morning devotion [prayers] and, said from today don't go to her place to buy food because you will contact AIDS. If she touches anything don't touch it. So, that alone made us to look at her somehow. Then I was still in primary school and had no meaningful knowledge of HIV”. **Onyeche, interview with Female Christian group, Otukpo**

Furthermore, the role poor HIV knowledge plays in stigmatisation of people living with HIV was highlighted by Ramatu, a participant in the female Muslim group interview. Ramatu stressed that the thinking that even non-intimate relationships with people living with HIV could result in individuals contracting HIV fuels the discriminatory attitudes some have towards those living with HIV:

“...some people think if you speak with the HIV patient you will get it [HIV] and some people think that even if you shake hands with the HIV patient you will be infected. Others think if you eat food with them you will be infected or if you sleep with them on the same bed you will be infected”.

Ramatu, female Muslim group discussion, Otukpo.

Similarly, poor HIV knowledge was implicated, in the interview with Margaret, as one of the root causes of HIV stigma locally.

“Well, I think [the reason people stigmatise and discriminate] is mostly because they have no knowledge about HIV... if they know this is a deadly disease which cannot be contracted through shaking of the hand, eating with someone who is positive or even by talking with a positive person... I don't think they will go ahead doing that kind of a thing”. **Margret, person living with HIV and lead worker at HIV Otukpo General Hospital HIV centre.**

8.2.2 Forms of HIV stigma and discrimination:

Two broad forms of stigma were identified from the interviews – external (or enacted) stigma which is stigma from others and internalised (felt or self-directed) stigma which is stigma from the person living with HIV towards himself or herself (350, 351). The commoner of the two HIV related stigma is external stigma. External stigma exists at home and in out of home locations like point of HIV care. Zachariah (a medical doctor who attends to people living with HIV in Otukpo) described a scenario in which HIV stigma begins in the community, when people living with HIV engage local transport services (Okada men or motorcycle taxis) to access his HIV clinic. People living with HIV are often asked by these Okada men “are you one of them?” he added.

“...at times if you enter something like a local transport, Okadas, and tell them to bring you here [to the HIV clinic] you will discover that they [Okadas] will tell you, are you one of them? The problems and stigma starts when people living with HIV engage the services of Okada riders in this place”. **Zachariah, medical doctor at HIV clinic Otukpo.**

Stigma from others is sometimes directed at family members of people who are HIV positive. This dimension to HIV related stigma was captured in the interview with Mr. Idoko, a hotel manager and volunteer HIV worker in Makurdi.

“There was this particular case of a girl... she lost both parents to HIV and the community where she lived seriously stigmatised her... to the extent that kids taunted her on the streets... legal action against some members of that community was needed for the stigmatisation to stop” **Interview Idoko, a hotel manager and volunteer HIV awareness campaigner, Makurdi.**

Relatives of people living with HIV also engage in discriminatory and stigmatising behaviours towards people living with HIV. One explanation for this trend is the widely held belief that HIV is a death sentence, therefore, efforts directed at care will eventually amount to nothing.

“I’ve come across relatives that their loved one is living with HIV and the way they stigmatise the patient ...there is no support from the relative to the victim, so it makes the victim of HIV to feel isolated. The stigmatised feel that he/she no longer belong to the society” **Nkechi, Junior military personnel, Makurdi.**

“After all, these people [living with HIV] will die very soon, so what is the need of us [family members] taking care of them?” **Interview with Joy, person living with HIV, Otukpo.**

Fear of social exclusion could underpin HIV related stigma at family levels. Families known to have an HIV member will most certainly be seen in bad light in public circles. As a result, members of local communities would rather isolate and hide

family members who are HIV positive so as to avoid stigma from other community members. The quote below shows how a family locked away a member, from public eyes, to avoid the community stigma and shame associated with having a family member who is HIV positive.

“A friend of mine, who resides in Abuja, once called my mobile and I was so surprised that she sounded very, very weak. She said to me ‘come over I’m dying’. I asked where, Abuja? She replied no, ‘to the village’. On getting to her compound in the village I was told, by her family, that she’s in Abuja. I replied no, she just called me. So they were confused. I know her room so I forced my way to her room and what I found was shocking - the room was stinking, smelling. I saw my friend in this [poorly] state... I got her together and said to her “no, you are not staying here”. On asking what the problem was, she replied that she is HIV positive. On the same day, we left the village and came down to Otukpo where she was received into my house. Today she is back on her feet.” **Margret, person living with HIV and lead worker at HIV Otukpo General Hospital HIV centre.**

In the interview with some young men in Otukpo, it was stated that people living with HIV are discriminated against at recruitment exercises. Michael, a group discussant, stressed that those living with HIV are treated like they are not useful to society. Michael went further to state that the recruitment process into federal civil service in Nigeria requires medicals. In the medicals, a number of blood tests (including HIV test) is required. Whilst one who tests positive for HIV may not be told out right that they are rejected on the basis of their HIV test results, it is quite common, he said, that testing positive will automatically mean one will not make it into the shortlist.

“Like those infected with the virus, the way the society treats them makes them feel as if they are not useful to the society... like if you are applying for some particular job, they will ask you to go for some tests, including HIV tests, and when they discover you have this infection [HIV]... you will not know what will happen at the end of the day... though you know you are fit you will not be shortlisted”. **Michael, Christian male group discussion, Otukpo.**

Pre-employment discrimination also takes place during recruitment into the armed forces: only those who are HIV free are admitted into the Nigerian military.

“During recruitment they [armed forces] insist that only those who are HIV free will be admitted... This is still being deliberated at the national level”.

Interview with Olu, senior military personnel, Makurdi.

HIV based discriminations are not only limited to pre-employment screenings. It was gathered that those who are detected to have HIV in employment risk losing their job as well. It is, therefore, easy to understand why individuals would prefer not disclose their HIV status and/or show reluctance towards HIV testing. It is also easy to understand why an HIV positive status is seen locally as a thing of shame or a death sentence.

“...some of those infected with HIV might even lose their job when the organisation discover they are positive for HIV. And some of them, it’s not only the infections that kill them but maybe how the society treats them”.

Ochoche, Christian male group discussion, Otukpo.

The most extreme of external stigmatization and discrimination encountered is the view that people living with HIV need to be quarantined or isolated from the general public to prevent disease transmission. This perspective was encountered in the interviews with an Okada rider in Makurdi and in the group discussion with prison inmates in Otukpo. Mr. Aondona (an Okada rider in Makurdi) believes that the government needs to run a program where people living with HIV are killed off to prevent HIV transmission. Matthias, a prison inmate in Otukpo, on the other hand believes that people living with HIV should be held in facilities that prevent them from interacting with HIV free members of society.

“Government should kill those who are HIV positive, this way those who are negative can have sex without fear of contracting HIV”. ***Aondona, Okada rider interview, Makurdi.***

“The only thing that [government] needs to do is to apprehend those living with HIV and keep them in some place where they could be fed off

government, otherwise, they [people living with HIV] will keep spreading the disease". Matthias, interview with prison inmates, Otukpo.

Another dimension of external stigma and discrimination faced by people living with HIV is stigma from healthcare staff (facility based stigma). Grace (an interview participant) relayed her mother's experience in one of the interviews held in Makurdi with university female students. Grace reported that some healthcare staff (nurses) walked out on some HIV positive individuals during a seminar because they did not want to have anything to do with people living with HIV.

"...there was a day my mom came back from the hospital. She came back and was like they were having a seminar for people living with HIV and people that had the virus were coming for drugs and tests. However, some nurses and... some people that don't want to have anything to do with [people living with HIV] walked out on them". Grace, university students' group discussion, Makurdi.

The second form of stigma, far less encountered in my research, is internalised (self-directed) stigma. In this form of stigma, people living with HIV uphold negative views about their disease status. This form of stigma is driven mainly by the society (or external stigma). People living with HIV tend to settle into a state of self-pity and fail to confront negative stereotypes about HIV. In an interview with Mrs Enewa (a lead NGO worker in Otukpo), it was found that people living with HIV engage in self-stigmatising behaviours by dwelling too much on what members of society say about people living with HIV. Enewa also added that people living with HIV shy away from open talks aimed at challenging existing negative narratives about HIV.

"Even those living with HIV stigmatise their self too. They always feel that people are talking about them, which may not be true. So stigma is still there, although not as high as before. Those [living with HIV] who have accepted this and, are willing to live a positive life, no longer think about stigma - they can even come out openly and tell that they are HIV positive, and ask what is the big deal? Do you even know your status?" Interview with Enewa, Otukpo.

8.2.3 The impact of stigma on utilisation of local HIV services:

A number of themes around how stigma impacts on HIV epidemiology in the local area emerged from the interviews and focus group discussion.

First is the negative impact stigma has on willingness of locals to go for HIV testing. It is plausible to think that for a highly stigmatised disease, like HIV, testing would not be very popular among locals as HIV testing would only serve to confirm a diagnosis that brings “shame, pain and death”. In the quote below, Ene (a group discussant) recounted her experience at an HIV screening event near her house. In her experience, showing interest in HIV activities, such as testing, is often misconstrued as a sign of being HIV positive or promiscuous living.

“There was a certain time an HIV awareness campaign was taking place nearby and I was with a classmate. I suggested we go for an HIV screening but my classmate said not to go, saying that ‘everybody there has HIV’. She said wanting to test for HIV shows that you are positive. So, when people see you taking part in anything like that... anything pertaining to HIV they believe you are at least positive”. **Ene, participant in female Christian group discussion, Otukpo.**

Similarly, David (a person living with HIV) stated that stigma remains a significant obstacle to medication access among people living with HIV.

“The reason HIV has been a problem in Benue State is because some of us or some persons that are down with the sickness do not want to come out and access HIV medications because of stigma”. **David, person living with HIV interview, Makurdi.**

In the interview with Jafaru, a junior uniform personnel in Otukpo, revealed that stigma significantly influences people’s HIV testing decisions negatively. Jafaru described a scenario where individuals who appear to be ill and needing tests, as well as those who are in apparent good health, refuse to access HIV tests for the fear of being told they are HIV positive.

*“I think the major problem is stigma and lack of understanding... when some people are sick and you advice they should go for tests to understand what the problem is, they will not go because they do not want to be exposed... even though the tests are confidential. People don’t like knowing their status... including those that are not even infected... if you ask people to go for a check-up, to know their status, some don’t even have the courage because they say if they get to know that they are HIV positive, it will cause them BP [high blood pressure] or whatever”. **Jafaru, junior uniform personnel, Otukpo.***

This view above was echoed in the interview with Olu, a senior military personnel based in Makurdi.

*“Because of stigma a lot of our soldiers are actually hiding. For fear of stigma, our soldiers, who want to access HIV care, avoid the army hospital. They like to look for a civilian place where they will just wear plain clothes or even go to chemist and buy the medications... because of stigma people are not coming out... people are hiding... people are not even telling their wives.” **Interview with Olu, senior military personnel, Makurdi.***

Stigma (as highlighted in the quote from the interview with Olu above) also impacts on the choice of where people living with HIV chose to access care and medications. Locations closer to where people living with HIV reside often fail to provide the confidentiality required to keep their HIV status private. This lack of privacy and assurances that people living with HIV will not have their status disclosed inadvertently are strong disincentives for utilisation of local HIV services. Unfortunately, alternative HIV facilities that may offer the much needed privacy and protection of HIV status (because they are far from where individuals living with HIV are known) are often times considerable travel distances away and do have significant cost implications (especially for poorer rural residents). In the interview with male Christian group in Otukpo, a participant (Mr. Ochube) recounted an instance when he overheard someone who is HIV positive stating he would prefer to embark on the approximately 3.5 hours round trip to access his medications despite having a general hospital that is less than 30 minutes away that could provide the

same services. This is because accessing medications locally do carry significant risk for accidental HIV status disclosure.

“I overheard a man saying some time ago that he will prefer to go to Aliede to access his HIV drugs and that he cannot afford to access his medications in the local general hospital because most faces will know him and before long the information about his HIV status will be common knowledge”. **Ochube, male Christian group, Otukpo.**

Similarly, the role of stigma in influencing where people chose to access medications was highlighted in the interview with Dr John who attends to people living with HIV in Makurdi. John describes a picture where some of the clients who access medications at his facility would travel several miles (sometimes from neighbouring States) to access medications in his clinic (health tourism), all in a bid to avoid accidental disclosure and stigma in their local places.

“...some come from within all local governments within Benue and some come from Nasarawa, Abuja, as far as Cross Rivers... because of stigmatization in places [local communities] where they reside”. **John, Doctor Interview, Makurdi.**

Stigma was also blamed for the deaths of some persons living with HIV because it hinders access to HIV medications. People who are HIV positive are afraid of being stigmatised when accessing local services and prefer to travel hundreds of miles away from their usual places of residence to locations they would not be recognised. However, lack of funds for this travel constitutes a significant obstacle (as already discussed in Chapter 7 under poverty). The implication is, therefore, erratic HIV medication refill and missed hospital appointments. This in turn results in treatment failure and development of resistant HIV strains.

“Sometimes, one who goes to collect his/her medication may stumble into someone they know who is also there to collect the HIV medications and the person will then will go back and broadcast that he or she saw the other person collecting some HIV medications. I think these kinds of attitude have led to the death of many persons living with HIV with others

*choosing to travel far away from home to access medications... so instead of accessing medications here in the general hospital Otukpo, I will travel to Zaki Biam, or another State for my medications. At times it may be impossible to get money for transport to such distances to access medications". **Erdoo, female sex worker interview, Otukpo.***

Since some of these communities are small and the possibility of running into people known to those living with HIV is high. Ochayi, a participant in one of the group interviews in Otukpo describes a scenario where one could run into a neighbour who works in the clinic, an action that could potentially lead to accidental HIV status disclosure and stigmatisation. This scenario raises a number of questions about confidentiality and patient information handling in HIV clinics.

*"...some people shy away from accessing care and treatment because they may run into their neighbour who works in the hospital". **Ochayi, male Christian group discussion, Otukpo.***

Accidental disclosure resulting from meeting local faces known to people living with HIV at HIV centres was picked up in one of my interviews. In this interview, Joshua ran into a lady he knew in the clinic where he accesses his HIV medications. The lady would later, without Joshua's consent, speak to his wife about their chance meeting at the HIV clinic and disclose his HIV status to his wife in the community. However, Joshua had prior to this encounter disclosed his HIV status to his wife.

*"So there was one woman that I ran into at this [HIV] clinic. She thought I had not disclosed my status to my wife and upon returning back to my community she decided to speak to my wife about our meeting at the clinic. My wife was already aware of my status so this did not mean anything to her. We later decided to confront her about this incident and she was not even able to utter a word in reply when I and my wife sat with her to iron issues out". **Joshua, person living with HIV, Makurdi.***

Another stigma related action described frequently in the interviews, which discourages HIV services uptake among people living with HIV, is a trend in which HIV free locals pay visits to HIV centres where HIV care is delivered, snooping

around for faces of interest in a bid to identify individuals who are HIV positive. This action, common among young men who are trying to woo young ladies, acts as a major barrier to local access of medications. As a result, some persons living with HIV go the extra mile to protect their HIV status by travelling to locations far removed from their places of origin to access medications. Such spying visits to HIV clinics are aimed at overcoming non-disclosure issues because people living with HIV would normally not disclose their HIV status for fear of HIV related stigma.

*“...people living with HIV would normally attend their clinics once every week. The problem is that if a young man is attracted to a young lady but is not sure about her HIV status, he will go to the clinic on the clinic day, say Monday, to check it out if the lady would attend. For the fear of being spotted, most of those living with HIV avoid the local clinic, preferring to travel out of town. Some will even arrange for their medications to be collected by proxy”. **Ijegwa, male Christian group. Otukpo.***

The view above was confirmed by Esther, who added that, in order to avoid inadvertent disclosure and the stigma that follow such disclosures, people living with HIV decide to skip their turns during clinic visits, waiting until about 5 patients down the line before they go into consultation rooms. This is because of the very little to no privacy accorded patients during visits to some clinics.

*“Sometimes people living with HIV are called at the clinics to attend their visit but they will not come forward, they will be hiding. They will refuse to come forward until 5 other persons down the list, then they will come forward. This is done to ensure people around would not be able to identify them by their personal details. Some will refuse to attend their clinic days all together”. **Esther, university students’ group discussion, Makurdi.***

Stigma is also blamed for the transmission of HIV to non-HIV positive others, mainly through non-disclosure. Sometimes the decision to get others infected could be deliberate or forced by stigma. This scenario links very strongly with the “deliberate transmission of HIV” already discussed in Chapter 7.

“Probably because of stigmatisation (I stigmatise at times), people living with HIV hide their status and inflict others with HIV so that they will not be the only one in that shoe”. **Joy, female Christian group discussion, Otukpo.**

Another important variable identified in local HIV related stigma is HIV denialism, often hidden under the cover that HIV is caused by supernatural forces. This observation could be a direct knock on effect of HIV stigmatisation. In some instances, the belief that HIV is caused by supernatural forces stems from lack of proper HIV knowledge. Below are some quotes in support of the narrative that HIV is caused by supernatural forces:

“The society, you know, attribute HIV to witchcraft because the symptoms are not familiar in the communities”. **Rabiu, Muslim male group interview, Otukpo.**

“...people believe that HIV is caused either by a witch or by someone wishing them evil...” **Interview with Dr. John, Makurdi.**

Stigma is also blamed for HIV denialism. Ascribing HIV to diabolical or spiritual causes (such as witch craft and spiritual attacks) provides a means for individuals (especially those residing in rural areas) to escape the stigma often associated with being HIV positive. As a result, an alternative explanation for HIV, which labels HIV as a mysterious diseases cast on victims by witches and powerful evil men, becomes a convenient narrative. This is because, this alternative narrative is devoid of HIV related stigma as it is linked to socially recognisable constructs (witch craft and evil men) that are devoid of immoral lifestyles. It is easier to draw community sympathy and love (and avoid social death often associated with HIV stigma) if HIV is linked to a socially recognisable narrative as the one described above. This HIV denialism narratives are capable of discouraging individuals (especially those living in the villages) from HIV testing and accessing HIV services: seeing an HIV positive test would be a confirmation of an HIV positive status and a step towards HIV stigma. The belief that HIV is caused by supernatural forces, it appears, is a convenient narrative for escaping stigma: it could very easily be a cultural practice (when viewed

from a belief perspective) as much as it could be a coping mechanism used by some to overcome stigma in their local communities.

*“When they have HIV in the village they begin to hide under certain things that will make people convinced [it is not HIV]. Some people they say it is witches... it is this... [even] after they have known that it’s HIV”. **David, person living with HIV interview, Makurdi.***

In the interview with Ben, an IDU in Makurdi, it was picked up that being an IDU attracts a lot of social stigma which gets in the way of procuring clean needles and other materials used for injecting drugs. As a result, IDUs end up sharing sharps and other IDU paraphernalia.

*“The shame of being identified as an IDU won’t allow one to buy stuff like that [referring to needle and other IDU paraphernalia]. So I always rely on IDU friends who were in possession of these items”. **Ben, IDU, Makurdi.***

8.3 Ineffective awareness campaigns

Ineffective HIV awareness campaigns have been blamed for local HIV burden.

*“HIV is still a big problem in our society today and it’s because proper awareness and proper orientation have not been taking place”. **Male Christian group interview, Otukpo***

One of the shortfalls with HIV awareness campaigns is their concentration in urban locations. In the quote below, Thomas (an MSM community member) spoke of an HIV sensitisation outreach to a rural location where he observed that locals demonstrated low levels of HIV awareness and knowledge of how to use condoms.

*“There was this peer session we carried out in a rural area in one of the local governments here in Makurdi and the people are still very much behind on [laugh] the knowledge of HIV and AIDS and it’s kind of scary that they don’t even know how to use a condom properly”. **Thomas, men who have sex with men interview, Makurdi.***

Similarly, Adole (a university students) reiterated that HIV awareness is poor in rural locations as evidenced by higher rates of teenage pregnancies in rural locations. Adole thinks that increased teenage pregnancies, especially in rural areas, is a testament to unsafe sexual practises and a pointer to poor HIV prevention knowledge. This is because “if condoms are being used consistently and effectively, especially in the rural areas, rates of teenage pregnancies should also be lower than he has observed locally”, he added.

“I think the reason why I would say sensitisation is not enough is that in our rural areas, especially here in Benue State, if you go to the villages and see the rate at which young ladies, of ages ranging from 16 and above get pregnant, you will know for sure that these people have not really gotten this information... if they have, I don't think these ladies and young men will become premature fathers and mothers, as I would put it. If they have been truly sensitised I think they should have used prevention and that wouldn't have resulted to unwanted pregnancies”. **Adole, male university students' group discussion, Makurdi.**

In a separate interview, Dr John reported that new cases of HIV infections are driven by poor HIV awareness.

“New infection is driven by those people that don't even know their status... their awareness is very poor... counselling and testing is very important” **Dr. John, Makurdi.**

Language is another obstacle to effective HIV awareness campaigns. Mr Okopi highlighted the need for campaigns to be structured in a way that carry along locals who do not understand English. He added that current campaigns rely heavily on spoken words (usually in English) and stressed the need for non-verbal communication techniques (like images and drawings) that provide alternative forms of communication. This picture is further complicated by the fact that some locals are not able to read efficiently in local languages, thus translated and/or transcribed materials have limited impact.

“So the grassroots campaign is not very effective in this part of the country... what about the people who don’t know how to speak and don’t understand English, how will they know about HIV/AIDS? So you see people who don’t know anything about HIV tend to spread [broadcast] false news and fear about HIV which leads to fear of the disease and fear of those that are HIV positive. So, the campaign has not really gotten to the grassroots, they need to intensify the campaigns about HIV through other means apart from the verbal campaigns”. **Okopi, Male Christian group, Otukpo.**

There are a number of languages spoken in Benue State. The two main ethnic groups are Tiv and Idoma. However, these ethnic groups do not have a common language. The Idoma ethnic group, for example, has a number of dialects. These differences in spoken language presents awareness campaigns with a unique challenge – one of accurate transcription and translation of awareness materials. Relying on translations done in the most widely spoken language would imply that smaller groups are left out in the campaigns. The fact that not all members of these communities could read materials printed in local languages further complicates the picture. At the moment it does not appear like campaigns are doing enough to address these language challenges.

“We have multiple tribes and each of these have languages and even the languages further still have different dialects. So it becomes difficult communicating in all these languages by head personnel, you know”. **Dr. Zachariah, Otukpo.**

It is suggested that awareness campaigns may be going on in forms that are not easily understood by locals. More effort is required to ensure awareness materials incorporate local languages and contexts.

“The information [about HIV] should be put out there but it should be put out in such a way that the persons the information is meant for actually get it. And how do you do this? Whatever information should be made available in such a way that the average person can understand it... Let it be in the local languages... Like songs in local languages [in Tiv, Idoma,

Igede, Hausa] that people can generally understand. Even handbills or flyers [should be in these languages]. More effort should be put into localising the information". Interview Idoko, a hotel manager and volunteer HIV awareness campaigner, Makurdi.

Participants of other interviews echoed the fact that campaigns are often structured in ways that benefit the young and educated more, with older and less educated members of society being left behind. This implies that campaigns are inherently discriminatory, along age and educational status lines.

"HIV is a problem because of ineffective campaigns. Now people are not exposed to HIV know-how. When they do their campaigns they only go to schools where people are formally educated. What about our parents who are not educated?" Joy, female Christian group interview, Otukpo.

This age discrimination was echoed in the interview with a long distance driver (quote below). Again those most discriminated against appear to be rural residents.

"You know in the rural area, in the village, some people don't know much about it especially old people that don't travel long they don't know much about the this thing" Interview with Paul, long distance driver, Makurdi

The skewed nature of campaigns (along places of residence and levels of education), which disadvantages less educated and older residents of rural areas, was highlighted in the interview with Dr. John. John argued that ensuring services are closer to the people, rather than reliance on radio programs, jingles and billboard advertisements, may be a better way to bridge gaps in awareness campaigns.

"people in town already get HIV messages through all those things [like radio programs, jingle and billboard advertisements] but villagers do not have access to all those things, as a result government need to bring healthcare services closer to the people through community mobilisations, involving local leaders and local schools programs ". Dr. John Interview, Makurdi.

Awareness campaigns are not frequent or sustained for long enough to effect significant change. In the interviews with female sex workers in Makurdi, it was gathered that an NGO had failed to follow up on a promise to continue with an HIV intervention among the group of female sex workers interviewed.

*“...they [the NGO] came here for a period of time to teach us on how to be safe and on how to use condoms and how to handle men... the last time they came, they came to ask us some questions on the impact of what they have been teaching us, then they said they will come back... Yes, that's what they said. But it has been long they said this”. **Female sex workers interview, Makurdi.***

Other quotes from interviews with other groups in support of the fact that campaigns are not frequent enough can be found below.

*“Private and public organisations should find a way to keep this information continuous, as continuous information, over time, would change even those people that are still in denial”. **Interview Idoko, a hotel manager and volunteer HIV awareness campaigner, Makurdi.***

*“One of the major problems with the NGOs is lack of sustainability. You hear about this particular NGO and then with time they go into oblivion and then I think what contributes to that is also corruption, because NGOs in Nigeria are solely established for money making purposes”. **Nasiru, Muslim male group interview, Otukpo.***

Only a few schools incorporate HIV education in their curriculum. Inclusion of HIV education in schools curriculum was strongly advocated during the interviews. Other less utilised spaces for HIV campaigns, mentioned during the interviews, include mobile phone messages/applications and religious gatherings. Leaflets and posters do not appear to be effective methods for getting HIV messages across to the population according to interview participants as “people hardly read print materials”.

“People don't like reading so when you share handbills [flyers] on HIV, people don't read them... one of the easiest way people can get HIV

information is when it is texted to their phone...” Okopi, male Christian group discussion, Otukpo.

In the next quote, HIV awareness campaigns in educational settings is advocated in addition to places of worship.

“...We can also get this information to people through classes... through adult education classes and regular schools as well as churches and places of worship... Male Christian group Otukpo” Ochayi, male Christian group, Otukpo

According to interview participants, sex education needs to take place on a scale much bigger than what happens currently.

“...Sex education is still very low in our society among young adults, adolescents and teenagers. I think that the age range most at risk, and in which this disease is predominant in this part of the country, is at risk because of knowledge, or lack of knowledge, which tend to limit the girl child or the female folks when it comes to negotiation for safer sex”. Adakole, Christian male group interview, Otukpo.

Creation of school clubs and other awareness programs, dedicated to HIV awareness activities, was also advocated in the interviews.

“Extracurricular activities like HIV/AIDS awareness clubs should be allowed where individuals can sit with a coach”. Dayo, Male Christian group Otukpo.

An interview participant pointed out the absence of government policy on the incorporation of HIV education into school curriculum as a setback for local fight against HIV.

“In fact, in schools (both public and the private schools) they are supposed to have curriculum that talk about HIV prevention and all those things. The policy is not even there to say one is facing issues of enforcement”. Tom, NGO staff Makurdi

One criticism of ongoing awareness campaigns reported by interview participants is the need for awareness campaigns to be decentralised and carried out in smaller units that are closer to target groups. Mr Adakole stressed that awareness campaigns should not only make information available to people but should be designed to ensure that messages are “heard, accepted and believed” in order for desired outcomes to be achieved. Mr Adakole argued that getting messages communicated through decentralised units that are closer to the people will facilitate the attainment of the much needed behavioural change required to halt HIV transmission. This approach is also very likely to overcome language barriers.

“Small local units where this information is passed across, informally, as opposed to the formal [mass] media approach of passing information across, may be more effective. Formal methods will ensure that the messages are heard but it might not be accepted and believed and this is the most important part of creating this awareness: that [messages] are heard, accepted and believed - that is what makes it useful. So if the distribution or dissemination of the information could be brought to lower levels in villages, groups, town halls and other smaller units like these, it will make the information more effective in curbing the spread of HIV”.

Adakole, Male Christian group, Otukpo.

The same view expressed above by Mr. Adakole, was reinforced in the interview with the male the Muslim group. Nasiru expressed the opinion that existing HIV awareness campaigns (through television, print and electronic media) have failed to achieve desired results.

“... The campaigns are quite okay in the television, on the paper and in the media ... but then it's not creating much impact on the common people”.

Nasiru, Muslim male group interview, Otukpo.

Mr Tom, an NGO worker and nurse based in Makurdi believes that awareness campaigns have hitherto targeted the wrong groups and have been insensitive to group differences. He, therefore, called for awareness campaigns that are based on the needs of the community and informed by needs assessment in target

communities. His position underscores the need for awareness campaigns to be specific and targeted.

*“The targets have been wrong. What has been happening are blanket campaigns... and you think it will work? No. You need, first of all, to study the community. Study what misconception is going on in the community and then you design a targeted approach to address that problem. You don’t just do blanket interventions and go away and tell people you have done this and that... No. Each community is different and you know Nigeria is vast with different cultures and different understandings as it is; religious and otherwise. So you need to study each community and know what the problem in that community is and handle it as it is. You see, the way you handle the stigma issues in community A may not work for the same problem [stigma] in community B. The solutions should be more or less grassroots driven and not the top-down approach which is the current practise. That is the reason why the awareness campaigns are not working”. **Tom, NOG staff, Makurdi***

Following from Tom’s quote above, it appears the content, approach and, sensitivity of the awareness campaigns are questionable and may need reviewing. In the interview with some female university students in Makurdi, the lack of youth friendly HIV awareness campaigns was highlighted. In this interview it was pointed out that campaigns are conducted in such a way that young people are made to feel like being HIV positive is the end of the world: awareness campaigns are not youth friendly and delivered in a judgemental way. It appears campaigns paint a picture which wrongly suggests that having sex is equal to contracting HIV. It follows, therefore, that religious and social messages of celibacy are often times confused with HIV messages. Young people are as a result told to abstain without being presented the option of safer sex and access to HIV medications.

“...the awareness is created is more like a death sentence. Like... you know that you’re just going to die, so why will one want to take HIV test? I think the people that are counselling they are... too official. The kind of pictures they are painting is like erm when you have HIV AIDS it’s the end of the world. The awareness campaigns also makes it look like having sex

*is same as contracting HIV". **Doo, university students' group discussion, Makurdi.***

*"So I think the way the awareness is created is too stiff for the youth. It is more like if you have HIV you should be isolated, you should not go out, you should not go to the market, if you brush shoulders with the person pushing the truck he is going to have HIV. That is the kind of notion we have. And I don't think sexual intercourse is the only way we can get HIV. I think even the people that are more mature are even spreading the disease more than the youth". **Maria, university students' group interview, Makurdi.***

Sometimes the language chosen for awareness campaigns and sex education is deliberately watered down to ensure the message is socially acceptable or "culturally" sensitive. This is what an interview participant referred to as "sugar coating" and "coded" campaigns. The downside to "sugar coating" and "coding" is that the original message is lost in the process of communication and the aim of the campaign is very often defeated.

*"They go around looking for codes for everything... sugar coating... they are more concerned about the impression they make... the way they conduct sex education is as follows: 'if you shake a boys hand you will get pregnant' or 'when boy sneezes near you, you will get pregnant' or 'well, boys are bad, boys can give you pregnancy'. That is all... They also rush through the process as well. Then about AIDS they will say 'boys can also give you AIDS' but without talking about how". **Gloria, university female group interview, Makurdi.***

The failure of current awareness campaign approaches to produce the right results was summarised and captured succinctly in the interview with a representative of NACA. In this interview, Dr Chuks stated that individuals on face value may appear to know enough but if their knowledge is probed, they are found to be lacking in "comprehensive HIV knowledge".

“...the issue is about comprehensive knowledge... I mean a lot of people don't have comprehensive knowledge... If you look at the surveys you'll find out that awareness appear to be very high but when you dig deep and ask individuals about 5 routes of HIV transmission or how one may prevent himself from contracting HIV, the responses you will get will amaze you” **Chuks, NACA interview.**

8.4 Medication access, funding and sustainability issues

The thinking that HIV is a death sentence may be explained, in part, by existing knowledge gaps created by poor awareness campaigns. It may also be secondary practical issues locals face with regards to medication access and the quality of HIV services delivered. Nigeria has low HIV medication coverage, coupled with medication access challenges created by poverty and stigma. It is, therefore, easy to see why HIV is still considered a death sentence by locals. This picture is further complicated by uncertainties surrounding funding for current intervention programs and medications.

Funding for ancillary HIV services (such as staff training, blood tests and support staff) required for smooth and efficient delivery of HIV care and HIV prevention services is not only in short supply but uncertain as international donors are beginning to scale down funding activities in Nigeria. Much of the HIV response in Nigeria is supported by donor agencies like PEPFAR. This bleak funding (and HIV services) scenario is further compounded by the fact that there is very little political will on the part of the Nigerian government towards funding for HIV interventions. It is expected that, whilst international agencies scale down their funding, the Nigerian government steps in to take ownership of some of aspects of HIV care. This transition has begun but it is far from successful. In the interview below, Dr Chuks (a representative of NACA) spoke about the challenges the country faces with regards to current and future funding for HIV activities in Nigeria:

“For me the major challenge is domestic funding... most of the money we are spending on treatment come from international donors. We need to increase our domestic funding... even though the NASA (national AIDS spending assessment) showed that health expenditure as at 2012 has

*grown from about 9% to 25%, however, we still need to increase this as we should be taking ownership of this [HIV] response, that's the only way we can ensure it's sustainable beyond donor funding... donor fatigue is already setting in, they [donors] are no longer increasing their allocation, especially PEPFAR who is the biggest single donor for HIV [activities] in Nigeria. They [PEPFAR] are still maintaining their support of about 400 million USD per annum but without the yearly increments that used to be the case". **Interview with Chuks, NACA representative.***

As a result of the uncertainties with HIV funding, there are disruptions in the delivery of essential HIV services.

*"... We've been having some hitches with international donor agencies and partners... the partners have reached an agreement with the federal government to stop the personnel support they were offering previously. These personnel were under the payroll of international partners... the Nigerian government is still battling to absorb most of the personnel and this gap is negatively affecting our services. It's more of humanitarian services here at the moment... ". **Interview with Dr. Zachariah, Otukpo.***

There are reports of some HIV support staff working for months without being paid. These staff were previously supported by funds coming from international agencies working to halt HIV spread in Nigeria.

"In the past, we had doctors that run this programme and, are involved in providing clinic services for the people living with HIV but they left because there was not enough funds to pay them... some of these doctors worked without being paid for about a year. In fact, they even took the centre to court because they were not paid and the case is in court as we speak. Also, people in records departments and other supporting staff have left and this has affected the running of the programme. People working here now do so purely on voluntary basis... Some people living with HIV come to be attended to and the wait in the clinics could be up to 3, 4 or 5 hours, if at all there is any one available to see patients. Sometimes our clients get frustrated and some of them even cry, saying, they are being treated

poorly because they are HIV positive. Some will even begin to recount how they acquired HIV, stating that they acquired it through no stigmatised routes like blood transfusion and that they were never promiscuous”.

Interview with Dr John, Makurdi.

Similarly, other non-essential services that used to be delivered alongside core HIV care are being scaled back due to dwindling international support.

“Initially they were giving condoms in this clinic for free. But now all that have ceased”. **David, person living with HIV, Makurdi.**

Due to limited funds and resources, medication choices are also limited. As a result, medical practitioners have only a narrow range of medications to choose from. Resistance testing is not routinely carried out for funding reasons.

“The medications and medications choices here is limited... Ideally, we are supposed to do resistance testing and genotyping and all that, to know which drugs to use that will be effective [against HIV]. It is not the case here... we just start with the first line and then proceed to the second line if this fails... and we have only a few range of medications to choose from and some of the medications we have, some people might have developed resistance to them before they are even started on them... my greatest worry is the increasing number of people who are failing their first line medication”. **Tom, nurse and NGO staff, Makurdi.**

When asked about the sustainability and continuity of the current HIV intervention programme, Dr John was unsure what the future holds for HIV care in Benue State and Nigeria.

“Well, continuity is really a very big problem. Continuity, I don’t know... the way I am seeing this program, maybe in future individuals will have to cater for themselves, in ways similar to other diseases like diabetes and malaria. In fact this picture is beginning to emerge, already, as government have demonstrated through her actions that they’re incapable of offering support to people living with HIV, even though they [government] have not come out openly to say so, but from what is

available at the moment, continuity is really a very big challenge. A very big challenge, honestly". Interview with Dr John, Makurdi.

In the interview with Christian male group in Otukpo, it was mentioned that unsteady supply of medications and other protective equipment constitute a significant barrier to the fight against HIV in the local area.

"Supplies are not very consistent and this tends to limit the proper utilisation of preventive materials and antiretroviral medications... I've heard people who are living with HIV and, who are on medication, go to facilities where these drugs should be available and for a prolonged period of time, they cannot access those drugs because they are exhausted from the stock and supplies have not been made or because there are issues with reconciliation between agencies and government parastatals and foreign donors and all that, so it comes to affect the steady flow or supply of these materials". John, male Christian interview, Otukpo.

The above picture clearly demonstrates how a problem that exists at the country level could impact on HIV care at local levels. It also exemplifies a problem whose solution lies with governments (local and international) and not individuals in the local area of study.

8.5 Unemployment

In a number of interviews, lack of steady source of income and high unemployment rates were cited as significant obstacles to the fight against HIV in Benue. Unemployment which stems from lack of economic opportunities is directly related to poverty. In the previous chapter, the impact of unemployment and poverty, at individual level and how it impacts on lifestyle choices, was explored. In the interview with female sex workers, lack of employment opportunities was cited as the main driver for young women taking to commercial sex work. It was stated clearly that if there were alternative economic opportunities, a number of young ladies would not engage in commercial sex work. If sex workers have alternative sources of livelihood and are provided conducive legal frameworks, the degree of exploitation that takes

place would most likely not occur as they will be empowered enough to negotiate safer sex with rich clients.

“Some people go into prostitution to earn [a] living. For HIV to be prevented they [government] should create more jobs for people... if young people have work to do, they won't prostitute for money and it's when you go into such acts that you easily contract HIV/AIDS” **Fatima, female group discussion, Otukpo.**

“If I had an alternative business I will not be here, you understand. It is because of lack of money that I am here. Not that I love doing this business... it is the situation that we find ourselves in that is responsible for our being here. If I have a business doing I don't think I will be here” **Female sex workers group discussion, Makurdi.**

In the interview with Christian females, unemployment theme was reaffirmed. Benue State has a lot of agricultural potentials (arable farm lands and good weather conditions) but farming in this area is largely subsistence with very little government input. There are hardly any large scale economic activities taking place that engage the youth population of Benue State. What is available on an industrial scale, as highlighted by interview participants, are hotels and relaxation spots where people go to socialise.

“When you go around you can count several hotels here but you cannot count up to one or two companies where youth can work. You can count for yourself. I have not seen anyone... I've not”. **Anyalewa, Female Christian group interview, Otukpo.**

“We don't have factories in Benue State that can employ so many workers”. **Interview with Enewa, a lead NGO worker, Otukpo**

In the same vein, Dr John stressed the need for government to empower people, especially women, and focus on poverty eradication as a means of fighting HIV in the local area. Dr John argued that it is only when certain basic needs of life such as

food security and poverty are overcome that people will pay attention to HIV campaigns.

“Empowerment. Government needs to do a lot of things to empower people because it is only a healthy man and someone that is well fed that will be afraid of taking ill. If you are hungry... you know that hunger, like disease, could equally kill you. Even if services are located close to the people that need them, they will not be utilised if the people are hungry. Government should equally look at how to empower the people. Women empowerment and poverty eradication I think are important factors that will really contribute to a reduction in HIV prevalence, if addressed by government. You know, all other advocacy programmes are important but until people are empowered they will not listen to you”. **Interview with Dr John, Makurdi.**

“HIV is a big problem around here because we have high rates of unemployment, you have a lot of unemployed youth that don’t do anything, because of that they’re engaging in a lot of illicit sex”. **Musa, general public group interview, Makurdi.**

It is, therefore, obvious that the lifestyle choices people make is a function of prevailing local economic conditions.

8.6 Cultural, social and gender based issues

Culture is defined as “the way of life, especially the general customs and beliefs, of a particular group of people at a particular time” (347). It is clear from this definition that culture is dynamic and changes with time and place.

One cultural practice identified as important for HIV epidemiology in my interviews is levirate marriage (widow inheritance). Levirate marriage refers to a scenario where a widow is taken into the home of a close male relative of the deceased husband, with the relative assuming the role of the deceased husband (352). Levirate marriage takes place in a number of places in Africa (352) and has been documented in Europe (for example Catherine of Aragon, Queen of England, who was initially

married to Arthur Price of Wales, later married Henry the VII, younger brother of Arthur following the death of the prince of Wales) (353); Asia (354) as well as in the Middle East and ancient Israel (355). The practice, of levirate marriage, is intended to provide security (social and material) for the family of the deceased and ensure family wealth is kept within the bloodline in societies that are patriarchal. However, as the structure of societies evolved and women began to feature more in political and social spheres, this culture faded away in many societies. The practice of levirate marriage has been shown to enhance the transmission of HIV within societies (356). In the interview with Tom, it was gathered that in certain parts of Nigeria, including the middle belt (North Central region and rural areas), levirate marriage still continues to play a small but significant role in the epidemiology of HIV. The mechanism through which levirate marriage contributes to the problem of HIV locally is similar to polygyny and stigma. Since HIV is highly stigmatised in the local area, an HIV positive widow will not want to disclose her status to a relative of her deceased husband whom by tradition is required to take over the roles of the late husband.

“In some parts of the country, including the middle belt, [levirate marriage] is still happening. In the Tiv speaking area when a man dies, someone takes over his wife, mainly the brother... despite this information about HIV”. Tom, NGO staff, Makurdi.

The quotes below demonstrate how levirate marriage and non-disclosure (occasioned by stigma) work hand in hand to increase HIV risk in the local community. This is a clear example of how different variables could interact to produce excess risk for HIV in this community.

“... Given that HIV is a thing of shame, it follows that the widow of a man who dies of HIV will not be quick to say so for fear of stigma. In that case, the brother who goes for the woman could contract HIV...” interview with Reverend Father Emmanuel, Otukpo.

“...people inherit widows without any knowledge of what killed the husband. That is the more reason why in rural areas people are more infected with HIV”. David, person living with HIV interview, Makurdi.

The culture of levirate marriage is fading away and it appears it is only a matter of time before it is outlawed by local leaders. Levirate marriage seems to be commoner in rural settings where traditional practises are commonplace.

“Once a brother dies another brother automatically inherits the widow... This tradition is currently being discussed by the traditional chiefs who are the custodians of all the rules and traditions of the land, with the aim of doing away with it. People are beginning to look at succession planning and will writing as alternatives to levirate marriage”. **Interview with Enewa, a lead NGO worker, Otukpo.**

Another cultural practice, closely related to levirate marriage, which encourages the transmission of HIV is polygyny. Polygyny, a form of marriage in which a man is allowed to have more than one wife, is an acceptable cultural practice that is encouraged by some religious groups (Islam and traditionalists) in Nigeria. The argument for polygyny being a cultural and religious practice that encourages HIV transmission is that once a member of a polygynous family contracts HIV, the other members are automatically at increased risk for contracting HIV. The quotes below support the fact that polygyny is an acceptable practice locally and implicates polygyny in HIV transmission.

“In the communities you have polygyny... you know, in most of our communities it [polygyny] is accepted”. **Tom, NGO staff, Makurdi.**

“And our polygynous way of living encourages HIV spread [transmission]. In Benue State we embrace polygyny”. **Interview with Enewa, a lead NGO worker, Otukpo.**

The fact that HIV can easily be transmitted in a polygynous marriage setting is highlighted in a quote from the interview with university female group below.

“I asked my dad (who is resting in the Lord now) why HIV is a problem in Benue and he told me that polygyny, practised especially among the Tiv, is to blame. No sentiment. These men who get married to more than one wife may have a wife who might have contracted HIV. So by having sex with that particular one [with HIV], the disease could spread to the other

women through the man. If one of the women is breastfeeding, it could further spread to the breastfeeding baby". **Lucy, female university group interview, Makurdi.**

Tribal marks (usually made on the face), locally procured (and unhygienic) male circumcision and female genital mutilation were identified as some dying cultural practises that play a role in the epidemiology of HIV in Benue. It is alleged that these practises have almost faded away completely. The way these practises of tribal marks and female genital cuttings work to increase HIV prevalence is through the use of non-sterile cutting instruments.

"Genital... mutilation and locally procured male circumcision, both of which are disappearing now, are good breeding grounds for the spread of HIV and also the practice of tribal marks. Some of these things are disappearing now". **Reverend Father Emmanuel, Otukpo.**

"And there is another cultural factor which is female genital mutilation. Although it has reduced, but in some part of Benue State it is still practised. Some of these rituals are carried out in the villages where there is no knowledge of the principles of sterilisation or aseptic techniques, so one razorblade can be used on like ten girls and that is a very fast means for spreading the virus in Benue State" **Yemi, general public group interview, Makurdi.**

It appears there are on-going efforts by local groups at ending these practises.

"The practice of tribal marking of children at birth. There are so many NGOs working against this practise but it is still there. They [locals] will tell you, this is what we inherited from our parents, and this is how we know ourselves". **Dr Zachariah, Otukpo.**

The local society is largely patriarchal. This social structure ensures that the female gender is at the short end of a number of social decisions and suffers a number of social injustices and gender based discriminations. Based on the interviews, women are hardly in any position to negotiate safer sex, mainly because they are not

empowered enough (economically or socially) to do so. The implication of this is that the woman is expected to run decisions (including economic, sexual and reproductive health matters) through a male head for consent most times.

“You know like it is always said females are the weaker sex, so because of poverty and low socioeconomic status sometimes they're almost [always] at the receiving end.... So you see, women empowerment and poverty eradication I think are some of the important factors that [if addressed] will really contribute to a reduction in [local] HIV prevalence”. **Dr John, Makurdi interview.**

The view that the man is the head of the home and should be responsible for decision making at home, or in a relationship, is a widely held view among members of the local society.

“You know a man, they say, are the head which is very true”. **Joy, female person living with HIV, Otukpo.**

As a result, the female gender is conferred a rather passive role within society.

“The female gender is still conferred with the passive role. You [the female] just accepts whatsoever choices offered to her or the options that is passed down to her... she just accepts them in 98 out of 100 times. When you have a 98 out of 100 chance, and you can just make generalisation that it is true for all scenario. So when it comes to negotiating of safer sex the ladies primarily have very little say” **John, male Christian group interview, Otukpo.**

“A man is always a man... the man is the head of the house”. **Interview with Nkechi, junior uniform personnel, Makurdi.**

This imbalance in ascribed gender roles also impacts on health seeking behaviour and HIV testing.

“I think in this aspect [referring to gender related issues] the male have more say than the female. Let us talk about married people. A husband

goes elsewhere get infected with HIV. You as a woman cannot ask him let's got for [HIV] test first. He has more say than you as a woman. Even when he knows that he is HIV positive he won't even hide it from you as a woman. So I think the male has more say in this regard". **Elameyi, female group interview, Otukpo.**

The lack of voice ascribed to the female gender in relationships is no different for women in polygynous settings. If a woman in a polygynous setting suspects that any of the other parties could be HIV positive, she is not socially empowered to demand that an HIV test be conducted except the man she is married to gives his consent.

"If a woman suspects that the other of her mates, that her husband is also sleeping with [in the polygynous setting] looks sick, she cannot negotiate safer sex by saying look, my husband we have to go for a test or all that. You know, she has no right to do that. She will be thrown out. And if any one of the wives gets to know they are HIV positive first and asks the husband for a test, she will be thrown out or labelled as the one that has brought HIV to the home". **Tom, NGO staff, Makurdi**

Furthermore, a female is held to more account than a male in marriage.

"If a woman is rumoured to have committed adultery here, before long the story will get to her parents. The bride's father and or the husband would be the ones asking her to leave her home. But in a man's case [when reverse is the case] we [women] don't have a say". **Margaret, person living with HIV, Otukpo**

A man is able to disclose his HIV status to his wife and expect little or no negative repercussions. However, reverse is the case if an HIV positive woman discloses her HIV status to her husband. It is also clear that attempts to negotiate safer sex options could be perceived as promiscuous and unacceptable behaviour. The quote below drives home these points.

"If a woman who is married, for example, finds out she is HIV positive, she could be thrown out of her matrimonial home. Nobody cares to find out if it is the man that got her infected. At that point it doesn't matter. But the

*man can freely say 'I'm HIV positive' [with little consequences]". **Interview with Idoko, a hotel manager and volunteer HIV awareness campaigner, Makurdi.***

Mr Idoko expressed the view that even when the man is to blame and is the one who may have infected his wife, he does not face any backlash from local society.

*"There is this sort of impression... that if a woman becomes HIV positive and she was infected by her husband, she is expected not to complain... however, the man has no restrictions. The man can go out, do what he wants to do, get infected, go home and infect his wife. If his HIV status becomes known, the blame will be on the woman, so women keep quiet... for their own sake they keep quiet a lot". **Interview Idoko, a hotel manager and volunteer HIV awareness campaigner, Makurdi.***

Other quotes in support of the passive role the female gender is ascribed in the local society are as follows:

*"...the belief that the women do not have a say [is important]... They [women] are housewives. Whereas, men are the ones that make the decisions. Yeah, any decision, they [the males] make including decisions concerning someone's life... in a relationship the guy has more say than the female, the guy will take decision and the girl has nothing to say about the decision". **Jane, Female Christian group discussion, Otukpo.***

*"In our society it is not very easy for a woman to discuss [issues related to condom use] with her husband except in very rare cases... It is hard... It is difficult because when you discuss this with him he will be suspecting something. What do you mean?!" **Fatima, female Muslim group interview, Otukpo.***

In the quote below, Mr. Adakole states that the societal impact of being HIV positive is far more devastating for a female. He argued that a man who is infected with HIV has a better outlook compared to a lady as he could go on to attain certain social

milestones, like getting married to any lady of his choosing, with relative ease. The same social opportunity does not exist for an HIV positive lady.

“I think that’s generally because of... erm... the patriarchal nature of our society. Let me use this analogy, a man who is 40 years old and is not married is not under as much pressures as a lady who is aged 35 and unmarried. Similarly, the outlook for a man who is HIV positive [in this society] is better. The man is in a position to say that life doesn’t stop here [after an HIV diagnosis]: I can still go on with life, there are ladies if I want to still get married. And like we know today, men living with HIV are able to get married even if their HIV status is known to the lady, but I can tell you categorically that there is no woman living with HIV in our society today that a man who is HIV free will accept [to marry]...” **Adakole, Christian male group, Otukpo.**

Willingness to accept change and discuss openly about sex have been pointed out in the interviews as factors that have significant implications for HIV epidemiology in Benue State. There is a sharp difference in attitude between the two study locations in this context. Whilst the Tiv speaking area is more open to discussions about HIV and have a more liberal attitude towards sex, the Idoma speaking area is less receptive of new ideas with open discussions about sex considered a taboo. The more liberal approach in the Tiv speaking area has been cited as reason for reduced stigma but can also be blamed for the increased prevalence observed in the area. However, the less receptive and more closed Idoma speaking area has more incidents of stigma. This high stigma could create a falsely low prevalence of HIV, as individuals are less likely to disclose a positive HIV status or go for HIV testing.

“Idomas ‘naturally’ are known to be slow in accepting change, especially when they are new ideas”. **Interview with Enewa, a lead NGO worker, Otukpo.**

“The [Tiv] have a more liberal approach to this sex thing. They don’t really place so much restrictions on sex, so there’s actually a high prevalence of HIV in this area, but I think they are more accepting of the fact that HIV is a problem. However, if you go to the Idoma areas, talks [discussions]

about sex is still a taboo let alone HIV. There is still this aura of denial [in Idoma areas] because most people believe that if someone is infected [with HIV] then they were sleeping around... there is this stigma associated with being infected with HIV". Interview Idoko, a hotel manager and volunteer HIV awareness campaigner, Makurdi.

Social gatherings (like parties, clubs and wakes) have been blamed for the increased prevalence of HIV in the local area. The reason locals cite these events as high risk for HIV transmission appears to be excessive use of alcohol at these meetings. It is widely speculated that alcohol and substance use increases risk for engaging in high risk sexual behaviours as they becloud judgement. Similarly seasonal movements of people during festive periods like Christmas and New Year were implicated in local HIV epidemiology due observed spikes in social activities that are believed to encourage HIV transmission. During these periods, HIV positive strangers whose HIV status is unknown to locals come into town and mix with locals, interview participants allege.

"When we have celebrations, festivities, so many things happen there. We go for parties, people go for clubbing and wakes, only God knows the kind of things that happen around there. During times like these people are drunk and they are there together dancing and all that... So, if some of these things [excesses in social gatherings] can be reduced it will go a long way to discourage the spread of HIV..." Emmanuel, reverend Father, Otukpo.

It is also reported that people in Benue like to take out time to relax despite the low economic activity and poverty in the State. "Excessive" alcohol use was pointed out as possible reason for increased local HIV prevalence by Dr John.

"Benue is a place where people believe they can enjoy themselves, even though there is not much money. There is a lot of alcohol use". Dr John, Makurdi.

Locals pointed out that there are "several" relaxation spots and pubs where people go to socialise, a development they consider alarming. It is believed that these

relaxation spots contribute to local HIV prevalence as activities that take place at these locations are perceived as factors that promote opportunities for illicit sexual encounters.

“When you go around you will find there are several hotels here to spoil yourself but you cannot count up to one or two companies where youth can work. You can count. I have not seen anyone. I’ve not... this is why we can’t control sex in this town. That is why the transmission of HIV is much”. **Ene, female Christian group, Otukpo.**

Also, substance abuse featured in the interviews (though less frequently) as an important determinant of local HIV epidemiology. Locals believe that substance use (like alcohol) predispose to HIV by clouding rational thinking.

“There’s a lot of drug (weed) and alcohol use”. **Hotel manager, Makurdi.**

“Drug use can lead into a lot of high risk behaviour such as having sex without a condom”. **Ben, IDU, Makurdi.**

There is the suggestion that local campaigns have largely ignored social factors such as alcohol and substance abuse in local HIV campaigns. The reason for this is unclear.

“You see, there are so many ongoing HIV campaigns that do not address alcohol. Alcohol increases the rate of sexual urge in men... once a lady is drunk she is prone to abuse. The availability of the beer parlours encourage prostitution. The number of beer parlours in our locality is increasing”. **Adam, male Christian group interview, Otukpo.**

In the nutshell, it appears that peer pressure and substance abuse (alcohol and drugs) are important pathways through which social factors mentioned above operate to influence local HIV prevalence and epidemiology.

“I think the activity that has led to an increased HIV [burden], in this town, Otukpo, is parties. Though I know it has reduced, as some persons have gained admissions to higher institutions and have moved away from town.

*During the years 2009 through 2012 there was a lot of partying in this town". **John, male Christian group interview, Otukpo.***

*"One of the things I've realised also is that areas that consume a lot of alcohol in Nigeria are areas where we have the highest [HIV] prevalence. So it's an area that we'll have to really research. What is the relationship we've got between alcohol use and HIV in Nigeria to be specific?" **Tom, NGO staff, Makurdi.***

Again, alcohol was implicated in the discussions around wakes. During wakes it is common practice that alcoholic beverages are made available to guests paying condolence visits to the family of the deceased. This cultural rite (of wakes) which is usually well attended (sometimes by people numbering in the hundreds) provides the stage for meeting between people that are from different works of life. Some wakes are comparable to parties or celebrations and could last for days, and in some instances, a week or even slightly longer. The lack of proper judgement that comes with excessive alcohol use is blamed for the high risk behaviour described by participants during these rites.

*"We have another cultural attitude that contributes to this high prevalence rate – wakes. During wakes, we take a lot of drinks in Benue State and we know what alcohol can do to rational thinking. During wake, you find a lot of drinks are given free of charge so as to keep people awake and entertained... but people use that period to go around having sex and engaging in all sort of behaviours that could encourage HIV transmission". **Interview with Johnson (an NGO Support worker who works with FSW), Otukpo.***

*"I think influences of alcohol and other things like Indian hemp are important because when a man is drunk he's not in his right senses so he can just go on and have sex without protection". **Mark, male university students' interview.***

In the same way, increasing numbers of hotels, described as outlets for alcohol use and partying, was pointed out in the interviews as important for local HIV transmission.

“Even the numbers of hotels here contribute to HIV transmission. No new hotels, joints and, beer parlours should be allowed. They are not good. They are corrupting our children. I used to see some things that I don’t like in ‘joints’ [hotels and beer parlours]. People go to these places and when they have a few drinks they just check into a hotel”. **Onyechi, Junior personnel interview, Otukpo (male).**

It was also mentioned that the local culture impacts negatively on the acceptance and use of condoms. The reason for this is the perceived role condoms play in contraception. Since most of these communities engage in subsistence farming, large families are seen as an economic asset because they provide the workforce required to cultivate the farms. Premium is, therefore, placed on having many children.

“I know of cultures in Idoma land that says a man is permitted to have as many children as possible, so the use of condom is like a control measure against you having the number of children you should have”. **Uvah, male university group interview, Makurdi.**

“On the issue of condoms, some individuals because of their belief, practice and tradition, they do not accept condoms. They call it the White man’s something.” **Isa, senior uniform personnel, Otukpo.**

Below is a quote from an interview that supports the cultural practice which places premium on large families.

“Yeah, I know. I know of cultures in Idoma land that says a man is permitted to have as many children as possible, so the use of condom is like a control measure against having the number of children you could have”. **Mark, Male University students’ group discussion, Makurdi.**

It will be incomplete to close this section without mention of the challenges individuals who identify as gay within the local society face. In the interviews with gay participants, it was gathered that stigma, fear of being found out, ignorance and unprotected sex constitute the main drivers of HIV epidemiology in the local gay community. Being openly gay is a criminal offence in Nigeria and, punishable by jail sentence. Below are some quotes in support of the challenges gay members of the local society face.

“It is not like people do not know what to do... the fear of actually going out there and, getting probably a condom and lube in a chemist is what stops people”. **Henry, MSM community interview.**

“The fear of being caught and, stuff like that, makes people in the community not to mind their health”. **Tony, MSM community interview.**

In the next quote, it is quite obvious that the respondent (a member of the gay community) demonstrates poor knowledge as well as poor risk perception. He states that his risk for HIV is low but fails to recognise that unprotected oral sex is associated with increased risk for HIV transmission.

“My risk for HIV is low... I hardly have penetrative sex and I am very careful... Yes, I use condoms for sex but I don’t use condoms when I give head [oral sex]”. **Tony, MSM community interview.**

Since being openly gay is not socially acceptable, some gay members of society would, out of social pressures, get married to women but continue to have secret relationships with gay lovers. This secrecy, occasioned by social pressure, has implications for HIV transmission between gay communities (a group known to have high HIV prevalence) and the general public.

“In Nigeria most MSM get married because of the pressure from society that [males] have to get married to a female and make babies”. **Henry, MSM community interview.**

“I think it is the social [pressure]... I am faced with the same situation from my family... should I get married, it is just because they want me to. I will

get married [to a woman] to ensure my gay status is protected as, otherwise, they will keep asking, 'why are you not getting married'? 'Do you have any problem'? And stuff like that... I think I will get married to a woman just because of my family, otherwise I won't". **Tony, MSM community interview.**

8.7 Religion

Religion plays a hugely important role in HIV epidemiology in Benue State. This is because the two most populous religious groups in Nigeria (Islam and Christianity) have significant following in the local area. Religion impacts on a number of HIV related themes that range from local perception of what causes HIV through to the belief that HIV has a "cure". It is common to hear individuals discontinue HIV medications as a show of faith towards securing divine HIV healing/cure. Religion interferes with condom uptake (among young and unmarried persons especially) as condoms are an indication of the intention to engage in a sex act: sex is strictly forbidden for unmarried individuals in religious circles. Another reason condoms are not so popular within religious groups is the contraceptive role it plays. It is thought (among Catholic Christians and adherents of Islamic faith) that condoms interfere with procreation.

"People believe so much in some men of God (religious leaders)... Just today in the hospital I saw a case of a woman who abandoned her ARTs [HIV medications]. She was pregnant at the time she took the decision to discontinue ARTs... today she came to the clinic, along with the child, [both] looking very bad. She delivered her baby whilst not taking the medications. She came to the hospital today because her child was becoming very sick. She had stopped her medication for months and during counselling we realised that the reason she abandoned her medication is nothing but "faith healing". She went to one of the pastors who claim that he can cure HIV. In Otukpo, if you go round you will find posters [bills] pasted on walls by people who claim to have cure for HIV". **Tom, interview Makurdi.**

The practice of encouraging people to discontinue ARTs, as a show of faith towards divine healing, does not only encourage development of resistance HIV strains, but also increases the risks of HIV transmission.

"I've met someone who said 'my pastor said I'm cured'. But her viral load was way up. She was obviously sick. So she was insisting that her pastor said she was cured. You have some religious organisations who tell people they don't need to take HIV medications because they are cured".

Interview Idoko, a hotel manager and volunteer HIV awareness campaigner, Makurdi.

Further still, the thinking that HIV is a curse from God comes in the way of treatment seeking behaviour and discourages some HIV positive individuals from seeking medical care.

"Some believe HIV is a punishment from God. Those who believe this, especially the religious ones, don't even care to go for treatment. They see it as a punishment from God they have to carry... in some religious circles, if you have HIV, it is deemed a punishment from God and you have to accept it as there is no cure. They say that even if you take the medications you will definitely die, and when you die you will go to hell".

Ada, General public group interview, Makurdi.

This perspective above was re-echoed in other interviews.

"Some after they learn that they are HIV positive, decide to sit back at home praying for God's intervention because of the 'religious factor'... They sit back at home believing that they will be healed or God will get rid of the virus instead of them to take the [anti]retroviral medications as they pray for God's intervention". ***Martha, General public group interview, Makurdi.***

"Once a very religious person is tested positive, it is said that the Egyptian disease has fallen on you. All they will do afterwards is payers: 'all HIV positive people receive your healing!'" ***Mary, General public interview, Makurdi.***

The notion that HIV can be cured is also popular among locals, who think that only those who have enough faith can be divinely healed of HIV. How much faith is enough faith is hard to quantify and define.

“If you meet the man of God and, you believe that God can heal you and, you pray to God for forgiveness and, you are strong in praying he may be able to heal you... if you believe you can be healed”. **Okopi, Okada interview, Otukpo.**

As highlighted earlier, religion impacts on local HIV epidemiology by encouraging discontinuation of medications through false assurances of faith healing.

“Some people say they are in the process of the healing, like a lady came here, instead of accessing ARTs she was told by her pastor to sweep the church, and that as she sweeps the church she sweeps the HIV away”. **Elameyi, Person living with HIV, Otukpo.**

Faith healing is firmly rooted in the belief that HIV is a death sentence which God alone is able to overturn through divine healing. This notion is further reinforced by “testimonies” of such healings. The locally widespread belief that HIV can be healed through divine means is captured in the quote below.

“I’ve actually talked to people that have been cured of cancer and I’ve heard testimonies of people that have been cured of AIDS”. **Jane, University female interview, Makurdi.**

It appears that faith healing, of HIV, is conditional on closeness to God. Also, being close to God offers hope for a good life in haven after death, for those that may never get healed of their HIV infection. This narrative is particularly powerful considering an HIV diagnosis is locally perceived as a death sentence and punishment for immorality.

“Once one contracts the disease [HIV], it is necessary for one to get very close to God, extra ordinarily close to God, because he is the only one who can stamp out HIV, there is no human solution... there have been several failed attempts at finding the cure to HIV... all we have are

medications to manage the disease... so if I catch the disease, God forbid, what I will do is to get closer to God because if I am close to God even if I die I will not be double minded as I will have asked God for forgiveness and I will know where I will be going afterwards [is haven] but if I don't believe in God then I have no choice and I will be going to hell fire".

Obande, Okada interview, Otukpo.

Furthermore, religious bodies are strongly against the use of condoms, more so among young unmarried members of society. Advocacy for condom use among this group is seen as an endorsement of sin. This approach to condom use, by religious groups, pose serious limitations to the use of condoms in preventing HIV transmission.

"The church advocates for faithfulness... we preach conduct, not condom".

Interview with reverend father Emmanuel, Otukpo.

In one of the interviews, it was highlighted that the Catholic Church poses significant barriers to condom use as they advocate against its use.

"I am sorry to mention this, the Catholic people, I will say, are the ones giving us problem [with HIV awareness] because they keep on preaching abstinence alone. As others here have said, they [Catholics] refuse to talk about 'faithfulness and use of condoms', most especially the use of condom. Condoms go a long way to help us in the area of HIV but that is what they kick against. They insist that the bible say we should go into the world and multiply. Don't use anything, don't kill anybody [they say]. Jane, General group interview (female nurse), Makurdi.

Similarly, in Islamic circles, condoms are not encouraged as they are seen as items that encourage immoral behaviours that a true Muslim is expected to avoid.

"Well, from the Islamic point of view, it is said that we should desist [from sex]". Mustapha, Male Muslim group interview, Otukpo.

"We preach conduct, not condom... we don't preach condom". Rasheed, Imam and Muslim leader interview, Otukpo.

This view expressed by the Muslim leader and a participant in the male Muslim group interview above was further confirmed by a member of the female Muslim community in Otukpo who reported that the condom is prohibited especially for the Muslim youth.

“From the religious perspective condom is totally prohibited because for the youth, based on Islamic Sharia, fornication and adultery is Haram [sin]. And the Prophet [sallā Allāhu 'alayhi wa sallam] have said that what is Haram is Haram, Halal is Halal [what is good is good] and, what is bad is bad and when you are in doubt you should leave (abstain from) that which you are in doubt about because that is best of purity. So from the religious perspective condom is prohibited because when you encourage condom, it is as if you are encouraging adultery and fornication. So it is totally prohibited. What is not good can never be good”. **Fatima, Muslim female group interview, Otukpo.**

The quote below demonstrates the reluctance of a Muslim faithful towards condom use - condoms are not the preferred methods for contraception in Islam. It follows, therefore, that condom use in this circle is principally for contraception (and only in the extreme of cases where other “approved” natural methods have failed).

“So if all other ones [methods of contraception] that Islam approve you’ve tried and you are not be able to achieve contraception, and you feel that using of condom is the only way, then you can use it. There is a place [for condom] in Islam but it is not number one”. **Isa, senior uniform personnel and Muslim, Otukpo.**

Abstinence, therefore, is the only practical and socially acceptable option for young people locally. However, the practise of abstinence by Christians and Muslims remains to be seen as many participants confirmed that much of what is preached in religious circles is not practised by many. It became evident, from the interviews, that there is a disconnection between the lifestyle religious leaders expect their members to lead and what obtains outside places of worship. This disconnect in expected and actual behaviours is captured in the quote below.

“Majority of the population of this country is either Christian or Muslim... about half Christian and half Muslims... and many are still avoiding abstinence. As far as Islam is concerned, one should not even go closer to adultery [sexual sins] and if you are a good Muslim you should be able to desist from that. But you can see even in the Muslim community [laughs] this [sexual sin] is still very common”. **Adamu, Muslim group interview, Otukpo.**

The same views as above was expressed in the interview with the general public group in Makurdi.

“Some people in church will sit quietly and listen to the pastors, when they go back home, you see them doing something different from what they were taught in the church... they are living a kind of double life; living a saintly life in the church then switching to ‘club guy’ life at night”. **Johnson, General public group interview, Makurdi.**

In the quote below, the disconnection between what is preached in churches and what is practised by church members was further highlighted. John reported that this gap between what churches expect of their members and what actually happens outside of the church will always be present. The implication of this statement is that there will always be a gap in HIV prevention if churches (and other religious groups) continue to advocate abstinence alone.

“... There will always be disconnection between the church and the people about HIV and AIDS”. **John, General public group discussion, Makurdi.**

Furthermore, it was found that abstinence is thought to be practised by only a small number of young persons as exemplified in the post below.

“I will like to say that it is very, very difficult for over 70 percent of the people to abstain from sex”. **Aboje, Male Christian group discussion, Otukpo.**

Behavioural approaches, like ABC (Abstinence, Being faithful and Condoms), have limited impact because young people like to explore, says Tom. Tom further added

that the practice of polygyny and extramarital relationships makes it harder for members of the local society to apply ABC to any significant lengths. So, given the cultural and social environment, the preferred methods (of ABC) in religious circles is clearly inadequate in the fight against HIV. This picture is captured in the quote below.

*To a great extent ABC (Abstinence, Being faithful and Condoms) [campaigns] have definitely helped, especially use of condoms. Abstinence, generally it's a behavioural thing and it's not usually easy to abstain, and you need to know that these people especially, at the younger age they, want to explore and do everything that their mates are doing, so abstinence is not usually easy. And then being faithful, to some extent does not actually work in a community like ours where men are allowed [extramarital affairs], even [if] they are married, you know, people don't really frown at, extramarital affairs that much because they feel men are polygynous in nature... So you can see that even being faithful is usually difficult except those with strong religious root or strong love for their families with certain level of understanding... they are struggling to ensure that they keep their families. But in Africa, in fact they look at [those abstaining from sex or extramarital affairs] as if [they] keep so much to [their] wife, a lot of people even look at [them] as weaklings". **Tom, NGO staff, Makurdi***

Another way religion impacts on HIV epidemiology is through Polygyny: polygyny is allowed in Islam and among traditionalists who worship ancestral gods. Polygyny is discouraged within Christian circles. The impact of polygyny and how it encourages HIV transmission has been highlighted in the section for culture above.

*"Well, Islam encourages 4 wives and if you are the first wife and your husband is about going to take in another woman, you first of all tell him that he should please go for HIV test with the second woman. Since you are in the home already, you have tested yourself and you are now free from HIV/AIDS, so you tell the partner, the second woman coming in, that she should tell him they go for tests as well, so as to protect yourself and your husband". **Hajiya, Muslim female group interview, Otukpo.***

It appears some traditional belief patterns also discourage condom use. The interview participant reported that some traditional beliefs and practices prohibit the use of condoms.

“...some people will tell you straight away that their belief doesn’t allow them to use condoms and all those things. And there are some traditional practices that discourage condom use. I have heard speculations about places in Idoma areas that they believe condoms can kill, I am yet to investigate this”. **Tom, NGO staff, Makurdi.**

Sex education is perceived as immoral within religious circles, chiefly because it is seen as a process that encourages or exposes young people to knowledge about sex, which in turn can lead to fornication and adultery. As a result, any form of sex education that promotes the use of condoms is not accepted and considered sinful. Young people, therefore, tend to shy away from sex education. In the interview with Nkechi (a junior military officer), it was reaffirmed that attempts at communicating important sex education at her school were usually greeted with disdain and rejection from herself and her colleagues. And this is largely because they were made to believe that such discussions are unhealthy and ungodly. They, therefore, looked down on the male teacher tasked with the responsibility of delivering the lectures.

“Like when the man [our teacher] was talking about the male and female bodies and nakedness and everything... in fact when he brought a condom to a class and started demonstrating, I swear to God, no student stayed back... they [students] would talk bad about the teacher saying he is a very bad lecturer, you understand”. **Interview with Nkechi, junior uniform personnel, Makurdi.**

As a result, acceptable forms of sex education in religious circles are usually brief and devoid of important details needed to communicate intended messages.

“In Islamic world anything that is Halal is legally accepted, sex education in Islam... [is] ‘do not go close to sex’”. **Ibrahim, Male Muslim community interview, Otukpo.**

Religion impacts negatively on HIV risk perception. This is because it affects the content and depth of conversations about sex among young persons in sexual relationships. When young people engage in conversations about safe sex in relationships, they are not at liberty to do so in great detail as they have been conditioned, by their social and cultural environment, to believe they are engaging in forbidden activities. In the quote below, a young lady (Jane) describes how her conversation with a Christian male whom she intended to have a relationship with did not include asking about his HIV (and sexual health) status, because “he is a Christian”. Whereas, she would not hesitate on enquiring about the HIV status of someone she had met in a non-religious circle (for example in a club). Religion thus dampens her HIV risk perception and plays a significant role in her projection of HIV risk to the immoral “other” [someone who goes to night clubs in this instance]. Also, men intent on having unprotected sex could come under the false pretext that they are “religious”, something that did not readily occur to Jane at the time of this interview. The quote (below) highlights how impracticable abstinence, the cornerstone (and most preached about component) of the main HIV prevention message (ABC - Abstinence, Being faithful and Condoms) in this local area, is among young people.

*“There was this guy that I liked and he liked me too... we got talking about it [sex and condom] and everything [around HIV] because a relationship was in view. So we got talking about it and I asked what his view on protection and all of that is... He was just straightforward ‘I don’t like condoms.’ And I said okay, me too. And because he’s a Christian I did not ask whether he has AIDS or anything like that. When I meet a believer who knows who he is and what he has, then I don’t see any point in asking whether they have AIDS. If I was in the shoes of those who go for clubbing and I meet a guy there, of course I will ask”. **Jane, University female interview, Makurdi.***

In the interview with Dr Chuks, the belief (especially among people of faith) that they cannot contract HIV (usually expressed in the expression “it is not my portion”, in reference to some divine protection from HIV) was brought to light. Dr Chuks also added that some individuals would go ahead to compare their lifestyles with that of

an assumed “other” who they believe leads a more risky lifestyle – a form of HIV risk projection.

“You know we are a very religious country [Nigeria]... Some will tell you, it [HIV] is not my portion, I wouldn’t get it and some people will actually start comparing themselves with other people they believe engages in more risky lifestyles than them and say they [people engaging in risky lifestyles] don’t have HIV. They have not even tested that other person, yet they believe he or she doesn’t have HIV”. **Interview with Chuks, NACA representative.**

Finally, the inclusion of sex and HIV education in schools curriculum appears a near impossible task in Nigeria at the moment, given the very strong religious influence and the thinking that sex education only serves to corrupt morals. According to Tom (an interview participant), policies aimed at making sex education mandatory in Nigerian schools will be resisted vehemently. He also added that conversations around how to ensure HIV lessons are at infantile stages (as there are no policies to back this up), thus discussions around how to enforce sex education curriculum in schools far-fetched and irrelevant.

“In fact, schools (public and private) are supposed to have curriculum that address HIV prevention and all those things. The policy is not even there, at national level, to say one is facing issues of enforcement. In fact, in some states they will even reject it outright because of religious sentiment and all those things, so it’s not accepted across board. So it’s not at national level. They have not pushed to make it the standard”. **Tom, NGO staff Makurdi**

8.8 Cognitive dissonance (the disconnect between youth and society)

In this section I have presented the dilemma young people face with preparedness for safer sex and with accessing safer sex choices. I have identified, based on the interviews, an existing dissonance between day to day realities of young people and local norms or societal expectations (as dictated by social institutions like the family and religious organisations). This discrepancy has been highlighted, albeit

surreptitiously, in some of the previous sections. Whilst young people are open to ideas of sex education and condom use, the social and cultural structures around them point them otherwise, thus seriously limiting their capacity to make healthy choices in a setting where HIV prevention options are already in short supply. Local society creates an image of the ideal youth which is difficult for the youth population to fill. In the quotes below, young people acknowledge that abstinence is the best method for HIV prevention but reckon this is hardly practised. The expression “body no be firewood” is a local idiom commonly used convey the message that the desire to have sex is normal and, at some point, one will succumb to the pressures to engage in sexual activities: sex is only natural. Also, the difficulty with abstinence was highlighted in the section where I presented results for the impact of religion on local HIV epidemiology above.

“Abstinence is the best way. Even though it’s really not easy, a lot of times you will hear people say ‘body no be firewood’, but still abstinence is the best way of stopping or preventing the transmission of HIV”. Okopi, male Christian group discussion, Otukpo.

In the next quote, Judith spoke of the unique challenges young people face with the standards set by society. According to Judith, young people (especially ladies) are afraid of accepting condoms in the open, even if they are in a sexual relationship, because young and unmarried individuals are not expected to be in sexual relationships and accepting condoms in public confirms that one is in a sexual relationship or intends to engage in a sex act.

“In this [African] setting and culture condom is not totally accepted... whenever someone sees a lady with it [condom] they will say she is spoilt... she is bad... she is engaging in premarital sex. There was a day some group was carrying out free HIV tests and distributing condoms. A young girl was handed a condom and she refused to collect it, this lady is someone I know has a boyfriend. She visits her boyfriend, sleeps over at her boyfriends every night and, goes home very early in the morning. She refused to accept it publicly because of what people will say. The reason I say condoms are not generally accepted is because of what people would definitely say. If my mom sees it with me, she will say Jesus Christ! What

is this thing doing with you?!” Judith, General public group interview, Makurdi.

In addition, “cognitive dissonance” affects young people’s readiness for making the right choices by denying them access to correct and complete information about HIV prevention methods (including the only locally viable option – condoms).

“All the preaching in the church is directed towards abstinence, but when we talk about prevention of HIV AIDS it has to follow ‘ABC’. The abstinence, which is the first and foremost, being faithful to one partner and then constant and correct and consistent use of condom. But in the church you discover that just the abstinence is being preached and in a case where that is preached, the other two are left out and not everyone sitting under that congregation, like they said, have the understanding of the word of God. Some persons are still growing in the faith and could easily be thrown off by little temptation [to have sex]. So you discover that there is so much disconnection when you have only knowledge of abstinence. You don’t know the other things that are involved [like B and C]. So by the time a church member, maybe a so-called believer, is falling [going to have sex], he goes flat [i.e. have sex with no protection] because he doesn’t have the means [and knowledge] of preventing or protecting himself/herself from acquiring HIV. So [if] I only know about abstinence, what about the other things? So when I’m faced with the challenge now I will just fall. You commit a sin and contract the virus as well”. John, General group interview, Makurdi.

Given the above scenario, it is clear that ABC is inadequate in addressing HIV burden in this local area.

“ABC is not enough and not effective, yet it is the main campaign slogan for many years running: The only component of ABC, the widely preached prevention messages in awareness programs, which appears promising is the promotion of condoms. However, even condom use is seen as an immoral and unacceptable behavioural approach”. Interview with Tom, Makurdi.

Daniel, an interview participant, reinforced the notion that a lady is not expected to be in possession of a condom. These kinds of expectations fail to take into account, the needs of a young woman to protect herself from HIV and other STDs in addition to unwanted pregnancies.

“This is Africa. Yes. This is Africa. A woman should not be seen with things like that [condoms]”. Daniel, male university group interview.

Similarly, Adakole (a participant in the male Christian group interview) painted a picture in which contrasting messages are communicated to the public from government and religious groups. According to Adakole, abstinence is the chief message from religious groups. However, government campaigns promote condoms. These contrasting messages create tension in the world of young people locally, as they are split between their religious belief and peer pressure. This leaves young people at a point where they are confused and unprepared to make proper sexual health choices.

“Abstinence and being faithful to one partner, particularly a married partner, is a thought primarily projected among the religious faithful - Christian, Muslims... That method [abstinence] is the most widely accepted method for HIV prevention among religious folks. However, efforts from ministry of health and other NGO seems to publicise correct use of condom as a good alternative for those who cannot abstain from sex. So, the two predominant methods are abstinence and condom use but I think among the age bracket that HIV seems to be more prevalent in this place, the use of condom, seems to be more welcoming to them than abstinence”. Adakole, Male Christian group, Otukpo.

Cognitive dissonance was captured in the interview conducted with an older member of society and lead NGO worker who thinks condoms are not appropriate for young people but accepts that young people are already engaging in sex and agreed, reluctantly, that it will only be proper to ensure they are protected. Her views reflects a small positive disposition towards condom use but falls in the minority for those in her age group (older members of society).

“Where we have difficulty is with the youth. I do not think it is proper to allow the youth to start using condom. But, again, if they are already having sex what do you do? Do we continue to preach behavioural change when they are already having sex? And you don’t know when they go in for the sex. But in schools we preach and we talk about behavioural change to be assertive. Face your education. Sex can come later”.

Interview with Enewa, a lead NGO worker, Otukpo.

8.9 Literacy levels

Low literacy levels have been implicated in the epidemiology of HIV in the local area. Differences in literacy levels between rural and urban areas were cited as reason for differences in HIV burden between towns and villages.

Literacy levels is important for local HIV epidemiology because current awareness campaigns, as demonstrated previously, fail to adopt approaches that are accessible and sensitive to the unique needs of urban and rural dwellers. As a result only the educated and more enlightened members of society benefit significantly from on-going HIV awareness activities.

“People in the urban areas in this society are enlightened already: they watch TVs, they read papers, they go to awareness clubs, so they are educated on the virus already, so they know how to abstain in one way or the other, and that helps them. However, those in rural areas don’t even know what to do and they don’t even know who is who - who have the virus or not - so it keeps spreading there and they are more affected there than those in the urban areas and the educated ones, due to literacy issue”. ***Onyeche, interview with Female Christian group, Otukpo***

Low literacy levels, especially in rural areas, remains a significant obstacle to effective HIV awareness campaigns as locals find it difficult to understand communicated messages in their current forms.

“The messages are not being understood because most of them are not educated, so they can hardly understand you if you can’t speak [the local]”

language to them. This is my own understanding and it is based upon my experience locally: I've seen them, I have been with them, and I've tried to talk to them [locals]. I can't [communicate] because I can't speak the [local] language". Interview with Nkechi, junior uniform personnel, Makurdi.

Rabiu (an interview participant) pointed out that society needs to be enlightened in order for HIV campaigns to be effective. A similar view was expressed in the interview with the NACA representative (see quotes below)

You see, the number one thing is to be enlightened. The society must be enlightened, that is one". Rabiu, Muslim male group interview, Otukpo.

"Literacy level may also be an issue". Interview with Chuks, NACA representative.

8.10 Loosely regulated health care systems

A loosely regulated healthcare system that allows for substandard and unlicensed medical practice have been identified as an important variable in HIV epidemiology in Benue State. The mechanism through which this factor impacts on HIV epidemiology is through the use of unsterile operating equipment as well as transfusion of poorly screened blood products. This trend is more prevalent in rural areas where there is hardly any well-staffed government health facility to attend to health needs of locals. These substandard practises, therefore, thrive on the gap that exist in healthcare delivery at grassroots.

"The rate of medical quackery [substandard and unlicensed practices], is very, very high. Untrained people carry out medical operations at home. They transfuse unscreened blood at home. Some of the quacks may have worked as attendants in the hospital for a short time, then go to the village to render [medical] services... so all those things they are major drivers. They use unsterilized instruments..." Interview with Dr. John, Makurdi.

Onyeche, a participant in one of my focus discussions, stressed that the elimination of substandard (quack) practises and substandard chemist shops that engage in unscrupulous activities will help reduce HIV risks in the local area. This is because these outlets use contaminated and non-sterile materials on clients.

“I want the government to eliminate quack [substandard] hospitals, roadside hospitals... [and] chemists that use non sterile instruments to treat more than one person”. Onyeche, interview with Female Christian group, Otukpo.

It appears these substandard practises are commoner in the rural areas.

“In these small villages where there are no hospitals, you will find clinics where there are quacks acting like qualified doctors. They [quacks] carry out operations including [unsafe] abortions and appendectomy and they don’t sterilize their equipment, there is every possibility that HIV could be transmitted”. James, general public interview, Makurdi.

8.11 Healthcare services siting

Another important observation made in the course of the qualitative data analyses is the skew in healthcare facilities siting. According to interview participants, there are communities that do not have health care facilities, “not even a primary healthcare structure”, they allege.

“In some communities you discover that they don’t even have health care or a hospital in that community. They will have to travel to the next village or the next 3 villages before they get or see where to get treatment”. Ochayi, Male Christian group interview, Otukpo.

The quote below highlights how poor services siting could lead to resource wastages. The concentration of HIV services at comprehensive centres (general hospitals) which are mostly located within townships could result in wastages as the services are underutilised. This could explain, in part, the poor client load at comprehensive centres described by Dr Chuks in the quote below. If HIV services are spread out to

cover rural areas (where primary healthcare facilities are supposed to be located) the same resources concentrated in the townships could be better utilised with greater impact and coverage.

“Efforts are ongoing to ensure there is equitable distribution of services. We aim to have 5 general comprehensive centres [general hospitals providing HIV services] in every state of the federation but some [centres] have become inefficient, let me put it that way, because we are spending money to maintain them but their client load or patient load is quite low, so it doesn't justify the money used to maintain the equipment [facility]. We are also looking to extend services to primary health care centres as well... but we still have places where within many kilometres radius people don't have access to HIV care... of course Nigeria is a big country”
Interview with Dr Chuks, NACA representative.

8.12 Violent conflicts

The role conflicts play in HIV epidemiology is poorly understood and not explored in great detail. Suggested mechanisms for how HIV risk is increased during conflicts includes movement of people which brings HIV infected individuals in contact with uninfected individuals, adverse effect of conflicts on local economies, degradation of public health structures, breakdown of protective sociocultural structures and increased high risk behaviours among soldiers and general public (357). In the interviews, it was pointed out that violent conflicts contribute to HIV transmission by creating room for exploitation of internally displaced persons. During these periods, there is also a breakdown of social structures that protect against HIV transmission (for example the family unit) says Daniel, an interview participant.

“There have been crises recently and, in times like this people are displaced, you find that people who were normally resident in their homes in the villages now take refuge in primary school buildings... this creates room for social vices. People in the Agatu area and some parts of Tiv land are currently displaced. These internally displaced individuals are soft targets for HIV positive individuals to exploit”. **Daniel, general public group interview, Makurdi.**

CHAPTER 9: The quantitative methods and results: HIV in Benue part 3 (exploring the relationship between variables)

9.1 An overview

In this chapter, I have presented details of the quantitative methods used in the survey. Quantitative data were collected (between December, 2015 and January, 2016) after qualitative data were collected and analysed. Themes from the qualitative process informed, to a large extent, the content and conduct of the survey. Results of the quantitative exercise have been reported in this chapter.

9.2 Justification for a quantitative arm in this research

The quantitative arm of this research complements the qualitative research. A quantitative component to my research is important for defining patterns and relationships between variables identified in the systematic review and qualitative exercises. A quantitative arm is also useful for quantifying the associations between variables of interest if at all any relationship exists. This unique perspective that a quantitative approach brings to this research is important for priority setting in a system that has finite or limited healthcare resources.

9.3 Ethical considerations

As is the case with the qualitative arm, an ethics approval was sought before quantitative data were collected. The Newcastle University ethics committee was provided a sample of the survey tool. A copy of this questionnaire (Appendix Q) was also sent to Benue State ministry of Health ethics committee for scrutiny and approval.

9.4 The data collection tool – questionnaire

The questionnaire used for data collection is a structured, self-administered, tool that explored important themes about HIV in Benue State. A questionnaire was designed, from scratch, for the survey because of the uniqueness of the themes identified in the literature review and qualitative processes: it was not possible to find a questionnaire with tested psychometric properties that adequately addresses my research question. As a result, an approach utilising an adaption of existing questionnaires was chosen. The HIV knowledge section of my questionnaire stems from the misconceptions about HIV identified in the interviews. Similarly, questions on place and area of residence were based on the knowledge, from the qualitative section, that there could be significant differences in local HIV epidemiology along places and areas of residence.

The knowledge section of the administered questionnaire is an adaptation of the HIV K-18-Q questionnaire (358). The HIV K-18-Q questionnaire has item-total correlation of 0.24 – 0.57; internal consistency (α) of 0.75 – 0.89; test – retest reliability (r) of 0.76 – 0.94; it correlates strongly with older and validated instruments [$r = 0.93$ to 0.97] and is reliable for use with low-literacy populations like my study population (358). Other sections of the questionnaire were based on information gathered from the literature review and qualitative processes and do not have known psychometric properties.

This questionnaire was piloted among Nigerians living in the United Kingdom (Newcastle), friends of other nationalities (a Namibian) and in Nigeria before it was used in the field. Some questions and contents were modified after the pilot. For example, the question on gender was missing in initial drafts of the questionnaire and was only picked up during the pilot phase. The final questionnaire was submitted to Newcastle ethics committee for approval before use. A copy of the survey tool has been included in the appendices (Appendix Q).

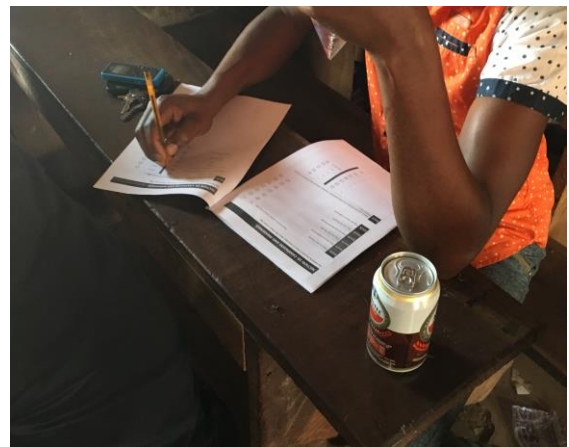
9.5 Quantitative data collection

Questionnaires were administered to individuals at random in different locations across the Otukpo and Makurdi. The questionnaire was translated and back

translated into Idoma and Tiv. However, no copies of the translated versions were completed as participants who were not able to read and write in local languages. Those not literate enough to read and write in local languages and English were interviewed by IO. Participants that were interviewed consists, mostly, of commercial sex workers and rural residents. The fact that most of the interviews were conducted within townships could account for the higher numbers of town/urban respondents.

Most respondents were able to complete the English language version of the questionnaire. Over a thousand questionnaires (about 1100) were distributed. I was able to retrieve only three hundred and ninety one questionnaires (response rate of 35.55%). In the end, only 389 responses were included in the analyses, two were missing pages in the demography section and had to be excluded. Some pictures from the quantitative field work have been included below (Figure 9.1). Incentives such as drinks, light refreshments and travel fare (to and fro locations) were provided to encourage participation.

Figure 9.1: Images of survey participants completing questionnaires (Muslim community)



[PHOTO CREDITS – IO]

9.6 Quantitative data handling and analyses

The first step in data analyses was a discussion with my supervisor (MP) about the analyses plan. An analyses plan was developed by IO and reviewed by the supervisory team led by MP. The questionnaire was then coded (by IO) and responses entered into an Access database designed by IO. Data entry into this

database was done with the assistance of MP's secretary (Katharine Kirton - KK). Following data entry, data were cleaned and missing variables were imputed: either with a conservative estimate of the missing data or with estimates deduced from other related variable(s) supplied by the respondent (359). For example two missing data on when individuals last tested for HIV were imputed with a conservative estimate of less than three months ago. Similarly, twenty six missing responses on the question "campaigns are hard to understand" were replaced with a conservative estimate of "No". Also, missing responses on the knowledge question were imputed with "I don't know" response. This is because responses of "less than three months", "No" and "I don't know" to the questions above were considered outcomes that are less likely to result in a type – II error (failing to reject a null hypothesis that is false) (359). Data were assumed to be missing at random.

Analyses were exploratory in nature, seeking to identify patterns and relationships between variables. Software packages used for my analyses are Stata, version 14.1, and "R" statistical package (360, 361). "R" was used in analyses where a lot of computing memory was required and where it was not possible to compute some statistics like Fisher's exact for tables greater than 2x2 in Stata. In these instances, "R" statistical package, which uses Monte Carlo simulation methods (362), was preferred over Stata. Fisher's exact analyses conducted using "R" were carried out under the following conditions: Fisher.test command; Control = 30; Simulate.p.value = T (true) and B (number of permutations) = 2000.

Descriptive statistics (using frequency tables, histograms and percentages) was used to summarise and describe my survey data, to help reveal any patterns that may be present. Nominal data (such as gender, occupation and places of residence) were summarised using frequency tables (and percentages). Numerical data (for example age, HIV knowledge, stigma and risk scores) were summarised using means (and their corresponding standard deviations), percentiles and histograms. An assumption of normality was made, following the descriptive analyses, because my sample was similar to the demography of Benue State reported by government sources (page 23, Figure 2.6 and Table 9.2).

Inferential analyses included Chi squared test, Fisher's exact test, student t-test, linear regression and binary logistic regression analyses. Chi squared test (and

Fisher's exact for tables that have one or more cells with values less than 5) was used to test for association between variables in contingency tables. The student t-test was used to compare means between variables of interests (346).

In the regression analyses, univariate analyses as well as "stepwise regression" analyses were used to identify variables that are important for inclusion in fitted models: significance was set at P values of less than 0.05 (363). Linear regression analyses were conducted to model and explore relationship(s) between a number of dependent variables (HIV stigma score, HIV knowledge scores and HIV risk scores) and some explanatory variable(s) of relevance. Assumptions made in the linear regression include the presence of a linear relationship between the dependent and explanatory variables; normality; there is little or no autocorrelation and; there is little to no collinearity between variables (359, 364, 365). Properties of fitted models (such as P values and R^2 statistics) were reported for these regression analyses. The adjusted R^2 statistic gives the amount of variance of the dependent variable that is explained by the explanatory variable(s) included in the model. For example, an R^2 value of 0.50 implies that only 50% of the variance in the dependent variable is explained by the explanatory variable(s) in the model. F-test was used to test for the goodness of fit of linear regression models (366). Binary logistic regression analyses were conducted to explore likely predictors of patterns of condom use during last three sex and some explanatory variables of interest (359). Conditions met in the logistic regression include that the dependent variable is binary (consistent or inconsistent condom use) and that the dependent variable is coded such that the factor level 1 of the dependent variable (consistent condom use) represents the desired outcome (359, 367). Other assumptions made in the logistic regression analyses include that the model is fitted correctly; the error terms were independent; there is linearity of explanatory variables and log odds and; a large enough sample size (359, 367). Properties of fitted models (such as P values and pseudo R^2 statistics) were reported for these regression analyses. The pseudo R^2 statistic has an interpretation similar to the adjusted R^2 statistic described above. Likelihood Ratio test (LRT) was used to test for the goodness of fit of the logistic regression model (363, 368).

In the statistical analyses, significance was set at P value of less than 0.05. Exact P value statistics, along with estimated 95% confidence interval for effects estimates, were reported for analyses, where applicable. All reported P values are two tailed.

Where necessary, sensitivity analyses were carried out to test the robustness of assumptions made in the analyses, by removing data and redoing analysis in a stepwise manner (363). For example, there were instances where I conducted analyses for male and female respondents separately, in order to explore gender differences. Other instances where sensitivity analyses were conducted includes analyses along different classifications of educational and marital status and in model variables selection.

9.7 Descriptive statistics

There were a total of 389 respondents in the survey. The age categories of respondents is shown in Table 9.1 below. The most frequent age group in the survey was the 23 – 27 age category.

Table 9.1: Age category of respondents

Age Category (years)	Frequency	Percent (%)
18-22	89	22.88
23-27	94	24.16
28-33	89	22.88
34-37	43	11.05
38-42	32	8.23
43-47	23	5.91
48-52	5	1.29
Above 52	14	3.60
Total	389	100

One thousand one hundred questionnaires were distributed, out of which only 391 questionnaires were returned: a response rate of 35.55%. My sample is very much similar to the demography of Nigeria and Benue State (Figure 2.3 and Figure 2.6).

One hundred and ninety-nine of the respondents identified as males and 49% identified as females (Table 9.2).

Table 9.2: Gender of respondents

Gender	Frequency	Percent (%)
Male	199	51.16
Female	190	48.84
Total	389	100

About 82% of the population were Christians. Ninety-nine percent of respondents identify with at least one religious group (Table 9.3).

Table 9.3: Religion of survey respondents

Religious group	Frequency	Percentage (%)
Christianity	317	81.49
Islam	53	13.62
Traditional	16	4.11
None	2	0.51
Other	1	0.26
Total	389	100

Most of the respondents reside in regions that are described as townships or cities (Table 9.4). This distribution is similar for both Tiv and Idoma speaking areas

Table 9.4: Distribution of survey respondents by place of residence

Area of residence	Place of residence	
	Village/Rural (%)	Town/City (%)
Idoma speaking area	36 (18.40)	159 (81.50)
Tiv speaking area	38 (19.59)	156 (80.41)
Total	74 (19.02)	315 (80.98)

About 67% of the survey participants are straight in sexual orientation. Slightly over 15% percent were not willing to disclose their sexual orientation (Table 9.5).

Table 9.5: Sexual orientation of survey participants

Gender	Frequency	Percent
Straight	297	76.35
Bisexual	23	5.91
Same sex	10	2.57
Not willing to say	59	15.17
Total	389	100

The survey sample was largely composed of students and civil servants. The most frequent occupation is the student group. In the “Other” classification, which makes up approximately four percent of the population, there were 5 female sex workers and 10 “applicants” (or graduate level individuals) that were unemployed at the time of the survey. The second largest occupational group is the professional group made up of teachers, doctors, nurses and engineers. Plant operators were the least frequent with only 3 respondents who stated they work as plant or factory operators (Table 9.6). The occupational classification style adopted in my survey is the UK standard occupation classification (369).

Table 9.6: Occupational of survey respondents

Occupation	Frequency	Percent
Student	134	34.45
Professional	108	27.76
Sales	38	9.77
Farming	36	9.25
Managers	16	4.11
Other	15	3.86
Technicians	11	2.83
Elementary	10	2.57
Clerical	9	2.31
Crafts	9	2.31
Plant operators	3	0.77
Total	389	100

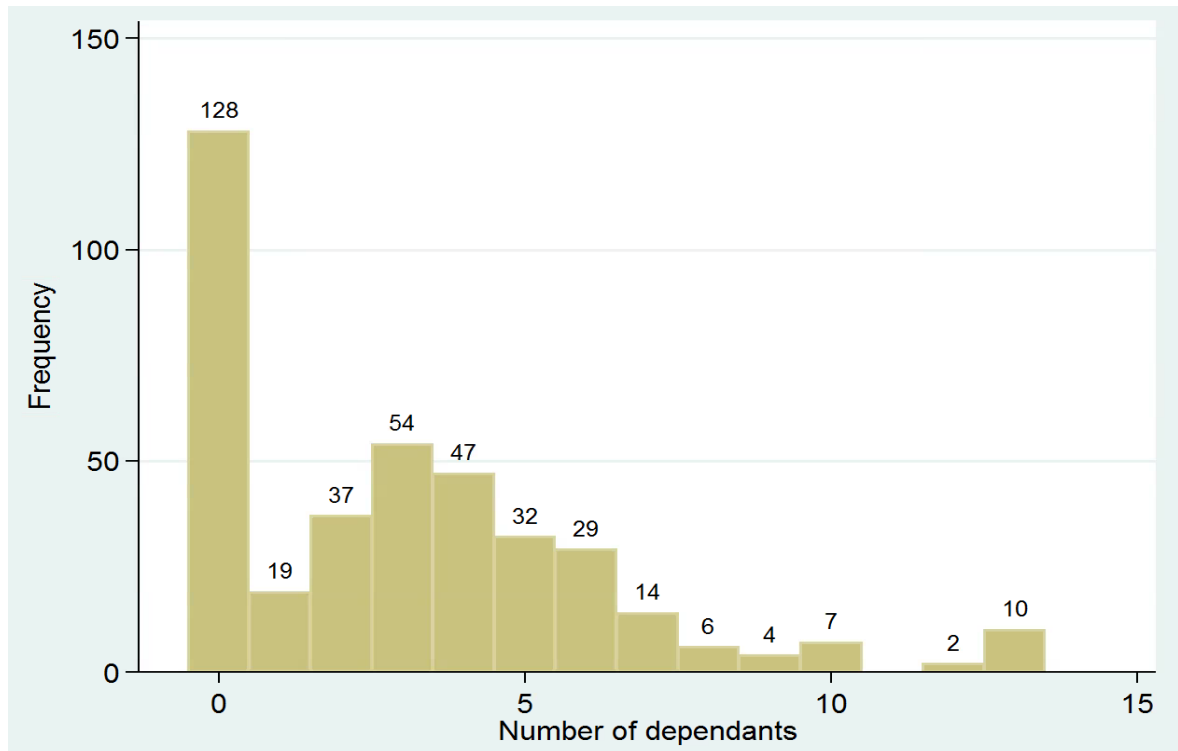
Sixty-eight percent of the survey respondents had at least tertiary education with only one participant indicating he had no formal education (Table 9.7).

Table 9.7: Breakdown of levels of educational of survey respondents.

Level of education	Frequency	Percent
None	1	0.26
Primary	16	4.11
Secondary	106	27.25
Tertiary and above	266	68.38
Total	389	100

A hundred and twenty-eight of the respondents had no dependants. Mean number of dependants was 3 (SD 3.0), with numbers of dependants ranging for 0 – 13 (Figure 9.2).

Figure 9.2: Histogram showing number of dependants of survey participants in frequencies



The marital status of the survey sample is given in Table 9.8. Most of the respondents were single and not in a relationship.

Table 9.8: Marital status of survey respondents

Marital status	Frequency	Percent
In a relationship (not married)	89	22.88
Married (1 spouse)	128	32.90
Married (more than 1 spouse)	12	3.08
Single	152	39.07
Separated	2	0.51
Widowed	5	1.29
Divorced	1	0.26
Total	389	100

Participants, on average, resided in a three-room accommodation facility (range of 1 – 6 rooms) along with other occupants (Mean of 4, SD 3 and range of 0 - 13) [Figure 9.3 and Figure 9.4].

Figure 9.3: Histogram showing reported number of rooms in the house participants reside

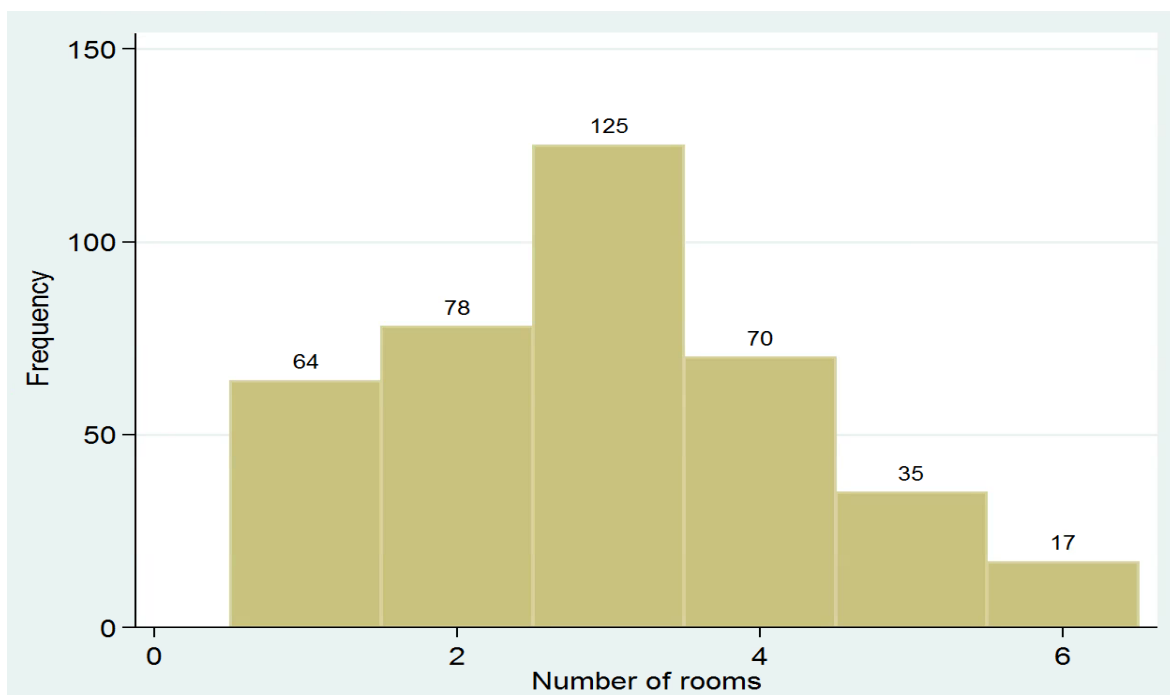
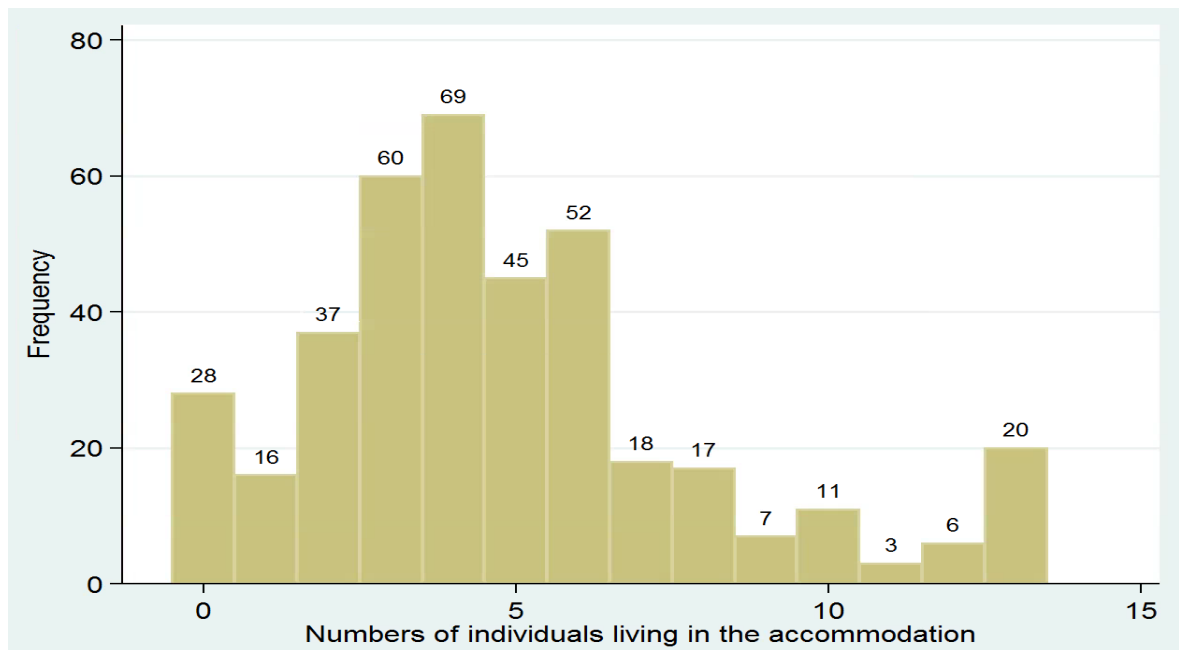
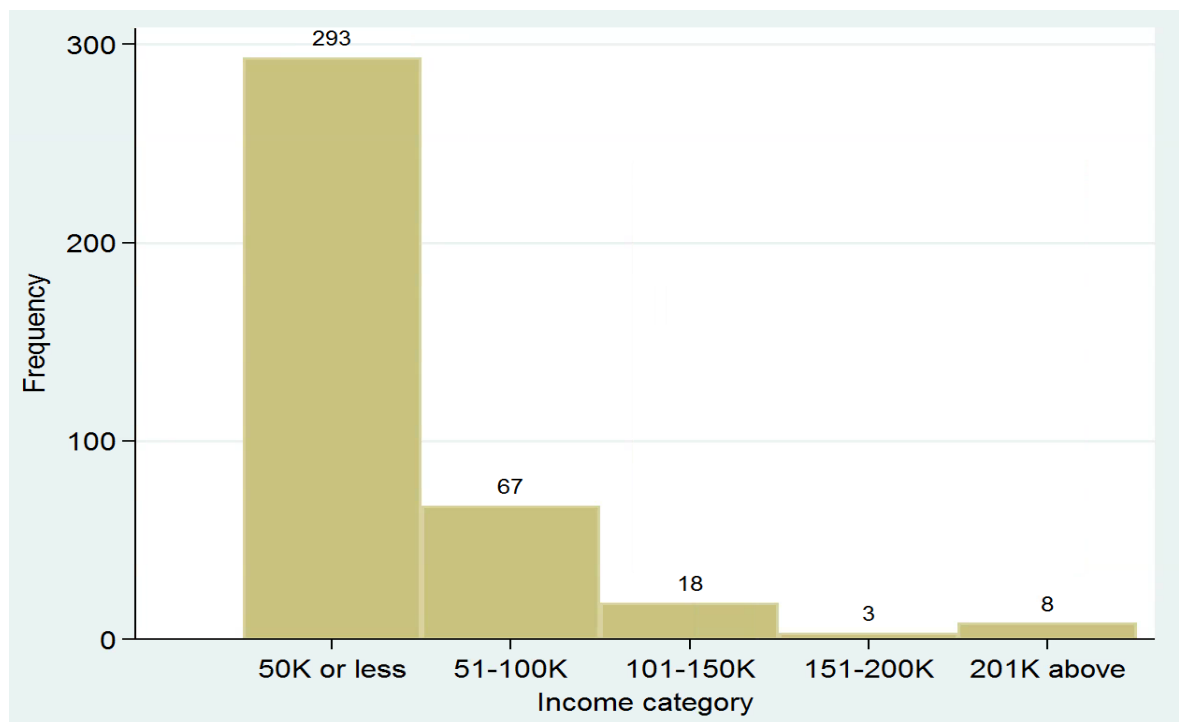


Figure 9.4: Histogram showing numbers of individuals residing in the same accommodation as survey respondents.



Two hundred and ninety-three survey respondents indicated that their total monthly income, from all sources, is about 50,000 Naira or less. Only 8 earned 200,001 Naira or above.

Figure 9.5: Histogram of reported income [in thousands of Naira]



About 3% of the survey population reported they were HIV positive (Table 9.9).

Table 9.9: Self-reported HIV status of survey respondents

Self-reported HIV status	Frequency	Percentage
Not willing to say	18	4.63
Positive	12	3.08
Negative	310	79.69
I think am Negative	49	12.60
Total	389	100

9.8 Socioeconomic status of respondents

One question of interest in my analyses is the socioeconomic status of locals. To explore this, data on place of residence, educational status and choice of energy source were collected and analysed. Choice of cooking energy was used in assessing socioeconomic status because more well off members of the local society would tend to use cleaner forms of cooking energy. In exploring respondents socioeconomic status, I tested the null hypothesis that there is no difference in choice of cooking energy based on respondents' place of residence and levels of education against an alternate hypothesis which states that there exists a difference along these variables.

In the analysis of place of residence and source of cooking energy, it was found that firewood is the more common source of cooking energy among people residing in areas designated as rural/villages against kerosene for people residing in cities or towns. This association is statistically significant (Table 9.10).

Table 9.10: Cooking energy choices of respondents by place of residence

Source of cooking energy	Place of residence most of the time	
	Village/Rural (%)	Town/City (%)
Firewood	49 (66.22)	69 (21.90)
Kerosene	13 (17.57)	133 (42.22)
Gas and Electricity	3 (4.05)	92 (42.22)
Gas and Kerosene	0 (0.00)	13 (4.13)
Gas, Kerosene and Electricity	0 (0.00)	2 (0.63)
Firewood and Kerosene	9 (12.16)	5 (1.59)
Gas and Firewood	0 (0.00)	1 (0.32)
Total	74 (100)	315 (100)

Fisher's EXACT < 0.001

Similarly, analysis to explore association between education and energy source revealed that firewood was the most common cooking energy source among individuals with less than tertiary education, as opposed to kerosene among those who had up to and above tertiary education. This association is statistically significant (Table 9.11).

Table 9.11: Cooking energy sources of respondents by levels of education

Source of cooking energy	Level of education		
	None or Primary (%)	Secondary (%)	Tertiary (%)
Firewood	15 (88.24)	52 (49.06)	51(19.17)
Kerosene	0 (0.00)	40 (37.74)	106 (39.85)
Gas and Electricity	1 (5.88)	5 (4.72)	89 (33.46)
Gas and Kerosene	0 (0.00)	2 (1.89)	11 (4.14)
Gas, Kerosene and Electricity	0 (0.00)	0 (0.00)	2 (0.75)
Firewood and Kerosene	1 (5.88)	7 (6.6)	6 (2.26)
Gas and Firewood	0 (0.00)	0 (0.00)	1 (0.38)
Total	17 (100)	106 (100)	266 (100)

Fisher's EXACT < 0.001

The association between income and place of residence was explored to assess if income varied between respondents along places of residence. It was found that reported income did not differ significantly between rural residents in Tiv and Idoma speaking areas (Table 9.12)

Table 9.12: Self-reported income of rural residents in Tiv and Idoma speaking areas

Reported income [in thousands of Naira]	Area of residence most of the time	
	Idoma (%)	Tiv (%)
Less than 50K	31 (86.11)	34 (89.47)
50K - 100K	4 (11.11)	2 (5.26)
101K - 150K	1 (2.78)	1 (2.63)
201K and above	0 (0.00)	1 (2.63)
Total	36 (100)	38 (100)

FISHER'S EXACT = 0.708

However, there was significant association between self-reported income and areas of residence, with respondents residing in Tiv speaking areas reporting higher income compared to those in Idoma speaking areas (Table 9.13).

Table 9.13: Self-reported income of city or town residents in Tiv and Idoma speaking areas

Reported income [in thousands of Naira]	Area of residence most of the time	
	Idoma (%)	Tiv (%)
Less than 50K	127 (79.87)	101 (64.74)
50K - 100K	24 (15.09)	37 (23.72)
101K - 150K	8 (5.03)	8 (5.13)
201K and above	0 (0.00)	7 (4.49)
Total	159 (100)	156 (100)

FISHER'S EXACT = 0.002

There was no significant association between place of residence and self-reported income among residents in Idoma speaking areas (Table 9.14).

Table 9.14: Self-reported income of rural and town residents in Idoma speaking areas

Reported income [in thousands of Naira]	Resident in Idoma speaking area most times	
	Rural (%)	Town (%)
Less than 50K	31 (86.11)	127 (79.87)
50K - 100K	4 (11.11)	24 (15.09)
101K - 150K	1 (2.78)	8 (5.03)
Total	36 (100)	159 (100)

FISHER'S EXACT = 0.809

However, there is a statistically significant association in self-reported income between rural and township residents in Tiv speaking areas, with residents of townships reporting higher income compared to rural residents (Table 9.15).

Table 9.15: Self-reported income of rural and town residents in Tiv speaking areas

Reported income [in thousands of Naira]	Resident in Tiv speaking area most times	
	Rural (%)	Town (%)
Less than 50K	34 (89.47)	101 (64.74)
50K - 100K	2 (5.26)	37 (23.72)
101K - 150K	1 (2.63)	8 (5.13)
151K - 200K	0 (0.00)	3 (1.92)
201K and above	1 (2.63)	7 (4.49)
Total	38 (100)	156 (100)

FISHER'S EXACT = 0.041

Being resident in any of the Idoma speaking areas is significantly associated with lower self-reported income when compared with income reported by those resident in Tiv speaking areas (Table 9.16)

Table 9.16: Exploring differences in mean income between respondents in Idoma and Tiv speaking areas

Group	Observations	Mean	Std. Dev.	95% Conf. interval	
Idoma	195	30.89	13.09	29.05	32.75
Tiv	194	37.63	24.18	34.21	41.05
Combined	389	34.26	19.69	32.29	36.22
Difference		-6.73		-10.60	-2.86

P VALUE = < 0.001

Similarly, being resident in a rural area is associated with lower reported income when compared to income reported by respondents resident in towns (Table 9.17).

Table 9.17: Exploring differences in mean income between rural and urban respondents

Group	Observations	Mean	Std. Dev.	95% Conf. interval	
Village/Rural	74	29.73	15.30	26.18	33.28
Town/City	315	35.32	20.46	33.05	37.58
Combined	389	34.26	19.69	32.29	36.22
Difference		-5.59		-10.56	-0.61

P VALUE = 0.028

There is no statistically significant difference in reported income between males and females (Table 9.18).

Table 9.18: Exploring differences in mean income between male and female survey respondents

Group	Observations	Mean	Std. Dev.	95% Conf. interval	
Male	199	34.93	19.59	32.19	37.66
Female	190	33.55	19.82	30.72	36.39
Combined	389	34.26	19.69	32.29	36.22
Difference		1.37		-2.56	5.30

P VALUE = 0.493

9.9 Local HIV stigma

A scale, “HIV stigma score”, was calculated from responses to questions asked under the “policy, stigma and discrimination” section of the questionnaire. This variable (stigma score) reflects the chances of a respondent to stigmatise. HIV stigma score ranges from “unlikely to stigmatise” (a score of zero) through highly likely to stigmatise (a score of seven) on the scale. Less than one percent of respondents scored zero on this scale. HIV stigma scores ranged from zero to seven. The most frequent score on this scale is four [Table 9.19].

Table 9.19: Summary of calculated HIV stigma score for survey respondents

HIV stigma score	Frequency	Percent
0	3	0.77
1	41	10.54
2	65	16.71
3	99	25.45
4	111	28.53
5	35	9.00
6	31	7.97
7	4	1.03
Total	389	100

Calculated HIV stigma score is significantly higher among rural/village respondents compared urban/city residents (Figure 9.6 and Table 9.20).

Figure 9.6: Boxplot showing HIV stigma score by places and areas of residence

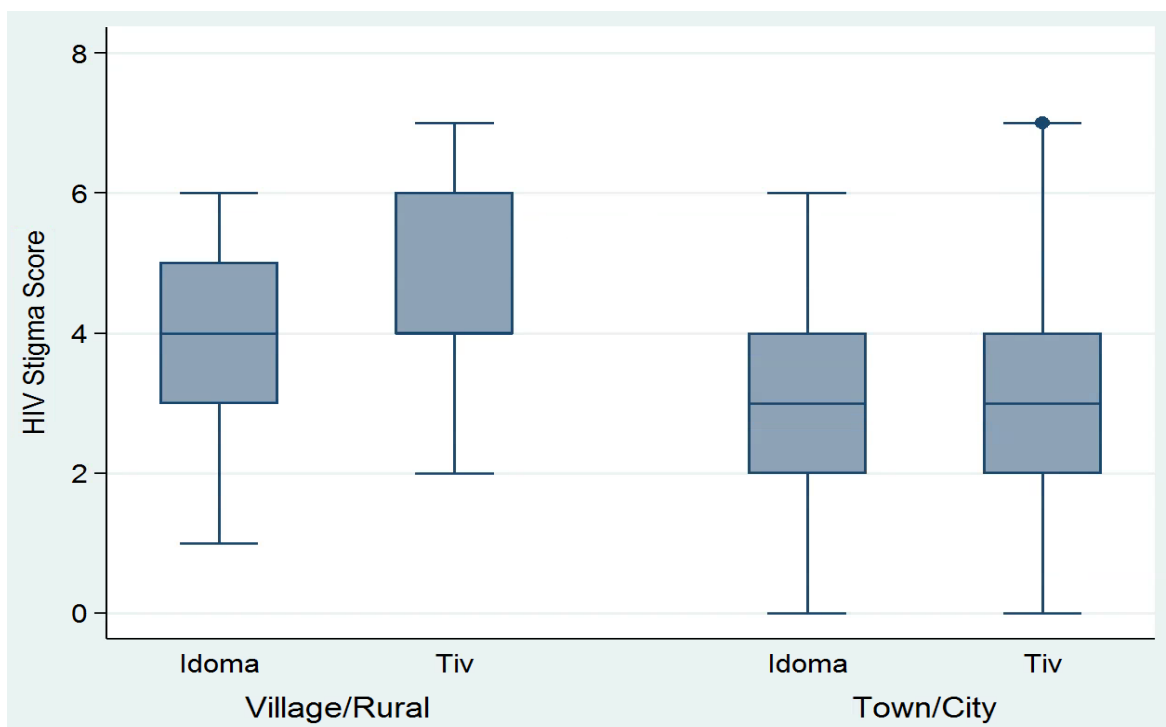


Table 9.20: Exploring differences in HIV stigma score based on respondents' place of residence

Group	Observations	Mean	Std. Dev.	95% Conf. interval	
Village/Rural	74	4.24	1.39	3.92	4.57
Town/City	315	3.13	1.37	2.98	3.29
Combined	389	3.35	1.44	3.20	3.49
Difference		1.11		0.76	1.46

P VALUE = 0.001

There is no statistically significant difference in mean HIV stigma score between respondents resident in Idoma speaking areas and those resident in Tiv speaking areas (Table 9.21).

Table 9.21: Exploring differences in HIV stigma score between respondents resident in Idoma and Tiv speaking areas

Group	Observations	Mean	Std. Dev.	95% Conf. interval	
Idoma	195	3.40	1.39	3.20	3.59
Tiv	194	3.29	1.48	3.08	3.49
Combined	389	3.35	1.44	3.20	3.49
Difference		0.11		-0.18	0.39

P VALUE = 0.446

Univariate analyses involving variables that could impact, positively or negatively, on HIV stigma in Benue State (for example educational status, attitude towards HIV testing as defined by reporting past HIV test, self-reported HIV risk, age, gender, self-reported HIV status and HIV knowledge) were carried out to assess if any of these variables is/are significantly associated with HIV stigma score. A summary of the univariate analyses have been reported in Table 9.22, Table 9.23 and Table 9.24 respectively. Variables that were significantly associated with HIV stigma score (Table 9.22 and Table 9.23) were fed into a linear regression model. Age and gender were dropped from this model as they were not significantly associated with HIV stigma score (Table 9.24).

Table 9.22: Univariate analyses of HIV stigma scores and levels of education of survey respondents

Levels of education	HIV stigma score			
	0 - 1 (%)	2 - 3 (%)	4 - 5 (%)	6 - 7 (%)
Education				
Primary or less	0 (0.00)	4 (2.44)	8 (5.48)	5 (14.29)
Secondary	8 (18.18)	36 (21.95)	44 (30.14)	18 (51.43)
Tertiary	36 (81.82)	124 (75.61)	94 (64.38)	12 (34.29)
Total	44 (100)	164 (100)	146 (100)	35 (100)

FISHER'S EXACT < 0.001.

Table 9.23: A summary of univariate analyses of HIV stigma scores and some explanatory variables (last HIV test date, self-reported HIV risk and HIV knowledge score).

Variables	HIV stigma score			
	0 - 1 (%)	2 - 3 (%)	4 - 5 (%)	6 - 7 (%)
Last HIV test date*				
Less than 4 months	18 (40.91)	48 (29.27)	32 (21.92)	0 (0.00)
4 - 6 months	8 (18.18)	26 (15.85)	14 (9.59)	1 (2.86)
7 - 9 months	9 (20.45)	21 (12.80)	11 (7.53)	3 (8.57)
Above 9 months	8 (18.18)	46 (28.05)	65 (44.52)	21 (60.00)
Never	1 (2.27)	23 (14.02)	24 (16.44)	10 (28.57)
Total	44 (100)	164 (100)	146 (100)	35 (100)
Self-reported HIV risk**				
No risk	9 (20.45)	57 (34.76)	29 (19.86)	7 (20.00)
Small risk	16 (36.36)	47 (28.66)	57 (39.04)	16 (45.71)
High risk	12 (27.27)	34 (20.73)	23 (15.75)	1 (2.86)
I don't know	7 (15.91)	26 (15.85)	37 (25.34)	11 (31.43)
Total	44 (100)	164 (100)	146 (100)	35 (100)
HIV Knowledge score*				
2 - 6	0 (0.00)	3 (1.83)	17 (11.64)	10 (28.57)
7 - 11	4 (9.09)	26 (15.85)	28 (19.18)	12 (34.29)
12 - 16	20 (45.45)	74 (45.12)	53 (36.30)	8 (22.86)
17 - 21	20 (45.45)	61 (37.20)	48 (32.88)	5 (14.29)
Total	44 (100)	164 (100)	146 (100)	35 (100)

* FISHER'S EXACT < 0.001 ** FISHER'S EXACT (USING "R" STATISTICAL PACKAGE) = 0.004

Table 9.24: Univariate analyses of HIV stigma scores and some explanatory variables (gender and age categories).

Variables	HIV stigma score			
	0 - 1 (%)	2 - 3 (%)	4 - 5 (%)	6 - 7 (%)
Gender*				
Male	25 (56.82)	95 (57.93)	63 (43.15)	16 (45.71)
Female	19 (43.18)	69 (42.07)	83 (56.85)	19 (54.29)
Total	44 (100)	164 (100)	146 (100)	35 (100)
Age category**				
18-22	4 (9.09)	36 (21.95)	41 (28.08)	8 (22.86)
23-27	15 (34.09)	44 (26.83)	30 (20.55)	5 (14.29)
28-33	12 (27.27)	45 (27.44)	28 (19.18)	4 (11.43)
34-37	6 (13.64)	13 (7.93)	17 (11.64)	7 (20.00)
38-42	3 (6.82)	14 (8.54)	11 (7.53)	4 (11.43)
43-47	4 (9.09)	7 (4.27)	8 (5.48)	4 (11.43)
48-52	0 (0.00)	1 (0.61)	3 (2.05)	1 (2.86)
Above 52	0 (0.00)	4 (2.44)	8 (5.48)	2 (5.71)
Total	44 (100)	164 (100)	146 (100)	35 (100)

* CHI2 = 7.73 P = 0.052 ** FISHER'S EXACT (USING "R" STATISTICAL PACKAGE) = 0.057

In the fitted linear regression model, a statistically significant association was found between educational status and HIV knowledge score. Respondents reporting up to tertiary education had lower HIV stigma scores compared to respondents in the reference category (i.e. those with up to or less than primary education) [Table 9.25]. Similarly, a significant association was found between self-reported last HIV test dates and HIV stigma score, with respondents who reported an HIV test of "more than 9 months ago" and "no HIV test in the past" having higher HIV stigma score when compared to their reference group (Table 9.25). Also, a significant positive association was found between HIV stigma score and self-reported HIV risk, with those who self-report "small" and "unknown" HIV risk being more likely to have higher

computed HIV stigma score when compared with respondents in their reference category (Table 9.25). Finally, a statistically significant inverse (or negative) association was found between HIV knowledge and HIV stigma score (Table 9.25).

Table 9.25: Result of linear regression model exploring relationship between HIV stigma score and some explanatory variables.

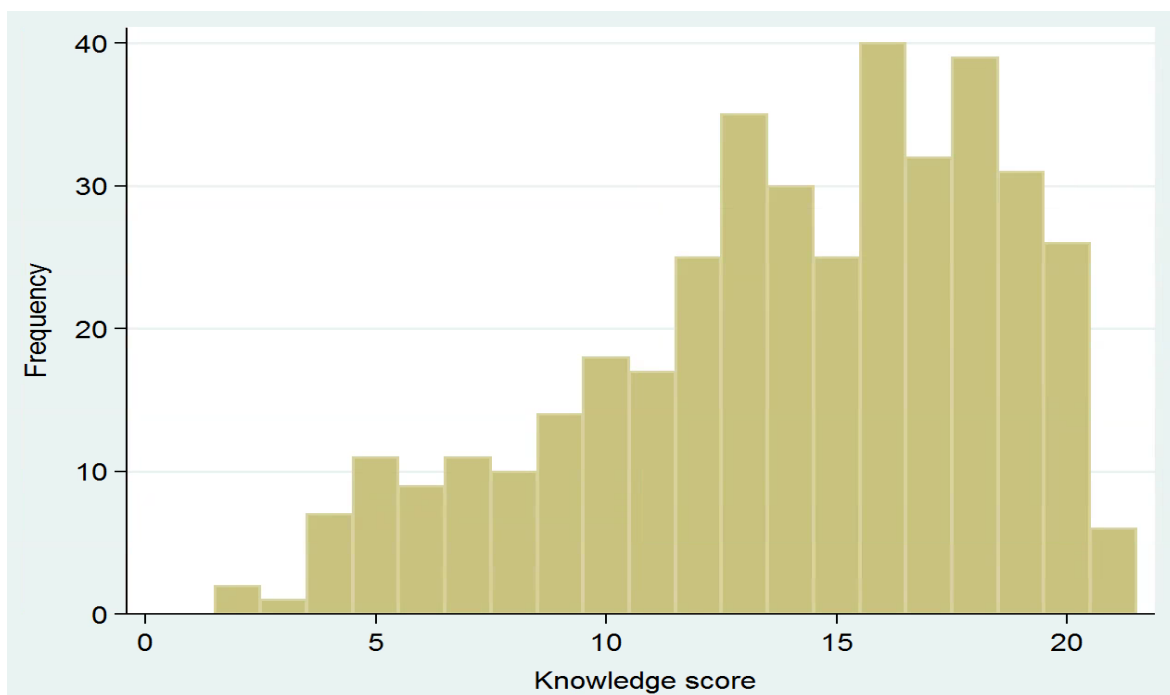
Explanatory variables	Coefficient	95% Conf. interval		P	F-test P value
Educational status					0.022
Primary education or less	1	(Reference category)			
Secondary education	-0.51	-1.21	0.18	0.144	
Tertiary and above	-0.88	-1.60	-0.16	0.017	
Last HIV test					< 0.001
Less than 4 months ago	1	(Reference category)			
4 - 6 months	0.001	-0.45	0.45	0.996	
7 - 9 months	0.06	-0.41	0.52	0.818	
Above 9 months	0.75	0.41	1.09	<0.001	
Never	0.61	0.16	1.07	0.008	
Self-reported HIV risk					0.005
No risk	1	(Reference category)			
Small	0.48	0.14	0.82	0.006	
High	-0.05	-0.45	0.35	0.803	
I don't know	0.42	0.04	0.81	0.031	
HIV Knowledge					0.006
Knowledge score	-0.06	-0.09	-0.02	0.006	

The fitted linear regression model in the analysis (presented in Table 9.25) above is statistically significant [at $p < 0.001$] and explains about 19% of the variance in HIV stigma scores [adjusted $R^2 = 0.19$].

9.10 Knowledge of HIV among respondents

Knowledge of HIV among respondents was assessed in this study through a set of knowledge questions contained in section 2 of the questionnaire. Based on responses to these questions, a knowledge score variable was calculated. This variable, knowledge score, is an aggregate of correct responses to the 21 questions in the knowledge section of the administered questionnaire. The mean knowledge score was 14.05 (SD = 4.40) [Figure 9.7].

Figure 9.7: Histogram showing frequency of knowledge scores.



Univariate analyses to explore factors that could potentially influence HIV knowledge score (for example level of education, gender, place and areas of residence, age, condom use at first sex and condom use in last three sex) were conducted. In these univariate analyses, all variables explored were significantly associated with HIV knowledge score (Table 9.26 and Table 9.27).

Table 9.26: Results of univariate analyses of HIV knowledge score and some variables of interest (levels of education, place and areas of residence and gender)

Variables	HIV knowledge score			
	2 - 6 (%)	7 - 11 (%)	12 - 16 (%)	17 - 21 (%)
Education*				
Primary or less	8 (26.67)	8 (11.43)	0 (0.00)	1 (0.75)
Secondary	20 (66.67)	39 (55.71)	31 (20.00)	16 (11.94)
Tertiary	2 (6.67)	23 (32.86)	124 (80.00)	117 (87.31)
Total	30 (100)	70 (100)	155 (100)	134 (100)
Place of residence**				
Village/rural	20 (66.67)	26 (35.71)	20 (12.90)	9 (6.72)
Town/city	10 (33.33)	45 (64.29)	135 (87.10)	125 (93.28)
Total	30 (100)	70 (100)	155 (100)	134 (100)
Area of residence***				
Idoma	16 (53.33)	45 (64.29)	86 (55.48)	48 (35.82)
Tiv	14 (46.67)	25 (35.71)	69 (44.52)	86 (64.18)
Total	30 (100)	70 (100)	155 (100)	134 (100)
Gender ^π				
Male	8 (26.67)	36 (51.43)	75 (48.39)	80 (59.70)
Female	22 (73.33)	34 (48.57)	80 (51.61)	54 (40.30)
Total	30 (100)	70 (100)	155 (100)	134 (100)

***FISHER'S EXACT <0.001 || **PEARSON CHI2 (3) = 73.81 P< 0.001 || *** PEARSON CHI2 (3) = 18.49 P < 0.001 || π PEARSON CHI2 (3) = 11.59 P = 0.009.**

Table 9.27: Results of univariate analyses of HIV knowledge score and age categories (in years), condom use last three sex and condom use at first sex

Variables	HIV knowledge score			
	2 - 6 (%)	7 - 11 (%)	12 - 16 (%)	17 - 21 (%)
Age category *				
18-22	14 (46.67)	23 (32.86)	32 (20.65)	20 (14.93)
23-27	4 (13.33)	15 (21.43)	47 (30.32)	28 (20.90)
28-33	1 (3.33)	11 (15.71)	39 (25.16)	38 (28.36)
34-37	3 (10.00)	8 (11.43)	14 (9.03)	18 (13.42))
38-42	4 (13.33)	3 (4.29)	10 (6.45)	15 (11.19)
43-47	1 (3.33)	7 (10.00)	6 (3.87)	9 (6.72)
48-52	1 (3.33)	2 (2.86)	1 (0.65)	1 (0.75)
Above 52	2 (6.67)	1 (1.43)	6 (3.87)	5 (3.73)
Total	30 (100)	70 (100)	155 (100)	134 (100)
Condom use last three sex**				
Irregular condom use	27 (90.00)	42 (60.00)	80 (51.61)	71 (52.99)
Consistently	1 (3.33)	5 (7.14)	33 (21.29)	41 (30.60)
Not applicable (N/A)	2 (6.67)	23 (32.86)	42 (27.10)	22 (16.42)
Total	30 (100)	70 (100)	155 (100)	134 (100)
Condom use first sex**				
Yes	1 (3.33)	10 (14.29)	43 (27.74)	38 (28.36)
No	25 (83.33)	38 (54.29)	71 (45.81)	79 (58.96)
Declined or N/A	4 (13.33)	22 (31.43)	41 (26.45)	17 (12.69)
Total	30 (100)	70 (100)	155 (100)	134 (100)

* FISHER'S EXACT (USING "R" STATISTICAL PACKAGE) = 0.002 || ** FISHER'S EXACT < 0.001

Variables explored in Table 9.26 and Table 9.27 were entered into a linear regression model (results reported in Table 9.28 and Table 9.29) to assess the patterns of relationship between these variables and HIV knowledge score. The fitted linear regression model is significant [$p < 0.001$] and explains about 44% of observed variance in HIV knowledge scores [adjusted $R^2 = 0.44$].

A significant positive association was found between consistent condom use in last three sex and HIV knowledge score (Table 9.28). Condom use at first sex was not significantly associated with HIV knowledge scores (Table 9.28).

Table 9.28: Linear regression model exploring relationship between HIV knowledge scores and some explanatory variables (condom use at first sex and during last three sex) – part 1

Explanatory variables	Coefficient	95% Conf. interval		P	F-test P value
Condom use at first sex					0.096
Declined response or Not applicable (N/A)	1	(Reference category)			
Yes	1.37	0.07	2.67	0.039	
No	0.68	-0.53	1.88	0.270	
Condom use last three sex					0.002
No or sometimes	1	(Reference category)			
Not applicable (N/A)	0.78	0.37	1.94	0.183	
Consistent condom use	1.66	0.72	2.61	0.001	

There was a positive association between HIV knowledge score and level of education (higher levels of education, secondary and above, were associated with higher HIV knowledge scores when compared with the reference group) [Table 9.29]. Gender was not significantly associated with HIV knowledge scores. There was a positive association between HIV knowledge scores and areas of residence: residing in Tiv areas is associated with higher HIV knowledge scores compared to the reference group (residing in Idoma areas) [Table 9.29]. Similarly, residing in town/city was positively associated with HIV knowledge score. Overall, age was not significantly associated with HIV knowledge scores. However, there was some sub-group effect with age: age categories “28 -33” and “38-42” were positively associated

with HIV knowledge when compared with the reference group (respondents aged 18 – 22 years) [Table 9.29].

Table 9.29: Linear regression model exploring relationship between HIV knowledge scores and some explanatory variables (education, gender, area and place of residence and age categories) – part 2.

Explanatory variables	Coefficient	95% Conf. interval		P	F-test P value
Educational status					< 0.001
Primary education or less	1	(Reference category)			
Secondary education	2.93	1.11	4.75	0.002	
Tertiary and above	6.29	4.43	8.16	< 0.001	
Gender					0.101
Male	1	(Reference category)			
Female	-0.57	-1.25	0.11	0.101	
Area of residence					< 0.001
Idoma speaking area	1	(Reference category)			
Tiv speaking area	1.32	0.64	2.00	< 0.001	
Place of residence					< 0.001
Village/rural	1	(Reference category)			
Urban/City	2.46	1.42	3.49	< 0.001	
Age categories					0.292
18-22	1	(Reference category)			
23-27	0.55	-0.46	1.55	0.286	
28-33	1.30	0.24	2.36	0.016	
34-37	1.19	-0.10	2.49	0.071	
38-42	1.56	0.12	3.00	0.034	
43-47	1.30	-0.29	2.89	0.108	
48-52	0.49	-2.59	3.57	0.757	
Above 52	1.19	-0.83	3.20	0.249	

9.11 Patterns of condom use

Questions in section three of the questionnaire were analysed to explore local patterns in condom use. Fifty-four percent of respondents said they did not use condoms at first sex (Table 9.30).

Table 9.30: Rates of condom use at first sex

Condom use at first sex?	Frequency	Percent
No	213	54.76
Yes	92	23.65
Declined to respond or Not applicable	84	21.59
Total	389	100

A statistically significant association was found between condom use at first sex and levels of education, among female respondents: rates of condom use at first sex is higher among females who have higher education (Table 9.31). This observation was absent among male respondents (Table 9.32).

Table 9.31: Analysis of how condom use at first sex varies with levels of education among female respondents

Condom use at first sex?	Level of education		
	None or Primary (%)	Secondary (%)	Tertiary (%)
Declined to respond or Not applicable	0 (0.00)	12 (20.69)	37 (31.09)
Yes	1 (7.69)	15 (25.86)	23 (19.33)
No	12 (92.31)	31 (53.45)	59 (49.58)
Total	13 (100)	58 (100)	119 (100)

* FISHER'S EXACT = 0.023

Table 9.32: Analysis of how condom use at first sex varies with levels of education among male respondents

Condom use at first sex?	Level of education		
	None or Primary (%)	Secondary (%)	Tertiary (%)
Declined to respond or Not applicable	1 (25.00)	11 (22.92)	23 (15.65)
Yes	0 (0.00)	12 (25.00)	41 (27.89)
No	3 (75.00)	25 (52.08)	83 (56.49)
Total	4 (100)	58 (100)	147 (100)

* FISHER'S EXACT = 0.572

Reported rates of condom use at first sex was lower in Tiv speaking areas compared to Idoma speaking areas and lower in rural areas compared to urban areas: both trends being statistically significant (Table 9.33 and Table 9.34).

Table 9.33: Rates of condom use at first sex by place of residence (Tiv and Idoma).

Condom use at first sex?	Idoma (%)	Tiv (%)
No	90 (46.15)	123 (63.4)
Yes	52 (26.67)	40 (20.62)
Declined to respond or Not applicable	53 (27.18)	31 (15.98)
Total	195 (100)	194 (100)

PEARSON CHI2 (2) = 12.44 P = 0.002

Table 9.34: Rates of condom use at first sex by area of residence (Village or Town).

Condom use at first sex?	Village or rural (%)	Town or city (%)
No	55 (74.32)	158 (50.16)
Yes	10 (13.51)	82 (26.03)
Declined to respond or Not applicable	9 (12.16)	75 (23.81)
Total	74 (100)	315 (100)

PEARSON CHI2 (2) = 14.13 P = 0.001

Furthermore, condom use in last three sexual experiences was explored among respondents. Two hundred and twenty respondents, in total, indicated they used condoms irregularly (i.e. sometimes or not at all) in their last three sexual experiences [Table 9.35].

Table 9.35: Frequency table showing consistency of condom use (last three sex)

Condom use last three sex?	Frequency	Percentage
All the times or Not applicable	169	43.45
Sometimes	109	28.02
No	111	28.53
Total	389	100

Rates of consistent condom use during last three sexual experiences was significantly lower in villages and rural areas compared to townships. Conversely, rates of irregular condom use in last three sex was significantly lower among urban dwellers compared to rural/village respondents (Table 9.36).

Table 9.36: Rates of condom use during last three sexual experiences stratified by places of residence

Condom use last three sex	Place you reside most of the time	
	Village/Rural (%)	Town/City (%)
All three times or Not applicable	15 (20.27)	154 (48.89)
Sometimes	33 (44.59)	76 (24.13)
No	26 (35.14)	85 (26.98)
Total	74 (100)	315 (100)

PEARSON CHI2 (2) = 21.65 P < 0.001

Also, rates of condom use was found to be significantly associated with levels of education, with those reporting higher levels of education being more likely to have consistently used condoms in their last three sexual encounters, compared to their

less educated counterparts (Table 9.37). However this difference disappears, for males, when data were analysed separately for males and females (Table 9.38).

Table 9.37: Analysis of condom use rates during last three sex by level of education

Condom use last three sex	Level of education		
	None or Primary (%)	Secondary (%)	Tertiary (%)
All three times or Not applicable	1 (5.88)	48 (45.28)	120 (45.11)
Sometimes	8 (47.06)	37 (34.91)	64 (24.06)
No	8 (47.06)	21 (19.81)	82 (30.83)
Total	17 (100)	106 (100)	266 (100)

FISHER'S EXACT = 0.001

Table 9.38: Analysis of condom use rates during last three sex by gender (females only)

Condom use last three sex	Level of education		
	None or Primary (%)	Secondary (%)	Tertiary (%)
All three times or Not applicable	1 (7.69)	26 (44.83)	54 (45.38)
Sometimes	7 (53.85)	25 (43.10)	27 (22.69)
No	5 (38.46)	7 (12.07)	38 (31.93)
Total	13 (100)	58 (100)	119 (100)

FISHER'S EXACT < 0.001

Irregular condom use (defined as not using condoms all the time in the last three sexual experiences) was the most common condom practise across all relationship groups except in the “singles” group where there were more “not applicable” responses. This association was statistically significant and remained significant (at Fisher’s exact < 0.001) even after data for married individuals (married with one or more spouse) and singles were excluded from the analysis in separate sensitivity analyses (Table 9.39).

Table 9.39: Rates of condom use during last three sex by respondents' marital status

Relationship status	Condom use last three sex		
	Not applicable (%)	Irregularly (%)	Consistently (%)
In a relationship (not married)	16 (17.98)	48 (53.93)	25 (28.09)
Married (1 spouse)	7 (5.47)	107 (83.59)	14 (10.94)
Married (more than 1 spouse)	0 (0.00)	12 (100)	0 (0.00)
Single	63 (41.45)	49 (32.24)	40 (26.23)
Separated	0 (0.00)	1 (50.00)	1 (50.00)
Widowed	3 (60.00)	2 (40.00)	0 (0.00)
Divorced	0 (0.00)	1 (100)	0 (0.00)
Total	89 (22.88)	220 (56.56)	80 (20.57)

FISHER'S EXACT < 0.001.

There was no statistically significant relationship between rates of condom use during last three sex and areas of residence (Table 9.40)

Table 9.40: Rates of condom use during last three sex by respondents' areas of residence

Condom use last three sex	Area of reside most of the time	
	Idoma speaking area (%)	Tiv speaking area (%)
All three times or Not applicable	95 (48.72)	74 (38.14)
Sometimes	51 (26.15)	58 (29.90)
No	49 (25.13)	62 (31.96)
Total	195 (100)	194 (100)

PEARSON CHI2 (2) = 4.56 P = 0.101

Consistent condom use during last three sex was significantly associated with reporting condom use at first sex. Conversely, reporting no condom use at first sex was significantly associated with irregular condom use (Table 9.41).

Table 9.41: Exploring the relationship between condom use at first sex and consistency of condom use during last three sex

Condom use first sex	Condom use last three sex		
	Consistently (%)	Irregularly (%)	Not applicable (%)
Yes	47 (58.75)	37 (16.82)	8 (8.99)
No	30 (37.50)	169 (76.82)	14 (15.73)
Declined or Not applicable (N/A)	3 (3.75)	14 (6.36)	67 (75.28)
Total	80 (100)	220 (100)	89 (100)

PEARSON CHI2 (4) = 256.99 P < 0.001

A cross tabulation of responses to the question on alcohol use before sex and frequency of condom use revealed there was a significant difference in condom use between those who use alcohol before sex and to those who do not use alcohol before sex (Table 9.42).

Table 9.42: Exploring the relationship between alcohol use before sex and its impact on rates of condom use

Condom use during last three sex	Alcohol before sex	
	No (%)	Yes (%)
Not applicable	87 (25.14)	2 (4.65)
No or sometimes (irregular condom use)	197 (56.94)	23 (53.49)
All three times	62 (17.92)	18 (41.68)
Total	346 (100)	43 (100)

FISHER'S EXACT < 0.001

There was no significant difference in condom use between those who inject drugs and those who do not inject drugs (Table 9.43).

Table 9.43: Exploring injection drug use and condom use during last sex

Condom use during last three sex	Injection drug use	
	Yes (%)	No (%)
Not applicable	5 (41.67)	84 (22.28)
No or sometimes (irregular condom use)	6 (50.00)	214 (56.76)
All three times	1 (8.33)	79 (20.95)
Total	12 (100)	377 (100)

FISHER'S EXACT = 0.280

Only about 44% of the population reported they had received sex education at home in the past (Table 9.44).

Table 9.44: Frequency of sex education at home or at family level

Sex education at home or family?	Frequency	Percentage
Yes	174	44.73
No	215	55.27
Total	389	100

Indicating that one had sex education in the past was significantly associated with a favourable response to the question on whether respondents think it is easy for a woman to demand that her partner uses condoms during sex (Table 9.45).

Table 9.45: Exploring how survey respondents' perception of ease of demanding condom during sex vary with history of sex education (at home or from a family member)

It is easy for a woman to tell a man to use condom during sex	Sex education at home?	
	Yes (%)	No (%)
I agree	135 (56.72)	103 (43.28)
I disagree	39 (25.83)	112 (74.17)
Total	174 (44.73)	215 (55.27)

PEARSON CHI2 (1) = 35.67 P < 0.001

A logistic regression model was fitted to explore predictors of consistent condom use (defined as using condoms all three times in last three sexual experiences). Data for non-responders and those who responded “Not applicable” were excluded from this model. This is because the main objective of this analysis is to identify factors that may be associated with consistent or inconsistent condom use amongst those that should potentially be using them.

Survey respondents who reported condom use at fist sex, as well as those who indicated that they reside in the city or townships, were more likely to use condoms consistently compared to their respective counterparts (those who reported not using condom during their first sexual experience and rural residents) [Table 9.46 and Table 9.46]. Respondents who reported “not having sex education” at home were unlikely to have consistently used condoms in their last three sex [Table 9.46].

Table 9.46: Binary logistic regression exploring relationship or patterns between condom use last three sex and some variables of interest (part 1)

Explanatory variables	Odds ratio	95% Conf. interval		Wald P	LRT P-value
Condom use at first sex					< 0.001
Declined or N/A	1	(Reference category)			
Yes	5.61	1.41	22.36	0.014	
No	1.39	0.36	5.45	0.629	
Sex education at home					< 0.001
Yes	1	(Reference category)			
No	0.32	0.17	0.61	0.001	
Injection drug use					0.083
No	1	(Reference category)			
Yes	0.14	0.01	1.29	0.083	
Alcohol use before sex					0.2182
No	1	(Reference category)			
Yes	1.74	0.72	4.19	0.218	

Table 9.47: Binary logistic regression model exploring relationship between condom use last three sex and some variables of interest (part 2)

Explanatory variables	Odds ratio	95% Conf. interval		Wald P	LRT P-value
Educational status					0.949
Primary education or less	1	(Reference category)			
Secondary education	1.25	0.11	14.39	0.856	
Tertiary and above	1.11	0.09	12.55	0.930	
Gender					0.937
Male	1	(Reference category)			
Female	0.98	0.52	1.83	0.937	
Area of residence					0.505
Idoma speaking area	1	(Reference category)			
Tiv speaking area	1.25	0.65	2.39	0.505	
Place of residence					0.028
Village/rural	1	(Reference category)			
Urban/City	3.68	1.16	11.73	0.028	
Age categories					0.421
18-22	1	(Reference category)			
23-27	1.32	0.52	3.37	0.565	
28-33	0.71	0.27	1.88	0.493	
34-37	0.41	0.11	1.62	0.205	
38-42	0.61	0.16	2.28	0.459	
43-47	0.62	0.13	3.05	0.554	
48-52	Omitted *				
Above 52	0.23	0.02	2.70	0.240	

***OMITTED DUE TO LOW NUMBERS OF OBSERVATIONS**

In a sensitivity analysis, “age” variable was omitted from the binary logistic regression model. The overall direction of conclusion remained unchanged after age was dropped from the model (Table 9.48).

Other variables included in the analyses to explain condom use patterns last three sex (injection drug use, alcohol use before sex, level of education, gender, area of residence and age) were not significant [Table 9.46, Table 9.7 and Table 9.48].

The logistic regression models fitted in the analyses were significant [P values < 0.001] and explains about 22% of the observed variance in condom use patterns when age was excluded from the model [pseudo $R^2 = 0.22$, Table 9.46, Table 9.7] and 24% when age was included in the model [pseudo $R^2 = 0.24$, Table 9.48].

Table 9.48: Binary logistic regression model after age variable was excluded from analysis

Explanatory variables	Odds ratio	95% Conf. interval		Wald P	LRT P value
Condom use at first sex					< 0.001
Declined or N/A	1	(Reference category)			
Yes	5.39	1.37	21.19	0.016	
No	1.13	0.29	4.32	0.859	
Sex education at home					0.001
Yes	1	(Reference category)			
No	0.35	0.18	0.66	0.001	
Injection drug use					0.069
No	1	(Reference category)			
Yes	0.13	0.01	1.18	0.070	
Alcohol use before sex					0.119
No	1	(Reference category)			
Yes	1.98	0.84	4.65	0.119	
Educational status					0.751
Primary education or less	1	(Reference category)			
Secondary education	1.55	0.14	17.22	0.722	
Tertiary and above	1.19	0.11	13.05	0.890	
Gender					0.898
Male	1	(Reference category)			
Female	0.96	0.52	1.77	0.898	
Area of residence					0.726
Idoma speaking area	1	(Reference category)			
Tiv speaking area	1.12	0.59	2.12	0.726	
Place of residence					0.008
Village/rural	1	(Reference category)			
Urban/City	4.47	1.47	13.55	0.008	

9.12 HIV testing

Only about 25% of the population have tested for HIV in the preceding three months. Approximately 15% reported they have never tested for HIV in the past. approximately 36% reported they last tested for HIV over nine months ago (Table 9.49).

Table 9.49: Frequency of HIV testing among survey respondents

Last HIV test	Frequency	Percentage
Less than 4 months	98	25.19
4 - 6 months	49	12.60
7 - 9 months	44	11.31
Above 9 months	140	35.99
Never	58	14.91
Total	389	100

There was significant age variation in HIV testing among respondents, with respondents in the 18 – 22 years age category being more likely to report they have never tested for HIV. The other age categories were more likely to report they tested for HIV over nine months ago (Table 9.50).

Table 9.50: Summary of last HIV test by age categories.

Age category	Last HIV test (in months)				
	Less than 4 (%)	4 - 6 (%)	7 - 9 (%)	More than 9 (%)	Never (%)
18 - 22	15 (16.85)	16 (17.98)	5 (5.62)	18 (20.22)	35 (39.33)
23 - 27	31 (32.98)	12 (12.77)	8 (8.51)	33 (35.11)	10 (10.64)
28 - 33	29 (32.58)	10 (11.24)	16 (17.98)	29 (32.58)	5 (5.62)
34 - 37	7 (16.28)	3 (6.98)	7 (16.28)	23 (53.49)	3 (6.98)
38 - 42	10 (31.25)	2 (6.25)	3 (9.38)	16 (50.00)	1 (3.13)
43 - 47	4 (17.39)	3 (13.04)	2 (8.70)	12 (52.17)	2 (8.70)
48 - 52	0 (0.00)	0 (0.00)	1 (20.00)	3 (60.00)	1 (20.00)
Above 52	2 (14.29)	3 (21.43)	2 (14.29)	6 (42.86)	1 (7.14)
Total	98 (25.19)	49 (12.60)	44 (11.31)	140 (35.99)	58 (14.91)

FISHER'S EXACT (USING "R" STATISTICAL PACKAGE) = 0.001

Individuals resident in both Tiv and Idoma speaking areas were very likely to report their last HIV test was at least nine months ago (Table 9.51).

Table 9.51: Last HIV test by area of residence

Area of residence	Last HIV test (in months)				
	Less than 4 (%)	4 - 6 (%)	7 - 9 (%)	More than 9 (%)	Never (%)
Idoma	49 (25.13)	28 (14.36)	16 (8.21)	62 (31.79)	40 (20.51)
Tiv	49 (25.13)	21 (10.82)	28 (14.43)	78 (40.21)	18 (9.28)
Total	98 (25.19)	49 (12.60)	44 (11.31)	140 (35.99)	58 (14.91)

PEARSON CHI2 (4) = 14.44 P = 0.006

Similarly, nine months or above was the most common response (among rural and city survey respondents) when survey participants were asked when they last tested for HIV (Table 9.52).

Table 9.52: Last HIV test by place of residence

Place of residence	Last HIV test (in months)				
	Less than 4 (%)	4 - 6 (%)	7 - 9 (%)	More than 9 (%)	Never (%)
Village/Rural	15 (20.27)	3 (4.05)	7 (9.46)	35 (47.30)	14 (18.92)
Urban/Town	83 (26.35)	46 (14.60)	37 (11.75)	105 (33.33)	44 (13.97)
Total	98 (25.19)	49 (12.60)	44 (11.31)	140 (35.99)	58 (14.91)

PEARSON CHI2 (4) = 10.68 P = 0.030

There was no statistically significant differences in responses between males and females to the last HIV test date question (Table 9.53).

Table 9.53: Last dates of HIV test by gender

Place of residence	Last HIV test (in months)				
	Less than 4 (%)	4 - 6 (%)	7 - 9 (%)	More than 9 (%)	Never (%)
Male	57 (28.64)	26 (13.07)	26 (13.07)	63 (31.66)	27 (13.57)
Female	41 (21.58)	23 (12.11)	18 (9.47)	77 (40.53)	31 (16.32)
Total	98 (25.19)	49 (12.60)	44 (11.31)	140 (35.99)	58 (14.91)

PEARSON CHI2 (4) = 5.7212 P = 0.221

Respondents with primary education were more likely to respond they have “never” tested for HIV in the past as opposed to a “more than 9 months ago” response among those who had secondary or higher levels of education (Table 9.54).

Table 9.54: Last HIV test date by levels of education

Place of residence	Last HIV test (in months)				
	Less than 4 (%)	4 - 6 (%)	7 - 9 (%)	More than 9 (%)	Never (%)
Up to primary	2 (11.76)	1 (5.88)	2 (11.76)	7 (41.18)	5 (28.41)
Secondary	19 (17.92)	17 (16.04)	4 (3.77)	39 (36.79)	27 (25.47)
Tertiary	77 (28.95)	31 (11.65)	38 (14.29)	94 (35.34)	26 (9.77)
Total	98 (25.19)	49 (12.60)	44 (11.31)	140 (35.99)	58 (14.91)

FISHER'S EXACT < 0.001

9.13 Exploring the local social environment

Just over 48% of the population reported there are too many hotels in their local environment, when asked what they thought of the number of hotels around where they live (Table 9.55).

Table 9.55: Respondents' views on numbers of hotels in their local environment

Thoughts about number of hotels locally	Frequency	Percentage
Too many	188	48.33
Not bothered	123	31.62
Just enough	25	6.43
None in my area	53	13.62
Total	389	100

Nearly 75% of respondents believe that hotels have a significant role to play in HIV epidemiology locally (Table 9.56).

Table 9.56: Survey respondents' views on hotels and local HIV transmission.

Hotels impact on HIV transmission locally	Frequency	Percentage
No impact on HIV transmission	84	21.59
Encourage HIV transmission	291	74.81
Discourage HIV transmission	14	3.60
Total	389	100

There was a statistically significant trend in which locals believe that hotels encourage HIV transmission. This trend is maintained across the different responses to the “numbers of hotels” question.

Table 9.57: Opinions of respondents about the impact of hotels on local HIV transmission

Hotel impact on HIV transmission	Thoughts about number of hotels locally			
	Too many (%)	Not bothered (%)	Just enough (%)	None (%)
No impact	30 (15.96)	37 (30.08)	6 (24.00)	11 (20.75)
Encourage HIV transmission	153 (81.38)	83 (67.48)	18 (72.00)	37 (69.81)
Discourage HIV transmission	5 (2.66)	3 (2.44)	1 (4.00)	5 (9.43)
Total	188 (100)	123 (100)	25 (100)	53 (100)

FISHER'S EXACT = 0.020

More than 85% of the population reported that they think HIV transmission is higher at certain times (and periods) of the year: during festivities and wakes (Table 9.58 and Table 9.59).

Table 9.58: Summary of responses to question on what respondents think about HIV transmission during festive periods

HIV transmission is higher during festivities	Frequency	Percentage
Yes	336	86.38
No	53	13.62
Total	389	100

Table 9.59: Summary of responses to question on what respondents think about how wakes impact on local HIV transmission

HIV transmission is higher during wakes	Frequency	Percentage
Yes	314	80.72
No	75	19.28
Total	389	100

Respondents reported that males are considered to be “heads” (leaders) and as such are conferred the social responsibility of decision making. This observation is statistically significant and does not vary by gender (Table 9.60).

Table 9.60: Respondents' views on question relating to gender roles and decision making

Gender	A man is head and makes all decisions			
	True for all (%)	True for many (%)	True for few (%)	Not true (%)
Male	45 (22.61)	81 (40.70)	44 (22.11)	29 (14.57)
Female	65 (34.21)	79 (41.58)	29 (15.26)	17 (8.95)
Total	110 (28.28)	160 (41.13)	73 (18.77)	46 (11.83)

PEARSON CHI2 (3) = 9.67 P = 0.022

About sixty percent of respondents reported that it is less of a problem if a man is caught cheating in a relationship compared to a woman (Table 9.61).

Table 9.61: Survey participants' views on male cheating in relationship or marriage

It is less of a problem if a man cheats	Frequency	Percentage
Agree	233	59.90
Disagree	156	40.10
Total	389	100

Close to 80% of respondents indicated a law which criminalises deliberate HIV transmission will be a good law. Only about 4% of the population held the opinion that this law will be a bad law with about 9% declining to respond, and another 9% stating the law will be of no value (Table 9.62).

Table 9.62: Opinions of respondents about a law which criminalises deliberate HIV transmission

Opinion about a law which criminalises deliberate HIV transmission	Frequency	Percentage
I chose not to answer	33	8.48
Good law	304	78.15
No value	34	8.74
Bad law	18	4.63
Total	389	100

About 12.85% of the population answered yes when asked if they have seen or heard of any cases of female circumcision in the last 5 years (Table 9.63).

Table 9.63: Responses to question on female circumcision locally, over a period of 5 years.

Have you seen or heard of any case of female circumcision, locally, in the last 5 years?	Frequency	Percentage
Yes	50	12.85
No	339	87.15
Total	389	100

9.14 HIV medication and services access

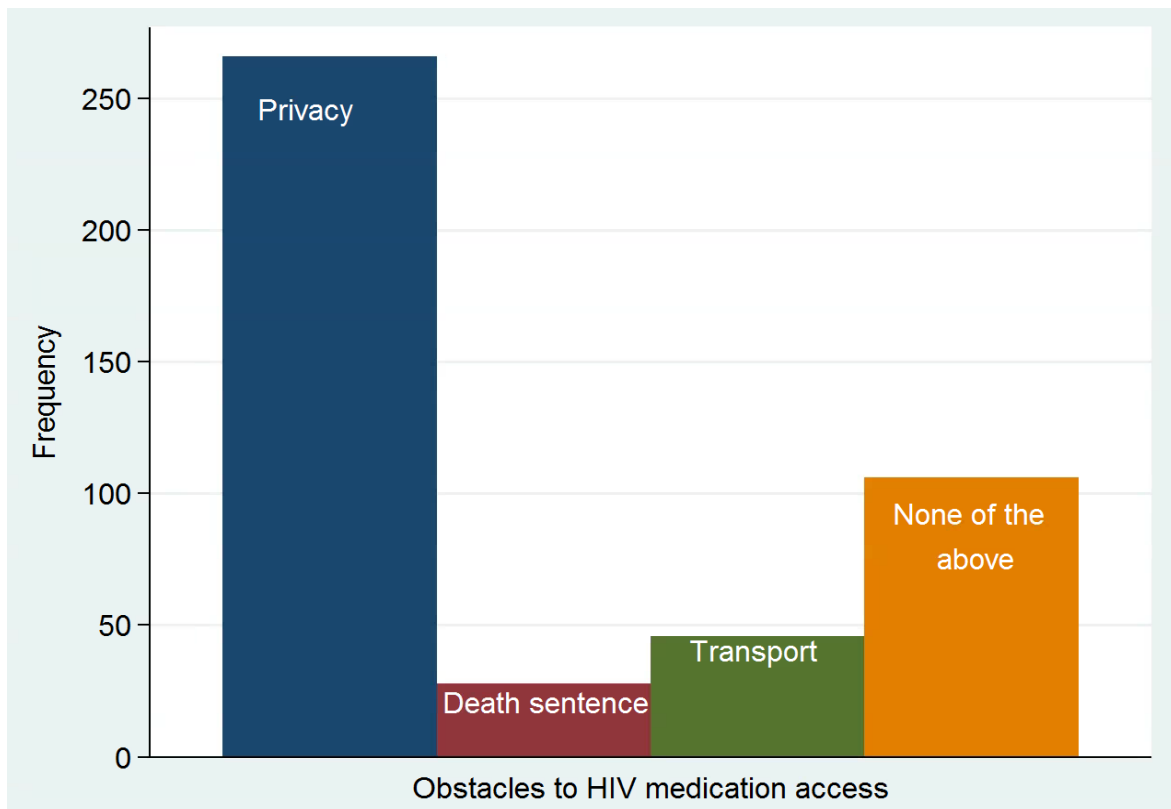
Approximately 17% of those that have attended an HIV service in the past (38 out of 219) reported that staff at the facilities they visited were not friendly (Table 9.64).

Table 9.64: Summary of respondents' opinion about staff attitude at HIV centres

Staff attitude at HIV centres	Frequency	Percentage
Friendly	84	21.59
Not friendly	38	9.77
No opinion	97	24.94
Not applicable	170	43.70
Total	389	100

The most common reason cited by respondents, as potential obstacle to intention to access HIV medication, is privacy followed by transportation costs. Many participants selected the “none of the above” option, implying none of the options provided was applicable to them (Figure 9.8).

Figure 9.8: Bar chart showing commonly cited obstacles or concerns associated with HIV medication access



About 272 respondents (approximately 70% of the sample size) indicated that they were aware of adolescent friendly services. Almost half (193 respondents or 49.62%) of all respondents believe that HIV services are not accessible to young people for reasons of stigma (Table 9.65). Those who are not aware of these services have a higher proportion of individuals who indicated that the services are not accessible to young people because of stigma (Table 9.65).

Table 9.65: Survey respondents' awareness of youth friendly services and perceived ease of access to these youth friendly HIV services for young people

Are you aware of youth friendly HIV services?	Do you think young people are able to attend sex education services freely?	
	Yes	No
Yes	171	101
No	25	92
Total	196	193

Younger respondents (in the 18 – 33 years age categories) were more likely to respond “yes” to the question “do you think young people can freely access sex education services without fear of stigma?” This difference in opinion between younger and older respondents was statistically significant (Table 9.66).

Table 9.66: Summary of perceived access to sex education services by age categories

Age category (years)	Do you think young people are able to attend sex education services freely?	
	Yes (%)	No (%)
18-22	45 (50.56)	44 (49.44)
23-27	66 (70.21)	28 (29.79)
28-33	48 (52.93)	41 (46.07)
34-37	13 (30.23)	30 (69.77)
38-42	11 (34.38)	21 (65.63)
43-47	9 (39.134)	14 (60.87)
48-52	1 (20.00)	4 (80.00)
Above 52	3 (21.43)	11 (78.57)
Total	196	193

FISHER'S EXACT < 0.001

Perceived (young persons') access to sex education services also vary, significantly, by gender. Males were more likely to report that sex education services are more readily accessible to young people, without fear of stigma, compared to females. This difference in opinion, between males and females, is statistically significant (Table 9.67).

Table 9.67: Respondents' perceived ease of access to sex education services by gender

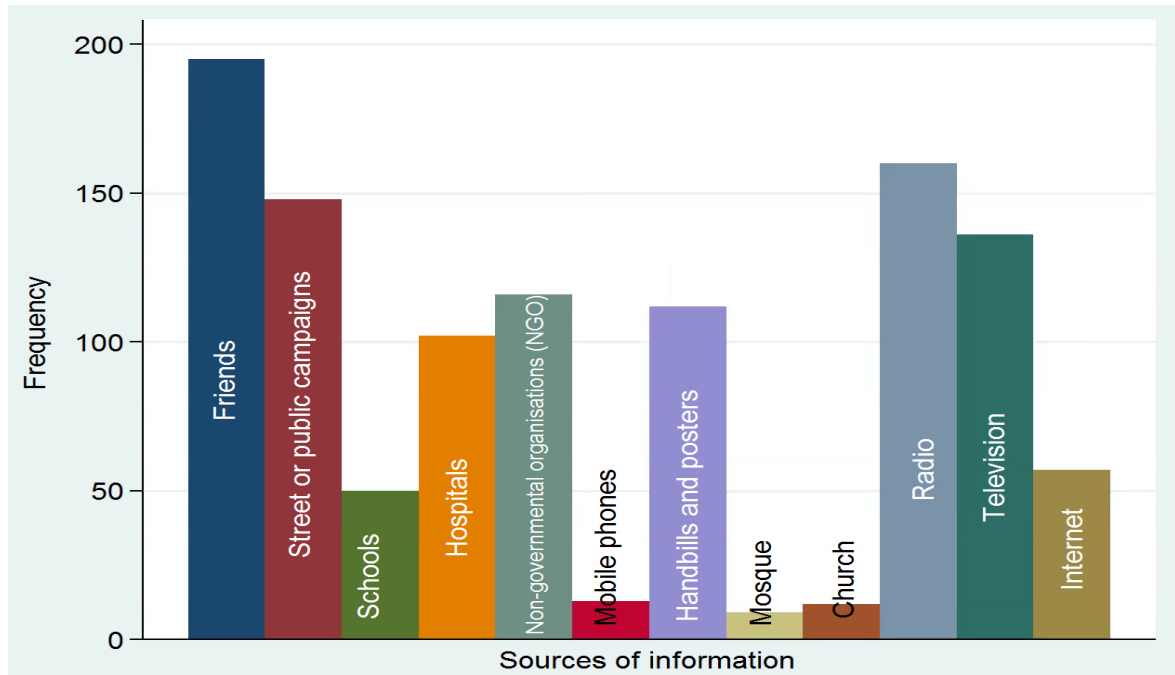
Gender	Do you think young people are able to attend sex education services freely?	
	Yes (%)	No (%)
Male	111 (55.78)	88 (44.22)
Female	85 (44.74)	105 (55.26)
Total	196 (50.39)	193 (49.61)

PEARSON CHI2 (1) = 4.741 P = 0.029

9.15 Exploring local HIV awareness campaigns

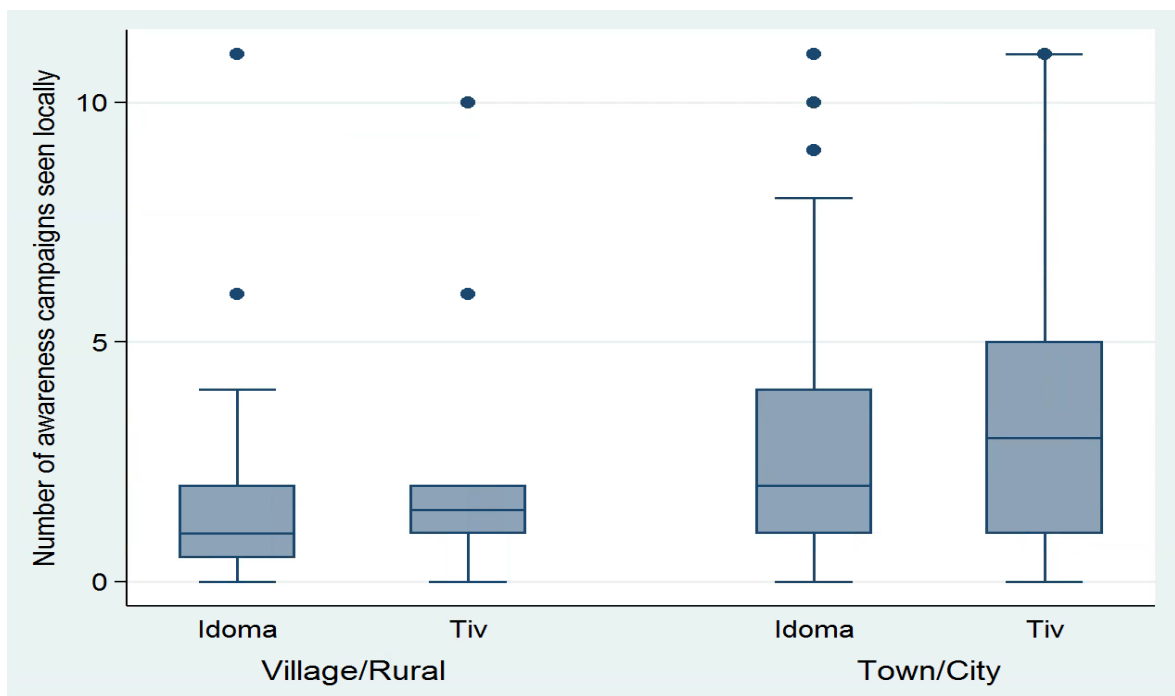
Survey responders indicated their three most common sources of HIV information are friends, radio and campaigns on the streets/public places respectively. Schools, mobile phones and religious places (churches and mosques) were the least cited spaces where respondents got information on HIV (Figure 9.9).

Figure 9.9: Bar chart showing frequency of sources of HIV information



A boxplot of frequency of campaigns stratified by places/areas of residence revealed that HIV awareness campaigns were commoner in urban areas compared to rural areas. It also shows that awareness campaigns were more frequent in Tiv speaking areas compared to Idoma speaking parts of Benue State (Figure 9.9).

Figure 9.10: Boxplot showing frequency of awareness campaigns by place of residence



A test of statistical significance revealed that campaigns were significantly more frequent in Tiv speaking areas compared to Idoma speaking areas (Table 9.68).

Table 9.68: Exploring difference in frequency of HIV awareness campaigns between Idoma and Tiv speaking areas

Group	Observations	Mean	Std. Dev.	95% Conf. interval	
Idoma	195	2.63	2.99	2.21	3.05
Tiv	194	3.25	2.95	2.83	3.67
Combined	389	2.94	2.99	2.64	3.24
Difference		-0.62		-1.21	-0.02

P = 0.042

Similarly, campaigns were significantly more frequent in towns compared to villages/rural areas (Table 9.69).

Table 9.69: Exploring difference in frequency of HIV awareness campaigns between rural and urban (or township) areas

Group	Observations	Mean	Std. Dev.	95% Conf. interval	
Rural	74	1.70	1.89	1.26	2.14
Town	315	3.23	3.12	2.88	3.58
Combined	389	2.94	2.99	2.64	3.24
Difference		-1.53		-2.27	-0.78

P < 0.001

9.16 Local perception and internalisation of HIV risk

When asked what constitutes the biggest risk factor for contracting HIV in the local area, most respondents indicated that unprotected sexual intercourse forms the most important risk factor, although a small proportion stated their greatest risk come from haircuts or witches and wizards (Table 9.70).

Table 9.70: Survey responders perceived sources of HIV risk

Perceived HIV risk source	Frequency	Percentage
Unprotected sex	296	72.73
Blood transfusion	68	16.70
Haircuts	38	9.34
Witches and wizards	5	1.23
Total	407	100

There was no statistically significant difference in reported perceived HIV risk between male and female survey responders (Table 9.71).

Table 9.71: Perceived HIV risk sources by gender.

HIV risk	Gender	
	Male (%)	Female (%)
Haircuts	24 (11.43)	14 (7.11)
Unprotected sex	156 (74.29)	140 (71.07)
Blood transfusion	29 (13.81)	39 (19.80)
Witches and wizards	1 (0.48)	4 (2.03)
Total	210 (100)	197 (100)

FISHER'S EXACT = 0.098

To explore how well individuals have internalised existing local HIV risk factors (mentioned above), a cross tabulation of frequency of condom use and self-reported HIV risk was generated. This analysis showed that irregular condom use was the most common practise among survey respondents, regardless of their self-reported HIV risk.

Table 9.72: Exploring internalisation of personal HIV risk (using self-reported HIV risk and condom use practises among survey respondents)

Self-reported HIV risk	Condom use during last three sex		
	Not applicable (%)	No or sometimes (%)	All three times (%)
No or Small risk	50 (21.01)	141 (59.24)	47 (19.75)
Moderate or High risk	15 (21.43)	32 (45.71)	23 (32.86)
IDK	24 (29.63)	47 (58.02)	10 (12.35)
Total	89 (22.88)	220 (56.56)	80 (20.57)

PEARSON CHI2 (4) = 11.7125, P = 0.020

The observed trend (in Table 9.72 above) was not significant after sensitivity analyses, along marital status, was conducted.

Nearly 56% of survey respondents reported that their knowledge of HIV underpinned their self-reported HIV risk rating. However, about 14% cited “God’s protection” and about 9% cited “not being promiscuous” as reasons for how they rated their HIV risk (Table 9.73).

Table 9.73: Reasons, given by respondents, explaining how they have rated their risk for contracting HIV

Reasons for HIV risk self-rating	Frequency	Percentage
I know how HIV is contracted	217	55.78
God's protection	55	14.14
Not sure if my partner is faithful	43	11.05
I am not promiscuous	33	8.48
Professional risk	24	6.17
have sex with healthy looking people	17	4.37
Total	389	100

The mean HIV knowledge score was 14 (SD 4.40), with a minimum score of 2 and a maximum score of 21 out of a possible 21 (Table 9.74).

Table 9.74: Percentile rank of HIV knowledge score of respondents

Total knowledge scores	Percentile rank (%)	
		Smallest
4	1	2
5	5	2
7	10	3
11	25	4
15	50	
		Largest
18	75	21
19	90	21
20	95	21
21	99	21

A combination of good knowledge of HIV transmission routes (as demonstrated above) and irregular condom use among survey responders (as demonstrated in Table 9.72) is a strong pointer to poor risk perception and/or internalisation of personal HIV risk.

A “risk score” variable was calculated by allotting a uniform score of one to the presence of certain demographic and behavioural high HIV risk factors (such as being a sex worker, injection drug use, needle sharing, sex with a sex worker, sex with a non-regular partner, MSM sexual orientation, using alcohol before sex, not using condoms during last three sex and irregular condom use during last three sex). About half of the population reported at least one HIV behavioural risk, with about thirty percent reporting no risk [Table 9.75].

Table 9.75: Summary of calculated HIV risk score

Risk score (Numbers of high risk factors)	Frequency	Percentage
0	113	29.05
1	208	53.47
2	50	12.85
3	15	3.86
4	2	0.51
5	1	0.26
Total	389	100

There was no significant association between the calculated HIV risk score statistic and level of education. (Table 9.76)

Table 9.76: Calculated HIV risk score by level of education

Level of education	HIV risk score					
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
Primary or less	0 (0.00)	13 (6.25)	4 (8.00)	0 (0.00)	0 (0.00)	0 (0.00)
Secondary	30 (26.55)	59 (28.37)	12 (24.00)	4 (26.67)	1 (50.00)	0 (0.00)
Tertiary	83 (73.45)	136 (65.38)	34 (68.00)	11 (73.33)	1 (50.00)	1 (100)
Total	113 (100)	208 (100)	50 (100)	15 (100)	2 (100)	1 (100)

FISHER'S EXACT = 0.131

Similarly, there was no significant association between gender and HIV risk score (Table 9.77).

Table 9.77: Calculated HIV risk score and gender

Gender	HIV risk score					
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
Male	55 (48.67)	100 (48.08)	33 (66.00)	9 (60.00)	1 (50.00)	1 (100)
Female	58 (51.33)	108 (51.92)	17 (34)	6 (40.00)	1 (50.00)	0 (0.00)
Total	113 (100)	208 (100)	50 (100)	15 (100)	2 (100)	1 (100)

FISHER'S EXACT = 0.162

Calculated HIV risk scores was significantly associated with areas of residence of survey respondents (Table 9.78)

Table 9.78: Calculated HIV risk score by areas of residence

Area of residence	HIV risk score					
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
Idoma	67 (59.29)	91 (43.75)	30 (60.00)	6 (40.00)	1 (50.00)	0 (0.00)
Tiv	46 (40.71)	117 (56.25)	20 (40.00)	9 (60.00)	1 (50.00)	1 (100)
Total	113 (100)	208 (100)	50 (100)	15 (100)	2 (100)	1 (100)

FISHER'S EXACT = 0.030

Being resident in town or city was significantly associated with higher HIV risk score reports (Table 9.79).

Table 9.79: Calculated HIV risk score by places of residence

Place of residence	HIV risk score					
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
Village/rural	11 (9.73)	48 (23.08)	12 (24.00)	2 (13.33)	1 (50.00)	0 (0.00)
Town/city	102 (90.27)	160 (76.92)	38 (76.00)	13 (86.67)	1 (50.00)	1 (100)
Total	113 (100)	208 (100)	50 (100)	15 (100)	2 (100)	1 (100)

FISHER'S EXACT = 0.020

There was no significant association between HIV risk score and HIV knowledge (Table 9.80).

Table 9.80: Exploring associations between respondents' HIV risk score and HIV knowledge score

HIV knowledge score categories	HIV risk score					
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
2 - 6	3 (2.65)	20 (9.62)	5 (10.00)	2 (13.33)	0 (0.00)	0 (0.00)
7 - 10	23 (20.35)	36 (17.31)	10 (20.00)	1 (6.67)	0 (0.00)	0 (0.00)
12 - 16	49 (43.36)	79 (37.98)	20 (40.00)	7 (46.67)	0 (0.00)	0 (0.00)
17 - 21	38 (33.63)	73 (35.10)	15 (30.00)	5 (33.33)	2 (100)	1 (100)
Total	113 (100)	208 (100)	50 (100)	15 (100)	2 (100)	1 (100)

FISHER'S EXACT = 0.408

The association between HIV risk score and age categories was statistically significant. It appears that respondents in the age categories “23-27” and “34-37” are more likely than others to have higher HIV risk scores (Table 9.81).

Table 9.81: Calculated HIV risk scores by age categories

Age categories	HIV risk score					
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
18-22	41 (36.28)	33 (15.87)	13 (26.00)	2 (13.33)	0 (0.00)	0 (0.00)
23-27	32 (28.32)	48 (23.08)	8 (16.00)	4 (26.67)	2 (100)	0 (0.00)
28-33	20 (17.70)	45 (21.63)	20 (40.00)	4 (26.67)	0 (0.00)	0 (0.00)
34-37	8 (7.08)	26 (12.50)	4 (8.00)	4 (26.67)	0 (0.00)	1 (100)
38-42	5 (4.42)	24 (11.54)	3 (6.00)	0 (0.00)	0 (0.00)	0 (0.00)
43-47	5 (4.42)	16 (7.69)	2 (4.00)	0 (0.00)	0 (0.00)	0 (0.00)
48-52	0 (0.00)	5 (2.40)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Above 52	2 (1.77)	11 (5.29)	0 (0.00)	1 (6.67)	0 (0.00)	0 (0.00)
Total	113 (100)	208 (100)	50 (100)	15 (100)	2 (100)	1 (100)

FISHER'S TEST (DONE USING "R") < 0.001

There was a significant association between marital status and HIV risk score (Table 9.82)

Table 9.82: Exploring relationship between calculated HIV risk scores and marital status

Marital status	HIV risk score					
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
In a relationship	22 (19.47)	47 (22.6)	15 (30.00)	4 (26.67)	1 (50.00)	0 (0.00)
Married (1 spouse)	15 (13.27)	99 (47.60)	12 (24.00)	2 (13.33)	0 (0.00)	0 (0.00)
Married (> 1 spouse)	0 (0.00)	8 (3.85)	1 (2.00)	3 (20.00)	0 (0.00)	0 (0.00)
Single	72 (63.72)	50 (24.04)	22 (44.00)	6 (40.00)	1 (50.00)	1 (100)
Separated	1 (0.88)	1 (0.48)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Widowed	3 (2.65)	2 (0.96)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Divorced	0 (0.00)	1 (0.48)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Total	113 (100)	208 (100)	50 (100)	15 (100)	2 (100)	1 (100)

FISHER'S TEST (DONE USING "R") < 0.001

This association between marital status and HIV risk score was no longer significant after respondents married in monogamous and polygynous settings were excluded. There was significant association between condom use at first sex and risk score with those who reported not using condom at first sex also reporting higher HIV risk scores (Table 9.83).

Table 9.83: Exploring trends association(s) between calculated HIV risk score and condom use at first sex

Condom use at first sex	HIV risk score					
	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)
Yes	28 (24.78)	43 (20.67)	19 (38.00)	2 (13.33)	0 (0.00)	0 (0.00)
No	25 (22.12)	145 (69.71)	28 (56.00)	12 (80.00)	2 (100)	1 (100)
NA	60 (53.10)	20 (9.62)	3 (6.00)	1 (6.67)	0 (0.00)	0 (0.00)
Total	113 (100)	208 (100)	50 (100)	15 (100)	2 (100)	1 (100)

FISHER'S EXACT < 0.001

A linear regression model was fitted to explore the relationship between HIV risk score and some of the variables (marital status, area and place of residence, age and condom use at first sex) explored above. The fitted model was significant [$P < 0.05$] and explained about 17% of observed variance in HIV risk score [adjusted $R^2 = 0.17$].

Overall, marital status was not significantly associated with calculated HIV risk scores, however, it was observed that the marital status “widowed” was negatively associated with calculated HIV risk score and this association is significant (Table 9.84). Areas and places of residence as well as age were not significantly associated with calculated HIV risk scores (Table 9.85).

Condom use at first sex was significantly associated with calculated HIV risk scores (Table 9.85). Reporting condom use at first sex as well as responding “not applicable or declining to respond” were negatively associated with calculated HIV risk score (Table 9.85).

Table 9.84: Linear regression model exploring relationship between HIV risk score and marital status

Explanatory variables	Coefficient	95% Conf. interval		P	F-test P value
Marital status	2.11				0.051
In a relationship (not married)	1	(Reference category)			
Married (1 spouse)	-0.22	-0.46	0.03	0.081	
Married (more than 1 spouse)	0.28	-0.19	0.76	0.239	
Single	-0.05	-0.25	0.15	0.613	
Separated	-0.66	-1.75	0.43	0.232	
Widowed	-0.82	-1.56	-0.09	0.029	
Divorced	0.72	-0.79	2.23	0.353	

Table 9.85: Linear regression model exploring relationship between HIV risk score and some explanatory variables (condom use at first sex, areas and places of residence, and age)

Explanatory variables	Coefficient	95% Conf. interval		P	F-test P value
Condom use at first sex					< 0.001*
No	1	(Reference category)			
Yes	-0.25	-0.45	-0.06	0.012	
Declined or Not applicable	-0.85	-1.06	-0.63	< 0.001	
Area of residence					0.792
Idoma speaking area	1	(Reference category)			
Tiv speaking area	0.02	-0.13	0.17	0.792	
Place of residence					0.082
Village/rural	1	(Reference category)			
Urban/City	-0.18	-0.39	0.02	0.082	
Age categories					0.513
18-22	1	(Reference category)			
23-27	0.06	-0.16	0.28	0.598	
28-33	0.19	-0.04	0.43	0.110	
34-37	0.24	-0.08	0.56	0.145	
38-42	-0.05	-0.39	0.29	0.780	
43-47	-0.03	-0.43	0.38	0.904	
48-52	0.02	-0.69	0.74	0.952	
Above 52	0.002	-0.48	0.49	0.992	

* FACTOR ANALYSIS.

CHAPTER 10: Discussion and conclusion

10.1 A brief recap

A lot of positive strides have been made in biomedical research into HIV, leading to the discovery of medications that can effectively treat HIV, halt progression of HIV into AIDS, and reduce risk of HIV transmission to others (66, 67). These advances have translated into increased life expectancy and better quality of life for people living with HIV. As a result, HIV is no longer the death sentence it used to be, especially for those who have access to these life changing medications. Until the cure for HIV is found, the next major milestone in the global fight against HIV is, undoubtedly, ensuring that everyone living with HIV have access to these highly effective HIV medicines. Barriers to HIV medications access are anything but straight forward and they vary from one place to another. Identifying and describing the patterns and correlates of existing barriers to effective HIV campaigns (including access to medications) in places where HIV remains a significant burden is critical to the success of global and local fights against HIV. It is only when interventions are designed to overcome these dynamic challenges (to effective HIV campaigns and access to HIV medications) that we can begin to say that the end of the HIV pandemic is in sight.

10.2 Principal findings from the comparative analyses

From the comparative analyses of country level data, I found that differences in HIV prevalence rates between countries are a function of three broad factors: country wealth (or poverty), equitable distribution of resources (especially HIV related services) and literacy. Wealth in itself is not a risk factor for diseases, however, it remains an important health determinant, often associated with better health indices (370). This is because those who are better off economically tend to be the same who are empowered enough to make healthy choices (371). In the same manner, country wealth, an index of the potential or capacity of a country to provide quality healthcare for her citizens, could partly explain observed better health outcomes/indices in wealthier nations. It was observed, in the comparative analyses,

that wealthier nations have better HIV profiles compared to poorer countries. Differences in country wealth could, in fact, explain why some countries (like the UK and USA) have better HIV medication coverage. Implementation of newer and better HIV treatment policies is not a function of scientific evidence alone. Rather, policy implementation is almost always a function of the cost of a new intervention (how much a country is willing or able to pay for a particular HIV treatment option) and effectiveness (the science of efficacy). This could explain why implementation of some evidence based HIV policies, such as the commencement of HIV medications at diagnosis, continues to be a struggle for a low-middle income country like Nigeria. It could also explain why governments prioritise and would prefer to go for low cost alternatives that may be less effective, but more affordable. For example, the introduction of pre-exposure prophylaxis (PreP) in a number of high income countries continues to be hotly debated for reasons of cost-effectiveness: a successful PreP in England has been described as “an enormous challenge” by Public Health England, and primarily for reasons of cost (372).

Furthermore, I have demonstrated (in the comparative analyses) that equitable distribution of country wealth is as important as absolute country wealth in the fight against HIV. Poorer nations with more equitable systems have better HIV profile compared to countries within similar income bands that have poorer equality indices. For example South Africa, a nation with a better wealth index but ranked one of the most unequal countries in the world (in terms of income inequality), has a bigger HIV burden compared to Nigeria, a country which is not as wealthy as South Africa but less unequal when compared to South Africa. Similarly, India which has a poorer wealth index (GNI) but a more equitable system, compared to Nigeria, has a better HIV profile. Also, the HIV burden in the UK is lighter compared to that in the USA (another high income country) which has a poorer income inequality index when compared to the UK. This income inequality difference between the UK and the USA could explain, in part, the difference in HIV burden between the two countries. According to information available through Public Health England, HIV medications are available, free of charge, through the NHS for UK residents living with HIV (373). However, in the USA, access to HIV medications is hugely dependent on an individual's health insurance cover, and the latter is, in turn, a function of income (374). In fact, the centre for disease control (CDC) reports that “getting health

insurance to help pay for HIV care and treatment can be a challenge for some people living with HIV” in the USA (374). It is, therefore, easy to see how income could exclude individuals who may not earn enough to purchase insurance that provide cover for HIV care in the USA. As a result, the section of society that, for structural and social reasons, are not able to afford good insurance (or ensure access to healthcare), will be at increased risk for HIV transmission. By extension, the poor of every society, especially societies that have no public and social welfare systems to subsidise and/or cater for healthcare for their disadvantaged populations, carry a greater burden of HIV. This could be explained by the scientific fact that people living with HIV who are not on medications are more likely to transmit HIV to others (67).

In the comparative analyses, a non-linear relationship was demonstrated between HIV prevalence and income inequality. The public health implications of a non-linear relationship between HIV prevalence and income inequality (Gini) is that huge reductions in HIV prevalence are possible if a country aims to reduce income inequality from the extremes of values (for example Gini of 60 as seen in South Africa) to somewhere around 35. However, only little gains (if at all any) is to be expected for reductions in Gini below 35. Also, a linear relationship was demonstrated between HIV prevalence and GNI. The presence of a linear relationship between GNI and HIV prevalence implies that incremental gains in country GNI will translate into reductions in country HIV prevalence. Implying that important gains could be made in HIV prevalence reductions with every marginal increase in country GNI. As a result, public health campaigns that seek to reduce income inequality and empower or improve the capacity of a nation to cater for her citizens are urgently needed in the fight against HIV in poorer countries (especially poorer nations that have huge income inequality indices).

Also, I was able to demonstrate the role political will and leadership plays in HIV epidemiology (as seen in the analyses between South Africa and Nigeria). Lack of political will power to address HIV constitutes an important limiting variable in the epidemiology of HIV in Nigeria. Literacy is another important factor in HIV epidemiology that was explored in this analysis. Though the exact mechanism through which literacy influences health outcomes remains unclear, it could be speculated that more literate individuals are better empowered to understand and internalise HIV campaign messages (12, 14, 15). Nigeria’s HIV picture on the global

stage is, therefore, significantly influenced by a comparatively low GNI; high Gini (and income inequality), lack of political will and low literacy levels (amongst other factors that I will be discussing in later sections of this chapter).

10.3 Principal findings, HIV in Nigeria (systematic review)

HIV prevalence shows huge variability within Nigeria. Some of the reasons behind differences in HIV prevalence across Nigeria were picked up in the systematic review of literature from Nigeria.

One factor of note is the depth of research into HIV in Nigeria. Key populations relevant to HIV epidemiology in Nigeria (such as men who have sex with men, female sex workers, traditional birth attendants, religious leaders, people in institutions like prisons and long distance drivers) continue to be under represented in research. The implication is that HIV epidemiology continues to be poorly understood and quantified in some circles or regions. It is, therefore, no surprise that such under-researched communities or sections of society continue to have disproportionately higher prevalence of HIV or even under-reported HIV burden. This is because the dynamics that promote HIV in these communities (as well as relevant HIV correlates) continue to be poorly characterised and understood. The North-East of Nigeria, for example, was found to have the smallest numbers of HIV research publications (relevant to my systematic review question), some areas in this region also report some of the lowest HIV prevalence in Nigeria.

Stigma, religion and societal expectations are important structural variables that work, in a complex manner, to shape HIV epidemiology in Nigeria and in Benue State. These variables (stigma, religion and societal expectations) impact negatively on local perception of HIV risk and uptake of condoms; gender role in relationships; HIV testing and HIV services uptake as well as HIV status disclosure. Messages communicated from some local institutions (for example churches, mosques and families) are in conflict (content wise and in expected actions) with messages from HIV awareness campaigns led by government and third sector groups (the latter two mainly funded by international organisations with predefined objectives and agendas). These conflicting messages and expected standards of behaviours impacts negatively on preparedness of young people to adopt safer sex practises

("social cognitive dissonance"). For example, the church and mosques actively discourage condom use among young unmarried youth. However, condom use is one of the chief messages advocated by third sector organisations/government agencies in HIV awareness activities. These conflicting messages have the capacity to dampen HIV risk perception and negatively impact on preparedness for safer sex practises among young people locally: young people continually find themselves at crossroads between religious (and societal) expectations not to use condoms and peer/social pressures to engage in high HIV risk sex acts.

Another variable of importance from the systematic review is poor risk perception: this relates to a scenario in which individuals who are knowledgeable about HIV transmission and who acknowledge that HIV is a problem locally, fail to take measures to protect themselves from contracting HIV. Most individuals caught up in the cycle of poor risk perception simply state that "HIV is not their portion" in reference to the fact that they will not contract HIV. The slogan "it is not my portion" is a phrase commonly used in religious circles, in Nigeria, to refute the odds of an adverse event befalling someone. More often than not, its use defies logic and natural expectations of cause and effects.

Socioeconomic status of individuals is another important theme identified in the review of HIV publications from Nigeria. Being female, as well as being of poor socioeconomic background (for example low levels of education) were found to be associated with increased HIV risk. It was found that being married did not confer any protection from HIV, when risk for HIV among married and single individuals was compared in meta-analysis. This finding challenges the locally prevalent norm that marriage is protective against HIV. The finding that marriage is not protective against HIV should be incorporated into local campaigns messages (and pre-marital testing and counselling sessions) to stress that high risk behaviour, rather than marital status, is more important for HIV transmission. Similarly, it is worth stressing in awareness campaigns that local practises of polygyny, as demonstrated in my review, have negative implications for HIV transmission as well.

Excessive reliance on behavioural change campaigns, to the detriment of comprehensive (or combination prevention) methods that aim to increase literacy and improve economic conditions of locals, appear to be commonplace. Much of the

interventions encountered in the review are heavily reliant on the theory that health education leads to behaviour change. In practise, knowledge does not always lead to behaviour change, as knowledge is just one item out of many other items required for behaviour change to take place (375, 376). The role of a supportive environment (social, cultural and economic) cannot be overemphasised. Local HIV interventions must be designed in ways that address environmental factors that discourage healthy behavioural choices. Addressing poverty, reducing stigma and making HIV medications more readily accessible would constitute important structural or environmental changes in the local fight against HIV.

I also observed a skew in siting of health facilities (including HIV services) in Nigeria, with services concentrated in urban centres. This bias in services siting implies that rural residents are unable to access HIV services (and information) in the right way, in the right amounts, at the right time and with the right content. This skew in services constitutes significant barrier to services access especially for rural residents who may need to travel long distances before they could access an HIV centre, journeys they may not be able to afford due to poverty. Rural residents, unable to afford travel and care expenses, resort to the services of traditional birth attendants and traditional healers, who are not knowledgeable in safe HIV practises.

Poor STDs detection and treatment rates is another important factor in HIV epidemiology in Nigeria. A clear understanding of why STD detection rates continue to be low is important for HIV epidemiology in Nigeria. This is because it is well known that STDs enhance HIV transmission (315). It will be appropriate to speculate that a number of factors like services siting, poor or weak public health systems and lack of access to health services may play vital roles. Addressing the problem of poor STD detection rates will go a long way to help in the fight against HIV in Nigeria.

The existence of legal provisions that criminalise same sex relationships and female sex work implies that the activities of people in these groups are driven underground where unsafe and unregulated high HIV risk practises thrive. Similarly, an HIV treatment policy of CD4 count less than 350 ensures that some persons living with HIV are significantly more likely to transmit HIV to others when they engage in unprotected sex.

10.4 Principal findings, HIV in Benue State (empirical research)

In the empirical phase of this research, socioeconomic variables (such as education, gender and poverty) featured very strongly in local HIV epidemiology. For example, about 75% of respondents reported a total monthly income (from all sources) of at most 50,000 Nigerian Naira (which is less than 160 USD), despite almost eighty percent having up to tertiary education. Local monthly house rent costs between 10,000 and 20,000 Nigerian Naira on average. Furthermore, being female was found to be associated with more passive roles in society. Interview participants cited, on numerous occasions, the lack of economically viable opportunities as an important HIV driver locally. There was enough evidence (from the qualitative and quantitative analyses) to conclude that poverty and poor socioeconomic conditions are important determinants of HIV risk in Benue State. One marker of social deprivation demonstrated in my research is respondents' reported source of cooking energy. I found that less clean forms of cooking energy such as firewood was more popular among respondents of lower socioeconomic standing as opposed to kerosene and gas (relatively cleaner sources of cooking energy) that were associated with better socioeconomic standings. Similarly, research participants who reside in rural areas were at a greater disadvantage in most of the analyses: HIV campaigns were significantly less frequent in rural areas; lower HIV testing rates was associated with rural residence; lower HIV knowledge score as well as higher rates of irregular condom use were associated with rural residence. Respondents in Idoma speaking areas performed poorly on some of the variables explored compared to residents in Tiv speaking areas (income, HIV knowledge score, and number of HIV awareness campaigns see locally).

It was found that certain times of the year and certain events (festivities and wakes) were associated with increased high risk HIV behaviours. Movement of people from big cities (like Abuja) into these smaller towns (like Otukpo) may be the chief reason for spikes in increased HIV risk behaviours, at certain times of the year, as described by locals. Contrary to what locals believe, there was no statistical evidence backing the qualitative impression that alcohol use is to blame for increased high risk behaviours as observed by locals at certain times of the year. Rather, condom use practises appear to be better among those who drink alcohol before sex. The impact

of alcohol on HIV risk behaviour in this local environment will need to be investigated further for a clearer understanding of relationship patterns, if at all any exists, between these two variables. What is clear, however, is the need for upscaling of HIV awareness activities at certain times of the year, when high HIV risk behaviour are thought to spike.

Those who had sex education at home in the past were more likely to request and/or use condoms in their last three sexual experiences when compared with those who did not have any sex education at home. This could be due to the fact that those who had sex education at home may have developed a more pragmatic approach to issues of sexual health and, therefore, feel more empowered to negotiate condom use with their partners.

Stigma is another important driver of HIV epidemic in Benue State. It is, therefore, not surprising that most individuals cited “privacy” as their main concern when intentions to access HIV medications was explored. I found, from the qualitative interviews, that stigma is stronger in Idoma speaking areas. However, there was no statistical evidence to back this qualitative finding. This lack of statistical significance could be explained by the thinking that stigma is higher only in some Idoma speaking areas (for example Ogobia which was named in the interviews) and low in others. It is possible, therefore, that the qualitative interview was able to identify increased stigma in Ogobia (an Idoma speaking area) whereas the survey did not as questionnaires were not distributed in Ogobia (questionnaires were handed out only in Otukpo, a different Idoma speaking town to Ogobia).

There was evidence to suggest that stigma is higher among those who report that they do not know their HIV risk as well as those who state that their HIV risk is small when compared with those who reported that they have no risk for HIV. This finding could be a reflection of the social and cultural undertones that fuel local stigma behaviours – HIV is seen as a disease of immorality and individuals who believe that their risk for HIV is low are more likely to avoid contact with the “immoral” HIV positive other. Stigma was lower among those with tertiary education compared to those who have primary education or less and found to decrease with increasing education. This finding could be a reflection of the impact of education on understanding and perception of HIV and HIV related stigma – those who are better

educated are better placed to understand HIV messages, and by implication, more likely to act in non-stigmatising ways. This trend could also be a reflection of the gaps identified in local campaign strategies – local awareness campaigns have been reported to be heavily reliant on materials that are more useable for more literate members of the society. It is, therefore, beneficial for interventions to factor into their design, approaches that increase literacy levels locally and/or include more local content.

Increased access to medications was found to be associated with lower stigma. This finding presents a unique window of opportunity that could be exploited to reduce local HIV stigma. It appears that the reduction of HIV stigma that comes with increased HIV medication access stems from the benefits of HIV medications (such as increased life expectancy and better quality of life). One benefit of ARTs, for locals, is their potential to bring about the realisation that HIV is not a death sentence and by extension, not a punishment from God: people living with HIV who are on medications tend to live longer and have better quality of life compared to those who are not on HIV medications.

Criticisms of HIV awareness campaigns in Benue State, identified in this research, includes their huge reliance on mass media approaches and that they fail to incorporate enough of local content. As a result, HIV messages are not correctly communicated, especially in rural settings and among individuals with low levels of education and literacy. This picture is further compounded by the observation that only a small fraction of locals, especially in Idoma speaking areas, are literate (able to read and write) in local languages. That HIV testing remains low, with most respondents reporting their last HIV test was over 9 months prior to my research, is a pointer to the fact that locals are not actively engaging with HIV reduction activities at levels needed for effective control.

I found that HIV knowledge was fairly good among interview and survey respondents. However, there were misconceptions among general populations and specific groups (like MSM, traditional practitioners and Okada men) that are fatalistic. Misconceptions rather than outright lack of knowledge is, therefore, the prevailing knowledge gap: the knowledge locals have is not be enough to halt HIV transmission within some groups. This is in keeping with the statement obtained during the interview with Dr Chuks (a

representative of NACA) who stated that “lack of comprehensive knowledge rather than outright lack of knowledge is the important driver for HIV epidemiology in Nigeria”. Condom use remains lower than expected for the level of HIV knowledge demonstrated by locals, especially in rural areas: one explanation for this observation could be that locals are failing to correctly perceive and/or internalise their risk for HIV. As expected, HIV knowledge scores were positively correlated with levels of education. However, the lack of any significant relationship between HIV risk score and levels of education as well as HIV risk score and HIV knowledge score, raises further questions about local perception and internalisation of HIV risk.

Also I found, in the quantitative analyses, that there was no significant difference in HIV risk between respondents who were single and respondents who were married. This finding is in keeping with that from the systematic review, which suggests that being married does not confer protection from HIV.

Among the MSM network in Benue State, it was found that legal restrictions, discrimination and relationship secrecy continue to be the main drivers of high HIV risk behaviours. Members of the MSM community, in order to maintain an image that conforms to what is socially accepted, are forced to enter into heterosexual relationships (and marriage) whilst maintaining a secret gay life. Religious forums (churches and mosques) and mobile phones remain important communication channels that are poorly utilised in local HIV campaigns. Respondents were overwhelmingly in support of a law which criminalises deliberate transmission of HIV. Laws that decriminalise sex work, gay activities and criminalise deliberate transmission of HIV are, therefore, urgently needed (the latter somewhat controversial and will be explored later in this chapter).

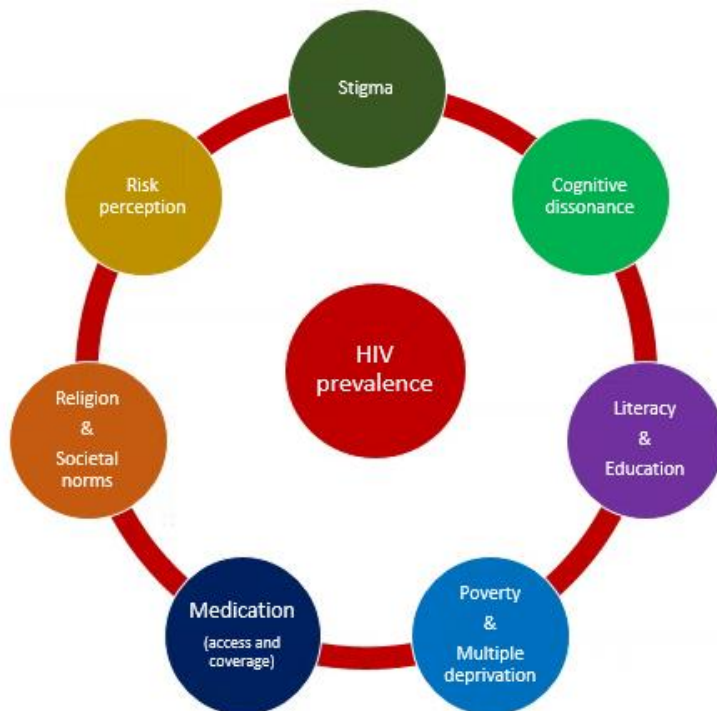
Condom use patterns did not vary significantly between people who inject drugs and those who do not inject drugs. This pattern is in keeping with findings from the systematic review, suggesting that risk for people who inject drugs has more to do with unsafe needle practises. Those who reported condom use at first sex and those who reside in city or urban areas were more likely to report consistent condom use. Inconsistent condom use is the more likely condom practise among respondents that had no sex education in the past.

10.5 Summary of research findings

Important themes in the epidemiology of HIV in Benue State, identified in this research, include HIV related stigma; social cognitive dissonance; low literacy levels; language barriers; low rates of condom use; poverty and multiple deprivation; issues relating to HIV medication access and coverage; religion and local social norms and, poor HIV risk perception. In a bid to create a concise summary of these variables, I have created an explanatory model (Figure 10.1) which reflects some of the themes highlighted above. In this model, most of the factors discussed in this chapter have been condensed into seven broad categories for clarity. It is worth noting that these factors interact with one another in a complex manner, within the local environment, to produce observed HIV prevalence.

Themes highlighted in this conceptual model work together, in a complex web of interrelated influences, to determine local HIV prevalence. For example “cognitive dissonance” which is influenced by structural factors embedded within the local environment (such as societal norms and religious influences) impacts on “risk perception” which in turn dampens preparedness for healthy sexual health choices. Similarly, “poverty and multiple deprivation” impacts negatively on HIV medication access and coverage. Poor medication access and coverage, in turn, has the potential to fuel HIV related stigma which in turn can negatively impact the uptake of HIV services and interventions.

Figure 10.1: A simplified illustrative model explaining HIV epidemiology in Benue State, Nigeria



One novel finding of my research is the non-linear relationship between HIV prevalence and income inequality (Gini) at country levels. It is also the first time that the concept of “cognitive dissonance” would be described in relation to HIV in Benue State. The relationship between brothel based FSW and Okada men implies that, for the first time, Okada men are presented as a high HIV risk group in Nigeria, in the same category as FSW, IDU and MSM. Further research is needed to explore this trend.

10.6 Combining the research evidence

Findings from all sections of my PhD work [i.e. the background, the comparative analyses, the systematic review and the empirical research] indicate there is sufficient evidence to suggest HIV is strongly associated with inequality, multiple deprivation and poverty. Communities most afflicted by HIV are those on the worst end of the inequality, poverty and deprivation spectrum. These factors work to increase risk for HIV by limiting what is available to people at country level (for example HIV medication coverage), influencing the capacity of locals to access

services (for example education and economic opportunities) as well as predisposing individuals and populations to high HIV risk behavioural choices (for example commercial sex work).

It was observed, in the course of my data collection activities (and highlighted in the qualitative interviews), that language barrier constitutes an important limitation to HIV campaigns in Benue State, especially in rural areas. I had my survey questionnaires translated into the two main local languages, in the hope to overcome this challenge. However, it became apparent during field work that most locals only speak their local languages - they were unable to read or write in the local languages and English. The importance of this observation is that awareness campaigns, especially through print media, may be failing to communicate intended messages. This observation makes bare the need for more efforts at ensuring accurate delivery of HIV messages. HIV knowledge gaps or misconceptions observed in this research could in fact stem from gaps in communication brought about by the language challenges I have observed in the field. For example, the misconception expressed in the interview with Aondona (an Okada man), in which he states that HIV is only transmitted through blood, exemplifies how messages could be lost in communication, especially when there is need for translation from one language to another. The need for a dedicated service that ensures accurate translation of materials into local languages and the use of pictorial depictions (as mentioned in some qualitative interviews) cannot be overemphasised. There is urgent need for interventions that aim to increase literacy levels and awareness campaigns to be well organised (i.e. delivered by well-trained resource persons and utilising accurately translated audio-visual materials). Whilst increasing literacy will provide long term solution to communication challenges observed in my research, well organised awareness campaigns on the other hand will come in handy as short term solution.

The need for awareness campaigns to adopt a grassroots approach is crucial, as research participants described awareness events that fail to incorporate enough local content. Research participants suggested decentralisation of campaigns into smaller and more functional units that are managed by locals and with inputs from young people. This approach, suggested in some of the interviews, is essential as it brings interventions close to locals and instils some measure of ownership that could lead to increased participation. However, the concept of community participation and

ownership can be a difficult one to explain and execute as roles and responsibilities are hard to define and clarify (377). In addition to being slow and arduous, community driven activities do require substantial amount of time and energy to build (378).

Another feature of current campaigns that make them less effective is their reliance on modalities that are poorly understood among less educated members of society. Potentially useful spaces for awareness activities in the local environment are religious circles and mobile phones. This is because most locals are religious and/or have mobile phones. Failure of current awareness campaigns to harness these spaces for HIV message communication constitute missed opportunities. HIV messages are predominantly communicated through roadside campaigns, flyers, radio and TV in the local area. However, these methods are often devoid of the much needed presence of gatekeepers and respected members of society (like pastors and imams) that can be mobilised through faith based campaigns.

Based on my field work, it appears existing HIV campaigns are not sensitive to the needs of young people. A number of young people reported that current awareness campaigns and HIV services are rigid and communicated in “blanket, non-targeted” ways that makes young people feel like “having sex is same as contracting HIV”. This rigid approach to HIV communication could be the result of the overriding influence of local ways of life (social, cultural and religious values) on awareness campaigns. Interventions must, therefore, seek to involve local opinion leaders and gatekeepers who are custodians of local norms and cultural practises. These local opinion leaders must be engaged in discussions about HIV from a factual and evidence based perspective that could help bring about cultural shifts necessary for effective HIV campaigns.

Furthermore, it was obvious that young people have a need for clarity in communication about HIV that older members of society are either not aware of and/or are not willing to address, for cultural and religious reasons. This difference in opinion and perspectives about sex education could explain why young people (below 34 years) responded that sex education services are accessible, whereas older respondents believed otherwise. This divide could also be a reflection of changing views, with young people holding a more liberal perspective about sexual

health matters compared to older members of the local population. This liberal view about sex education (commoner among younger research respondents) was picked up in the interviews: younger interview participants were generally more welcoming of sex education at home fronts, with some young people expressing regrets that their parents never had any sex education sessions with them at home. However, older members of society (usually parents) as well as religious structures are not very welcoming of sex education. Responses to ease of access to sex education may have been influenced by a mix of belief (for older respondents) and reality (for younger respondents). This divide in opinion further buttresses the concept of social cognitive dissonance that I have earlier described. Since older members of society are more likely to head charity groups and lead HIV campaigns, their conservative approach to issues of sex education and condom use could reflect in the manner and way in which campaigns are designed and delivered and ultimately received by the local youth population.

Government policies and lack of political will constitute important factors in the epidemiology of HIV locally. Important local HIV services are being cut because of dwindling international funding and a lack of local government support. Resources that have been lost, in some HIV centres in Benue State, include CD4 count services, records staff, and medical staff. As a result, an already burdened HIV care system is subjected to further strain and, the quality of care significantly compromised. Furthermore, it appears there is no policy (or legal framework) that stipulates the commencement of HIV medications at CD4 values of above 350. The implication of these policy and funding gaps is the creation of a pool of HIV positive individuals who are readily able to transmit HIV to others. This picture is further complicated by the fact that HIV medication coverage in Nigeria remains low. Furthermore, sending individuals who test positive for HIV back to their communities, and without starting them on HIV medications (because they have CD4 above 350), sends out the wrong message about the significance of HIV testing and could have a negative impact on people's perception of the seriousness of an HIV diagnosis and uptake of testing. There is also the attendant risk that newly diagnosed cases of HIV, not started on HIV medications promptly, could be lost to follow up. These challenges and bottlenecks in local HIV care pathways could explain why frustration was cited, in the interviews, as reason why some people living with HIV may want to deliberately

infect others. There is no law that criminalises deliberate HIV transmission in the local area, implying that deliberate transmission of HIV continues unchallenged. The significant support for laws that criminalise deliberate HIV transmission, expressed by locals, presents a unique opportunity (yet to be exploited and/or explored) in the fight against HIV in the local area. This strong support also highlights the urgency and need for this law. Deliberate transmission of HIV is criminalised in a number of countries (such as the United Kingdom, USA, Denmark, Canada, etc.) and these laws have resulted in the prosecution of one individual (Stephen Kelly) in Glasgow, in 2001, for recklessly infecting his ex-girlfriend Anne Craig (160, 165). However, opinions remains divided about the ethics and effectiveness of such laws. Some schools of thoughts opine that the criminalisation of reckless HIV transmission have the potential to “discriminate against people living with HIV, by targeting them for punishment and, do not reflect broader shared responsibilities for HIV transmission and sexual health” (164, 166). The National Aids Trust (NAT) also argues that deliberate or reckless HIV transmission prosecutions “do not result in reductions in HIV transmission, but on the contrary, they undermine public health activities” (166). Other factors that could potentially complicate the implementation of such laws include the difficulty associated with establishing if one took reasonable steps to protect others from contracting HIV, in view of what is obtainable in their local society and environment: for example the availability of condoms and HIV medications (164). It is, therefore, unjust to prosecute an individual (who has not been empowered enough by their local authorities) for failings that are embedded within the wider environment. As pointed out in this research, in Nigeria and Benue State, there are a number of environmental determinants of local HIV transmission that needs to be addressed (such as availability of HIV medications and social cognitive dissonance) before one can begin to have meaningful conversations around criminalisation of deliberate HIV transmission in a way that it will not be discriminatory and unjust. The degree of support expressed for laws that criminalise deliberate HIV transmission in the local area where I conducted my research is difficult to ignore and could be indicative of the local perception of the magnitude of this problem. It is, therefore, plausible to infer that local authorities need to explore the feasibility of such a law in Nigeria through further research aimed at characterising and quantifying this problem. Research into structural changes that may be required for effective implementation of these laws is also needed. More importantly, interventions that

seek to address broader environmental determinants of HIV transmission rather than policies criminalising reckless transmission should take front burner position. Given the controversies surrounding laws that criminalise deliberate or reckless HIV transmission and the state of HIV intervention in Nigeria (and Benue state) at the moment, it will be sensible to classify the implementation of laws that criminalise reckless HIV transmission as a medium to long term objective.

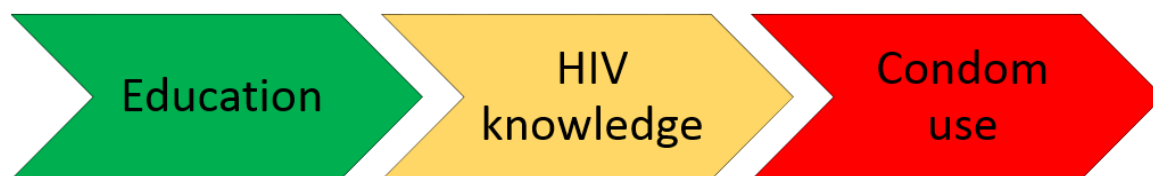
HIV continues to be perceived as a death sentence locally. This is because of dwindling donor funding and HIV services, poverty, low medication coverage and stigma (that are significant barriers to HIV medications access locally). In fact, HIV was perceived as a death sentence in countries like the USA and UK many years ago when there were no effective HIV medications available. This perceived death sentence that is associated with an HIV diagnosis underpins local HIV related stigma. Since HIV is highly stigmatised, locals would normally not disclose their status to their partners and members of their immediate society. I found that this vicious and seemingly impossible to break cycle of stigma could be halted (and reversed) through HIV education (as expressed during the interview with Paul, a long distance driver) and with HIV medications [as demonstrated in one of the publications (175) included in the systematic review]. It follows, therefore, that increasing medication access could prove a very important way to address local HIV burden that stems from stigma, considering stigma remains one of the commonest obstacle to HIV medication access cited by locals. Access to medications that reduce chances of HIV transmission, it appears, is the minimum requirement for one to effectively control the HIV epidemic in Benue State. More so that a number of cultural and religious practises are at conflicts with the widely promoted ABC prevention method.

Poorly funded, neglected and non-functional PHC facilities within rural settings creates a vacuum that is filled by traditional healers and traditional birth attendants who are barely knowledgeable about HIV transmission. As a result, there is widespread substandard and unsafe (quack) medical practices that in turn encourage HIV transmission. There is need for government to invest in training traditional healers and traditional birth attendants in aseptic techniques, considering TH/TBA have been tasked with the job of filling healthcare needs gap that exist at local levels through their incorporation into the PHC structure (96). An intervention that seeks to

empower TBA/TH has potentials for great success as it will owned and driven by host communities.

From the qualitative and quantitative exercise, education and HIV knowledge were repeatedly implicated in the processes that lead up to high risk HIV behaviours. I found a significant association between education and condom use in my univariate analyses. Education was later found to be non-significant in the fitted model explaining patterns of condom use during last three sex. This led to the thinking that the relationship between education and condom use may not be a direct one and could be dependent on a third variable (HIV knowledge). Respondents with better education performed better on the knowledge section of the questionnaire and higher HIV knowledge scores in turn was associated with safer condom practises. It is, therefore, logical to theorise that the relationship between education and condom use, in my study population, is moderated by HIV knowledge scores (Figure 10.2).

Figure 10.2: Conceptual flow diagram explaining the proposed theory of relationship between education and condom use



This explanation supports the thinking that both education (literacy) and HIV knowledge are important variables in HIV risk reduction discussions, especially in environments like Benue State, where the mainstay of HIV interventions remains condom use and behavioural interventions. Being educated up to and above secondary education appears to be enough to build the skills needed for individuals to adopt safer practises, as far as condom use is concerned.

Condom use is only just one aspect of HIV risk. HIV risk score (which captures HIV risk from other domains such as sex work, injection drug use, needle sharing, sex with a sex worker, sex with non-regular partner, MSM sexual orientation, using alcohol before sex, not using condoms during last three sex and irregular condom use during last three sex) was calculated to explore in detail the concept of risk

perception and excess risk that may derive from high risk behaviours. It was found that HIV risk score was not significantly associated with HIV knowledge score and levels of education. The lack of correlation between HIV risk scores and these two variables (HIV knowledge and education) could be a pointer to the fact that individuals are not correctly perceiving their risk for HIV or they are failing to correctly internalise their HIV risk. This highlights two very important issues. First, there could be a practical limit to knowledge and education based approaches. That is, education does not always result in the desired action. The theory that awareness and education does not always translate into desired action (in this instance behaviours that reduce HIV transmission risk) is a well-known phenomenon in public health parlance (379). Second, the role of local environment in shaping action cannot be overlooked. This is because, knowledge and education may increase safer condom practises, however, factors embedded within society that are capable of shaping HIV risk perception and influencing efficacy are equally important in determining behaviour. For example, an individual who is knowledgeable in how to use condoms may chose not to use it for religious reasons. This leads my discussion to the next set of variables (environmental factors) that could limit the effectiveness of education, HIV knowledge and, by implication condom use.

Another reason for the lack of significant correlation, observed in this research, between the computed HIV risk score variable and some respondent demographics (such as age, level of education, gender, marital status and HIV knowledge) could be explained by the fact that the HIV epidemic in the local area (and in Nigeria) is generalised, with transmission occurring in the general population and high HIV risk groups. The concept of HIV risk being directly proportional to number of high HIV risk behaviours is, therefore, unlikely to hold true for an environment where the HIV epidemic is generalised and dispels the widely held local belief that HIV is a disease of the immoral and ungodly.

Religion could influence local behaviours and do so regardless of local HIV knowledge and levels of education. This is because faith can, very often, be at conflict with science. At times the practical display of one's faith will require that scientific evidence is overlooked (as is the case with respondents reports of people living with HIV abandoning their HIV medications as evidence of their belief and acceptance of divine healing). The depth of penetration of religion into local way of

life was exemplified in the inscription “God is on [in] control” which I saw in one of the brothels where I interviewed some brothel-based sex workers (top left image in Figure 6.1). God is virtually present in every sphere of local life, it will seem, even in a brothel. Some locals expressed the belief that HIV could be healed by God, only if one has enough faith and acts according to divine instructions. Locally prevalent trends such as faith healing and the dislike for condoms and sexual health conversations within religious circles have been demonstrated to be at conflict with the science of HIV prevention. Religious influences, therefore, go a long way in blunting HIV risk perception and could explain, in part, why despite good HIV knowledge, HIV risk score does not correlate with education and HIV knowledge scores. Religious influences could also result in conflict of ideologies, especially among young people (social cognitive dissonance): messages preached in religious places differ significantly from what obtains in non-religious settings and from the practical experiences of young people (i.e. peer and social pressures to engage in sex acts).

Another local factor, capable of preventing HIV knowledge from translating into expected action (for example increased condom use), is the local economy and living standards. There is demonstrable poverty and deprivation in Benue State which in turn impacts on local practices. Individuals who are poor would tend to care less about their HIV risk and engage in high risk behaviours (such as female sex work or selling off of their HIV medications) in order to meet their economic needs. This again dampens local perception of HIV risk and/or comes in the way of healthy actions.

Gender plays a rather indirect but important role in local HIV epidemiology. Gender, as a social construct, ensures that certain societal values and roles are ascribed to a particular gender. Among local population, the female gender is ascribed a passive role which reflects in her reduced capacity to negotiate safer sex practices in relationships as well as in her capacity to take advantage of opportunities for upward social mobility. This could explain why females performed poorly (compared to their male counterparts) in most of the indices explored in my analyses (for example levels of education, consistency of condom use, and rates of HIV testing). It is expected, locally, that females submit to males and, with decisions as simple as going for an HIV test may need to be approved by a male (especially for women who are

married). In both the qualitative and quantitative exercises, it was found that very low levels of sex education was taking place at home front. This low levels of sex education at home is expected, given the cultural and religious contexts in the local area: such activities would be considered immoral, sinful and capable of corrupting good morals.

The pathway for how local environment impacts on HIV epidemiology could be reduced to two effects they create: poor risk perception and social cognitive dissonance. These later two in turn impacts on people's preparedness and efficacy when it comes to issues relating to condom use and access to HIV services. I have attempted to condense this into a simple conceptual frame work represented in Figure 10.3.

Figure 10.3: Diagram explaining how local environment impacts on HIV epidemiology



Another important finding in this research is the very low rates of condom use at first sex reported by respondents which could be a reflection of poor preparedness for safer sex as well as poor sex education. This has significant implications for younger people who may be exploited. Evidence from this research also suggests that being married is not protective against HIV. Possible explanations for the lack of risk difference between married and single individuals could include the cultural practise of polygyny and non-disclosure of HIV status among partners or couples. This trend is further reinforced by the fact that it is less of a problem if a male is caught in the web of an extra-marital affair compared to the woman.

I was able to demonstrate a unique and important link between Okada riders and FSW, implying that Okada men could be considered as a high HIV risk group. This is because of the finding that Okada riders would prefer to have sex with brothel based FSW, based on the misconception that brothel based FSW are less likely to be infected with HIV. As a result, they (Okada riders) often fail to use condoms when

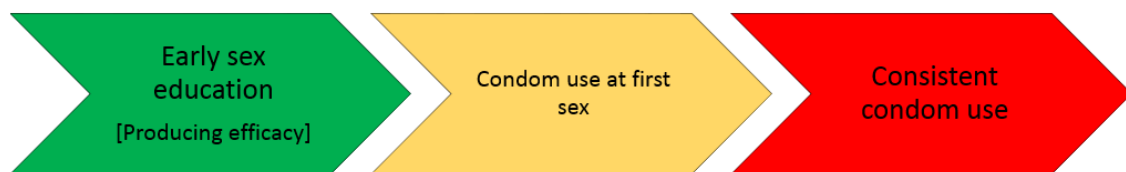
engaging the services of FSW. This pattern is not only important for Okada riders but forms a significant link between a defined high risk group (FSW) and the general public. This is because of casual sexual encounters between Okada men and random members of the general public. Since Okada men are not considered a high HIV risk group, the tendency for members of the public to insist on condom use during sex will be low as local condom use is often tied to one's perception of HIV risk.

Alcohol use before sex was not a significant predictor of condom use in the last three sexual experiences, despite locals suggesting that alcohol increases HIV risk through unprotected sex. Since alcohol is not acceptable within religious circles (because it is usually associated with immoral behaviours and seen as a sign of being promiscuous), it is possible that the association between alcohol use and HIV risk cited in the interviews could have stemmed from a moral or religious standpoint rather than a real effect. This moral argument supports the trend described by Dr. Chuks of NACA. In this interview, Dr Chuks stated that, "statistical evidence in a recently concluded NACA research suggested that 40% of new infections were likely to occur among members of the general population who consider themselves to be low risk for HIV (namely cohabiting partners, and people who are married)". Members of religious groups would often consider themselves low risk for HIV as they believe that HIV is a disease of immorality. An alternative argument could be that there exists a dose response relationship between risk for HIV and alcohol use, in which excessive use of alcohol will be associated with more risk. This lack of statistical evidence to back up the qualitative finding of alcohol being responsible for increased high HIV risk behaviour is worth further investigation.

Significant predictors of the likelihood of consistent condom use identified in this research include urban or city residence and condom use at first sex. Inconsistent condom use practises is most likely among individuals that have not had "sex education at home" in the past. It is possible that the positive association between condom use at first sex could be the result of the self-confidence (and efficacy) created by sex education delivered to respondents at home and at an early age. This logic supports the argument that sex education needs to be started at an early age, preferable before young people attain the age where they begin to explore sex, in order for long term benefits such as consistent condom use to be realised (Figure

10.4). This finding further supports the argument for the inclusion of sex education in local education programs and, at levels that target young people (preferably late teenagers). The association between consistent condom use and places of residence could be explained by challenges associated with local HIV campaign (such as HIV services siting, frequency of awareness campaigns, language barrier and poverty) that disproportionately affect and, disadvantage, rural residents.

Figure 10.4: Relationship between sex education at home and consistent condom use



10.7 Study strengths

The choice of different techniques in my research constitutes confers robustness from a methods point of view. A comparative analyses, ensured that I am able to do a focused and structured review of data, which is relevant and necessary for my research. This also ensured that I have kept my PhD work within manageable scope whilst at the same time describing unique HIV patterns at country levels. A detailed review, in the form of a systematic review and meta-analyses, provided the theoretical basis and foundation for my research. The qualitative component of this research provided the context needed for one to understand the uniqueness of HIV epidemiology in Benue State and the quantitative arm was relevant for exploring relationship pattern(s) between relevant themes. Furthermore, a mixed methods approach ensured that observations made in the qualitative process are further substantiated, refuted or classed as inconclusive through quantitative methods. The chances of arriving at a spurious conclusion is, therefore, minimised in this mixed methods research. The use of a coding frame in the qualitative data generation as well as the fact that interview participants were drawn from a wide range of background are some of the strengths of my study. The benefits of having a coding

frame includes a structured approach to data analyses that ensured inconsistencies in approach to data analysis are minimised. The coding frame also ensured that the right kind of questions were asked of my data. The fact that the primary researcher, responsible for the conduct of interviews, is from the local area also adds strength to the research as he is less likely to be considered as an “outsider” by respondents. Furthermore, that a number of my research findings correlate with what is already known in other communities (about HIV) is a pointer to the fact that there is little negative researcher effect in the research.

10.8 Study weakness and limitations

In the systematic review, I relied on data collected and aggregated by others for my analyses. I recognise that these data may have been collected with a different set of objectives from mine. Since participants (in the empirical research stage) were interviewed about experiences in the past, it is possible that their accounts may not be as accurate. The implication of this is that the data I have used for my literature review and data gathered through field work may be lacking in accuracy due to temporal constraints.

Another potential weakness is the survey questionnaire. Some sections of the questionnaire were designed based on qualitative data and are, therefore, unique to this study. The questionnaire was piloted in the UK and in Nigeria and adjustments made before data were collected to ensure reliability and validity issues are minimised. Also, certain sections (like the knowledge section) were based on tested questionnaires with known psychometric properties. However, other sections of the survey instrument were new and have never been used outside of this study. The psychometric properties of these sections of the questionnaire remains unknown. Also, the empirical stage relied heavily on self-report, which can be subject to reporting bias. My study is a cross section of views and perceptions, thus, it is weak in proving causality. Only theories and relationships can be explored as a result.

Low literacy levels of participants is another limitation to my research work. To limit the impact of low literacy, only individuals who can read and write in English were allowed to complete the English version on their own. Participants not literate in local

and English languages were interviewed by the researcher (IO). This alternative was considered better than excluding non-literate participants, to avoid bias. The downside is that not very many could be interviewed due to time constraint (limited time for field work). Another limitation is poor postal services in Benue State. This meant that it was a lot more difficult to distribute and retrieve questionnaires: questionnaires were distributed and retrieved by hand. A lot of time and resources were spent on travels phone calls. In some instances, individuals were brought together in groups to complete survey questionnaires as a cost saving alternative. This could explain why I had only 391 questionnaires back out of over 1000 distributed. It also explains why my sample had more town respondents.

Another limitation to this piece of PhD work is the fact that some response categories (such as numbers of those who report they are living with HIV, numbers reporting same sex or bisexual relationships and those who identify as sex workers) have very small numbers of responses. This implied that further subgroup analyses that may be helpful in explaining HIV epidemiology in the local area were not tenable. However, in instances where there was sufficient numbers (for example analyses along lines of gender, marital, age and levels of education) sensitivity/subgroup analysis were conducted and the results and possible implications presented in relevant sections.

Finally, I was not able to exhaustively answer one of my research questions which relates to “why HIV prevalence in Benue states is higher than national prevalence levels?” Though some of the variables identified in this research could well explain why prevalence is higher in Benue state, a more robust answer to this question would be one that incorporates a comparative design which compares Benue state with a few other states in Nigeria. This sort of design is well outside of the scope of my PhD research work given the amount of resources and time that is required to execute a comparative study involving more than one State in Nigeria. I have adopted the above design to ensure that my work remains relevant, manageable and reflects best use of available resources at the time of this research.

10.9 Implications for policy and interventions

From the forgoing, it is apparent that ABC (abstinence, being faithful and condom use), the mainstay of current government led campaigns against HIV in local area, is grossly inadequate and ineffective. This is because of existing conflicts between the content of the ABC campaign and what is culturally perceived as norm/acceptable behaviour (social cognitive dissonance). For example, it is not possible for all young people or unmarried young persons in this local area to abstain from sex. However, the expectation from (churches and mosques) and cultural standards demands that young people abstain from sex and all sex related conversations. Similarly, being faithful is a campaign requirement that is rendered ineffective by local practise of polygyny and the unwritten norm that men are allowed some leeway in terms of fidelity in relationships. Furthermore, condom use is out of bounds for unmarried individuals as the question of sex among young people is considered immoral to even discuss. The only methods that may be culturally and socially appealing to locals are comprehensive approaches that incorporate a number of key elements (namely increased medication coverage, increased literacy, economic empowerment and poverty eradication). Religious groups (churches and mosques) could help shape local HIV narratives, positively, by actively encouraging HIV medications uptakes among adherents; addressing stigma by stressing that HIV is not a punishment from God; discouraging fraudulent claims of divine HIV cures and, encouraging the “ABC” campaign in full, without bias against the condom component of campaigns.

Comprehensive interventions have the potential to reverse HIV related stigma and address cultural norms inimical to the fight against HIV. They can also lead to improved gender rights and gender equality. For example, HIV stigma is largely informed by the perception that HIV is a death sentence and punishment from God. These perceptions are traceable to poor medication coverage and access issues. Once individuals begin to access medications and mortality as well as quality of life improves, some local norms and superstitions about HIV that are hinged on the perception that HIV is a death sentence and/or a curse from God, are likely to fade away because of the superior argument that treatment will present. Similarly, the belief that HIV disrupts family and marriage potentials is likely to change once locals

begin to see examples of HIV free babies born to HIV positive parents. People will only adopt a new way of life (or yield to cultural transformations) only if they are presented with a new way of doing things that is superior to what they previously knew. A superior argument in the context of my research will entail increased availability of HIV medications and the knowledge that people living with HIV can attain their full potential with HIV medications. It is also worth stating that future campaigns aimed at reducing HIV burden in Benue state should incorporate elements that address misconceptions about HIV, especially in local and remote areas. These enlightenment campaigns will be more effective if they were designed in ways that overcome language barriers identified in this research.

Furthermore, I found that HIV related stigma decreases with increases in level of education, a finding which strengthens the argument for inclusion of interventions that seek to improve literacy levels in local HIV programs. Government needs to increase HIV funding and explore more innovative approaches (such as the use of mobile phone applications) in HIV campaigns. There is need for government to engage religious groups, key stake holders, educational institutions and grassroots in comprehensive HIV activities. These important gate keepers and public spaces have the power to effect huge change within their communities if properly mobilised. There is also need for government to decriminalise FSW and MSM activities so as to open up these key high risk groups for increased interventions and HIV research. Finally, there is need for government to explore laws that prohibit deliberate transmission of HIV (due largely to strong local support in favour of such laws) and make it mandatory for sex education to be taught at secondary schools.

10.10 Future research questions

One area of future research interest is the question of risk perception. An understanding of the perception of HIV risk in this local environment is important for the development of targeted and cost-effective interventions. It is also important that more research are carried out among high HIV risk groups and key stake holder groups (such as traditional healers and birth attendants) to ensure that patterns and correlates of HIV epidemiology are clearly understood and characterised at local levels. Further research is needed to explore the relationship between alcohol and increased HIV risk described in the qualitative arm of my research. It is possible that

HIV risk behaviours may be positively associated with alcohol consumption, but in a non-linear fashion. Research exploring, for example, the presence (or absence) of a dose response relationship between HIV risk behaviours and different levels of alcohol use may reveal an interesting pattern. The feasibility of developing a mobile phone application that deliver HIV related information to locals, at the convenience and privacy of their mobile phones, is another potential research project. Most Nigerians and Benue State residents have mobile phones that could be used to communicate messages that are considered immoral in public settings for religious, social and cultural reasons. Furthermore, research into high risk HIV practises among Okadas in this local area is important to further establish or refute any associations between this job and HIV transmission as implied in my research. Finally, research comparing effectiveness of comprehensive approaches against traditional ABC methods (that are rooted in behavioural change theories) are needed to assess impact and cost-effectiveness of comprehensive methods in this environment.

10.11 Conclusion

The HIV picture in Benue State and Nigeria has a lot to do with poverty and policy gaps. According to Maslow's hierarchy of needs, physiological needs (need for essentials such as food, water, warmth and rest) supersedes the need for safety (security) which in turn ranks higher than our needs for belongingness (love and relationships) (380). It, therefore, follows that interventions that fail to address basic needs of locals (like poverty and inequality) will continue to fall short of the intended objective of reducing HIV prevalence (love and relationship) in Benue State and Nigeria. Halting HIV transmission in Benue State will require more than just behavioural interventions: it will require comprehensive (or combination) intervention approaches that incorporate poverty reduction initiatives and a significant grassroots and youth participation.

There is no doubt that HIV prevalence is on the decline in Nigeria (93, 381) and much of the gains recorded in Nigeria can be attributed to three main factors: upscaling of access to HIV medications, rolling out of more HIV treatment/testing centres and policy changes (see section 2.11 on HIV response in Nigeria above). However, significant levels of new infections were reported in 2015 (19, 382), with much of these undoubtedly taking place in pockets of under reached and hard to

reach populations like those in rural Benue state. It is the understanding and interruption of HIV transmission in defined populations (like those captured in my research) that forms the crux of my PhD work. HIV continues to be a major public health problem today, largely because advances recorded in the fight against HIV (like potent HIV medications and access to these medications) are yet equitably distributed between populations and groups across the world. The next big task in the global fight against HIV is, therefore, to ensure current gains are distributed fairly.

10.12 Reflexivity (my role in the research)

I was responsible for the design of the research question and then the application (and securing) of funding (via the commonwealth scholarships commission in the UK). I was also responsible for data generation and analyses of data. The presentation of this work is entirely my plan and I have not used any professional proofreading services in the writing up process. I have received invaluable supervisory support from my supervisors throughout this piece of work: they have offered advice on how to maintain a healthy work-life balance (I remember a walk and a trip to the Victoria tunnel organised by Ed Ong) in addition to providing support needed for a standard PhD work. I have clearly reported any support sought outside of what is available to me at Newcastle University (like when I needed to transcribe some of my interviews: this was done by a UK based professional transcriber – JD transcription services). Overall, I have learned and applied new research skills during the course of this research: designing data collection tools; organisational skills like arranging and managing meetings in academic and non-academic settings; conducting and analysing qualitative interviews and budgeting (I was able to successfully complete my PhD research using resources available to me and staying within budget). Finally, the fact that I am a native of Benue State (Idoma) meant that I was not treated as an outsider, a factor that has important implications for the quality of data collected (during field work).

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Appendices

Appendix A: Sample search strategy (Medline)

1. HIV.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
2. HIV infection*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
3. Human immun*deficiency virus.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
4. Acquired Immun*deficiency Syndrome.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
5. 1 or 2 or 3 or 4
6. Stigma.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
7. Telephone.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]
8. Social marketing.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

9. (Voluntary counselling and testing).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

10. Voluntary counselling.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

11. Knowledge.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

12. Internet.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

13. Behavio*ral.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

14. Behavio*r.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

15. School.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

16. Community.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

17. Information communication.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

18. Home.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

19. Economic.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

20. Abstinence.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

21. Abstinence plus.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

22. Mass media.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

23. Skill* building.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

24. Psychosocial.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

25. Condom.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

26. Campaign*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

27. 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26

28. Succes*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

29. Gain*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

30. Progress*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

31. Change*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

32. Mortalit*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

33. Incidence.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

34. Prevalence.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

35. Problem*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

36. Limitation*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

37. Set*back*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

38. Politic*.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

39. Economic.mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]

40. 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39

41. 5 and 27 and 40

42. exp Africa, Western/ or exp Africa, Northern/ or exp South Africa/ or exp Africa, Eastern/ or Africa.mp. or exp "Africa South of the Sahara"/ or exp Africa, Central/ or exp Africa/
or exp Africa, Southern/

43. 41 and 42

Appendix B: Details of included studies appraisal

Cross Sectional studies quality assessment – National Collaborating Centre for Environmental Health			
Study ID	Title page and introduction	Study methods	Results and discussion
Abasiubong 2012 (194)	Peer reviewed article published in a journal (Mental Health in Family Medicine). The authors did not state the funding source nor declare any conflict of interest. There is a convincing and well defined rationale for conducting this study and the study addressed a well-defined question.	Sample size was calculated based on HIV/AIDS prevalence of 5% and a sample error of 3% (thus adequate). No significant difference was reported in sociodemographic data of participants (table provided). Data was self-reported (questionnaire) and the validity of the questionnaire was not stated.	The results may be accurate for the local population.

Abiona 2014 (195)	Peer reviewed article published in a journal (Health Education Journal). Authors asked a well-defined question and there is convincing rationale for the research. The study was supported by the Illinois General Assembly and the Illinois Department of Public Health.	Participants were recruited from four continents. Countries included were chosen on the basis of differential HIV/AIDS prevalence. Multistage sampling was employed. Data collection instrument was translated and back translated and the psychometric properties were reported in another document (Balogun et al., 2011)	Results may be accurate for the populations studied but generalisation beyond the groups studied will be seriously limited due to small numbers
Aboki 2014 (269)	Peer reviewed article published in a journal (African Journal of Reproductive Health). Authors asked a well-defined question and there is good rationale for the study.	Participants were drawn from a representative database in 2007 and 2012 respectively and the data obtained were analysed using standard techniques.	Results likely to be accurate for the population studied.
Adebajo 2012 (196)	Peer reviewed article published in a journal (African Journal of	Respondent driven sampling and blood tests were employed in data collection.	Results likely to be accurate for the population studied

	<p>Reproductive Health). Authors asked a well-defined question and there is convincing rationale for the research. Canadian Institute of Health Research (CIHR) provided funding for the research data collection.</p>	<p>Blood samples were collected and analysed using standard and reliable techniques. Psychometric property of the questionnaire was reported (Cronbach's alpha of 0.79). Analysis methods were adequate and appropriate.</p>	
<p>Adebayo 2010 (182)</p>	<p>Peer reviewed article published in a journal (African Journal of AIDS Research). Authors asked a well-defined question and there is convincing rationale for this research. The research was funded by DFID and USAID</p>	<p>Participants were drawn from a nationally representative survey (the National HIV/AIDS reproductive health survey) using probability sampling that employed three-level multi-stage cluster sampling (Non-response rate for the database survey was 1.6%). Qualitative data were generated through focus group discussions with participants of the research. FDG sessions had about 7-</p>	<p>Result likely to be accurate for the population studied.</p>

		8 participants per session and were conducted using local languages or English language.	
Adebowale 2013 (197)	Peer reviewed article published in a journal (African Journal of Reproductive Health). Authors asked a well-defined question and there is convincing rationale for the research. Source of funding was not stated	Participants were drawn from 2008 demographic health survey conducted in Nigeria. This is a nationally representative database	Results likely to be representative and accurate for the population studied but the use of a database may be a limitation since the datasets may have been collected without these research questions in mind
Adegun 2012 (270)	Peer reviewed article published in a journal (Journal of Public Health and Epidemiology). The authors asked a well-defined question and there is clear rationale for this study. Source of funding not stated.	Participants were recruited into the study only if they consented to taking part. Psychometric properties of the questionnaire used was not mentioned and it did not appear like the questionnaire was piloted.	Results not likely to be accurate for the population. Generalisation beyond the study populations is questionable and limited.

<p>Adejuyigbe 2004 (198)</p>	<p>Peer reviewed article published in a journal (AIDS Care). The authors asked a well-define question and there is convincing rationale for the research. Source of funding was not stated and the authors did not declare any conflicts of interest</p>	<p>Participants were recruited based on clinical symptoms suggestive of HIV infection. They were then interviewed and tested for HIV infection. Tests for HIV infection were conducted in the haematology department of the hospital. Details about the questionnaire psychometric properties were not given.</p>	<p>The results may be accurate for the population studied</p>
<p>Ahmed 2013 (201)</p>	<p>Peer reviewed article published in a journal (AIDS Care). The study received support from U.S. Centres for Disease Control and Prevention and the National Institutes of Health Fogarty AIDS International Training Research Program. The study addressed a well-defined question</p>	<p>Sample was large and confounders were adequately addressed. Differences in sociodemographic data of participants were not significant (table provided). Data collection relied on tests (for HIV) and reported data (questionnaire). Analyses were not on an intention-to-treat basis</p>	<p>Results may not be accurate for the population studied as interviews on HIV care services were done for less than half of the study participants and self-reported STI were not laboratory confirmed cases. Care should be exercised in generalisation beyond this population</p>

	and was well focused. There is a convincing rationale for this study		
Aishat 2015 (271)	Peer reviewed article published in a journal (Pan African Medical Journal). The research was funded by Nigeria Field Epidemiology and Laboratory Training Programme and African Field Epidemiology Network (AFENET). Authors asked a well-defined question and there is clear rationale for the research.	A two-stage sampling technique was used: stage one involved random selection of sites and stage 2 involved random recruitment of participants in six randomly selected sites. Sample size calculation was used to determine the minimum number of participants required. Data was collected by trained research assistants. Psychometric properties of the questionnaire was not reported and it is unclear if the questionnaire was piloted. Data was analysed using Epi-Info.	Results likely to be accurate for the population studies. There is good potential for generalisation beyond the population studied.
Ajoge 2013	Peer reviewed article published in a	Authors used a combination of	In summary, the research methods though broad enough to capture prevalence

(267)	journal (International Journal of Infectious Diseases). This research was funded by Ahmadu Bello University Board of Research and the HIV Research Trust	questionnaires and blood tests in the research. Blood tests were carried out using standard techniques. It appeared they had employed multistage sampling technique for selection of cases. The psychometric properties of the questionnaire used were not stated. The sample may not have been representative of the study population and this was stated as a limitation by the researchers (limited resources cited as reason).	information lacked the required depth needed to address the research question – to determine factors associated with high prevalence of HIV in North central or Middle Belt region of Nigeria. The research conclusion that “community-based intervention is necessary for the control of HIV in North-Central Nigeria” is not supported by the research findings and draws on a distant correlation that further research is needed to understand important risk factors in the region studied. Furthermore, the bulk of this research work hardly demonstrated any differences between the communities studied in terms of factors associated with high prevalence of HIV in the stated region.
Ajuwon 2010 (183)	Peer reviewed article published in a journal (International Quarterly of Community Health Education). The authors asked a well-defined question. Funding source for the	Large sample size with well-defined populations. Interviewers were given trainings and assessed prior to data collection. Interviews were conducted one-to-one and interviewers were	Results highly likely to be accurate for the study population

	study was not stated. There was a convincing rationale for the study	matched with those they interviewed on gender. Data analyses appeared appropriate	
Akani 2005 (203)	Peer reviewed article published in a journal (Nigerian journal of medicine: Journal of the national association of resident doctors of Nigeria). The authors asked a well-defined question and there is convincing rationale for the research. Source of funding not stated	Convenience sampling was adopted. Tests were conducted using standard and reliable techniques/methods.	Results likely to be accurate for the population studied.
Akpa 2011 (204)	Peer reviewed article published in a journal (HIV and AIDS Review). Funding source was not stated. The research addressed a well-defined	Large sample size. Interviews were conducted at multiple locations chosen by convenience. Questionnaires (“standardised”) were also employed in	The results likely to be accurate for the populations included in the study

	<p>question and was well focused.</p> <p>There is also a convincing rationale for this study</p>	<p>the data collection process. No mention made of any confounding variables</p>	
<p>Aniebue 2009 (205)</p>	<p>Peer reviewed article published in a journal (The Southern African Journal of HIV Medicine). The authors asked a well-defined question and there is convincing rationale for this study. Source of funding was not mentioned</p>	<p>Consecutive truck drivers who use the local motor park were recruited for the study. Questionnaires, whose psychometric properties were not stated but were pretested, were used for data collection. Medical students were responsible for data collection and the study had a response rate of 89.2%</p>	<p>Results likely to be accurate for the population studied only.</p>
<p>Ankomah 2013 (206)</p>	<p>Peer reviewed article published in a journal (HIV/AIDS - Research and Palliative Care). The research surveys were funded by grants from the British department for</p>	<p>Multistage sampling method based on data from multi-round cross-sectional surveys conducted by the Federal ministry of Health Nigeria. Analyses appeared adequate</p>	<p>The result could be said to be accurate for the population studied. However, small numbers in some of the analyses can be an important factor in the extent to which results could be generalised.</p>

	<p>international development (DFID) and United States department for international development (USIAD). There is a convincing rationale for this study and the research addressed a well-defined question.</p>		
<p>Apena 2014 (207)</p>	<p>Peer reviewed article published in a journal (International Journal of Technology, Policy and Management). The authors asked a well-defined question and there is convincing rationale for the research. Source of funding was not stated</p>	<p>Authors employed a stratified proportional sampling technique for case selection. Psychometric properties of the questionnaire used were not stated but some details of how the questionnaire was developed were reported. Statistical analyses were appropriate for the data.</p>	<p>Results are likely to be accurate for the population studied</p>
<p>Aransiola 2014 (181)</p>	<p>Peer reviewed article published in a journal (Global Health Promotion).</p>	<p>Participants were selected via purposive sampling from a pool of service users.</p>	<p>Results may be accurate for the population but accuracy of this statement is limited by the small numbers and the fact that participants were recruited from</p>

	<p>This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. There is a convincing rationale for this study and the research asks a clearly focused question.</p>	<p>Interviews were analysed using standard and acceptable techniques.</p>	<p>a pool of individuals who are already known to the facility.</p>
<p>Asekun-Olarinmoye 2009 (208)</p>	<p>Peer reviewed article published in a journal (Research Journal of Medical Sciences). Source of funding for research was not stated. There is a convincing rationale for this study and the research asks a clearly focused question.</p>	<p>Stratified random sampling was employed. Data was self-reported (questionnaire) and there was no attempt made at addressing potential confounding variables. Questionnaire was pretested in another institution. Analyses appear adequate. Response rate was 90.9%</p>	<p>Results may be accurate for the population studied.</p>
<p>Ayoola 2013</p>	<p>Peer reviewed article published in a</p>	<p>Authors used purposive sampling for</p>	<p>Results likely to be accurate for the population studied</p>

(209)	journal (African Journal of Reproductive Health). Authors asked a well-defined question and there is convincing rationale for the research. The authors asked a well-defined question and there is convincing rationale for the research. Funding source was not stated.	case selection and the instrument for data collection was pretested though the psychometric properties were not stated. Data analysis appeared to be appropriate for the data.	
Azunwu 2012 (210)	Peer reviewed article published in a journal (Journal of Community Health). Funding source was not reported. There was a convincing rationale for this study and the research addressed a well-defined question.	Convenience sampling method was adopted. Blood samples were collected according to standard protocols and analysed using standard and validated instruments.	Results are highly likely to be accurate for the population studied

Babalola 2007 (211)	Peer reviewed article published in a journal (AIDS & Behaviour). The authors asked a well-defined question and there is convincing rationale for the study. The study was funded by Packard Foundation.	Multistage sampling technique. The process was randomised and the authors employed the ballot method. Questionnaires were administered by interviewers. The psychometric properties of the questionnaire were not reported and it is unclear if it was pretested in the population.	Results likely to be accurate for the population studied
Babalola 2009 (212)	Peer reviewed article published in a journal (Social Science and Medicine). The authors asked a well-defined question and there is convincing rationale for the research. Source of funding for the research was not stated.	The authors used a national database which is reported to be nationally representative and weighted for states, rural-urban locations and gender	Results likely to be accurate for the population
Balogun	Peer reviewed article published in a		

2013 (273)	journal (Nigerian Quarterly Journal of Hospital Medicine). Authors asked a well-defined question and there is clear rationale for the study.		
Balogun 2014 (274)	Peer reviewed article published in a journal (Nigerian Postgraduate Medical Journal). Authors asked a well-defined question and there is clear rationale for the study.		
Bassey 2007 (213)	Peer reviewed article published in a journal (International Nursing Review). Funding source was not reported and there was no declaration of conflict of interest. There is convincing rationale for this research and the research question	Convenience sampling method. No details provided on the properties of data collection instrument. Participants seem to be aware of the research question and focus group discussions had large numbers (minimum of 15 per session).	Results may be accurate for the population studied

	was clearly defined.		
Bukar 2008 (214)	Peer reviewed article published in a journal (Odonto-Stomatologie Tropicale). Source of funding for research was not stated. There is, however, a convincing rationale for this study and the research asks a clearly focused question.	Random sampling at States level (Six states) and individual levels. Data was collected using self-administered questionnaire. The property of the questionnaire was not stated and it was not stated if the questionnaire was standardised.	Results could be accurate for the population studied
Dahlui 2015 (276)	Peer reviewed article published in a journal (PLOS ONE). Authors asked a well-defined question and there is good rationale for the study.	Participants were drawn from a nationally representative database	Results likely to be accurate for the population.
Durojaiye 2011 (216)	Peer reviewed article published in a journal (Annals of Tropical Medicine and Public Health). Authors asked a well-defined question and there is	Selection of schools and participants for the study was random as stated by authors, however, details of the randomisation process was not reported	Result may be accurate for the population studied.

	<p>convincing rationale for the study.</p> <p>No source of funding support was stated and authors did not declare any conflicts of interest.</p>	<p>in the article. Out of a population of over 16,400 students, a total of 315 were selected with only 302 questionnaires analysed in the end. Data was collected using a questionnaire whose psychometric properties were not given but it was reported that the questionnaire was piloted.</p>	
<p>Efunshile 2007 (217)</p>	<p>Peer reviewed article published in a journal (African Journal of Clinical and Experimental Microbiology).</p> <p>The authors asked a well-defined question and there is convincing rationale for the research. Source of funding was not stated.</p>	<p>The authors employed convenience sampling. Out of a total of 150 seafarers eligible for the research, a total of 94 (62.7%) of them agreed to participate. Self-administered questionnaires were used for data collection. Biologic samples (blood and urine) were collected and analysed using standard</p>	<p>Results likely to be accurate for the population studied</p>

		methods.	
Ejele 2005 (218)	Peer reviewed article published in a journal (Nigerian Journal of Medicine: Journal of the National Association of Resident Doctors of Nigeria). Funding source was not reported. There is a convincing rationale for conducting this research and the research addressed a well-defined question.	Study was based on data generated from pre-employment medical examination of unemployed individuals in Port Harcourt. Screening was done using standard methods and instruments. The instruments have good psychometric properties.	Results are likely to be accurate for the population studied.
Ekanem 2005 (219)	Peer reviewed article published in a journal (African Journal of Reproductive Health). The authors asked a well-defined question and there is convincing rationale for this research. Funding for this research	Consecutive individuals who met inclusion were interviewed by the researchers using a semi-structured questionnaire whose psychometric properties were not reported. Objectives of the study was discussed with the	Results are likely to be accurate for the population studied.

	was not stated.	participants before data collection	
Eluwa 2012 (277)	Peer reviewed article published in a journal (J Acquir. Immune Defic. Syndr). The authors asked a well-defined question and there is good rationale for the study. Funds for data collection and technical support for the survey were provided by British Government's Department for International Development (Department for International Development/United Kingdom Agency for International Development)	Data was drawn from a nationally representative database. Analyses techniques were appropriate and adequate	Results likely to be accurate for the population.
Eluwa 2013 (220)	Peer reviewed article published in a journal (Drug & Alcohol	Recruitment for this study was through respondent driven sampling	Results are very likely to be accurate for the populations studied.

	Dependence). The study was funded by DFID/UKAID. The authors asked a well-defined question and there was convincing rationale for this research.	("snowballing"). Questionnaires were pilot tested. There was no mention of the psychometric properties of the questionnaire. Blood tests were conducted using the National HIV testing protocol.	
Enwereji 2008 (184)	Peer reviewed article published in a journal (Tanzania journal of health research). The authors asked a well-defined question and there was convincing rationale for this study. Funding source was not reported.	There was no mention of how participants were recruited for this study. Data were collected using interviews and questionnaires. It was not clear if interviewers received any training. The psychometric properties of the data collection tool was not stated	Important issues raised in the research but it is unclear how representative and accurate this findings may be for the population studied, much to the problems highlighted in the methods
Essien 2006 (223)	Peer reviewed article published in a journal (Military Medicine). The study was funded by a grant from	Details of the study methods and materials were published in a separate document which the authors made	Results may be accurate for the population studied only.

	World AIDS Foundation. The authors asked a clearly defined and well-focused question and there is convincing rationale for this work.	reference to.	
Etukumana 2011 (224)	Peer reviewed article published in a journal (West Indian Medical Journal). The authors asked a well-defined question and there is convincing evidence of the rationale for this study. This work was done in part fulfilment of the fellowship in Family medicine of the West African College of Physicians. The source of funding was not stated.	Consecutive women attending the antenatal clinic and who were willing to participate in the study were recruited. The study participants were aware of the research objectives at the start of the research. Data collection was through a questionnaire. The psychometric properties of the data collection instrument were not stated.	Study likely to be accurate for the population only.
Ezugwu 2014 (278)	Peer reviewed article published in a journal (International Journal of	Participants were consecutive attendees of an HIV clinic in Enugu who met the	Result likely to be accurate for the population studied. There is limited potential for generalisation to other populations given some methodological gaps

	Gynaecology and Obstetrics). The authors asked a well-defined question and there is convincing evidence of the rationale for this study. Source of funding was not stated.	inclusion criteria. The study was adequately powered and pretested questionnaires were administered by trained interns. Psychometric properties of the questionnaire was not stated.	identified.
Fakolade 2010 (225)	Peer reviewed article published in a journal (Journal of Biosocial Science). The research was funded by DFID and USAID grants. There is convincing rationale for this research and the authors did ask a well-defined question.	Samples were drawn from a database which is nationally weighted and thus should be representative. Details of the questionnaire property were not given. Analyses were adequate	Results very likely to be accurate for the population described and can be generalised to regions represented in the study.
Fawole 2014 (192)	Peer reviewed article published in a journal (African Health Sciences). Authors asked a well-defined	The sample size needed was calculated using Stat Calc. Module of EPI INFO version 6 statistical software package. A	Results likely to be accurate for the population studied.

	<p>question and there is good rationale for the study. The research was supported by National Agency for Control of AIDS (NACA) and the Institute of Human Virology Nigeria (IHVN) through donation of condoms and other incentives handed out to participants.</p>	<p>combination of sampling methods was employed: snowballing for identification of brothels in Abuja, simple random technique for selection of brothels and stratification (along social class). The questionnaire used is built on the tool used in the World Health Organization multi-country survey on Women's Health and Domestic Violence against Women. Data analyses appeared to be appropriate and adequate.</p>	
<p>Gadzama 2014 (279)</p>	<p>Peer reviewed article published in a journal (Nigerian Journal of Clinical Practice). The authors asked a well-defined question and there is convincing rationale for the study.</p>	<p>The data collection instrument used is an adaptation of the revised injection safety assessment tool for the assessment of injection safety and the safety of phlebotomy, lancet procedures, intravenous injections and</p>	<p>Results likely to be accurate for the population studied. Chances for generalisation beyond the facilities assessed is seriously limited.</p>

	Source of funding not reported.	infusions (Tool C- Revised). The processes adopted for selection of sites for the survey were not clearly defined and it is not clear how this could impact on the findings of the research.	
Ibrahim 2013 (226)	Peer reviewed article published in a journal (West Indian Med Journal). The authors asked a well-defined question and there is convincing rationale for the research. Source of funding was not stated	Authors screen consecutive attendees of antenatal clinic at the hospital between 2008 and 2011. Positive cases were identified through standard and reliable testing techniques and included in the research. Stratified sampling was used to identify women who will be included in the study from among those that were HIV/AIDS negative. A structured questionnaire was used to collect data on sociodemographic and behavioural	Results likely to be accurate for the population studied.

		risk factors for HIV. Psychometric properties of the questionnaire were not stated.	
Idoko 2015 (193)	Peer reviewed article published in a journal (BMC Public Health). Authors asked a well-defined question and there is convincing rationale for the study. The research was supported by funding from the Bill and Melinda Gates Foundation administered through Georgetown University, USA (Grant 3528-613-NACA).	It would appear convenience sampling technique was employed in the research. Data analyses appear to be adequate and appropriate.	Results may be accurate for the population studied.
Ikechebelu 2009 (227)	Peer reviewed article published in a journal (Nigerian Journal of Clinical Practice). Research funding source was not stated. Authors asked a	Participants were selected through systematic sampling of those attending treatment at a hospital in the state. There was no mention of blinding and	Results may be representative of the population studied

	well-defined question and there is convincing rationale for this study.	details of the sampling method were not provided. Questionnaires were used for data collection and the psychometric properties of the questionnaire were not provided.	
Iliyasu 2013 (228)	Peer reviewed article published in a journal (American Journal of Men's Health). Authors asked a well-define question and there is convincing rationale for the research. There was no external funding for this research (appeared it was funded by authors)	Multistage sampling was employed by the authors. Questionnaires used for the research were adapted from that used for a national survey (National Demographic Survey: National Population Commission). Psychometric properties of the instrument were not stated.	Results likely to be representative and accurate for the population with potentials for generalisation.
Isibor 2004 (229)	Peer reviewed article published in a journal (African Journal of Reproductive Health). The authors	All practicing journalists in the seven media outlets in the study area were invited for the study; 86.1% response	Results likely to be accurate for the population studied

	asked a well-defined question and there is some rationale for the study. Source of funding for this study was not stated.	rate. Data was collected using a piloted data collection instrument though the psychometric property of the instrument was not stated.	
Iyaniwura 2006 (231)	Peer reviewed article published in a journal (West African Journal of Medicine). The authors asked a well-defined question and there is convincing rationale for the research. Source of funding for the research was not stated	Local communities (wards) selected were chosen at random. Data was collected using questionnaires whose psychometric properties were not reported. It was stated if the questionnaire was pretested. Trained 5th year medical students were responsible for administration of the questionnaires.	Results may be accurate for the local population
Iyaniwura 2008 (230)	Peer reviewed article published in a journal (West African Journal of Medicine). The authors asked a well-	Cluster sampling technique was employed in the study. There was a response rate of about 68% and data	Results may be accurate for the population studied. The capacity for authors to generalise is seriously limited due to the high non-response rate

	<p>defined question and there is convincing rationale for this study.</p> <p>Source of funding for the stud was not stated.</p>	<p>was collected using a questionnaire.</p> <p>Some questionnaires were excluded from the analysis for incomplete data.</p> <p>The psychometric properties of the tool used was not stated</p>	
<p>Iyoke 2010 (232)</p>	<p>Peer reviewed article published in a journal (Nigerian Journal of Medicine: Journal of the National Association of Resident Doctors of Nigeria). The authors asked a well-defined question and there is convincing rational for the study.</p> <p>Source of funding was not reported</p>	<p>Systematic random sampling using the daily clinic attendance register as the sampling frame was employed.</p> <p>Response rate was 94.8%. The psychometric properties of the data collection tool were not stated. Analysis appeared adequate</p>	<p>Results may be accurate for the population studied</p>
<p>Keating 2006 (233)</p>	<p>Peer reviewed article published in a journal (BMC Public Health). There is convincing rationale for the study</p>	<p>2 stage Cluster design was adopted and sample size was calculated and adjudged to be adequate and enough to detect a</p>	<p>Results likely to be accurate for the population studied</p>

	<p>and the authors asked a well-defined question. This study was funded by the United States Agency for International Development (USAID) through the MEASURE Evaluation Project and under the terms of Cooperative Agreement GPO-A-00-03-00003-00.</p>	<p>change of 10 percentage points in a variety of key indicators in the VISION Project areas in each state with 90% power and a probability of committing a type-I error set at 5% (two-sided test). Samples were selected randomly.</p>	
<p>Kehinde 2005 (280)</p>	<p>A peer reviewed article published in a journal (The Journal of The Royal Society for the Promotion of Health). The authors asked a well-defined question and there is convincing rationale for the research. Funding source for the study was not stated</p>	<p>Convenience sampling method was employed in the study. Cases were defined using standard laboratory tests. The psychometric properties of the questionnaire used was not mentioned.</p>	<p>Results likely to be accurate for the population studied</p>

<p>Lawoyin 2007 (185)</p>	<p>Peer reviewed article published in a journal (African Journal of Reproductive Health). There is convincing rationale for the study and the authors asked a well-defined question. Authors reported support from US Consulate General.</p>	<p>Convenience sampling method was employed in the study. Small sample size considering the population of the areas studied. Psychometric properties of the questionnaire used were not reported and it was not stated if the questionnaires were piloted.</p>	<p>Results may not be accurate for the population studied and there are serious limitations for generalisation beyond the participants of the study. However, important themes worth exploring further were raised in the study.</p>
<p>Merrigan 2011 (235)</p>	<p>A peer reviewed article published in a journal (Sexually Transmitted Infections). The authors asked a well-defined question and there is convincing rationale for the study. The research was funded by USIAD and CDC.</p>	<p>Participants for this study were recruited via respondent driven sampling. Psychometric properties of the questionnaire were not reported but authors reported that the questionnaire (used for the behavioural component) was pilot tested and adapted locally before data collection. Laboratory tests were conducted using standard</p>	<p>Results very likely to be accurate for the population studied.</p>

		protocols. Analysis methods appeared adequate.	
Munoz 2010 (174)	A peer reviewed article published in a journal (SAHARA: Journal of Social Aspects of HIV/AIDS Research Alliance). The authors asked a well-defined question and there is convincing rationale for the research. Funding source for the study was not stated	The participants were recruited via convenience sampling. Exact number of participants in focus group meetings was not reported but meetings were held in private locations. Interviews were conducted by members of the research team and in language the participants understand. Data analyses appeared adequate	Results likely to be accurate for the population studied. Important themes worth exploring further were identified. However, due to small numbers , generalising the findings of this study to other brothel workers in this area may be misleading
Muoghalu 2013 (186)	Peer reviewed article published in a journal (Journal of Social Aspects of HIV/AIDS). Authors asked a well-defined question and there is convincing rationale for the	Authors employed multistage sampling technique. Psychometric properties of the questionnaire used were not reported.	Results likely to be accurate for the population studied

	research. Source of funding was not reported		
Nwachukwu 2011 (236)	A peer reviewed article published in a journal (African Journal of Reproductive Health). There is convincing rationale for this study and the authors asked a clearly defined question. Funding source for the research was not stated	Data from a data base was used for the study. The survey used a multi stage sampling method. The database holds data generated from the national demographic health survey.	Results likely to be accurate for the population studied.
Nwokedi 2006 (238)	Peer reviewed article published in a journal (African Journal of Clinical and Experimental Microbiology). Authors asked a well-defined question and there is convincing rationale for the study. Source of funding was not stated.	Consecutive prospective recruits were screen using standard techniques. The sample had significantly more males than females and there was very little detail on the characteristics of the population.	Limited usefulness as population was not clearly defined.

<p>Nwokoji 2004 (187)</p>	<p>Peer reviewed article published in a journal (BMC Public Health). There was convincing rationale for the study and the authors asked a well-defined question. Funding source was not stated.</p>	<p>Stratified sampling technique was applied. Respondents were aware of the research purpose and data was collected through questionnaires and interviews. Psychometric properties of questionnaire were not stated though authors did report that the survey instruments were pre-tested.</p>	<p>Results likely to be accurate for the population studied.</p>
<p>Obidoa 2012 (239)</p>	<p>Peer reviewed article published in a journal (Journal of Public Health in Africa). The authors asked a well-defined question and there is convincing rationale for the research. Source of funding was not stated and the authors declared there were no conflicts of interest.</p>	<p>Data from a representative and robust survey was used. Methods of analysis appeared adequate</p>	<p>The results are likely to be accurate for the population studied. The use of a database may pose some limitations to analysis since the datasets may have been collected without the research question in mind</p>

Odimegwu 2013 (188)	Per reviewed article published in a journal (BMC Public Health). The authors asked a clearly defined question and there is convincing rationale for the study. Source of funding for the research was not stated.	Convenience sampling. Focus group meetings were held with about 8-9 participants per session and the authors reported that local heads were also interviewed. Focus group meetings were held for spate groups in the sample (along gender and age definitions). Quantitative data was collected through home visitations.	Results may be accurate for the populations studied.
Odu 2011 (240)	Peer reviewed article published in a journal (International Journal of Tropical Medicine). Source of funding was not stated. There is convincing rationale for this research and authors did ask a well-defined question.	Convenience sampling (volunteers). Population was stratified on age, sex socioeconomic status. The data collection instrument was defined and it has a reliability coefficient of 0.75. Data collection instrument was administered by the researcher and a research	Results are likely to be accurate for the sample

		assistant. Data analysis appear adequate	
Ogboi 2010 (241)	Peer reviewed article published in a journal (TAF Preventive Medicine Bulletin). Authors asked a well-defined question and there is convincing rationale for the research. Source of funding was not stated.	Recruitment was through convenience (civilian applicants applying for military training). Samples for HIV tests were collected and analysed using standard and reliable techniques. Demographic data were captured through interviews.	Result likely to be accurate for the population studied.
Ogbuji 2005 (242)	Peer reviewed article published in a journal (African Journal of Medicine & Medical Sciences). Funding source was not reported. There is a convincing rationale for conducting this research and the research addressed a well-defined question.	Selection was random and the process of randomisation was described. Data was collected using questionnaires (self-report). There was no mention of the properties of the data collection instrument in the report	Results may be accurate for the population of students studied, however, the authors did acknowledge that small numbers will mean that study findings may not be representative of the entire student population due to small numbers

Ojini 2007 (243)	Peer reviewed article published in a journal (African Journal of AIDS Research). The authors asked a clearly defined question and there is convincing rationale for this study. Source of funding was not stated	Convenience sampling technique was employed. Blood samples were collected using standard methods and techniques. The tests used were of good psychometric properties and have well known properties.	Results may be accurate for the population studied.
Okoli 2011 (244)	Peer reviewed article published in a journal (African Journal of AIDS Research). The authors asked a well-defined question and there is convincing rationale for the study. The source of funding was not stated	The sampling method appeared to be convenience sampling and participants were interviewed at the end of consultations with doctors. The data collection instrument is a questionnaire which was piloted; however, the psychometric properties were not stated.	Results may be accurate for the population studied
Okonkwo 2007 (245)	Peer reviewed article published in a journal (AIDS Patient Care & Stds).	Method of sampling was not stated though it appears to be convenience	Results may be accurate for the population studied

	<p>The authors asked a well-defined question and there is convincing rationale for the study. The source of funding for the research was not stated.</p>	<p>sampling. Nurses trained and informed about the purpose of the study were responsible for administration of the questionnaires. Details about the properties of the questionnaire were not stated however, authors did report that the questionnaires were piloted.</p>	
<p>Okonta 2007 (246)</p>	<p>Peer reviewed article published in a journal (Tropical doctor). Authors asked a well-defined question and there is convincing rationale for the study. Source of funding was not stated</p>	<p>Selection of schools included in the study was said to have been "arbitrary". However, the students included were reported to have been selected through a random process that was not described. Data was collected through interviewing of respondents and their responses were entered into a questionnaire. The psychometric properties of the questionnaire were not</p>	<p>Result not likely to be accurate and representative of the population studied</p>

		stated.	
Okoror 2013 (175)	Peer reviewed article published in a journal (AIDS Patient Care & Stds.). Authors asked a well-defined question and there is convincing rationale for the study. Source of funding was not reported.	Authors relied on purposive sampling for case selection. Data collection and analysis methods appeared adequate	Results likely to be accurate for the population studied but limited generalizability due to small numbers
Okulate 2008 (247)	Peer reviewed article published in a journal (AIDS Care). The authors asked a well-defined question and there is convincing rationale for the study. Source of funding was not reported	Selection for the study was via cluster sampling and a table of random numbers was used to ensure a random process. A questionnaire was used for the data collection and it was reported that this questionnaire has been used extensively and validated in Nigeria as well (reference made to some studies). Though 1125 participants agreed to	The study is likely to be accurate for the population studied.

		participate, only 914 questionnaires were analysed in the end and reasons for excluding some of the questionnaires were not given.	
Olagbuji 2011	Peer reviewed article published in a journal (Journal of Obstetrics & Gynaecology). The authors asked a well-defined question and there is convincing rationale for this study. Funding source was not stated	Convenience sampling (women who consented to the study from among those attending antenatal clinic). The sample size was adequate (minimum sample size required was calculated to be 153). The psychometric property of the data collection instrument was not given.	Results likely to be accurate for the population studied.
Olaleye 2013 (249)	Peer reviewed article published in a journal (African Journal of AIDS Research). The authors asked a well-defined question and there is	Multi-stage cluster and probability-proportional-to-size sampling methods were used to select respondents for the study. A pretested questionnaire was	Results may be accurate for the population studied

	<p>convincing rationale for the study.</p> <p>The source of funding was not stated</p>	<p>used for data collection and interviews were conducted by trained field officers.</p> <p>Analysis appeared adequate</p>	
<p>Olowookere 2013 (251)</p>	<p>Peer reviewed article published in a journal (BioMed Central). Authors asked a well-defined question and there is clear rationale for the study.</p> <p>Source of funding was not stated</p>	<p>Records were screened for eligibility and included if they meet the study criteria.</p> <p>Data assessed were those of clients who attended the facility between 2006 and 2010. Analysis methods were appropriate</p>	<p>Not likely to be representative and may not be accurate for the local population</p>
<p>Omenka 2013 (176)</p>	<p>Peer reviewed article published in a journal (SAGE). Authors asked a well-defined question and there is clear rationale for the study. The study was funded by UMB AITRP Grant, Number 5-D43 TWO1041 from the United States' National</p>	<p>A combination of purposive and convenience sampling techniques were employed in selecting participants.</p> <p>Participants were not diverse enough and interviews may not have explored the topic in great detail.</p>	<p>Not likely to be representative due to the small numbers interviewed and lack of diversity in the interviews.</p>

	<p>Institutes of Health's Fogarty International Centre awarded to Dr William Blattner of the Institute of Human Virology, University of Maryland, Baltimore.</p>		
<p>Omoigberale 2006 (252)</p>	<p>A peer reviewed article published in a journal (Nigerian Journal of Clinical Practice). Authors asked a well-defined question and there is convincing rationale for the study. Source of funding was not stated.</p>	<p>Sampling appeared to be stratified though what authors described appeared more like convenience sampling. Data collection was through a self-report questionnaire and the questionnaire properties were not stated.</p>	<p>Results may be accurate for the population studied.</p>
<p>Omowunmi 2004 (253)</p>	<p>Peer reviewed article published in a journal (African Journal of AIDS Research). The authors asked a well-defined question and there is</p>	<p>Convenience sampling technique was applied. Questionnaires used for data collection were pre-tested before they were administered, although the</p>	<p>Results may be accurate for the population studied. Generalisation beyond his population can be potentially misleading</p>

	<p>convincing rationale for the research.</p> <p>The research was funded by NIMR, under the ministry of Science and Technology, Nigeria.</p>	<p>psychometric properties were not reported. Interviews were conducted by a trained research staff</p>	
<p>Onyeneho 2009 (189)</p>	<p>Peer reviewed article published in a journal (Tanzania journal of health research). Authors asked a clearly defined question. The research was funded by Society for Women and AIDS in Africa and there is convincing rationale for the research</p>	<p>Authors did not report details of the sampling technique. Details of the methods used to collect quantitative data were not provided as well.</p> <p>Interviews were administered by members of Society for Women and AIDS in Nigeria and interviews had about 6-8 participants per session.</p>	<p>Unclear if the results are accurate</p>
<p>Oshi 2005 (177)</p>	<p>Peer reviewed article published in a journal (Journal of Biosocial Science). Authors asked a well-defined question and there is</p>	<p>Participants were teachers recruited from government owned schools.</p> <p>Recruitment was via snowballing. In-depth interviews were conducted and</p>	<p>Results may be accurate for the population studied but now likely to be accurate when generalised beyond the study group.</p>

	<p>convincing rationale for the study.</p> <p>Research was sponsored by Prime and Power Konsult Ltd</p>	<p>done so in English language.</p>	
<p>Owolabi 2005 (190)</p>	<p>Peer reviewed article published in a journal (Journal of Obstetrics & Gynaecology). The authors asked a clearly defined question and there is convincing rationale for the study.</p> <p>Source of funding for this research was not stated.</p>	<p>Multistage sampling method.</p> <p>Questionnaire was pretested though the psychometric property was not stated.</p> <p>Qualitative data was collected via focus group meetings but details of these meetings were not reported.</p>	<p>Results may not be accurate for the population studied.</p>
<p>Oye- Adeniran 2014 (281)</p>	<p>Peer reviewed article published in a journal (International Quarterly of Community Health Education). The authors asked a clearly defined question and there is convincing rationale for the study. Research</p>	<p>The research utilised a multi-stage stratified random sampling method for selection of participants. Questionnaire used for data collection was briefly described but the psychometric properties were not stated. The authors'</p>	<p>Results may be accurate for the population but it is highly unlikely that this study findings could generalise to any population other than the local population studied.</p>

	was supported by The David & Lucile Packard Foundation, USA.	recommendation (about the intervention favoured) was not supported by the result of the study.	
Oyediran 2005 (285)	A conference paper not published in any peer reviewed journal. Authors asked a well-defined question and there is good rationale for the research. Source of funding not stated.	A nationally representative database data was used in the study. Analyses appeared to be adequate and appropriate for the dataset.	Findings very likely to be accurate for the population studied.
Peters 2004 (254)	Peer reviewed article published in a journal (Tropical Doctor). Funding source was not reported. There was convincing rationale for the research question and the research addressed a well-defined question	Patient participants were selected "randomly" from the list of traditional healers' practices. Details about the randomisation process were not stated. Questionnaires were used for data collection and it was not stated if it was validated or standardised.	Due to small numbers, results may not be accurate for the population studied. However, important points were raised in the survey that is worth exploring further.

<p>Reis 2005 (215)</p>	<p>Peer reviewed article published in a journal (PLoS Medicine). Authors asked a clearly defined question. The research was funded by USAID and there is convincing rationale for the research</p>	<p>Multistage sampling technique. Interviewers were offered training before data collection began. Psychometric properties of the data collection instrument were not stated though instrument was piloted before data collection. Data analysis methods appeared adequate though data was not analysed on intention to treat basis.</p>	<p>Authors did state that it is not clear how representative the attitudes and behaviours reported by the participants in this study are, and future studies in Nigeria and in other countries are necessary to answer this question.</p>
<p>Sabitu 2009 (255)</p>	<p>Peer reviewed article published in a journal (Nigerian Journal of Medicine: Journal of the National Association of Resident Doctors of Nigeria). Funding source was not reported. There is a convincing rationale for conducting this</p>	<p>Stratified sampling was adopted. The study had a response rate of 88.4%. Data was collected using an interviewer questionnaire that was pre-tested. The questionnaire was an adaptation of the one used for the 2003 National Demographic Health Survey in Nigeria (a</p>	<p>Results are accurate for the population studied. Attempts to generalise beyond this population may be misleading i.e. “a nationwide intervention” based on the study findings as hinted by the authors in their discussion/conclusion.</p>

	research and the research addressed a well-defined question.	national survey). Details of modifications were not provided	
Saddiq 2010 (178)	Peer reviewed article published in a journal (AIDS Care). The authors asked a well-defined question and there is convincing rationale for the research. Source of funding was not stated	Authors used purposive sampling and data was collected through in depth interviews and focus group meetings.	Results likely to be accurate for the population studied
Salaudeen 2014 (282)	Peer reviewed article published in a journal (Annals of African Medicine). The authors asked a well-defined question and there is convincing rationale for the study. The source of funding was only stated as "Nil".	Data were collected via a pretested interviewer- administered questionnaire. Psychometric properties of the questionnaire was not stated. Trained research assistants (people living with HIV and HIV counsellors) were responsible for data collection.	Results may be accurate for the population studied.

Sangowawa 2012 (256)	Peer reviewed article published in a journal (Journal of public health in Africa). The authors asked a well-defined question and there is convincing rationale for the study. The source of funding was not stated	Respondents were recruited from HIV/AIDS support groups and clinics. The recruitment centres were said to have been selected at random and all consenting adults in the selected centres were interviewed. The questionnaire used for the study was translated into the local language and back translated and it was pretested before administration.	Results may be accurate for the population studied
Sekoni 2015 (283)	Peer reviewed article published in a journal (Nigerian Quarterly Journal of Hospital Medicine). The authors asked a well-defined question and there is convincing rationale for the study. Funding was not stated.	Details of how recruitment was carried out not reported. Also, psychometric property of the instrument used for data collection not stated. Data were collected by trained research assistants and after school hours. Data analyses	Results may be accurate for the population. Generalisation beyond this population is almost impossible due to the poorly defined population and gaps in reporting of the methods identified.

		appear adequate.	
Smith 2003 (151)	Peer reviewed article published in a journal (Medical Anthropology). The authors asked a well-defined question and there is convincing rationale for the study. The research was funded by the National Science Foundation and the National Institutes of Health.	Surveys and ethnographic data were collected by trained personnel who could speak the local language.	Results highly likely to be accurate for the population studied.
Smith 2004 (179)	Peer reviewed article published in a journal (Culture, Health and Sexuality). The authors asked a well-defined question and there is convincing rationale for the study. The research was funded by the National Science Foundation and the	Surveys and ethnographic data were collected by trained personnel who could speak the local language.	Results highly likely to be accurate for the population studied.

	National Institutes of Health.		
Smith 2007 (180)	Peer reviewed article published in a journal (American Journal of Public Health). The authors asked a well-defined question and there is convincing rationale for the study. The research was funded National Institutes of Health.	Interviews, lasting between 1-1.5 hours, were conducted by the author (for male participants) and two research assistants for the female participants.	Results may be accurate for the population studied
Sunmola 2005a (257)	Peer reviewed article published in a journal (AIDS Care). The authors asked a well-defined question and there is convincing rationale for the study. Funding for the research was not stated.	Random selection using table of random numbers was employed. The psychometric properties of the questionnaire were reported and authors stated that it is an instrument which has been validated in Nigeria.	Results very likely to be accurate for the population studied only. The extent to which the results could be generalised is unclear.

Sunmola 2005b (191)	Peer reviewed article published in a journal (AIDS Care). The authors asked a well-defined question and there is convincing rationale for the study. Funding for the research was from John and Catherine MacArthur foundation (grant).	Interviews were conducted with the truck drivers prior to questionnaire development. Sampling appeared to be random and based on chance as only truck drivers who stopped to pass the night at the study site were included in the study. Psychometric properties of the questionnaire was reported and ranged from fair to good.	Results are very likely to be accurate for the study population.
Tun 2013 (258)	Peer reviewed article published in a journal (International Journal of STD & AIDS). Authors asked a well-defined question and there is convincing rationale for the study. The research was funded by United Kingdom Department for	Respondent driven sampling and blood tests were employed in data collection. Blood samples were collected and analysed using standard and reliable techniques. Psychometric property of the questionnaire was not reported. Analysis methods were adequate and	Results likely to be accurate for the population studied

	International Development (DFID) through Enhancing Nigeria's Response to HIV/AIDS (ENR).	appropriate.	
Ukaire 2015 (284)	Peer reviewed article published in a journal (African Journal of Reproductive Health September). The authors asked a well-defined question and there is convincing rationale for the study. Source of funding was not reported.	Selection of cases appeared to be non-systematic. However, there was a clear description of cases that were confirmed through standard and acceptable laboratory tests. Data analyses appeared to be adequate and appropriate.	Results likely to be accurate for the population studied. Small numbers would and issues with how cases were selected would limit capacity for generalisation beyond this population.
Umar 2012 (259)	Peer reviewed article published in a journal (The Pan African Medical Journal). The authors asked a well-defined question and there is convincing rationale for this study. Source of funding for this research	Participants were selected from a list of practising clergymen in the metropolis and invited to be a part of the study. The study had a response rate of 94.6%. Psychometric properties of the questionnaire were not reported	Results likely to be accurate for the population studied

	was not stated.		
Umeora 2005 (260)	Peer reviewed article published in a journal (African Journal of AIDS Research). The authors asked a well-defined question and there is convincing rationale for the research.	Records analysed were those of couples who presented to the facility between 200 and 2004 for pre-marital HIV screening following church referral. Standard and reliable testing methods were used for the screening.	Results likely to be representative for the population studied.
Uneke 2007 (261)	Peer reviewed article published in a journal (AIDS Care). The authors asked a well-defined question and there is convincing rationale for the study. Source of funding for this research was not stated	Referrals from faith based organizations were included in this study. Blood samples were collected from consenting participants and analysed for HIV sero-positivity using standard and acceptable techniques. Statistical analyses appeared adequate.	Results likely to be accurate for the population but there is limited capacity for generalisation given the limited information on participants
Utulu 2007	Peer reviewed article published in a journal (Journal of Biosocial	Sampling was essentially convenience and only participants who consented	Results may be accurate for the population studied. Authors stated that the

(262)	Science). The authors asked a well-defined question and there was convincing rationale for this research. Source of funding for the research was not stated	were included in the study. Blood tests were carried out using standard test kits and using standard methods. Analyses appeared adequate. There was no mention of blinding in the study	sample may not be representative as it is a facility based research.
Uzochukwu 2011 (263)	Peer reviewed article published in a journal (Health Policy). There is convincing rationale for this study and the authors asked a well-defined question. Source of funding for the research was not stated	Stratified sampling was employed and data collection instrument was pretested. However, the psychometric properties of the questionnaire was not stated	Results likely to be accurate for the population studied
Vu 2013 (264)	Peer reviewed article published in a journal (Journal of Acquired Immune Deficiency Syndromes). The authors asked a well-defined question and there is convincing rationale for the	Authors utilised respondent driven sampling for selection of cases. Analyses were appropriate. Screening for HIV/AIDS was done using standard and reliable techniques.	Results likely to be accurate and representative for the population studied.

	<p>research. The research was funded by UK Department for International Development.</p>		
<p>Wusu 2011 (265)</p>	<p>Peer reviewed article published in a journal (Tanzania Journal of Health Research). The authors asked a well-defined question and there is convincing rationale for this study. Source of funding for this research was not stated.</p>	<p>Multistage sampling technique was employed. Data was collected using a questionnaire but details about the questionnaire properties were not stated. Analyses appeared adequate</p>	<p>Results may be accurate for the population studied</p>
<p>Yahaya 2010 (266)</p>	<p>Peer reviewed article published in a journal (African Journal of Reproductive Health). Authors asked a well-defined question and there is convincing rationale for this study. Source of funding was not stated.</p>	<p>Only youth aged 15-24 were included in the study and the methods of selection appeared to be convenience sampling technique. The questionnaire used was tested and the test-retest reliability estimated to be 0.67. Trained research</p>	<p>Results may be accurate for the population studied</p>

		assistants were responsible for data collection.		
Case control studies quality assessment table – Newcastle Ottawa scale				
Study ID	Selection	Comparability	Exposure	Remarks (maximum of 9 stars)
Ajewole 2007 (202)	Cases and controls were drawn from the same community from registered social organizations using a list of such organizations obtained from the ministry of youth and sport (multistage sampling was employed) (2*)	Only age was considered at baseline with slight difference between intervention and control groups (mean age of 16.33 and 16.25 years respectively) (1*)	Same questionnaires were used for ascertaining outcomes of interest in both groups (1*)	4*
Essien 2005	Authors only reported that the	The two groups differ significantly in	Interviews were	2 stars

(221)	regiments used were selected on “purpose”. There were no further descriptions of the selection process. Controls came from the same community (1*)	some factors at baseline that were not controlled for.	held with participants and relied on self-reports and there was no mention of blinding. The same questionnaire was administered to intervention and control groups (1*)	
Essien 2011 (222)	While selection was through convenience sampling, participants were said to have been randomly	Authors did assess for important difference between groups at baseline and found no significant baseline	No mention of blinding of outcome	4 stars

	<p>allocated into groups, the sample is likely representative. Controls were selected from the same community (2*)</p>	<p>differences. They also stated that the two groups were "matched" (2*)</p>	<p>assessors and data was not analysed on intention to treat basis</p>	
<p>Lapinski 2008 (234)</p>	<p>The study recruited participants using a non-probability method. Allocation into groups was said to be random but this resulted in unequal numbers in the two groups (60 cases and 40 controls). Cases were those who would go on to receive an intervention (a movie) and then complete a questionnaire afterwards while controls were participants who completed a questionnaire without seeing the</p>	<p>The study failed to report the sociodemographic profile of the participants. The study also failed to report any attempts made to control for confounding variables in the population and it is not clear if the control and intervention groups are comparable at baseline (i.e. before intervention)</p>	<p>Same methods was applied for ascertainment of outcome for the two groups (a questionnaire) (1*)</p>	<p>2 stars</p>

	<p>movie. There were no independent validation of participants' self-report of HIV status or previous testing for HIV (1*)</p>			
<p>Nwauche 2006 (237)</p>	<p>Cases were migrant workers while non-migrant workers served as controls. Participants were consecutive samples with controls selected from within the community (3*).</p>	<p>The study did not control for any baseline difference between cases and controls</p>	<p>Endpoint was ascertained through questionnaires and it was not stated if assessors were blind to the case/control status of participants. No reports of dropouts in both</p>	<p>5 stars</p>

			control/cases groups (2*)	
Olley 2007 (250)	Case definition was adequate and those sampled were “consecutive participants” attending a follow up management program. Controls were drawn from the same program and were those who were not in a support program (4*)	Study did not mention any factors that were controlled for. The mean duration of knowledge of HIV serostatus was 3.3 years for intervention group and 4.8 years for control. More in the control group were in employment compared to the intervention group (56% vs 12%)	Participants completed self-report questionnaires. There was no mention of blinding in the study	4 stars
Cohort studies quality assessment – Newcastle Ottawa scale				
Study ID	Selection	Comparability	Outcome	Remarks (maximum of 9 stars)
Adeokun	There was scanty description of the derivation of the cohort other than	There was no mention of any factors	Again it was not described in any	2 stars

2006 (199)	<p>it was a volunteer population.</p> <p>Equally so, there was very little said about the non-exposed group in the report. Exposure in this case was an intervention delivered following baseline assessment using a structured interview (questionnaire)</p> <p>(1*)</p>	controlled for in the study.	<p>useful detail how outcomes were assessed though it appeared that the process would have relied heavily on self-reports. The follow-up period was adequate for the question.</p> <p>There was no statement on attrition. (1*)</p>	
Adeyemo 2014 (200)	<p>Participants data analysed were selected based on “completeness” of needed data. There were no</p>	<p>There was no mention of any factors that were controlled for in the study</p>	<p>Outcome of interest was assessed through</p>	2 stars

	control groups but case ascertainment was through hospital documentation of sero-positivity (1*)		hospital records (1*)	
Akinyemi 2010 (272)	Scanty description of why criteria for inclusion was set at age between 15 and 59 years. There was no control arm in the study (1*)	No mention of any controlled factors in the study.	Outcome assessment relied on participant self-reports. Cases were confirmed through standard blood tests (1*)	2 stars
RCT studies quality assessment (Cochrane risk of bias)				

Study ID	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Others (comments)
Coker 2015 (275)	Low risk: Process of randomisation described and adequate.	Unclear risk: No mention of this process and there was not enough information to access this.	High risk: No blinding done	High risk: No blinding done	High risk: Missing data likely to impact on outcome of findings (only 276 was observed until the end of the	Low risk	High risk of bias.

					study)		
Okonofua 2003 (268)	Unclear risk: authors only mentioned that allocation was via a random process that was not described further	Unclear risk: Insufficient information to make this judgement (authors did not report on this)	High risk: No blinding done	High risk: No mention of blinding	Low risk: Missing data not likely to impact on outcome	Low risk: authors reported on pre-specified outcomes	There is high risk of bias based on the lack of blinding in the process. There were significant baseline differences between the intervention and control groups that could impact on the results of the study as well.

Appendix C: Data used for comparative analyses plots exploring relationship between HIV prevalence, GNI and Gini

Country	Gini	Gini year	HIV prevalence	HIV prevalence year	GNI	GNI year	Log HIV prevalence	Log Gini	Log GNI
Angola	42.72	2008	2.2	2015	4180	2015	0.7885	3.7547	8.3381
Argentina	42.67	2014	0.4	2015	12460	2015	-0.9163	3.7535	9.4303
Armenia	31.48	2014	0.2	2015	3880	2015	-1.6094	3.4494	8.2636
Australia	34.94	2010	0.2	2015	60070	2015	-1.6094	3.5536	11.0033
Azerbaijan	31.79	2008	0.2	2015	6560	2015	-1.6094	3.4592	8.7887
Bangladesh	32.13	2010	0.1	2015	1190	2015	-2.3026	3.4698	7.0817
Belarus	27.18	2014	0.6	2015	6460	2015	-0.5108	3.3025	8.7734
Belize	53.26	1999	1.5	2015	4420	2015	0.4055	3.9752	8.3939
Benin	43.44	2011	1.1	2015	860	2015	0.0953	3.7714	6.7569
Bolivia	48.40	2014	0.3	2015	3080	2015	-1.2040	3.8795	8.0327
Botswana	60.46	2009	22.2	2015	6510	2015	3.1001	4.1020	8.7811

Brazil	51.48	2014	0.6	2015	9850	2015	-0.5108	3.9412	9.1952
Burkina Faso	35.30	2014	0.8	2014	660	2015	-0.2231	3.5639	6.4922
Burundi	33.36	2006	1.0	2015	260	2015	0.0000	3.5074	5.5607
Cabo Verde	47.19	2007	1.0	2015	3290	2015	0.0000	3.8542	8.0986
Cambodia	30.76	2012	0.6	2015	1070	2015	-0.5108	3.4262	6.9754
Cameroon	46.54	2014	4.5	2015	1330	2015	1.5041	3.8403	7.1929
Central African Republic	56.24	2008	3.7	2015	320	2015	1.3083	4.0296	5.7683
Chad	43.32	2011	2.0	2015	880	2015	0.6931	3.7686	6.7799
Chile	50.45	2013	0.3	2015	14060	2015	-1.2040	3.9210	9.5511
Colombia	53.50	2014	0.5	2015	7130	2015	-0.6931	3.9797	8.8721
Congo, Dem. Rep.	42.10	2012	0.8	2015	410	2015	-0.2231	3.7400	6.0162
Costa Rica	48.53	2014	0.3	2015	10210	2015	-1.2040	3.8822	9.2311
Cote d'Ivoire	43.18	2008	3.2	2015	1410	2015	1.1632	3.7654	7.2513

Djibouti	44.13	2013	1.6	2015	1030	2005	0.4700	3.7871	6.9373
Dominican Republic	47.07	2013	1.0	2015	6130	2015	0.0000	3.8516	8.7210
Ecuador	45.38	2014	0.3	2015	6010	2015	-1.2040	3.8151	8.7012
El Salvador	41.84	2014	1.0	2015	3940	2015	0.0000	3.7339	8.2789
Gabon	42.18	2005	3.8	2015	9210	2015	1.3350	3.7419	9.1280
Gambia, The	47.33	2003	1.8	2015	460	2014	0.5878	3.8571	6.1312
Georgia	40.09	2014	.4	2015	4160	2015	-0.9163	3.6911	8.3333
Ghana	42.77	2005	1.6	2015	1480	2015	0.4700	3.7558	7.2998
Greece	36.68	2012	0.3	2015	20290	2015	-1.2040	3.6022	9.9179
Guatemala	48.66	2014	0.6	2015	3590	2015	-0.5108	3.8849	8.1859
Guinea	33.73	2012	1.6	2015	470	2015	0.4700	3.5184	6.1527
Guyana	44.55	1998	1.5	2015	4090	2015	0.4055	3.7966	8.3163
Haiti	60.79	2012	1.7	2015	820	2015	0.5306	4.1074	6.7093

Honduras	50.64	2014	0.4	2015	2270	2015	-0.9163	3.9247	7.7275
Indonesia	39.47	2013	0.5	2015	3440	2015	-0.6931	3.6755	8.1432
Iran, Islamic Rep.	37.35	2013	0.1	2015	6550	2014	-2.3026	3.6203	8.7872
Italy	35.16	2012	0.4	2015	32790	2015	-0.9163	3.5599	10.3979
Jamaica	45.46	2004	1.6	2015	5010	2015	0.4700	3.8168	8.5192
Kenya	48.51	2005	5.9	2015	1340	2015	1.7750	3.8818	7.2004
Kyrgyz Republic	26.82	2014	0.2	2015	1170	2015	-1.6094	3.2891	7.0648
Latvia	35.48	2012	0.7	2015	14900	2015	-0.3567	3.5690	9.6091
Lesotho	54.18	2010	22.7	2015	1330	2014	3.1224	3.9923	7.1929
Liberia	36.48	2007	1.1	2015	380	2015	0.0953	3.5968	5.9402
Madagascar	42.65	2012	0.4	2015	420	2015	-0.9163	3.7530	6.0403
Malawi	46.12	2010	9.1	2015	350	2015	2.2083	3.8312	5.8579
Malaysia	46.26	2009	0.4	2015	10570	2015	-0.9163	3.8343	9.2658

Mali	33.04	2009	1.3	2015	790	2015	0.2624	3.4977	6.6720
Mauritania	32.42	2014	0.6	2015	1370	2014	-0.5108	3.4788	7.2226
Mauritius	35.84	2012	0.9	2015	9610	2015	-0.1054	3.5791	9.1706
Mexico	48.21	2014	0.2	2015	9710	2015	-1.6094	3.8756	9.1809
Moldova	26.83	2014	0.6	2015	2220	2015	-0.5108	3.2895	7.7053
Mongolia	32.04	2014	0.1	2015	3830	2015	-2.3026	3.4670	8.2506
Morocco	40.72	2006	0.1	2015	3040	2015	-2.3026	3.7067	8.0196
Mozambique	45.58	2008	10.5	2015	580	2015	2.3514	3.8195	6.3630
Namibia	60.97	2009	13.3	2015	5210	2015	2.5878	4.1104	8.5583
Nepal	32.84	2010	0.2	2015	730	2015	-1.6094	3.4916	6.5930
Nicaragua	47.05	2014	0.3	2015	1940	2015	-1.2040	3.8512	7.5704
Niger	33.99	2014	0.5	2015	390	2015	-0.6931	3.5261	5.9661
Nigeria	42.97	2009	3.1	2015	2820	2015	1.1314	3.7605	7.9445
Pakistan	30.69	2013	0.1	2015	1440	2015	-2.3026	3.4239	7.2724

Panama	50.70	2014	0.7	2015	12050	2015	-0.3567	3.9259	9.3968
Paraguay	51.67	2014	0.4	2015	4220	2015	-0.9163	3.9449	8.3476
Peru	44.14	2014	0.3	2015	6200	2015	-1.2040	3.7874	8.7323
Philippines	43.04	2012	0.1	2015	3540	2015	-2.3026	3.7621	8.1719
Rwanda	50.44	2013	2.9	2015	700	2015	1.0647	3.9208	6.5511
Senegal	40.29	2011	0.5	2015	1000	2015	-0.6931	3.6961	6.9078
South Africa	63.38	2011	19.2	2015	6050	2015	2.9549	4.1491	8.7078
South Sudan	46.34	2009	2.5	2015	790	2015	0.9163	3.8360	6.6720
Spain	35.89	2012	0.4	2015	28520	2015	-0.9163	3.5805	10.2584
Sri Lanka	39.16	2012	0.1	2015	3800	2015	-2.3026	3.6677	8.2428
Sudan	35.39	2009	0.3	2015	1840	2015	-1.2040	3.5664	7.5175
Suriname	57.61	1999	1.1	2015	9300	2015	0.0953	4.0537	9.1378
Swaziland	51.45	2009	28.8	2015	3230	2015	3.3604	3.9406	8.0802
Tajikistan	30.76	2014	0.3	2015	1240	2015	-1.2040	3.4262	7.1229

Tanzania	37.78	2011	4.7	2015	910	2015	1.5476	3.6318	6.8134
Thailand	37.85	2013	1.1	2015	5620	2015	0.0953	3.6336	8.6341
Togo	46.02	2011	2.4	2015	540	2015	0.8755	3.8291	6.2916
Tunisia	35.81	2010	0.1	2015	3970	2015	-2.3026	3.5782	8.2865
Uganda	41.01	2012	7.1	2015	670	2015	1.9601	3.7138	6.5073
Ukraine	24.09	2014	0.9	2015	2620	2015	-0.1054	3.1818	7.8709
Uruguay	41.60	2014	0.5	2015	15720	2015	-0.6931	3.7281	9.6627
Uzbekistan	35.27	2003	0.2	2015	2150	2015	-1.6094	3.5630	7.6732
Venezuela, RB	46.94	2006	0.5	2015	11780	2013	-0.6931	3.8489	9.3742
Vietnam	37.59	2014	0.5	2015	1980	2015	-0.6931	3.6267	7.5909
Zambia	55.62	2010	12.9	2015	1500	2015	2.5572	4.0185	7.3132
Zimbabwe	43.15	2011	14.7	2015	850	2015	2.6878	3.7647	6.7452
USA	41.10	2013	0.6	2015	54960	2015	-0.5108	3.7160	10.9144
UK	36.20	2012	0.19	2015	43340	2015	-1.6607	3.5891	10.6768

Appendix D: Summary of main study findings, interventions favoured in reviewed studies and theme codes used for cloud analysis

Study ID	Population	Main study findings and intervention favoured in the study	Risk for HIV/AIDS transmission	Codes
Abasiubong 2012 (194)	Unmarried HIV positive population. About a quarter had no formal education with a significant student population. Women in this sample had higher education and were more likely to be employed (Table 1 in the report)	There was no reported change in sexual behaviour following HIV diagnosis. Reported daily sexual activity was higher in women than men (10.3% vs 4.9% respectively). Only about 58.4% of men and 56.9% of women were persuaded to use condoms after testing positive for HIV. Intervention favoured: Condom use and behaviour change methods	Poor information seeking; low condom use; partners of HIV positive participants refusing screening; female gender; economic factors	"information seeking" "low condom use" "screening" "gender" "poverty"
Abiona 2014 (195)	Participants were recruited from three continents (North America, Asia and Africa) and	Compared to US students, the HIV/AIDS knowledge of Turkish students was more likely to	Risk perception and inaccurate knowledge/information	"risk perception" "inaccurate"

	<p>five universities in four countries (USA, South Africa, Turkey and Nigeria). The countries were selected based on difference in HIV prevalence but the universities were randomly selected. Young persons were included in the research because they are judged to be disproportionately affected by HIV/AIDS.</p>	<p>be inaccurate and the knowledge of South African and Nigerian students was more likely to be accurate. South African students were the most exposed to HIV/AIDS information and Turkish students were the least exposed ($p < .001$). A higher percentage of students from South Africa and Nigeria (countries with high HIV prevalence) incorrectly perceived themselves as being very knowledgeable about HIV/AIDS. Frequency of exposure to HIV/AIDS information was not associated with knowledge.</p> <p>Intervention favoured: More students in countries with higher HIV prevalence had accurate HIV/AIDS knowledge and poorer perception of their level of knowledge than students in countries with low prevalence. Governments in the countries studied should ensure that young people receive accurate</p>		<p>knowledge”</p>
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		HIV/AIDS information, with special attention paid to educating young women.		
Aboki 2014 (269)	Participants were 15 to 19 year olds, drawn from a nationally representative survey (National HIV and AIDS reproductive health survey data). The population was largely single.	Over the five year period, HIV prevalence in the population increased significantly ($p=0.02$) especially in female ($p=0.008$). The number of female adolescents who became sexually active decreased significantly ($p=0.02$), and use of condom at last sexual act with non-marital sexual partners significantly increased ($p=0.01$). There was an insignificant increase in the proportion of males and females who engaged in transactional sex and who had multiple sex partners over the study period. More females who engaged in transactional sex were HIV positive ($p=0.01$), and more males who were sexually active in the last 12 months were HIV positive ($p=0.01$).	Low condom use, commercial sex work, multiple sexual partners	“Low condom use” “CSW” “MSP”

		Intervention favoured: Prevention programs that focus on mother to child transmission and adolescent females.		
Adebajo 2012 (196)	Participants were recruited from the community of men who have sex with men in Lagos and Oyo States. About 55% of the population regarded themselves as bisexual. Over 96% of the population had up to or above secondary education. The population was largely single (97%) and unemployed (43.3%)	<p>Authors found that about a third of the respondents (MSM population) reported internalized homophobia. With homosexual/gay men as reference, respondents who self-identified as bisexual were two times more likely [AOR 2.1; 95 CI: 1.6 - 2.9, $p < 0.001$] to report internalized homophobia. Those who were HIV positive were also twice as likely to report internalized homophobia compared to those who were HIV negative [AOR 1.8; 95% CI: 1.2 - 2.7, $p = 0.004$].</p> <p>Intervention favoured: Prevention programmes that take internalized homophobia into considerations</p>	Homophobia - stigma	"stigma"

<p>Adebayo 2010 (182)</p>	<p>Participants were recruited from the six geopolitical zones of the country. About two-thirds were recruited from rural areas and more than a quarter were said to have no formal education. About half however, had at least secondary education. About 56% of the population have their domicile in the North of the country and almost half of the population were married or living with a sexual partner at the time of the study.</p>	<p>The authors found that a 26% of the sample population engaged in high risk behaviours despite claiming they are at no risk of contracting HIV. Reasons given for this action include avoiding sex with sex workers, protection from God, trusting sexual partners. Some were reported to have fatalistic tendencies such as “Me, if I am not using a condom to make love with my girlfriend it is because I love her; that is my own risk. Anything that comes from this [inside] me, I am ready to bear it, if to die, I go.” Overall authors reported that, being single, Christian, male, and listening to the society for family health radio campaigns were associated with a higher perception of risk of contracting HIV. Participants had adequate knowledge of HIV but this did not reflect in their practices.</p>	<p>Risk perception</p>	<p>“risk perception”</p>
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		Intervention favoured: interventions that target individuals in the group who engage in high risk practices despite reporting they are at low or no risk of contracting HIV		
Adebowale 2013 (197)	Participants were selected from a database which is nationally representative. They were unmarried male youth aged 15-24 years recruited from different socioeconomic strata and religious backgrounds.	<p>The authors found that among the sexually active, age, region, residence, education, wealth index, ever undergone HIV test and total life-time number of sexual partners were significantly associated with current use of condom. Condom use was found to be lowest among those classified in wealth index band of "poorest" and "poorer". Also, they added that having ever undergone HIV test increased the likelihood of using condom.</p> <p>Intervention favoured: Free distribution of condoms among the study population</p>	Poverty; condoms	"poverty" "low condom use"

<p>Adegun 2012 (270)</p>	<p>Participants were consenting users of the hospital (University Teaching Hospital, Ado-Ekiti) attending the General Outpatient, Urology, Antenatal and Adolescent clinics of the hospital. The age range is 10 and above, with most participants being in the 15 – 54 age range. The population was predominantly (59.1%) female.</p>	<p>Although, knowledge of sexually transmitted infections was high in the general population, especially among those with postsecondary school education (85.4%) and the drivers (90.9%), it was relatively low among the adolescents and the youths who are the most vulnerable in this environment ($\chi^2 = 14.343$; $p < 0.05$). News media was the highest source of information about Sexually Transmitted Infections. Age, educational level and the type of occupation appear to be important factors affecting knowledge.</p> <p>Intervention favoured: Health education among high risk groups</p>	<p>Poor knowledge</p>	<p>“Inaccurate knowledge” “age younger”</p>
<p>Adejuyigbe 2004 (198)</p>	<p>HIV-concordant mother-child pairs. Only 2.51% of the population had no formal education with many of the participants having secondary</p>	<p>Ninety-three (46.7%) of 199 mother-child pairs were HIV-positive. When compared with the 106 HIV-negative mothers, the HIV-positive mothers</p>	<p>Age; unemployment; early sexual debut; education; polygyny</p>	<p>“age younger” “poverty” “early sex” “education”</p>

	<p>education or higher. Most of the participants were married (93.97%) and 24 of the participants were unemployed.</p>	<p>were younger, unemployed, had earlier sexual exposure, lower education and were married to polygynous spouses.</p> <p>Interventions favoured: It is recommended that initiatives designed to reduce mother-to-child-transmission of the HIV virus in the southwest of Nigeria should include education and improvement of the economic status of female adolescents; promotion of cultural practices such as virginity until marriage while discouraging polygyny and early marriage. Health education on prevention of HIV infection should target potential mothers and their partners</p>		"polygyny"
<p>Adeokun 2006 (199)</p>	<p>The participants were volunteers recruited from market places across two cities (Ogbomosho and Ibadan) in Oyo State.</p>	<p>The authors reported statistically significant reductions in stigma at the end of the 2 year follow up and argued that an improved</p>	<p>Stigma</p>	<p>"stigma"</p>

		<p>understanding of the HIV epidemic did result in reductions in the stigma of AIDS. They also argued that detailed training within HIV surveillance provides more understanding than the basics of HIV/AIDS available in the mass media and has more impact on stigma reduction.</p> <p>Intervention favoured: Behaviour change communication method described by the authors.</p>		
Adeyemo 2014 (200)	<p>Pregnant women who had “complete” records were selected for inclusion in this retrospective analysis of hospital attendance records obtained from two hospitals. Participants were aged anywhere between “less than 20 years to above 40 years”.</p>	<p>It was found that prevalence of HIV/AIDS is lower in the private facility (Redeemed Camp Maternity Centre owned by a religious organization) compared to the public facility (Olabisi Onabanjo University Teaching Hospital owned by the state). Also the authors stated that the observed prevalence of HIV/AIDS of 7.7% reported among the population is higher than the national average</p>	<p>Parity; age; religion (higher among Muslims)</p>	<p>“parity” “age older” “religion Muslims” "gravidity high"</p>

		<p>of 4.1% and that being older as well as increasing parity tends to be associated with increased risk of being HIV/AIDS positive.</p> <p>Interventions favoured: those that seek to control HIV/AIDS prevalence among older age pregnant women</p>		
Ahmed 2013 (201)	<p>The population in this study include the general public (presenting to hospital outpatient departments), patients presenting with STI symptoms, serodiscordant partners, brothel based sex workers, non-brothel based sex workers, motorcycle and taxi drivers and people living in communities proximal to these groups.</p>	<p>Women aged 18-24 were less likely than their male counterparts to know that there were medicines available to treat HIV (p value =0.03). Participants with current genital ulcer disease were more likely to be HIV-infected (OR Mobile HCT = 1.65, 1.31-2.09 vs OR Facility = 0.27, 0.24 – 0.31). Those that have previously tested for HIV were more likely to test negative compared to those that have never tested (OR Mobile HCT = 0.75, 0.64-0.88; OR Facility = 0.27, 0.24-0.31)</p>	<p>Female gender; age (18-24 years); no previous history of HIV/AIDS testing; brothel based sex workers (CSW); low levels of STI treatment/recognition</p>	<p>"gender" "screening" "CSW" "STI rates" "age younger"</p>

		Intervention favoured: mobile HIV/AIDS counselling services for “hard to identify most-at-risk groups”		
Aishat 2015 (271)	The population is HIV positive mothers The mean age of the mothers was 31.0 ± 5.7years. 86% of the population were married and 80% had babies less than 6 months of age. Only 42% had completed secondary education and were into trading.	The choice of EBF was influenced by spouse influence (84.0%), family influence (81.0%) and fear of stigmatisation (53.0%). Predictors of EBF were; monthly income (AOR = 2.6, C.I. =1.4-4.5), infant feeding counselling (AOR = 2.7, C.I. = 1.6-6.9) and fear of stigmatisation (AOR = 7. 2, C.I. = 2.1-23.6). Intervention favoured: comprehensive approaches that address economic conditions of women living with HIV	Poverty; Stigma; Female gender	“Poverty” “Stigma” “Female gender”
Ajewole 2007 (202)	Young adults (aged 12-23 years) in a rural community. They were predominantly (up to	Authors reported that those in the intervention group demonstrated better awareness in terms of	Education	“education”

	<p>98%) students and the sample was equally split between males and females.</p>	<p>knowledge, attitude and practices on issues relating to HIV/AIDS compared to the control group. They concluded that interventions utilising health educational models can be effective in reducing HIV/AIDS infection rate.</p> <p>Intervention favoured: Public health education as part of school curriculum for young adults</p>		
<p>Ajoge 2013 (267)</p>	<p>The authors included women in multiple sites in the middle belt region of the country. Two urban sites (Makurdi and Minna) and two rural sites (Bwari and Panyam). The population were those used in a national survey (sentinel survey). Most of the women were either unskilled or were housewives having less than secondary (12 years) of education. About a quarter of the sample (420 out of the total 1011 sampled</p>	<p>Overall, the authors reported HIV/AIDS prevalence of 10.3% which is higher than national estimates for the region. Furthermore, they found that HIV/AIDS prevalence is higher in the urban sites compared to the rural sites with the highest prevalence reported in Makurdi. The authors conducted a multivariate analysis in which they concluded that seropositivity was significantly associated with being from an urban site (Makurdi</p>	<p>The study did not pin point any clear risk factors other than location (urban residents have a greater risk).</p>	<p>"urban residence"</p>

	across all 4 sites) were from Makurdi.	and Minna) compared to Panyam (which is one of the rural sites). In the Makurdi site, HIV/AIDS seropositivity was found to be associated with having had an abortion or miscarriage in the past (OR 4.6, CI 1.1-19.9) with other variables analysed (for example number of sex partners currently and in the past, STD, accommodation, occupation etc.) being non-significant. In the other sites, HIV/AIDS seropositivity was associated with previous pregnancy and living in an official house (OR 25.3, 95% CI 1.5–423.5 and OR 17.7, 95% CI 1.2–272.3 respectively) Intervention favoured: Those targeting risk factors at community levels		
Ajuwon 2010 (183)	Study population was drawn from regions where HCT services were available. Participants of this	Only 15.8% of the population had heard about HCT. Of the fraction who knew about the services,	Stigma; poor knowledge about HCT services (screening);	“stigma” “screening” inaccurate

	<p>study included students (46%) and 54% apprentices (a youth with limited formal education undergoing some form of vocational training under an instructor who operates a small business).</p>	<p>only 31% knew where to access the services and 7% had actually taken the test. Barriers identified by the participants include stigmatization, perceived exorbitant cost of the test, and lack of knowledge about where to get the service. Some believed HCT is only meant for sexually active persons. 86.2% of the population indicated that they will be willing to test if it was free of charge.</p> <p>Intervention favoured: HCT centre creation and promoting HCT centres activities through the media. Peer education</p>	<p>misconceptions</p>	<p>knowledge”</p>
<p>Akani 2005 (203)</p>	<p>Participants were couples undergoing pre-marital HIV testing in the hospital between 2000 and 2003.</p>	<p>Amongst the 168 individuals tested, 35 (20.8%) were found positive. Seroprevalence was significantly higher among females 23 (27.4%) compared to males 12 (14.3%). Infection rate was highest in the 25-29 years group (29.7%, n=22)</p>	<p>Age; Gender; Faith based organizations</p>	<p>“age younger” “gender” “FBO”</p>

		<p>and lowest in those of 35-39 years (6.1 %, n=2), though this difference was not statistically significant (p-value=0.058). Infection rate was significantly higher among females (p-value=0.036); among prospective couples from Orthodox churches (p-value=0.021); couples with prolonged courtship (>6 months) (p-value=0.0001); couples with history of premarital sex (p-value=0.0001); and couples with history of cohabitation (p-value=0.0001).</p> <p>Intervention favoured: interventions targeting faith based organizations, urging them to be more receptive of measures that emphasize behavioural and social changes</p>		
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Akinyemi 2010 (272)	People living with HIV accessing care at University College Hospital, Ibadan. Participants below 15 years and above 59 years were excluded from the study.	<p>Condoms usage before treatment and at last clinic visits was 14.0% and 43.3% respectively. Overall reports of condom use at specified periods were as follows: 1 – 6 months (33.0%); 7 – 12 months (37.3%) and above 12 months (53.8%). Patients in a marital union and those with higher education were more likely to use condoms.</p> <p>Intervention favoured: interventions that target high risk sexual behaviour among people living with HIV</p>	<p>Low condom use</p> <p>Literacy</p>	<p>“low condom use”</p> <p>“Literacy levels”</p>
Akpa 2011 (204)	People living with HIV/AIDS	<p>It was found that 71(21.3%), 88(26.3%) and 43(12.8%) of the participants were facing HIV-related stigma from their place of works, the public and their family members. Also, the results of the logistic regressions show that PLWHA who have no formal education and those with primary</p>	Stigma and discrimination	"stigma"

		<p>education were less likely to face stigma from the public (OR-0.212; 95% CI-0.064–0.702; p<0.05) and their employers (OR-0.236; 95% CI-0.072–0.775; p<0.05) respectively. Attendance at surveys was less for centres in the North (Sokoto and Kebbi) and PLWHA who are Muslims were more likely to face stigma based on the logistic regression conducted by the authors</p> <p>Intervention favoured: Stigma reducing methods</p>		
Aniebue 2009 (205)	<p>Participants were long distance truck drivers in Enugu area of Nigeria and reported being married (75.9%). They were predominantly Christians and majority had primary and or secondary education.</p>	<p>The study finds that 95.7% were aware of HIV/AIDS, 88.8% identified unprotected sexual intercourse as a mode of transmission, and 78.4% knew that use of a condom during sexual intercourse protects against HIV/AIDS transmission. Ninety-eight drivers (84.5%) engaged in extramarital sexual relationships and</p>	<p>Condoms; risk perception</p>	<p>“low condom use” “risk perception”</p>

		<p>42.9% had multiple sexual partners. Of the drivers 43.1% had used condoms at some stage and 28.6% used them consistently. Reasons for non-use were mainly unavailability, sexual dissatisfaction and religious convictions. Age, marital status and educational status were significant predictors of condom use among sexually active LDTDs.</p> <p>Intervention favoured: campaigns to improve the general acceptability of condoms are recommended. Improved distribution of condoms at the stations where the drivers stop would improve accessibility and use.</p>		
Ankomah 2013 (206)	Men who are in a defined “stable” relationship (currently married or cohabiting) that have reported having an extramarital sex in the past	Bivariate analysis in the study showed that condom use statistically associated with education ($P = 0.0001$), and rural/urban residence	Poor knowledge on how to use condoms; risk perception; condom availability	<p>“condom knowhow”</p> <p>“risk perception”</p> <p>“condom availability”</p>

	12 months	<p>(P = 0.0001), with only 39.4% in rural areas compared with 57.4% in urban areas (P = 0.0001) using condoms in the last extramarital sex.</p> <p>Respondents who knew how to use condoms were about 13.5 times more likely to have reported condom use when compared with their counterparts who did not know how to use condoms (p<0.0001). Availability of condoms rather than cost tends to impact on condom use in extra marital relationships. Those of Yoruba and Igbo ethnic groups were more likely to use condoms compared to those of Hausa ethnicity.</p> <p>Intervention favoured: Behavioural interventions to increase the use of condoms</p>		"low condom use"
Apena 2014	Study participants were students in senior	Variables explored in this research include (a)	Knowledge (which shows urban-	"inaccurate

(207)	<p>secondary school students (59.7%) and students of Lagos State University (LASU, 40.3%).</p> <p>Participants were from rural (44.7%) and urban (53.2%) areas of Lagos State and were aged 15 years and above.</p>	<p>behavioural change information – BCI, (b) sexually transmitted infections (STIs) and clinical understanding (c) sexual activities (d) condom use and (e) fear of HIV/AIDS-related stigma and discrimination (HASD). The authors found that the population studied demonstrated attributes that puts them at risk for contracting HIV/AIDS.</p> <p>Intervention favoured: “Knowledge Management (KM) techniques” and behavioural change communication (BCC).</p>	<p>rural dichotomy); MSP; Poor condom use; Sigma and discrimination</p>	<p>knowledge” “MSP”</p> <p>“low condom use”</p> <p>“stigma”</p>
Aransiola 2014 (181)	<p>Participants were people living with HIV who have been using the services of the clinic for at least one year. Three had BSc degrees whilst eight had completed high school. They were mostly diagnosed of HIV between 2007 and 2010.</p>	<p>The results reveal both the diversity among even a small number of patients, and persistent cross-cutting themes of stigma, discrimination, poverty, and the psychological impacts of insecure livelihoods and well-intentioned but ultimately stigmatizing supports such as selective food</p>	<p>Poverty, stigma</p>	<p>“Poverty” “Stigma”</p>

		<p>parcels. Both population-based interventions against stigma and poverty, as well as micro-level, contextualized attention to patients', families' and health workers' fear of social exclusion and infection at a clinic and community level are needed if patients – and society – are to live well with HIV in Nigeria.</p> <p>Intervention favoured: comprehensive approaches that address stigma, social support for people living with HIV and poverty.</p>		
<p>Asekun- Olarinmoye 2009 (208)</p>	<p>Undergraduate students of a polytechnic</p>	<p>Majority of the participants knew condoms (94.6%). Of the sexually active sample, males were more likely to report support for condom use during sexual intercourse ($X^2 = 4.38$ $P=0.036$) and also use condoms ($X^2 = 8.94$, $P=0.003$) compared to their female counterparts. The most</p>	<p>Mass media and not a health care facility as main source of information about condoms; inconsistent condom use; lack of support for condom use</p>	<p>“condom knowhow” “low condom use”</p>

		<p>cited reason for condom use is HIV/AIDS prevention and other STI's (63.9%). Disposition to condom use was high but did not translate to consistent use. Common reasons for not using condoms include cultural believe and partner's wish (cultural barriers and societal expectations in 98.4% and 84.1% respectively). The electronic media is the most cited source of information on condoms (69.9%). About 16% of the population do not support condom use</p> <p>Intervention favoured: Gender roles in reproductive health and policies that empower females to negotiate condom use better.</p>		
Ayoola 2013 (209)	<p>Study participants were MSM in Lagos State Nigeria. They were aged between 15-60 years. Ethnicity of those sampled includes Yoruba,</p>	<p>The authors found that only about 40.5% of the population uses condoms "all the time" and 85% use one form of lubricant or the other during</p>	<p>Poor condom use; transgender sex among MSM which is a high risk group; transactional sex;</p>	<p>"low condom use" "transgender sexMSM" "CSW"</p>

	<p>Hausa, Igbo, Efik and Urhobo. The participants identified themselves and Christians (76.6%), Muslims (21.0%) and Traditionalists (2.4%). A huge percentage (66%) were single and not in a stable relationship. Majority of the MSM population had up to secondary (58.8%) and tertiary (32.3%) education.</p>	<p>sexual encounters. Reasons for not using condoms include “I got carried away” in 27.9%, partner opposed in 26.7%, “I did not bother” in 10.5%, condom not available in 10.5%, condom interferes with pleasure in 7.0%, “I was forced” in 7.0% and “I was too shy” in 3.4%. It was found that 47.1% of the 291 respondents have sex with males and females. Another important finding is that 66.3% of MSM do not live openly as MSM. Those with lower education tended to engage in transactional sex more than their more educated counterparts</p> <p>Intervention favoured: behavioural change initiatives to reduce risky practices which predisposes this group of MSM to HIV and sexually transmitted infections</p>	<p>educational status</p>	<p>“MSM” “education”</p>
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<p>Azuonwu 2012 (210)</p>	<p>Military personnel in Niger-Delta area of Nigeria who are willing to participate in the study</p>	<p>A prevalence of 14.67% (higher than the national average) was determined. Prevalence was also significantly higher for female personnel compared to the male counterparts ($p=0.05$). Significant negative correlation between HIV infection and CD4 count $r=-0.443$, $p<0.01$. Intervention favoured: Policies that aim to increase condom availability and use among serving personnel, especially for men/women who are posted to missions.</p>	<p>Travel and long absence away from home; high prevalence of HIV in the population</p>	<p>“frequent travel” “long absence”</p>
<p>Babalola 2007 (211)</p>	<p>Participants were selected from households in randomly selected local government areas of the state. Average age of participants is 19.4 years for male participants and 18.8 years for female participants.</p>	<p>The authors argued that social norm is strongly and directly associated with readiness for HIV testing among men but have no apparent influence among women. For both sexes, social norm appears to have strong mediating influence on the relationship between personal perceived</p>	<p>Stigma; social norms that promote stigma; VCT&HIV/AIDS knowledge</p>	<p>“stigma” “inaccurate knowledge” “culture”</p>

		<p>stigma and readiness for HIV testing.</p> <p>Intervention favoured: Authors do support interventions that target stigma. The authors also argue that in order to eliminate HIV-related stigma, it is not enough to target individual cognitive processes; strategic efforts should target social structures in order to change negative social norms.</p>		
Babalola 2009 (212)	Female participants (15-49 years) and male participants (15-64 years) were selected from the database for inclusion in the study.	<p>The authors argued that media-based HIV programs constitute an effective strategy to combat HIV/AIDS-related stigma and should therefore be intensified in Nigeria.</p> <p>Intervention favoured: media based intervention for HIV related stigma</p>	Stigma	"stigma"
Balogun 2013	Male and female participants recruited from a	Overall, 71 (16.0%) of respondents used condom	Low condom use	"low condom use"

(273)	hospital setting. There were 175 (39.5%) males and 268 (60.5%) females in the study	consistently. Only 55 (12.4%) of the respondents were aware of female condom while 9 (2%) used it.		
Balogun 2014 (274)	Male and female participants recruited from a hospital setting. There were 175 (39.5%) males and 268 (60.5%) females in the study	The disclosure rate to sexual partners was 9.7% (43 persons) among studied PLHIV. Consistent condom use was highest (12.7%) among PLHIV who had disclosed to sexual partners while inconsistent use was highest (93.3%) among those that did not disclose their HIV status.	Non-disclosure Low condom use	“Non-disclosure” “Low condom use”
Bassey 2007 (213)	Traditional birth attendants in rural communities in Cross Rivers State Nigeria.	44.3% of the TBA had no formal education. Only 35% of the population reported knowing what HIV means. Only 2.1% of the population reported they were aware of their clients’ HIV status prior to delivery. 43.6% used sterilised blades, while 10.7% used protective glove and clothes during delivery. Intervention favoured: Educational campaign for	Poor knowledge of HIV/AIDS among traditional birth attendants; unsafe practices by TBA’s	“inaccurate knowledge”

		TBAs		
Bukar 2008 (214)	Dentists, dental therapists and dental technologists working in government hospitals.	<p>Significant numbers of dental professionals in Nigeria reported attitudes and behaviours towards people living with HIV/AIDs which are discriminatory.</p> <p>Intervention favoured: Access to discrimination free quality oral and dental care to people living with HIV/AIDS and anti-discrimination policies/strategies</p>	Discrimination	“stigma”
Dahlui 2015 (276)	Data is from a nationally representative data base and covered individuals of different age categories and from different socio-economic background.	<p>A total of 56 307 men and women aged 15–49 years participated in this national survey. About half of the population in Nigeria have HIV stigma. Younger persons, men, those without formal education and those within poor wealth index are more likely to have stigma towards PLWHA. In addition, married people are more likely to have</p>	<p>Stigma</p> <p>Poor HIV knowledge</p>	“stigma” “inaccurate knowledge”

		<p>stigma on PLWHA and are more likely to blame PLWHA for bringing the disease to the community. Also about half of the population discriminates against PLWHA. However, those with higher levels of education and those from higher wealth index seem to be more compassionate towards PLWHA. About 70% in the population are willing to care for relative with AIDS, even more so among those with higher level of education.</p> <p>Intervention favoured: HIV education interventions aimed at reducing stigma levels in communities</p>		
Coker 2015 (275)	Participants were people living with HIV on treatment between August 2006 and January 2008 at the Aminu Kano Teaching Hospital	Of the 600 participants (43% males), 276 were observed till the end of the study. There were no significant differences in mean log ₁₀ VL between	Adherence	“Adherence”

	(AKTH), Kano. At baseline, 43.2% were male and 58.9% were married.	<p>the intervention groups. At the end of entire follow-up period, 83% (229/276) who were not lost to follow-up achieved undetectable VL (< 400 copies/ml). In the multivariable analysis, age between 30-34 years (vs 18-24 years) and both baseline CD4 ranges between 100-199 cells/mm³ or 200-349 cells/mm³ (vs CD4 <100 cells/mm³) as positively associated with VL suppression while poor self-reported adherence and <95% Rx refill rates were negatively associated with VL suppression.</p> <p>Intervention favoured: interventions that encourage good adherence and optimal medication refill rates</p>		
Durojaiye 2011 (216)	Students of eight public tertiary institutions in Lagos were sampled for the study. They were	Although the mean score of participants' responses to ten HIV/AIDS knowledge questions	Risk perception; MSP; condom use	"risk perception" "MSP" "low condom

	<p>mostly Christians (78.8%) and single or never married (94.4%).</p>	<p>was 8.3 of 10, 73.5% of them did not perceive themselves at risk of being infected. Majority (53.8%) did not change their dating behaviour as a result of concerns for HIV/AIDS and 70.3% had multiple lifetime sexual partners. Those who perceived themselves to be at risk of contracting HIV were more likely to use condoms always ($p = 0.019$). Authors argued that students were in the first stage of the behaviour change model: recognition of the problem.</p> <p>Intervention favoured: Interventions aimed at addressing risk perception</p>		<p>use”</p>
<p>Efunshile 2007 (217)</p>	<p>Study participants were trainee seafarers (sailors) aged between 15-40 years. Majority of the participants (75.5%) were aged between 21-25 years and 75.5% were males. Eighty seven</p>	<p>The authors found that 25% of the population did not believe that having sex with a CSW puts them at greater risk of HIV/AIDS and 19.1% did not believe that condoms were protective. Despite a</p>	<p>Poor risk perception; fatalistic tendencies; transgender sex; condom use; inaccurate knowledge</p>	<p>“risk perception” “fatalistic tendencies” “transgender sexMSM” “low</p>

	<p>(92%) of the population had secondary education with the remainder having diplomas. About 6.4% of the population identified as Muslims with the remainder identifying as Christians. Participants identified as Hausa/Fulani (25.5%), Ibo (22.3%) and Yoruba (8.5%).</p>	<p>prevalence of HIV/AIDS of 5.3% among the population (as determined by the authors in the same study), 67% of the study participants believed that they were at little or no risk of HIV. There was poor knowledge of how STIs are transmitted among the population. Being of the female gender and having trichomoniasis were significantly associated with HIV infection (p values of <0.05 respectively). Knowledge of HIV infection route did not appear to be a problem as 90% of the population demonstrated good knowledge according to the authors.</p> <p>Intervention favoured: Educational programs and condom promotion</p>		<p>condom use” “inaccurate knowledge”</p>
Ejele 2005 (218)	<p>Unemployed young men and women undergoing pre-employment medical screening</p>	<p>A prevalence of 5.1% was determined among the less than 19 years age category who had the</p>	<p>Socio-economic status (poverty, unemployment); age (19 years</p>	<p>"poverty" "age younger"</p>

	in Port Harcourt	<p>highest prevalence of HIV/AIDS. Prevalence was higher among females (3.6%) than among males (2.4%). In the discussions, authors observed that employment status be an important determinant for the observed trend (“poverty and chronic unemployment” were implicated in the discussions).</p> <p>Intervention favoured: Behavioural, social and cultural change approaches</p>	or less)	
Ekanem 2005 (219)	Participants were intra-city commercial bus drivers and motor park attendants. Level of education was not given.	The men were found to have a strongly woven network of sexual relationships. Their sexual network included, apart from their wives and regular partners, commercial sex workers, young female hawkers, schoolgirls, and market women within and outside the motor parks. More than two thirds (74.3%) of the men had multiple sex	Low condom use; CSW; poor risk perception; MSP	<p>“low condom use”</p> <p>“CSW” “risk perception” “MSP”</p>

		<p>partners and many of them had had sexually transmitted diseases at one time or another.</p> <p>Condom ever-use rate was 65.6% but consistent and regular use rate with casual partners was 11.6%. Almost all the respondents (96.4%) knew themselves to be at high risk of contracting STDs, while 87.6% felt that it was impossible for them to “catch” AIDS. Poor knowledge of risk factors for STDs was exhibited, as many of them attributed their previous STDs to excessive exposure to the sun, having sex in the sun, and their partners remaining in the bath for too long. Intra-city commercial bus operators and men at motor parks are a high risk group for acquiring HIV infection. Their sexual networking with a variety of women within and outside the parks also seems to suggest that they play a major role in</p>		
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		<p>transmitting HIV infection in urban communities in Nigeria</p> <p>Intervention favoured: interventions targeting motor pack workers</p>		
<p>Eluwa 2012 (277)</p>	<p>Participants were female sex workers, aged 15 years and above, drawn from a nationally representative database.</p>	<p>A total of 2897 and 2963 FSWs were surveyed in 2007 and 2010, respectively. Overall HIV prevalence decreased in 2010 compared to 2007 (20% vs. 33%; $P = 0.001$), with similar magnitude of declines among BB-FSW (23% vs. 37%; $P = 0.0001$) and NBB-FSW (16% vs. 28%; $P = 0.0001$).</p> <p>Consistent condom use with boyfriends in the last 12 months was lower in 2010 compared to 2007 overall (23% vs. 25%; $P = 0.02$) and among BB-FSWs (17% vs. 23%; $P = 0.01$) while NBB-FSWs showed a marginal increase (30% vs. 27%; $P = 0.08$). FSWs residing in the Federal Capital</p>	<p>Low condom use; female sex work</p>	<p>“low condom use” “CSW”</p>

		<p>Territory [adjusted odds ratio (AOR): 1.74 (1.34 2.27)] and Kano state [AOR: 2.07 (1.59 2.70)] were more likely to be HIV-positive while FSWs recruited in 2010 [AOR: 0.81 (0.77–0.85)] and those who had completed secondary education [AOR: 0.70 (0.60–0.80)] were less likely to be HIV-positive.</p> <p>Intervention favoured: venue based intervention programs for female sex workers that also address low condom use with boyfriends among female sex workers.</p>		
Eluwa 2013 (220)	<p>Participants were injecting drug users sampled from all the geopolitical zones of the country. Most of the participants had primary and secondary education and the commonly abused drugs are cocaine and heroin.</p>	<p>Total numbers of IDUs ranged from 197 in Lagos to 273 in Cross River and Oyo states. HIV prevalence was highest in Federal Capital Territory (FCT) at 9.3%, Kaduna 5.8%, Oyo 5.1%, Kano 4.9%, CR 3.3% and Lagos 3.0%. Although</p>	IDU; low condom use	"IDU" "low condom use"

		<p>>90% of participants were male, females had higher HIV prevalence in all states surveyed except FCT (range: 7.4% in CR to 37.7% in Kano). Logistic regression showed that females were significantly more likely to be HIV positive in Kano [OR = 33.2, 95% CI: 6.8–160.4], Oyo [AOR = 15.9, 95% CI: 3.69–68.51], Lagos [OR = 15.5, 95% CI: 2.41–99.5] and Kaduna states [AOR = 19.6, 95% CI: 4.4–87.6]. For injecting risk behaviour, only receptive sharing was associated with HIV [AOR = 7.6, 95% CI: 1.2–48.7] and [AOR = 0.2, 95% CI: 0.04–0.92] in Oyo and Kaduna states respectively.</p> <p>Interventions favoured: Interventions targeting IDU – Further research and community-based opioid substitution therapy/needle exchange programs</p>		
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<p>Enwereji 2008 (184)</p>	<p>Participants were women (including widows) who are HIV positive. The women were largely Igbos, had varying degree of education with most having between primary and secondary education. All of them were Christians</p>	<p>The study found that 85 (86.7%) of the women were denied rights to family resources. Thirty-eight (64.4%) of them had negative relationship with their family members for demanding their husbands' property. Because of limited financial assistance, the women took two types of risks in order to survive in the communities. Twenty-five women (25.5%) earned their livelihood by acting as hired labourers to others in the farm. More than half (55.1%) of the HIV positive women were practicing unprotected sex. Although as high as 79.6% of women were aware of risks of unprotected sex, 54 (55%) of them practised it. The commonest reason for taking the risk was sex partners' dislike for condom use.</p> <p>The high proportion of HIV positive women who</p>	<p>Socioeconomic factors; unprotected sex</p>	<p>"poverty" "low condom use"</p>
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		<p>were denied access to family resources, could suggest lack of care and support.</p> <p>Intervention favoured: Socioeconomic empowerment of women in society</p>		
Essien 2005 (221)	<p>Participants were members of the same military regiment located in opposite parts of the city of Lagos. They were majorly between 19-49 years.</p>	<p>Authors argued that participation in the intervention resulted in increased condom use with casual partners at 6- and 12-months follow-up assessments. Specifically, 36% of the participants in both regiments reported that they hadn't even thought of using condoms with a casual partner at baseline. However, a positive intervention effect was observed in the intervention, but not the control regiment at the 6-months (40% vs. 0.9%) and 12-months (46.8% vs. 4.3%) follow-up assessments ($p < 0.05$).</p> <p>Intervention favoured: Situationally based</p>	Condom use	"low condom use"

		intervention for uniformed personnel		
Essien 2006 (223)	Participants were uniformed service personnel in the Southwest of Nigeria. They are of different ethnicities and religious backgrounds and with varying educational qualifications.	The study found that knowledge of how to correctly wear condom was the most significant positive predictor of the intention to use condom, adjusted prevalence odds ratio (APOR), 5.99, (95% CI, 1.26, 19.79). The other main positive predictors of intent to use condom were the knowledge of the mode of HIV transmission via blood, APOR 2.43 (95%CI, 1.01, 5.82), saliva (5. 87, 95% CI, 3.15, 10.94), and pre-ejaculatory fluid (APOR, 3.58, 95% CI, 1.67, 7.48). Male gender was also a significant positive predictor of the intent to use condom, APOR, 2.55, (95% CI, 1.10, 5.97). The results further indicated alcohol use (APOR, 0.32, 95%CI, 0.16, 0.61), marijuana use (APOR, 0.24, 95% CI, 0.11, 0.56), and the frequency of oral sexual behaviour (APOR, 0.006, 95% CI, 0.002,	Knowledge; gender; education	“condom knowhow” “gender” “education”

		<p>0.019) as negative predictors of the intent to use condom.</p> <p>Intervention favoured: interventions that incorporate the above sociodemographic and lifestyle predictors of condom use</p>		
Essien 2011 (222)	<p>Female military personnel in the Southwest of Nigeria. There was no significant difference between the two groups (control and intervention) at baseline though participants in the control group were more likely to be single and without a child.</p>	<p>The authors reported that the motivational skills-building intervention did not improve participants' knowledge of HIV/AIDS any better than did the HIV education control condition at each assessment period, but it significantly increased condom use among women in this group by 53.6% at 3-month follow-up. HIV preventive behaviours among women in the motivational skills-building intervention group improved significantly, being 2 and 3 times more, compared to women in the HIV education control</p>	Condom use; MSP	<p>"low condom use"</p> <p>"MSP"</p>

		<p>group at 3-month and 6-month follow-up assessments. The intervention also significantly improved behavioural intentions of participants as well as reduced alcohol use before sex by 25%, after 3 months; and number of sexual partners by 12% after 6 months. Women in the intervention group were five times more likely than women in HIV education control group to suggest that their new male partners use condom.</p> <p>Intervention favoured: video tape based HIV intervention</p>		
Etukumana 2011 (224)	<p>Pregnant women attending antenatal clinic at a rural mission hospital in Zawan. Most of the participants were married and unemployed.</p>	<p>In multiple logistic regression carried out by the authors, HIV infection was independently associated with suspecting their partner of extramarital sex (adjusted odds ratio 3.8, 95% CI 1.6, 9.0), post-primary education (AOR 2.4, 95% CI</p>	<p>MSP; educational level Extramarital affair</p>	<p>“education” “MSP”</p>

		<p>1.1, 5.3), multiple sexual partners (AOR 2.4, 95% CI 0.97, 6.2) and cigarette smoking by a partner (AOR 3.0, 95% CI 0.95, 9.4). Despite high levels of HIV awareness in the population, only 20% reported any condom use.</p> <p>Intervention favoured: ABC methods (abstinence, be faithful, condoms)</p>		
Ezugwu 2014 (278)	<p>Participants were HIV-positive, sexually active women receiving care at adult HIV clinics in Enugu. Most respondents were married (62.3%). In total, 65% of the respondents lived in Enugu metropolis, and most were Christians (99.8%) of Roman Catholic (68%) and Protestant (18%) denominations.</p>	<p>The rate of contraceptive use was 73.1%; 26.9% (n = 91) of women were not using modern contraceptives. Male condoms were the most frequent contraception used (78.1%, n = 193), but 48.2% of women reported inconsistent use. The proportion of women using a dual-contraceptive method was 25.1%; none used the female condom. Having a regular sexual partner was significantly associated with use of modern</p>	Condom use	"low condom use"

		<p>contraception (odds ratio, 73.00; 95% confidence interval, 34.13–156.13; P b 0.001). Misconception and fear of adverse effects were the most common reasons for not using contraception.</p> <p>Interventions favoured: interventions that promote condom use</p>		
Fakolade 2010 (225)	<p>Population were aged 15-64 years and resident in different part of Nigeria. The sampling methods adopted in the surveys is weighted for gender, states and rural-urban locations</p>	<p>A significant and positive trend was evident between 2003 and 2007. ($p < 0.0001$) Furthermore, exposure to mass media communications on HIV and AIDS issues and social support were significantly related to the reduced stigma and discrimination against people living with HIV/AIDS ($p < 0.0001$). Authors claimed that male respondents were more likely to demonstrate accepting attitudes to people living with HIV/AIDS compared to their female counterparts. They also</p>	<p>High levels of discrimination; stigmatisation</p>	<p>"stigma"</p>

		<p>reported that Christians were less likely to stigmatise and discriminate against people living with HIV/AIDS. Respondents from the South West were said to be most likely to stigmatise and discriminate against people living with HIV/AIDS compared to people resident in other regions of the country.</p> <p>Intervention favoured: mass media approaches</p>		
Fawole 2014 (192)	<p>The study population was brothel-based FSWs from the different classes of brothels in Abuja. Many had secondary school education (42.3%), while (32.4%) had tertiary education. Many (69.5%) has never been married, 49.0% had a child or children. Most (72.5%) were Christians. Eighty nine percent of FSWs took alcohol before engaging in sexual intercourse, while 56.4%</p>	<p>The prevalence of VAW six months preceding the survey was 52.5%. Sexual violence was the commonest type (41.9%) of violence experienced, followed by economic (37.7%), physical violence (35.7%) and psychological (31.9%). The main perpetrators of sexual violence were clients (63.8%) and brothel management (18.7%). Sexual violence was significantly more experienced (aOR</p>	<p>CSW, Substance use</p> <p>Violence against sex workers</p>	<p>“CSW” “Substance abuse”</p>

	<p>smoked the cigarette or Indian hemp.</p>	<p>2.23; 95%CI 1.15-4.36) by older FSWs than their younger counterparts, by permanent brothel residents (aOR 2.08; 95%CI 1.22-3.55) and among those who had been in the sex industry for more than five years (aOR 2.01; 95%CI 0.98-4.10). Respondents with good knowledge levels of types of violence were less vulnerable to physical violence (aOR 0.45; 95%CI 0.26-0.77). Psychological violence was more likely among FSWs who smoked (aOR 2.16; 95%CI 1.26-3.81). Risk of economic violence decreased with educational levels (aOR 0.54; 95%CI 0.30-0.99 and aOR 0.42; 95%CI 0.22-0.83 for secondary and post-secondary respectively). Consequences of the violence included sexually transmitted infections (20%) and HIV (8.0%).</p> <p>Intervention favoured: Interventions that educate</p>		
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		FSWs on their rights and enable them avoid violence are urgently required. Young women need economic and educational empowerments to enable them avoid sex work.		
Gadzama 2014 (279)	Health care professionals in 27 survey locations (health facilities) where observations took place. Locations visited include the ward, emergencies, intensive care, laboratories, kidney centre.	Only 33.3% of the units (95% CI, 16- 54) had non- sharps infectious healthcare waste of any type inside containers specific for non- sharps infectious waste and 17 (77.3%) of the observed therapeutic injections were prepared on a clean, dedicated table or tray, where contamination of the equipment with blood, body fluids, or dirty swabs was unlikely. Absence of recapping of needles was observed in 11 (50.0%) units giving therapeutic injections. Only 7.4% of units surveyed had separate waste containers for infectious non- sharps.	Knowledge Injection safety	"Knowledge" "injection safety"

		Intervention favoured: intervention aimed at addressing poor knowledge and injection safety practices.		
Ibrahim 2013 (226)	Participants were pregnant women attending antenatal care at Niger Delta University Teaching Hospital in Bayelsa State who tested positive for HIV/AIDS - out of the 2661 women tested between 2008 to 2009, 120 (33.3%) tested positive. The HIV positive women were then compared with a randomly selected set of women (240), which did not test positive for HIV/AIDS (that were selected from the same cohort and community). Majority of the participants had up to secondary education alone and were either married or cohabiting.	The seroprevalence rate during the study period was 4.9%. Parity, age at first coitus, educational status, marital status and occupation do not seem to increase the risk. However, partner being unemployed, hospital/clinic delivery, the route of last delivery, previous induced abortion and the number of lifetime partners were identified as risk for HIV seropositivity (all p-values < 0.005). Intervention favoured: educational interventions, adherence to universal precautions and routine antenatal screening for pregnant women.	Socioeconomic factors; health services utilization; MSP; induced abortion	"MSP" "poverty"
Idoko 2015	Participants of this study were serodiscordant	HIV serodiscordant couples were identified as the	Stigma;	"Stigma"

(193)	<p>couples in Nigeria and some persons working in HIV field in Nigeria (A list of 238 persons working in the HIV and AIDS field as researchers, ethicists, journalists, implementing partners, development partners, policymakers, and health care providers was generated from the NACA programme office). The online survey respondents were from a number of countries: France, Nigeria, the United States, Australia, Congo, Canada, Ghana, and Ethiopia.</p>	<p>appropriate target group for PrEP use. Most respondents felt that PrEP use by key affected populations would help reduce the HIV incidence. Stigma was identified as a major concern and a potential barrier for the acceptance and use of PrEP by HIV serodiscordant couples. Electronic and print media were identified as important means for massive public education to prevent stigma and create awareness about PrEP. In a male dominated society such as Nigeria, HIV-negative male partners in serodiscordant relationships may resist enrolment in PrEP programmes. This may be complicated by the fact that the identified index partner in most serodiscordant relationships in Nigeria is an HIV-positive woman, who is often diagnosed during pregnancy.</p>		
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		Intervention favoured: interventions that motivate HIV-negative male partners to use PrEP and establishment of effective public education programmes in addressing stigma.		
Ikechebelu 2009 (227)	The population were people living with HIV/AIDS in South East of Nigeria. The sample had more women than men. Only 5.7% of the population had no formal education and majority were Christians.	Most of the population were in heterosexual relationship (97%). Married couples in serodiscordant were 25.3% while the singles in serodiscordant relationship were 20%. About 56% of the population did not use condoms for their adopted sexual practice though 65% believe that condoms would protect against HIV transmission Intervention favoured: Teaching of safer sex practices in health care centres, schools and village gatherings	Condom use; fatalistic tendencies	“low condom use” “fatalistic tendencies”
Iliyasu 2013	Participants were registered undergraduate	The authors found that 98.1% of the respondents	Condom use	“low condom use”

(228)	<p>university students in Kano (Bayero University). Postgraduate students were excluded from the research. Participants were aged 16-42 years and came from arrange of religious and ethnic backgrounds and university faculties</p>	<p>were circumcised despite an observed low awareness of its protective role in HIV transmission. Only 51.2% procured circumcision at a health facility.</p> <p>Intervention favoured: male circumcision</p>		
Isibor 2004 (229)	<p>The study population included all persons involved in news gathering, writing, editing and presentation and are affiliated to the seven media organisations in Ibadan. This includes reporters, feature writers, editors, producers and scriptwriter.</p>	<p>The journalists' overall mean AIDS knowledge score was 10.6 out of 14 points. About one third (29%) believed that the bite of a mosquito could transmit HIV and 28% thought that AIDS could be cured if detected early. Although 75.2% agreed that the rights of PLWAs to employment should be protected, 49.6% believed AIDS patients should be detained in hospital to prevent the spread of HIV. About a quarter (25.2%) had received training about HIV/AIDS, while 74.8% had not. The majority (65.4%) had never written any report on</p>	<p>Knowledge; negative attitudes; risk perception</p>	<p>“inaccurate knowledge” “stigma” “risk perception”</p>

		<p>HIV/AIDS-related issues, while 35.6% had done so</p> <p>Intervention favoured: Advocacy and training workshops</p>		
<p>Iyaniwura 2006 (231)</p>	<p>Participants of this study were largely below the age of 25 years (97%), single, Christians and Yoruba. Most of them have secondary education (60.3%). The local community is a predominantly farming community.</p>	<p>The authors reported that of the 393 respondents, 309 (78.6%) had a positive attitude towards HIV testing and about 19.8% had indicated that they were unaware of voluntary counselling and confidential testing (VCCT). Forty-five had been tested for HIV in the past and out of this 10 of them went for voluntary HIV testing. Major reasons for not testing include “believed that they couldn't get HIV (47.6%), it had not occurred to them to test (17.4%), no time to go for testing (10.9%) and stigma (7.9%)”. Of the 348 who had never tested for HIV, 62.8% of them indicated that they would test if it were free. The</p>	<p>Risk perception; stigma; attitude; cost of testing for HIV</p>	<p>“screening” “stigma” “risk perception”</p>

		<p>authors argued that single youth with secondary education and who knew someone with HIV were more likely to desire an HIV test ($p < 0.05$) and youth who were more willing to care for someone who had HIV were more willing to go for a test compared to those who are not willing to care for someone with HIV (70.5% vs 65.0%)</p> <p>Intervention favoured: interventions that target low levels of education, stigmatization and cost of HIV testing</p>		
lyaniwura 2008 (230)	<p>Participants were young graduates attending orientation camp for the compulsory one year national service program. They were largely from the 3 largest ethnic groups in Nigeria with 85% of them reporting that they were married.</p>	<p>While 73% of the population had ever had sex, 54.8% have had sex in the last 1 year. Majority of those that have had sex in the past had used condoms before (85.6%), only 53% had used it in their last sex and only 34.4% use it regularly.</p> <p>Males were more likely to report history of sexual</p>	Low condom use; MSP	<p>"low condom use"</p> <p>"MSP"</p>

		<p>activity, have multiple sexual partners but use condoms more regularly compared to females ($p < 0.05$). Major behavioural changes made to avoid HIV include being faithful to partner (32.2%), abstaining from sex (27.1%), and using condoms during sex (20.6%). For both primary and secondary abstainers, religious and moral convictions were the main motivators</p> <p>Intervention favoured: Educational interventions (messages) that target males</p>		
lyoke 2010 (232)	<p>Participants were individuals living with HIV/AIDS who attended the antiretroviral clinic of the University of Nigeria teaching hospital. Up to 90% had formal education with most of them having primary and secondary education. They were largely Christians and married. About 98%</p>	<p>The authors of this paper found that Females indulged in risky sexual activity principally in obedience to the demands of their male partners and were more likely to have sexual partners who were unaware of their serostatus than males. They concluded that risky sexual behaviour</p>	<p>Gender; Culture; Non-disclosure</p>	<p>“gender” “culture” “non-disclosure”</p>

	of the population were Igbos	<p>among women living with HIV/AIDS in Enugu despite exposure to intensive counselling was still mainly driven by the subordinate traditional gender roles of women in this culture. Only in 48% of cases that spouses were aware of the participants' serostatus.</p> <p>Intervention favoured:</p>		
Keating 2006 (233)	Participants were selected from areas that were targeted by the VISION project. Participants have access to mass media	<p>Exposure to the VISION mass media campaign was high: 59%, 47%, and 24% were exposed to at least 1 VISION radio, printed advertisement, or TV program about reproductive health, respectively.</p> <p>The differences in outcome variables between 2002 baseline data and the 2004 follow-up data were small. However, those with high program exposure were almost one and a half (Odds Ratio [O.R.] = 1.47, 95% Confidence Interval [C.I.] 1.01–</p>	Risk perception, condom use	"risk perception" "low condom use"

		<p>2.16) times more likely than those with no exposure to have discussed HIV/AIDS with a partner. Those with high program exposure were over twice (O.R. = 2.20, C.I. 1.49–3.25) as likely as those with low exposure to know that condom use can reduce risk of HIV infection. Program exposure had no effect on condom use at last sex.</p> <p>Intervention favoured: Programs that target rural populations, females, and unmarried individuals, and disseminate information on where to obtain condoms, are needed to reduce barriers to condom use. Improvements in HIV/AIDS prevention behaviour are likely to require that these programmatic efforts be continued, scaled up, done in conjunction with other interventions, and targeted towards individuals with specific</p>		
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		socio-demographic characteristics.		
Kehinde 2005 (280)	Participants were consenting patients who attended the STC clinic from March to November 2001. Of the 210 patients seen, 98 (46.7%) were male and 112 (53.3%) were female ($p>0.05$). The majority, 171 (81.4%) were aged 20-39 years, while only ten (4.8%) were adolescents.	<p>One-hundred-and-eighty (85.7%) had an STI, of which 41 (22.8%) were co-infected with HIV.</p> <p>Thirty (16.7%) patients with meningococcal urethritis/cervicitis and five (2.8%) with gonorrhoea were also positive for HIV. Five patients were HIV positive but had no other STI.</p> <p>Patients with gonorrhoea, non-gonococcal urethritis/cervicitis, trichomoniasis and bacterial vaginosis were more likely than those with warts, candidiasis and herpes to have co-infection ($\chi^2=12.5$, $p=0.04$). The study's HIV prevalence rate was 21.9%. STI/HIV co-infection rate was significantly higher among unskilled and unemployed patients compared with professional and skilled workers ($p<0.05$).</p>	<p>High STI rates and poor detection/treatment of STI</p> <p>Education</p>	<p>"STI rates"</p> <p>"low education"</p>

		Intervention favoured: interventions that increase STI detection and treatment locally.		
Lapinski 2008 (234)	Participants were recruited through the help of local NGOs in Abuja. Most of the participants (73%) had never tested for HIV in the past and none was reported as HIV positive. Other details about the participants were not reported.	The authors of this study claimed that the intervention was effective relative to a control in impacting perceptions of the severity of HIV and some stigma-related attitudes, particularly for male participants; and that for this sample, risk and stigma perceptions significantly impact intentions to test for HIV. It also showed that severity perceptions mediated the relationship between viewing the film and testing intent. Intervention favoured: Entertainment-education methods	Risk perception; stigma	“risk perception” “stigma”
Lawoyin 2007 (185)	Participants were young women in secondary (39.7%) and tertiary (60.3%) education. The	Authors found low knowledge levels (only 83.8% of the population were able to correctly identify	Knowledge; stigma	“inaccurate knowledge” “stigma”

	<p>participants were largely single (88.2%) and most of them were in the age range of 20-30 years</p>	<p>the primary mode of HIV transmission), misconceptions about HIV/AIDS as well as widespread stigma.</p> <p>Intervention favoured: Comprehensive and culturally appropriate HIV/AIDS and sexual health programs for young women in Nigeria that meet their needs.</p>		
<p>Merrigan 2011 (235)</p>	<p>Participants were men who have sex with men in the selected states. About half of the sample was mobile, spending about a month away from home at a time and a small number (34) reported being married or cohabiting with an opposite sex. Some in addition to having sex with men also have girlfriends with which they have sex as well.</p>	<p>A total of 879 MSM participated, 293 from each state. Eight participants (1.1%, CI 0.1% to 2.2%) in Cross River, 27 (9.3%, CI 5.7% to 15.4%) in Kano and 74 (17.4%, CI 12.3% to 23.2%) in Lagos tested positive for HIV. No syphilis was detected. The median age was 22 years. MSM reported an average of 4.2 male anal sex partners in the past 6 months. Between 24.4% (Lagos) and 36.0% (Kano) of MSM reported selling sex to other men. Up to</p>	<p>Mobility (travel); condom use; transgender sex; CSW</p>	<p>“frequent travel” “low condom use” “transgender sexMSM” “CSW”</p>

		<p>49.7% of MSM reported sex with a girlfriend and ≤ 6.5% purchased sex from female sex workers.</p> <p>Consistent condom use in commercial sex with other men over the past 6 months ranged from 28.0% (Cross River) to 34.3% (Kano), in contrast to between 23.9% (Kano) and 45.8% (Lagos) for non-commercial sex. Associations with HIV positivity included age in the three states, having been the receptive partner in anal sex in the past 6 months in Lagos and in Lagos and Kano feeling at risk of HIV.</p> <p>Intervention favoured: interventions that aim to reduce burden of HIV among MSM</p>		
Munoz 2010 (174)	The study participants were brothel/hotel workers aged 18 years and above who have been resident in a brothel for at least on year.	A thematic analysis of data was undertaken following transcription and validation of interviews. Five themes emerged from the data:	Stigma; knowledge; VCT; unsafe work environment (policies); CSW; fatalistic tendencies;	“stigma” “inaccurate knowledge” “screening”

	<p>They reported some level of formal education and most would describe themselves as leading a “double life”, in apparent reference to the fact that friends and family were not in the know of their FSW profile.</p>	<p>(i) flawed knowledge and fatalistic attitudes; (ii) the psychosocial and economic context of sex work; (iii) religious beliefs, stigma and risk taking; (iv) barriers to HIV testing; and (v) legal and policy constraints to sex work</p> <p>Intervention favoured: measures that give the brothel management greater roles in participating in interventions aimed at addressing stigma, encouraging protective sex and generally removing social, economic and legal constraints that disempower FSWs; interventions that focus on individual and structural factors that increase sex workers’ vulnerabilities are urgently required.</p>	<p>poverty; screening; low condom use</p>	<p>“government policies” “CSW” “fatalistic tendencies” “poverty” “low condom use”</p>
<p>Muoghalu</p>	<p>Members of households 18 years and above in three communities were selected for</p>	<p>The findings were that majority of the respondents viewed HIV/AIDS as a disease that</p>	<p>Stigma; Knowledge; socioeconomic factors; condom</p>	<p>“stigma” “inaccurate knowledge”</p>

2013 (186)	questionnaire completion. Caregivers (6 of them) and community leaders (6 of them) were interviewed in depth.	<p>afflict immoral people and as a punishment from God. Only a handful of them saw the disease as a disease that could afflict anybody. Also, many of the respondents said that AIDS is real but showed a low level of knowledge. It was further indicated that there were significant relationships between educational level, sex, occupation, income influence perception and peoples' reactions to HIV positive status of a relative while there were no significant relationships between these variables and knowledge of HIV/AIDS. It was concluded that these negative perceptions were as a result of the people's low level of knowledge and cultural belief systems, which see a strange illness as punishment from God for disobedience.</p> <p>Intervention favoured: HIV/AIDS awareness and educational programmes which integrates stigma</p>	use	"poverty" "low condom use"
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		reduction		
Nwachukwu 2011 (236)	Participants were drawn from urban and rural areas of the country and across upper, middle and lower social class (wealth status). None of the participants were married though some indicated they were "living together" with a partner.	<p>Analysis was based on 3573 (out of 11,050) observations using logistic regression model to estimate the effects of identified predictors of volunteering for HIV testing. Results show that national prevalence of VCT is low (2.6%) with regional variations. Generally, the critical factors associated with VCT uptake are age, sex, education, wealth index and risk perception with North (sex, education, religion, occupation and risk perception) and South (age and education) variance.</p> <p>Intervention favoured: evidence based youth programs that encourage uptake of VCT in the different regions of the country</p>	Education; MSP; gender; risk perception	"education" "MSP" "gender" "risk perception"

<p>Nwauche 2006 (237)</p>	<p>The study recruited 300 migrant workers (cases) and 200 non-migrant workers (controls). Details about the populations could not be elicited by authors who cited company policies and prohibition of in-depth probing of participants' lifestyle</p>	<p>A total of 23(7.66%) of migrant oil workers engaged in what the authors defined as "high risk sexual behaviour" versus none in the control group. High risk sexual behaviour patterns identified include "bisexuality (10 respondents who were all males and married)", "high risk sexual partnerships (7 respondents)" and "multiplicity of sexual partnerships (6 respondents)"</p> <p>Intervention favoured: authors only stated that interventions targeting migrant oil workers need to be developed</p>	<p>Migration (travel); high risk sexual behaviour</p>	<p>"long absence"</p>
<p>Nwokedi 2006 (238)</p>	<p>Prospective service personnel aged 21-39 years in Kano State. Further details about the population not given</p>	<p>The authors determined that the prevalence of HIV among this population is 1.4%. HIV prevalence was greater among females compared to the males in this population ($P<0.001$)</p>	<p>Gender</p>	<p>"gender"</p>

		Intervention favoured: N/A		
Nwokoji 2004 (187)	Participants were recruited from the Naval base in Lagos. They were largely ratings (75.2%), Christians (81%), and married (63.5%). Only 2.1% had only primary level education	<p>The mean age of the respondents was 34 years.</p> <p>Although the overall mean AIDS knowledge score was 7.1 of 10 points, 52.1% of respondents believed that a cure for AIDS was available in Nigeria and that one can get HIV by sharing personal items with an infected person (25.3%).</p> <p>The majority (88.1%) had had lifetime multiple partners ranging from 1–40 with a mean of 5.1; 32.5% of male respondents had had sexual contact with a female sex worker, 19.9% did so during the six months preceding the survey. Forty-one percent of those with sexual contact with a female sex worker did not use a condom during the most recent sexual encounter with these women. Naval personnel who have been</p>	History of transfers (travel); MSP; unprotected intercourse	<p>“frequent travels”</p> <p>“long absence”</p> <p>“MSP” “low condom use”</p>

		<p>transferred abroad reported significantly more risky sexual behaviours than others. Group discussants and key informants believed that sex with multiple partners is a tradition that has persisted in the navy even in the era of AIDS because of the belief that AIDS affects only foreigners, that use of traditional medicine provides protection against HIV infection, and influence of alcohol</p> <p>Intervention favoured: Educational programs, condoms promotion and changes in transfer policies</p>		
Obidoa 2012 (239)	<p>Participants were young women aged 15-24 who had never been married. The majority of them had secondary education (66.6%) while 6.9% had no education. About half of the population</p>	<p>The authors reported that among those who are sexually active, 80% indicated that they did not use a condom during their first sexual encounter. Regression analysis revealed that younger age,</p>	<p>Age; knowledge; living standards; partner violence; low condom use</p>	<p>“age younger” “inaccurate knowledge” “poverty” “low</p>

	reside in urban areas and close to three-quarters (74.2%) were unemployed	<p>lower HIV/AIDS prevention and transmission knowledge, lower knowledge of where to obtain condoms, lower material standard of living and greater intimate partner violence were significantly associated with sexual risk-taking in this population.</p> <p>Intervention favoured: Interventions that seek to identify and address specific processes and contexts that promote the concentration of risk taking among the study population was recommended</p>		<p>condom use”</p> <p>“partner violence”</p>
Odimegwu 2013 (188)	Participants were from the west and east of Nigeria and most of them have secondary education (32.9%) and tertiary education (46.5%). The participants sampled were from urban and rural areas of the states where the	<p>Authors argued that public attitudes to HIV/AIDS and those infected with the disease are negative.</p> <p>The markers for stigma on the overall stigma index are significant predictors of utilization of voluntary counselling and testing. As the sum of</p>	Stigma	"stigma"

	<p>study was conducted though in the end majority of the respondents were from urban locations.</p>	<p>negative feelings increases, there is less likelihood to using voluntary counselling and testing (VCT) and vice versa.</p> <p>Interventions favoured: Approaches to de-stigmatise AIDS; well-designed messages communicated through the media, town halls, health centres and public places.</p>		
<p>Odu 2011 (240)</p>	<p>Commercial sex workers in Ekiti state. The population was stratified by age and socioeconomic status.</p>	<p>The authors found that a large percentage (52.5%) of the sample do not use condoms with their clients with the misconception that clients who can practice “withdrawal” do not need to wear condoms. Though the respondents have good knowledge of HIV/AIDS, it did not reflect in their sexual practices. The study found that socioeconomic status, age and location do influence the use of condoms among commercial</p>	<p>Condom use; misconceptions; CSW</p>	<p>“low condom use” “inaccurate knowledge” “CSW”</p>

		<p>sex workers: condom use is higher among sex workers who are of higher socioeconomic status; who older than 25 years and who reside in urban locations.</p> <p>Intervention favoured: Empowerment of commercial sex workers</p>		
Ogboi 2010 (241)	<p>Participants were civilian applicants undergoing recruitment into the Nigeria Army between January-February and July-August 2005. They were aged 18-30 years and were recruited from all over the six geopolitical zones of the country. Most of the participants were males.</p>	<p>Authors found that Out of the 9260 samples collected, 204 (2.2%) tested positive for HIV with the highest proportion (73.5%) occurring in the 22-25yrs bracket. The mean age of the applicants was 22yrs, with age range of 18-30 years and sex ratio of 1:7 (M: F). Age sex-specificity shows aged between 21-24 years have the highest number of HIV-antibody positivity.</p> <p>Intervention favoured: Voluntary counselling and testing plus increased inter-sectoral collaboration</p>	Age; gender	<p>“age younger”</p> <p>“gender”</p>

		between military and civilian facilities.		
Ogbuji 2005 (242)	Students at University of Ibadan Nigeria (College of Medicine, Faculty of Law & Faculty of Art). Majority of the participants (88.9%) were Christians and single (85.7%)	<p>About knowledge of HIV/AIDs, 98.2% reported that the major route of infection is blood transfusion, followed by use of unsterilized needles (97.2%) and unprotected sexual intercourse (93.5%). There appeared to be a gap between knowledge and practices. 63 (29%) of the student population had reported ever having sex and out of this fraction, only 16% reported consistent condom use. There were 39 non-responses to the sexual behaviour question.</p> <p>Intervention favoured: organized HIV/AIDs educational programmes targeting university students</p>	Low condom use; misconceptions, poor risk perception	“low condom use” “inaccurate knowledge” “poor risk perception”
Ojini 2007	Patients with symptoms suggestive of HIV/AIDs presenting for the first time at the hospital	Predominant route for infection was the heterosexual intercourse (92.1%); MSM	Gender; late presentation	“gender” “late

(243)	<p>between January 2005 and January 2006. Only 6% of the population had no formal education with the remainder having primary education or higher. The participants were largely traders (39.8%) followed by artisans (20.2%). Many of the female participants were unemployed and identified as housewives.</p>	<p>contributed only 0.5%. Late presentation was also common with the lead presenting condition being pulmonary TB. Female participants had significantly higher CD4 counts at presentation compared to the male participants</p> <p>Intervention favoured: Interventions targeting high risk groups identified in the study (traders)</p>		presentation”
Okoli 2011 (244)	<p>Participants were HIV positive individuals who were using free antiretroviral drug services in Enugu. Majority (44%) had secondary education and only 3.8% had no formal education. Also, most of the participants were single/never married.</p>	<p>The authors found that high cost of transportation, HIV stigma, and long waiting hours were found to be key barriers to the use of ART services. On average, ART clients spent just under four hours at the clinic during their monthly appointments. The use of personal savings and financial support from relatives were the main means to access treatment. When the data were analysed according to clients’ SES, transportation</p>	<p>Cost of accessing drugs; stigma; long waiting hours</p>	“treatment access”

		<p>costs were a chief concern among the poorest while those who were better off were more likely to be concerned about stigma and discrimination.</p> <p>Intervention favoured: interventions that take into consideration the location and accessibility of services</p>		
Okonkwo 2007 (245)	<p>Participants were women pregnant women attending antenatal clinic in Awka. Those aged 25-35 years made up the majority of the sample and most of the women were married. Only 2.1% of the sample had no formal education</p>	<p>The majority of the women (87%) approved of VCT; of those who approved, 93% were aware that VCT could reduce the risk of transmission of HIV to their babies. All respondents who accepted VCT were willing to be tested if results remained confidential and 89% would accept if they were tested simultaneously with their partners. 69% of the women who refused VCT attribute their refusal to the social and cultural stigmatization associated with HIV. Overall, the acceptance of</p>	Discrimination; education; VCT	<p>“stigma” “education”</p> <p>“screening”</p>

		<p>VCT appears to depend on the understanding that VCT has proven benefits for the unborn child.</p> <p>Intervention favoured: innovative health education strategies that aim to overcome what the authors perceive as the biggest obstacle to widespread acceptance of VCT – stigma.</p>		
Okonofua 2003 (268)	<p>Participants were young people aged between 12-25 years who were in secondary and tertiary institutions.</p>	<p>Youth in the intervention schools, compared to control schools, reported significant improvements in knowledge of STDs, condom use, partner awareness that youth had an STD, and treatment-seeking behaviour. Treatment by private physicians increased (OR=2.1, 95% CI=1.1-4.0), and treatment by patent medicine dealers or pharmacists decreased (OR=0.44, 95% CI=0.22-0.88). The reported prevalence of STD symptoms in the past 6 months was significantly reduced in</p>	<p>Knowledge; condom use; treatment seeking behaviour; STI rates</p>	<p>“inaccurate knowledge” “low condom use” “STI rates”</p>

		<p>the intervention compared to control schools (OR=0.68,95%CI=0.48-0.95).</p> <p>Intervention favoured: the intervention tried by authors had components of peer education and adolescent friendly sexual health services</p>		
Okonta 2007 (246)	<p>Participants were students of a selected secondary school in the local area. Further details about the population were not given in the report</p>	<p>Authors reported that only 5% of the respondents were able to state the full meaning of HIV or AIDS. A minority (28%) believed that HIV was real while the majority (72%) believed that HIV infects whites only. Forty-eight percent of them have changed their sexual practices owing to the AIDS menace. A small percentage, 12%, believed that HIV/AIDS could kill. The authors argued that there is low awareness of HIV/AIDS as well as misconception about the infection, especially in non-urbanized cities of Nigeria.</p>	<p>Knowledge; Ignorance; misconceptions</p>	<p>“inaccurate knowledge”</p>

		Intervention favoured: educational and behaviour change methods		
Okoror 2013 (175)	Participants were recruited from urban (Ibadan) and rural (Eruwa) locations in Oyo State, Nigeria and largely of Yoruba ethnicity. They were aged 22-58 years. Most of them had only up to college education reported being married. Most of the households reported not having enough money for basic needs like food and clothing. On the average most of the participants were 4 years post HIV diagnoses.	Enacted stigma based on sickly appearance leading to isolation within communities and consequent loss of source of livelihood. Following commencement of ART and people living with HIV started looking better, there was some reported stigma reversal and acceptance within community. The authors the patterns observed suggest that people living with HIV/AIDS adhered to therapy to avoid anticipated stigma. Intervention favoured: N/A	Stigma	"stigma"
Okulate 2008 (247)	The bulk of participants (military personnel) were less than 35 years and female participants were significantly younger. Most of the	Male soldiers were more likely to be older, married and living alone than their female counterparts. Female soldiers had had better	Gender; condom use; alcohol	"gender" "low condom use" "alcohol"

	<p>participants had attained secondary education (which is about 12 years of education) and the females were significantly better educated. Participants were predominantly married.</p>	<p>education than the males but, in spite of that, alcohol use and sexual relationships in the context of alcohol were widespread with no difference between the genders. However, alcohol abuse as detected in 22-27% of the soldiers was more likely to be a male problem. Having more than one sex partner did not distinguish the male soldiers from the females. Consistent condom use was uncommon, found in only 16-20%, with no difference between genders. Married persons (more likely to be males) were more guilty of no or inconsistent condom use.</p> <p>Intervention favoured: Large-scale interventions, including more extensive condom promotion, training large numbers of peer educators, promoting ingenious ways of female self-protection from the highly dominant males and</p>		
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		encouraging further research have been advocated.		
Olagbuji 2011	HIV positive pregnant women attending antenatal clinic at a University teaching hospital. They were mostly married and had secondary level of education or higher.	The study found that 20 women (12%) did not disclose their status to their spouse. Non-disclosure was significantly associated with being nulliparous and unmarried women. Fear regarding spread of the information (57.8%), stigmatisation (53%) and deterioration in the relationship with the spouse (47%) were the three commonest reasons for non-disclosure. Intervention favoured: Stigma reducing measure and appropriate management of information following disclosure of seropositive status	Non-disclosure; stigma; relationship breakdown	“non-disclosure” “stigma”
Olaleye 2013 (249)	Participants were people living with HIV/AIDS and resident in rural and urban locations. About a fifth of the population had no formal	The study found that about location of health facilities was generally high (about 79%) among the respondents but higher among males, urban	Access to treatment; inequalities; travel problems	“treatment access”

	<p>education and about two-thirds were said to belong to the lowest wealth class.</p>	<p>dwellers and those in highest wealth class ($p < 0.05$). About 60% of rural PLWHA and 55.2% of those in the lowest wealth class reported illness compared with 49.4% of urban residents and 47.4% of those in the highest wealth class.</p> <p>However, PLWHA in urban areas utilised government hospitals more than those in rural areas while rural PLWHA and those in the lowest wealth class travelled longer distances to ART sites ($p < 0.05$). PLWHA in lowest wealth class and females faced catastrophic health expenditure of 67.6% and 55.5% of their monthly income respectively.</p> <p>Intervention favoured: Expansion of ART sites in rural areas and decentralisation of HIV care at government hospitals will reduce travel distance and transport costs and ensure universal access to</p>		
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		healthcare services among PLWHA.		
Oshi 2005 (177)	Participants were teachers at Government owned schools in Eastern Nigeria. Average age of the teachers was 32 years and up to 90% of them were married.	<p>The findings show a high level knowledge of HIV/AIDS preventive measures among teachers.</p> <p>However, teachers are not passing on this knowledge because of cultural and social inhibitions. In addition, teachers have not been receiving adequate training and motivation on information, education and communication for HIV/AIDS sex education</p> <p>Intervention favoured: policy change to accommodate sex education in schools</p>	Poor levels of sex education; cultural norms	“culture”
Olley 2007 (250)	People living with HIV/AIDS. Participants who were not enrolled in any support group were compared with those who are members of a support group.	Those who attended support groups were reported to be significantly more knowledgeable about HIV/AIDS ($t=4.02$, $p=0.00$) and also reported more favourable attitudes towards illness and	Non-membership in a support group	“social support”

		<p>treatment ($t=3.38$, $p=0.005$)</p> <p>Intervention favoured: Psycho-social care interventions (support group memberships) for people living with HIV/AIDS</p>		
<p>Olowookere 2013 (251)</p>	<p>Records of attendees of a HIV counselling and testing centre were used for the study. Criteria for selection were documentation of clients' sexual exposure and "completeness" of records. Records included were those of individuals aged 18 years and above, regardless of their HIV status, gender and level of education.</p>	<p>The authors found that the majority (53%) of the respondents were females, 232 (12%) were HIV positive, and 38.2% had multiple sexual partners. Only heterosexual vaginal sex was reported among the clients. Overall 45.2% of the clients did not use a condom in their last sexual act. Factors identified to be significantly associated with non-use of condoms were; younger age, having had higher education and positive HIV status.</p> <p>Intervention favoured: Behavioural change communication interventions</p>	<p>Low condom use</p>	<p>"low condom use"</p>

<p>Omenka 2013 (176)</p>	<p>Study participants include 28 HIV patients on ART, three healthcare providers and three policy makers. Participants were aged 22-55 years and were drawn from different socioeconomic strata and gender.</p>	<p>Purposive/convenience sampling methods were employed by the authors. Authors reported narratives of pervasive stigma, economic and health system barriers to accessing ART, growing fears that free ART will cease in what was pointed out as part of a sophisticated synthesis of social determinants of health and clinical care.</p> <p>Intervention favoured: approaches that address issues of vulnerability, access and agency.</p>	<p>Access to ART; staff attitude at centres; logistics associated with securing ART e.g. distance</p>	<p>“treatment access”</p>
<p>Omoigberale 2006 (252)</p>	<p>University of Benin students and randomly selected secondary school students in Benin. The secondary schools were all within 20 kilometres radius of the Teaching hospital and there were 5 of them.</p>	<p>Only 1487 (28%) had sufficient knowledge of HIV/AIDS. Also, only 3601 (38%) believe HIV is a real killer disease and frightened by it, thus changing their sexual behaviour. The remainder reported one form of misconception or the other: “it is a western propaganda to enslave developing nations (20%)”. Some respondents, 6365 (67%),</p>	<p>Poor HIV/AIDS knowledge; misconceptions; poor screening rates</p>	<p>“inaccurate knowledge” “screening”</p>

		<p>do not believe that HIV/AIDS exists. Out of 5320 participants that have heard about HIV/AIDS, only 853 have ever been screened for HIV/AIDS and reasons for screening include “blood donation” (458 participants) and “anxiety” following an illness (65 participants)</p> <p>Intervention favoured: intensive awareness campaigns through the media</p>		
Omowunmi 2004 (253)	<p>The study participants are traditional birth attendants whose experience in the practice ranged from 1 to 30 years and over. They were predominantly from the Yoruba tribe (96%) and identified as Muslims. About 24% had no formal education with about 5% having tertiary education.</p>	<p>Authors found that knowledge of modes of transmission of HIV was less than adequate and included lack of knowledge of the existence of HIV/AIDS amongst some practitioners, claims for the ability to treat HIV/AIDS, failure to name major avenues of transmission and confusion of HIV/AIDS with other conditions. The use of measures to prevent</p>	<p>Knowledge; poor prevention techniques</p>	<p>“inaccurate knowledge”</p>

		<p>infection of clients and themselves showed that normal standards of infection control are not adhered to. The authors argued that as many as 60% of children born in Nigeria are delivered by traditional birth attendants and that use of the services of herbal practitioners extends across the entire society in both rural and urban settings, a reason for concern they added. It is suggested that better incorporation of TBAs/HPs into the well-developed primary health care system offers not only a way of overcoming the risks of infection posed by traditional health practices but also offers an opportunity to extend the reach of voluntary counselling and testing and prevention of mother-to-child infection programmes.</p> <p>Intervention favoured: Appropriate training for TBAs, integration of TBAs into the primary health</p>		
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		care systems and referral systems between TBAs and other professional healthcare staff.		
Onyeneho 2009 (189)	Participants were brothel sex workers in Enugu. About 51.1% of them had secondary education with the remainder having less than secondary education.	FSWs in Enugu were of diverse socioeconomic backgrounds. They were however mostly in their productive ages of 16-47 years, with a mean age of 26.9 years. Poverty was the common reason for sex work. Some engaged in sex work to provide their school needs and those of other dependants. The respondents were aware of HIV/AIDS and dread being infected by it because of the stigma and absence of cure. Three percent do not use condom at all. Others use unorthodox methods (e.g. douching with salt solution immediately after sex), if a client refuses to use condom. Condom use depended on the client's choice. Misconceptions exist among the respondents on mode of transmission. Perceptual factors, more	Misconceptions; socioeconomic factors	"inaccurate knowledge" "poverty"

		<p>than demographic differences played great role in the attitude of the FSWs towards HIV/AIDS.</p> <p>Intervention favoured: Interventions that target HIV education and socioeconomic factors (skills training) among FSW</p>		
Owolabi 2005 (190)	<p>Participants were students in senior secondary years 1 and 2 in coeducational settings. They were selected from 5 out of the 22 of such facilities in the area. Respondents were mostly Christians (80.2%).</p>	<p>Quantitative data was collected from 450 senior secondary school 1 and 2 students who were selected from 5 of the 22 co-educational secondary schools in Ilesa using a multistage sampling technique. In addition qualitative data was collected by focus group discussion (FGD) with 8 groups (4 for each of the sexes) of ten randomly selected respondents from 4 other secondary schools. Sixty three per cent had had sexual intercourse. There was no statistically significant ($p>0.05$) difference between the</p>	Risk perception; MSP; STI	<p>“risk perception”</p> <p>“MSP” “STI rates”</p>

		<p>genders [females (52.3%) males (77.8%)], although males appeared to be more sexually active. The median age at first intercourse was 12 years with a range of 6 – 19 years. Many of the respondents had multiple sexual partners. There is poor perception of the risk of sexually transmitted infections (STIs) including that of human immune deficiency virus (HIV)</p> <p>Intervention favoured: Structured family life education for schools</p>		
Oye-Adeniran 2014 (281)	<p>Participants were female university students drawn from two universities in Nigeria (University of Ibadan and Bayero University). Most of the sample were single (91.5%). 65.4% identified as Christians and 25.4% as Muslims.</p>	<p>Alcohol is the most abused substance according to this study. Substance abuse was found to be significantly affiliated with religious identity with those who identify as traditional worshippers being most likely to use substances (39.4%). Alcohol use found to be significantly associated</p>	Substance abuse	“substance abuse”

		<p>with sexual activity with 26.9% of those who use alcohol indicating they had sex in the 4 weeks leading up to their interviews as opposed to only 8.9% among those who do not use alcohol. There was no significant relationship between substance use and unprotected sex, however.</p> <p>Intervention favoured: public health education programmes that highlight the potential dangers in substance use and sexual behaviour.</p>		
Oyediran 2005 (285)	Participants data selected from a nationally representative database was used in the study.	<p>It was found that more females, than males, would like to keep a positive diagnosis of HIV in a family member secret (F=42.9% vs. M=39.0%).</p> <p>About 63% of the participants reported that an office colleague who became sick with HIV/AIDS should not be allowed to continue work.</p> <p>Furthermore, 64% reported that a child with</p>	Stigma	"Stigma"

		<p>HIV/AIDS should not be allowed to school.</p> <p>Intervention favoured: Stigma reducing interventions</p>		
<p>Peters 2004 (254)</p>	<p>Traditional healers and people who patronise their services in select states in south-eastern Nigeria. Five of the participants had no formal education while all the traditional healers had no formal education and resided in rural areas</p>	<p>What authors thought to be serious risk for spread of HIV/AIDS in the practices of traditional healers were reported and this include poor sterilization of sharp objects used for cutting, needle reuse, and rubbing in of traditional concoctions into actively bleeding sites. Authors claimed that traditional healers are patronised by over 60% of the sampled population. Also, described was poor knowledge of HIV in 62% of the population.</p> <p>Intervention favoured: Educational interventions on HIV/AIDS</p>	<p>Unsterilized instruments; cross contamination; poor HIV/AIDS knowledge</p>	<p>“inaccurate knowledge”</p>

<p>Reis 2005 (215)</p>	<p>Participants were health care professionals (Doctors – 31%, Nurses – 56%, certified midwives – 12%) in tertiary institutions across four states in Nigeria. Participating facilities were largely general hospitals (54%) followed by primary health care centres (23%). Only two teaching hospitals participated</p>	<p>About 9% of the sample population depicted discriminatory attitudes towards people living with HIV/AIDS. Also, 40% believed that healthcare professionals with HIV should not be allowed to work in any area of health care delivery that requires patient contact.</p> <p>Intervention favoured: educational interventions and provision of protective and treatment materials</p>	<p>Discrimination</p>	<p>“stigma”</p>
<p>Sabitu 2009 (255)</p>	<p>Prison inmates in an overcrowded facility in Kaduna (northern Nigeria). About 5.9% of the population had no formal education.</p>	<p>Mixed knowledge about HIV/AIDS (Good = 39.8%, Fair= 48.7% and Poor= 11.8%). Authors found that more than two-thirds of the inmates had adequate knowledge but risky behaviour was common. There was a strong and statistically significant association observed between educational attainment and knowledge about</p>	<p>Inadequate knowledge; sharing of sharp objects by inmates; low condom use among the sexually active inmates</p>	<p>“inaccurate knowledge” “low condom use”</p>

		<p>HIV/AIDS. About 26.8% of the inmates either denied the existence of HIV/AIDS or stated that they had no idea that HIV/AIDS existed in the facility.</p> <p>Intervention favoured: information and education programs on AIDS for prison inmates nationwide</p>		
<p>Saddiq 2010 (178)</p>	<p>A total of 56 interviews were carried out in Maiduguri among the following groups - Muslim leaders, Christian leaders, Traditional rulers, Women opinion leaders, People living with HIV and AIDS, Civil servants, Housewives, Lecturers, Politicians, Political party followers/supporters, Water vendors, Mechanics, Drivers and Traders.</p>	<p>Authors found that participant views on the links between polygyny and HIV were varied. However, one clear emerging theme was that it is not the practice of polygyny per se that shapes vulnerability to HIV and AIDS but the dynamics of sexual relations and practices both within and beyond the marital union whether monogamous or polygynous. The ways in which these social relationships are negotiated and experienced are in turn shaped by religious traditions, gender roles</p>	<p>Gender; Social norms and practices</p>	<p>“gender” “culture”</p>

		<p>and relations, education and socio-economic status.</p> <p>Intervention favoured: Interventions that promote behaviour-change strategies to support women and men’s resilience to HIV. The need for interventions that promote gender equity in sexual negotiations was highlighted</p>		
<p>Salaudeen 2014 (282)</p>	<p>Participants were people living with HIV enrolled into care and treatment at General Hospital Abejukolo in Omala Local Government Area of Kogi State. Over one- third of the respondents 90 (39.0%) had secondary education while 31 (13.4%) had no formal education.</p>	<p>About three quarters (70.6%) of the respondents had ever used condom. Reasons given by respondents who did not use condom were: Desire for children (39.7%), and reduction of sexual pleasure (17.7%) and partner preference. More than half (56.0%) of the respondents with multiple partners did not use condom. About half 119 (51.5%) have used condom in the last sexual encounter. Gender, literacy level and disclosure of</p>	<p>Gender; Education; non-disclosure</p>	<p>“gender” “Literacy” “low condom use”</p>

		<p>HIV status to partners significantly influence condom use during sexual intercourse.</p> <p>Intervention favoured: interventions that lead to increased disclosure and condom use among people living with HIV.</p>		
<p>Sangowawa 2012 (256)</p>	<p>Participants were young people living with HIV/AIDS aged between 18-35 years. Most of the participants (97.8%) were diagnosed about 5 years prior to the study, married in a monogamous setting and were Christians. About 63.5% were employed</p>	<p>The study found that about 80% of the population had disclosed their HIV status. The majority of them had informed their spouses (66.3%), mothers (47.1%), fathers (39.1%) and siblings (37.7%). Sixteen (11.5%) respondents [15 (93.8%) females and one (6.2%) male] had suffered discrimination since disclosure of their status. Of these, 25.0% respondents were sent out of their matrimonial homes by their husbands, 25.0% were abandoned by their spouses and 12.5% indicated their fiancé broke up their relationship.</p>	<p>Discrimination; stigma</p>	<p>“stigma”</p>

		<p>A higher proportion of females (12.9%) than males (4.3%) had suffered discrimination. In addition, a significant proportion of respondents who were separated/divorced (73.3%) had been victims of discrimination compared with those who were widowed (10.5%) or single (5.9%) ($P<0.05$).</p> <p>Intervention favoured: Efforts addressing discrimination</p>		
<p>Sekoni 2015 (283)</p>	<p>Participants were young persons in public secondary schools. Majority of the students were in the 15-19years age bracket, females, Christians and lived in monogamous homes. All the three arms namely commercial class, arts class and science class were included. Less than one tenth of the students 90 (8.9%) had been</p>	<p>Among this group, more than half had tested once and 37.8% tested because they had participated in risky behaviour. Fifteen percent were sexually active, among this group 20% engaged in transactional sex. Only 36.8% used condom at first sex which increased to 57.2% at last sex, however, consistent condom use was practiced by 22.4%.</p>	<p>Low condom use; VCT</p>	<p>“low condom use” “screening”</p>

	screened for HIV infection.	<p>Students who are sexually experienced ($p < 0.001$) were more likely to have been screened while those in science class ($p = 0.012$) were more willing to screen for HIV. Male students were more likely to have had sex ($p < 0.001$). Compared to Science and Commercial students, those in Arts class were more likely to have had sex ($p = 0.004$), use condoms ($p = 0.017$) and use it consistently ($p < 0.001$).</p> <p>Intervention favoured: interventions that encourage HCT uptake and condom use among young people.</p>		
Smith 2003 (151)	The study participants were young Igbo rural-urban migrants in two big cities in Nigeria (Aba and Kano). Most of the migrants would have completed up to secondary education (58.9%	<p>The study explored HIV risk perception (personal and general) and its impact on spread of HIV. Authors argued that participants' perception of risk of contracting HIV is tied to morality (for</p>	Migration (travel); risk perception; Knowledge; stigma	<p>"travel" "risk perception"</p> <p>"inaccurate knowledge" "stigma"</p>

	<p>and 63.9% in Aba and Kano respectively) and may be enrolled in an apprenticeship program. For majority of the migrants, they travel back to their rural communities at least once in a year. Participants were predominantly Christians, migrated to the cities after age 12 and have resided in the city for at least 3 months before the study. The participants must not have been married in the past or present.</p>	<p>example condom use is linked with promiscuity and lack of trust in relationships). They also argued that while the participants reckoned that HIV is a very big problem in Nigeria, this failed to reflect in their individual perception of risk as a good number thought they were not at risk of contracting HIV. Thus, the authors concluded that these rural-urban migrants project AIDS risk onto immoral “others,” a stance that enables them to interpret the epidemic without internalizing their own risks. Other factors discussed by authors include the role of religion on perception of risk and the impact of the notion that HIV is a death sentence on participants’ attitude towards those who live with HIV/AIDS. These have huge implications for the rural communities from where these migrants originate and often travel</p>		
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		<p>back to.</p> <p>Interventions favoured: Public health campaigns that take advantage of growing expectations that premarital sexual relationships should be based on love, making use of the incredible power of religion in shaping people's moral compass and making treatment more assessable for young people</p>		
Smith 2004 (179)	<p>The study participants were young Igbo rural-urban migrants in two big cities in Nigeria (Aba and Kano). Most of the migrants would have completed up to secondary education (58.9% and 63.9% in Aba and Kano respectively) and may be enrolled in an apprenticeship program. For majority of the migrants, they travel back to their rural communities at least once in a year.</p>	<p>Study findings suggest that popular religious interpretations of HIV risk pose real dangers, leading many young migrants to imagine themselves as at little or no risk, and contributing to inconsistent protective practices. The study highlights the limitations of intervention strategies that ignore the extent to which religion, health, sexuality and morality intersect in people's</p>	<p>Migration; risk perception; Knowledge; stigma</p>	<p>"long absence" "risk perception" "inaccurate knowledge" "stigma"</p>

	<p>Participants were predominantly Christians, migrated to the cities after age 12 and have resided in the city for at least 3 months before the study. The participants must not have been married in the past or present.</p>	<p>everyday lives.</p> <p>Intervention favoured: interventions that are sensitive to the study findings above; incorporating religion, health, sexuality and morality into their design</p>		
<p>Smith 2007 (180)</p>	<p>The participants were 20 couples who have been married for any time between 5 years to over 20 years. The men were almost always older than the women (typically 5-10 years) and tend to earn more. Most of the male participants were well educated and tended to marry women who had similar accomplishments.</p>	<p>The study found that certain factors such as work related mobility, socioeconomic status and male peer pressures all influence men's extramarital behaviour. 14 out of the 20 men interviewed had a history of extramarital relationship but none of those married for less than 5 years reported any affairs. The authors also argued that perceptions such as "impersonal or promiscuous sex" tend to inhibit condom use in extra marital affairs.</p> <p>Intervention favoured: interventions that address socioeconomic and gender inequality, and stigma</p>	<p>Low condom use; MSP; stigma</p>	<p>"low condom use" "MSP" "stigma"</p>

Sunmola 2005a (257)	Participants were undergraduate students of university of Ibadan from the social science faculty.	<p>Results indicated both men and women reported that condoms hindered their sexual satisfaction, caused health problems for them and reduced their sexual interest. The findings also showed that obtaining condoms from clinics and perception that condoms do not cause health problems predicted the likelihood of condom use for both sexes. In addition, the results indicated that obtaining first time information from family members or relatives predicted the likelihood of condom use for women</p> <p>Intervention favoured: interventions that make condoms free at institutions and interventions that are tailored to overcome barriers that interfere with condom use</p>	Condom use	“low condom use”
Sunmola	Participants of this study were all long distance	Risky sexual behaviours (mean of 8 sexual	Being a truck driver with long	“frequent travel”

2005b (191)	<p>truck drivers from different parts of the country. They are of different ethnicities (Huasa-60%, Yoruba-23%, Igbo-6%, Tiv/Idoma-8%, other-2%). They largely (67.6%) had elementary level or no education. Most of the respondents were Muslims (65%). Days spent away from home ranged from 1 to 3 weeks per trip</p>	<p>partners in the last 2months in about 52% of the population; only 18.2% felt there could be sexual health risk for them and their partners; low condom use rate with 32.3% reporting ever using condoms). Risk perception is poor as 21% felt they could not contract HIV/AIDS. High condom knowledge but low consistent condom use rate among respondents. Predictors of condom use include educational status (those with secondary education were more likely to use condoms), likelihood of reporting that condom causes health problems (those who report that condoms causes health problems were less likely to use condoms), use of local decoctions to enhance sex (those who use these decoctions were less likely to use condoms) and frequency of listening to radio (those who listen to radio more being more likely</p>	<p>stay from home (travel); low condom use rate; poor risk perception</p>	<p>“long absence” “low condom use” “risk perception”</p>
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		to use condoms). Intervention favoured: condom education for truck drivers through radios; free condoms for truckers; counselling centres to address barriers to condom use.		
Tun 2013 (258)	Participants were male IDU in Lagos State Nigeria who largely identified as Christians (74.0%), single (60.8%), living in rented homes (30.9%) or with parents (36.0%). About a third were not earning any income.	Estimated HBV, HCV, HIV, syphilis, gonorrhoea and chlamydia prevalence were 7.8%, 7.7%, 0.9%, 1.9%, 0.0%, and 3.7%, respectively. Intervention favoured: programs that allow for IDU to access safer options (for example interventions that allow IDU access to needles to prevent needle sharing).	Multiple sexual partnerships; poor uptake of HIV testing; unprotected sex; IDU	“MSP” “screening” “low condom use” “IDU”
Ukaire 2015 (284)	Participants were pregnant women seen at national hospital Abuja between November 2013 and June 2014.	HIV seroconversion was detected in 2(1.2%) of the 165 parturient with initial HIV negative result early in the index pregnancy. HIV infection was	Screening	“screening”

		<p>detected in four (2.7%) of the 59 parturient with unknown HIV status. Secondary school level education was significantly associated with HIV seroconversion in pregnancy $P < 0.001$. HTC in labour using rapid testing strategy is feasible and acceptable in our setting.</p> <p>Intervention favoured: interventions that promote VCT at point of delivery for pregnant women.</p>		
Umar 2012 (259)	<p>Participants were religious leaders, predominantly Muslims (128) and Christians (30). About 27% of the respondents have had tertiary education, 13% had primary education, and 28% had only Qur'anic education.</p>	<p>The authors found that 49% of the respondents had adequate knowledge of HIV/AIDS with more Christian clerics compared to Muslim Clerics having better knowledge of HIV/AIDS ($P < 0.0001$). All the Christian clerics opined that they would insist on mandatory premarital HIV testing for their subjects before joining them in marriages.</p>	<p>Low levels of premarital testing; Low support for premarital testing by Muslim clerics; knowledge</p>	<p>"screening" "inaccurate knowledge"</p>

		<p>Most of the participants would readily endorse abstinence and mutual fidelity as measures for HIV/AIDS control. The authors concluded that most of the religious leaders lacked adequate knowledge of HIV/AIDS and the use of mandatory premarital HIV testing is yet to be adopted by the Muslim clerics. Awareness campaigns should be intensified for the religious leaders to improve their knowledge of HIV/AIDS.</p> <p>Intervention favoured: Awareness campaigns for religious leaders</p>		
Umeora 2005 (260)	<p>Participants were intending couples referred from a catholic church for pre-marital screening. The participants had a mean age of 32.9 (SD 5.0) but all those less than 19 years that were tested were females.</p>	<p>Authors found that out of 858 individuals (or 429 couples) tested for HIV, 52 individuals were found to be HIV-positive (overall prevalence 6.1%), and females were marginally more affected than males. In both sexes, prevalence was higher in</p>	Gender; Age	“gender” “age younger”

		<p>younger age groups. Prevalence among adolescent females was 10.7%. Although no male adolescents were screened, prevalence for the group aged 20 to 29 years was 6.3% for females and 10.8% for males. The prevalence estimate was slightly higher for rural dwellers (6.2%) than for urban residents (5.9%), but this was not statistically significant.</p> <p>Intervention favoured: screening for general public and not just intending couples</p>		
<p>Uneke 2007 (261)</p>	<p>Participants were individuals who visited the hospital (federal medical centre) for routine pre-marital HIV screening between March 2003 and February 2005. They were mostly referred from faith based organisations. About 85% of the population are in their third and fourth decades</p>	<p>The authors found that of the total of 319 individuals (148 males, 171 females) screened, 25 (7.8%, 95%CI: 4.9-10.7%) were confirmed HIV-positive, comprising 13 (8.8%, 95%CI: 4.2-13.4%) males and 12 (7%, 95%CI: 3.2-10.8%) females. No significant difference was observed in the</p>	<p>Stigma; compulsory HIV screening; age</p>	<p>“stigma” “screening” “age younger”</p>

	<p>of life.</p>	<p>association between HIV infection and gender ($X^2 = 0.58$, $df = 1$, $P < 0.05$). The highest prevalence of HIV infection (8.9%) was found in the 20-30 age category while the least HIV infection prevalence (5.3%) was observed among persons above 40 years old. There was no significant difference in the association between HIV infection and age ($X^2 = 0.68$, $df = 3$, $P < 0.05$). The authors also argued that mandatory pre-marital HIV screening could generate social stigmatization and infringement of the fundamental human rights of infected individuals.</p> <p>Intervention favoured: Authors recommend voluntary counselling and confidential HIV testing and especially pre- and post-test counselling as the basis of pre-marital HIV testing. They also suggested that guidelines for the management of</p>		
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		test-positive individuals and non-concordant couples and the safeguarding of confidentiality should be developed. Training and capacity building for religious leaders, to appropriately manage social issues associated with HIV/AIDS as it affects their organizations, are recommended.		
Utulu 2007 (262)	Participants of this study were women attending antenatal clinic at the hospital. Most of the participants were married in a monogamous setting and have up to secondary education or higher. Their spouses were largely unskilled or semi-skilled and most of them reside in urban areas.	multivariate logistic regression by the authors suggests that a young age of 15–24 years (multivariate OR=3.3, 95% CI=1.2–8.4, $p=0.02$); ever had other STIs (OR=1.6, 95% CI 1.1–2.3, $p=0.009$); no formal maternal education (OR=0.6, 95% CI 0.4–0.9, $p=0.021$) and having one lifetime sexual partner (OR=0.4, 95% CI 0.3–0.5, $p<0.00001$) were significantly associated with HIV infection in the study population. Following bivariate analysis the found that being single, having a partner with low level of formal	Early sexual debut; age ; MSP; living separate from a spouse; STI; education	“early sex” “age younger” “marital status” “STI rates” “education”

		<p>education, living in a rural location, being in a polygynous/multiple partner union, being a higher order polygynous wife, being married more than once and reporting a history of a sexually transmitted infection were significantly associated with HIV infection.</p> <p>Intervention favoured: interventions targeting young people and incorporates STI control and abstinence</p>		
Uzochukwu 2011 (263)	<p>Participants were from two tertiary institutions (UNEC and IMT) in Enugu. Most participants were aged 20-24 years.</p>	<p>Most of the respondents (64%) have heard about VCT and 70.6% of the students obtained their information from the mass media ($P < 0.05$) while a minority (3.8%) heard from families. 76.6% of respondents believe VCT can provide useful information on HIV/AIDS and VCT is obtainable mainly in teaching hospitals (78.5%) and to a</p>	<p>Knowledge/education; cost of screening</p>	<p>“knowledge” “education” “screening”</p>

		<p>lesser extent in government hospitals (9.8%) and NGOs(8.8%), while being almost non-existent in private hospitals (2.9%). 81% of the respondents did not attend VCT while only 19% attended. The reasons for non-attendance were that majority of the students (45.7%) were unaware of the services ($P<0.05$), indifferent to VCT (20.0%), (12.8%) felt it was costly and (13.3%) were afraid of discovering their HIV status. About 50% of the respondents were willing to pay for VCT and the mean willingness to pay was \$3.2 (N370). Out of those willing to pay, 46% of them are willing to pay (\$2.6) N300 while 34% and 20% are willing to pay \$3.4 (N400) and \$4.3 (N500), respectively ($P<0.05$). Among those not willing to pay, 67.6% of them think it should be free ($P<0.05$). Males and people with higher knowledge of VCT stated</p>		
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		<p>higher WTP values than females and those with less knowledge of VCT. Log OLS also showed that a higher level in the University was positively related to WTP.</p> <p>Intervention favoured: intervention that increase knowledge of where to get VCT services; reduction of VCT costs to affordable levels by government</p>		
Vu 2013 (264)	<p>Participants are Men who have sex with men in three major cities in Nigeria including the Federal Capital Territory. Most of them were younger than 30 years and have up to or above secondary education.</p>	<p>Authors found that a high proportion of MSM reported high-risk behaviours, including unprotected anal sex with men (30–50%), unprotected vaginal sex with women (40%), bisexual behaviour (30–45%), and never been tested for HIV (40–55%). The population-based estimates of HIV among MSM in the 3 cities were 34.9%, 11.3%, and 15.2%, respectively. In Abuja,</p>	Trans gender sex; Condom use	<p>“transgender sexMSM” “low condom use”</p>

		<p>HIV was significantly associated with unprotected sex and transactional sex. In Ibadan, HIV was significantly associated with unprotected sex and self-identified bisexual. In Lagos, HIV was significantly associated with the older age.</p> <p>Intervention favoured: interventions targeting MSM that focus on a comprehensive approaches that combines behavioural, biomedical, and structural components.</p>		
Wusu 2011 (265)	<p>Participants were students of two public universities (Lagos state university and University of Lagos) and the reason why authors preferred the schools is because the students of these institutions were thought to be more likely to be knowledgeable about the subject of the research. Students from faculties of social</p>	<p>Result indicates that 26.1% of males and 28.9% of females ever participated in HCT. The average number of heterosexual partners kept by the respondents declined among males and females from 3.17 and 2.36, respectively before they participated in HCT to 2.27 and 1.6 after they participated in HCT. The differences in the</p>	MSP	"MSP"

	sciences, arts and sciences were selected for the study.	<p>average number of sexual partners by the respondents before and after they participated in HCT were statistically significant ($P=0.000$). The proportion of male respondents who engaged in frequent sex also declined from 35.8% (before participating in HCT) to 24.1% (after participating in HCT) and from 25% (before participating in HCT) to 24.7% (after participating in HCT) among females</p> <p>Intervention favoured: HCT for undergraduates</p>		
Yahaya 2010 (266)	Participants were recruited from youth organisations in three senatorial districts in Kwara state. Most of the participants come from urban locations and most of them identified themselves as Muslims.	Authors reported ignorance, poverty, inadequate number of VCT centres, stigma and discrimination as major factors responsible for the low patronage of VCT centres in Kwara State. Gender and religion had no significant influence on the respondents' views while place of residence	Ignorance; VCT; stigma	<p>"inaccurate knowledge"</p> <p>"screening" "stigma"</p>

		<p>influenced VCT uptake.</p> <p>Intervention favoured: Educational interventions and increasing VCT centres. Self-testing was also advocated and it was argued that this will overcome stigma.</p>		
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Notes: **M** =Male; **F**= Female; **SD** = Standard deviation; **MSM** = Men who have sex with men; **CSW** = Commercial sex workers; **OR** = Odds ratio; **STI/STD** = Sexually transmitted infection(s) or disease(s); **VCT** = Voluntary counselling and testing for HIV/AIDS; **TH** = Traditional healers; **TBA** = Traditional birth attendants; **HCT** = HIV/AIDS counselling and testing; **LDTDs** = Long distance truck drivers; **MSP** = Multiple sexual partnerships; **IDU** = Injecting drug users; **PLWHA** = People living with HIV/AIDS; **HPs** = Herbal practitioners; **OLS** = Ordinary log squares; **WTP** = Willingness to pay

Appendix E: Table showing numerical data entered into meta-analyses.

Risk for HIV/AIDS based on gender				
Study ID	Gender	Number with HIV	Number without HIV	Total numbers
Ahmed 2013 (201)	M	1085	9293	10378
	F	2733	14461	17194
Azuonwu 2012 (210)	M	18	108	126
	F	4	20	24
Ejele 2005 (218)	M	9	364	373
	F	18	477	495
Eluwa 2013 (220) ¶	M/F	56	1459	1515
Uneke 2007 (261)	M	13	135	148

	F	12	159	171
Nwokedi 2006 (238)	M	7	810	817
	F	6	77	83
Ogboi 2010 (241)	M	134	7988	8122
	F	70	1068	1138
Akani 2005 (203)	M	12	72	84
	F	23	61	84
Umeora 2005 (260)	M	23	406	429
	F	29	400	429
Kehinde 2005 (280)	M	24	74	98
	F	17	95	112

Risk based on educational status (raw data from included publications)				
Study ID	Educational status	Number with HIV	Number without HIV	Total numbers
Etukumana 2011 (224)	None	0	14	14
	Primary	9	108	117
	Secondary	19	151	170
	Post-secondary	10	39	49
Utulu 2007 (262)	None	8	68	76
	Primary	22	102	124
	Secondary	28	142	170
	Tertiary	3	31	34

Adejuyigbe 2004 (198)	None	3	2	5
	Primary	41	30	71
	Secondary	29	36	65
	Tertiary	20	38	58
Eluwa 2013 (220) 𐀀𐀁	None	1	15	16
	Primary	14	244	258
	Secondary	30	731	761
	Tertiary	10	272	282
Ibrahim 2013 (226)	None	14	42	56
	Primary	31	68	99
	Secondary	59	94	153

	Tertiary	16	36	52
Kehinde 2005 (280)	None	1	4	5
	Primary	8	26	34
	Secondary	10	53	63
	Tertiary	22	86	108
Data used in exploring the relationship between educational status and risk for HIV/AIDS (prorata adjusted and categorized)				
Study ID	Educational status	Number with disease	Number without disease	Total numbers
Etukumana 2011 (224)	Primary or less	9	122	131
	Secondary or higher	29	190	219
Utulu 2007 (262)	Primary or less	30	170	200

	Secondary or higher	31	173	204
Adejuyigbe 2004 (198)	Primary or less	44	32	76
	Secondary or higher	49	74	123
Eluwa 2013 (220) ¶¶¶	Primary or less	15	259	274
	Secondary or higher	40	1003	1043
Ibrahim 2013 (226)	Primary or less	45	110	155
	Secondary or higher	75	130	205
Kehinde 2005 (280)	Primary or less	9	30	39
	Secondary or higher	32	139	171
Risk based on age (raw data from included publications)				

Study ID	Age category (years)	Number with HIV	Number without HIV	Total numbers
Ukaire 2015 (284)	<19	0	1	1
	20-24	0	13	13
	25-29	1	57	58
	30-34	4	80	84
	35-39	1	50	51
	40-44	0	15	15
	≥45	0	2	2
Ahmed 2013 (201)	18-24	770	6358	7128

	25-29	1176	7062	8238
	30-34	901	5070	5971
	35-39	512	2632	3144
	40-44	353	1936	2289
	45+	106	696	802
Azuonwu 2012 (210)	20-39	14	110	124
	≥40	11	25	36
Ejele 2005 (218)	< 19	7	128	135
	20-29	12	391	403
	30-39	5	195	200
	40-49	3	127	130

Etukumana 2011 (224)	16-20	8	54	62
	21-25	13	95	108
	26-30	5	87	92
	31-35	9	46	55
	36-40	1	22	23
	41-45	2	6	8
	46-50	0	2	2
Utulu 2007 (262)	15-19	6	48	54
	20-24	25	100	125
	25-29	17	93	110
	30+	13	102	115

Uneke 2007 (261)	≤20	2	28	30
	21-30	12	123	135
	31-40	10	12	22
	≥41	1	18	19
Efunshile 2007 (217)	15-20	0	3	3
	21-25	4	67	71
	26-30	1	18	19
	31-40	0	1	1
Ibrahim 2013 (226)	≤19	4	22	26
	20-25	23	47	70
	26-30	52	85	137

	31-35	27	54	81
	>35	14	32	46
Nwokedi 2006 (238)	20-24	3	279	282
	25-29	6	362	368
	30-34	4	206	210
	35-39	0	40	40
Ogboi 2010 (241)	18-21	40	2460	2500
	22-25	150	6350	6500
	>25	14	246	260
Umeora 2005 (260)	≤19	3	25	28
	20-29	30	378	408

	30-39	19	379	398
	40-49	0	24	24
Kehinde 2005 (280)	<10	0	2	2
	10-14	0	0	0
	15-19	0	10	10
	20-29	20	76	96
	30-39	18	57	75
	40-49	2	16	18
	>50	1	8	9
Data used in exploring relationship between age and risk for HIV/AIDS				

Study ID	Age (years)	Number with HIV	Number without HIV	Total numbers
Ukaire 2015 (284) *	Up to 25	0	14	14
	Above 25	6	210	216
Ahmed 2013 (201) *	Up to 25	1005	7770	8775
	Above 25	2813	15984	18797
Azuoanwu 2012 (210)*	Up to 25	4	28	32
	Above 25	21	107	128
Ejele 2005 (218) *	Up to 25	13	324	337
	Above 25	14	517	531
Etukumana 2011 (224)	Up to 25	21	149	170

	Above 25	17	163	180
Utulu 2007 (262) *	Up to 25	34	167	201
	Above 25	27	176	203
Uneke 2007 (261)*	Up to 25	8	90	98
	Above 25	17	91	108
Efunshile 2007 (217)	Up to 25	4	70	74
	Above 25	1	19	20
Ibrahim 2013 (226)	Up to 25	27	69	96
	Above 25	93	171	264
Nwokedi 2006 (238) *	Up to 25	4	351	355
	Above 25	9	536	545

Ogboi 2010 (241)	Up to 25	190	8810	9000	
	Above 25	14	246	260	
Umeora 2005 (260) *	Up to 25	18	214	232	
	Above 25	34	592	626	
Kehinde 2005 (280) *	Up to 25	10	50	60	
	Above 25	31	119	150	
Risk for HIV/AIDS based on past history of sexually transmitted diseases (STDs)					
Study ID	Numbers without history of STDs but positive for HIV	No history of STDs and no HIV	Numbers with a history of STDs and positive for HIV	History of STDs but no HIV	Total numbers
Ahmed 2013 (201)	3153	21349	667	2417	27586
Etukumana 2011 (224)	30	267	8	45	350

Risk based on marital status				
Study ID	Marital status	Numbers with HIV	Numbers without HIV	Total numbers
Etukumana 2011 (224)	Single	0	4	4
	Married	38	306	344
Utulu 2007 (262)	Single	6	10	16
	Married	53	330	383
Adejuyigbe 2004	Single	10	2	12
	Married	83	104	187
Ibrahim 2013 (226)	Single	16	46	62
	Married	81	133	214

Kehinde 2005 (280)	Single	15	73	88
	Married	25	92	117

¶ Separate risk estimates presented for the respective States: not included in the meta-analysis as risk was not presented separate for the genders. ¶¶ Figures were those provided by authors after they were contacted. ¶¶¶ Figures were those provided by authors after they were contacted. * Prorata adjusted.

Appendix F: Characteristics of included studies

Cross sectional studies						
Study ID	Location	Age (years)	Methods	Number of participants	Source of data	Study focus
Abasiubong 2012 (194)	Akwa-Ibom state (South South)	M= 36.8 (SD 3.9), F = 29.2 (SD 1.7)	Quantitative	365: M= 142, F= 223	Questionnaire via a survey	To explore attitudes and sexual behaviour of unmarried people with HIV/AIDS living in Niger Delta of Nigeria
Abiona 2014 (195)	USA, Turkey, South Africa and Nigeria (South West – Osun State)	22.1 (4.0)	Quantitative	2570: M=926,F=1636 missing =8	Questionnaire	To examine HIV/AIDS knowledge, perceptions of knowledge and sources of HIV information among university students in four countries with different HIV prevalence rates

Aboki 2014 (269)	Multiple sites (North East, North West, Middle Belt, South East, South West, South South): All across Nigeria	Range: 15 – 19 years	Quantitative	Unclear but appears to be about 2118. Gender breakdown not possible to deduce.	Secondary analyses of 2007 and 2012 database data (National HIV and AIDS reproductive health survey data)	This paper examines the evidence of changes in high-risk behaviour of adolescents (15years-19 years) - use of condom with non-marital partner and boyfriends/girlfriends, engagement in transactional sex, sex with multiple partners and current sexual activity - between 2007 and 2012. It also tries to identify possible factors associated with changes in HIV prevalence among adolescents during the study period with a view to developing key recommendations for the design and scale-up of HIV prevention programmes that focused on adolescents.
Adebajo 2012 (196)	Multiple sites Lagos and Oyo (South West)	Median of 22 years (interquartile range 20-26)	Quantitative	1125: M	Questionnaire and blood tests	To assess the level of internalized homophobia and associated factors among men who have sex with men (MSM) in Nigeria.
Adebayo	Multiple	15-24	Mixed	6618:	Questionnaire and	

2010 (182)	locations (2 state each from North West, North East, Middle Belt, South West, South East, South South): Kano, Kastina, Borno, Gombe, Benue, Kogi, Lagos, Ondo, Enugu, Edo, Rivers, Cross			M=49.4%,F=50.6%	Focus group discussions	To assess participants' perception of their personal risk of contracting HIV/AIDS
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	Rivers.					
Adebowale 2013 (197)	Multiple sites (Middle Belt, North East, North West, South East, South South)	20.5 (SD 2.4)	Quantitative	1575: M	Database (Demographic health survey 2008)	To explore patterns and correlates of condom use among unmarried male youth in Nigeria
Adegun 2012 (270)	Ado Ekiti (South West)	10 years and above	Quantitative	592: M= 242, F= 350	Questionnaire	To assess the level of knowledge of sexually transmitted infections and possible factors associated with knowledge of patients attending outpatient clinic in University Teaching Hospital, Ado-Ekiti, Nigeria.
Adejuyigbe 2004 (198)	Osun (South West)	Mean 26.4 (SD 5.2) for HIV positive mothers and 29.4 (SD 5.8)	Quantitative	199, all F	Questionnaire	The identify sociodemographic characteristics of HIV-positive mother-child pairs in Ile-Ife

		for HIV negative mothers				
Ahmed 2013 (201)	Multiple site (Middle Belt, North West): Abuja, Niger, Kaduna, Nasarawa and Benue	18 and above	Quantitative	27,949: M= 10378, F=17194	Questionnaire and blood tests	The use of mobile HIV/AIDS counselling and testing as an effective tool to access hard-to-reach most at risk groups in Nigeria. A comparison was made between mobile and facility based HIV/ADIS counselling and testing
Aishat 2015 (271)	Oyo State (South West)	Mean 31.0 (SD 5.7)	Quantitative	600: F	Questionnaire	To explore exclusive breastfeeding practice among HIV positive mothers in Oyo State.
Ajoge 2013 (267)	Multiple sites in Middle Belt (Makurdi,	26.5 (SD 5.3)	Quantitative	1011: F	Questionnaires and Blood tests	Authors stated that the aim was to determine factors responsible for high prevalence of HIV/AIDS in middle belt region of Nigeria

	Bwari, Minna, Panyam)					
Ajuwon 2010 (183)	Oyo State (South West)	15-24	Mixed	1281: M= 703, F= 578	Interviews (focus group meetings) and questionnaires	To assess the knowledge of HIV/AIDs and the use of HCT services among secondary school students and apprentices in Ibadan, Nigeria
Akani 2005 (203)	Port Harcourt (South South)	30.44 (SD 5.03)	Quantitative	168: M=84, F=84	Blood samples	To explore the experiences of couples undergoing pre-marital HIV testing in Port Harcourt, Nigeria
Akpa 2011 (204)	Multiple locations (Middle Belt, North West):	18 and above	Quantitative	335: M=223 F=112	Questionnaire	To study the prevalence of HIV-related stigma and the effect of stigma on HIV treatment adoption among PLWHA attending HIV treatment locations in some selected states in the North-West geopolitical zone of Nigeria.

	Abuja, Kaduna, Sokoto and Kebbi					
Aniebue 2009 (205)	Enugu (South East)	21-69	Quantitative	116, all M	Questionnaire	To determine HIV/AIDS related knowledge, sexual practices and predictors of condom use among Nigerian long-distance truck drivers
Ankomah 2013 (206)	Multiple sites: North and South	15 – 64	Quantitative	642, all M	Data from a representative database (collected between 2003-2007)	To explore the determinants of condom use in sexual relationships outside of marriage
Apena 2014 (207)	Lagos State (South West)	15-25 and above	Quantitative	956: M=421, F=535	Questionnaires	To explore behavioural challenges as it relates to HIV/AIDS among senior secondary and university students in Lagos State
Aransiola 2014 (181)	Osun State (South West)	Range: 25– 40 years	Qualitative	15: M= 5, F= 10	Interviews	To explore if is stigma still a significant problem for people living with HIV (PLHIV) who have secured access to antiretroviral (ARTs) as well as support systems available to people living with HIV.

Asekun-Olarinmoye 2009 (208)	Osun State (South West)	15 -29	Quantitative	409: M=178, F=231	Questionnaire	To explore the knowledge, attitude and practices around condom use among undergraduate students in a polytechnic
Ayoola 2013 (209)	Lagos State (South West)	15-60	Quantitative	291: M	Questionnaire	To explore transactional sex, condom and lubricant use among men who have sex with men in Lagos State, Nigeria
Azuonwu 2012 (210)	“Niger-Delta” region (South South)	20 – 55	Quantitative	150: M=126, F=24	Blood samples	To explore HIV/AIDS among military personnel in Niger-Delta area of Nigeria.
Babalola 2007 (211)	Multiple sites (North West, North East)	15-24	Quantitative	3844: M=1924, F=1920	Questionnaire	To explore readiness for HIV testing among young people in Northern Nigeria; the role of social norm and perceived stigma
Babalola 2009 (212)	Multiple locations	15-64	Quantitative	10081: M=5396, F=4685	Database	

	(North West, North East, Middle Belt, South West, South East, South South)					To explore the link between these communication efforts and HIV-related stigma using data from a nationally representative household survey
Balogun 2013 (273)	Lagos (South West)	14 to 75	Quantitative	443: M= 175, F= 268	Survey (Questionnaire)	To explore condom use among antiretroviral therapy naive people living with HIV at a tertiary health care hospital in Lagos, Nigeria and its implication for prevention of new infections.
Balogun 2014 (274)	Lagos (South West)	18 to 75	Quantitative	443: M= 175, F= 268	Survey (questionnaire)	To determine the rate of disclosure to sexual partners and consequent safer sexual practices among people living with HIV (PLHIV)
Bassey 2007 (213)	Cross- River State (South South)	20 and above	Quantitative	140: M=19, F=121	Questionnaire	To survey the knowledge and attitude to HIV/AIDS among traditional birth attendants in rural communities in Cross Rivers Nigeria

Bukar 2008 (214)	Multiple locations (Middle Belt, North East, South East, South South, South West): Taraba, Nassarawa, Katsina, Enugu, Rivers, Ogun	25 – 60	Quantitative	75: M=52, F=23	Questionnaire	To investigate discriminatory attitudes towards people living with HIV/AIDS among dental professionals in Nigeria
Dahlui 2015 (276)	Multiple locations (Middle Belt, North East,	15-49	Quantitative	56307: M= 17 359, F= 38 948	Data from database (2013 Nigeria Demographic and Health Survey)	To provide an insight into HIV/AIDS related stigma and discrimination against people living with HIV in Nigeria.

	South East, South South, South West): Taraba, Nassarawa, Katsina, Enugu, Rivers, Ogun					
Durojaiye 2011 (216)	Lagos (South West)	23.3 (SD 3.6)	Quantitative	302: M=134, F=168	Questionnaire	To explore knowledge, attitude and practice of HIV/AIDS among tertiary education students in Lagos
Efunshile 2007 (217)	Lagos State (South West)	15-40	Quantitative	94: M=71, F=23	Questionnaire and blood tests	To explore knowledge, attitude and practices of trainees seafarers to HIV/AIDS and STIs at Apapa seaport Lagos
Ejele 2005 (218)	Rivers State (South South)	18-49	Quantitative	868: M=373, F=498	Blood sample	To determine seroprevalence of HIV/AIDS among unemployed undergoing pre-employment medical examination in Port Harcourt

Ekane 2005 (219)	Lagos (South West)	26 (SD 8.3)	Quantitative	373, all M	Questionnaires	To determine sexual behaviour, HIV-related knowledge and condom use by intra-city commercial bus drivers and motor park attendants
Eluwa 2012 (277)	Multiple sites (South South, Middle Belt, North West, South West): Cross Rivers, FCT, Kaduna, Kano, Lagos, Oyo	Median age of 26 years (in 2007 data) and 25 (in the 2010 data)	Quantitative	5943 F	Database (integrated biological and behavioural surveillance surveys) data from two years: 2007 and 2010	To estimate the change in HIV prevalence and sexual risk behaviours between 2 consecutive rounds of integrated biological and behavioural surveillance surveys (IBBSSs) and determined correlates of HIV transmission among female sex workers in Nigeria.
Eluwa 2013 (220)	Multiple sites (South South, Middle Belt,	18 and above	Quantitative	1459: M=1375, F=84	Blood samples and questionnaire	To explore HIV prevalence and risk behaviour among injection drug users in Nigeria

	North West, South West): Cross Rivers, FCT, Kaduna, Kano, Lagos, Oyo					
Enwereji 2008 (184)	Abia State (Abia)	Average of 22	Mixed	98, all F	Questionnaire and interviews	To explore sexual behaviour and inheritance rights among HIV- positive women in Abia State
Essien 2006 (223)	Multiple sites in Southwest of Nigeria	18 and above	Quantitative	2214: M=86.63%, F=13.32%	Questionnaire	To explore sociodemographic and lifestyle predictors of intention to use condoms in HIV intervention among uniformed service personnel
Etukumana 2011 (224)	Plateau State (Middle Belt)	16 – 50	Quantitative	350, all F	Questionnaire	To explore HIV risk factors among pregnant women in a rural setting in Nigeria
Ezugwu	Enugu	18–45	Quantitative	400 F	Questionnaire	To determine the prevalence and pattern of, and factors associated

2014 (278)	(South East)					with, contraceptive usage among HIV-positive women in Enugu, south-eastern Nigeria.
Fakolade 2010 (225)	Multiple sites (North East, North West, Middle Belt, South East, South West, South South): All across Nigeria	15-64	Quantitative	31,692, details about gender not reported	Database data from three waves of national surveys in 2003, 2005 and 2007	To explore the impact of exposure to mass media campaigns and social support on HIV related stigma and discrimination in Nigeria
Fawole 2014 (192)	Federal Capital Territory	25 to 29	Mixed	305: F	Questionnaire and in-depth interviews	To document the prevalence and types of violence experienced by FSWs, identify the risk factors of experiencing violence to women (VAW) and the perpetrators of these acts.

	Abuja					
Gadzama 2014 (279)	Borno (North East)	Not stated	Quantitative	Not stated	Observation and questionnaire	To determine the level of adherence to universal precaution for safe injection practices in the hospital.
Ibrahim 2013 (226)	Bayelsa State (South South)	29.3 (SD 5.12) for those who tested positive for HIV and 28.8 (SD 5.9) for those HIV	Quantitative	360: F	Questionnaire and blood tests	To determine the HIV seroprevalence rate and to identify factors responsible for this rate among pregnant women
Idoko 2015 (193)	Multiple sites: Abuja (FCT), Edo and Cross River (South	20 - 64	Mixed	Unclear	Interviews and online survey	To explore the public opinion, community interest, and perceptions about the use and access to PrEP in Nigeria.

	South), and Benue (Middle Belt)					
Ikechebelu 2009 (227)	Anambra State (South East): a population based study	36 (SD 3.2)	Quantitative	298: M=105, F=193	Questionnaire	To explore sexual practices of people living with HIV/AIDS in South Eastern Nigeria
Iliyasu 2013 (228)	Kano State (North West)	16-42	Quantitative	375: M	Questionnaire	To explore knowledge and attitudes to male circumcision among university students in Kano, Nigeria and how it impacts on male HIV risk.
Isibor 2004 (229)	Oyo state (South West)	25 – 56	Quantitative	254: M=63.4%, F=36.6%	Questionnaire	The explore journalists' knowledge of AIDS and attitude to persons living with HIV in Ibadan
Iyaniwura 2006 (231)	Ogun state (South West)	15-29	Quantitative	393: M=196, F=197	Questionnaire	To explore HIV testing in a local youth population in Nigeria

Iyaniwura 2008 (230)	Ogun state (South West)	20-29	Quantitative	376: M=197, F=179	Questionnaire	To assess the sexual practices of young graduates and their attitude to abstinence only policy
Iyoke 2010 (232)	Enugu (South East)	36 (SD 9.2)	Quantitative	474: M=146, F=328	Questionnaire	To explore the gender perspectives of sexual and reproductive practices of people living with HIV/AIDS in Enugu
Keating 2006 (233)	Multiple locations Bauchi, Enugu and Oyo States (North East, East and South West)	15-49	Quantitative	3279: M=56.5%, F=43.5%	Questionnaire	This paper assesses to what extent exposure to a program (VISION Project, a mass-media campaign that focused on reproductive health and HIV/AIDS prevention) translates into increased awareness and prevention of HIV/AIDS.
Kehinde 2005 (280)	Oyo (South West)	Unclear	Quantitative	210: M= 98, F= 112	Questionnaire and laboratory tests	To ascertain STI/HIV co-infection rates and also to obtain relevant socio-demographic and reproductive health data associated with STI/HIV infections among special treatment clinic (STC) attendees.

Lawoyin 2007 (185)	Multiple sites (South West): Oyo, Lagos	18-30	Mixed	68, all F	Questionnaire and interviews (informal group discussions)	The study aimed to assess the impact of an education based HIV/AIDS program designed for young women.
Merrigan 2011 (235)	Multiple sites (South West, South South, North West): Lagos, Kano, Cross River	18 and above	Quantitative	879, all M	Questionnaire	HIV prevalence and risk behaviours among men having sex with men in Nigeria
Munoz 2010 (174)	Oyo (South West)	18 -35	Qualitative	60, all F	In depth interviews and focus group discussions	To explore the socio-structural context of female sex workers' vulnerability to HIV infection in Ibadan
Muoghalu	Anambra	18 and	Mixed	914: M=461,	Questionnaire and	Perception of HIV/AIDS among the Igbo of Anambra State, Nigeria

2013 (186)	State (South East)	above		F=453	Interviews	
Nwachukwu 2011 (236)	Multiple sites: Site in the North and south of Nigeria	15-24	Quantitative	3573: M=852, F=2721	Database (National demographic health survey; a survey of households)	To explore regional patterns and correlates of HIV voluntary counselling and testing among youth in Nigeria
Nwokedi 2006 (238)	Kano State (North West)	21-39	Quantitative	900: M=817, F=13	Blood tests	To explore HIV seroprevalence rates among prospective services personnel in a Nigeria security facility
Nwokoji 2004 (187)	Lagos (South West)	18 – 66	Mixed	480: M= 451, F=29	Questionnaire and interviews	To explore knowledge of AIDS and HIV risk-related sexual behaviour among Nigerian Naval personnel
Obidoa 2012 (239)	Multiple sites (North West, north East, Middle	15-49	Quantitative	1836, all F	Data from a database (NDHS)	To explore factors associated with HIV/AIDS sexual risk among young women aged 15 to 24

	Belt, South West, South East, South South)					
Odimegwu 2013 (188)	Multiple sites (South West, South East): Osun and Imo states	18 and above (mean = 31.8)	Mixed	987: M=42.5%, F=57.5%	Questionnaire and interviews	To explore HIV/AIDS stigma and utilization of voluntary counselling and testing in Nigeria
Odu 2011 (240)	Ekiti state (South West)	15 and above	Quantitative	200, all F	Questionnaire	To explore condom use among a high risk (commercial sex workers) group in Ekiti State
Ogboi 2010 (241)	Kaduna State (participants were from all 6 zones:	18-30	Quantitative	9260: M=8122, F=1138	Blood tests and interviews	To determine HIV Infection patterns among Civilian Applicants for Nigeria Military Service

	North West, North East, Middle Belt, South South, South West, South East)					
Ogbuji 2005 (242)	Oyo State (South West)	16-23	Quantitative	217: M= 82, F= 134 (1 not reported)	Questionnaire	To explore knowledge about HIV/AIDS and sexual practices of students in University of Ibadan Nigeria
Ojini 2007 (243)	Lagos State (South West)	35.9 (SD 9.1)	Quantitative	585, male/female numbers not available	Blood tests	To determine the sociodemographic and clinical features of patients who were tested positive for HIV in this hospital
Okoli 2011 (244)	Enugu (South East)	Mean of 36	Quantitative	240: M=78, F=162	Questionnaire	To explore socioeconomic status and barriers to use of free antiretroviral treatment for HIV/AIDS

Okonkwo 2007 (245)	Anambra State South East)	Categories were stated: less than 25, 25-35 and above 35.	Quantitative	240, all F	Questionnaire	To determine the awareness, attitudes and beliefs of pregnant women in Nigeria towards VCT
Okonta 2007 (246)	Enugu State (South East)	15.45 (SD 3.62)	Quantitative	250: M=45%, F=55%	Interviewer administered questionnaires	To assess HIV.AIDS awareness and changes in sexual practices among secondary school students in Nsukka, Nigeria
Okoror 2013 (175)	Oyo State (South West)	22-58	Qualitative	35: M=17, F=18	Interviews and focus group discussions	To explore the cultural context of HIV stigma on antiretroviral therapy adherence among people living with HIV/AIDS
Okulate 2008 (247)	Lagos (South West)	Categories given: below 35 and above 35	Quantitative	1125: M=84.5%, F=15.5%	Questionnaire	To explore condom use and other HIV risks among Nigerian soldiers
Olagbuji	Edo State	31.6 (SD	Quantitative	166, all F	Questionnaire	To explore spousal disclosure of HIV serostatus among pregnant

2011 (248)	(South South)	3.67)				women attending antenatal care
Olaleye 2013 (249)	Multiple sites (Middle Belt): Benue, Nasarawa, Plateau, FCT	Not stated	Quantitative	1200: M= 26.7%, F=73.3%	Questionnaire	Inequalities in access to healthcare services among people living with HIV/AIDS in Nigeria
Olowookere 2013 (251)	Osun State (South West)	35.4 (10.5)	Quantitative	1921: M=898, F=1023	Retrospective analysis of sociodemographic records of clinic attendants	To determine the pattern of condom use among clients at a Nigerian HIV counselling and testing centre
Omenka 2013 (176)	Benue State (Middle Belt)	22-55	Qualitative	28: Gender distribution not reported	FGD	To explore the experiences of those using ART services in Benue State, Nigeria

Omoigberale 2006 (252)	Multiple sites in Edo (South South)	15 -25	Quantitative	9500: M=4950, F=4550	Questionnaire	To determine attitude and knowledge of youth to routine HIV screening and HIV/AIDS
Omowunmi 2004 (253)	Lagos (South West)	Mean of 51 years	Quantitative	189: M=70%, F=30%	Questionnaire	The explore the knowledge, attitudes and perceptions of HIV/AIDS among traditional birth attendants and herbal practitioners in Lagos, Nigeria
Onyeneho 2009 (189)	Enugu (South East)	16-47	Mixed	135, all F	Interviews and focus meetings	To assess knowledge, attitude and practice of HIV/AIDS among female sex workers
Oshi 2005 (177)	East of Nigeria	Average age of 32	Qualitative	70: M=48, F=22	Interviews	An exploratory study to examine the social and cultural determinants of the teaching of HIV/AIDS sex education among secondary school teachers in Eastern Nigeria
Owolabi 2005 (190)	Osun (South West)	16-19	Mixed	450: M=194, F=356	Questionnaire and interviews	To explore the sexual behaviour of secondary school adolescents and its implication for the spread of STIs and HIV/AIDS

Oye-Adeniran 2014 (281)	Multiple sites: Kano (North West) and Oyo (South West).	17- 49	Quantitative	2408: F	Questionnaire	To explore the relationship between substance use and sexual behaviour among female students in two Nigerian universities.
Oyediran 2005 (285)	Multiple sites (North West, north East, Middle Belt, South West, South East, South South)	15 years and over	Quantitative	1090: M= 4962, F= 5128	Database data	To explore HIV/AIDS stigma and discrimination in Nigeria
Peters 2004 (254)	Multiple locations	Patients: 15-62	Quantitative	89: M=65, F=24	Questionnaire	Evaluation of the role of traditional healers in the spread of HIV/AIDS

	(South South): Rivers, Akwa Ibom, Cross River and Bayelsa States.	Traditional healers: 40-65				
Reis 2005 (215)	Multiple sites (South East, North East, North West, South West): Abia, Gombe, Kano, Oyo	20-67	Quantitative	1103: M=37%, F=63%	Questionnaire	To explore discriminatory attitudes and practices by health workers towards patients with HIV/AIDS in Nigeria
Sabitu 2009	Kaduna	18-58	Quantitative	374: M=327, F=	Questionnaire	To explore knowledge of HIV/AIDS and associated risky behaviour

(255)	(North West)			47		among inmates of Kaduna convict prison
Saddiq 2010 (178)	Borno State (North East)	Not stated	Qualitative	49: gender details not given	FGD and in depth interviews	To explore the relationship between HIV/AIDS and polygyny
Salaudeen 2014 (282)	Kogi (Middle Belt)	33.2 (SD 9.02)	Quantitative	231: M= 95, F= 136	Questionnaire	To determine condom use among people living with HIV/AIDS (PLWHA)
Sangowawa 2012 (256)	Oyo state (South West)	18-35	Quantitative	170: M=30, F=140	Questionnaire	Experiences of discrimination among youth living with HIV/AIDS
Sekoni 2015 (283)	Lagos (South West)	15-19years	Quantitative	1,029: M= 493, F= 518. 11 missing	Questionnaire	To explore the use of HIV screening services and sexual behaviour of in-school adolescents in Surulere, Lagos State
Smith 2003 (151)	Multiple sites (South East, North West): Abia, Kano	15-24	Qualitative	863: M=441, F=422	Surveys/ethnography	Morality and perceptions of personal risk in Nigeria

Smith 2004 (179)	Multiple sites (South East, North West): Abia, Kano	15-24	Qualitative	863: M=441, F=422	Surveys/ethnography	To explore Christianity and HIV/AIDS related beliefs and behaviour among rural-urban migrants.
Smith 2007 (180)	Multiple sites (South East): Abia, Imo	Not stated	Qualitative	20 couples, male/female couples	Interviews (marital case study)	To explore modern marriage, men's extramarital sex and HIV risk in South Eastern Nigeria
Sunmola 2005a (257)	Oyo state (South West)	Mean 23.7 (SD 3.7) for females and 24.4 (SD = 3.1) for males	Quantitative	224: M=128, F=96	Questionnaires	To evaluate sexual behaviour, barriers to condom use and actual use of condoms among students of a University in Nigeria

Sunmola 2005b (191)	Multiple sites (South West, Middle Belt, North East): Ibadan, Oyo, Ogbomosh, Kotangora, Minna, Katsina-ala, Jalingo and Bali	20 – 74	Mixed	412, all M	Questionnaire and interviews	To assess sexual practices and barriers to condom use among long distance truck drivers in Nigeria
Tun 2013 (258)	Lagos State (South West)	18-50	Quantitative	328:M	Questionnaire and blood tests	To explore the prevalence of hepatitis B and C virus, HIV, syphilis, gonorrhoea and chlamydia in male injection drug users in Lagos, Nigeria
Ukaire 2015	Abuja (FCT,	32.0	Quantitative	224: F	Blood tests	To determine the HIV seroconversion rate in pregnancy and the

(284)	Middle Belt)	(SD 5.06)				prevalence of HIV in pregnant women in labour with previously unknown status.
Umar 2012 (259)	Sokoto State (North West)	26.3 (SD 20.3)	Quantitative	158: gender not stated but most likely an all M study	Questionnaire	To explore knowledge and use of mandatory premarital HIV testing as a prerequisite for marriages among leaders in Sokoto, Nigeria
Umeora 2005 (260)	Ebonyi State (South East)	32.9 (SD 5.0)	Quantitative	858: M=429, F=429	Hospital records for couples	To explore prevalence of HIV/AIDS among couples undergoing pre-marital classes in a catholic institution
Uneke 2007 (261)	Ebonyi State (South East)	Categories reported: less than 20, 21-30, 31-40 and above 40	Quantitative	391: M=148, F=171	Blood tests	To explore the impact of mandatory pre-marital HIV testing by faith based organisations in Nigeria
Utulu 2007	Benue State	26 (SD 6.1)	Quantitative	404, all F	Blood tests and	To determine the epidemiological features of HIV infection among

(262)	(Middle belt)				Questionnaire	pregnant women in Makurdi
Uzochukwu 2011 (263)	Enugu State (South East)	15-39	Quantitative	500:M= 242, F=258	Questionnaire	To explore the knowledge, awareness and willingness to pay for VCT among tertiary institution students in Enugu
Vu 2013 (264)	Multiple sites Lagos and Oyo (South West) and Abuja (Middle Belt)	18-52	Quantitative	712: All M	Blood tests	To explore HIV/AIDS among men who have sex with men and its implications for combination prevention
Wusu 2011 (265)	Lagos state (South West)	Average of 24 for males and 23 for females	Quantitative	625: M=48%, F=52%	Questionnaire	To explore the role pf HIV counselling and testing in sexual health behaviour change among undergraduates in Lagos Nigeria
Yahaya 2010 (266)	Kwara State (Middle Belt)	15-24	Quantitative	600: M=390, F=210	Questionnaire	To examine factors that hinder acceptance of VCT among youth in Kwara State

Case control								
Study ID	Location	Age (years)	Methods	Participants No.	Intervention/Cases	Controls	Study focus	Source of data
Ajewole 2007 (202)	Ekiti State (South-West)	12 – 23 years	Quantitative	500: M=250, F=250	Health education sessions about HIV/AIDS – lectures and other communication materials	Unclear from the report what was done to this group. It appeared there was no active intervention.	To assess the impact of education based intervention models on knowledge, attitude and practices around HIV/AIDS in a rural community in Nigeria	Questionnaires
Essien 2005	Lagos (South	18 and	Quantitative	2209: M=1914, F=	Participants in this	Wait-list	To explore the	Questionnaire

(221)	West)	above		295	group were given an intervention which is based on “transtheoretical” model of behaviour change. They had 5 one-hour sessions of group interactions administered by trained health educators. This group had 1222 participants	group. This group had 978 participants	effectiveness of a situationally-based HIV risk reduction intervention for the Nigerian uniform services on readiness to adopt condom use with casual partners	
Essien 2011 (222)	South West	18 years and above	Quantitative. Outcome data was collected at 3	346, all F	5 sessions of video that is based on cognitive behavioural	5 sessions of video based education on HIV, devoid	To explore the effectiveness of a video-base motivational	Questionnaire

			months and 6 months post intervention		principles. The sessions lasted 90 minutes each and were delivered by facilitators who were provided information on common misconceptions about HIV in Nigeria. There were 174 participants in this group.	of any motivational and skills building content. There were 172 participants in this group	skills-building HIV risk-reduction intervention for female military personnel	
Lapinski 2008 (234)	Abuja (Middle Belt)	27.62 (SD 5.71)	Quantitative	100: M=63, F= 37	This group had 60 participants who would later see a movie (intervention)	This group had 40 participants who did not see the	To assess the impact of an intervention that targets HIV/AIDS stigma and risk	Questionnaire

						intervention movie	perception	
Nwauche 2006 (237)	Multiple sites (South west, South South): Lagos, Port Harcourt	Categorised into below and above 35	Quantitative	500: M=420, F=80	There were 300 migrant workers selected at random in this group. To qualify as a case, an individual needs to be a migrant worker working at an oil facility in the study area	Controls were 200 non-migrant workers	To explore, among migrant oil workers, the interplay of migration, high- risk sexual behaviour and HIV transmission	Questionnaire
Olley 2007 (250)	Multiple sites (South West): Oyo, Osun, Lagos	Mean = 28.7 (SD 6.6)	Quantitative	81: M=34, F=42 (5 were not reported)	Support group which had 42 participants. In this group, participants received	In this group there were 34 participants	Association between support group membership,	Questionnaire

					information on medication, drug resistance and attended workshops	who were not in any support group	sociodemographic and HIV related factors including Knowledge and attitudes of illness of people living with HIV/AIDS	
Randomised controlled studies								
Study ID	Location (State)	Age range (years)	Number	Intervention	Control	Study focus	Source of data	
Coker 2015 (275)	Kano (North West)	Mean = 33.2	600: M= 258 F= 342	Two interventions: <u>Intervention A:</u> Standard HIV care	Standard treatment only	To explore Socio-Demographic and	Direct observation via blood tests	

				+ daily reminders + follow up calls from peer educators + adherence support Intervention B: A above + home visits by peer educators		Adherence Factors Associated with Viral Load Suppression in HIV- Infected Adults Initiating Therapy in Northern Nigeria: A Randomized Controlled Trial of a Peer Support	
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						Intervention	
Okonofua 2003 (268)	Edo (South South)	12-25	1896: M=888, F=1008	The intervention includes establishing health clubs in schools, training of peer educators and training of health providers who will provide adolescent friendly sexual health services. Intervention activities lasted for 11 months	Two control groups were used in the study: one from the local area where the intervention is taking place (Benin city) and another from a nearby community (Ekpoma). The authors reported that this approach was adopted to minimise the impact of "mixing" of intervention and	To evaluate the impact of an intervention on STD treatment-seeking behaviour and STD prevalence among Nigerian youth`	Questionnaire

					control conditions.				
Cohort studies									
Study ID	Location (State)	Age range (years)	Gender	Methods	Participants No.	Study focus	Study duration	Exposure	Source of data
Adeokun 2006 (199)	Oyo (South- West)	Not reported	Not given	Quantitative	Unclear, only reported as over 1000	To explore HVI/AIDS stigma and test the effectiveness of an intervention among a cohort of “market	2 years	Behaviour change communication intervention	Questionnaire

						agents”			
Adeyemo 2014 (200)	Ogun State (South-West)	Not reported	F	Quantitative	3486	To determine the prevalence, trend and factors associated with HIV infections among pregnant women presenting to two hospitals in the region	3 years	Cohort of pregnant women	Retrospective analysis of hospital attendance records

Akinyemi 2010 (272)	Oyo (South West)	20 – 59	M and F	Quantitative	866: M= 306, M= 560	To explore Condom use among antiretroviral therapy patients in Ibadan, Nigeria	1 year	HIV positivity	Blood tests and interviews using forms
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Notes: M=male; F=female; STD=Sexually transmitted disease; SD=Standard deviation

Appendix G: Ethics approval, Ministry of Health, Benue State, Nigeria

GOVERNMENT OF BENUE STATE OF NIGERIA

Telephone: 044-533529, 531604
Telegram: COMMHEALTH



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

Ref. No. MED/261/Vol.11/615

**Ministry of Health & Human
Services**

**P.M.B. 102093
Makurdi, Benue State**

Date: _____

3rd October, 2014

Inalegwu Oono
Postgraduate Department
Newcastle University
U.K.

**RE: APPLICATION FOR ETHICAL CLEARANCE ON "UNDERSTANDING THE PATTERNS
OF SPREAD OF HIV/AIDS IN BENUE STATE AND MIDDLE BELT OF NIGERIA –THE
MISSING LINK BETWEEN CAMPAIGNS AND RESULTS".**

Your letter for the request for ethical approval was received by the ethical committee. The Committee has gone through your proposal and is pleased to inform you that your proposal met ethical guidelines.

You are therefore granted ethical approval to enable you carry out the proposed study.

A handwritten signature in black ink, appearing to read 'Gabriel Ameh'.

Gabriel Ameh
For: Ethical Committee

Appendix H: Ethics approval, Newcastle University



11/12/14
Inalegwu Oono
PhD candidate
Institute of Health and Society
Baddiley-Clark Building

Faculty of Medical Sciences
Newcastle University
The Medical School
Framlington Place
Newcastle upon Tyne
NE2 4HH United Kingdom

FACULTY OF MEDICAL SCIENCES: ETHICS COMMITTEE

Dear Inalegwu

Title: Understanding the patterns of spread of HIV/AIDS in Benue State and middle belt of Nigeria - the missing link between campaigns and results.

Application No: 00825 2014

Start date to end date: 23 September 2014 to 26 September 2016

On behalf of the Faculty of Medical Sciences Ethics Committee, I am writing to confirm that the ethical aspects of your proposal have been considered and your study has been given ethical approval.

The approval is limited to this project: **00825/2014**. If you wish for a further approval to extend this project, please submit a re-application to the FMS Ethics Committee and this will be considered.

During the course of your research project you may find it necessary to revise your protocol. Substantial changes in methodology, or changes that impact on the interface between the researcher and the participants must be considered by the FMS Ethics Committee, prior to implementation.*

At the close of your research project, please report any adverse events that have occurred and the actions that were taken to the FMS Ethics Committee.*

Best wishes,
Yours sincerely

A handwritten signature in black ink that reads "K. Sutherland".

Kimberley Sutherland
On behalf of Faculty Ethics Committee

cc:
Professor Daniel Nettle, Chair of FMS Ethics Committee
Ms Lois Neal, Assistant Registrar (Research Strategy)

*Please refer to the latest guidance available on the internal Newcastle web-site.

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The University of Newcastle upon Tyne trading as Newcastle University



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Appendix I: Interview schedule reflecting actual field work

S/N	Respondent category	Location	Tools	Numbers	Stratification variables	Comments
1	General public	Makurdi	FGD	1 FGD	Mixed group	Recruited, at random, from the outpatient department of a hospital. Participants were aged 18 through to 40 years.
2	Female sex workers (FSW)	Otukpo	In depth interviews	3 interviews	Duration as FSW, Location	Interviews held in brothels.
		Makurdi	FGD	1 FGD	Duration in FSW, Location	Interview held in a brothel
3	Long distance driver (LDD)	Makurdi	In depth interview	1 interview	Long distance driving	Interview was held at the motor park
4	Uniform personnel	Makurdi	In depth interviews	3 interviews	Rank, gender	Military personnel – one senior and two junior. One female
		Otukpo	In depth interviews	3 interviews	Rank, gender	Police force members – one senior and two junior. One female

5	Traditional Birth Attendants (TBA)	Otukpo	In depth interview	1 interview	Not applicable	One female in the rural area
6	Religious leaders	Otukpo	In depth interview	2 interviews	Islam/Christianity	An Imam who is also a community leader and a Reverend Father
7	People living with HIV/AIDS	Makurdi/Otukpo	In depth interviews	4 interviews	Not applicable	Recruited through hospital doctors that provide care
8	Prison inmates	Otukpo	FGD	1 FGD	All males	Recruited through doctors
9	Men who have sex with Men	Makurdi	FGD	1 FGD/ 1 interview	Not applicable	Started as an in depth interview but ended as FGD. Recruited through gatekeepers
10	Doctors	Makurdi/Otukpo	In depth interviews	2 interviews	Infectious disease doctors/doctors caring for PLWHA	Contacted directly as gatekeepers
11	3rd Sector workers (NGO, Charities)	Makurdi/Otukpo	In depth interviews	2 interviews	HIV/AIDS related groups, location	Charity heads and people who work in the 3rd sector
12	HIV/AIDS support group	Otukpo	In depth	1 interviews	Not applicable	Participants recruited through a

	workers/field worker		interviews			local NGO (Otabo)
13	National Agency for Control of AIDS	Abuja	In depth interview	1 interview	Not applicable	A representative of NACA delegated by the DG following a chat with the DG
14	Brothel/Hotel managers	Makurdi	In depth interviews	1 interviews	Location	Hotel contacted directly
15	Student groups	Makurdi	FGD	2 FGD	Gender	Recruited through student leaders
		Otukpo	FGD	1 FGD	Gender	Males only. Participants were all Christians
16	Religious groups	Otukpo	FGD	4 FGD	Gender, religion.	Predominantly young persons
17	"Okada" riders	Makurdi	In depth interviews	3 interviews	Location	Recruited at random from roadside
		Otukpo	FGD	1 FGD	Location	Recruited at random from roadside
18	Injecting drug user (IDU)	Makurdi	In depth	1 interview	NA	Recruited through an MSM

			interview			participant
19	Motor park workers	Makurdi	FGD	1 FGD	NA	Group had LDD and coach loaders

FGD = focus group discussion. Interviews = in-depth interviews. NACA = national agency for control of AIDS. MSM = men who have sex with men

Appendix J: Table showing demography of qualitative research respondents.

Serial number	Type of discussion	Number of participants	Age category (years)	Gender	Characteristics	Occupation	Time in occupation	Location of interview	Code
1.	In-depth	One	40 or above	Male	Persons living with HIV and AIDS (PLWHA)	Other (Farming)	More than five years	Makurdi	15032301
2.	In-depth	One	30 – 39	Male	PLWHA	Teacher	More than five years	Makurdi	15032302
3.	In-depth	One	30 – 39	Male	Motor park staff	Long distance driver	More than five years	Makurdi	15040701
4.	Group	Five	20 – 39	Males	Motor park staff	Drivers and goods loaders	Two years and above	Makurdi	15040702
5.	In-depth	One	30 – 39	Male	Attends to people living with HIV as a doctor	Doctor	More than five years	Makurdi	15031701
6.	Group	Six	20 – 39	Males	Prison inmates	Not applicable	One year and above	Otukpo	15031801
7.	In-depth	One	30-39	Male	Attends to people living with HIV as a doctor	Doctor	About two years	Otukpo	15031602

8.	In-depth	One	40 and above	Female	PLWHA and staff at local HIV facility	HIV worker (charity/NGO)	Three to four years	Otukpo	15031601
9.	In-depth	One	40 and above	Female	PLWHA and staff at local HIV facility	HIV worker (charity/NGO)	Four to five years	Otukpo	15031603
10.	In-depth	One	40 and above	Male	Religious leader	Imam	Four to five years	Otukpo	15031401
11.	Group	Five	18 – 39	Males	Muslim community	Mixed: teachers, pharmacist and others (civil servants)	One through more than 5 years	Otukpo	15031402
12.	Group	Six	18 – 29. One was aged 40 years or above	Females	Muslim community	Mixed: teachers, tailors and fabric knitting and students	One through more than 5 years	Otukpo	15031403
13.	In-depth	One	30 – 39	Female	Junior uniformed personnel	Police	More than five years	Otukpo	15031302

14.	In-depth	One	40 and above	Male	Junior uniformed personnel	Police	More than five years	Otukpo	15031301
15.	In-depth	One	30 – 39	Male	NACA representative	Doctor	More than five years	Abuja	15022501
16.	In-depth	One	30 – 39	Male	Senior uniformed personnel	Police	More than five years	Otukpo	15031201
17.	Group	Six	20 – 29	Females	General public and Christians	Students	Only one indicated less than one year	Otukpo	15031001
18.	Group	Five	20 – 29	Males	General public and Christians	Teachers and students	Between one and three years	Otukpo	15030901
19.	Group	Six	20 – 39	Males	General public and Christians	Unemployed, teachers and students	Between one and three years	Otukpo	15030902
20.	Group	Six	20 – 29	Females	University students and general public	Mixed: students and one administrative assistant	Less than one year. Students did not answer this question	Makurdi	15042201

21.	Group	Ten	20 – 29	Mixed: Males and females	General public, recruited from hospital outpatient department	Mixed: doctor, NGO, Nurse, civil servants, student.	Less than one year through to more than five years	Makurdi	15042202
22.	Group	Six	20 – 29	Males	University students and general public	Recent graduate (unemployed) and students	Only one participant indicated three to four years. Others did not answer this question	Makurdi	15042203
23.	In-depth	One	30 – 39	Male	Charity/NGO. Participant is based in Makurdi but has coverage to Otukpo and other Idoma speaking areas	Nurse who attends to PLWHA	More than five years	Makurdi	15042901
24.	In-depth	One	30 – 39	Male	Junior uniform personnel	Armed forces	More than five years	Makurdi	15041602
25.	In-depth	One	40 and above	Male	Senior uniform personnel	Armed forces	More than five years	Makurdi	15041603

26.	In-depth	One	20 – 29	Female	Junior uniform personnel	Armed forces	One to two years	Makurdi	15041601
27.	In-depth	One	20 – 29	Male	Charity/NGO staff and community development worker	A volunteer NGO staff who works with FSW	One to two years	Otukpo	15050204AB
28.	In-depth	One	20 – 29	Female	Female sex worker	Sex work	Two to three years	Otukpo	15050201
29.	In-depth	One	30 – 39	Female	Female sex worker	Sex work	One to two years	Otukpo	15050202
30.	In-depth	One	40 and above	Female	Female sex worker	Sex work	Three to four years	Otukpo	15050203
31.	In-depth	One	40 and above	Female	NGO worker and charity lead	Works for a local NGO as the chair and founder	Four to five years	Otukpo	15050301AB
32.	In-depth	One	20 – 29	Male	Graduate	Hotel manager and volunteer charity staff who works with sex workers in Makurdi area	Less than a year as hotel manager	Makurdi	15050503

33.	In-depth	One	20 – 29	Male	MSM	Volunteer charity worker	Charity staff	Makurdi	15050501
34.	Group	Two	20 – 39	Males	MSM. Participants were happy to be interviewed together.	One is a civil servant, the other is a volunteer charity worker	Two to three years	Makurdi	15050502
35.	Group	Three	20 - 39	Females	Participants work in the same brothel and were happy to be interviewed together.	Sex workers	Less than one year to three years	Makurdi	15050504
36.	In-depth	One	30 – 39	Male	Religious figure	Reverend Father	Two to three years	Otukpo	15050801
37.	In-depth	One	40 above	Female	No formal education	Traditional birth attendant	More than five years	Otukpo	15050902
38.	Group	Three	20 – 39	Males	Little formal education	Okada riders	One through five years	Otukpo	15050901
39.	In-depth	One	20 – 29	Male	Little formal education	Okada riders	Two to three years	Makurdi	15050701

40.	In-depth	One	30 – 39	Male	Little formal education	Okada riders	Less than one year	Makurdi	15050702
41.	In-depth	One	20 – 29	Male	Little formal education	Okada riders	Four to five years	Makurdi	15050703
42.	In-depth	One	30 – 39	Male	Tertiary education and NGO worker	Injection drug user	Less than a year	Makurdi	15050704

Appendix K: Participant information sheet



Ministry of Health and Human Services, Benue State, Nigeria

Participant information sheet

Date: 08/12/2014

You are being invited to take part in a research study.

The study will involve talking to a researcher from Newcastle University, UK (Inalegwu Oono, a Nigerian) about your perception and experiences of HIV/AIDS.

This leaflet is for you to keep, it tells you why we want to carry out this research and what taking part means for you.

Please read the leaflet carefully and take your time to decide if you want to take part or not. Talk to other people about the study if you want to, and ask the researcher if there is anything that you do not understand or that you would like more information on.

Title of the project: Understanding the patterns of spread of HIV/AIDS in Benue State and middle belt of Nigeria – the missing link between campaigns and results

Name of the researcher: Inalegwu Oono

Researcher's contact details: Institute of Health and Society, Newcastle University, United Kingdom. NE2 4AX
Mobile – 090 345 2599
Email - i.p.oono@newcastle.ac.uk

Sponsoring institution: Newcastle University, Newcastle Upon Tyne, Tyne and Wear

Ethical approval status: Ethical approval for this research has been obtained from Ministry of Health Benue State, Nigeria and Newcastle University ethics committee

Funding source: Inalegwu Oono is a Commonwealth scholar funded by the UK Government.

How to file a complaint: please contact the primary researcher in the first instance if you have any queries regarding this research, verbally or in writing, using details above. Alternatively, you could contact the Ministry of Health, Benue State on the details provided below -

Ministry of Health and Human Services, Benue State Government, Nigeria
PMB 102093, Makurdi, Benue State, Nigeria
Telephone: +234 (0) 44 533529, 531604
Email: Gab_ameh@yahoo.com

Purpose/Aims of the research:

The purpose of this research is to understand the reasons why prevalence of HIV/AIDS is high in Benue State and some other States in Nigeria.

Main objectives:

1. To investigate the reason for increased HIV/AIDS prevalence in Benue State and Nigeria.
2. To identify and categorise challenges to effective HIV/AIDS campaign in Benue State and Nigeria.
3. To explore variations, if at all any, in the risk for HIV/AIDS in Benue State Nigeria.
4. To provide useful information for future research on HIV/AIDS in Benue State Nigeria.
5. To highlight common interventions for HIV/AIDS in Benue State Nigeria.

Appendix L: Sample research flyer (designed in different sizes and orientations)



Ministry of Health and Human Services, Benue State, Nigeria

Understanding the patterns of spread of HIV/AIDS in Benue State and middle belt of Nigeria – the missing link between campaigns and results

- ⇒ *Are you resident in Benue State?*
- ⇒ *Have you lost loved ones, relatives or friends to HIV/AIDS?*
- ⇒ *Do you currently live with HIV/AIDS?*
- ⇒ *Are you interested in being a part of the solution to HIV/AIDS?*
- ⇒ *Are you involved in an NGO or charity that care for people living with HIV/AIDS?*
- ⇒ *Did you answer yes to any of the above questions?*



Then join our research to explore the root causes of HIV/AIDS in our communities

For further information please contact Dr Inalegwu Oono on the following -

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This project is funded by research grant from Commonwealth Scholarships Commission in the United Kingdom

Please spread the message and not the virus....

HIV/AIDS is real....

Appendix M: Interview prompt used for qualitative data collection

Questions asked during interviews and FGD (the guide)

1. Generic questions – ice breakers and common to all interview group
2. Specific questions – specific to interview groups and may be important only for some interviews
3. Closing questions – general to all groups

Generic questions:

1. Please briefly tell me what factors have informed your choice of this profession or career?
2. Could you briefly tell me what you know about HIV/AIDS?
3. If I was to ask you to describe HIV/AIDS to me, as it relates to your immediate environment, what would you say?

Specific questions:

A. Knowledge gaps – misconceptions, practices among TBA/TH

1. Could you briefly tell me what you know about HIV/AIDS?
2. Are you able to tell me details of how you came about the information you currently have about HIV/AIDS?

Chief source of information?
3. Do you think HIV/AIDS is a major problem in this area?

If yes, why?
4. Please briefly highlight important way(s) you know HIV/AIDS is spread in Nigeria and Benue State?

5. In your everyday practice, are there any particular measures you take to avoid the transmission of HIV/AIDS?
6. What do you think are important knowledge gaps and misconceptions about HIV/AIDS among the population?

B. HIV prevention – VCT, Condoms, campaigns

1. Are you happy to tell me the HIV/AIDS prevention methods you know?
2. What are your views about the prevention methods you know?
3. Which of these methods do you think is available to you?
4. Are there any reasons why any method(s) may not be readily accessible and available to you?
5. Are you happy to speak on your preferences for any of these prevention methods you have mentioned and how consistent you think you use them?
6. Are there any factors that discourage people in your circle or local area from taking up any of the HIV/AIDS prevention services you have mentioned already?
7. How easy is it for you to access HIV/AIDS prevention materials?

C. Risk perception

1. Do you think you are at any risk of contracting HIV/AIDS?
2. Are you able to provide me with any reasons for your answer?*
3. Could you highlight briefly on any important steps you have taken in the past to help stop the spread of HIV/AIDS?

4. Do you know of any other popular HIV/AIDS prevention measures others around you are taking - you may not necessarily have engaged in these activities?
5. If there is only one factor you think is the most important factor in reducing your risk for HIV/AIDS infection, what would that factor be?
6. Could you please explain how this factor works to provide you protection from HIV/AIDS infection?

D. Stigma

1. How do you think people view those who have HIV/AIDS in your area?
2. What do you think people fear most about HIV/AIDS infection?
Probe: The disease or the stigma. Please give reasons for your answer
3. Do you know of any local factors (including attitude) that may impact on the spread of HIV/AIDS?
4. Please tell me what you think about HIV/AIDS related stigma and how it may affect HIV/AIDS spread?

E. Long travels/long stay away from home – LDTD, uniform personnel

1. Do you think your job makes people like you vulnerable to HIV/AIDS infection?
2. How do you think your kind of job may predispose others to HIV/AIDS infection?

3. Are you aware of any HIV/AIDS prevention services that target people in your category?
4. Are you happy to highlight on how effective you think these HIV/AIDS prevention services have been in doing their job?
5. What are the experiences of colleagues who had HIV/AIDS – are there any known support processes set up to cater for them?

F. Commercial sex work

1. What kinds of pressures do you have to put up with every working day?
2. How do you think your nature of job may predispose you to HIV/AIDS infection?
3. How do you think your job may predispose others to HIV/AIDS infection?
4. Are you aware of any challenges that are peculiar to people in your circle of business?
5. What steps do you take to ensure that your HIV/AIDS risks are as low as possible?
6. Are there any factors or reasons that prevent you from being consistent with your HIV/AIDS prevention actions?
7. Are there any services you think may help support people in your circle of job in terms of HIV/AIDS prevention including general support services?
8. Are you aware of any general limitations to your being able to take up these HIV/AIDS prevention services?

G. Socioeconomic factors

1. Do you think HIV/AIDS affect people in your society to varying levels?
2. Do you think there are certain groups in your society that are more affected by HIV/AIDS?
3. If yes to the above question, who could these groups be and why?

H. Gender roles in society

1. Do you think your position in society, as it relates to gender, impacts on your decision to effectively access safer sex options?
2. Are you able to freely discuss issues about your sexual health with anyone you think you need to speak to?
3. If you were in a relationship today, do you think you could freely discuss issues relating to your partners' HIV/AIDS status?
4. Do you know your partners' status before you started having any sexual relationship (protected or unprotected)?

I. People living with HIV/AIDS

1. How long have you been living with HIV/AIDS?
2. What do you find most challenging or difficult?
3. Are you able to talk about what you think is key to control of HIV/AIDS in this area?
4. Are you able to speak to me about the reasons why you take your medications (if you are on any)? Prompt: Motivation for taking medications

5. Spread the message not the virus is a common slogan among everybody, are you aware of any challenges or factors that stop people who have HIV/AIDS from being able to do this effectively?

Closing questions:

1. What are the most important factors you think may play key roles in the control of HIV/AIDS in this area?
2. What do you think is/are the most acceptable method for HIV/AIDS prevention in your local area?
3. What steps do you think should be taken at community level to help stall the spread of HIV/AIDS in your local area?

Are there any government action(s) do you think is and/or are needed to bring about a reduction in the spread of HIV/AIDS in the local

Appendix N: Research consent form



Ministry of Health and Human Services, Benue State, Nigeria

Understanding the patterns of spread of HIV/AIDS in Benue State and middle belt of Nigeria – the missing link between campaigns and results

Consent form

Participant Identification Number:

- | | Please
Tick
Box |
|--|--------------------------|
| 1- I confirm that I have read and understand the information sheet dated / / 2014 for the above study. I have had the opportunity to think about the information; ask questions and have had these questions answered satisfactorily. | <input type="checkbox"/> |
| 2- I understand that taking part is voluntary and that I am free to change my mind at any time without giving any reason and without my legal right being affected. | <input type="checkbox"/> |
| 3- I understand that group discussions will be recorded and then typed out, with all information that could identify me or anyone else removed. Only the research team at the Newcastle University, UK will have access to information from interview. | <input type="checkbox"/> |
| 4- I understand that direct quotes may be taken from what I say and used in publications. I understand that neither I nor anyone else will be identifiable from these quotes. I give my permission for direct quotes to be used in publication. | <input type="checkbox"/> |
| 5- I understand that anything I say in the interview will be confidential. The only time the researcher (Inalegwu Oono) would need to break this confidentiality is if he sees or is told something which raises serious concern for my personal safety or safety of others. | <input type="checkbox"/> |
| 6- I agree to take part in the above study. | <input type="checkbox"/> |

Name of Participant:

Date:

Signature:

Name of researcher: Inalegwu Oono

Date:

Signature:

Appendix P: Sample coding frame in Nvivo software

The screenshot shows the Nvivo software interface with a coding frame table. The table lists 25 nodes with their respective sources, references, and creation/modification dates. The nodes are as follows:

Name	Sources	References	Created On	Created By	Modified On	Modified By
Condoms	30	149	08/07/2015 16:14	DIP	29/09/2015 15:53	DIP
Cultural factors	25	75	08/07/2015 17:15	DIP	24/09/2015 13:17	DIP
Economic factors	32	79	08/07/2015 17:16	DIP	23/09/2015 12:05	DIP
Funding issues	9	29	12/08/2015 16:13	DIP	12/08/2015 16:32	DIP
Government	27	75	08/07/2015 17:17	DIP	21/08/2015 13:05	DIP
IDU	1	22	20/08/2015 12:34	DIP	23/09/2015 13:22	DIP
Individual factors	19	40	08/07/2015 17:17	DIP	23/09/2015 16:45	DIP
Knowledge	31	97	08/07/2015 17:55	DIP	23/09/2015 12:07	DIP
Mental health	2	2	06/09/2015 12:43	DIP	23/09/2015 13:19	DIP
Misconceptions	29	65	08/07/2015 18:17	DIP	06/10/2015 16:23	DIP
MSM	2	32	20/08/2015 21:08	DIP	23/09/2015 13:19	DIP
NACA	1	12	21/08/2015 11:07	DIP	21/08/2015 13:16	DIP
Non disclosure	17	28	08/07/2015 18:10	DIP	23/09/2015 16:14	DIP
Occupation	31	133	08/07/2015 17:53	DIP	12/08/2015 14:30	DIP
Prevention	8	16	13/08/2015 19:06	DIP	22/09/2015 19:33	DIP
Religious factors	20	70	08/07/2015 17:19	DIP	23/09/2015 16:56	DIP
Risk perception	27	66	13/08/2015 18:29	DIP	24/09/2015 10:55	DIP
Sex education and friendly services	7	25	22/09/2015 13:19	DIP	15/10/2015 11:31	DIP
Social factors	11	27	08/07/2015 17:25	DIP	12/08/2015 14:30	DIP
Sources of information	20	65	08/07/2015 17:33	DIP	13/08/2015 20:34	DIP
Stigma and discrimination	37	153	08/07/2015 17:25	DIP	24/09/2015 12:49	DIP
Why HIV is a problem	37	177	10/08/2015 12:14	DIP	22/09/2015 14:38	DIP

Appendix Q: Data collection tool (the questionnaire)

SECTION 1: DEMOGRAPHICS

The following questions relate to your personal information . Please answer ALL

Q1.01 Participant identification number:

Q1.02 Age (in years)

Please tick

(a) 18 - 22

(b) 23 –27

(c) 28-33

(d) 34-37

(e) 38-42

(f) 43-47

(g) 48-52

(h) 52 and above

Q1.03 Where do you live currently?

Please tick

(a) Idoma speaking area

(b) Tiv speaking area

Q1.04 Highest level of education

Please tick

(a) None

(b) Primary

(c) Secondary

(d) Tertiary and above

SECTION 1: DEMOGRAPHICS

The following questions relate to your personal information . Please answer ALL

Q1.05 Which of the following is your religion? Please tick

- (a) Christianity
- (b) Islam
- (c) Traditional
- (d) None
- (e) Other

If other please specify

Q1.06 Occupation Please tick

- (a) Manager
- (b) Professional (for example doctor, nurse, teacher)
- (c) Technician
- (d) Clerical
- (e) Sales and services
- (f) Farming/agriculture
- (g) Crafts
- (h) Plant/machine operator
- (i) Elementary
- (j) Student

(k) Other (please specify)

SECTION 1: DEMOGRAPHICS

The following questions relate to your personal information . Please answer ALL

Q1.07	Marital status	Please tick
(a)	In a relationship (not married)	<input type="checkbox"/>
(b)	Married (one spouse or partner alone)	<input type="checkbox"/>
(c)	Married (more than one spouse or partner)	<input type="checkbox"/>
(d)	Single	<input type="checkbox"/>
(e)	Separated	<input type="checkbox"/>
(f)	Widowed	<input type="checkbox"/>
(g)	Divorced	<input type="checkbox"/>

Q1.08	Sexual orientation	Please tick
(a)	Straight/Heterosexual	<input type="checkbox"/>
(b)	Same sex/Gay/Homosexual	<input type="checkbox"/>
(c)	Bisexual	<input type="checkbox"/>
(d)	Not willing to say	<input type="checkbox"/>

Q1.09	How much is your monthly income from all sources	Please tick
(a)	Less than 50,000 naira	<input type="checkbox"/>
(b)	51,000 to 100,000 naira	<input type="checkbox"/>
(c)	101,000 to 150,000 naira	<input type="checkbox"/>
(d)	151,000 to 200,000 naira	<input type="checkbox"/>
(e)	201,000 naira and above	<input type="checkbox"/>

SECTION 1: DEMOGRAPHICS

The following questions relate to your personal information . Please answer ALL

Q1.10	How many dependants do you have (anyone who relies on you for support is your dependant)		Please tick		Please tick
		1	<input type="checkbox"/>	8	<input type="checkbox"/>
		2	<input type="checkbox"/>	9	<input type="checkbox"/>
		3	<input type="checkbox"/>	10	<input type="checkbox"/>
		4	<input type="checkbox"/>	11	<input type="checkbox"/>
		5	<input type="checkbox"/>	12	<input type="checkbox"/>
		6	<input type="checkbox"/>	More than 12	<input type="checkbox"/>
		7	<input type="checkbox"/>	No dependant	<input type="checkbox"/>

Q1.11	How many people live in your house with you		Please tick		Please tick
		1	<input type="checkbox"/>	8	<input type="checkbox"/>
		2	<input type="checkbox"/>	9	<input type="checkbox"/>
		3	<input type="checkbox"/>	10	<input type="checkbox"/>
		4	<input type="checkbox"/>	11	<input type="checkbox"/>
		5	<input type="checkbox"/>	12	<input type="checkbox"/>
		6	<input type="checkbox"/>	More than 12	<input type="checkbox"/>
		7	<input type="checkbox"/>	None	<input type="checkbox"/>

SECTION 1: DEMOGRAPHICS

The following questions relate to your personal information . Please answer ALL

Q1.12 Where do you reside most of the time

Please tick

(a) Village/rural

(b) Town/city

Q1.13 What kind of house do you live in (count only bedrooms)

Please tick

(a) 1 room

(b) 2 rooms

(c) 3 rooms

(d) 4 rooms

(e) 5 rooms

(f) More than 5 rooms

Q1.14 What is your main source of cooking energy

Please tick

(a) Firewood

(b) Kerosene

(c) Gas or electric stoves

Q1.15 What is your gender?

Please tick

(a) Male

(b) Female

SECTION 2: KNOWLEDE OF HIV/AIDS

The following questions relate to your knowledge of HIV/AIDS. Please answer ALL

Please tick the boxes (True, False, I don't know) for each of the questions		True	False	I don't know
Q2.01	Coughing and sneezing DO NOT spread HIV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.02	One can get HIV by sharing a glass of water with someone who has HIV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.03	Pulling out the penis before a man reaches orgasm keeps a woman from getting HIV during sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.04	A woman can get HIV if she has anal sex with a man	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.05	Showering, or washing one's genitals/private parts, after sex keeps a person from getting HIV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.06	All pregnant women infected with HIV will have babies born with AIDS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.07	People who have been infected with HIV quickly show serious signs of being infected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.08	There is a vaccine that can stop adults from getting HIV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.09	People are still highly likely to get HIV from the saliva exchanged during kissing even if there are no mouth injuries (or ulcers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.10	A woman cannot get HIV if she has sex during her period	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.11	There is a female condom that can help decrease a woman's chance of getting HIV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.12	A natural skin condom works better against HIV than does a latex condom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.13	Somebody who looks healthy cannot have HIV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.14	Having sex with more than one partner can increase a person's chance of getting HIV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.15	Taking a test for HIV one week after having sex will tell a person if she or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.16	A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.17	HIV is contracted ONLY through blood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.18	Using Vaseline or baby oil with condoms lowers the chance of getting HIV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.19	A person can get HIV from oral sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.20	HIV is caused by witches and wizards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q2.21	HIV can ONLY be contracted during sex if there is breach in skin and blood is exchanged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION 3: ATTITUDE

The following questions relate to your response to HIV/AIDS awareness campaigns. Please answer ALL

Q3.01 What is your HIV status	Please tick
(a) Positive	<input type="checkbox"/>
(b) Negative	<input type="checkbox"/>
(c) I think I am negative	<input type="checkbox"/>
(d) I am not willing to say	<input type="checkbox"/>

Q3.02 When was the last time you tested for HIV	Please tick
(a) More than a year ago	<input type="checkbox"/>
(b) 7-9 months ago	<input type="checkbox"/>
(c) 4-6months ago	<input type="checkbox"/>
(d) Less than or equal to 3 months ago	<input type="checkbox"/>
(e) Never	<input type="checkbox"/>

Q3.03 In your last three sexual experience, did you use condoms	Please tick
(a) No, I did not use condoms	<input type="checkbox"/>
(b) Yes, I used condoms sometimes but not always	<input type="checkbox"/>
(c) I used condoms all three times	<input type="checkbox"/>
(d) Not applicable	<input type="checkbox"/>

SECTION 3: ATTITUDE

The following questions relate to your response to HIV/AIDS awareness campaigns. Please answer ALL

Q3.04	In the last 1 year, have you had sex with a sex worker	Please tick
(a)	Yes	<input type="checkbox"/>
(b)	No	<input type="checkbox"/>
(c)	I chose not to answer	<input type="checkbox"/>
(d)	Not applicable	<input type="checkbox"/>

Q3.05	In the last 1 year, have you had sex with someone who is not your regular partner (married or unmarried)	Please tick
(a)	Yes	<input type="checkbox"/>
(b)	No	<input type="checkbox"/>
(c)	I chose not to answer	<input type="checkbox"/>
(d)	Not applicable	<input type="checkbox"/>

Q3.06	The first time you had sex, did you use condom	Please tick
(a)	Yes	<input type="checkbox"/>
(b)	No	<input type="checkbox"/>
(c)	I chose not to answer	<input type="checkbox"/>
(d)	Not applicable	<input type="checkbox"/>

Q3.07	What will people think if they see you with condom	Please tick
(a)	They will think nothing	<input type="checkbox"/>
(b)	They will think I am trying to be safe	<input type="checkbox"/>
(c)	They will think I am promiscuous	<input type="checkbox"/>
(d)	They will think I am a good person	<input type="checkbox"/>

SECTION 4: RISK PERCEPTION

The following questions relate to your understanding of your risk for contracting HIV/AIDS. Please answer ALL

Q4.01	What is your risk for contracting HIV	Please tick
(a)	I do not know	<input type="checkbox"/>
(b)	I have no risk at all	<input type="checkbox"/>
(c)	My risk is small	<input type="checkbox"/>
(d)	My risk is moderate	<input type="checkbox"/>
(e)	My risk is high	<input type="checkbox"/>

Q4.02	Why have you rated your risk as above	Please tick
(a)	I know how HIV is contracted	<input type="checkbox"/>
(b)	I only have sex with people who look healthy	<input type="checkbox"/>
(c)	God protects me from HIV	<input type="checkbox"/>
(d)	My profession puts me at risk	<input type="checkbox"/>
(e)	HIV is disease for people who are promiscuous, I am not promiscuous	<input type="checkbox"/>
(f)	I am not sure if my partner is faithful	<input type="checkbox"/>

Q4.03	In general, where do you think the biggest risk for contracting HIV comes from (not your risk this time but speaking generally)	Please tick
(a)	Haircuts and unsterilized instruments	<input type="checkbox"/>
(b)	Unprotected sex	<input type="checkbox"/>
(c)	Blood transfusion	<input type="checkbox"/>
(d)	Witches and wizards	<input type="checkbox"/>

SECTION 5: CULTURE

The following questions relate to how culture impacts on HIV/AIDS. Please answer ALL

Q5.01	It is common practise for a woman to depend on her spouse or partner for her financial needs	Please tick
(a)	True all the time	<input type="checkbox"/>
(b)	True for many people	<input type="checkbox"/>
(c)	True only in a few cases	<input type="checkbox"/>
(d)	Not true, I disagree	<input type="checkbox"/>

Q5.02	A man is the head ,therefore, he makes all the decisions and the woman will have to obey even if she does not agree	Please tick
(a)	True all the time	<input type="checkbox"/>
(b)	True for many people	<input type="checkbox"/>
(c)	True only in a few cases	<input type="checkbox"/>
(d)	Not true, I disagree	<input type="checkbox"/>

Q5.03	It is less of a problem if a man cheats in a relationship compared to a woman	Please tick
(a)	I agree	<input type="checkbox"/>
(b)	I disagree	<input type="checkbox"/>

Q5.04	In the last 5 years have you seen or heard about any case of female circumcision where you currently live	Please tick
(a)	Yes	<input type="checkbox"/>
(b)	No	<input type="checkbox"/>

SECTION 5: CULTURE

The following questions relate to how culture impacts on HIV/AIDS. Please answer ALL

Q5.05	In your opinion, it is easy for a woman to tell a man to use condoms during sex	Please tick
(a)	I agree	<input type="checkbox"/>
(b)	I disagree	<input type="checkbox"/>

Q5.06	Have you discussed safer sex options with a member of your family in the past (for example using condoms or testing for HIV/AIDS)	Please tick
(a)	Yes	<input type="checkbox"/>
(b)	No	<input type="checkbox"/>

SECTION 6: POLICY, STIGMA AND DISCRIMINATION

The following questions relate to HIV/AIDS policies, stigma and discrimination. Please answer ALL

		Please tick the relevant boxes to the right	
		Yes	No
Q6.01	It is an embarrassment in the society if anyone in your family is infected with HIV	<input type="checkbox"/>	<input type="checkbox"/>
Q6.02	Do you know of any laws or policies that protect people who have HIV from stigma/discrimination?	<input type="checkbox"/>	<input type="checkbox"/>
Q6.03	If you know somebody who has HIV, will you buy food stuff from them?	<input type="checkbox"/>	<input type="checkbox"/>
Q6.04	Do you think people who have HIV should have a separate school	<input type="checkbox"/>	<input type="checkbox"/>
Q6.05	Where you currently live, do you think somebody who has HIV will feel free enough to say they have HIV	<input type="checkbox"/>	<input type="checkbox"/>
Q6.06	Do you think the way your family or friends will respond to you if you are HIV positive makes you think twice about taking HIV tests?	<input type="checkbox"/>	<input type="checkbox"/>

Q6.07	What is your opinion about a law that will prescribe jail sentences for anyone who deliberately infects another person with HIV/AIDS?	Please tick
(a)	It will be a good law	<input type="checkbox"/>
(b)	I think this law is of no value	<input type="checkbox"/>
(c)	It will be a bad law, I don't like it	<input type="checkbox"/>
(d)	I do not want to answer	<input type="checkbox"/>

Q6.08	People who are HIV positive face rejection from others a lot	Please tick
(a)	I agree	<input type="checkbox"/>
(b)	I disagree	<input type="checkbox"/>
(c)	Maybe	<input type="checkbox"/>

SECTION 7: ALCOHOL AND DRUG USE

The following questions relate to use of alcohol and substance abuse. Please answer ALL

Please tick the relevant boxes to the right		Yes	No	Not applicable
Q7.01	Do you drink alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q7.02	Would you normally drink alcohol before sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q7.03	Do you inject recreational drugs or substances (like cocaine or any other medicine for example)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q7.04	When you inject these drugs, do you share needles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q7.05	Do you find it hard to access clean needles for injecting drugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7.06	On average, how many glasses, cups or bottles of alcohol do you drink in a week	Please tick	
	1	<input type="checkbox"/>	8 <input type="checkbox"/>
	2	<input type="checkbox"/>	9 <input type="checkbox"/>
	3	<input type="checkbox"/>	10 <input type="checkbox"/>
	4	<input type="checkbox"/>	More that 10 <input type="checkbox"/>
	5	<input type="checkbox"/>	Not applicable <input type="checkbox"/>
	6	<input type="checkbox"/>	
	7	<input type="checkbox"/>	

SECTION 8: SOCIAL FACTORS

The following questions relate to social factors that may impact on HIV/AIDS spread. Please answer ALL

Q8.01	What do you think about the number of hotels, brothels and beer parlour where you currently live	Please tick	
(a)	There are too many of them	<input type="checkbox"/>	
(b)	I am not bothered by the number of them	<input type="checkbox"/>	
(c)	There are just enough	<input type="checkbox"/>	
(d)	There is none	<input type="checkbox"/>	

Q8.02	In your opinion, do you think hotels and brothels have a role to play in HIV spread where you live currently	Please tick	
(a)	They do not impact on HIV spread in any way	<input type="checkbox"/>	
(b)	Yes, they encourage HIV spread	<input type="checkbox"/>	
(c)	Yes, they discourage spread of HIV	<input type="checkbox"/>	

Q8.03	Do you think HIV spread is higher at certain times and periods of the year listed below	Yes	No
(a)	Festive periods like Christmas and traditional festivals	<input type="checkbox"/>	<input type="checkbox"/>
(b)	Wakes and funerals	<input type="checkbox"/>	<input type="checkbox"/>

SECTION 9: ACCESS TO HEALTHCARE AND PREVENTION SERVICES

The following questions relate to access to relevant HIV services. Please answer ALL

Q9.01	If you were HIV positive, which of the following would you be most concerned about when going to collect your medicines (please tick <u>ONLY</u> two)	Please tick
(a)	Somebody may see me and know that I have HIV	<input type="checkbox"/>
(b)	HIV is a death sentence so there is no point going for medicines	<input type="checkbox"/>
(c)	I am not able to afford transport fare	<input type="checkbox"/>
(d)	None of the above	<input type="checkbox"/>

Q9.02	What do you think about the staff at HIV centres you have attended before (please tick only one)	Please tick
(a)	They are very friendly	<input type="checkbox"/>
(b)	They are <u>NOT</u> friendly and judgemental	<input type="checkbox"/>
(c)	I have no opinion	<input type="checkbox"/>
(d)	Not applicable to me	<input type="checkbox"/>

		Please tick the relevant boxes to the right	
		Yes	No
Q9.03	Are you aware of any services that teach young people about how to be safe (for example how to use condoms)	<input type="checkbox"/>	<input type="checkbox"/>
Q9.04	Do you think young people can freely access sex education services (for example information on safer sex and buying of condoms) without fear of stigma	<input type="checkbox"/>	<input type="checkbox"/>

SECTION 10: CAMPAIGNS AND AWARENESS

The following questions relate to campaigns about HIV. Please answer ALL

		Please tick the relevant boxes to the right	
		Yes	No
Q10.01	They are very friendly	<input type="checkbox"/>	<input type="checkbox"/>
Q10.02	They are very judgemental	<input type="checkbox"/>	<input type="checkbox"/>
Q10.03	They are very detailed	<input type="checkbox"/>	<input type="checkbox"/>
Q10.04	They are not detailed enough	<input type="checkbox"/>	<input type="checkbox"/>
Q10.05	They are not frequent	<input type="checkbox"/>	<input type="checkbox"/>
Q10.06	They are hard to understand	<input type="checkbox"/>	<input type="checkbox"/>

Q10.07	Where you currently live, how many awareness campaigns have you seen in the last 12 months (Please tick)			
	0	<input type="checkbox"/>	7	<input type="checkbox"/>
	1	<input type="checkbox"/>	8	<input type="checkbox"/>
	2	<input type="checkbox"/>	9	<input type="checkbox"/>
	3	<input type="checkbox"/>	10	<input type="checkbox"/>
	4	<input type="checkbox"/>	More that 10	<input type="checkbox"/>
	5	<input type="checkbox"/>		
	6	<input type="checkbox"/>		

SECTION 10: CAMPAIGNS AND AWARENESS

The following questions relate to campaigns about HIV. Please answer ALL

Q10.08 Where would you normally get information on HIV from (please tick ONLY 3)

Friends	<input type="checkbox"/>	Mosque	<input type="checkbox"/>
Campaigns on the streets and public places	<input type="checkbox"/>	Church	<input type="checkbox"/>
At school (as part of school curriculum)	<input type="checkbox"/>	Radio	<input type="checkbox"/>
Hospital	<input type="checkbox"/>	TV	<input type="checkbox"/>
NGO	<input type="checkbox"/>	Internet	<input type="checkbox"/>
Mobile phone	<input type="checkbox"/>		
Handbills and posters	<input type="checkbox"/>		

