

**PREVALENCE AND CORRELATES OF HIV, SYPHILIS, HEPATITIS B,
HEPATITIS C INFECTIONS AND SEXUAL BEHAVIOURS OF
MEN WHO HAVE SEX WITH MEN IN TWO CITIES IN NIGERIA**

By

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ABSTRACT

Globally, men who have sex with men (MSM) continue to be disproportionately affected by the HIV pandemic. However, prior to this study, very little was known about the magnitude and factors that heighten MSM's vulnerabilities to HIV and other STIs in Nigeria.

A cross-sectional survey was administered to 1,125 consenting MSM in Lagos and Ibadan recruited through modified respondent driven strategy. Sero-prevalence of HIV, hepatitis B (HBV), hepatitis C (HCV) and syphilis and levels of unprotected anal intercourse (UAI) were determined using data adjusted for network size and unweighted data for the pooled sample. Correlates of HIV, HBV, HCV and UAI were examined using multiple logistic regression analyses.

Results revealed relatively young sexually active men who engaged in multiple concurrent sexual relationships with both men and women. More than half of the men self-identified as bisexual, and 44.4% as homosexual. High levels of risky sexual behaviours were demonstrated with over two-thirds of MSM in Ibadan (65.5%) and Lagos (69.7%) reporting UAI with their

male partners in the previous 6 months. Correlates of URAI included homosexual identity, older age, lack of social support, and douching.

Prevalence of previously undiagnosed HIV infection were four times higher in Lagos 12.7% (95% CI 10.6-15.0), and Ibadan 11.2% (95% CI 5.7-16.2) than the national HIV prevalence among Nigerian men. Prevalence of HBV (10.1% and 18.0%); HCV (2.8% and 4.3%) and current active syphilis (0.03%) infections in Lagos and Ibadan respectively were also high. Correlates of HIV were URAI and UIAI with men and women, condom breakage, homosexual identity, increasing age, employment, sexual activities with non-African white men and internalized homophobia.

Bisexual identity, UIAI with male sex partners, and low self-esteem were associated with HBV infection. Correlates of HCV were URAI and reported sex with men who had lower educational status.

This study confirms the existence of MSM who engage in risky behaviours with very limited access to appropriate HIV and STI prevention services.

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Finally, it is only a few who have the opportunity to truly give back to society. For the rare opportunity to do this in such abundance and improve life for generations to come, I give all thanks and honour to God.

DEDICATION

To Dare Odumuye and his peers struggling to be accepted by one and all

EXECUTIVE SUMMARY

The Men's Study, Nigeria was the first to explore and ascertain the magnitude and distribution of unprotected anal intercourse (UAI), and of undiagnosed HIV, hepatitis B (HBV), hepatitis C (HCV) and syphilis infections among men who have sex with men (MSM) in two cosmopolitan cities in the southwest of Nigeria.

Prior to the main study, a preliminary study was conducted employing qualitative techniques to assess the feasibility of the study, as well as articulate the experiences of a group of purposively selected self-identified MSM in expressing their sexuality and accessing health care services in a predominantly homo-negative society.

Subsequently, 1,125 self-identified MSM, recruited through modified respondent driven sampling, were interviewed, counselled, and tested for HIV, HBV, HCV, and syphilis at three secure venues in Lagos and Ibadan.

The study revealed a group of relatively young MSM, many of who were sexually active with both men and women. More than half of the men self-identified as bisexual, and 44.4% as homosexual. Half of the respondents reported concurrent vaginal and anal sexual activities with multiple female sex partners in the year preceding the study, most (>60%) of which were unprotected. Similarly, the men also reported multiple concurrent sexual relationships with other men and consistent condom use was infrequent and varied with the type of sex partner.

Approximately one-third of the respondents experienced internalized homophobia as well as hostility. Less than one-tenth of the men had disclosed their sexual orientation to people other than members of the MSM community.

The findings from this study highlight the high levels of risky sexual behaviours that MSM engaged in with different types of male and female partners including multiple concurrent male and female sex partners, sex in exchange for money or gifts, inconsistent use of condoms, and unprotected insertive and receptive anal intercourse. Over two-thirds of MSM in Ibadan (65.5%) and Lagos (69.7%) reported unprotected anal intercourse (UAI) with their male partners in the previous 6 months. Factors found to be independently associated with unprotected receptive anal intercourse (URAI) included unprotected insertive anal intercourse (UIAI) with men, homosexual identity, HIV-infection, douching, engaging in sexual relationship with mostly older men and lack of social support. Although internalized homophobia also increased the likelihood of URAI, this was not statistically significant ($p=0.07$).

More than half of the respondents (57.0%) also reported unprotected insertive anal intercourse (UIAI) with men in the last 6 months. Correlates of UIAI with men included older age, UIAI with women, engaging in sexual activities with White African men. Bisexual identity also increased the odds of UIAI with men by 26.0% although it did not achieve statistical significance ($P=0.07$).

Furthermore, more than a quarter of men who reported sexual activities with women engaged in UIAI with their female sex partners. Correlates of UIAI with women were URAI and UIAI with men, increasing age, bisexual identity and sex with non-African White men.

This study demonstrated a high prevalence of previously undiagnosed HIV infection among MSM in Lagos, 12.7% (95% CI 10.6-15.0), and Ibadan, 11.2% (95% CI 5.7-16.2). These prevalence estimates were four times higher than the national HIV prevalence among Nigerian men of 3.2%. Unfortunately, most of the men (>75%) were unaware of their HIV status prior to this study because they had never been tested for HIV.

Of the 145 men who tested positive for HIV infection, a high proportion (75.0%) reported high-risk sexual behaviours including URAI with men; 54.0% engaged in sexual activities with female partners in the previous year, of whom 42.1% reported unprotected anal intercourse with their female partners in the past year; 84.1% perceived that they were at low risk of infection; and 60.0% had never been tested for HIV. HIV infection was independently associated with unprotected receptive and insertive anal intercourse with men and women, condom breakage, homosexual identity, increasing age from 20 years and being employed. Other correlates of HIV infection included engaging in sexual relations with non-African white men, engaging in sexual relationships with men who had higher educational status, and experiencing internalized homophobia.

At the time of this study, no study in the published literature had examined population-proportion estimates of hepatitis B, C, and syphilis among MSM in Nigeria. Prevalence of HBV surface antigen was 10.1% in Lagos and 18.0% in Ibadan. Self-identifying as bisexual, engaging in UIAI with male sex partners, and low self-esteem were independently associated with HBV infection.

The estimated prevalence of hepatitis C was 2.8% in Lagos and 4.3% in Ibadan. Multivariable analyses revealed that unprotected receptive anal intercourse and engaging in sexual

relationships with men who had lower educational status were significantly associated with increased risk of HCV infection.

Prevalence of active syphilis was very low in this study population with only three MSM (0.3%) from Ibadan diagnosed with syphilis.

This study confirms the existence of MSM who engage in risky behaviours with very limited or no access to appropriate HIV and STI prevention services. Unfortunately, the high HIV, HBV and HCV prevalence revealed by this study will continue unabated if MSM infected with these infections remain unaware of their serostatus and if effective prevention programs are not implemented on a broad scale. Therefore, this is a call to the Government of Nigeria to create an enabling environment for the establishment of MSM-friendly, comprehensive combination prevention services for MSM to access in order to avert new infections and reduce unrecognized infections.

It is encouraging that this study has catalysed more MSM-focused research and provision of targeted prevention services for MSM in Nigeria such as two rounds of the Integrated Biological and Behavioural Surveillance Survey (IBBSS) and the Men's Health Network, Nigeria (MHNN). There is a dire need to increase the awareness of health care providers about the specific needs of MSM through training and scale-up of comprehensive HIV prevention programmes in primary, secondary, and tertiary health institutions across Nigeria.

Members of the MSM community also need behaviour change educational interventions using peer educators and role models as agents of change leveraging existing channels of communication within sexual networks of MSM to increase the awareness of HIV and STIs. In

doing so, it is also important to recognise the diversity within the MSM community, and hence, the need to provide targeted services including regular HIV counselling and testing, provision of condoms and lubricants, STI syndromic management, and reproductive health services that meet the specific needs of different segments of the MSM community. Currently in Nigeria, routine screening for HBV is exclusively for newly diagnosed HIV-infected persons on their first visit to ARV hospitals for confirmation of diagnosis. This implies that opportunities for screening and early detection of HBV and HCV among high-risk HIV-uninfected MSM are rare in Nigeria.

The epidemiologic information provided in this thesis is important for government, policy makers, donors, and prevention programmers to allocate appropriate resources toward research and HBV, HCV, syphilis and HIV prevention and treatment interventions for MSM and their sex partners.

ACRONYMS

AIDS	Acquired Immuno-Deficiency Syndrome
APIN	AIDS Prevention Initiative, Nigeria
ARN	Alliance Rights of Nigeria
BCC	Behaviour Change Communication
CFSW	Client of Female Sex Partner
CRS	Chain Referral Sampling
FMOH	Federal Ministry of Health
FP	Female Partner
FSW	Female Sex Worker
FTF	Face-to-Face
HAART	Highly Active Anti-Retroviral Therapy
HBsAg	Hepatitis B Surface Antigen
HBV	Hepatitis B Virus
HCT	HIV Counseling and Testing
HCV	Hepatitis C Virus
HIV	Human Immunodeficiency Virus
IAI	Insertive Anal Intercourse
	Integrated Biological, Behavioural Surveillance Survey
IBBSS	
IDU	Injecting Drug User
LGBTI	Lesbian, Gay, Bisexual, Transgender, Intersex
MARPs	Most at Risk Populations
MP	Male Partner
MSM	Men who have Sex with Men
NACA	National Agency for the Control of AIDS
	National AIDS/STDs Control Program (Nigeria)
NASCP	
NELA	Network on Ethics, Law, HIV and AIDS
	Prevention, Support and Care
NRFP	Non-Regular Female Partner
NRMP	Non-regular Male Partner
PEPFAR	President's Emergency Plan for AIDS Relief
PLHIV	People Living with HIV and AIDS
RAI	Receptive Anal Intercourse
RFP	Regular Female Partner
RMP	Regular Male Partner
RDS	Respondent Driven Sampling
RPR	Rapid Plasma Reagin
SSA	Sub-Saharan Africa
STI	Sexually Transmitted Infections

TPHA	<i>Treponema palladium</i> hemagglutination assay
UIAI	Unprotected Insertive Anal Intercourse
URAI	Unprotected Receptive Anal Intercourse
USAID	United States Agency for International Development
UVI	Unprotected Vaginal Intercourse
VI	Vaginal Intercourse

TABLE OF CONTENTS

Abstract		ii
Acknowledgements		iv
Dedication		vi
Executive Summary		vii
Acronyms		xii
Table of Contents		xiv
List of Figures		xvii
List of Tables		xviii
List of Appendices		xx
Prologue		1
Chapter 1	INTRODUCTION	3
Chapter 2	THE RESEARCH PURPOSE, OBJECTIVES & CONCEPTUAL FRAMEWORK	10
2.1	Research purpose and objectives	10
2.2	Conceptual framework	12
Chapter 3	LITERATURE REVIEW	15
3.0	Introduction	15
3.1	Men who have sex with men in SSA	20
▪	3.1.1 Evidence of homosexuality and anal sexual practices between men in SSA	20
▪	3.1.2 Prevalence of same-sex activity in SSA	22
3.2	Socio-demographic characterization of MSM in SSA	24
▪	3.2.1 Demographic characteristics	24
▪	3.2.2 Sexual identities of MSM in SSA	27
▪	3.2.3 Bisexuality and MSM in SSA	29
▪	3.2.4 MSM as a potential bridge risk group to women	30
3.3	Sex partner characteristics and sexual networks	30
3.4	Behavioural factors – high-risk behaviours of MSM	33
▪	3.4.1 Sexual debut	33
▪	3.4.2 Sexual behaviours of MSM in SSA	33
▪	3.4.3 Male sex work in SSA	34
▪	3.4.4 Anal intercourse (AI)	36
▪	3.4.5 Condom use among MSM in SSA	37
3.5	Psychologic Factors	39
▪	3.5.1 Extent of ‘Outness’	39
▪	3.5.2 Internalized Homophobia	41
▪	3.5.3 Perceived Risk for Acquiring HIV	42
3.6	Structural Factors	43
▪	3.6.1 Secrecy, Stigma and Violence against Male Same-Sex Activities in SSA	43
▪	3.6.2 Health Seeking Behaviours of MSM in SSA	44
3.7	Biologic Factors	45
▪	3.7.1 Prevalence of other STIs among MSM in SSA	45

▪	3.7.2	Prevalence of HIV Among MSM in SSA	47
3.8		Hepatitis B among MSM in SSA	48
3.9		Hepatitis C among MSM in SSA	52
Chapter 4		RESEARCH METHODS	55
4.1		Study Design	55
▪	4.1.1	Feasibility Study	55
▪	4.1.2	Community Advisory Committee (CAC)	56
▪	4.1.3	Study Sites	57
▪	4.1.4	Study Design	57
▪	4.1.5	Study Sample and Inclusion Criteria	58
▪	4.1.6	Outcomes of Interest	58
▪	4.1.7	Independent Variables	59
▪	4.1.8	Sample Size Calculations	59
▪	4.1.9	Training, pilot testing of instruments and recruitment strategies	62
4.2		Recruitment of Study Participants	62
▪	4.2.1	Recruitment Strategies	62
▪	4.2.2	Data and Blood Collection	66
▪	4.2.3	Data Collection	66
▪	4.2.4	Biologic Sample Collection	67
▪	4.2.5	Laboratory Testing of Biologic Samples	68
4.3		Study Measures	72
▪	4.3.1	Measurements	73
▪	4.3.2	Reliability of Interviewer-Administered Questionnaire	73
▪	4.3.3	Validity of Questionnaire Data	75
▪	4.3.4	Quality Control of Laboratory Procedures and Results	75
4.4		Results of Reliability Tests	77
▪	4.4.1	Outcomes of Interest	77
▪	4.4.2	Independent Variables	79
4.5		Data Analyses	88
Chapter 5		RECRUITMENT OF RESPONDENTS	93
▪	5.1.1	Recruitment of Respondents	93
▪	5.1.2	Recruitment Dynamics	94
▪	5.1.3	Comparison of Retained and Deleted Recruits	98
▪	5.1.4	Characteristics of the Retained Respondents	102
Chapter 6		RESULTS	107
6.1		Descriptive Analyses of the Study Sample	107
6.2		Socio-Demographic Characteristics of the Respondents	107
6.3		Sexual History and Sex Partner Characteristics	110
6.4		Smoking, Alcohol, Drugs and Sex	112
6.5		Sexual Behaviours of Respondents	113
▪	6.5.1	Respondents' Sexual Behaviours with Women	113
6.6		Sexual Behaviours with Non-Commercial Male Partners	116
6.7		Sexual Behaviours with Commercial Male Partners	118
6.8		Condoms and Lubricant Use	119
6.9		Knowledge and Attitudes to HIV and STIs	120

6.10	Characteristics of Respondents who consented to HIV screening	121
6.11	Prevalence of STIs and HIV	122
6.12	Psychosocial Responses to Sexual Orientation	124
6.13	Correlates of Unprotected Receptive Anal Intercourse	127
6.14	Correlates of Unprotected Insertive Anal Intercourse with men	133
6.15	Correlates of Unprotected Insertive Anal Intercourse with women	138
6.16	Correlates of HIV among MSM	143
6.17	Correlates of HBV Infection among MSM	151
6.18	Correlates of Hepatitis C among MSM	156
6.19	Comparison of Risk Markers across Outcome variables	160
Chapter 7	DISCUSSION	163
	Study Strengths and Limitations	210
Chapter 8	RECOMMENDATIONS	221
Chapter 9	CONCLUSION	223
	REFERENCES	224
	APPENDICES	267

LIST OF FIGURES

Figure 1	Map of Nigeria	5
Figure 2	Conceptual Framework of Factors Associated with HIV Infection	14
Figure 3	Flow Chart of Respondents during Data Collection	71
Figure 4	Recruitment Patterns in Lagos and Ibadan	95
Figure 5	RDS Recruitment in Ibadan	96
Figure 6	RDS Recruitment in Lagos	97
Figure 7	Number of Recruits per Wave	98
Figure 8	Flow Chart of Recruitment	100
Figure 9	HIV Prevalence by Week of Recruitment	124

LIST OF TABLES

Table 1	Summary of studies referencing MSM in SSA	17
Table 2	Effects of varying samples sizes and estimates of attributes on precision of estimates	61
Table 3	Study tables and constructs	72
Table 4	Socio-demographic characteristics of respondents for the reliability sub-study	77
Table 5	Agreement between interviews on socio-demographic characteristics	79
Table 6	Agreement on Knowledge of HIV	85
Table 8	Agreements between interviews on social habits	88
Table 10	Comparison of deleted and retained data –quantitative variables	100
Table 11	Comparison of deleted and retained data – categorical variables	101
Table 12a	Characteristics of Respondents by Venue of Interview	104
Table 12b	Comparison of Seeds Vs. Others	105
Table 12c	Characteristics of Respondents in Successive RDS Waves	106
Table 13	Socio-demographic characteristics	109
Table 14	Sexual history and characteristics of respondents’ sex partners	111
Table 15	Type and patterns of substance use by respondents	112
Table 16	High risk sexual behaviours of respondents with women	114
Table 17	Sexual behaviours of respondents with non-commercial male partners	117
Table 18	Respondents and sex in exchange for money and gifts	118
Table 19	Condoms and Lubricants	119
		xviii

Table 20	HIV Knowledge, attitudes scores and risk perception scores	121
Table 21	Characteristics of respondents who provided blood samples	122
Table 22	Prevalence of HIV, syphilis, hepatitis B and hepatitis C	124
Table 23	Reported experience of hostility, extent of ‘outness’, social support	125
Table 24	Experiences of internalized homophobia as reported by respondents	126
Table 25	Correlates of unprotected receptive anal intercourse with men	128
Table 26	Predictors of unprotected receptive anal intercourse with men	131
Table 27	Correlates of Insertive anal intercourse with men	134
Table 28	Predictors of unprotected insertive anal intercourse with men	137
Table 29	Correlates of unprotected anal intercourse with women	139
Table 30	Predictors of unprotected insertive anal intercourse with women	142
Table 31	Correlates of HIV infections among MSM	146
Table 32	Predictors of HIV infection among MSM	149
Table 33	Correlates of HBV infection among MSM	152
Table 34	Predictors of HBV infection among MSM	155
Table 35	Correlates of HCV infection among MSM	156
Table 36	Predictors of HCV infection among MSM	159
Table 37	Comparison of predictors across outcome variables	161

LIST OF APPENDICES

Appendix 1	Criminal Code Act	268
Appendix 2	Feasibility Study	269
Appendix 3	Respondents' Screening Form	289
Appendix 4	Power calculations	290
Appendix 5	Qualitative Study Instruments	292
Appendix 6	Quantitative Study Instrument	295
Appendix 7	Proportion of MSM Engaging in Unprotected Anal Intercourse	342
Appendix 8	University of Toronto, Ethics Approval	343
Appendix 9	College of Medicine, University of Lagos, Ethics Approval	344
Appendix 10	Same Sex Bill	345
Appendix 11	Published Papers	349
Appendix 12	HIV Prevalence among MSM in Africa 2002-2009	354
Appendix 13	Same-Sex Marriage Law 2014	355

PROLOGUE

Understanding the epidemiology of an infectious disease in a population is important for monitoring, informing policies and programming, and for controlling the infection.

The human immunodeficiency virus (HIV) infection remains one of the leading causes of morbidity and mortality in sub-Saharan Africa (SSA). Even after over two decades of the discovery of the virus, SSA carries the highest burden of HIV infections and HIV and AIDS related morbidity and mortality in the world. The region accounts for two-thirds of people living with HIV and three-quarters of global AIDS deaths and sub-Saharan Africa is the only region in the world where women are disproportionately affected in comparison with men (UNAIDS 2008; 2010; 2013). Also, Africa accounts for nearly 90% of children living with HIV and AIDS.

Situated in the west of Africa is Nigeria, the most populous country in Africa with over 165 million people and the tenth most populous in the world, with the third largest global HIV burden in terms of the absolute number of adults and children infected after South Africa and India. Reported HIV prevalence was 3.6% in the general population in 2008 (with sex-specific prevalence of 4.0% among women aged 15-49 years and 3.2% among men aged 15-64 years)¹; 4.1% among pregnant women²; and more than 3 million people living with the virus.

¹ Federal Ministry of Health. (2008). National HIV and AIDS and Reproductive Health Survey (NARHS Plus 2007).

² Federal Ministry of Health. (2010). National HIV Sero-Prevalence Sentinel Survey Among Pregnant Women Attending Antenatal Clinics in Nigeria: Technical Report 2010.

Interestingly, whilst the epidemic in high and middle income countries is predominantly attributed to male same-sex behaviour, in SSA, transmission of HIV is mainly linked to heterosexual and, more recently, to vertical spread. Male same-sex transmission has been largely denied and overlooked in SSA.

Furthermore, various cultural, behavioural, social, and biologic risk factors have been suggested to explain the wide disparity in the prevalence and transmission of HIV within and between the region and the rest of the world. The role of male same-sex sexual activities in the epidemiology of HIV in Nigeria has been unexplored with sparse or no data on HIV prevalence and risk behaviour among men who have sex with men (MSM) despite the considerable historical and anthropological evidence of same-sex behaviour.

Homosexuality is criminalized in more than two-thirds of African countries including Nigeria, with reports of MSM facing harassments, physical and sexual assaults, detention, social stigma, and employment, education, and health service discrimination. As a result, same-sex practices are often clandestine, undisclosed, and cloaked in secrecy, with many MSM engaging in sexual relationships with women and even marrying out of the need to respond to the strong cultural pressures attached to marriage and procreation.

Against this backdrop, the study at the heart of this thesis titled ‘The Men’s Study, Nigeria’ was conceived out of a need for information and data on the roles of male same-sex behaviours in the epidemiology of HIV in Nigeria. It is hoped that knowledge will be advanced through this work and that gaps in the epidemiology of HIV will be filled.

CHAPTER 1

INTRODUCTION

Over the years, HIV-related research, interventions, and public discourses have primarily focused on women's greater vulnerability to HIV and other sexually transmitted infections (STIs) relative to men in Africa (Reid 2005). What is less known and researched are the factors that heighten men's vulnerabilities to HIV.

Since the first officially reported cases of AIDS in East-Central Africa in the early 1980s (Serwadda 1985; Buve 1997; Buve 2002), sub-Saharan Africa has progressed through the most devastating impacts of HIV and AIDS. Despite major successes achieved in the introduction of highly active anti-retroviral therapy (HAART) for treatment of people living with HIV (PLHIV) in high-income countries, SSA remains the worst affected of all regions in the world with substantial morbidity and mortality (UNAIDS 2000; Morison 2001; Lane 2006).

With just over one-tenth of the world's population, SSA contributes nearly two-thirds (22.5 million [20.9 million–24.3 million]) of the global burden of HIV infections (33.2 million [30.6–36.1 million]) with the highest adult (15-49 years) prevalence of 5.0% [4.6%–5.5%], compared with 1% worldwide and less than 1% in most developed countries (Kalipeni 2004; UNAIDS 2008). SSA is the only region where the absolute number of new HIV infections among adults and children almost equals the number of deaths from AIDS. In 2007 alone, an estimated 1.9 [1.6-2.1] million new HIV infections and 1.5 [1.3 – 1.7] million deaths from AIDS were reported among adults and children in the region, representing 75% of global AIDS deaths

(UNAIDS 2006; 2008) thus, making AIDS the leading cause of death in SSA (Piot 2002) and the fourth leading cause of death in the world (Ebrahim 2005; UNAIDS 2006). The spread of HIV in sub-Saharan Africa has reversed much of the progress achieved in health, education, life expectancy, and quality of life since the mid-1950s (Inungu 2006).

At the beginning of the epidemic in SSA in the 1980s, HIV-infected men outnumbered HIV-infected women but currently, the converse is true in most countries in the region (Quinn 1986; Maartens 2000; Reid 2005). Approximately 75% of women living with HIV globally reside in SSA and, within the region, women are disproportionately affected in comparison with men with approximately 60% of adult and young persons living with the virus being women (UNAIDS 2006). In 2005 and 2007, SSA was the only region other than the Caribbean, North Africa, and the Middle East where the female-to-male ratio of the absolute number of HIV-infected persons was greater than 1.0. Worse still, the female-to-male ratio of HIV among young people (15-24 years) was 3:1 in 2005 and 2007 (UNAIDS 2006; 2008), and almost 90% of all children living with HIV reside in SSA (Caldwell 1993).

Sexual transmission is the predominant mode of transmission of HIV (over 90%) in SSA (Hunter 1993; Buvé 1995; Fleming 1999; Weiss 2000; Baeten 2005) although there are other established routes including parenteral (contaminated blood transfusions), re-use of unsterilized needles, needle stick injuries, and vertical transmission from mother-to-child (Quinn 1986; Khouri 1995; Royce 1997; Fleming 1999; Weiss 2000; Cohen 2004; Baeten 2005).

There are major differences in the epidemiology of HIV between regions of the world (Cameron 1989). However, despite various hypotheses advanced to explain the dichotomy between modes

of transmission in SSA and high income countries (Hu 1996; Rakwar 1999; Morison 2001; 2001; Gray 2004; Kalipeni 2004; de Soysa 2013), a number of questions, including the role of same-sex behaviours in the epidemiology of HIV, remain unanswered.

Situated in West Africa, Nigeria (Figure 1) is the most populous (165 million) country in SSA and the tenth most populous country in the world (Nasidi 2006). The 2007/8 United Nations Development Programme (UNDP) Human Poverty Index ranked the country among the poorest 20 countries in the world (Spink 2007; Spink G. 2008). It is estimated that 70% of Nigerians live on < \$1/day, the majority of whom are women.

Figure 1: Map of Nigeria showing the 36 states and the Federal Capital Territory and the Six Geo-Political Zones



Since the first two cases of HIV were reported in 1985 in Nigeria, the country witnessed a steady increase in the prevalence of HIV from a low (0.9%) in 1986 to a high (5.8%) in 2001 and then down to 5.0% in 2003 when the first sign of a decline was reported (Nasidi 2006).

However, despite this decline, Nigeria contributes the highest number of people living with HIV and AIDS (estimated to be 2.9 million) in West Africa, the second highest in SSA, and the third highest in the world after South Africa and India (Kates 2005).

There is significant variation in the prevalence of HIV across the country, with some states being more affected than others, but no state is spared in Nigeria with the prevalence ranging from 1% to 10%. In some states, the epidemic is more concentrated and driven by the commonly classified high-risk groups (female sex workers [FSWs], people who use drugs (PWUD), and transport workers) and, in other states, the epidemic has extended beyond these groups and is more generalized and sustained by multiple sexual partnerships in the general population. HIV affects all age groups, but youth and young adults are particularly vulnerable, with young women at higher risk than young men, with a male-to-female ratio of 1:2 (UNAIDS 2006). By 2008, an estimated 220,000 [170,000-260,000] children and adults had died of AIDS and almost a million children (<17 years of age) were orphaned as a result of AIDS (UNAIDS 2008).

In this region, it is believed that HIV is transmitted primarily through unprotected heterosexual sexual relationships (82%) (Peeters 2000; Kanki 2002) and to a lesser extent through mother-to-child transmission (2.6%), and contaminated blood and blood products (2.5%) (Nasidi 2006; Spink 2007). There are several known drivers that contribute to the transmission of HIV in Nigeria; prominent among these are sexual behaviour (mobility of female sex workers, high-risk practices among itinerant workers), high prevalence of STIs, stigmatization and discrimination, cultural factors, and inadequacy of the health care system.

To a great extent, empirical information on homosexuality and bisexuality has been extremely scant in Nigeria although sex between men occurs. There are instances of “*Dan-Daudu*” among the Hausas in Northern Nigeria who are married men with children but who also have sex with other men (Tade 1991; Teunis 2001). Clinical evidence of high prevalence of anal fistulas, anal fissures, and haemorrhoids, suggestive of anal intercourse (Ajayi 1974; Ani 1983), has been documented.

Data showing other sexual practices that are more efficient in transmitting HIV such as heterosexual or homosexual anal intercourse are scarce in SSA and virtually non-existent in Nigeria. The fact that surveillance and public health prevention efforts do not include MSM indirectly shows the extent to which same-sex sexual behaviours are unrecognised as risk factors for HIV and STI transmission in Nigeria (Epprecht 2006). Therefore, there is an urgent need for a better understanding of MSM’s sexuality, their sexual behaviours and sexual health particularly as they relate to HIV, and the need to include high-risk men in HIV prevention programmes in Nigeria. This study adds to the body of knowledge about the prevalence and correlates of HIV and STIs and patterns of sexual behaviours among MSM in Nigeria. It provides baseline data for further studies and the development of appropriate HIV and AIDS prevention programs targeted at this population.

Significance of the Study

In Nigeria, a significant proportion of resources allocated by international aid organizations towards HIV programming are focused on women, adolescents, and children. At the time of this study in 2006, there was a dearth of epidemiologic and behavioural information about male

same-sex activities in the country. Consequently, the contribution of same-sex behaviours to the epidemiology of HIV in Nigeria is unknown.

The present study conducted in 2006 was the first and largest to characterize MSM, their sexual behaviours and HIV/STI risks in Nigeria and Africa. Although many other studies have since been conducted, this study catalyzed the interests and provided the template and baseline for further advancement of knowledge.

Organization of Thesis

This manuscript begins with an introduction to the thesis. Chapter 2 provides the overall goal and specific objectives of the study and provides a conceptual framework and hypothesis that guides the study. Chapter 3 which is a critical review of the African scientific literature on the variations of homosexuality, bisexuality, sexual identities and roles, HIV and other STI prevalence and patterns, and factors that predict them. Because this study was conducted in 2007, the literature review was limited to studies conducted up to 2009 for relevance. Chapter 4 provides the research methodology of this study starting with a short synopsis of the feasibility study which informed all aspects of the study processes. Details of the study design including the inclusion criteria and recruitment strategies are outlined. Because the study instruments were used for the first time, it was necessary to examine the psychometric properties of most of the measures. The chapter ends with a section on sample size calculations and the analysis strategy undertaken. Chapter 5 presents the outcome of the recruitment of participants into the study and compares data deleted and retained. The results of the study by objectives are presented in Chapter 6, and Chapter 7 discusses the findings of the study and compares these findings with

other studies conducted within the region. Chapter 8 draws the conclusion of the study, and Chapter 9 presents recommendations for future action. The manuscript ends with an Epilogue that highlights some of the major developments since this study was conducted.

CHAPTER 2

RESEARCH PURPOSE, OBJECTIVES & CONCEPTUAL FRAMEWORK

2.1. Research purpose and objectives

The purpose of this study was to investigate the prevalence and correlates of unprotected anal intercourse, HIV, syphilis, hepatitis B, and hepatitis C among men involved in same-sex activities in two large cities in Nigeria.

The specific research objectives were:

- 1 To characterize men in Nigeria who engage in same-sex activities, including:
 - a) Characterizing the study sample with respect to **Individual level factors - socio-demographic** (*age, education, employment, socioeconomic status, religion, marital status, sexual identity,*), and **psychologic** (*perceived risk of acquiring HIV, forced sex, self-esteem*); **Network - sexual network sexual activities and sex partner characteristics** (*characteristics of partners, types of sexual partners, sexual roles, types of sexual activities*); **Community** characteristics (access to HIV testing and counseling (HTC) services, social support, internalized homophobia and extent of outness); **Structural** characteristics (*participants' experience of hostility by others based on participants' sexual orientation and experience of poverty*).
 - b) Characterizing the sexual behaviours (*age at sexual debut, type and number of sex partners, type of sex acts, condom use, drug and alcohol use*) of MSM with respect to their potential for HIV acquisition.
- 2 Determine the prevalence and factors associated with unprotected anal intercourse.
- 3 Determine:
 - a) The prevalence of HIV, syphilis, hepatitis B and C among MSM; and

b) The factors associated with presence of HIV, syphilis, hepatitis B, and hepatitis C.

2.2. Conceptual Framework

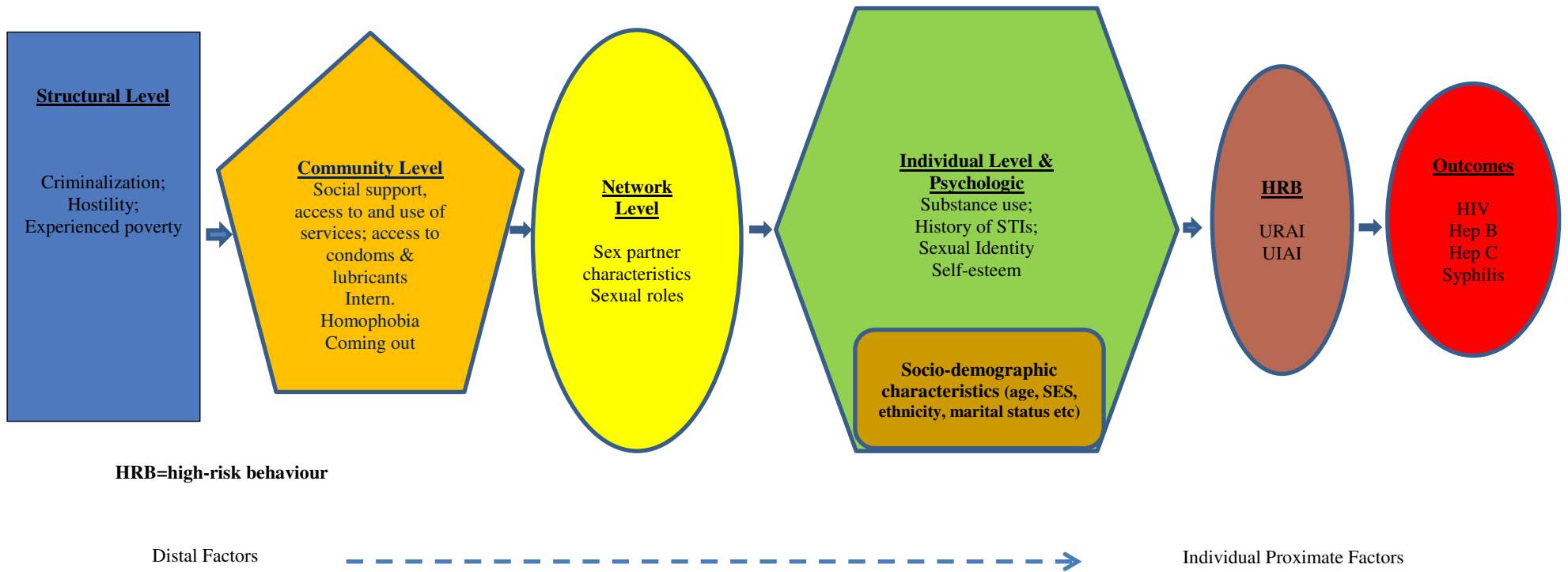
To gain a better understanding of the context and interactions between multiple proximal and distal risk factors that influence sexual risk behaviours and HIV and hepatitis B and C infections, a conceptual framework was needed. There are numerous adaptations of the health beliefs and behaviour change conceptual frameworks (Rosenstock 1988; Ajzen 1991; Ibarra 2001); however, the modified socio-ecologic model provides the best framework for this study (Beyrer 2007). This model builds on Kreiger's socio-ecologic framework grounded in three theories: psychosocial, social production of disease and political economy of health, and eco-social theory (and related multi-level frameworks) to elucidate individual and contextual physical, social and political factors that explain social inequalities and health disparities (Krieger 2001). The modified social-ecologic model is a flexible model that allows the examination of individual risk factors within the context of sexual network, community, and the wider public policy environment.

This study examined the interplay of individual, social and sexual network, community and structural level risk factors associated with sexual behaviours that predispose individuals to HIV infection among self-identified gay and bisexual men in Nigeria. For this study, Figure 2 is a pictorial display of risk factors at different levels. Individual level factors included age, socioeconomic factors, marital status, knowledge of HIV, type of sexual activity, substance use (injecting and non-injecting), and history of reported STIs. At the social and sexual network levels, number of sex partners, partner characteristics, and sexual roles were examined. Community level factors included access to health care services, internalized homophobia and

coming out. At the structural level, experienced hostility and poverty as a result of sexual orientation and same-sex sexual practice were considered.

Our study was premised on the belief that being a sexual minority in a society that normalizes heterosexuality as universal can be stressful to MSM, resulting in adverse physical, mental and social wellbeing that increase vulnerability to HIV and other STIs.

Figure 2: Conceptual Framework of Factors Associated with HIV Infection Risk among MSM in Nigeria



CHAPTER 3

LITERATURE REVIEW

3.0. Introduction

The scope of this review includes prevalence and risk factors for HIV-related high-risk behaviours, HIV, syphilis, hepatitis B, and hepatitis C among MSM predominantly in sub-Saharan Africa. An extensive search for scientific articles and conference abstracts was conducted through an exploration of several electronic databases including Ovid, PubMed Central, Medline, Embase, PsycINFO, as well as conference proceedings and general search engines such as Google. Published articles were identified using medical subject headings (MESH) or keywords that included combinations of “men who have sex with men”, or “MSM”, or “black MSM” or “same-sex behaviour”, and/or behaviour or “Homosexual Men”, or “Homosexuality”, or “Bisexual” or “Men” and cross-referenced with “unprotected anal intercourse,” or “unprotected receptive anal intercourse” or “unprotected insertive anal intercourse”; “HIV infection,” or “Human Immunodeficiency Virus,” or “AIDS,” or “Acquired Immunodeficiency Disease Syndrome,” or “Hepatitis B,” or “Hepatitis C” and “Africa” or “sub-Saharan Africa.”

Inclusion criteria for the studies included: (i) peer-reviewed anthropologic studies on MSM conducted in Africa; (ii) peer-reviewed epidemiologic studies on HIV, hepatitis B, and hepatitis C prevalence and incidence, sexual behaviours, and risk factors for HIV, hepatitis B and C among MSM and heterosexual male populations in SSA or Africa; (iii) peer-reviewed

conference abstracts on similar topics, (iv) publications in English published between 1990 and 2007 targeting persons aged 15 years and above.

Articles retrieved with content from the same data were excluded. Likewise, all newspaper reports and reports from unrecognized sources were excluded. Lastly, reference lists in selected articles were examined to identify other potentially relevant citations.

The search for qualitative and quantitative studies on MSM at the time of this review yielded 21 articles and abstracts. Of these studies, 14 (66.7%) were quantitative and 7 (33.3%) qualitative (out of which four were review reports) (Table 1). Half of the quantitative studies recruited MSM exclusively whilst the remaining seven quantitative studies were conducted either in the general population (57.1%) or among prison inmates (42.9%). Of all studies, only three studies (14.3%) included testing for HIV. No study tested for the hepatitis viruses.

Table 1: Summary of studies referencing MSM in sub-Saharan Africa

	First Author	Title/Country	Study Year	Type of Study	Age range	Sample Size	Target Group(s)	GP ³ HIV Prevalence	HIV Prev (%) among MSM	STI Prevalence	Sex with Women	Other
1	van Harmelen	An association between HIV-1 subtypes and mode of transmission in Cape Town, SA	1997	Blood test		58	HIV+ MSM (44.8%) HS (55.2%)	10.4%				
2	Simooya AA	'Behind walls': A study of HIV risk behaviours and seroprevalence in prisons in Zambia	1998-1999	Questionnaire	<20- >40	1523	Prisoners	19%	26.7%	Syphilis = 37%	100%	3.8% admitted to AI
3	Tapsoba LP	Sexual health services for men who have sex with men in an African environment: challenges and experiences, Dakar	2000	Service provision		790	MSM			42% reported penile discharge, 22% reported lesions or pustules on the anus		Possibility of same-sex activities although didn't explore further
4	Odujinrin O	Social characteristics, HIV and AIDS knowledge, preventive practices and risk factors elicitation among prisoners in Lagos, Nigeria	2001	Questionnaire		252	Inmates					42.8% of inmates were aware of same-sex activities in the prisons
5	Ehlers VJ	The Well being of Gays, Lesbians and Bisexuals in Botswana.	2001	Questionnaire	21-35	92 HIV+ MSM and 330 HIV+	MSM/Lesbian					

³ GP = General Population

						Heterosexual Men						
6	Niang CI	Meeting the Sexual Health Needs of MSM in Senegal	2002	Ethnographic and survey	18-53	250	MSM				42% experienced discharge from the anus/ penis 24% itching around the penis & 22% sores & pimples around the anus.	99%
7	Niang CI	“It’s raining stones”: Stigma, Violence and HIV Vulnerability among MSM in Dakar, Senegal	2003	Qualitative			MSM					
8	Attipoe D	Revealing the Pandora Box or Playing the Ostrich? A Situational Appraisal of MSM in Accra Metropolitan Area and its Environs – Ghana	2004	Exploratory questionnaire	15-40	150	MSM				36.7% reported penile ulcers; 33.3% urethral discharge ; 31.3% anal ulcers	46%
9	Anyamele C	Sexual Minorities, Violence and AIDS in Africa	2005	A review report			MSM					
10	Wade AS, 2004	HIV and STI among MSM in Senegal	2005	Survey	18-52	463	MSM	0.9%	21.5% [17.8-25.5]	S = 4.8% HSV = 22.3% C = 4.1% G = 5.4%	94.1%	
11	Onyango-	Understanding the HIV/STI Risks	2005	Quantitative	18-	500	MSM		-	Genital/a	97%	

	Ouma W	and Prevention Needs of MSM in Nairobi, Kenya		e and qualitative						nal sores = 5%		
12	Angala P	MSM as presented in VCT data in Kenya	2006	VCT data		780	GP		MSM = 13% MSMW = 9.6%		69.4%	
13	Skovdal M	An Investigation of the Impact of Migration among MSM in Kenya	2006	Qualitative	17-34	64	MSM		-		59.4%	
14	Adei AA	Prevalence of HIV, HBV, HCV and Syphilis among Inmates and Prison Officers in Accra, Ghana	2006	Quantitative	17-84 years	281	Inmates		19.2%	Hep		
15	Jewkes R	Factors associated with HIV seropositivity in young, rural South African men	2006	Cross sectional analyses of a randomised controlled trial	15-26	1277	GP		MSM = 6.5%			
16	Caceres C,	Estimating the number of MSM in low and middle income countries	2006	Literature Review			MSM					
17	Zulu K	Understanding HIV risk behaviour among MSM in Zambia	2006	Cross sectional	18-40	641	MSM		33%		51%	
18	Wade 2007	Reduction of Risk behaviours among MSM in Senegal after targeted prevention	2007	Intervention			MSM		21.8% [18.3-25.7]			
19	Sanders EJ	HIV-1 Infection in high-risk MSM in Mombasa, Kenya	2007	Cohort study		285	MSM		Homosexual 43% [34-52] Bisexual 12.3% [7-17]		60%	
20	Geibel S	Are you on the market: A capture-recapture enumeration of MSM in and around Kenya	2007	Capture-recapture		739	MSM					
21	Baral et al	Elevated risk for HIV infection among MSM in low- and middle-income countries 2000-2006: a systematic review.	2007	Systematic Review			MSM in low & medium income countries					

3.1. MEN WHO HAVE SEX WITH MEN IN IN SUB-SAHARAN AFRICA

3.1.1. Evidence of Homosexuality and Anal Sexual Practices between Men in SSA

From the start of the HIV epidemic to date, MSM have remained disproportionately affected by HIV, accounting for a significant proportion of HIV and STIs globally, particularly in the high income countries (Parker 1998; UNAIDS 2006). According to UNAIDS, unprotected sex between men accounts for 5-10% of HIV infections worldwide (UNAIDS 2006).

Interestingly, despite the mounting evidence of the longstanding history of same-sex practice in SSA, very little is known about the burden of HIV and other STIs in this population. Even in the 21st century, it is still believed that sex between men is a foreign sexual behaviour imported from the West and from Arab slave traders (Parker 1998; Ehlers 2001; Murray 2001; Sharma 2004; Wade 2005).

Homosexuality is outlawed, denied, and highly stigmatized in 31 of 43 countries (72.1%) in SSA, including Nigeria, resulting in grave paucity of epidemiologic data on high-risk sexual behaviours, HIV, and other STIs, and grossly inadequate prevention interventions targeted at MSM⁴ (Murray 2001; Teunis 2001).

Compared to other parts of the world, same-sex is rarely discussed on the public agenda in SSA (Niang 2002; Anyamele 2005) although there are anthropological and sociological references to the existence of diverse male same-sex practices in male-dominated institutions (such as male-only schools, military) and occupations, kinship patterns, family structures and tribes in several

⁴ For the purpose of this study, MSM (Men who have sex with other men) is a behavioural term to describe all men involved in sex with other men irrespective of their circumstances, preferences or self-identification. The term encompasses: gay, homosexual, bisexual, heterosexual men who sometimes have sex with other men and transgendered men.

countries in SSA dating back to the 17th century (Sanders 1997; Murray 2001; Niang 2002; 2003; Reid 2005; Allman 2007). Beyond evidence from prisons, there is also clinical and pathological evidence supporting the existence of homosexuality in SSA (Brody 2003). In the early 1970s, several studies documented a constellation of signs and symptoms of colonic and rectal conditions indicative of male and female receptive anal intercourse (Ajayi 1974; Ani 1983). These conditions included multiple or sequential infections such as anal warts, rectal gonorrhoea, chlamydia, syphilis, hepatitis A, and positive entamoebic stools through oral-anal transmission (Sohn 1977; Kang 1979; 1980; Pehrson 1981; Kaufman 1982) and non-infectious pathologies such as itching, fissures, fistulas, haemorrhoids, foreign bodies, polyps, abscesses in the anus, and reduced anal sphincteric tone (Khairul 1985) collectively called the 'Gay Bowel Syndrome' (Kazal 1976; Goldbaum 1979; Heller 1980; Kang 1980; Quinn 1984; Rodriguez 1986; Scarce 1997). In a study in Ibadan in the southwest of Nigeria, 2.4% of 336 outpatient clinic patients presented with anal fistulae and concomitant peri-anal discharge of pus and blood (Ani 1983). Women were also affected although to a lesser extent (Ajayi 1974; Ani 1983). Male-to-female distribution of anal fissures was 2:1 and for anal fistulas 7:1 (Ajayi 1974)

While there is a clear distinction between situational same-sex activity and gay lifestyle (Sanders 1997), documentary evidence exists of male same-sex practices in sub-Saharan African prisons (Orubuloye 1995; Odujinrin 2001; Simooya 2001; Brody 2003) characterized by overcrowding and confinement over protracted periods (Amory 1997; Sanders 1997). Reasons advanced for this occurrence include the absence of female sex partners, coercion, and physiological response to closeness to other males (Eigenberg 1992; Green 2003).

Other evidence of homosexuality can be traced to studies conducted among African migrants. Although there was a massive denial of same-sex practices among AIDS cases in early studies conducted among Africans, in 1986, Quinn et al found that 11 of 177 (6.2%) African AIDS patients residing in 10 European countries were MSM (Quinn 1986). In another analysis of 8,862 voluntary HIV testers in Spain, 6 of 66 (9.1%) men from sub-Saharan Africa self-identified as MSM (Castilla 2002). South Africa was the first country in the region that declared male same-sex sexual contact as a risk factor for HIV transmission (van Harmelen 1997). Apparently, the first cases of AIDS diagnosed between 1982 and 1987 in South Africa were almost exclusively self-identified homosexual men (Williamson 1995; van Harmelen 1997).

3.1.2. Prevalence of Same-sex Activity in SSA

Caceres and colleagues' review of published and unpublished studies of the prevalence of same-sex activity among the general population in low- and middle-income countries drew the world's attention to the stark lack of data on MSM in SSA, Middle East and North Africa, and the sparseness of epidemiological data in other low- and middle-income countries (Niang 2003; Caceres 2005; Caceres 2006). From 1990 to 2004, when this review was conducted, only eight of 561 (1.4%) studies were conducted in SSA, compared with 235 from Asia (41.9%), 21 from the Caribbean (3.7%), 42 from Eastern Europe and Central Asia (7.5%), 224 from Latin America (40%) and 31 from the Middle East and North Africa (5.5%). Of the eight studies from SSA, only two provided the prevalence of selected characteristics of male same-sex behaviour and none measured biological outcomes such as prevalence of HIV or STIs. In addition, there were no data on the prevalence of same-sex activity in the general population (Caceres 2006).

Subsequent studies provided estimates of the prevalence of male same-sex activity in the general population in SSA (Simoooya 2001; Chimphambano 2005; Adjei 2006; Angala 2006; Jewkes 2006; Lane 2006; Mattson 2007). Two separate studies in Kenya revealed that 0.3% of 1,337 young men and 0.9% of 88,738 male voluntary counseling and testing (VCT) clients reported male-male sexual activities (Angala 2006; Mattson 2007). In rural South Africa, 3.6% of 1,277 young men reported sexual contact with other men (Jewkes 2006). In a national survey of 11,904 South African youth, 0.06% of the boys reported anal sex with other men (Lane 2006). Other estimates come from studies conducted in prisons where 3.3% of 1,318 Zambian, 2.1% of 164 Malawian and 31% of 281 Ghanaian inmates reported engaging in same-sex sexual activities with other men (Simoooya 2001; Chimphambano 2005; Adjei 2006). As in other parts of the world, men who engage in same-sex activities in SSA are from diverse socio-demographic backgrounds (Attipoe 2004; Onyango-Ouma 2005).

Sex between men in SSA is determined by a number of factors. The few available studies have found that a significant proportion of MSM (>50%) in SSA engage in same-sex activities for financial benefit, sexual pleasure, or both (Niang 2002; Attipoe 2004). Other less common reasons include absence of women and coercion (Feldman 1997; Sanders 1997). A survey of 661 sexually active primary and secondary school students from four communities in Mwanza, Tanzania reported that 6.0% (4.7% boys and 7.4% girls) reported anal intercourse as their first sexual act (Matasha 1998). In South Africa, sexually active youth (15-24 years) who reported engaging in anal intercourse were twice as likely to be HIV-infected than their counterparts who engaged only in vaginal intercourse (Lane 2006). In another study in South Africa, 27% of 199 black MSM reported unprotected anal intercourse (Lane 2006). Non-mutual or coercive anal penetration referred to as “*Kunyenga*” is also a common practice among street boys (from as

young as seven years) in Tanzania to fulfil cultural initiation rites where gang rapes are perpetrated by older street boys on younger recruits (Lockhart 2002). In a study in Tanzania, of 75 such boys (aged 8-20 years), 76% engaged in anal sex with other boys at least once a month and during the same time frame, half of the boys also reported sexual encounters with female partners (Lockhart 2002).

3.2. SOCIO-DEMOGRAPHIC CHARACTERIZATION OF MSM IN SSA

3.2.1. Demographic Characteristics

The scientific literature is replete with studies demonstrating positive correlation between educational attainment and reduced risk of HIV infection (de Walque 2003). This is in part a result of better responsiveness of more educated persons to HIV and AIDS prevention messages than those less educated (de Walque 2003). Sunmola in his study among long distance truck drivers in Nigeria found that drivers who had at least secondary education were less likely to have misconceptions about condoms and were also less likely to use sex enhancing drugs (Sunmola 2005). Conversely, other studies have reported increased risk of infection with education (Hargreaves 2002). In a systematic review examining educational attainment and HIV-1 in developing countries, Hargreaves and Glynn reported an inverse association (Smith 1999; Hargreaves 2002). The impact of educational level on HIV risk is similar for men and women (Smith 1999) although some studies have shown that higher educational attainment among women whether at the individual or community level is more significantly associated with safer sexual behaviours such as decreased likelihood of having multiple sex partners and increased use of condoms (Kapiga 1995; Mnyika 1996; Smith 1999; Michelo 2006; Gabrysch 2008; Kayeyi 2009). The converse applies to men among whom higher level of education is

more frequently associated with multiple sex partnering, mobility, formal sector employment, and urban residence (UNAIDS 1999; Boerma 2003).

High-income countries at the individual and community level score higher on most measures of health status, health care access, and utilization indices than low-income countries (Mishra 2007; Piot 2007). However, the literature examining association between poverty and HIV reveals conflicting patterns (Buve 2001; Hargreaves 2002; Gillespie 2007; Mishra 2007). Whilst some studies have found that low level of education and unemployment are linked with HIV infection (Hargreaves 2002; Kalichman 2006; Lopman 2007), other country and individual level data have reported the converse (Gregson 2001; Mishra 2007). It is argued that wealthier Africans (men particularly) tend to engage in riskier sexual behaviours and have more sex partners than their less wealthy counterparts, thereby increasing their vulnerability to HIV infection (Mishra 2007). Although being wealthy also affords better opportunities of accessing health care services thereby increasing their likelihood of survival if infected (Mishra 2007). Thus, it is uncertain whether higher prevalence of HIV among wealthy people is because they adopt unsafe sexual behaviours or they are surviving longer because of increased access to treatment (Kongnyuy 2006). Early in the epidemic in SSA, wealth was implicated as a primary driver of the infection particularly among men. However, as the epidemic has progressed, it is increasingly becoming apparent that poverty may be playing a significant role in the epidemiology of HIV (Mishra 2007). For instance, prior to 1998 in Zimbabwe, HIV prevalence and incidence were highest among the wealthier, more mobile segment of the population. But from 1998 to 2003, the trend shifted to HIV incidence increasing with poverty probably resulting from the social upheaval at the time. Although wealthy men continue to have multiple partners, they are also more likely than their poorer counterparts to practice safer sex with partners in the same socio-economic classes (Lopman 2007). In a systematic review of 36

studies conducted in developing countries that examined the association between socio-economic status (measured as educational attainment) and HIV, it was found that data collected prior to 1996 showed either a positive or no association between high-risk of HIV and high educational attainment. However, studies conducted after 1996 were more likely to report higher risks among the less educated (Hargreaves 2002; 2002; 2008). Interestingly, this period coincides with the advent of HAART which, though it resulted in dramatic reductions in HIV-related morbidity and mortality, there were also concomitant reports of increased sexual risk behaviours (Wolitski 2001; Chen 2002; Crepaz 2002; Sarna 2005; Raymond 2006; Sullivan 2007) and increased incidence of STIs (Stolte 2001) including HIV incidence among MSM (Hogg 2001; Aral 2002; Dukers 2002) irrespective of age (Chen 2003) and wealth status (Gisselquist 2002). A study in South Africa demonstrated that risk of HIV was closely associated with community stressors related to poverty such as experience of poor education, unemployment, separation of families, prostitution, discrimination, violence and crime (Piot 2002; Kalichman 2006). Another study conducted in South Africa found that an additional year of education reduced the risk of acquiring HIV by 7% after controlling for sex, age, wealth, household expenditure, residence, migration status, and partnership status (Barnighausen 2007). As expected, the association between poverty and HIV may differ according to geographic location. A study that compared the impact of socio-economic deprivation on sexual behaviour in rural and urban Kenya found that the urban poor were at least three times more likely than rural poor to engage in high-risk sexual behaviours (Dodoo 2007).

3.2.2. Sexual Identities of MSM in SSA

A common error made by researchers, health care providers, programmers, and the general public is the assumption that men who have sex with men is a homogenous group (Stokes

1997). On the contrary, within this group may be a diverse collection of subgroups of men who differ in sexual behaviour, identity and vulnerability to HIV and other STIs (Peacock 2001). Understanding the differences in the characteristics of these subgroups will provide more culturally appropriate information that will be useful for designing more effective HIV and STI prevention programs in SSA.

Since the 1860s, there have been different conceptual definitions and measures of sexual orientation (Sell 1997). According to Boles et al, sexual identity, an integral component of self-identity, is a construct that describes a set of characteristics that a person perceives as representing his/her sexual orientation (Boles 1994). As Boles and colleague explained, there are five components of sexual identity, namely self-identified sexual identity; observable signs of sexual identity such as clothing styles and mannerisms; sexual role preferences (insertive or receptive); sexual acts (oral, vaginal, or anal) and friendships and associations (Boles 1994). An important part of sexual identity is sexual orientation. According to LeVay, sexual orientation is defined as the direction of sexual feelings or behaviour towards an individual of the opposite sex (heterosexuality), the same-sex (homosexual or gay), or some combination of the two (bisexuality) (LeVay 1993). Sexual identity is distinct from sexual behaviour (which describes the actual sexual activities a person engages in irrespective of his/her sexual orientation or identity (Murray 2001). Whereas same-sex behaviour may be universal, same-sex identity and roles are more varied and are typically more culture specific (Murray 2001). Hence, not all men who self-identify as heterosexual or homosexual are behaviourally so (Kinsey 1948; Goldbaum 1998). According to Kinsey, between the two extremes is a continuum of gradations represented by a seven-point scale from 0 representing exclusively heterosexual, to 6 representing exclusively homosexual (Kinsey 1948).

In SSA, besides heterosexuality, qualitative studies have uncovered the existence of a variety of other sexual identities that are shaped by cultural, environmental, structural, and economic forces and frequently expressed in secrecy (Murray 2001; Teunis 2001). There is a major difference between same-sex patterns in SSA and those found in developed countries. In the higher income countries, gay, homosexual, and bisexual identities are often adopted as the dominant patterns because individuals are defined primarily on the basis of their sexual preferences and not by differences of age, gender, class, and roles (Murray 2001). In contrast, in SSA, societal expectations of marriage and procreation override an individual's expression of his sexual identity and gender preferences (Murray 2001; Onyango-Ouma 2005; Undie 2008). For this reason in SSA, it is not uncommon to find men who self-identify as heterosexual, are married and have children but maintain regular sexual relationships with other men (Onyango-Ouma 2005). In Senegal, MSM called "*yauss*" or "*yoos*" tend to be the sexually insertive men who exhibit masculine identities, are more discrete about their same-sex relationships, and do not consider themselves as homosexual; hence, they may be married or have female sexual relationships and, at the same time, be discretely involved in other male relationships (Teunis 2001; Undie 2008). On the other hand, the sexually receptive MSM called "*gor jigeen*" or "*ibbis*" or "*oubis*" are typically effeminate, remain unmarried, and form close sexual networks that are easily recognisable because of their effeminate mannerisms (Teunis 2001).

Whilst there are clear distinctions between masculine and feminine gender-differentiated identities and roles in Senegal, in other parts of SSA, the distinctions are not as well defined. For example, in Nigeria, the "*yan daudus*" are MSM who dress and behave like women, but they may also be married (to women) and have children (Tade 1991; Teunis 2001). Other sexual identities that have been identified in the published literature among MSM are male sex workers (who sell sex to multiple partners and engage in risky sexual behaviours) and male clients who

patronize men who sell sex (Boles 1994; Sanders 2007). Thus, in SSA, homosexuality is categorized by how it is expressed and experienced by MSM. Often, the expressions of sexual identity and behaviour at any point in time are shaped by culture, social, and economic forces (Onyango-Ouma 2005). In a study that compared sexual identity and behaviour with HIV seropositivity, Boles and colleagues found that high-risk behaviour rather than sexual identity was a better predictor of HIV seropositivity (Boles 1994). Thus, with regard to the risk of HIV transmission or acquisition, the sexual behaviour a person adopts is the most important determinant irrespective of sexual identity or role.

3.2.3. Bisexuality and MSM in SSA

Although definitions of bisexuality (a man having both male and female sex partners whether serially or concurrently) have been inconsistent across studies conducted in SSA, many studies conducted in Africa have revealed that a significant proportion of MSM (60-94%) are behaviourally bisexual (Sanders 1997; Niang 2002; Attipoe 2004; Onyango-Ouma 2005; Wade 2005). In Mombasa, Kenya, 60% of 285 MSM reported sex with men and women. These men were more likely to be older, 9.9% were married compared with 2.6% of MSM who self-identified as homosexual (Sanders 2007). In Ghana, 69 (46.0%) of 150 MSM (46.0%) reported sex with female partners (Attipoe 2004). Similarly, in Zambia, 51.0% of 641 MSM also reported sex with women (Zulu 2006). In Senegal, although 94.0% reported lifetime sex with women, 74.1% of 463 MSM did so in the past 12 months (Wade 2005). In a study in Kenya, of the 60% (171/285) of men who self-identified as bisexual and 40% as exclusively homosexual, 40.4% and 75.4% reported recent receptive anal intercourse, respectively (Sanders 2007). In the two studies in Senegal and Kenya, HIV prevalence was significantly higher among men who reported sex exclusively with men than among those who reported sex with both men and

women (Wade 2005; Sanders 2007). Specifically, HIV risk was 6.3 times higher among self-identified homosexual men than bisexual men in Kenya (Sanders 2007). However, in these studies, bisexuality was assessed based on reported sexual behaviour rather than self-reported sexual orientation. Given the high level of bisexuality and the burden of HIV infections among MSM, there is a need for further studies on sexual networks of bisexual men and implications for transmission to the general population.

3.2.4. MSM as Potential Bridge Risk Group to Women

Anal and vaginal intercourse with women in combination with multiple or concurrent male and female sex partners present a risk for women who themselves may or may not engage in risky sexual behaviours (Miguez-Burbano 2001; Celum, Wald et al. 2008). A growing concern is the potential for bisexual men to transmit HIV and STIs to their female partners (Tielman 1991) given the higher prevalence of these infections among MSM than their heterosexual male counterparts (Baral 2007).

In SSA, a significant proportion of MSM maintain sexual relationships with female partners alongside their sexual activities with men (Caceres 2008; Smith 2009), possibly an effect of the emphasis placed on marriage and procreation by family and society in response to cultural norms attached to marriage (Allman 2007; Beyrer 2007; UNAIDS 2008).

3.3. SEX PARTNER CHARACTERISTICS AND SEXUAL NETWORKS

Similar to the practice among heterosexual men, multiple concurrent male and female sexual partnerships are common among MSM in SSA (Attipoe 2004; Onyango-Ouma 2005; Wade 2005). Empirical evidence in the scientific literature demonstrates positive correlations between

concurrent multiple sexual partnerships and HIV and STI transmission (Morris 1997; Rosenberg 1999; Auvert 2001; Lagarde 2001; Gregson 2002; Adimora 2003; Gorbach 2003; Kelley 2003; Dunkle 2004; Nnko 2004; Kalichman 2007).

High numbers of lifetime sexual partners (particularly casual and non-regular) is associated with increased risk of HIV acquisition irrespective of age (Mann 1988; Quigley 1997; Kalichman 2000; Piot 2002; Chen 2007). Compared to women, men in SSA generally tend to have a higher number of lifetime sex partners (Hunter 1993; Munguti 1997) and studies have found that having five or more lifetime partners quadruples the odds of HIV infection among men (Quigley 1997).

Sexual networks of certain core groups, including sex workers, play a major role in introducing, propagating, and sustaining HIV endemicity in any community (Vernazza 1999; Qu 2002). Because of the high-risk sexual activities they engage in, FSWs regardless of their socio-economic status are a major source of ulcerative and non-ulcerative STIs in SSA (Ghys 1997; Vernazza 1999) and are at higher risk of transmitting HIV than any other core group in SSA (Inungu 2006; FMOH. 2007). Sexual contact with FSWs is frequent among men in most urban areas in SSA because of their prolonged stay away from home as a result of migration patterns and delayed age at marriage (Piot 2002). In a large cross-sectional study of 1,405 male mine and farm workers in Zimbabwe, 48% reported sexual contact with FSWs and almost a third of them reported paying for sex in the previous year (Cowan 2005). Long distance truck drivers and intra-city commercial drivers are another core group of men at high-risk of STIs and HIV in many parts of SSA (Bwayo 1991; 1991; Bwayo 1994; Jackson 1997; Lavreys 1999; Rakwar 1999) because of the existence of tight sexual networks of men with multiple categories of

female sex partners (comprising regular partners, commercial sex workers, young female hawkers, schoolgirls, and market women) within and outside the motor parks (Ekanem 2005).

The structure and mixing patterns within existing sexual networks are also important determinants of HIV transmission in SSA (Anderson 1990; Aral 1999; Gregson 2002; HELLERINGER 2007). Disassortative mixing which involves sexual mixing between different social, ethnic, and demographic classes leads to more extensive HIV spread than assortative mixing patterns (Anderson 1990; Gras 1999; Liu 2006). Furthermore, the combination of concurrent sexual partnerships and disassortative mixing is a highly effective determinant of HIV spread in any community (Morris 1997).

Given the experiences of fear, violence, stigma, and discrimination that MSM face daily in most countries in SSA, maintaining close networks is commonplace (Teunis 2001; Onyango-Ouma 2005; UNAIDS 2005; Porter 2006). These networks of varied sizes offer social support and safety nets, and serve as channels for information dissemination and commodity distribution (UNAIDS 2005). Social and HIV prevention information may be efficiently disseminated within such social networks by word-of-mouth, through the internet, and via text messaging often at minimal cost (Onyango-Ouma 2005; Porter 2006; Choi 2007). Outside the networks, the more educated and influential MSM have strong connections with civil, religious, and social organizations (Onyango-Ouma 2005).

Understanding the characteristics of sexual and social networks of MSM is necessary for a better elucidation of the epidemiology of HIV and other STIs among MSM in SSA (Liljeros 2003; Choi 2007).

3.4. BEHAVIOURAL FACTORS - HIGH-RISK BEHAVIOURS OF MSM

3.4.1. Sexual Debut

Early age at sexual debut is common in SSA with significantly more men than women reporting their first sexual intercourse before the age of 16 years (Munguti 1997; Glynn 2001; Pettifor 2004; Adair 2007) although there are wide variations across SSA (Piot 2002; Jaspan 2006). Whilst some studies have reported a decline in age at first sex among men but an increase among women (Mwakagile 2001; Pettifor 2004; Hallett 2007), other studies have reported similar ages for both men and women (Zaba 2004). Among MSM, age of sexual debut is not much different from their heterosexual counterparts. In Kenya and Senegal, the reported median age of first sexual experience was 17 years for men and 16 years for women (Niang 2002; Onyango-Ouma 2005).

In Senegal, as in most African countries, a significant proportion of MSM (>30%) experience their first male sexual contact as adolescents often with men who are older, highly respected, and wealthier relatives, neighbours, senior students, teachers, and bosses (Niang 2002; Onyango-Ouma 2005; Wade 2005; Allman 2007). There are also reports of first sexual encounters among MSM resulting from rape or coercion (Attipoe 2004; Wade 2005).

Studies have demonstrated links between early sexual debut and increased risk of HIV because of the greater likelihood of exposure to higher lifetime number of sexual partners with varied risk profiles (Gregson 2002; Pettifor 2004; Hallett 2007).

3.4.2. Sexual Behaviours of MSM in SSA

It is widely reported that sexual behaviour is the commonest determinant of HIV transmission irrespective of the geographic area, gender, and demographic characteristics of individuals (Piot

2002; Auvert 2005). Globally, it is estimated that more than 90% of new infections among adults are acquired through sexual activity (N'Galy 1988; WHO. 1992; Gisselquist 2002; Gouws 2006; Cohen 2007). In SSA, as in other parts of the world, there is diversity in the patterns of sexual behaviour within and between countries which could contribute to the observed global and regional heterogeneity in the epidemiology of HIV (Piot 2002).

As of 2009, data on sexual behaviours of MSM were scant in SSA and, unfortunately, the few available studies used inconsistent classifications of MSM subgroups that make comparisons across studies difficult. Nonetheless, there are consistent reports of MSM engaging in risky sexual behaviours for various reasons including love, peer pressure, pleasure, the need to “fit in” or “belong,” and for economic gain (Teunis 2001; Niang C. 2004; Wade 2005).

Furthermore, there are consistent reports of significant associations between high-risk sexual behaviours and increased risk of HIV acquisition and transmission among men (Munguti 1997; Piot 2002).

3.4.3. Male Sex Work in SSA

There is considerable evidence for the strong association between female sex work and HIV risk in SSA as a result of multiple concurrent sexual partnerships and the other high-risk behaviours they engage in (Boles 1994; Auvert 2001; Morison 2001; Dunkle 2004; 2007). However, very few studies have examined the relationships between HIV and sex work or transactional sex among MSM in SSA (Geibel 2008). There are fundamental differences between male and female sex work. Unlike female sex workers and their clients, male sex workers are less visible,

less pimped, they may meet their clients in private residences more frequently, and sexual relationships with clients may be more reciprocated (Allman 1999; Geibel 2008).

In SSA, because male sex work is highly stigmatized, very few MSM self-identify as sex workers although a significant proportion receive money, goods, and services in exchange for sex (Niang 2002; Attipoe 2004; Onyango-Ouma 2005; Geibel 2007; Sanders 2007; Geibel 2008). Geibel and colleagues estimated the number of MSM who sell sex in and around Mombasa, Kenya using the capture-recapture methodology and found that, of 739 MSM who reported selling sex, 484 were enumerated on a single day of the exercise (Geibel 2007). A significantly higher proportion of MSM in SSA received rather than paid for sex with money, goods and services. In Kenya, 73.7% (210/285) of MSM reported receiving money in exchange for sex compared with 29.0% who reported paying men for sex (Sanders 2007). Similarly, in Senegal, nearly a quarter (22.5%) of MSM reported receiving money, compared with 9% who reported paying money for sex during their last sexual encounter (Niang 2002). Interestingly, in most parts of Africa including Ghana, MSM who receive money from their male sex partners in exchange for sex do not report such encounters as paid sex (Attipoe 2004; Allman 2007; Sanders 2007). This holds true in other studies. Self-identified bisexual men in Kenya are reported to be more likely than self-identified homosexual men to pay for sex (Sanders 2007). Given the illegality of male same-sex behaviours including male sex work in most parts of Africa including Nigeria (Onyango-Ouma 2005; Sanders 2007), prejudices against MSM expressed as homophobia, stigma, and discrimination often limit access of MSM to HIV prevention information and services (Okal 2009). As a result, male sex workers like female sex workers engage in high-risk behaviours that increase their vulnerability to HIV and other STIs (Geibel, van der Elst et al. 2007; Geibel 2008).

3.4.4. Anal Intercourse (AI)

In SSA, the implicit assumption is that heterosexual sex is exclusively penile-vaginal sex (Halperin 1999; Brody 2003; Schwartz 2004). As a result, research to ascertain the extent to which anal intercourse (AI) is practiced is lacking, and the true magnitude of its contribution to HIV transmission among men and women in SSA remains unknown.

Although not all MSM engage in anal intercourse (Goldstone 2004), it is the most frequent sexual practice and the most universally consistent risk factor linked to HIV transmission in this population (Moss 1987; Winkelstein 1987; Chetwynd 1992; Ruiz 1998; CDC. 1999; 2002; Dudley 2004).

With respect to the potential for HIV acquisition, URAI is the most efficient risk bearing sexual practice for homosexual and heterosexual transmission of HIV (Winkelstein 1987). The probability of transmission of HIV per sex contact via URAI with an HIV-viremic man is 0.82% [95% CI 0.5-3.38] compared with 0.11% [95% CI 0.06-0.16] for unprotected insertive anal intercourse (UIAI) (Vittinghoff 1999) and is approximately 10 times greater than unprotected receptive penile-vaginal intercourse (Vittinghoff 1999; Halperin 2000). Furthermore, engaging in anal intercourse triples the risk of gonorrhoea and other STI acquisition (Lorian 1988; Voeller 1991; Brody 2003; Schwartz 2004). Studies have demonstrated that persons, irrespective of gender and sexual orientation, who engage in anal intercourse are more likely to engage in other forms of risky sexual behaviours such as drug use, unprotected anal or vaginal intercourse (Baldwin 2000).

There is a growing body of epidemiologic evidence that AI is practiced in SSA not only between men but also between men and women (Bolling 1976; 1977; 1987; Voeller 1991; Halperin 1999; Baldwin 2000; Brody 2003; Ferguson 2003; Lane 2006), although disclosure of this practise is often suppressed by opposite and same sex couples because of cultural taboos (Halperin 1999; 2000) and by male same-sex couples because of stigma and criminalization (Erlander 1993; Brody 2003). Only three studies conducted among MSM in SSA reported unprotected anal sex with female partners (Onyango-Ouma 2005; Zulu 2006; Sanders 2007).

3.4.5. Condom Use among MSM in SSA

When used correctly and consistently, the male condom is an effective tool for preventing sexual transmission of HIV and other STIs between sexually active persons (Davis 1999; Ahmed 2001; Holmes 2004; WHO. 2004). Epidemiologic studies indicate that correct and consistent use of condoms during vaginal sex provides at least 80% reduction in the risk of HIV transmission and acquisition (Weller 2001; Aral 2002). Very few studies have ascertained the level of condom effectiveness during anal intercourse (Silverman 1997). The Multicenter AIDS Cohort of 2914 MSM (Detels 1989) observed significantly lower six-month HIV sero-conversion rates of 0.7% among MSM who reported consistent condom use compared with 4.3% among those who reported inconsistent condom use and 2.4% among MSM who reported no condom use (Detels 1989). Thus, compared with consistent use of condom, the relative risks of HIV infection for inconsistent use and no use were 6 and 3 respectively (Silverman 1997).

Furthermore, inappropriate or delayed application of condom, “insertive dipping,” or poor condom use skills may render a sexual encounter unsafe (Calzavara 2003; Allman 2004; Hoff 2004). “Insertive dipping” is the act of engaging in brief acts of unprotected dipping or rubbing of the penis on the anus or vagina during foreplay prior to penetrative intercourse (Hoff 2004).

In a study of 858 HIV-infected MSM, 11% of the men did not report unprotected insertive anal intercourse (UIAI) but admitted to engaging in insertive dipping and 37% of men who reported UIAI also reported insertive dipping (Hoff 2004). In Ontario, men who reported delayed application of condom during receptive anal intercourse were 6 times more likely to be infected with HIV than those who did not delay application (Calzavara 2003). Furthermore, poor condom use skill is significantly associated with condom slippage and breakage (Allman 2004).

Studies among MSM in SSA have revealed that condom use is generally low irrespective of the type of partnership. In Wade et al's study in Senegal, fewer than half of the MSM respondents reported consistent use of condoms during anal intercourse with their male and female partners (Wade 2005). In Kenya, more than 80% of MSM reported at least an episode of unprotected anal intercourse with a partner in the past three months (Sanders 2007). In another study in Kenya, only 40% of MSM reported condom use with their male and female partners (Niang 2003). Similarly in Zambia, 68% of MSM reported unprotected anal sex with their male and female partners (Zulu 2006; Sanders 2007).

However, despite the high level of awareness of condom use in most countries in SSA (Kapiga 1995; Kajubi 2005; Sunmola 2005), several barriers limit its use among sexually active individuals in the general population (Mnyika 1997; Varga 1997; Kajubi 2005; Kajubi P. 2005; Foss 2007). These include misconceptions about condoms (Ekanem 2005); limited access due to cost or unavailability (Bentley 1998; Adetunji 2001); low perception of risk (Ekanem 2005); use of other contraceptives (Myer 2002), alcohol consumption (Kennedy 1993; Myer 2002); socio-cultural, conceptual, and economic factors (Varga 1997); lack of trust in the efficacy of condoms (Dilorio 1997; Bedimo 1998; Sunmola 2005); low educational level; and poor skills in

condom use (Kapiga 1995; Lagarde 2001; de Walque 2003; Allman 2004; Sunmola 2005). One of the factors reported to significantly influence condom use among MSM is use of alcohol (Lane 2006). The pattern of use of condoms among MSM in SSA and its association with HIV and STI acquisition is unknown.

3.5. PSYCHOLOGIC FACTORS

3.5.1. Extent of ‘Outness’ or disclosure of sexual identity

In any society, sexual minority groups are often reported as one of the most stressed sub-populations because of the high level of stigma and discrimination they experience and the gross lack or inadequacy of relevant institutional support (Iwasaki 2007). Worse still, studies have revealed that the ‘coming out’ process (defined as the point in time when there is self-recognition by an individual of his identity as a homosexual and the first major exploration of a homosexual community (Dank 1971)) can be quite daunting and a major stress-inducing experience termed *minority stress* (Meyer 2003). For most homosexual men (Iwasaki 2007), coming out is a critical step for optimising identity formation, assuring self-acceptance for the establishment and maintenance of high self-esteem in a hetero-normative environment (Browning 1991; Shannon 1991).

Different theories have been postulated to describe the coming out process (Butler 2000; Dilley 2002). According to Cass’s theory, coming out to families, friends, colleagues and others evolves through six different stages - identity confusion, identity comparison, identity tolerance, identity acceptance, identity pride, and identity synthesis (Cass 1979). This model was later expanded to include awareness of same-sex attractions; occurrence of first gay or heterosexual experience; labelling oneself as gay or bisexual; disclosing one’s sexuality to others (but not

family members); experience of first gay romantic relationship; disclosing one's sexuality to family members; and fostering a positive identity (Savin-Williams 1990).

Globally, the mean age of coming out has declined in the past two decades from 20 years and older in the early seventies to the current 16 years and younger (Hunter 2007). The age of coming out in any society is a direct function of the level of sexual liberality. Thus, the more liberal the culture, the younger the mean age of disclosure (Herdt 1989; Butler 2000).

Reactions to disclosure can be positive if family and societal support are strong. However, in the absence of a supportive environment, negative reactions may vary from short-term reactions including loss of relationships, grief, anger, substance misuse, running away from home, or dropping out of school, and in the long-term, stress inducing adverse health outcomes including mental depression and suicidal ideation (Link 1997; Fergusson 1999; Cochran 2001; Mays 2001; Iwasaki 2007). A systematic review revealed that the risk of mental disorders, suicidal ideation, and deliberate self-harm among sexual minorities (lesbians, gay and bisexual (LGB) people) is more than four times the risk found among their heterosexual counterparts (King 2008).

To avoid the agony of isolation, verbal and physical abuse, violence, stigma, and discrimination as a result of same-sex orientation, many MSM conceal their sexual identities as a coping mechanism (Niang 2003; Shehan 2003). There is mounting empirical evidence that MSM who conceal their sexual identities are at greater risk of HIV infection (Kenamer 2000; Ntata PRT. 2008; Rosario 2009). Furthermore, among those already infected, more rapid advancement in the rate of the infection has been reported than their counterparts who do not conceal their

sexual identities (Cole 1996; Stokes 1998). However, a few studies have revealed converse associations between disclosure and HIV-related high-risk behaviours (Rotheram-Borus MJ. 1995).

Reasons attributed for the adverse reactions to disclosure include low-self-esteem, depression, and the lack of social support and prevention services (Shehan 2003). Additionally, bisexual men who do not disclose their sexual identities are believed to be potent channels for HIV transmission to their 'low risk' regular or steady female partners (Millett 2005).

Factors that may influence disclosure of sexual identity to family members include ethnicity/race, higher level of education, younger age, and HIV-infected status. Studies conducted in the US have shown that white MSM are more likely than black MSM to disclose their same-sex behaviour to their female partners, family and others (Stokes 1996; Kenamer 2000; Shehan 2003; Millett 2005).

3.5.2. Internalized Homophobia

Because of the high levels of stigma, discrimination, hostility, and criminalization MSM face in SSA, many remain hidden and remote from health and support services. As a result, many internalize negative attitudes, beliefs, assumptions, and prejudices about homosexuals, which may lead to hatred, guilt, devaluation, and shame towards themselves (Meyer 2003).

Studies have demonstrated links between homosexuality and internalized homophobia (Meyer 1998; Rosser 2008) and between internalized homophobia and HIV-related high-risk behaviour (Stokes 1998; Diaz 2004; Ryan 2009). Internalized homophobia is influenced by relationship satisfaction, extent of attraction to men and women, membership in gay groups, disclosure of

HIV status, and sexual identity (Ross 1996; Herek 1997; Dudley 2004). In addition, the presence of internalized homophobia is negatively linked to level of awareness of available HIV prevention services, perceptions of condom use self-efficacy, and the extent to which people integrate with other members of their community (Huebner 2002).

Few studies in sub-Saharan African settings have carefully examined internalized homophobia and how it relates to HIV infection.

3.5.3. Perceived Risk for Acquiring HIV

Empirical evidence suggests that perceived risk or susceptibility to HIV infection influences adoption of safer sexual behaviours such as increased uptake of HIV testing and counseling (Janz 1984; MacKellar 2006) and reduction in risk taking (Jemmott 2008). This explains why risk perception is included as an integral component of most health behaviour models and behaviour change interventions (Rogers 1983; Janz 1984; Prohaska 1990; MacKellar 2006).

The relationship between perception of risk and HIV-related risk taking is poorly understood. Whilst most studies have shown positive associations (van der Snoek 2006) (McKirnan 1989; Smith 2009), others have shown the converse (MacKellar 2006). Most young MSM with unknown HIV status perceive themselves at low or no risk of being infected or contracting the infection (MacKellar 2006) probably because of the illusion of invincibility (Deas-Nesmith 1998; Wickman 2009). However, knowledge of HIV and AIDS influences risk perception and may be a mediating factor between perception and risk taking (MacIntyre 2004; Prata 2006) because knowledge alone may not be sufficient to influence change in behaviour (Lindan 1991; MacPhail 2001; MacIntyre 2004). In their study among young people aged 15-24 years in

Mozambique, Prata found that 27% of women and 80% of men wrongly believed they had no risk or a small risk of contracting HIV whereas they were actually at moderate risk (Prata 2006).

Factors reported to influence HIV risk perception include knowing someone who has AIDS or has died of AIDS (Prata 2006), 'optimism' i.e. the feeling of invincibility (Deas-Nesmith 1998; MacIntyre 2004), stigma (Weinstein 1988), and the extent to which individuals are connected to their peers and families (Browning 1991; VanLandingham 1995).

3.6. STRUCTURAL FACTORS

3.6.1. Secrecy, Stigma and Violence against Men who have Sex with Men in SSA

Across much of SSA, there has long been strong denial of same-sex sexuality both as a sexual identity and as a sexual behaviour (Teunis 2001; Allman 2007). Same-sex practices are criminalized in most countries in SSA, with some exceptions such as South Africa and some countries colonized by the French (Anyamele 2005; Wade 2005). So far, South Africa is the only country in the region exhibiting more openly gay subcultures (Wade 2005; Lane 2006). In many other countries in the region, MSM constantly lead clandestine lives characterized by fear, violence, rejection, and secrecy (Teunis 2001; Niang 2003). Violence against MSM takes several forms including sexual (rape), physical violence, health-care mediated stigma, and verbal abuse perpetrated by law enforcement agencies, family, health care providers and the community (Niang 2003; Anyamele 2005). Studies that examine the patterns, prevalence, and effects of stigma, discrimination, and violence among MSM in SSA are sparse. A study that investigated the level of violence against MSM in Senegal found that 43% of the 250 MSM surveyed had been raped at least once, of which 13% reported policemen as the perpetrators (Niang 2003). In another study in South Africa that compared stigma and discrimination experiences of HIV-infected self-identified MSM with HIV-infected self-identified straight men

found that, although both groups experienced similar levels of internalized stigma, MSM participants experienced greater levels of isolation and discrimination and also scored higher on CES-D (Centre for Epidemiologic Studies Depression Scale) than the HIV-infected straight men ($p < 0.05$) (Cloete 2006). Furthermore, some MSM experienced social rejection and isolation from immediate families and the broader society (Allman D. 2007), others recounted experiences of non-disclosure of their sexual identity, loss of jobs and housing, and discrimination from health care providers (Ehlers 2001; Wade 2005).

In the face of such hostilities, MSM adopt various coping strategies including migrating from less tolerant to more tolerant environments to protect themselves and to promote individuality and anonymity (Niang 2003), clandestinely engaging in same-sex practices (Attipoe 2004; Skovdal 2006), and living double lives of secrecy by adopting heterosexual lifestyles to remain socially acceptable (Kiama 1999; Allman 2007). Studies have demonstrated that a significant proportion of MSM conceal their sexual identity from their families and the community and avoid seeking health care due to fear of potential negative consequences (Niang 2003; Allman 2007). Concealment of sexual identity is reported to negatively impact the well-being of MSM and the quality of research and intervention programmes designed for this sub-population in SSA (Ehlers 2001).

3.6.2. Health Seeking Behaviours of MSM in SSA

Although most MSM prefer to be seen by qualified health care providers, they often delay seeking health care (Niang 2002; Sharma 2004) and, when they do, only very few MSM disclose their sexual orientation to their health care providers (Ehlers 2001; Niang 2002; 2003). This is in part due to fear of exposure of their sexual orientation, poverty, distrust of health care providers, homophobia, and discriminatory attitudes of health care providers (Niang 2002;

Onyango-Ouma 2005). In their study, Niang observed that MSM were cautious and selective of the complaints they made to their health providers for fear of being treated with scorn and being exposed (Niang 2002). Rather than seek medical care and treatment, many MSM in Senegal and Ghana resort to self-medication, seek traditional treatment, or do nothing (Niang 2002; Attipoe 2004). Moreover, the fear of being labelled, stigmatized, and testing HIV-infected were reported by MSM in Kenya as strong barriers to accessing HIV prevention services (Angala 2006).

3.7. BIOLOGICAL FACTORS

3.7.1. Prevalence of other STIs among MSM in SSA

Information on the prevalence of STIs among African men, particularly African MSM, (Plowden 2000; The Lancet. 2001; Addis 2003) is sparse. The few available studies have found high prevalence of STIs among men with significant heterogeneity between countries. A common feature across the studies was that most men were asymptomatic, though they were diagnosed with chlamydia and gonorrhoea infections through laboratory testing (Grosskurth 1996; Klouman 2000). In Rakai district of Uganda, prevalence of gonorrhoea, chlamydia, and syphilis in men were 1.0%, 2.2%, and 10.5%, respectively (Gray 2004). In a prospective study of Kenyan male truck drivers, 10% reported sexually transmitted disease (STD) syndrome (urethral discharge, genital ulcer disease, or syphilis) (Rakwar 1999). Unfortunately, a significant proportion of men continued to have unprotected intercourse despite having the STD this syndrome (O'Farrell 2007).

One of the few studies that examined associations between STIs and HIV among men in SSA found that HIV shedding in seminal fluid was eight times higher in HIV-infected men with urethritis than among HIV-infected controls without urethritis (Cohen 1997). Genital ulcer

diseases are independent risk factors for HIV transmission among men irrespective of their circumcision status (Simonsen 1988; Halperin 1999). Just as condom promotion and early diagnosis and treatment of STIs results in significant decreases in the incidence of HIV and STIs among FSWs (Ghys 1997; Mayaud 2001; Ma 2002; Mayaud 2004), it is believed that similar interventions targeted at men could also contribute to significant reduction in HIV and STI incidence (Cohen 1997; Mayaud 2001).

The effects of STIs on same-sex transmission of HIV are unknown in SSA. MSM engage in risky sexual behaviours that put them at increased risk of HIV and other STIs particularly *Neisseria gonorrhoea*, *Chlamydia trachomatis*, syphilis, genital warts, herpes simplex virus (HSV-2) and viral hepatitis (Craib 1995; Tabet 1998). Among these, *N. gonorrhoea*, *C. trachomatis* and syphilis are the most common causes of sexually acquired ano-rectal and urethral infections for which early diagnosis and treatment are of utmost importance in men because of their independent associations with HIV acquisition (Craib 1995; Tabet 1998). Some studies have reported that HSV-2 may be an independent risk factor for HIV acquisition among MSM (Tabet 1998; Chen 2000; Koblin 2006). Because men with STIs are often asymptomatic, they are predisposed to complications of STIs, such as severe urethritis, proctitis, epididymorchitis, and infertility (Gerbase 1998).

Only two studies ascertained the prevalence of STIs among MSM in SSA (Wade 2005; Sanders 2007). In Senegal, prevalence of syphilis, HSV-2, chlamydia, and gonorrhoea were 4.8%, 22.3%, 4.1%, and 5.4%, respectively (Wade 2005); in Kenya, of 277 participants, 3.2% and 3.5% had gonorrhoea and syphilis, respectively (Sanders 2007). In their study in Senegal, Niang and colleagues revealed that 40% of 250 MSM reported penile or anal discharge (Niang 2002).

To date, no studies have provided measures of hepatitis B and C prevalence among MSM in SSA.

3.7.2. Prevalence of HIV among MSM in SSA

Globally, MSM are a subset of the general population at disproportionately higher risk of acquiring and transmitting HIV. Although the size of the population of MSM in SSA is not known, it is estimated that unprotected sex between men may account for 5-10% of global HIV infections, although this varies between countries and regions (UNAIDS 2006; van Griensven 2009).

At the time of this review, there were very few published studies on HIV prevalence and risk behaviour among MSM in SSA (Niang C. 2004; Onyango-Ouma 2005; Wade 2005; Sanders 2007; Baral 2009). The studies reported significantly higher HIV prevalence among MSM than general population prevalence (Wade 2005; Angala 2006; Sanders 2007). The first published epidemiologic study of HIV among 463 MSM in Senegal reported an HIV prevalence of 21.5% [95% CI = 14.6-22.0], 20 times higher than that of the general population (Wade 2005). In contrast, in Angala's study among 780 MSM who accessed VCT services in Kenya, prevalence of HIV was 13.0% among men who identified as homosexual, 9.6% among men who identified as bisexual, and 7.3% among men who identified as straight or heterosexual (Angala 2006). In Mombasa, Kenya, a total of 285 MSM who enrolled into a vaccine preparedness cohort study had an overall HIV prevalence of 24.6%, with HIV prevalence of 43% [95% CI = 34-52%] among men who had sex with other men compared with 12.3% [95% CI = 7-17%] among bisexual men (Sanders 2007).

Factors found to be significantly associated with HIV infection across the studies conducted in SSA include increasing age (Wade 2005; Sanders 2007). In Senegal, HIV prevalence among 18-20 year old MSM was 8.5%, increasing to 24.0% among those aged 21-24 years [AOR = 3.4, 95% CI 1.47-7.78], 25.0% among those aged 25-28 years [AOR = 3.6, 95% CI 1.57-8.25], and 32.6% among those aged 29-52 years [AOR = 5.24, 95% CI 2.22-12.3] (Wade 2005). Compared with men who practiced insertive anal sex in the past three months, the risk of HIV was 4-8 times higher among men who engaged in receptive anal intercourse [AOR = 3.9, 95% CI 1.4-11.0] or both receptive and insertive anal intercourse [AOR = 8.0, 95% CI 2.9-22.0] (Sanders 2007). In the available studies, having sex exclusively with men was strongly associated with HIV risk (Wade 2005; Sanders 2007). Having more than nine male partners quadrupled the odds of HIV (Wade 2005). Other factors reported to be significantly associated with HIV infection included injection drug use and having peri-anal condylomata (warts) (Sanders 2007).

3.8. HEPATITIS B AMONG MSM IN SUB-SAHARAN AFRICA

Hepatitis B (HBV) infection is a serious form of viral hepatitis and a major global public health problem, with an estimated 2 billion of the world's population harbouring past or present serologic evidence of the infection (Alter 2003; WHO. 2004). HBV is the 10th leading cause of death worldwide (Chin 2000; Lavanchy 2004). Over 370 million people are estimated to be chronic hepatitis B carriers, with a high probability of dying from cirrhosis and hepatic carcinoma. Annually, approximately 4 million new HBV infections occur and 0.5-1.2 million die from chronic hepatitis, cirrhosis, and hepatocellular carcinoma (WHO. 2004).

The course of hepatitis B is variable. In 90% of cases, acute hepatitis B is a self-limited benign liver disease that resolves spontaneously (WHO 2002), although in a small percentage of cases

it is fulminant and fatal. About 10% of acute adult cases go on to develop chronic HBV (Raimondo 2003). Chronic HBV also occurs in 90% of infants infected at birth (WHO 2002). Epidemiologic studies have established strong links between chronic HBV and hepatocellular carcinoma (Beasley 1975; Alter 2003; Bruix 2003; Llovet 2003; Bouvard 2009).

There is worldwide variation in the prevalence of chronic HBV infection in adult populations ranging from 0.1%-20% depending on the predominant age at which most infections occur. Nonetheless, at 8-20% prevalence, acute or chronic HBV (measured as hepatitis B surface antigen [HBsAg] positivity) is highest in SSA and South-east Asia, where most of the infections are acquired at birth or early childhood, although rare cases occur in adolescents and adults (Beasley 1975; Chin 1988; Alter 2003). In contrast, prevalence of HBV is low in high-income countries and most infections occur in adolescents and high-risk adult populations including MSM, people who inject drugs (PWIDs), persons with multiple high-risk heterosexual partners, and the immune-compromised (Chin 2000).

Several studies conducted in SSA have reported high prevalence of HBV (HBsAg) in sub-groups in the general population ranging from 10-25.1% among black urban, rural, and institutionalized children aged 6-14 years in Southern Africa (Abdool Karim 1988; Solarsh 1996), blood donors (9.9%) and STI patients (8.1%) in Mwanza, Tanzania (Jacobs 1997), pregnant women in Uganda (4.9%) and Rwanda (2.4%) (Pirillo 2007), health care providers (25.7%) in Nigeria (Belo 2000), and incarcerated persons in Ghana (17.4%) (Adjei 2006). HBV is the commonest cause of liver disease including primary liver cell cancer in Nigeria (Bojuwoye 1997). Sexual transmission of HBV is estimated to be several times more efficient from male-to-female than from female-to-male and for (receptive and insertive) anal intercourse

than vaginal intercourse (Chin 2000). However, since most HBV infections occur early in childhood in SSA, the proportion of adults susceptible to the risk of sexual transmission of HBV is much lower than in the West (Alter 2006); hence, the efficiency of sexual transmission of HBV in this region remains controversial. Some studies have reported sexual transmission occurring particularly in the presence of other STIs (Bile 1991; Jacobs 1997) whereas others have not (Combe 2001; Lesi 2007).

The scientific literature is replete with evidence of complex immunologic interactions between hepatitis B and HIV infection because of the shared transmission routes of mother-to-child, unsafe injection practices, blood transfusion, and sexual contact (Beasley 1975; Combe 2001; Aceti 2002). Among persons infected with HIV, hepatitis B is more common than in the general population (Mathews 2003; Uneke 2005; Alter 2006).

Currently, 5-10% of the 38.6 million persons infected with HIV in the world are co-infected with chronic HBV (Alter 2006). Since SSA is hyper-endemic for both HIV and chronic HBV infections, the likelihood of a significant proportion of HIV-infected persons being chronic carriers of HBV is high (Nacro 2001; Mphahlele 2006). The estimated prevalence of HBV in HIV-infected adults and children of 20 - 30% in many countries in the region is often significantly higher than in their HIV-uninfected counterparts (Uneke 2005; Burnett 2007; Koziel 2007; Lesi 2007) (Uneke 2005; Burnett 2007). However, the impact of HBV infection on the clinical outcome of HIV infections is not clear (Gitnick 1994; Aceti 2002). Whereas some studies have suggested that HBV accelerates the clinical course of HIV infection (Ockenga 1997; den Brinker 2000; Aceti 2002), others have reported the contrary i.e. HBV not worsening the clinical outcome of HIV infection (Gilson 1997; Thio 2003). Similarly, the impact of HIV

on the clinical outcome of HBV infection is complex (Rockstroh 2006). Some studies have suggested that HBV infection is more severe in HIV-infected persons (Hadler 1991; Gilson 1997; Thio 2003; Rockstroh 2006) whilst slow progression of HBV has been reported among HIV-infected patients (Gitnick 1994).

There is mounting evidence establishing that MSM are at increased risk of HBV and HIV co-infection (Willoughby 1986; Hadler 1991; Gilson 1997; Gully 1997; Tepper 1997; Ostrow 1999; Remis 2000). Although all available studies were conducted in developed countries, they all consistently reported high levels of serologic markers indicating past or persistent HBV infection in MSM (60-80%) (Schreeder 1982; Willoughby 1986; Colin 1999; Remis 2000; Yee 2002) because of the high-risk sexual activities MSM engage in (Ostrow 1999; Remis 2000). Interestingly, HBV is nine times more efficiently transmitted among MSM than HIV (Kingsley 1990). Factors that may influence the distribution of HBV and HIV co-infections in any sub-population include the age at the time of exposure to both viruses, age-specific prevalence of HBV chronic infection, the efficiency of exposures that account for HIV acquisition, and the size of the population of persons at risk of infection (Ostrow 1999; Alter 2006; Alter MJ. 2006; Koziel 2007; Koziel MJ. 2007).

Among MSM, factors associated with HBV infection and HBV-HIV co-infection include history of past or present ulcerative and non-ulcerative STIs (i.e., gonorrhoea, syphilis) (Willoughby 1986; Hart 1993; Koziel 2007), duration of same-sex activity (Schreeder 1982; Osella 1998; Koziel 2007), number of male sexual partners (Schreeder 1982; Willoughby 1986; Koziel 2007), unprotected receptive and insertive anal intercourse (Schreeder 1982; Kingsley 1990; Osella 1998; Koziel 2007), insertive fisting (Willoughby 1986) and rectal douching (Schreeder 1982; Schreeder MT. 1982 ; Koziel MJ. 2007).

At the time of this review, no study was found in the scientific literature that documented serologic evidence of past or present HBV and HBV-HIV co-infection among MSM in SSA. The present study examined the prevalence and risk factors for HBV infection and HBV-HIV co-infections among MSM in Nigeria.

3.9. HEPATITIS C AMONG MSM IN SUB-SAHARAN AFRICA

Like hepatitis B, hepatitis C (HCV) is a major global public health problem with an estimated 170 million people infected and a global prevalence of 3% [<1 to 5%], with wide temporal and geographic heterogeneity across regions of the world (Sy 2005; Alter 2007). Using Alter's classification of HCV endemicity, Africa (specifically Egypt, in the North of Africa) bears the greatest burden of HCV in the world with a prevalence of $>3.0\%$ in contrast to a very low prevalence of ($<1.0\%$) in Northern Europe and the United Kingdom (Alter 2006). It is estimated that HCV is responsible for more than a quarter of cases of cirrhosis and primary hepatocellular carcinoma globally (Alter 2006). The main mode of transmission is repeated direct percutaneous exposure to infected blood from illicit intravenous drug use, unsterile medical injections, medical, dental, and cosmetic procedures (such as tattooing, scarification, religious and cultural practices that involve piercing) and, to a lesser extent, blood and blood product transfusion (Madhava 2002; Beyrer 2005; Shepard 2005; Alter 2006). Other less common modes of transmission include sexual activity although, the contribution through this route remains unclear and controversial (Memon 2002; Sy 2005), haemodialysis, mother-to-child transmission, and occupational exposure (Sy 2005).

Transmission of HCV through the sexual route is less frequent, efficient, and often controversial. Whereas some studies have reported high prevalence among MSM, STI clinic

attendees, female sex workers, partners of injecting drug users, and HIV-infected persons (Tedder 1991; Memon 2002; van de Laar 2007), others did not find an association (Buchbinder 1994; Osella 1998; Gross 2001; Alary 2005; Myers 2009). This could have been due to a number of reasons including underestimation of sexual exposure from socially desirable responses, lack of power to detect the effect of sexual behaviour on HCV transmission, or insufficiently control for injecting drug use. People who inject drug (PWID) are most at risk of HCV with prevalence ranging from 31%-98% (Memon 2002).

Epidemiologic data on HCV in SSA are scanty. Nonetheless, Africa has the highest prevalence of HCV in the world at 5.3% (Madhava 2002; Sy 2005; Alter 2006). Prevalence is unequally distributed, with the highest recorded in Egypt (North Africa), followed by Central Africa (6.0%), West Africa (2.4%), and South and East Africa (1.6%) (Madhava 2002). HCV infection increases with age and, unlike developed countries where HCV is found commonly in individuals with a history of blood transfusion or illicit drug use, in developing countries the distribution is less well defined in the adult population (Madhava 2002).

There are controversies over the modes of transmission of HCV in SSA with suggestions that the parenteral route (unsafe medical injections and occupational exposure) may be the predominant mode of transmission given the less efficient sexual route and the apparently low rate of injecting drug use (Madhava 2002; Alter 2006). There have been very few studies that have examined HIV and HCV co-infections. A study conducted among 180 HIV-infected Nigerians found that 18.3% were co-infected with HCV and 27.8% with HBV. Twenty (11.1%) were infection with all three viral infection (Forbi 2007).

Prevalence of HCV is higher among MSM than in the general population (Esteban 1989) and among MSM sub-groups, prevalence of HCV is higher among those who inject drugs (Bodsworth 1996) and are HIV-infected (Bodsworth 1996; Alary 2005; van de Laar 2007). A study that compared HIV, HCV, and sexual risks among MSM and non-MSM drug users in Thailand reported that, compared to non-MSM drug users, the odds of HIV and HCV infections were at least two times higher among MSM who injected drugs (Beyrer 2005).

Given the shared route of transmission of HIV, HCV, and HBV, the occurrence of co-infections is not uncommon (Alter 2006) through percutaneous exposure. It is estimated that 4-5 million people are co-infected with HIV and HCV (Thomas 2008; UNAIDS. 2008). Reported prevalence of HIV-HCV co-infection in different high-risk groups ranges from the highest among persons who inject drugs (PWIDs) (72-95%), MSM (1-12%) and heterosexuals (9-27%) (Alter 2006; Calzavara 2007). The impact of HCV infection on the progression of HIV infection to AIDS remains unclear (Greub 2000). Although some studies reported accelerated the progression of HIV infection to AIDS with HCV co-infection even with treatment (Piroth 2000; De Luca 2002; Law 2004), in contrast, other studies observed no differences in HIV-related mortality between hepatitis C co-infected patients and those infected with HIV alone (Sulkowski 2002; Kaufmann 2003; Bonacini 2004; Rockstroh 2006).

Existing HIV infection and injecting drug use are two well established independent risk factors for HCV among MSM (Buchbinder 1994; Alary 2005; van de Laar 2007).

The present study investigated the prevalence and risk factors of HCV among MSM in Nigeria to provide a better understanding of the burden of HCV and HIV-HCV in this sub-population.

CHAPTER 4

RESEARCH METHODS

This study collected primary data using a constructed questionnaire consisting of modified questions derived from multiple sources: BiSex Study (Myers 1998), Ontario Men's Study (Myers 2004), M-Track (Myers 2006) and newly constructed questions.

4.1. STUDY DESIGN

4.1.1. Feasibility Study

Prior to the commencement of the main study, a feasibility study was conducted to assess the feasibility of the study and to refine the study design, recruitment strategies, and survey instruments. Several preliminary meetings were held in August 2005 with the Federal Ministry of Health, the National Agency for the Control of AIDS (NACA), and a cross-section of members of Alliance Rights Nigeria (ARN) (which was the only registered sexual minority equality rights and well-being advocacy group) (Allman 2007). This was followed by five structured focus group discussion (incorporating anonymous questionnaires) with a purposive sample of 59 men recruited through informants by word-of-mouth at venues considered to be safe locations by members of the MSM community in Lagos, Nigeria. Men recruited into the study were considered to be eligible if they admitted to engaging in same-sex sexual activities (defined as penetrative and non-penetrative anal intercourse) in the last 12 months; if they were 15-50 years of age and willing to participate in group discussions lasting about 90 minutes. One of the men was excluded because he self-identified as a female transgender⁵. Each group

⁵ A male-to-female (MTF) transgender person with a female gender identity.

represented approximately equal numbers of different age groups and literacy levels (15-29 years and illiterate, 15-29 years and literate, 30-50 years and literate, 30-50 years and illiterate).

The mean age of the men enrolled in the feasibility study was 27 years (range 16–58); 60% had post-secondary education; 56% were employed full or part-time; 83% were Christian; 16% were Muslim; 66% self-identified as bisexual and 31% as homosexual. Participant's experiences were diverse, with ethnic, religious, and class distinctions strongly influencing sexual expression. Same-sex community networks were hidden, with social activities taking place in non-commercial, private venues. Participants reported being socially ostracized by culture, religion, and lack of political will which increased their vulnerability to HIV-related high-risk behaviours (Allman 2007).

The final study was largely informed by the outcome of the feasibility study. Some of the recommendations included the design of the study, selection of states, location of study venues, gender of the interviewers, criteria for selection of the seeds for the recruitment technique adapted, types of incentives, the contents of the study instruments, etc. (Further details are available in Appendix 2 page 269).

4.1.2. Community Advisory Committee

A community advisory committee (CAC) was formed in the initial phase of the study to advise and provide support to the study team. The 10-person committee included the principal investigator, four members of the research team, and five members of the MSM community led by Dare Odumuye. One of the members of the CAC was Professor Sade Ogunsola, who was the Head of the Central Laboratory (where all the laboratory analyses were conducted). She was

also a consultant at the HIV and AIDS clinic where respondents who required further investigation and treatment were referred.

The role of the CAC was to provide guidance and technical support through every stage of the study. Specifically, the CAC contributed to the successful conduct and dissemination of the study findings. During the research implementation, the CAC met weekly to discuss progress and challenges encountered and when possible they provided support to overcome the challenges.

4.1.3 Study Sites

The main study was conducted in Lagos and Ibadan, the two largest cities in Nigeria, with an estimated population of 15 million and 2.5 million, respectively. Both cities in Lagos and Oyo states, respectively, are located in the southwest of Nigeria. Lagos, the former capital of Nigeria, is about 130 km east of Ibadan. Lagos and Ibadan are major commercial centres and cosmopolitan in outlook, attracting people from within and outside of Nigeria. Given the lack of data on the size of the MSM population in Nigeria or other countries in Africa, a conservative range of 1.5% - 2.5% of adult men based on a North American estimate of 2.6% (Binson 1995) was assumed to be the proportion of men who have sex with men in Nigeria. This estimate was used to derive estimates of the number of MSM aged 15 - 64 years in Lagos and Ibadan. On this basis, we estimated the number of MSM to be 57,000-95,000 in Lagos and 9,500-16,000 in Ibadan.

4.1.4 Study Design

A cross-sectional study design was employed to survey and obtain blood samples from approximately 1,100 men (160 from Ibadan and 940 from Lagos) who engaged in same-sex sexual activity in the 12 months preceding the study. The survey elicited information on socio-

demographic, sexual, behavioural, lifestyle, and other contextual characteristics. In addition, prevalence estimates of HIV and other STIs (syphilis and hepatitis B and C) were measured from venous blood specimens collected from consenting respondents. A link between the survey data and blood results using unique identifiers enabled the examination of potential factors associated with high-risk behaviours, STIs, and HIV risk.

4.1.5. Study Sample and Inclusion Criteria

For the purpose of this study, MSM were men, aged 16 years and older who were residents of Nigeria, spoke English or Pidgin and who had reported oral or anal sexual contact (with or without a condom) with another man in the previous 12 months. Informed consent was obtained from each respondent separately for the survey and biologic sample collection. Thus, it was not mandatory for respondents to provide both consents to be eligible [See details on sample size in Section 4.1.6 and recruitment in Section 4.2 below].

The study received ethics approval from the University of Toronto and the College of Medicine, University of Lagos Research Ethics Review Boards (see Appendices 8 and 9 page 343 and 343 respectively). Due to the sensitive nature of this study, efforts were made to ensure that all procedures were guided by the principles of respect and protection of the respondents as well as by scientific rigour.

4.1.6. Outcomes of Interest

The primary outcome variable for this study was HIV prevalence. Other secondary outcomes were prevalence and types of high-risk sexual behaviour (specifically unprotected anal

intercourse) and prevalence of other STIs (syphilis, hepatitis B and C) [see details on outcome assessment in sections 4.2.5 and 4.4.1 below].

4.1.6. Independent variables

These included socio-demographic characteristics, experiences of poverty, sexual orientation, partner characteristics, sexual behaviours, knowledge of and attitudes toward STIs and HIV, alcohol and drug use, health care utilization (for STI/HIV testing, diagnosis and management, and other health related issues), perceived vulnerability to HIV and AIDS, experienced stigma as a result of sexual identity or behaviour, experiences of discrimination, physical and sexual abuse, disclosure of sexual identity, experience of self-homophobia, and social support [See details in sections 4.3 & 4.4.2].

4.1.7. Sample Size Calculations

At the time of this study, the prevalence of HIV among MSM in Nigeria or in SSA was unknown. The prevalence of HIV in Nigeria based on the national sentinel surveillance among antenatal clinic attendees was 5.4% (FMOH. 2003). In South Africa, the national HIV prevalence among men was 8.2% (Adebajo 2002) and 27% among military men in Uganda (Nwokoji 2004). Prevalence of syphilis in a cohort of men in Uganda was 10.5% and 8.0% in Kenya (Rakwar 1999; Gray 2004). The prevalence of hepatitis B among pregnant women in Maiduguri (a Northern State in Nigeria) was reported to be 15.8% (Baba 1999).

Working on an assumption that prevalence of HIV in the study population ranged from 10-25%, the minimum sample sizes required to estimate the prevalence of HIV, syphilis, and hepatitis

viruses with a precision of +/- 4% ranged from 216 – 450 for HIV; 176-236 for syphilis; and 391 for hepatitis viruses using the formula

$$N = \frac{z_{1-\alpha/2}^2 P(1-P)}{d^2} \quad \text{where:}$$

P = estimated proportion = 0.25

d = desired precision = 0.04

$z_{1-\alpha/2}^2 = 1.96$

The highest sample size of 450 was calculated as the sample size. In a behavioural study of Nigerian military men, only 55% agreed to be tested for HIV (Adebajo 2002). Applying this assumption and adjusting for the effects of the sampling strategy using a design effect of 1.4⁶ (Aday 1996), the final sample size calculated for this study was 1,100 men – Lagos (940 men) and Ibadan (160 men).

With this sample size, the study had more than 80% power to detect significant differences in estimates of effects of a wide range of risk factors on prevalence of STIs (see power calculations in Appendix pages 247-248).

⁶ A design effect of 1.4 implies that the variance of any estimate based on the sample will be 40% higher than that derived from a simple random sample ⁽¹²⁴⁾

Table 2: Effects of varying samples sizes and estimates of attributes on precision of estimates (i.e. +/- the cell value around the column prevalence)

Sample Size	Prevalence of Outcome							
	2%	5%	10%	12.5%	13.5%	14.5%	15%	20%
	Precision ± Prevalence							
1100	0.83 (1.2-2.8)	1.28 (3.7-6.3)	1.78 (8.2-11.8)	1.95 (10.6-14.5)	2.02 (11.5-15.5)	2.08 (12.2-16.6)	2.1 (12.9-17.1)	2.36 (7.6-22.4)
750	1.0 (1.0-3.0)	1.56 (3.4-6.6)	2.15 (7.9-12.2)	2.37 (10.1-14.8)	2.44 (11.1-15.9)	2.52 (12.0-17.0)	2.56 (12.4-17.6)	2.86 (17.1-22.9)
500	1.23 (0.8-3.2)	1.91 (3.1-6.9)	2.63 (7.4-12.6)	2.90 (9.6-15.4)	2.99 (10.5-16.5)	3.09 (11.4-17.6)	3.13 (11.9-18.1)	3.51 (16.5-23.5)
250	1.73 (0.3-3.7)	2.70 (2.3-7.7)	3.72 (6.3-13.7)	4.10 (8.4-16.6)	4.34 (9.2-17.8)	4.36 (10.1-18.9)	4.43 (10.6-19.4)	4.95 (15.1-25.0)

4.1.9 TRAINING, PILOT TESTING OF STUDY INSTRUMENTS AND RECRUITMENT STRATEGIES

Six-weeks to the commencement of the main study, a series of training sessions were conducted for staff recruited specifically for the study (mobilizers, screeners, coupon managers, seeds, interviewers, data entry clerks, and health care personnel (nurse counsellors and testers, laboratory technicians, technologists and medical doctors). These trainings were facilitated by the Principal Investigator assisted by one of the co-investigators (who headed the research laboratory where all the biological samples were tested) using different adult learning strategies such as didactic power point presentations, role-playing, discussions, and pilot/field testing.

During the training, participants conducted mock interviews to test the study instruments and procedures. At the end of the training, feedback received from participants and their supervisors about errors and ambiguities identified were used to refine the study tools. Also during the pilot testing, the psychometric tests (test re-test reliability and internal consistency) of the study instruments were conducted.

4.2 RECRUITMENT OF STUDY PARTICIPANTS

4.2.1. Recruitment Strategies

A major challenge in conducting research on hard-to-access sub-populations is obtaining representative samples due to the non-existence of sampling frames and social stigma related to the social and sexual activities they engage in that are considered to be socially undesirable.

Therefore, to reach this population, innovative methods of sampling that produce unbiased estimates as well as maintain the confidentiality of participants were considered.

In the past two decades, several methods of recruiting hidden populations such as the snowball or chain referral, facility-based, targeted, and time-location sampling techniques have emerged (Magnani 2005). However, the main drawbacks of non-probability recruitment methods are sampling and selection biases resulting from selection of the initial seeds that influence the composition of the final sample. To minimize these limitations, the present study employed an adaptation of chain referral sampling strategy: the Respondent-driven sampling (RDS) technique designed to operate in settings where probability sampling methods are not feasible (Heckathorn 1997; Heckathorn 2001; Salganik 2004). It is premised on the assumption that peers can effectively identify and encourage participation of other peers (Kilworth 1978; Biernacki 1981).

RDS was designed to minimise sources of bias associated with chain referral sampling (CRS), including biases associated with the choice of the initial ‘seed’ sample, volunteerism, masking, differences in personal network sizes resulting in differential recruitment⁷ (Erickson 1979) and homophily,⁸ i.e., non-random selection resulting from people recruiting others like themselves (McPherson 2001). RDS minimises these biases statistically by combining the chain referral sampling technique with a mathematical model that weights the sample to compensate for the network effects and non-random sampling (Heckathorn 1997; Heckathorn 2002; Semaan 2002; Salganik 2004; Wang 2005; Salganik 2006; Volz 2008). Thus, RDS generates referral chains that must be long enough for the estimators of key outcome and independent variables to stabilize

⁷ The number of other MSM a potential recruiter knows. Which is also the number of potential recruits known to a respondent.

⁸ When recruitment patterns reflect affiliations to social ties i.e. referrals are made non-randomly.

and reach equilibrium that balances the tendency of participants to recruit peers who are alike in certain characteristics (Johnston 2008). RDS has been successfully applied to recruit hidden populations such as PWIDs, FSWs, and gay men, in Bangkok, Vietnam, Bangladesh, Burma, Cambodia, Egypt, Honduras, India, Kosovo, Mexico, Nepal, Vietnam, Pakistan, Papua New Guinea, and Russia (Heckathorn 1999; Sergeyev 1999; Heckathorn 2001; Salganik 2004; Ramirez-Valles 2005; Wang 2005; Abdul-Quader 2006).

Two unique features of RDS are the use of peer recruiters and the dual incentive system. The following steps were taken to implement this technique:

- i. To initiate the recruitment of respondents into the study, 10 men who met the eligibility criteria were purposively selected based on a diverse set of characteristics (age, socio-economic status, marital status, sexual orientation, and linkages to other MSM) as “seeds”. Each ‘seed’ received 500 Naira (N) (\$5.00) to cover their cost of transportation and other out-of-pocket expenses.
- ii. Next, each seed was given three recruitment coupons which were used to recruit peers who met the eligibility criteria into the study. For each ‘successful’⁹ recruitment, the recruiter received N200 (\$2) as incentive up to a maximum of N600 (\$6) for three successful recruitments. A cap of three coupons was imposed to minimize over-sampling of social group members as well as minimize the chances of recruiting non- MSM participants.
- iii. All new recruits also received the dual incentives and the process continued through several waves until the desired sample size was achieved. With the incentives,

⁹ A recruited person who meets the eligibility criteria and agrees to participate in the study.

participants felt motivated to recruit their peers particularly those most isolated members of the MSM community to participate in the study.

- iv. Each coupon had the study telephone number and a unique serial number used to link the recruit to his recruiter. Thus, recruits were linked to recruiters by coupons with unique ID numbers.

Information obtained from the recruiters and recruits included questions to establish (i) the relationship between recruits and their recruiters; (ii) the number of other MSM personally known to each respondent (recruit) (i.e., to ascertain the personal network size); (iii) the serial numbers of recruit's coupons; (iv) the serial numbers of new coupons given to recruit others; and (v) recruiter's network sizes using the coupon tracking system that linked unique identifiers.

Eliciting this information enabled the estimation of probability estimates of outcome data adjusted for network size and recruitment patterns (Heckathorn 2001; Heckathorn 2002). To safeguard against the recruitment of ineligible men into the study, each recruit was taken through two steps of stringent screening (see Appendix 4 page 290) to ensure that only eligible participants were recruited. The first round of active screening was conducted at the study site by a group of 'gatekeepers'¹⁰ who acted as screeners. This involved the screeners administering a short questionnaire [see screening form on page 289 - Appendix 3] to the respondents. The responses to the questions helped to determine whether the respondents met the eligibility criteria for recruitment. The second round of screening was passive. This occurred during administration of the questionnaire by trained interviewers who paid close attention to the content and consistency of respondents' responses. Additionally, to overcome duplication and impersonation, each respondents' little left finger nail bed was painted with indelible ink which

¹⁰ Respected and popularly known members of the MSM community

lasted for about three to four weeks and an electronic database of bio-data (age, date of birth, place of birth, height, and weight) was developed against which all new entries were verified (Sergeyev 1999).

4.2.2. Data and Blood Collection

Three study sites (two in Lagos and one in Ibadan) were identified for the interviews, counselling, and biologic sample collection. In Lagos, the main study site was a newly renovated bungalow situated within the Lagos University Teaching Hospital (LUTH) in Suru-Iere Local Government Area of Lagos state close to the departments of Community Health and Dentistry. The second site was at Planet One conference hall situated in Ikeja Local Government Area of Lagos State. In Ibadan, the location was a standalone bungalow which belonged to Dare Odumuye and was located in a quiet residential area. For comparability, similar seating arrangement, recruitment strategies, and data collection procedures were employed at all three study sites. The study sites were chosen and endorsed by members of the MSM community and the CAC based on the recommendations from the developmental study to increase accessibility, privacy, and security of study participants and researchers. Recruitment, data, and biologic sample collections were conducted Monday through Friday in LUTH and Ibadan and over the weekend at Planet One.

4.2.3. Data Collection

The interviewer-administered questionnaire elicited information on (i) socio-demographic characteristics; (ii) sexual identity and sexual preferences; (iii) sexual behaviours; (iv) partner characteristics and sexual mixing patterns; (v) knowledge and attitudes to STIs and HIV; (vi) alcohol and drug use in relation to sex; (vii) health care utilization; and (viii) psychosocial

characteristics including disclosure of sexual identity, experienced stigma to sexual identity, and social support. The questionnaire was non-nominal with only unique identifiers used. To ensure linkage of questionnaire data with biologic specimens, the same unique numbers were used.

The interviewers comprised 17 male and three female university graduates who were trained as data collectors, and sensitized prior to the commencement of the study. Some of the interviewers were MSM. The interview lasted approximately 60-90 minutes, with a mean of 75 minutes.

4.2.4. Biologic sample collection

Following completion of the interviewer administered survey, 4 ml of venous blood was drawn for HIV and STI testing from consenting participants after pre-test counseling was provided. Whilst all HIV screening occurred at the point of service, testing for syphilis, hepatitis B, and hepatitis C was conducted at the College of Medicine, University of Lagos Central Laboratory. Sera from blood samples collected in Ibadan were transported to Lagos daily. Results of blood tests were disclosed only to participants who returned for their results after post-test counseling was provided. Participants who tested positive to any of the tests or who had other medical or psychosocial needs were referred to designated health care providers (who had been sensitized about the study prior to the commencement of the main study) at the HIV and AIDS clinic, University Teaching Hospital, Idi-araba, Lagos located within the same premises as the study site for further diagnosis and management.

Blood specimens were anonymously linked to questionnaire data using the same participant's unique identifiers. To retrieve results of the blood tests and to link the results to the respondents, each respondent was asked to provide a secret code recorded by the study Nurse-Counselor

which they were mandated to provide as a precondition to link the results of the tests to individuals. Where participants failed to provide the secret code, they were referred to the Central Laboratory for re-testing.

4.2.5 Laboratory testing of biologic samples:

4.2.5.1. HIV serology: For this study, blood samples were tested for HIV-1 following WHO/UNAIDS HIV testing strategy III (Constantine 1994; WHO. 1997; Nkengasong 1999; Foglia 2004) using two enzyme immunoabsorbent assays (EIAs): Genetic Systems LAV EIA – [GS] (Bio-Rad Laboratories Blood Virus Division Redmond, WA) and Vironostika HIV-1 Microelisa System [V] (Organon Teknika Corp. Durham, NC) as screening tests. These two tests used different principles and antigens. Whilst Genetic Systems LAV EIA, an indirect EIA with a high sensitivity of 100% and specificity of 99.9% (Foglia 2004) employed the synthetic peptide principle, Vironostika, was an enzyme-linked immunosorbent microelisa test with a high sensitivity of 100% (CI 99.4% - 100%) and specificity of over 98% (CI 99.5% - 99.9%) (Nkengasong 1999).

Using the parallel algorithm, blood specimens were simultaneously tested with the two tests, GS and V. Samples that were non-reactive to both assays were defined as *negative*. Concordantly, reactive results from both assays were defined as HIV antibody *positive*. Blood tests that repeatedly yielded discordant results were interpreted as indeterminate (Constantine ; WHO. 1997; Nkengasong 1999; Foglia 2004). Sera of **all** indeterminate results and five percent of the rest of the samples were retested using Genetics Systems HIV-1 Western blot testing for confirmation of the results.

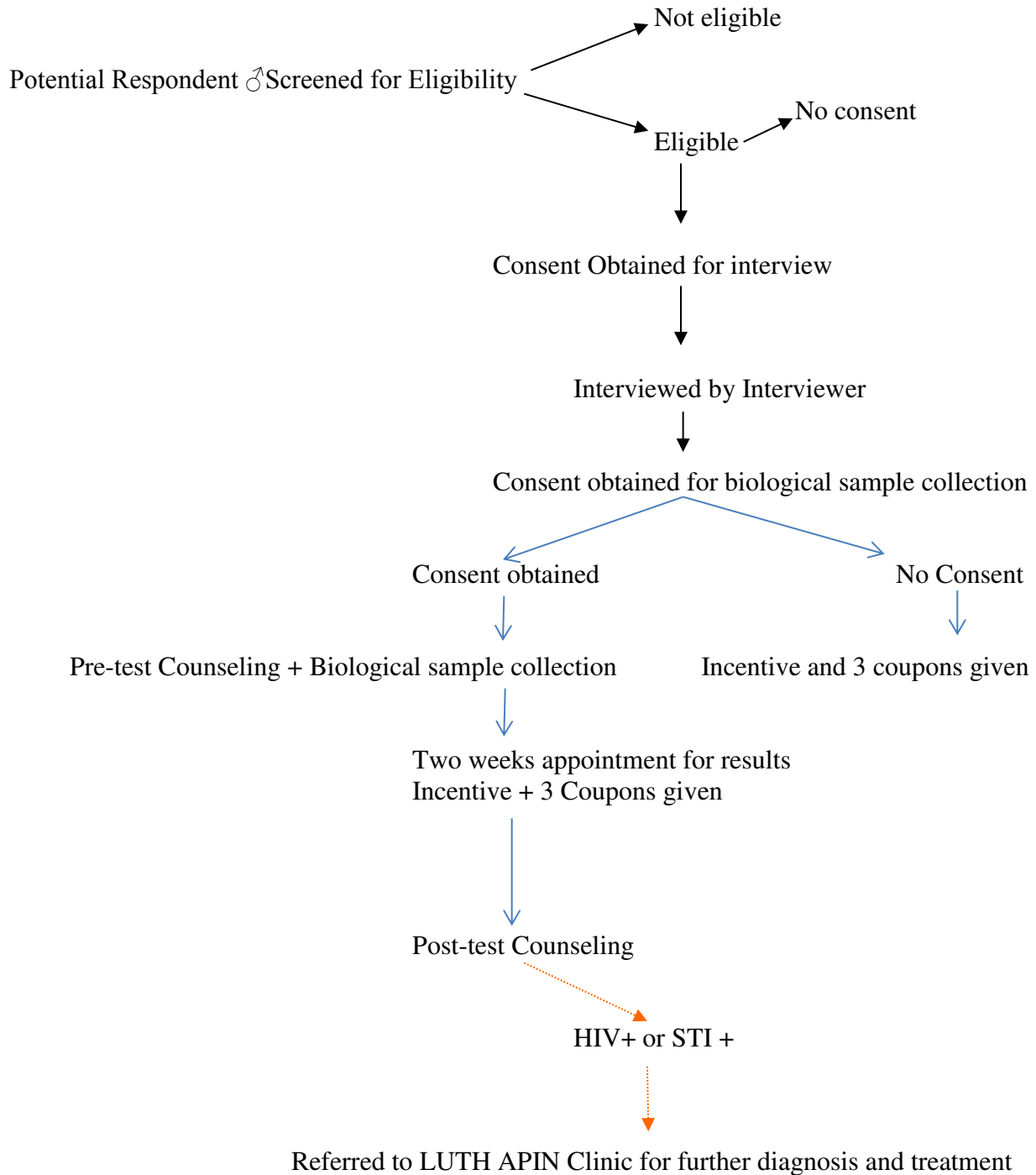
4.2.5.2. Testing for syphilis: Syphilis serology was performed using Rapid Plasma Reagin Test (RPR) (Becton-Dickson, Cockeysville, MD, USA) with a sensitivity of 77.5% - 100% depending on the stage of disease, and specificity of 94.1% (West 2002) following the manufacturer's instructions. Next, sera that were found to be RPR reactive were diluted to determine endpoint reactivity and were tested with *Treponema palladium* haemagglutination test (TPHA) (Fujirebio), a confirmatory test with sensitivity of 97.6% and specificity of 99.7% (Sato 1984). Diagnosis of active syphilis was made when both RPR and TPHA tests were positive or when only TPHA was positive but RPR was indeterminate with titres greater than 1:8, considered to be consistent with active infection (Golden 2003). Given that recent antibiotic use could affect the sensitivity of RPR tests, information about antibiotic use in the past 14 days was obtained from all respondents.

4.2.5.3 Testing for hepatitis B (HBV): Classification of a hepatitis B infection requires the identification of several serologic markers expressed during infection (incubation, acute, or convalescent). For this study, blood samples were screened for hepatitis B surface antigen (HBsAg) known to be a rigorous method for the diagnosis of active or chronic HBV infection using a commercially available Enzyme Linked Immunosorbent Assay (ELISA) based test kit by DIALAB, Austria with specificity of 99.8% and sensitivity of 100%. For the purpose of this study, *a repeatedly HBsAg positive result was indicative of active HBV infection.*

4.2.5.4. Testing for hepatitis C (HCV): Blood samples were also screened for anti-HCV antibodies using a third generation enzyme linked immunosorbent assay, Clinotech (Clinotech ®), containing recombinant proteins derived from core regions of HCV virus to identify apparently healthy participants with anti-HCV antibodies. The enzyme immunoassay test Clinotech ®, had a specificity of 99.98% and sensitivity of 99.86% (Clinotech ®). All samples

found to be positive were retested in duplicate before final confirmation of the result. Specimens found to be repeatedly reactive were interpreted to be positive for the presence of HCV antibodies identifying those who ever had the infection. Initially reactive specimens which did not react in the repeat tests were considered negative for antibodies to HCV.

Figure 3: Flow Chart Showing Movement of Respondents during Data Collection



4.3. STUDY MEASURES

The following sections describe the measures used in the study including their reliability and validity. Table 3 provides a summary of the measures used in this study. A copy of the complete questionnaire can be found in Appendix 6 (page 295).

Table 3: Study variables and constructs

Category	Variables
Socio-demographic	<ul style="list-style-type: none"> ▪ Age ▪ Self-reported sexual identity or orientation, sexual preference ▪ Ethnic group ▪ Religion ▪ Socioeconomic status ▪ Marital status ▪ Type of marriage (monogamy, polygamy) ▪ Whether respondent lives alone, in a group or with a man or woman
Individual	<ul style="list-style-type: none"> ▪ Age at first intercourse ▪ Sexual behaviours - lifetime and previous 12 months ▪ Types of sexual practices, ancillary sexual practices ▪ Frequency and patterns of condom use with regular, casual or anonymous partners ▪ Disclosure of homosexual activity ▪ Non-consensual sex encounters ▪ Involvement in paid sex ▪ Knowledge of attitudes to and beliefs of HIV and AIDS ▪ HIV testing behaviours ▪ Safer sex practices ▪ Perceived HIV status ▪ Whether circumcised ▪ History of previous STIs: gonorrhoea, syphilis, Chlamydia and HIV ▪ History of cigarette smoking, ▪ History of intravenous drug use ▪ HIV results
Sexual Partner (s)	<ul style="list-style-type: none"> ▪ Partner characteristics ▪ Sexual mixing patterns in the preceding year ▪ Concurrent or sequential sex partners
Situational	<ul style="list-style-type: none"> ▪ Non-use or inappropriate use of condoms ▪ Recent use of alcohol and illicit drugs. ▪ Condom availability ▪ Location of sexual intercourse ▪ Attraction to sexual partners
Interpersonal and Contextual	<ul style="list-style-type: none"> ▪ Integration into MSM community ▪ Self-homophobia ▪ Disclosure of sexual identity ▪ Perceived attitudes to same-sex behaviour by others ▪ Experiences of stigma from family, health care providers and the community ▪ Level of social support from family, friends, community.

4.3.1. Measurements

This section provides details of how the dependent and independent variables used for this study were measured, including the scales that were used. Each variable was tested for reliability¹¹ and uni-dimensionality.

4.3.2. Reliability of Interviewer-Administered Questionnaire

Since this was the first study conducted to elicit information on sensitive sexual and social behavioural issues from a same-sex population in Nigeria, and most of the responses obtained were self-reported sexual histories, an assessment of the reliability of data collected was undertaken prior to the commencement of the full data collection. Reliability of responses was assessed using (i) test-retest agreement within individuals to examine the extent to which the same questions administered to the same participants yielded consistent responses at different times (Coates 1986; Saltzman 1987; Aday 1996; Jeannin 1998; Weinhardt 1998; Sherman 2003).

4.3.2.1. Test-Retest (TRT) Procedure: Adapting Coates et al's model (Coates 1986), the study questionnaire was administered to 25 randomly selected potential respondents who had consented to be interviewed twice (two weeks apart)¹² by trained interviewers who were randomly assigned. Participants were not aware that the second interview was going to be a repeat of the questionnaire, and no self-identifying information was collected.

¹¹ Reliability refers to the consistency (stability) of the answers (responses) respondents give to the same questions when they are asked at different times assuming no real changes would have occurred that should cause them to answer differently⁽¹²⁴⁾.

¹² A short period of one week between the first and second interviews was chosen to minimise the probability of changes occurring in the underlying construct of interest.

The questionnaire included a subset of items from the main study questionnaire that were presented in the same format and sequence as the main study questionnaire. The two rounds of interviews were conducted under similar conditions (i.e., in the same room) following the same instructions. No participant was interviewed twice by the same interviewer. Items in the questionnaire included socio-demographic characteristics, sexual orientation/identity, sex partner characteristics, sexual behaviours, condom use, drug use, knowledge of and attitudes toward HIV and AIDS, health care utilization and HIV testing patterns, experiences of discrimination as a result of sexual orientation, extent of disclosure of sexual identity, and social support.

Test-retest reliability was computed using the Pearson correlation coefficients for quantitative variables after comparing global means and ranges across all responses in the first and second interviews. Categorical variables were assessed by percentage agreements on the same variables between interviews. Overall, Spearman rank-order coefficients were used for ordinal level variables, and Kappa measures of agreement were used for categorical variables.

A Kappa (TRT correlation coefficients) of **1** was defined as '*perfect agreement*'; **> 0.8** as '*almost perfect*'; **0.6-0.8** as '*substantial agreement*'; **0.41-0.6** as '*moderate agreement*'; and **<= 0.4** as '*poor agreement*' at different points in time (Coates 1986; Saltzman 1987; Aday 1996).

4.3.2.2. Internal consistency or inter-correlation: The extent to which different questions reflected the same concept was assessed using alpha reliability coefficients. Internal consistency reliability coefficients were computed for items making up scales to tap various concepts such as attitudes towards condom use (11 items), attitudes to HIV (17 items), self-homophobia (10 items), and self-esteem (9 items). The alpha coefficients were used to assess the feasibility of

combining attitudinal items into a Likert-type scale ranging from ‘strongly agree’ to ‘strongly disagree.’ For this study, a minimum coefficient of 0.70 was required to indicate that items included were adequately consistent in how they assessed the underlying constructs (Spector 1992; Nunnally 1994).

4.3.3. Validity of questionnaire data

Content, criterion, and construct validity of the study questions measure the extent to which (i) measures adequately represent concepts; (ii) measures agree with criterion indicators of concepts; and (iii) relationships between measures observed and measures predicted correspond with theories or hypotheses (Aday 1996). For this study, only criterion validity, reflecting correspondence between the survey measures and the “true” or gold standard for measures using (i) correlation coefficients and (ii) sensitivity and specificity analyses were conducted. Specifically, study participants’ responses to whether they (a) were circumcised; (b) had syphilis, genital or anal discharge, ulcer, herpes, or warts in the past 12 months; and (c) their reported HIV status correlated with the physical examination and blood test results. High correlation coefficients, sensitivity, and specificity between the study measures and the criterion source values were calculated to determine the validity of the survey measures.

4.3.4. Quality Control of Laboratory Procedures and Results

To ensure quality of the laboratory tests performed, the following steps were taken (WHO, 2005):

- (i) *Training of laboratory personnel:* In addition to engaging qualified laboratory staff for the study, steps were taken to provide refresher training for all staff.

- (ii) *On-site observation*: Careful on-site observation of all testing processes and procedures was undertaken by a laboratory scientist from the National HIV and Retrovirology Laboratories, Ottawa. This entailed an assessment of all parts of the quality system: personnel competency, quality control practices, observation of testing procedures, and record keeping.
- (iii) *Proficiency panel testing*: A panel of 5-10 specimens of known reactivity was sent from Ottawa to the Nigerian laboratory for testing. The results were reviewed in Ottawa and feedback was provided to the Nigerian laboratory.
- (iv) *Retesting of samples*: Dried blood spots of 10%¹³ (WHO, 2005) of all positive and all negative blood samples selected by random sampling (positives and negatives), and all indeterminate results were retested in Ottawa. Results were compared with those obtained from the Nigerian laboratory and sensitivity and specificity analyses were computed.

¹³ Testing 10% of ~ 1000 blood samples will provide 95% confidence of detecting at least one discrepant result when the underlying error rate is 3%.

4.4 Results of Reliability Tests

Table 4: Socio-demographic characteristics of respondents for the reliability sub-study

Characteristics	Frequency	%
Age		
19-24	11	45.8
25-30	11	45.8
31-42	2	8.4
Educational Level		
Primary	1	4.2
Secondary	9	37.5
Tertiary	14	58.3
Employment Status		
Yes	11	45.8
No	13	54.2
Nationality		
Nigerian	23	95.8
Non Nigerian	1	4.2
Religion		
Christianity	18	75
Islam	6	25
Marital Status		
Married	2	8.3
In a steady relationship	1	4.2
Single	21	87.5
Total	24	

Participant's ages ranged from 19 – 42 years with a mean of 26.2 (SD 5.04) years. Almost all the participants (95.8%) had at least secondary education.

4.4.2. Outcomes of Interest

This study had a few outcome variables:

(i) **High-Risk Sexual Behaviour:** For the purpose of this study, unprotected receptive anal intercourse (URAI), unprotected insertive anal intercourse (UIAI) with any male and insertive anal intercourse with female partner were measured as indicators of high-risk sexual behaviours. Whilst URAI was defined as the experience of penetrative receptive anal intercourse without a condom with any male partner in the previous 12 months, UIAI was defined as the experience of a man inserting his penis into another man's anus without a condom. To inquire about URAI,

respondents were asked, ‘In the past 12 months, did your male partner insert his penis in your anus with or without a condom (response *yes* or *no*)?’ For UIAI, respondents were asked if in the past 12 months, they inserted their penis into their male or female partner’s anus with or without a condom (asked as separate questions for male and female partners and with and without a condom (response *yes* or *no*). To determine the frequency of occurrence of URAI and UIAI, respondents were asked to indicate whether a condom was used the most recent time they engaged in receptive and insertive anal intercourse. Respondents were categorized as engaging in URAI, UIAI, or both if they responded in the affirmative to URAI or UIAI or both irrespective of the frequency of the acts, the number of partners, and the type of partners.

(ii) **HIV Serostatus:** Respondents concordantly reactive to the two rapid tests or who were initially discordantly reactive to the two assays but reactive to the confirmatory test were defined as HIV antibody positive; otherwise they were interpreted as HIV-negative.

(iii) **Hepatitis B:** Respondents with repeatedly HBsAg positive result were considered to have active HBV infection.

(iv) **Hepatitis C:** Repeatedly reactive specimens were interpreted to be positive for the presence of HCV antibodies.

(v) **Syphilis:** All TPHA positive results were indicative of a positive diagnosis of syphilis.

4.4.3. Independent Variables

4.4.3.1. Primary Independent variable

The primary independent variable for this study was *sexual orientation*. Recognising the considerable fluidity in sexual orientation throughout the lives of MSM (Kinsey 1948; Ruiz 1998; Kennedy 2001) and the unending debates on its definition (Stein 1999; Butler 2004), for this study, sexual orientation was defined as the gender of those to whom respondents were sexually and romantically attracted (Kinsey 1948; Phillips 2007). The sexual orientation of participants was ascertained by choosing from a 5-scale nominal item: (i) *heterosexual* reported attraction to the opposite sex; (ii) *homosexual/gay* reported attraction to same-sex; and (iii) *bisexual* reported attraction to both same and opposite sex.

4.4.3.2. Individual Level Factors

Socio-demographic Factors

These measures included *age, level of education, employment, marital status, socioeconomic status, and religion* which are known risk factors for HIV infection.

Table 5: Agreement between interviews on socio-demographic characteristics (n=24)

Items	% Agreement Observed	Kappa
Age (years)	99	0.95
Education	100	1.00
Total # of years of education	71	0.74
Employment status	92	0.83
Occupation	42	0.28
Nationality	100	1.00
Ethnicity	100	1.00
Religion	100	1.00
Marital status	96	0.78

There was a high degree of agreement between the first and second interviews for most of the non-sexual questions except for occupation. This is not surprising because Nigerians generally are reluctant to provide information on their occupation or income.

4.4.3.3. Network level – Interpersonal Factors

Sexual partner characteristics

Disassortative sexual/social mixing was defined as sexual mixing between partners from different countries, education, economic status, and age class. Respondents were asked if most of their male partners were younger, close to their age or older; of higher, same, or lower educational or income levels; if they were from the same tribe, an outside tribe, or from other African or non-African countries.

Respondents were also asked to classify the types and estimate the number of female and male sex partners they had had in their lifetime, as well as the number of partners they had had the previous year for each of four types of partners: (i) *regular* (male or female with whom respondent had penetrative sex on a regular basis); (ii) *non-regular* (male or female partner with whom respondent had sex on only one occasion including one-night stands and casual encounters; (iii) *sex client* (male or female sex partner who may or may not have been known to the respondent but who paid respondent money, drugs, clothing, or other goods and services in exchange for sex); (iv) *paid sex* (male or female partner unknown to the respondent who received money, drugs, or other goods and services from respondents in exchange for sex).

4.4.3.4. Individual level - Psychologic Factors

Perceived vulnerability to HIV and AIDS: Respondents were asked to assess their likelihood of contracting HIV by asking ‘what do you think are your chances of getting HIV?’ Responses were 1 (likely) and 0 (unlikely). A response of ‘likely,’ defined as high-risk perception, was assigned ‘1’ and ‘unlikely,’ defined as low risk perception, was assigned ‘0,’ yielding a binary variable.

Attitudes towards and frequency of condom use: Respondents’ attitudes towards condom use were assessed as well as frequency of condom use for vaginal and anal (with and without lubricant) sex. Information was also elicited on how often respondents experienced tearing or slippage of their condoms during anal intercourse in the past 12 months. Respondents’ attitudes toward using condoms with sexual partners were measured with a five-item scale (e.g., ‘using condoms takes the pleasure out of sex’), with responses ranging from 1 (strongly disagree) to 5 (strongly agree). Every negative statement (e.g., ‘a condom is not necessary if you know your partner’) was assigned a score of -1 (minus 1) and every positive statement (e.g. ‘I make sure I use a condom for anal intercourse with any male partner’) was assigned +1. The higher the aggregate positive score, the more positive respondents’ attitude to condom use.

Attitudes to STIs and HIV: A Likert scale of respondents’ agreement or disagreement to seventeen statements was used to measure attitudes toward HIV and AIDS. High aggregate negative scores indicated more negative attitudes and high aggregate positive scores indicated more positive attitudes. Separate measurement scales were developed to assess respondents’ attitudes toward STIs.

Non-disclosure of (or extent of concealment of) sexual identity: The study measured the extent to which respondents' sexual orientation was disclosed to others on a 5-point scale: **1** '*not out to anyone*'; **2** '*out to a third of people known*'; **3** '*out to half of people known*'; **4** '*out to three-quarters of people known*'; and **5** '*out to everyone*.' In addition, respondents indicated persons who were aware of their sexual orientation and whether they explicitly disclosed their sexual orientation to them.

Experiences of internalized or self-homophobia: Internalized-homophobia was defined as the degree to which individuals held negative attitudes toward themselves due to their sexual orientation and behaviours. It was measured using an eleven-item scale which included questions on homosexuality and its effect on level of comfort and how it affects relationship with friends and family members (the scale adequately captured internalized homophobia; Cronbach's $\alpha = 0.79$). Items included "*I am glad to be a man who has sex with men*," "*I wish I were heterosexual*," and "*Life as a homosexual is not as rewarding as life as a heterosexual*". A three-point Likert scale was used to assess each item with answers varying from "*strongly disagree*," "*neutral*," and "*strongly agree*" and having a score of -1 to 1 depending on the type of question. Questions favourable to homosexuality such as "*I am glad to be a man who has sex with men*," which denoted a positive attitude toward homosexual identity, were assigned a score of **-1**, **0** or **1** for strongly disagree, neutral, and agree, respectively, whereas a question like "*I wish I were heterosexual*" was assigned a score of **1**, **0**, and **-1** for strongly disagree, neutral, and agree, respectively. This created a balance in the scoring system and credited negative scores for questions suggestive of internalized homophobia. A composite index score was calculated with negative scores indicating the presence of internalized homophobia and the more negative the

scores, the higher the levels of internalized homophobia. Subsequently, the scores were re-categorized into binary variable “0/1,” with “0” representing all negative values, and 1 representing all values ≥ 0 and used as the dependent variable in the logistic regression. Sensitivity analyses conducted demonstrated that there were no differences in the associations between internalized homophobia (with the “0” scores grouped with the positive or negative values) and the HIV, HBV and HCV outcomes.

The scale was examined using principal component analysis, which showed that a scale with all 11 items was the best to adequately characterize internalized homophobia.

Self-esteem A 9-item scale was used to determine the extent to which respondents were satisfied with themselves (e.g., *‘I feel that I do not have much to be proud of’* or *‘On the whole I am satisfied with myself’*). Items were rated on a 5-point scale from **1** (strongly disagree) to **5** (strongly agree) and scored as **-1** for questions suggesting low self-esteem such as *‘sometimes I think I am no good at all’* and **1** for questions that indicated high self-esteem such as *‘I am able to do thing as well as other people.’* Next, a composite index score was calculated to indicate higher negative scores reflecting lower self-esteem.

4.4.3.5. Structural Factors

Experiencing hostility as a result of sexual orientation and sexual practices: For this study, hostility was measured using a 5-item scale. Respondents were asked to indicate which of the following hostile acts they experienced as a result of their sexual orientation: treated with disrespect; hassled by the police; beaten by ‘area boys’; insulted, threatened or ridiculed; and

target of gossip. Response categories were **1** for 'yes' and **0** for 'no.' Hostility was computed as aggregate scores across all 5 items. Hostility was experienced if the score was ≥ 1 .

Experiences of Poverty: Three questions were asked to measure recent experiences of poverty or financial hardship (*'in the past 12 months, how often did you run out of money for your basic necessities (food, shelter and clothing)?' 'In the past 12 months, how often have you had to borrow money from a friend or stranger to get by financially?' 'In the past 12 months, how often did you go without food for a whole day because you did not have money?'*) In response, respondents selected from 1 (always), 2 (sometimes), and 3 (never). Severe poverty was defined as experiencing poverty **always**. A respondent was categorised as experiencing moderate poverty if he experienced poverty **sometimes** and no experience of poverty if he **never** experienced any of the three items.

Comprehensive and correct knowledge of HIV: This 17-item composite scale was defined as correctly identifying ways of preventing HIV transmission and rejecting common misconceptions about HIV and AIDS. Items included questions regarding methods of transmission, physical indications of the presence of the virus, ability to cure AIDS, methods of prevention of HIV infection, etc. A binary outcome of '1' was assigned if questions were answered correctly and '0' if any of the questions were answered incorrectly. The aggregate score ranged from 0-17 with scoring 0-6 indicating 'poor' knowledge of HIV and AIDS; 7-12 indicating 'fair knowledge;' and 13-17 indicating 'good' knowledge of HIV and AIDS.

Table 6: Level of agreement between interviews on knowledge of HIV (n=24)

Items	% Agreement	Kappa
A person can get HIV from a toilet seat	71	0.48
HIV can be spread by mosquitoes	79	0.54
Anal sex is a less risky form of sex than vaginal sex for the spread of HIV	71	0.60
Spread of HIV is less when a man has sex with men than with women	63	0.52
A person can get HIV by sharing a glass of water with someone who has HIV	88	0.76
A pregnant woman with HIV can pass the virus to the baby	83	0.68
A man can get HIV if he has anal sex with a man	79	0.66
Eating healthy foods can keep a person from getting HIV	75	0.53
Using latex condom can lower a person's chances of getting HIV	88	0.76
A person can be infected with HIV and not know he/she is infected	88	0.72
There is a vaccine that can stop people from getting HIV	75	0.57
AIDS can be cured	67	0.55
You can usually tell if someone has HIV by looking at them	79	0.60
A person will not get HIV if he or she is taking antibiotics	88	0.61
A person can get HIV by swimming in the same pool with another who has HIV	88	0.64
Taking vitamins keeps a person from getting HIV	88	0.80
Coughing or sneezing can spread HIV	88	0.78

Table 6 shows that the percentage of agreement in the responses provided between interviews were high for six questions ('A person can get HIV by sharing a glass of water with someone who has HIV', 'A person can be infected with HIV and not know s/he is infected', 'Using latex condom can lower a person's chances of getting HIV', 'Taking vitamins keeps a person from getting HIV' and 'Coughing or sneezing can spread HIV') with Kappa coefficients of >0.70.

Social support: Social support was defined as the extent to which respondents had people (sexual partner, close friend, parent or family member, or colleague) to (i) depend on for help; (ii) count on to feel relaxed; (iii) accept them totally; and (iv) discuss sensitive issues related to their sexual relationships in the previous year. Response categories were **1** for 'yes' and **0** for 'no.'

Self-reported health care utilization & HIV/STI testing history: Respondents were asked about the last time they visited a health care facility and if they ever disclosed their sexual identity to their health care provider. Furthermore, they were asked to indicate if in the previous year they ever needed care but didn't seek it. Experience with HIV/STI testing was also elicited from the respondents.

4.4.3.6. Other sexual and social behaviours

Types and frequencies of sex acts: Respondents were asked about the type and frequency of penetrative and non-penetrative sex acts they engaged in during the previous year with their male and female sex partners: *insertive and receptive anal intercourse* with a condom, *insertive and receptive anal intercourse* without a condom, *insertive and receptive oral sex*, and *insertive vaginal sex (IVS)* with and without a condom. For example: *'did you insert your penis in your steady partner's anus with a condom in the past 12 months?'* *'Did your partner insert his penis in your anus without a condom in the past 12 months?'* *'Think of the past time you had anal intercourse with you steady male partner, was a condom used by you or your partner?'* These questions were asked in relation to the types (regular, non-regular, paid sex, and clients).

Table 7: Agreements between interviews on sexual identity and behaviours (n=24)

Items	% Agreement	Kappa
Sexual Identity	88	0.75
# of MSM friends personally known	71	0.72
Person first sexual experience was with	100	1.00
Age at sexual debut	63	0.73
Duration of same-sex activities	75	0.68
Type of sexual activity at first sex with a man	71	0.59
Type of sexual activity at first sex with a woman	88	0.73
Actual sexual activities in past 12 months	88	0.83
Total # of male and female partners in past year	83	0.79
# of male partners in past year	58	0.70
# of female partners in past year	100	1.00
Sex role (Top or bottom)	88	0.81
Sexual Preference	88	0.77
# of lifetime partners	71	0.65
Condoms tear during AI with male partner	83	0.71

Table 7 shows the levels of agreement of responses to sexuality measures were moderate to perfect. Respondents' first sexual contact with men and women and the number of female partners they had the previous 12 months had the highest Kappa of 1. Questions about the number of different sexual partners respondents had during their active sexual life were both quantitative and categorical. The numbers of female partners respondents reported were more reliably reported than male partners. There was a strong agreement between responses to numbers of partners.

Drug use: To elicit drug use, respondents were asked how often they 'sniffed, smoked, swallowed or injected marijuana, cocaine, heroin or native concoctions during the past 12 months.' Respondents were also asked if they consumed alcohol before or during sexual encounters with their male and female sex partners.

Table 8: Agreements between interviews on social habits (n=24)

Items	% Agreement	Kappa
Ever smoked	96	0.92
# of cigarettes smoked /day	100	1.00
Frequency of alcohol use in past 12 months	79	0.74
Ever used hemp	92	0.71
Used hemp in past 12 months	96	0.78
Ever used cocaine	100	1.00
Used Cocaine in past 12 months	100	1.00
Ever used valium	96	0.83
Used valium in past 12 months	92	0.46
Ever used Ecstasy, LSD, Opium, heroine	100	1.00

Questions relating to smoking and recreational drug use displayed very high percentage agreements and Kappa coefficients showed substantial agreements except on the use of valium (Table 8).

4.4. DATA ANALYSIS

After reviewing the data entered for accuracy, consistency, duplication, and completeness using Epiinfo, data were exported to STATA 12.0 and the RDS Analysis Tool (RDSAT 5.6) (Salganik 2004; Volz 2007) for further analyses.

A combination of univariable, bivariable and multivariable analytic methods were employed. Descriptive analysis was conducted adjusting for recruitment patterns, homophily, and differential sizes of participant's social networks using RDSAT (www.respondentdrivensampling.org). Thus, population estimates of the outcome variables (HIV, STIs, and HIV risk behaviours) adjusted for the networks size and recruitment patterns, 95% confidence intervals (CIs), number of waves and equilibrium proportions (Volz 2007) are presented. Equilibrium was calculated with a convergence radius of 2% of the sample estimate for the outcome variables in each of the study sites.

For the multivariable analyses, weights calculated based on respondents' personal social network sizes were derived from RDSAT and exported to STATA for the bivariable and multivariable analyses, thereby mitigating biases resulting from differential network sizes (Salganik 2004; Johnston 2008). In addition to including the seeds in all analyses conducted, we pooled data from Lagos and Ibadan for the multivariable analyses because of the small sample size obtained from Ibadan. Variables significant at the level of 0.2 in the bivariable logistic regression analyses were entered into multivariable logistic regression models to identify factors associated with the outcome variables while controlling for potential confounders.

Descriptive Analyses

Objectives 1a-c: Univariable analysis was performed for all key dependent and independent variables to characterize the study sample by examining frequency distributions for categorical variables, means and standard deviations for continuous variables and the amount and extent of missing data. A combination of date of birth, ethnicity and religion was used to identify probable duplicate respondents. Specifically, distribution of the study sample by key independent and dependent variables including socio-demographic characteristics, self-reported sexual identities (MSM and MSM/W) were examined for each study site and for the entire sample.

Prevalence and patterns of sexual behaviours were explored in terms of the types (unprotected or protected anal and vaginal sex), sex preference (whether respondent had sex exclusively with men or with men and women), patterns of condoms use, gender and number of sex partners, partner characteristics (regular, non-regular, paid sex workers, and clients), and HIV, HBV, and

HCV status. Mean numbers of lifetime sex partners and in past 12 months were computed for each respondent. Distributions found to be skewed were transformed.

Prevalence estimates of HIV, syphilis, hepatitis B, and hepatitis C and their respective 95% confidence intervals were estimated. Specifically, prevalence of HIV, syphilis, HBV, and HCV was calculated as [total number of positives/total specimens tested] x 100.

Bivariable Analyses: Associations between the independent variables (socio-demographic, personal, life-style, behavioural characteristics, etc.) and dependent variables (HIV, syphilis, HBV and HCV prevalence, and high-risk sexual behaviours (unprotected anal intercourse) were explored for the entire sample using Cochran-Mantel Haenszel Chi-squared tests or Fisher's exact tests for categorical data and presented with p values at the 0.2 level to identify predictor variables with significant associations with the outcome variables. Correlation analyses were conducted to examine the relationships between all variables. Finally, logistic regression analyses were conducted for discrete and continuous variables to describe bivariable relationships between the dependent (HIV, STI, and behavioural) variables and the independent study variables. Only variables with statistically significant association with the outcome variables at p-values of less than 0.2 were included in the multivariable models.

Multivariable Analyses

Objective 2 & 3: To examine factors associated with URAI, HIV, hepatitis B and C, the independent variables identified to be significantly associated with the outcome variables in the bivariable analyses were included in the multivariable models for each outcome. Multiple

logistic regressions were used to examine how each outcome variable was associated with clusters of covariates – individual/psychological, network, community level, and structural characteristics. For sexual behaviour outcomes - URAI, UIAI with men and UIAI with women, analyses were restricted to men who engaged in URAI, UIAI with men and UIAI with women respectively. The stages outlined by Kleinbaum and Hosmer and Lemeshow (variable specification, interaction, and confounding assessments) were employed in modelling the data to investigate associations between dependent and independent variables and build the multivariable models (Kleinbaum 1998; Hosmer 2000).

Model Building: To examine the importance of predictor variables, multiple versions of sequential regressions predicting the outcomes were conducted. The predictor variables were entered in blocks or cluster of variables as outlined in the conceptual framework starting first with UAI (URAI or UIAI with male or female); followed by individual, community, sexual network, structural and lastly, socio-demographic characteristics. For each outcome variable, several models of different specifications were built starting with the simplest core model to the more complex main effects models by adding a variable at a time using a p-value of 0.2 as the entry and removal criterion. Comparison of the coefficient of each of the variables with the coefficient from the model containing only the variable was done to identify variables that did not contribute to the model. In addition, interaction terms with the outcome variables were assessed by adding interaction terms to the model. Adjusted odds ratios (AORs) and 95% Wald's CIs adjusted for covariates are presented.

Test of goodness-of-fit was based on Likelihood Ratio (LR), Adjusted R^2 ; and Hosmer and Lemershow (HL) statistics, whereby a model with p-value greater than 0.05 was considered to be a good fit for the data. For all the outcome variables, the models with the best fit were selected.

CHAPTER 5

RECRUITMENT OF RESPONDENTS

5.1.1. Recruitment of Respondents

In Lagos, the first respondent was recruited on the 24th of April, 2006 and the last respondent was recruited on the 25th of July 2006. Recruitment in Ibadan commenced on the 10th of July 2006 and ended on the 19th of July, 2006.

Recruitment of respondents into this study was initiated by 25 respondents (15 in Lagos and 10 in Ibadan) purposively selected as the initial seeds representing diverse MSM community networks (young/old, married/single, employed/unemployed, educated/uneducated, etc.). Subsequently, 13 seeds were added in Lagos to boost the momentum of the recruitment. Thus, a total of 38 seeds (28 (73.4%) in Lagos and 10 (26.6%) in Ibadan) participated in the study.

All respondents in Ibadan were recruited by peers through the RDS strategy. However, in Lagos, a slight modification had to be made to the recruitment strategy by the 11th week when preliminary analysis revealed that respondents recruited were predominantly young from the lower socio-economic class. In addition, reports were received that some participants who were invited were unable to make their appointments because of their work schedules. Consequently, the decision was made by the community advisory committee for a third venue to be introduced where such participants were invited over the weekend. As obtained at other study sites, only men screened as MSM who were invited by peers (as evidenced by presenting their coupons)

and provided consent were interviewed at Planet One. Participants were informed about the study and interviewed by trained interviewers and counselors deployed to the venue in the privacy of well demarcated rooms. All of the study procedures in the other study sites were replicated and adhered to in Planet One except that the hours of operation of the RDS were Friday through Sunday. Participants who could not be interviewed were given further appointments and followed up by the research team. A total of 79 participants were interviewed at Planet One in Lagos.

Overall, the recruitment of the study participants spanned 14 weeks in Lagos and only two weeks (weeks 12 and 13) in Ibadan. Recruitment in Ibadan had to be terminated abruptly due to the arrest and detention of one of the interviewers by the Oyo State Security Service (SSS) for allegedly promoting same-sex activities. The interviewer was released a couple of days later, after the principal investigator was summoned to long sessions of interrogation.

5.1.2. Recruitment Dynamics

Figures 4-7 show the patterns of recruitment in Lagos and Ibadan which were essentially similar in both Lagos and Ibadan but for the abrupt termination of recruitment that occurred in Ibadan after two weeks. The peak of recruitment occurred on the 24th day of recruitment in Lagos and on the 3rd day of recruitment in Ibadan.

Recruitment was highest in the third wave of recruitment in Lagos and Ibadan although recruitment continued through to nine waves in Lagos and four in Ibadan suggesting that there was an appreciable sociometric depth of recruitment into the MSM community. Three coupons were given to respondents to recruit their peers into the study, however, the number of

respondents recruited varied widely with many (63.7%) recruiting zero, 14.2% recruiting one, 13.4% recruiting two and 9.7% recruiting three recruits (table not shown).

The relationship between recruiters and recruits also varied although more than three-quarters (77.5%) described their recruits as friends whilst 16.5% referred to their peers as sex partners.

Only 1.0% described their peers as family members.

Figure 4: Recruitment patterns in Lagos and Ibadan

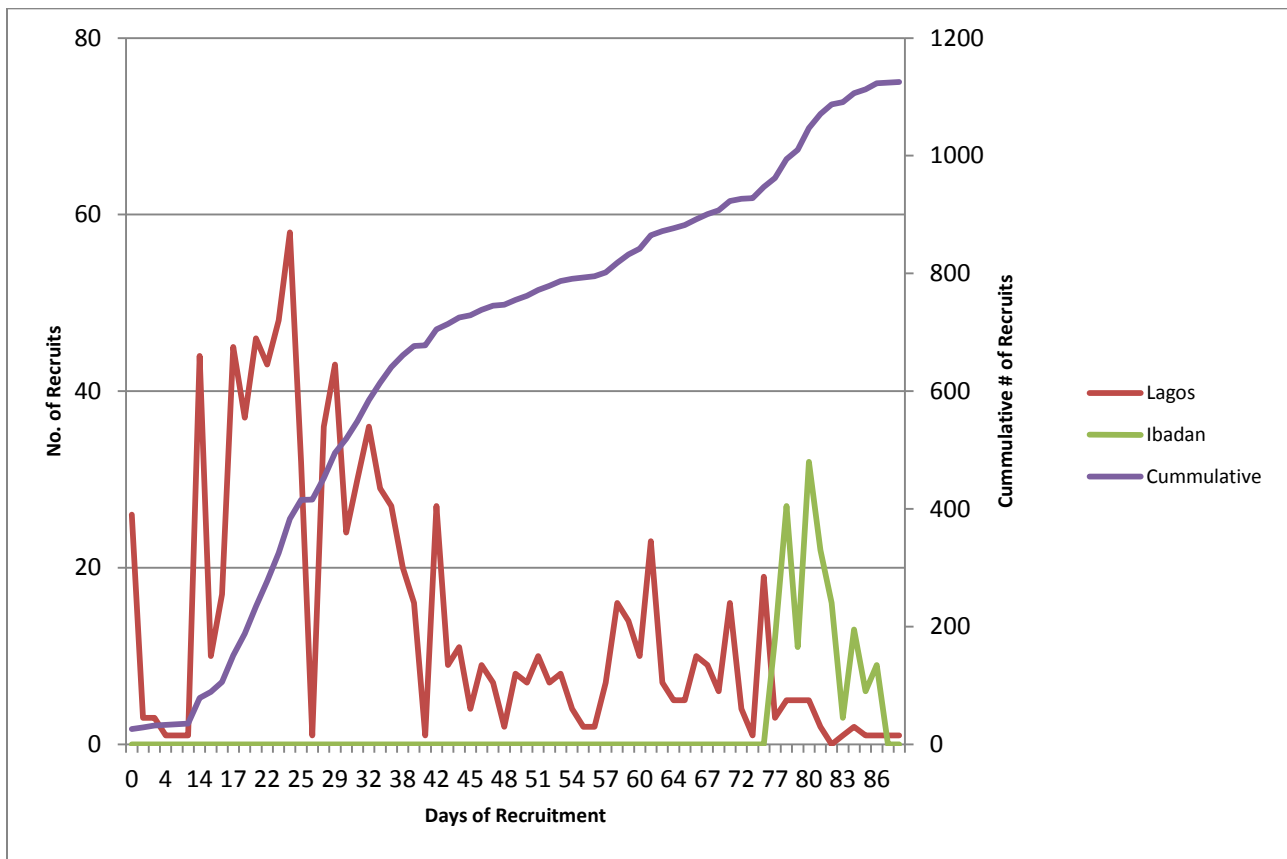


Figure 5: RDS Recruitment in Ibadan

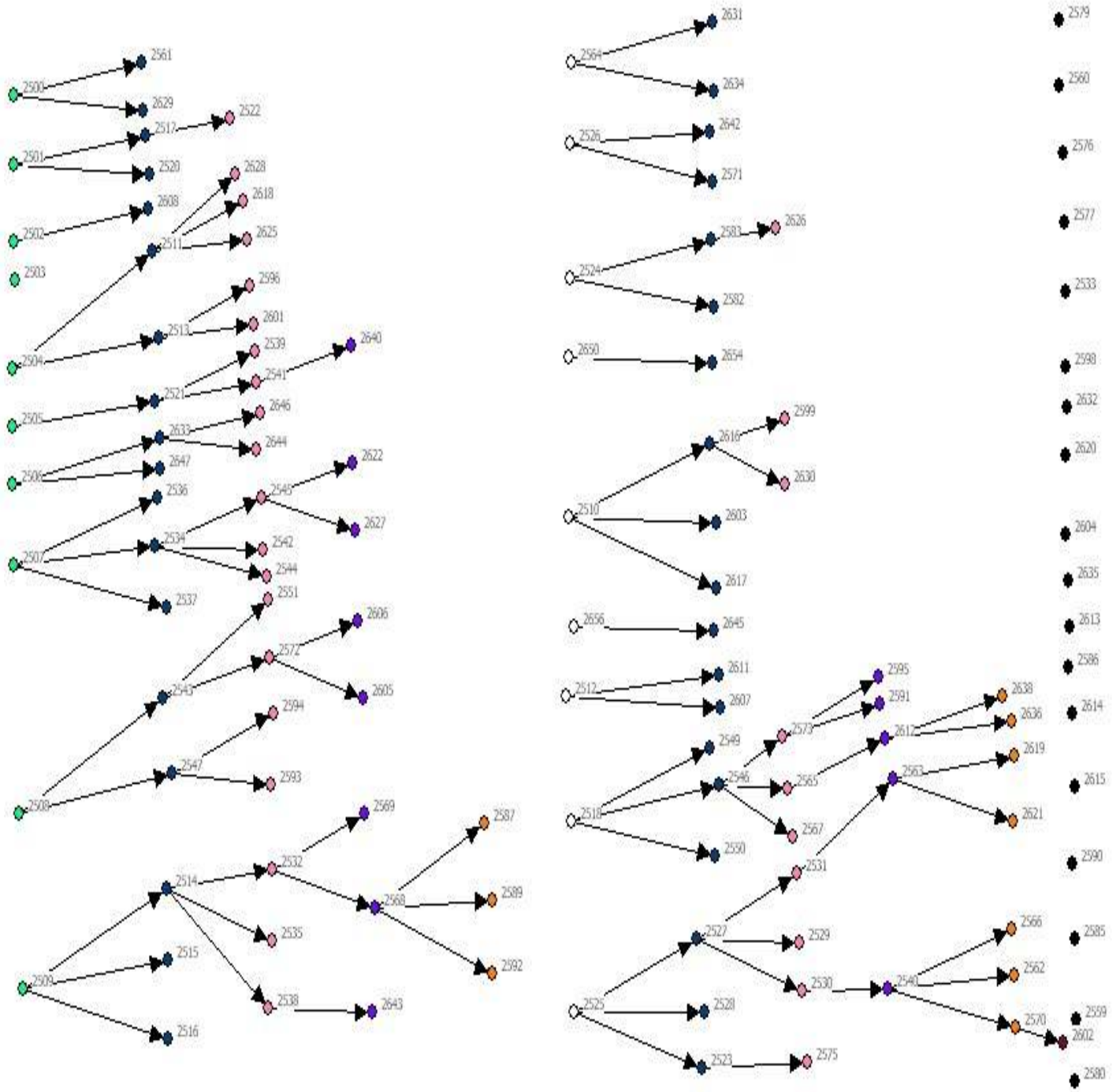


Figure 6: RDS Recruitment in Lagos

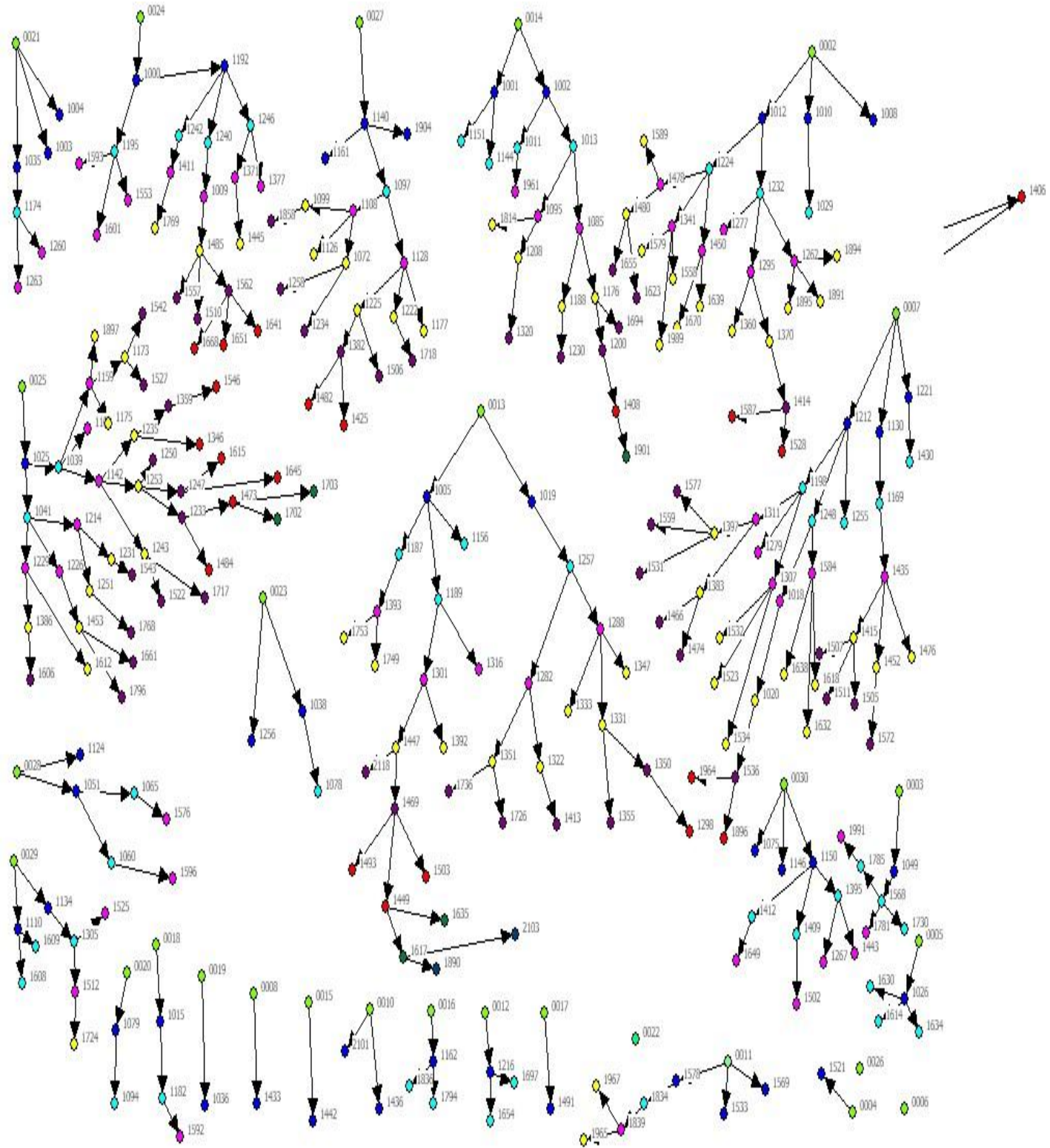
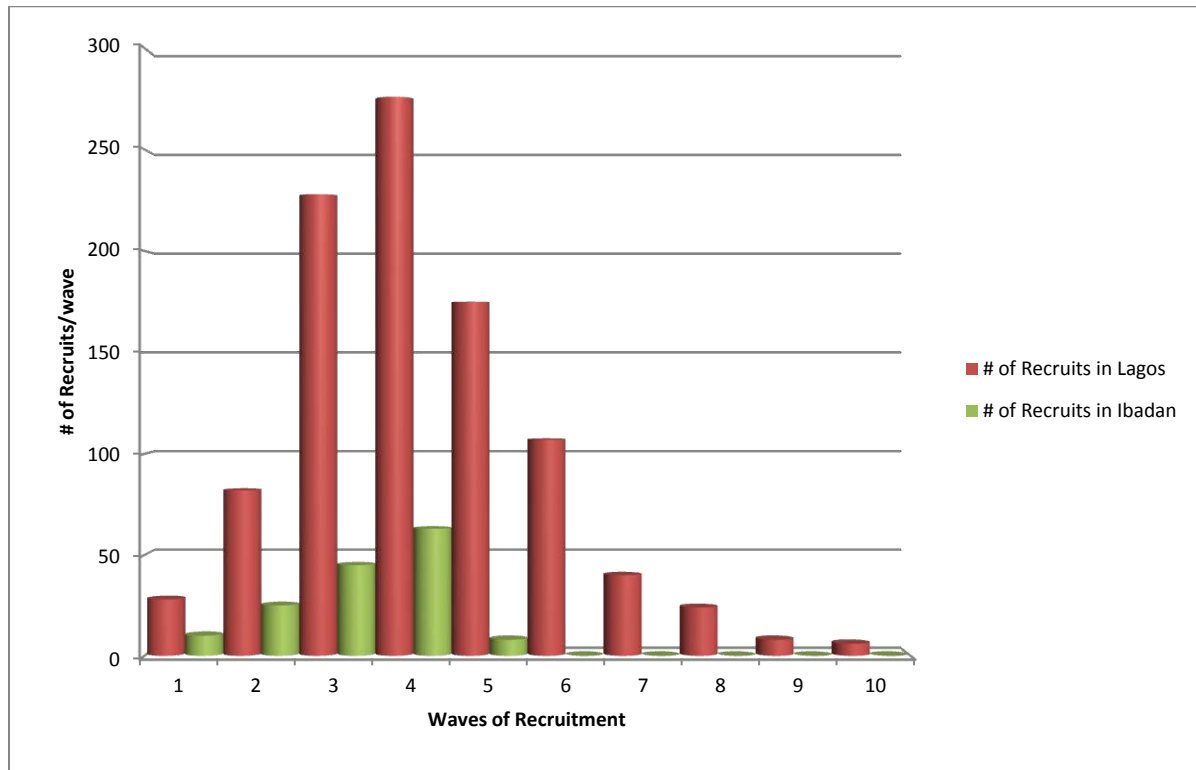


Figure 7 Number of Recruits per Wave



5.1.3. Comparison of retained and deleted data

In total, 1,226 men (1,065 in Lagos and 161 in Ibadan) were initially recruited through the RDS recruitment method into the Men’s Study, Nigeria. Of these, 101 observations (8.2%) were deleted due to incompleteness and inconsistencies in the data based on any of the criteria below (see Figure 8 below). Thus, the final sample for the study was 1,125 (92.8%) comprising 974 (87.0%) in Lagos and 151 (13.0%) in Ibadan.

Observations or questionnaires were considered for deletion if any of the following criteria was observed:

- If the participant ID was not provided.
- If reported sexual intercourse in the past 12 months was with ‘women only’.
- If respondent’s reported duration of same-sex activities was less than one year.

- If reported actual sexual activity in the past 12 months was with women only.
- If respondent's reported number of male partners in the past 12 months was zero.
- If respondents were not sexually active in the preceding year.
- If the reported lifetime number of male partners was zero.
- If respondent had never had sex with a man.
- If during the interview, the interviewer perceived that the respondent was restless, evasive, and inconsistent in his responses or admitted to not being gay.
- If the questionnaire was < 50% completed.

Figure 8: Flow Chart of Recruitment



Comparison of excluded data to the retained ones (Tables 10 and 11) showed that the excluded cases did not differ significantly from the retained data on most of the socio-demographic characteristics ($p \geq 0.05$). However, compared to the retained data, age of sexual debut with male partners was lower in the deleted data and fewer men (24.8%) identified as gay ($p < 0.05$). Furthermore, the deleted data had more participants who reported having higher lifetime female than male partners. Similarly, a slightly lower proportion of observations in the deleted data (80.4%) consented to being tested for HIV and fewer (7.3%) were reactive.

Table 10: Comparisons of the deleted and retained data – quantitative variables

Quantitative Variables	Retained Data (SD)	Deleted Data (SD)	P-values
Age distribution	Mean = 23.04 (4.2)	Mean = 23.7 (5.0)	0.3
Total school years	Mean = 12.77 (2.3)	Mean = 12.76 (2.2)	0.4
Sexual debut with female partners	Mean = 16.76 (2.7)	Mean = 16.54 (3.6)	0.6
Age of debut with male partners	Mean = 18.72 (5.1)	Mean = 17.29 (4.1)	0.002
Attitudinal scores on condom use	Mean = 3.31 (3.8)	Mean = 3.29 (3.8)	0.7
STI knowledge scores	Mean = 6.17 (3.1)	Mean = 6.08 (2.9)	0.8
HIV knowledge scores	Mean = 11.73 (3.8)	Mean = 11.91 (3.3)	0.6
Scores on attitudes to HIV	Mean = 6.37 (5.4)	Mean = 6.79 (5.5)	0.5
Scores on internalized homophobia	Mean = 1.16 (5.2)	Mean = 2.17 (5.5)	0.9

Table 11: Comparison of the deleted and retained data – categorical variables

Characteristics	Retained Data (1,125)	Deleted Data (101)	P value
Recruitment method			
Seeds	3.4%	0%	<0.05
RDS	92.7%	65.4%	
‘Social Event’	3.9%	34.6%	
Level of education			
Primary	3.2%	2.0%	0.80
Secondary	64.5%	65.7%	
Tertiary	32.3%	32.3%	
Ethnicity			
Hausa	1.8%	1.0%	0.53
Igbo	24.2%	16.8%	
Yoruba	57.9%	56.4%	
Others	14.4%	24.8%	
Religion			
Islam	18.8%	20.8%	0.69
Christianity	80.5%	78.2%	
Others	0.4%	1.0%	
Marital Status			
Married	2.7%	4.1%	0.34
Single	97.3%	95.9%	
Reported sexual identity			
Gay	44.2%	24.8%	<0.05
Bisexual	54.9%	70.3%	
Heterosexual	0.9%	4.9%	
# of lifetime Female Partners			
0-5	50.6%	32.0%	<0.05
6-20	39.4%	54.6%	
>20	10.0%	13.4%	
# of lifetime Male Partners			
0-5	46.4%	66.2%	<0.05
6-49	48.6%	26.8%	
50-99	3.6%	5.0%	
>100	1.4%	2.0%	
HIV Risk Perception			
Unlikely	7.9%	6.4%	0.87
Neutral	37.1%	37.5%	
Likely	55.0%	56.4%	
Ever been tested for HIV			
No	74.7%	71.6%	0.51
Yes	25.3%	28.4%	
Consented to have HIV test	96.4%	80.4%	<0.05
HIV Seropositivity	13.3%	7.3%	<0.05

5.1.4. Characteristics of the retained respondents

Table 12a provides data on the recruitment of respondents into the study. The majority of the retained respondents (96.1%) were interviewed within the Lagos University Teaching Hospital premises in Lagos and the ARN office in Ibadan (hereafter referred as pre-specified sites). Only 44 men (3.9%) were interviewed at the off-site Planet One venue.

Compared to respondents interviewed at Planet One, the 1081 MSM including the seeds interviewed at the pre-specified study sites in Lagos and Ibadan were significantly younger with median age of 22 years, most were from a lower socio-economic class as evidenced by the lower proportion (33.0%) with tertiary education, less than half employed (42%), and the higher proportion (87%) that had experienced poverty.

Also, a relatively lower proportion of MSM interviewed at LUTH and Ibadan (55.0%) than those interviewed at Planet One identified as bisexual, were married (2.8%) and were out of the closet (6.3%). With regards to vulnerability to HIV infection, more MSM interviewed at the pre-specified sites (8.4%) felt at high-risk of HIV, fewer (24.9%) had ever had an HIV test, and prevalence estimates of HIV and HBV were lower (13.2%).

Table 12b shows that the seeds (a subset of MSM interviewed at the pre-specified sites) were significantly older with a median age of 26 years, and a significantly higher proportion had tertiary education (55.3% vs. 32.9%), were gainfully employed (47.4% vs. 42.4%) and were married compared with their peers interviewed at the pre-specified sites. With regards to risky sexual activities, more seeds engaged in unprotected insertive anal intercourse with men and women and unprotected receptive anal intercourse with men. Similarly, prevalence of HIV, HBV

and HCV were highest among the seeds (33.3%, 20.6%, 5.9%) compared others interviewed at the pre-specified sites (12.5%, 11.2%, 3.2%) and at Planet One (17.1%, 17.5%, 2.5%).

This study has confirmed that respondent driven sampling (RDS) is an effective strategy for recruitment. Table 12c shows a steady increase in the number of respondents recruited through the waves of recruitment. In Lagos, the mean age of respondents decreased through waves of recruitment. Similarly, proportions of respondents reporting unprotected insertive and receptive anal intercourse with men and women decreased through subsequent waves of recruitment. Prevalence of HIV, HBV and HCV also followed a similar pattern with the highest prevalence recorded among the seeds decreasing through subsequent waves.

Table 12a: Characteristics of respondents by venue of interview

Characteristics	Pre-specified sites (1081)	Social Event (44)	P-value
Age (years)			
15-24	742 (68.6%)	16 (36.4%)	0.001
>= 25 years	339 (31.4%)	28 (63.6%)	
Median Age (years)	22	27	
Level of Education			
<= Secondary	716 (66.3%)	16 (36.4%)	0.001
>Secondary	364 (33.7%)	28 (63.6%)	
Employed	460 (42.5%)	27 (61.4%)	0.01
Marital Status			
Married	30 (2.8%)	3 (6.8%)	0.12
Single	1051 (97.2%)	41 (93.2%)	
Reported Sexual Identity			
Gay	486 (44.9%)	15 (34.1%)	0.16
Bisexual	596 (55.1%)	29 (65.9%)	
Experienced Poverty	936 (86.7%)	34 (77.3%)	0.08
HIV Risk Perception			
Low risk	993 (91.9%)	43 (97.7%)	0.16
High risk	88 (8.4%)	1 (2.3%)	
Ever been tested for HIV			
Yes	269 (24.9%)	17 (38.6%)	0.04
Extent of 'Outness'			
Closeted	1013 (93.7%)	38 (86.4%)	0.05
Out	68 (6.3%)	6 (13.6%)	
Experienced Int homophobia	363 (33.6%)	14 (31.8%)	0.8
Experienced hostility	324 (29.9%)	22 (50.0%)	0.005
Low self-esteem	112 (10.4%)	6 (13.6%)	0.5
HIV Positive	138 (13.2%)	7 (17.1%)	0.5
HBV Positive	120 (11.5%)	7 (17.5%)	0.3
HCV Positive	34 (3.3%)	1 (2.5%)	0.8
Experienced Condom Tearing	287 (26.6%)	16 (36.4%)	0.15
Sex with black African MSM	954 (88.9%)	34 (79.1%)	0.04
Sex with white African MSM	55 (4.8%)	11 (25.6%)	0.001
Had AI with female partners	149 (13.7%)	10 (22.7%)	0.01
Had UIAI with male partners	614 (56.8%)	28 (63.6%)	0.37
Had URAI with male partners	418 (38.7%)	16 (36.4%)	0.76

Table 12b: Comparison of Seeds vs. Others

Characteristics	Place of Interview			P-value
	Seeds (38)	LUTH/ARN (1043)	Planet One (44)	
Age (years)				
15 - 19	2 (5.3%)	187 (17.9%)	2 (4.5%)	0.001
20 - 29	27 (71.0%)	755 (72.4%)	26 (59.1%)	
>= 30 years	9 (23.7%)	101 (9.7%)	16 (36.4%)	
Median Age (years)	26 (19-42)	22 (15-54)	27 (19-38)	
Level of Education				
<= Secondary	17 (44.7%)	699 (67.1%)	16 (36.4%)	0.001
>Secondary	21 (55.3%)	343 (32.9%)	28 (63.6%)	
Employed	18 (47.4%)	442 (42.4%)	27 (61.4%)	0.04
Marital Status				
Married	3 (7.9%)	27 (2.6%)	3 (6.8%)	0.05
Single	35 (92.1%)	1016 (97.4%)	41 (93.2%)	
Reported Sexual Identity				
Gay	13 (34.2%)	472 (45.3%)	15 (34.1%)	0.15
Bisexual	25 (65.8%)	571 (54.7%)	29 (65.9%)	
Experienced Poverty	31 (81.6%)	905 (86.8%)	34 (77.3%)	0.14
Geo-political zone of origin				
North	1 (2.7%)	69 (6.7%)	4 (9.3%)	0.9
South West	18 (48.6%)	527 (51.1%)	21 (48.8%)	
South East	10 (27.0%)	204 (19.8%)	9 (20.9%)	
South South	8 (21.6%)	9 (20.9%)	9 (20.9%)	
HIV Risk Perception				
Low risk	28 (73.7%)	965 (92.5%)	43 (97.7%)	0.001
High risk	10 (26.3%)	78 (7.5%)	1 (2.3%)	
Ever been tested for HIV				
Yes	15 (39.5%)	254 (24.4%)	17 (38.6%)	0.01
Extent of 'Out				
Out	11 (28.9%)	57 (5.5%)	6 (13.6%)	0.05
Experienced Int homophobia	14 (36.8%)	349 (33.5%)	14 (31.8%)	0.8
Experienced hostility	9 (23.7%)	166 (15.9%)	11(25.0%)	0.14
Low self-esteem	3 (7.9%)	109 (10.5%)	6 (13.6%)	0.7
HIV Positive	12 (33.3%)	126 (12.5%)	7 (17.1%)	0.001
HBV Positive	7 (20.6%)	113 (11.2%)	7 (17.5%)	0.13
HCV Positive	2 (5.9%)	32 (3.2%)	1 (2.5%)	0.65
Experienced condom breakage	17 (44.7%)	270 (25.9%)	16 (36.4%)	0.01
Sex with black African MSM	8 (21.6%)	111 (10.7%)	9 (20.9%)	0.02
Sex with white Afr MSM	4 (10.8%)	47 (4.5%)	11 (25.6%)	0.001
Had AI with female partners	13 (34.2%)	136 (13.0%)	10 (22.7%)	0.001
Had UIAI with male partners	25 (65.8%)	589 (56.5%)	28 (63.6%)	0.35
Had URAI with male partners	20 (52.6%)	398 (38.2%)	16 (36.4%)	0.19

Table 12c Characteristics of Respondents in Successive RDS Waves

Distribution of Outcomes in Successive RDS Waves

Waves	Cumulative sample size		Mean Age		% UAI with FP		& UIAI with MP		% URAI with MP		% HIV+		% HBV+		%HCV+	
	LA	IB	LA	IB	LA	IB	LA	IB	LA	IB	LA	IB	LA	IB	LA	IB
0 (seeds)	28	10	26.2	24.8	39.3	20.0	67.9	60.0	60.7	30.0	34.6	30.0	20.8	20.0	8.3	0
1	82	25	24.1	26.4	22.0	28.0	63.4	60.0	47.6	56.0	25.9	24.0	17.3	12.0	7.4	4.0
2	228	45	22.8	25.2	9.6	11.1	54.8	64.4	38.6	26.7	13.1	11.4	9.5	25.0	2.3	0
3	276	63	24.3	24.1	11.6	11.1	55.4	50.8	39.1	30.2	12.7	6.3	10.0	19.0	4.6	0
4	175	8	23.6	25.6	17.7	-	58.9	50.0	37.1	33.1	10.1	0	13.0	-	1.8	12.5
5	107	-	22.3	-	13.1	-	55.1	-	36.4	-	10.6	-	48.0	-	3.8	-
6	40	-	22.2	-	10.0	-	62.5	-	40.0	-	2.6	-	7.9	-	2.6	-
7	24	-	22.8	-	20.8	-	58.3	-	29.2	-	14.3	-	9.5	-	0	-
8	8	-	21.9	-	12.5	-	62.5	-	37.5	-	25.0	-	0	-	0	-
9	6	-	22.7	-	0	-	16.7	-	33.3	-	16.7	-	0	-	0	-

CHAPTER 6

RESULTS

6.1. Descriptive Analyses of the Study Sample

Given the uniqueness of the respondent driven sampling technique, population proportion estimates (PPE)¹⁴ adjusted for respondent's network sizes and unadjusted estimates are presented per site except where unavailable.

6.2. Socio-demographic characteristics of the respondents

Table 13 shows that the study sample was relatively young, with a median age of 22.5 years and 66.0% [CI 56.9-74.2] from Ibadan and 78.2% [CI 75.5-80.8] from Lagos being youth aged 15-24 years. MSM from Ibadan were significantly older - 25.0 years (SD 4.8) than those from Lagos 23.5 years (SD 5.02) ($p < 0.001$). Although most respondents in both states had completed secondary education, over a third from Lagos had higher level of education having completed their tertiary education compared with 23.7% [95% CI 16.7-32.4] in Ibadan ($p < 0.0001$). A slightly higher proportion of MSM in Ibadan (34.1%) were gainfully employed compared to Lagos (24.7%). Although 40.5% (38.2% in Lagos and 55.2% in Ibadan) of those who reported being unemployed, were students. Using a 5-item composite measure of poverty, most of the respondents (90%) had experienced a form of poverty in the past 12 months.

¹⁴ PPEs are the proportion estimates calculated using RDSAT which accounts for respondent's network sizes and should be more representative of the characteristics found in the general population than sample proportions estimates calculated by dividing the number of respondents with characteristic of interest by the total sample size.

As expected, the majority of the respondents were Nigerians although there were 14 (1.2%) non-Nigerians among respondents in Lagos from neighbouring West African countries (Benin Republic, Ghana, Sierra Leone and Togo), Britain, Estonia and Lebanon. As typified by the cosmopolitan nature of Lagos and Ibadan, the six geo-political zones¹⁵ and all ethnicities were represented in the study sample although most were from the South West and the least from the North East. In both Lagos and Ibadan, Yoruba (54.8%) and Ibo (24.6%) ethnicities predominated although there were significantly more Yorubas in Ibadan (72.8%) than in Lagos (52.0%).

The majority of respondents (83.0%) in both states were Christian. All Christian and Muslim denominations were represented in the study sample although Pentecostals and Catholics predominated among Christians and Ahmadiyahs among Muslims. The majority of the respondents in Lagos and Ibadan were single although there were four times more married men in Ibadan (6.1%) than in Lagos (1.4%) ($p=0.01$). Furthermore, more MSM in Lagos (65.1%) than in Ibadan (55.0%) ($p<0.01$) reported a high probability of getting married in future.

Circumcision was very common as majority of the respondents (99.5%) in both Ibadan and Lagos reported being circumcised.

Respondents met other MSM through a variety of ways and at several meeting places. The most common ways included introduction from friends (83.6%), meeting at social events (55.4%) and via the internet (43.0%).

¹⁵ Nigeria is divided into thirty-six states and one Federal Capital Territory, which are further sub-divided into 774 Local Government Areas (LGAs). The states are aggregated into *six geopolitical zones*: North West (NW), North East (NE), North Central (NC), South East (SE), South South (SS), and South West (SW). Nigeria has six cities with a population of over 1 million people (from largest to smallest: Lagos, Kano, Ibadan, Kaduna, Port Harcourt, and Benin City). Lagos is the largest city in sub-Saharan Africa, with a population of over 15 million.

Table 13: Socio-demographic characteristics of the study sample

<i>Characteristics</i>	<i>Lagos (n=974)</i>		<i>Ibadan (n=151)</i>		<i>P-value</i>	<i>Pooled (n=1125)</i>
	<i>Unadjusted % (n)</i>	<i>Adjusted¹⁶ % (95% CI)</i>	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>		<i>Unweighted % (N)</i>
Age [mean; SD]	23.5 (SD 5.02)	n/a*	24.9(SD 4.8)	n/a	0.001	23.7 (SD 0.15)
Age (yrs)						
15-19	18.7 (182)	29.1 (25.8-33.3)	6.0 (9)	12.7 (3.8-22.0)	0.001	17 (191)
20-29	70.6 (688)	66.7 (62.3-70.0)	79.5 (120)	78.9 (70.0-89.1)		71.8 (808)
30-39	9.3 (91)	4.0 (2.6-5.6)	13.2 (20)	7.5 (1.9-12.1)		9.9 (111)
≥ 40	1.3 (13)	0.2 (0.0-0.5)	1.3 (2)	1.0 (0.2-2.4)		1.3 (15)
Education						
Primary	2.9 (28)	8.9 (4.5-14.0)	2.6 (4)	9.0 (4.1-14.4)	0.0001	2.8 (32)
Secondary	65.6 (638)	56.8 (47.2-66.1)	41.1 (62)	67.3 (58.5-75.0)		62.2 (700)
Tertiary	31.6 (307)	34.3 (24.7-44.1)	56.3 (85)	23.7 (16.7-32.4)		35 (392)
Employment						
Unemployed	71.4 (688)	75.3 (71.4-78.3)	62.9 (95)	65.9 (55.0-78.6)	0.07	70.3 (783)
Part-time	6.7 (65)	5.9 (4.3-7.7)	10.6 (16)	7.3 (1.1-13.3)		7.3 (81)
Fulltime	21.8 (210)	18.8 (16.0-22.5)	26.5 (40)	26.8 (17.3-36.1)		22.4 (250)
Marital status						
Single	97.7 (952)	98.6 (97.5-99.5)	92.7 (140)	93.9 (91.8-99.0)	0.01	97.1 (1092)
Married	2.3 (22)	1.4 (0.5-2.5)	7.3 (11)	6.1 (1.0-8.2)		2.9 (33)
Will Marry?						
Very unlikely	12.5 (119)	13.6 (10.5-16.8)	2.9(4)	6.1 (1.2-11.8)	0.001	11.2 (119)
Undecided	22.4 (214)	21.3 (18.5-24.9)	30.7 (43)	39.0(29.8-52.5)		23.5 (257)
Very likely	65.1 (622)	65.1 (6.1-68.7)	66.4 (93)	54.9 (40.8-65.3)		65.3 (715)
Religion						
Christian	80.8 (785)	82.7 (73.7-89.5)	80.7 (121)	82.7 (73.3-89.3)		80.7 (906)
Muslim	18.7 (182)	17.3 (10.5-26.3)	19.3 (29)	17.3 (10.7-26.8)		18.8 (211)
Other	0.5 (5)	--	0	--		0.5 (5)
State of Origin						
North West	1.3 (13)	0.8 (0.2-1.3)	1.3 (2)	0.6 (0-2.3)	<0.001	1.3 (15)
North East	0.2 (2)	0.5 (0-1.0)	0	0		0.2 (2)
North Central	5.1 (50)	5.0 (3.5-6.5)	4.6(7)	5.0 (1.6-10.3)		5.1 (57)
South West	47.4 (461)	49.9 (46.3-53.5)	69.5 (105)	77.5 (67.9-85.2)		50.4 (566)
South East	21.0 (204)	18.0 (15.1-20.6)	12.6 (19)	5.1 (2.2-10.3)		19.9 (223)
South South	23.8 (231)	25.1 (22.3-28.6)	11.9 (18)	11.8 (5.2-18.3)		22.2 (249)
Non Nigerian	1.1 (11)	0.9 (0.3-1.6)	0	0		1.0 (11)
Experienced poverty	85.8 (832)	89.5 (86.4-92.0)	88.7 (134)	89.7 (86.5-96.2)		>0.05
Circumcision						
Yes	99.5 (969)		99.3 (150)		0.82	99.5 (1119)
No	0.5 (5)		0.7 (1)			0.5 (6)

*Adjusted estimates not available from RDSAT.

¹⁶ Adjusted estimates are proportion estimates calculated using RDSAT which accounts for respondent's network sizes and believed to be more representative than sample proportions estimates calculated by dividing the number of respondents with characteristic of interest by the total sample size.

6.3. Sexual history and sex partner characteristics

Table 14 shows that most respondents in Lagos and Ibadan experienced their first sexual encounter with a female at a slightly earlier median age of 17 [IQR 15-18] compared to their first sexual encounter with a male, reported at a median age of 18 [IQR 15-20] years. The mean ages at sexual debut with women (17.2 years) and men (19.2 years) were significantly higher in Ibadan than Lagos (16.6 years and 17.3 years, respectively). Furthermore, a significantly higher proportion of MSM in Lagos (52.9%) than in Ibadan (33.4%) had their first sexual experience with a man, more than half of whom were older men ($p < 0.0001$).

With regard to reported sexual identity, more than half of the MSM in Lagos and Ibadan self-identified as bisexual/straight although many of the respondents (>55%) had sexual preferences for men. During penetrative sexual encounters with men, half of the respondents described themselves as ‘tops’ (i.e., the insertive partner) and a significantly higher proportion in Lagos (33.7%) than in Ibadan (22.7%) described themselves as versatile or ‘*deydah*’ i.e., both top and bottom.

Whereas more than half of the respondents reported sex with older men in both sites, a significantly higher proportion of respondents in Ibadan (66.6%) than in Lagos (42.1%) reported sex with females who were of the same age or younger.

Male partners of respondents came from within and outside of Nigeria. Whilst most had male sex partners from within and outside of their tribes, significantly more MSM from Lagos (20%) than Ibadan (7%) reported having male partners from within and outside of Africa. Similarly, the male partners of many respondents (>65%) were reported to have higher education and income.

Table 14: Sexual history and characteristics of respondents' sex partners

<i>Characteristics</i>	<i>Lagos (974)</i>		<i>Ibadan (151)</i>		<i>Pvalue</i>	<i>Pooled Unweighted</i>
	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>		
Age of sex debut						
With a man	17.3 (SD 3.9)	n/a	19.2 (SD 4.0)	n/a	0.0001	17.6 (4.0)
With a woman	16.6 (SD 3.6)		17.2 (SD 3.5)		0.048	16.7 (3.5)
Sex debut with						
A man	52.9 (515)	52.8 (49.3-56.2)	29.1 (44)	33.4 (25.5-42.5)	0.001	49.7 (559)
A woman	47.1 (459)	47.2 (43.4-50.9)	70.1 (107)	66.6 (57.5-74.5)		50.3 (566)
Age 1st male partner						
Older	57.7 (562)	53.6 (50.6-57.1)	56.3 (85)	59.0 (49.4-66.9)	>0.05	57.5 (647)
Same age	33.7 (328)	35.5 (32.1-38.5)	31.8 (48)	28.9 (22.1-35.3)		33.4 (376)
Younger	8.6 (84)	10.9 (8.4-13.3)	11.9 (18)	12.1 (7.7-18.9)		9.1 (102)
Sex preference						
With a man	55.9 (544)	54.7 (51.1-58.5)	58.9 (89)	63.3 (55.0-72.2)	>0.05	56.3 (633)
With a woman	15.6 (152)	17.0 (14.3-19.8)	15.9 (24)	12.3 (6.4-18.5)		15.6 (176)
With both	28.5 (278)	28.4 (24.8-31.6)	25.2 (38)	24.5 (16.7-32.0)		28.1 (316)
Sexual identity						
Straight	3.0 (3)	0.4 (0-0.7)	0	0	0.11	
Bisexual	54.1 (527)	51.7 (48.5-57.1)	62.9 (95)	55.6 (41.5-69.0)		55.6 (625)
Gay (homosexual)	45.6 (444)	45.8 (19.5-26.6)	37.1 (56)	44.4 (12.9-32.6)		44.4 (500)
Sex role						
Top	45.7 (445)	50.1 (46.3-53.6)	56.3 (85)	55.5 (44.9-65.4)	0.04	47.1 (530)
Bottom	20.3 (198)	16.2 (13.8-18.9)	18.5 (28)	21.9 (13.0-31.1)		20.1 (226)
Deyda	34.0 (331)	33.7 (10.4-37.5)	25.2 (38)	22.7 (15.6-31.5)		32.8 (369)
Age male partners						
Mostly younger	10.0 (97)	10.1 (8.0-12.2)	12.6 (19)	9.7 (5.1-15.1)	0.01	10.3 (116)
Same age & younger	9.3 (91)	9.5 (7.7-11.3)	13.2 (20)	11.6 (5.6-17.3)		9.9 (111)
Same age	15.0 (146)	17.3(14.7-19.9)	19.9 (30)	19.2 (12.5-25.1)		15.6 (176)
Same age & older	30.9 (301)	30.3 (27.0-33.9)	17.2 (26)	18.2 (12.0-25.4)		29.1 (327)
Mostly older	34.8 (339)	32.8 (29.4-36.4)	37.1 (56)	41.3 (32.4-51.4)		35.1 (395)
Age female partners						
Mostly younger	34.5 (345)	33.0 (29.9-36.0)	12.6 (19)	54.9 (45.9-64.9)	0.0001	38.3 (431)
Same age & younger	9.1 (89)	9.1 (7.1-11.1)	13.2 (20)	11.7 (6.8-18.0)		9.2 (103)
Same age	10.7 (104)	10.4 (8.3-12.4)	19.9 (30)	6.9 (3.1-10.2)		10.7 (120)
Same age & older	7.3 (71)	7.5 (5.9-9.4)	17.2 (26)	8.8 (4.3-14.1)		7.2 (81)
Mostly older	5.7 (56)	6.7 (5.1-8.5)	37.1 (56)	1.5 (0-3.5)		5.3 (60)
Not Applicable	31.7 (309)	32.8 (29.6-36.3)	13.9 (21)	16.4 (8.1-23.6)		29.3 (325)
Origin of MP						
Same tribe	71.5 (694)	69.4 (65.7-72.6)	81.5 (123)	81.7 (73.8-89.8)	0.01	72.8 (817)
Outside tribe	76.9 (743)	74.7 (71.7-77.9)	70.1 (45)	56.4 (47.7-68.6)	0.07	76.0 (849)
Black African MSM	12.4 (120)	7.1 (5.4-8.9)	5.3 (8)	4.1 (1.1-7.7)	0.01	11.5 (128)
White African MSM	6.1 (59)	2.4 (1.6-3.4)	2.0 (3)	1.2 (0-2.7)	0.04	5.6 (62)
Non-African whites	14.1 (136)	7.3 (5.9-8.9)	8.6 (13)	2.6 (0.5-5.0)	0.06	13.3 (149)
Non-African blacks	6.5 (63)	3.1 (2.2-4.2)	1.3 (2)	0	0.11	5.8 (65)
Education of MP						
Higher	64.2 (621)	56.6 (52.7-60.1)	57.6 (87)	59.8 (49.4-68.1)	>0.05	63.3 (708)
Same	27.6 (267)	34.0 (30.8-37.4)	34.4 (52)	33.1 (25.0-43.9)		28.5 (319)
Lower	8.3 (80)	9.5 (7.4-11.5)	7.9 (12)	7.1 (2.7-11.6)		8.2 (92)
Income of MP						
Higher	73.1 (709)	69.8 (66.5-73.3)	63.6(96)	65.3 (59.4-74.7)	0.05	71.8 (805)
Same	17.6 (171)	20.7 (17.7-23.7)	24.5 (37)	22.9(14.5-29.0)		18.6 (208)
Lower	9.3 (90)	9.5 (7.5-11.6)	11.9 (18)	11.8 (6.1-17.4)		9.6 (108)

MP = Male Partners

6.4. Smoking, Alcohol, Drugs and Sex

Smoking was reported by 38.0% of MSM in Ibadan and 27.3% from Lagos. Fewer respondents in Lagos (60%) than in Ibadan (75%) admittedly consumed alcohol in the past 12 months.

One-sixth of the respondents in Lagos and Ibadan reported substance use, particularly the locally brewed concoctions. Very few respondents in Lagos (3.5%) and Ibadan (7.0%) reported substance use before sexual encounters.

Table 15: Type and patterns of substance use by respondents

<i>Characteristics past yr</i>	<i>Lagos</i>		<i>Ibadan</i>		<i>P-value</i>	<i>Pooled Unweighted</i>
	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>		
Ever smoked	31.2 (322)	27.3 (23.5-30.9)	41.7 (63)	38.1 (28.9-48.5)	0.04	34.2 (385)
Freq of smoking						
Daily	19.5 (62)	17.6 (8.7-35.4)	32.8 (20)	57.8 (--)	0.05	21.6 (82)
Regularly	15.1 (48)	15.8 (5.0-19.7)	16.4 (10)	14.1 (2.9-32.1)		15.3 (58)
Occasionally	41.8 (133)	38.3 (28.4-50.0)	39.3 (24)	28.1 (--)		41.1 (157)
Not at all	23.6 (75)	28.4 (17.3-39.3)	11.5 (7)	0		21.6 (82)
Drank alcohol past Year	34.4 (335)	39.1 (35.0-43.3)	25.8 (39)	25.3 (11.6-29.3)	>0.05	33.2 (374)
Pattern of drinking						
Before sex with men	45.7 (290)	--	41.1 (46)	--	0.05	45.0 (336)
Before sex with women	34 (210)	--	29.5 (33)	--	0.002	33.2 (243)
After sex with men	32.7 (271)	--	38.4 (43)	--	0.001	42.1 (314)
Substance Use						
Yes	63.2 (616)	--	63.6 (96)	--	>0.05	63.3 (712)
Marijuana	9.0 (88)	9.4 (6.3-11.0)	13.9 (21)	12.7 (6.8-18.9)	0.03	10.6 (109)
Local Concoctions	55.0 (498)	57.4 (52.3-60.9)	64.3 (81)	68.8 (56.9-77.8)	>0.05	51.5 (579)
Used drugs beforesex						
Yes	5.6 (46)	3.5 (1.5-6.1)	5.5 (7)	6.9 (0-8.3)	>0.05	4.7 (53)

6.5. Sexual behaviours of respondents

6.5.1. Respondents' sexual behaviours with women

More than two-thirds of MSM (67.9%) in Lagos and 85.3% in Ibadan reported lifetime sex with a woman. Overall, 569/1125 respondents (50.6%) comprising 49.7% (484/974) in Lagos and 56.3% (85/151) in Ibadan reported having female sex partners in the year preceding the study. Of these, the majority (462/569) (81.0% (391/484) in Lagos and 90.0% (85/151) in Ibadan) had regular female partners; slightly more respondents from Lagos (45.3%) than Ibadan (41.0%) had non-regular female partners and one-eighth of MSM from Lagos and 6.0% from Ibadan reported paying female partners for sex.

In the month preceding the study, more than 60.0% of respondents from both Ibadan and Lagos reported penetrative sex with their regular female partners and 47.0% vs. 57.6% with their non-regular female partners in Lagos and Ibadan, respectively.

Respondents had both vaginal intercourse (VI) and anal intercourse (AI) with female partners. In the previous year, 191 respondents (191/462) comprising 41.4% (162/391) from Lagos and 40.8% (29/71) from Ibadan reported AI with their regular female partners. One hundred and seven out of 298 (35.9%) respondents consisting of 37.9% (99/261) in Lagos and 21.6% (8/37) in Ibadan reported engaging in AI with their non-regular female partners and forty-three out of 73 MSM (58.9%) in Lagos and Ibadan reported AI with their paid female sex partners. A significant proportion of respondents the AI acts were unprotected, as 66.0% from Lagos and 53.0% from Ibadan reported unprotected AI with regular female partners, 47.5% from Lagos and

50.0% from Ibadan with non-regular female partners, and 43.6% from Lagos and 25.0% from Ibadan with paid female sex partners.

Condom use during the last sex with female sex partners varied depending on the type of partner. Whilst only 22% of MSM in Lagos and 27% from Ibadan reported condom use during their last sexual encounter with regular female partners, more than 70% reported condom use with their non-regular and paid female sex partners in both study sites.

Table 16: High-risk sexual behaviours of respondents with women***

<i>Characteristics in past 12 months</i>	<i>Lagos</i>		<i>Ibadan</i>		<i>Pooled</i>
	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unweighted</i>
Lifetime # partner					
>= 20	9.0 (88)	7.6 (5.8-9.4)	12.6 (19)	16.7 (10.0-19.7)	9.5 (107)
11-19	7.4 (72)	6.0 (4.6-7.8)	6.6 (10)	3.2 (0.6-7.5)	7.3 (82)
6-10	12.2 (119)	11.7 (9.8-14.2)	11.9 (18)	6.8 (3.0-13.2)	12.2 (137)
3-5	18.3 (178)	18.3 (15.7-21.5)	29.1 (44)	25.9 (17.4-35.7)	19.7 (222)
1-2	23.3 (227)	24.2 (19.6-28.6)	26.4 (40)	32.7 (20.5 -43.3)	23.7 (267)
0	29.8 (290)	32.1 (28.4-35.5)	13.2 (20)	14.7 (0.86-25.3)	27.6 (310)
# Part past Year					
>=3	20.9 (204)	20.5 (18.9-31.7)	19.2 (29)	12.9 (0-29.4)	20.7 (233)
1-2	28.8 (280)	31.0 (26.0-35.8)	37.1 (56)	42.0 (23.9-62.1)	29.8 (336)
0	50.3 (490)	48.5 (44.6-52.0)	43.7 (66)	44.7 (34.6-56.0)	49.4 (556)
Female Partners r	49.7 (484)	51.5 (47.8-55.3)	56.3 (85)	55.3 (45.7-66.6)	50.6 (569)
Female Partners					
Regular Partners	80.8 (391)	80.9 (74.5-86.9)	83.5 (71)	90.2 (67.2-100)	81.2 (462)
Non-Regular P	53.9 (261)	45.3 (38.8-59.3)	43.5 (37)	41.0 (13.8-60-8)	52.4 (298)
Paid sex Part	13.4 (65)	12.5 (9.1-20.4)	9.4 (8)	5.9 (0-16.4)	12.8 (73)

#Regular Partners					
Unprotected VI					
1	60.4 (238)	58.1 (48.3-67.6)	69.0 (49)	79.0 (54.3-100)	62.1 (287)
2-4	34.0 (133)	39.0 (28.6-47.2)	29.6 (21)	21.0 (0-45.8)	33.3 (154)
>=5	5.6 (20)	2.9 (0.6-8.3)	1.4 (1)	0	4.5 (21)
Unprotected AI					
1	62.6 (67)	66.6 (--) [†]	52.6 (10)	41.6 (--)	16.7 (77)
2-4	32.7 (35)	33.4 (--)	42.1 (8)	33.7 (--)	9.3 (43)
>=5	4.7 (5)	0	5.3 (1)	24.7 (--)	1.3 (6)
CD use past Yr					
Sometimes	38.6 (151)	65.7 (60.9-75.2)	38.0 (27)	53.0 (39.7-66.6)	38.5 (178)
Never	61.4 (240)	34.3 (24.8-39.1)	62.0 (44)	47.0 (33.5-60.3)	61.5 (284)
CD* use at past sex					
Yes	21.9 (85)	21.7 (15.0-27.2)	22.5 (16)	26.6 (12.3-37.8)	22.0 (101)
# NR** Partners					
Unprotected VI					
1	42.7 (61)	30.5(--)	33.3 (5)	21.0 (--)	22.1 (66)
2-4	39.2 (56)	29.5 (--)	40.0 (6)	22.1 (--)	20.8 (62)
>=5	18.2 (26)	40(--)	26.7 (4)	56.9 (--)	10.1 (30)
Unprotected AI					
1	51.1 (24)	--	25.0 (1)	--	8.4 (25)
2-4	29.8 (14)	--	75 (3)		5.7 (17)
>=5	19.1 (9)	--	0		3.0 (9)
Freq. CD Use					
Always	16.9 (44)		24.3 (9)		17.8 (53)
Sometimes	52.9 (138)		56.8 (21)		53.4 (159)
Never	30.3 (79)		18.9 (7)		28.9 (86)
CD use at past sex					
Yes	73.8		83.8 (31)		73.8 (220)
# Paid Sex Partners					
Unprotected VI					
1	35.7 (10)	13 (--)	33.3 (1)	--	15.1 (11)
2-4	35.7 (10)	64.4(--)	66.7 (2)		16.4 (12)
>=5	28.6 (8)	22.5(--)	0		11.0 (8)
Unprotected AI					
1	58.8 (10)	--	100 (1)	--	15.1 (11)
2-4	23.5 (4)		0		5.5 (4)
>=5	17.6 (3)		0		4.1 (3)
Freq. of CD Use					
Always	78.5 (51)	--	87.5 (7)	--	79.4 (58)
Sometimes	21.5 (14)		12.5 (1)		20.5 (15)
CD use at past sex					
Yes	76.9 (50)	--	87.5 (7)	--	78.1 (57)
HIV status of FP					
Known	5.8 (28)	4.6 (1.7-7.7)	11.9 (10)	8.1 (0-22.3)	6.7 (38)

CD* = Condom; NR**= Non Regular *** Analyses restricted to only men who reported sexual activities with women.; [†] No adjusted estimates due to small sample size

6.6. Sexual Behaviours with Non-Commercial Male Partners

All respondents had had at least one male partner in the previous year. Over one-half of the respondents in Lagos and Ibadan reported 3-10 lifetime male partners. More respondents from Ibadan (66.0% and 90.2%) than Lagos (49.0% and 81.0%) had regular and non-regular male partners, respectively. The majority of the respondents (>95%) engaged in insertive and receptive AI with different types of male partners.

Although the majority of the respondents (>80%) reported ever using condoms with male partners in the previous year, condom use was generally lower for receptive anal intercourse (RAI) than for insertive anal intercourse (IAI). More respondents in Ibadan (39.5% and 28.0%) than Lagos (36.2% and 25%) reported UIAI and URAI, respectively with their regular male partners. With non-regular male partners, 52% and 35.6% respondents in Lagos reported UIAI and URAI, respectively. More than half of the respondents reported condom use with regular and non-regular male partners during their past sexual encounters.

Table 17: Sexual behaviours of respondents with non-commercial male partners*

<i>Characteristics</i>	<i>Lagos</i>		<i>Ibadan</i>		<i>Pooled</i>
	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unweighted</i>
Lifetime # of partners					
>= 500	1.0 (10)	1.2 (0.6-2.3)	1.3 (2)	0.2 (0-0.8)	1.1 (12)
100-499	3.3 (32)	2.2 (1.4-3.2)	7.9 (12)	3.6 (1.0-6.3)	3.9 (44)
50-99	6.8 (66)	4.4 (3.3-6.3)	7.9 (12)	5.0 (1.3-9.8)	6.9 (78)
20-49	10.2 (99)	7.5 (5.9-9.2)	4.6 (7)	2.0 (0-4.7)	9.4 (109)
11-19	10.1 (98)	7.8 (6.2-9.6)	9.3 (14)	7.4 (2.8 -12.3)	10.0 (112)
6-10	28.0 (273)	26.6 (24.0-29.9)	26.5 (40)	22.5 (12.9-29.2)	27.8 (313)
3-5	28.2 (275)	32.0 (28.4-34.7)	27.2 (41)	38.3 (30.5-49.1)	28.1 (316)
2	9.3 (91)	14.2 (11.4-16.6)	11.9 (18)	16.7 (10.2-26.7)	9.7 (109)
1	3.1 (30)	4.1 (2.6-5.3)	3.3 (5)	4.3 (0.8-6.1)	3.1 (35)
Type of Partners past year					
Regular partners	73.3 (714)	--	83.6 (96)	--	72.0 (810)
Non-regular partners	71.1 (693)	--	78.8 (119)	--	72.2 (812)
Paid sex partners	10.2 (99)	--	6.0 (9)	--	9.6 (108)
Clients who paid for sex	28.9 (281)	--	15.9 (24)	--	27.1 (305)
Ever used CD with a man	90.5 (881)	90.2 (87.9 -92.4)	84.8 (128)	83.4 (77.9-89.5)	89.7 (1009)
<u>Regular Partners</u>					
Protected Insertive AI					
0	29.0 (207)	26.2 (22.1-31.1)	41.7 (40)	43.9 (23.0-54.5)	30.5 (247)
1	52.4 (374)	55.3 (50.2-60.0)	49.0 (47)	49.3 (41.5-69.9)	52.0 (421)
2-4	17.8 (127)	18.1 (14.0-21.7)	8.3 (8)	3.9 (0-12.1)	16.7 (135)
>=5	0.8 (6)	0.4 (0-1.6)	1.0 (1)	2.9 (--)	0.9 (7)
Unprotected Insertive AI					
0	66.2 (473)	63.8 (58.7-68.3)	57.3 (55)	61.5 (44.4-71.4)	65.2 (528)
1	22.8 (163)	25.0 (20.4-29.3)	31.2 (30)	26.5 (19.2-43.7)	23.8 (193)
2-4	10.1 (72)	10.4 (7.8-13.6)	11.5 (11)	12.0 (1.5-21.4)	10.2 (83)
>=5	0.8 (6)	0.8 (0.1-2.1)	0	0	0.74 (6)
Protected Receptive AI					
0	53.4 (381)	56.0 (49.6-60.1)	60.4 (58)	47.4 (34.4-67.0)	54.2 (439)
1	32.6 (233)	30.7 (26.5-36.6)	34.4 (33)	47.7 (25.8-61.3)	32.8 (266)
2-4	13.0 (93)	12.6 (9.5-16.3)	5.2 (5)	4.9 (0-14.1)	12.1 (98)
>=5	1.0 (7)	0.7 (0.1-2.1)	0	0	0.86 (7)
Unprotected Receptive AI					
0	73.8 (527)	74.9 (69.4-77.9)	72.9 (70)	72.0 (56.4-89.4)	53.1 (597)
1	18.3 (131)	17.8 (14.7-21.9)	18.8 (18)	18.8 (7.1-28.9)	18.4 (149)
2-4	7.3 (52)	6.7 (4.8-9.4)	8.3 (8)	9.2 (0-21.1)	7.4 (60)
>=5	0.6 (4)	0.6 (0-2.1)	0	0	0.5 (4)
Condom use at past AI					
Yes	58.4 (405)	60.5 (53.5-64.6)	57.3 (55)	57.8 (37.9-76.7)	56.8 (460)
<u>Non Regular Partners</u>					
Protected IAI					
0	30.7 (213)	26.0 (21.4-29.2)	35.6 (42)	30.5 (19.2-40.3)	31.4 (255)
1	29.7 (206)	35.1 (31.2-40.7)	22.0 (26)	19.8 (12.5-29.1)	28.6 (232)
2-4	33.9 (235)	34.5 (29.7-39.5)	34.7 (41)	41.1 (30.5-54.0)	34.0 (276)
>=5	5.6 (39)	4.5 (2.9-6.0)	7.6 (9)	8.6 (2.0-14.3)	5.9 (48)
Unprotected IAI					
0	48.5 (336)	47.9 (43.1-53.4)	42.4 (50)	35.6 (23.6-44.5)	47.5 (386)

1	20.5 (142)	23.3 (19.7-28.8)	17.8 (21)	20.7 (12.3-30.5)	20.1 (163)
2-4	25.0 (173)	23.8 (18.6-27.3)	34.7 (41)	41.0 (32.2-52.2)	26.3 (217)
>=5	6.1 (42)	5.0 (3.2-6.7)	5.1 (6)	2.6 (0-8.0)	5.9 (48)
Protected RAI					
0	53.5 (371)	56.2 (51.9-61.5)	64.4 (76)	55.6 (45.9-70.8)	55.0 (447)
1	18.3 (127)	17.5 (13.3-20.9)	11.9 (14)	15.5 (5.6-26.9)	17.4 (141)
2-4	23.8 (165)	22.5 (19.1-27.2)	22.9 (27)	25.7 (15.4-32.6)	23.6 (192)
>=5	4.3 (30)	3.8 (1.9-4.8)	0.8 (1)	3.2 (0-7.3)	3.8 (31)
Unprotected RAI					
0	63.8 (442)	64.5 (59.3-68.9)	66.1 (78)	64.4 (55.3-76.8)	64.0 (520)
1	11.4 (79)	10.8 (7.5-13.7)	13.6 (16)	16.0 (7.1-23.9)	11.7 (95)
2-4	18.5 (128)	20.0 (17.1-25.0)	15.3 (18)	14.5 (8.2-20.7)	18.0 (146)
>=5	6.3 (44)	4.7 (2.9-6.3)	5.1 (6)	5.1 (0.6-9.9)	6.2 (50)
Used CD at past AI	60.8 (421)	62.4 (58.4-67.4)	51.7 (61)	56.4 (42.1-67.4)	59.4 (482)

* Analyses restricted to men who reported anal intercourse with non-commercial male partners

6.7. Sexual Behaviours with Commercial Male Partners

A total of 108 (9.6%) respondents paid money or gifts in exchange for sex and 305 (27.1%) received money or gifts for sex. Many (>65%) respondents reported condom use during anal sexual encounters with commercial male partners. Over a third (38.0%) of the respondents reported being offered more money for anal intercourse without condoms by their male clients.

Table 18: Respondents and sex in exchange for money or gifts*

<i>Characteristics in past 12 months</i>	<i>Lagos</i>		<i>Ibadan</i>		<i>Pooled</i>
	<i>unadjusted% (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unweighted</i>
Gave a man gifts for sex					
Yes	7.2 (70)	5.6 (4.0-7.1)	4.6 (7)	6.1 (1.9-10.9)	6.8 (77)
Received gifts for sex					
Yes	13.9 (135)	11.8 (9.6-14.1)	5.3 (8)	7.0 (2.5-12.2)	13.2 (143)
Gave money for sex					
Yes	7.8 (76)	6.4 (4.9-8.1)	4.6 (7)	5.7 (0.4-11.4)	7.4 (83)
Received money for sex					
Yes	28.1 (274)	25.0 (22.3-28.3)	14.6 (22)	10.1 (5.4-16.1)	26.3 (296)
Condom use at last AI with paid sex partner					
Yes	66.7 (66)	62.5 (51.7-88.9)	66.7 (6)	--	66.7 (108)
Condom use at last AI with male clients					
Yes	69.0 (194)	66.9 (48.3-85.9)	79.2 (19)	--	67.6(213)

*Analyses restricted to only men who reported AI with men in exchange for money or gifts

6.8. Condom and Lubricant Use

A third of the respondents who indicated ever using condoms in Lagos (264/885) and in Ibadan (39/129) experienced tearing of condoms during anal sex in the year preceding the study. Similarly, an equal proportion of respondents (14%) in both study sites experienced condom slippage at least once during anal intercourse in the previous year. Lubricant use with condoms during anal intercourse was significantly higher with male sex partners (91.9%) than with female sex partners (48.7%), although only 60% consistently used lubricants with their male partners.

Respondents used different types of lubricants with condoms during anal sex. The most commonly used were Vaseline (86%); hair cream (41.2%), saliva (21%) and KY jelly (24%).

Table 19: Condoms (CD) and lubricants use by respondents

<i>Characteristics in past 12 months</i>	<i>Lagos</i>		<i>Ibadan</i>		<i>Pooled</i>
	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unweighted</i>
Condom breakage					
Yes, once	9.9 (96)	8.1 (6.2-10.1)	9.9 (15)	10.4 (5.6-15.5)	9.9 (111)
Yes, more than once	17.2 (168)	14.5 (12.3-17.3)	15.9 (24)	10.8 (7.3-19.5)	17.1 (192)
No	63.8 (621)	68.1 (64.6-71.4)	59.6 (90)	64.0 (51.7-72.4)	63.2 (711)
Never used condoms	9.1 (89)	9.3 (7.1-11.5)	14.6 (22)	14.9 (8.2-20.3)	9.9 (111)
CD Slippage					
Yes, once	4.5 (44)	4.0 (2.7-5.5)	6.0 (9)	8.4 (4.5-13.7)	4.7 (53)
Yes, more than once	8.3 (81)	5.7 (4.3-7.5)	5.3 (8)	3.7 (0.8-6.8)	7.9 (89)
No	78.0 (760)	81.0 (78.0-83.7)	74.2 (112)	73.5 (65.3-81.9)	77.5 (872)
Never used condoms	9.1 (89)	9.3 (7.2-11.4)	14.6 (22)	14.4 (9.0-19.6)	9.9 (111)
Frequen. of Lube Use					
Always	65.3 (636)	64.3 (61.3-67.8)	71.5 (108)	72.0 (65.3-80.7)	66.1 (744)
Sometimes	26.0 (253)	27.5 (24.3-30.4)	24.5 (37)	27.0 (18.2-33.6)	25.8 (290)
Never	8.7 (85)	8.2 (6.2-10.1)	4.0 (6)	1.0 (0.0-3.3)	8.1 (91)

6.9. Knowledge of and attitudes to HIV and STIs

As Table 20 shows, the majority of the respondents (98.5%) had heard about HIV and AIDS, although most (>80%) denied knowing anyone who had AIDS. Based on the scoring system developed, 7.0% had poor comprehensive knowledge of HIV, 489 (43.5%) had fair knowledge, and 557 (49.5%) had good knowledge of HIV and AIDS. Of the 17 questions, seven respondents (0.6%) scored zero whilst 31 (2.8%) responded correctly to all seventeen questions. The mean score for respondents was 11.8 (SE 0.11) in Lagos and 12.5 (SE 0.23) in Ibadan.

Respondents displayed negative and positive attitudes towards HIV and AIDS depending on the questions asked. One-third of the respondents believed that AIDS is a punishment from God. Almost a quarter believed that AIDS is a white man's disease and 81.4% disagreed that AIDS affects only poor people. Based on the scoring system developed to measure attitude toward HIV and AIDS, 11.9% of the respondents scored between -1 to -12 (i.e., displayed negative attitudes), 3.0% were neutral, and the majority of the respondents (85.1%) scored between 1-17 (i.e., displayed varying degrees of positive attitudes). More than half of the respondents (>55%) had a low risk perception of HIV. Furthermore, many of the respondents demonstrated misconceptions about the transmission of HIV. For instance, 70% of the respondents erroneously felt that HIV is more likely spread through vaginal than anal sex and from a woman than a man.

With regard to knowledge of STIs, most of the respondents had heard about gonorrhoea (89.0%) and syphilis (55.0%) but only a few had heard about warts (14.2%) and only 78 respondents (6.9%) were aware of the six common STIs (gonorrhoea, chlamydia, syphilis, herpes, warts and hepatitis B). Very few of the respondents reported a history of gonorrhoea (5.4%), chlamydia

(0.3%), syphilis (0.9%), HSV-2 (herpes) (0.15%), warts (0.2%), and hepatitis B (0.3%) in the previous year. Ninety-four respondents (8.5%) reported genital ulcers (GU)¹⁷ and 14 (1.2%) reported anal ulcers (ANU)¹⁸ in the previous 12 months.

Table 20: HIV knowledge, attitudes scores and risk perception scores

<i>Characteristics</i>	<i>Lagos</i>		<i>Ibadan</i>		<i>Pooled</i>
	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unweighted</i>
HIV Knowledge Score					
0-6 (poor)	7.6 (74)	7.7 (5.9-10.0)	3.3 (5)	1.4 (0-4.1)	7.0 (79)
7-12 (fair)	43.9 (428)	45.9 (42.3-49.6)	40.4 (61)	59.0 (46.0-70.7)	43.5 (489)
13-17 (good)	48.5 (472)	46.3 (42.5-49.9)	56.3 (85)	39.6 (28.6-52.1)	49.5 (557)
Attitudes to HIV Score					
Negative attitude	12.5 (122)	11.7 (9.3-13.9)	7.9 (12)	11.6 (6.0-17.5)	11.9 (134)
Neutral	3.0 (29)	2.2 (1.3-3.3)	3.3 (5)	0.4 (0-1.2)	3.0 (34)
Positive	84.5 (823)	86.1 (83.8-88.6)	88.7 (134)	88 (82.1-93.7)	85.1 (957)
HIV Risk Perception					
Unlikely	55.6 (542)	58.3 (54.5-61.4)	53.6 (81)	54.6 (42.2-65.0)	55.4 (623)
Neutral	10.6 (103)	8.8 (7.1-10.7)	15.2 (23)	20.8 (15.6-30.8)	11.2 (126)
Likely	8.1 (79)	6.1 (4.7-7.8)	6.6 (10)	1.3 (0-3.6)	7.9 (89)
Don't know	25.7 (250)	26.8 (24.0-30.2)	24.5 (37)	23.2 (14.7-29.6)	25.5 (287)
Reported STI					
Yes	11.3 (110)	9.5 (9.3-9.6)	6.0 (9)	7.0 (2.7-11.8)	10 (116)

6.10. Characteristics of respondents who consented to HIV/STI screening

During the study, the majority of the respondents (96.4%) consented to being tested for STIs and HIV. Table 21 shows that proportion of MSM who consented to testing decreased with age from 98.4% among those 15-19 years to 89.7% among those aged 30 years, and level of education from 97.5% among those with at least secondary education to 94.4% among those with tertiary education. Furthermore, more MSM who consented were single (96.8%), unemployed (97.0%), had never been tested (97.5%) and experienced poverty (97.2%).

¹⁷ Genital ulcer (GU) is an ulcer on the genitals.

¹⁸ ANU is an ulcer on the area around the anal region.

In the multivariable analyses, the odds of consenting to screening was 2.5 times higher among younger MSM (15-29 years) (AOR 2.45; 95% CI 1.13-5.33); who experienced poverty (AOR 2.63 95% CI 1.27-5.45) and were single (AOR 2.73 95% CI 0.9-8.4).

Table 21: Characteristics of respondents who provided blood samples

Characteristics	Provided Blood Sample (1085)	Did not provide blood sample (40)	P-value
Age (years)			
15-19	188 (98.4%)	3 (1.6%)	0.001
20-29	784 (97.0%)	24 (3.0%)	
>= 30 years	113 (89.7%)	13 (10.3%)	
Level of Education			
<= Secondary	714 (97.5%)	18 (2.5%)	0.007
>Secondary	370 (94.4%)	22 (5.6%)	
Employment Status			
Employed	466 (95.7%)	21 (4.3%)	0.231
Unemployed	619 (97.0%)	19 (3.0%)	
Marital Status			
Married	28 (84.8%)	5 (15.2%)	0.001
Single	1057 (96.8%)	35 (3.2%)	
Reported Sexual Identity			
Gay	482 (96.4%)	18 (3.6%)	0.94
Bisexual	603 (96.5%)	22 (3.5%)	
Poverty			
Experienced Poverty	943 (97.2%)	27 (2.8%)	0.001
Did not experience Poverty	142 (91.6%)	13 (8.4%)	
Ever been tested for HIV	267 (93.4%)		
Yes	818 (97.5%)	19 (6.6%)	0.001
No		21 (2.5%)	
Extent of 'Outness'			
Closeted	1015 (96.6%)	36 (3.4%)	0.37
Out	70 (94.6%)	4 (5.4%)	
Experienced internal homophobia			
Yes	367 (97.3%)	10 (2.7%)	0.25
No	718 (96.0%)	30 (4.0%)	

6.11. Prevalence of STIs and HIV

A total of 286 respondents (25.4%) (24.7% in Lagos and 29.8% in Ibadan) had ever taken an HIV test, and only 264 (23.5%) of all respondents knew their HIV status. Among those who knew their status, nine respondents (0.8%) were HIV-infected and 255 (22.7%) were HIV-uninfected prior to the study; 12 respondents (1.1%) did not receive their test results.

Of the nine respondents who had prior knowledge of their HIV-infected status, seven (77.8%) were from Lagos, all nine were aged 25 years and above, five (55.6%) had higher than secondary education, and seven (77.8%) were employed. Most of them (88.9%) were Christian, and they were all married. With regards to sexual identity, five of them (60%) self-identified as bisexual and two-thirds self-identified as bottoms or versatile. Seven of the respondents (77.8%) engaged in UIAI, five (55.6%) in URAI, and five had experienced condom breakage. Four of the respondents (44.4%) disclosed their sexual identity to others, and six (66.7%) had experienced internalized homophobia. Interestingly, one of the nine respondents tested negative to the HIV test during the study and none tested positive to HBV, HCV, or syphilis.

Only three respondents (0.3%) in the study sample (all from Ibadan) tested positive to syphilis. Prevalence estimates of HIV, hepatitis B, and hepatitis C among MSM in this study population were 12.7% (95% CI 10.6 - 15.0), 10.1% (95% CI 8.2-12.1), and 2.8% (95% CI 1.9 - 4.0) in Lagos and 11.2% (95% CI 5.7 - 11.2), 17.7% (95% CI 11.3 - 27.6), and 4.3% (95% CI 0 - 4.5) in Ibadan, respectively.

Working in a recursive approach, precision of the prevalence estimates ranged from 0.96% to 1.94% compared to the precision of 4% determined apriori. This implies that the 95% confidence intervals around the estimates derived from this study were tighter.

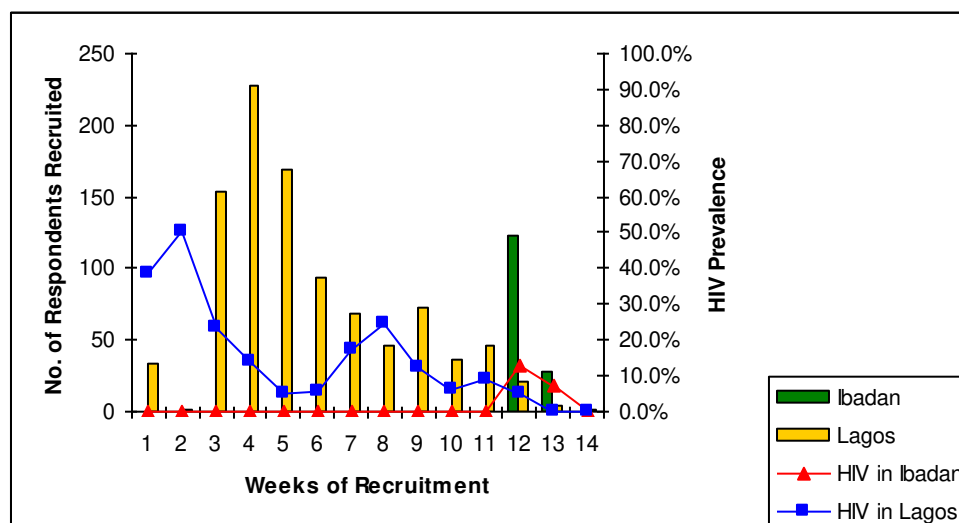
Figure 8 shows that the highest HIV prevalence was recorded during the second week of recruitment in both Lagos and Ibadan. Prevalence of co-infections were HIV-HBV (2.3%); HIV-HCV (0.6%), and HIV-HBV-HCV (0.3%).

Table 22: Prevalence of HIV, syphilis, hepatitis B and hepatitis C

Characteristics	Lagos (n=974)		d(%)*	Ibadan (n=151)		d(%)	Pooled
	Unadjusted % (n)	Adjusted % (95% CI)		Unadjusted % (n)	Adjusted % (95% CI)		
Ever had HIV test							
Yes	24.9 (243)	25.2 (22.2-28.4)		29.8 (45)	28.1 (21.9-37.0)		25.6 (288)
Reported HIV Status							
HIV positive	3.4 (8)	2.0 (0-5.6)		4.4 (2)	--		0.9 (10)
Study Outcomes							
HIV Positive	13.6 (127)	12.7 (10.6-15.0)	1.94	12 (18)	11.2 (5.7-11.2)	1.84	13.4 (145)
Syphilis Positive	0	--		2.0 (3)	--		0.28 (3)
Hepatitis B Positive	10.6 (99)	10.1 (8.2-12.1)	1.70	18.7 (28)	17.7 (11.3-27.6)	2.23	11.7 (127)
Hepatitis C Positive	3.5 (33)	2.8 (1.9-4.0)	0.96	1.3 (2)	4.3 (0-4.5)	1.18	3.2 (35)

* Precision of estimates

Figure 9: HIV Prevalence by Week of Recruitment



6.12. Psychosocial Responses to Sexual Orientation

Respondents reported varied experiences of hostility as a result of their sexual orientation. Most were treated differently (90%), some were insulted (8.2%), and 15% were targets of gossip.

Overall, 19.0% of respondents from Lagos and 16.2% from Ibadan experienced hostility because of their sexual orientation.

An attempt was made to measure the extent to which respondents were “out of the closet.” On a scale of 1 to 5, respondents were asked about the extent to which they felt comfortable disclosing their sexual identity to others. A score of 1 indicated being completely closeted and a score of 5 indicated being completely out of the closet. Two-thirds of the respondents from Lagos and half of those from Ibadan scored zero (i.e., were completely closeted). Only twelve of the respondents (1.1%) scored 5 (i.e., were fully out of the closet (<1%).

Overall, most of the respondents (86.5% in Lagos and 89.2% in Ibadan) displayed positive self-esteem. For the purpose of this study, social support was measured as the extent to which respondents were able to discuss personal issues, depend on, count on, and be accepted by others despite their sexual orientation. Over one-fifth of the respondents in Lagos had people they could depend on for help (22.8%), count on (28.1%), and discuss sexual issues with (35.8%), and who accepted them (32.2%). The four-point social support scale was further categorized into a binary variable by summing all scores across each item. Lack of social support indicated respondents who did not have any one to depend on, or count on, or discuss with or be accepting of him.

Table 23: Reported experience of hostility, extent of disclosure of identity ‘outness’, and social support

<i>Characteristics</i>	<i>Lagos</i>		<i>Ibadan</i>		<i>Pooled</i>
	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unadjusted % (n)</i>	<i>Adjusted % (95% CI)</i>	<i>Unweighted</i>
Experienced hostility					
Not treated with respect	7.6 (74)	4.5 (3.2-5.9)	5.3 (8)	3.0 (0.6-5.8)	7.0 (82)
Hassled by the police	4.3 (42)	2.2 (1.3-3.2)	6.0 (9)	4.4 (1.1-9.1)	4.5 (51)
Beaten by ‘area boys’	7.4 (72)	4.4 (2.8-5.6)	7.3 (11)	5.2 (1.9-9.9)	7.4 (83)
Insulted, threatened	17.0 (166)	8.2 (6.3-10.2)	13.2 (20)	7.6 (3.4-12.7)	16.5 (186)
Target of gossip	24.9 (243)	14.9 (12.1-17.1)	24.5 (37)	13.4 (8.3-21.0)	24.9 (280)
Experienced Hostility	31.9 (311)	19.3 (16.3-22.6)	27.8 (42)	16.2 (11.1-24.4)	31.4 (353)
Extent of ‘Outness’					
1 (completely in)	56.3 (548)	66.4 (62.0-70.5)	53.0 (80)	49.8 (42.3-64.9)	55.8 (628)
2	37.0 (360)	32.4 (28.4-36.9)	41.7 (63)	49.4 (35.1-57.6)	37.6 (423)
3	4.5 (44)	0.6 (0.3-0.9)	2.6 (4)	0.3 (--)	4.3 (48)

4	1.1 (11)	0.2 (0.1-0.5)	2.0 (3)	0.2 (--)	1.2 (14)
5 (completely out)	1.1 (11)	0.3 (0.1-0.6)	0.7 (1)	0.3 (--)	1.1 (12)
Social Support					
No one to depend on	21.0 (202)	22.8 (19.4-27.0)	21.2 (32)	23.6 (12.0-31.9)	21.2 (234)
No one to count on	23.9 (230)	28.1 (24.1-32.7)	15.2 (23)	10.3 (4.1-16.9)	22.9 (253)
No one accepted you	25.8 (248)	32.2 (27.9-36.6)	34.4 (52)	33.4 (19.7-43.3)	27.2 (300)
No one to discuss with	29.4 (283)	35.8 (31.5-40.7)	22.5 (34)	21.4 (14.2-29.5)	28.7 (317)
Lacked Social Support	51.6 (497)	59.2 (54.8-63.7)	53.0 (80)	62.0 (49.7-71.5)	52.3 (577)
Level of Self Esteem					
Negative self esteem	3.9 (38)	4.3 (2.2-6.6)	2.0 (3)	1.0 (0-3.6)	3.6 (41)
Neutral self esteem	7.1 (69)	9.2 (6.4-12.5)	5.3 (8)	9.8 (1.5-20.1)	6.8 (77)
Positive self esteem	89 (867)	86.5 (82.7-90.0)	92.7 (140)	89.2 (78.8-97.3)	89.5 (1007)
Internal Homophobia*					
Negative	33.5 (326)	36.1 (32.2-40.8)	25.2 (38)	14.7 (6.4-19.8)	32.4 (364)
Neutral	1.1 (11)	0.8 (0.2-1.4)	5.3 (8)	1.3 (0-2.8)	1.2 (13)
Positive	65.4 (637)	63.1 (58.4-67.1)	73.5 (111)	84.0 (78.4-92.8)	66.5 (748)

* a negative score indicates presence of internalized homophobia

Internalized homophobia, measured as a negative composite score on an eleven-item scale was experienced by 36.0% and 15% of the respondents in Lagos and Ibadan, respectively.

Table 24 summarizes responses to internalized homophobia scale items. The majority of respondents (78%) agreed that they were glad to be MSM and 82% agreed that their sexual orientation did not make them inferior. About a third wished they were heterosexual. Although 75% reported no regrets about their sexuality, 40% agreed that they would prefer to be heterosexual.

Table 24: Experiences of internalized homophobia as reported by respondents

Statements	Extent of Agreement		
	Disagree	Neutral	Agree
I am glad to be an MSM	205 (18.2%)	46 (9.1%)	874(77.7%)
My sexual identity does not make me inferior	187 (16.6%)	18 (1.6%)	920 (81.8%)
If there was a pill to change my sexuality, I will take it	698 (62.0%)	44 (3.9%)	383 (34.0%)
It will not bother me if I had children who were MSM	475 (42.2%)	59 (5.2%)	591 (52.5%)
I wish I were heterosexual	704 (62.6%)	47 (4.2%)	374 (33.2%)
I have no regrets about my sexuality	232 (20.6%)	34 (3.0%)	859 (76.4%)
When I am sexually attracted to a man, I do not mind if others know how I feel	492 (43.7%)	51 (4.5%)	582 (51.7%)
Life as a homosexual is not as rewarding as life as a heterosexual	595 (52.9%)	45 (4.0%)	485 (43.1%)
I feel my sexuality embarrasses my family	253 (22.5%)	35 (3.1%)	837 (74.4%)
If it were possible, I will accept the opportunity to be heterosexual	612 (54.4%)	59 (5.2%)	454 (40.4%)
I feel I have to pretend to be heterosexual to be acceptable to family and friends around me	272 (24.2%)	27 (2.4%)	826 (73.4%)

6.13. Correlates of Unprotected Receptive Anal Intercourse (URAI)

In the crude analysis, factors found to be significantly associated with self-reported URAI with men in the previous six months included age - 30 years and older, employment, not experiencing poverty, self-identifying as homosexual, and as the receptive or versatile partner (see Table 25). Other factors associated with URAI were sexually engaging with male partners from other African and non-African countries, engaging in UIAI with men, douching before or after anal intercourse, being HIV-infected, out of the closet, lack of social support, high risk perception and experiencing hostility and internalized homophobia.

To determine the correlates of unprotected receptive anal intercourse, five logistic regression models were fitted, starting with the simplest (reduced) model 1 to the most complex (full) model 5 with 22 covariates. Goodness-of-fit was based on Likelihood Ratio, Adjusted R^2 ; and Hosmer and Lemeshow statistics. Model 5 with R^2 value of 14.4% and HL of 4.45 ($p=0.81$) was the best of all the models explored.

Table 26 shows factors found to be independently associated with URAI after adjusting for covariates. These included self-identifying as homosexual [AOR 1.51; (95% CI 1.13–2.03)]; MSM who reported douching before or after anal intercourse were three times more likely to engage in URAI than those who did not report douching [AOR 3.68; (95% CI 2.44-5.57)]. Odds of engaging in URAI were almost doubled for men whose male sex partners were predominantly older men compared with MSM whose partners were of same age and younger [AOR 1.88; (95% CI 1.21-2.92)] . Furthermore, lack of social support increased the odds of URAI among MSM in this study by 47.0% [AOR 1.48; (95% CI 1.06-2.08)]. Although internalized

homophobia [AOR 1.33 (95% CI 0.98-1.82)] and hostility [AOR 1.41 95% CI 0.97-2.05) increased the likelihood of engaging in URAI by 33.0% and 41.0% respectively, however, they did not reach statistical significance (p=0.07).

Table 25: Correlates of unprotected receptive anal intercourse with men

<i>Characteristics</i>	<i>Bivariable Analysis</i>			
	N at baseline	% URAI	OR _{crude} 95% CI	P-value
Study Site				
Ibadan	151	33.1	1.0 (<i>ref</i>)	0.14
Lagos	974	39.4	1.31 (0.91-1.89)	
Age (yrs)				
15-19	191	38.7	1.0 (<i>ref</i>)	0.08
20-29	808	37.1	0.93 (0.77-1.48)	
>=30	126	47.6	1.44 (0.91-2.27)	
Education				
<=Secondary	732	39.7	0.86 (0.67-1.11)	0.25
>Secondary	392	36.2	1.0 (<i>ref</i>)	
Employed				
No	638	35.6	1.0 (<i>ref</i>)	0.018
Yes	487	42.5	1.34 (1.05-1.70)	
Marital status				
Single	1,092	38.3	1.0 (<i>ref</i>)	0.24
Married	33	48.5	1.08 (0.42-2.80)	
Religion				
Christian	906	38.3	1.0 (<i>ref</i>)	0.70
Muslim	219	37.4	1.52 (0.76-3.03)	
Sexual identity				
Homosexual/gay	500	43.8	1.49 (1.17-1.89)	0.001
Bisexual/straight	625	34.4	1.0 (<i>ref</i>)	
Sexual Role				
Top	530	2.8	1.0 (<i>ref</i>)	0.001
Bottom	226	65.5	65.1 (36.4-116.6)	
Versatile	369	73.4	94.9 (54.1-166.7)	
Experienced Poverty				
No	155	46.5	1.46 (1.04-2.05)	0.03
Yes	970	37.3	1.0 (<i>ref</i>)	

Sexual Networking with:				
African BMSM				
Yes	128	52.3	1.88 (1.30-2.73)	0.001
No	988	36.8	1.0 (<i>ref</i>)	
African WMSM				
Yes	62	59.7	2.48 (1.47-4.18)	0.001
No	1,054	37.4	1.0 (<i>ref</i>)	
Non-African WMSM				
Yes	149	54.4	2.10 (1.49-2.98)	0.001
No	968	36.2	1.0 (<i>ref</i>)	
Non-African BMSM				
Yes	65	60.0	2.51 (1.51-4.19)	0.001
No	1,045	37.4	1.0 (<i>ref</i>)	
Age of most MSM partners				
Mostly younger	227	33.9	1.41 (0.91, 2.17)	
Same age	176	26.7	1.0 (<i>ref</i>)	0.001
Mostly older	722	42.9	2.07 (1.43, 2.97)	
Income most MSM partners				
Mostly higher	805	40.2	1.35 (0.88, 2.06)	
Same income	208	34.6	1.06 (0.65, 1.73)	0.167
Mostly lower	108	33.3	1.0 (<i>ref</i>)	
Educ. of most MSM partner				
Mostly higher	708	42.7	1.68 (1.27, 2.22)	0.001
Same	319	30.7	1.0 (<i>ref</i>)	
Mostly lower	32	34.8	1.20 (0.74, 1.96)	
Had UIAI with MP				
No	483	28.4	1.0 (<i>ref</i>)	0.001
Yes	642	46.3	2.17 (1.69-2.78)	
Had UIAI with FP				
No	966	37.1	1.0 (<i>ref</i>)	0.01
Yes	159	47.8	1.56 (1.11-2.18)	
Douched past year				
No	958	33.7	1.0 (<i>ref</i>)	0.001
Yes	167	66.5	3.90 (2.75-5.52)	
Used Drugs before sex				
Yes	53	47.2	1.45 (0.83-2.51)	0.19
No	1,072	38.2	1.0 (<i>ref</i>)	
Extent of Outness				
Closeted	1,051	37.1	1.0 (<i>ref</i>)	0.001
Out of the closet	74	60.8	2.64 (1.63-4.28)	
HIV Status				
Negative	940	32.3	1.0 (<i>ref</i>)	0.001
Positive	145	74.8	5.98 (4.02-8.91)	
Experienced Hostility				
No	939	36.3	1	0.001
Yes	186	50.0	1.48 (1.14-1.91)	

Internal Homophobia				
No	748	34.5	1.0 (<i>ref</i>)	0.04
Yes	377	40.6	1.30 (1.00-1.68)	
Perception of HIV				
Low	1,036	37.8	1.0 (<i>ref</i>)	0.08
High	89	47.2	1.47 (0.95-2.27)	
Knowledge of HIV status				
Unknown	861	1.2	1.0 (<i>ref</i>)	0.55
Negative	255	39.2	1.04 (0.78-1.34)	
Positive	9	55.6	2.12 (0.54-7.58)	
Self-Esteem				
Low	118	38.1	1.00 (0.67-1.45)	0.92
High	1,007	38.6	1.0 (<i>ref</i>)	
Social Support*				
No	880	44.9	1.38 (1.03-1.85)	0.03
Yes	234	37.1	1.0 (<i>ref</i>)	

Table 26: Predictors of URAI with men

Variables in model	Model 1		Model 2		Model 3		Model 4		Model 5		Final Model
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	P-values
UIAI with men (ref=no)											
Yes	2.11	(1.64, 2.72)	2.25	(1.69, 2.99)	2.22	(1.66, 2.98)	2.16	(1.61, 2.91)	2.19	(1.63, 2.95)	<0.001
UIAI with women (ref=no)											
Yes	1.35	(0.96, 1.91)	0.91	(0.59, 1.40)	0.84	(0.54, 1.31)	0.87	(0.55, 1.36)	0.88	(0.56, 1.38)	0.58
Age (ref = 15-19 years)											
20-29 years			0.74	(0.51, 1.06)	0.77	(0.53, 1.12)	0.75	(0.51, 1.09)	0.76	(0.52, 1.11)	0.15
>=30 years			0.57	(0.32, 1.03)	0.64	(0.34, 1.75)	0.59	(0.32, 1.10)	0.59	(0.32, 1.11)	0.10
Employment status (ref = unemployed)											
Employed			1.07	(0.81, 1.43)	1.07	(0.80, 1.43)	1.06	(0.79, 1.43)	1.05	(0.78, 1.42)	0.73
Sexual identity (ref=bisexual)											
Homosexual			1.61	(1.22, 2.14)	1.63	(1.23, 2.17)	1.51	(1.12, 2.02)	1.51	(1.13, 2.03)	0.006
Douched before/after sex (ref=No)											
Yes			3.79	(2.56, 5.60)	3.52	(2.36, 5.27)	3.73	(2.47, 5.63)	3.68	(2.44, 5.57)	0.001
HIV risk perception (ref = low)											
High			1.08	(0.65, 1.80)	1.06	(0.62, 1.79)	1.09	(0.64, 1.86)	1.14	(0.67, 1.94)	0.64
Drug use before sex (ref=No)											
Yes			1.36	(0.72, 2.53)	1.27	(0.67, 1.83)	1.30	(0.68, 2.49)	1.29	(0.67, 2.47)	0.44
HIV status (ref=negative)											
Positive			5.25	(3.31, 8.31)	4.93	(3.07, 7.93)	5.13	(3.15, 8.34)	5.09	(3.13, 8.29)	0.001
Sexual Network (ref=No)											
Black African Men					1.11	(0.67, 1.83)	1.07	(0.64, 1.78)	1.04	(0.62, 1.73)	0.89
White African men					1.14	(0.53, 2.48)	1.15	(0.52, 2.54)	1.16	(0.53, 2.56)	0.71
Non-African Black Men					1.50	(0.71, 3.16)	1.57	(0.72, 3.36)	1.55	(0.72, 3.34)	0.26
Non-African White Men					1.02	(0.62, 1.69)	1.04	(0.63, 1.72)	1.02	(0.61, 1.69)	0.95
Age of Male Partners (ref=same age)											
Younger					1.26	(0.77, 2.08)	1.30	(0.79, 2.16)	1.30	(0.79, 2.17)	0.30
Older					1.80	(1.17, 2.77)	1.87	(1.21, 2.90)	1.88	(1.21, 2.92)	0.005
Income of most MP (ref = same)											
Higher					0.92	(0.62, 1.35)	0.88	(0.60, 1.31)	0.88	(0.60, 1.31)	0.54
Lower					0.77	(0.43, 1.39)	0.73	(0.40, 1.33)	0.71	(0.39, 1.30)	0.27
Education of most MP (ref= same)											
Higher					1.09	(0.76, 1.54)	1.03	(0.72, 1.47)	1.03	(0.72, 1.47)	0.88
Lower					0.99	(0.55, 1.80)	0.99	(0.54, 1.80)	0.98	(0.53, 1.79)	0.94
Access to HCT (ref=Yes)											
No							1.22	(0.88, 1.71)	1.24	(0.89, 1.74)	0.20
Had social support (ref=Yes)											
No							1.47	(1.05, 2.06)	1.48	(1.06, 2.08)	0.02

Extent of outness (ref = closeted)					
Out				1.79 (0.98, 3.26)	1.58 (0.85, 2.91) 0.14
Experienced int homophobia (ref = No)					
Yes				1.31 (0.96, 1.79)	1.33 (0.98, 1.82) 0.07
Experienced hostility (ref= No)					
Yes					1.41 (0.97, 2.05) 0.07
Experienced poverty (ref = Yes)					
No					1.30 (0.86, 1.96) 0.22
Model Fit					
Log likelihood (p-value)	729.80 (0.0001)	-633.79 (0.0001)	-620.41 (0.0001)	-609.73 (0.0001)	-607.34 (0.0001)
R ²	0.0272	0.1225	0.1330	0.1409	0.1443
Homer Lemeshow goodness-of-fit		5.57 (0.6948)	7.85 (p=0.4486)	2.65 (p=0.9544)	4.45 (p=0.8143)
■ = Ind. level (psychologic factors) ■ = Ind. level (socio-demographic factors) ■ = Network level factors ■ = Community level factors ■ = Structural level factors ■ = High risk behaviours ■ = Biological outcomes					

6.14. Correlates of unprotected insertive anal intercourse (UIAI) with men

Six months preceding the study, fifty-seven percent (642/1,125) of the men in this study reported unprotected insertive anal intercourse with their male sex partners. Factors significantly associated with UIAI with men were determined by comparing reported UIAI as an outcome variable with the individual, network, community and structural variables in the bivariable analyses. Table 27 shows that being 30 years and older, employed, married, bisexual and reporting a preference for the insertive or versatile roles were associated with engaging in UIAI with other men. Other factors included sexual networking that involved engaging in sexual activities with foreign male partners from other African and non-African countries, engaging in URAI with men and insertive anal intercourse with women, HIV sero-positive status, having high HIV risk perception and having social support.

Correlates of unprotected insertive receptive anal intercourse were determined by sequentially fitting four logistic regression models starting with the simplest (reduced) most proximal covariates to the most distal full model with 12 covariates (Table 28). Goodness-of-fit was based on an adjusted R^2 of 6.0% and Hosmer and Lemeshow statistics of 11.4.

Factors independently associated with UIAI after adjusting for confounders are displayed in Table 28. Being 30 years and above almost doubled the odds of UIAI [AOR 1.83; (95% CI 1.02-3.26)]; men who engaged in URAI with other men and UIAI with women were two times more likely to engage in UIAI with men. Additionally, men who engaged in sexual activities with White African MSM were two and half times more likely to engage in UIAI with men [AOR 2.44; (95% CI 1.11–5.40)]. Although self-identifying as bisexual increased the odds of UIAI with other men by 26.0%, this was not statistically significant [AOR 1.26; (95% CI 0.97–1.64)].

Table 27 Correlates of Unprotected Insertive Anal Intercourse (UIAI) with Men

<i>Characteristics</i>	<i>Bivariable Analysis</i>			
	N at baseline	% UIAI	OR _{crude} 95% CI	P-value
Study Site				
Ibadan	151	57.0	1.0 (<i>ref</i>)	0.98
Lagos	974	57.1	1.00 (0.71-1.42)	
Age (yrs)				
15-19	191	49.7	1.0 (<i>ref</i>)	0.13
20-29	808	55.8	1.28 (0.93-1.75)	
>=30	126	76.2	3.23 (1.96-5.32)	
Education				
<=Secondary	732	56.3	1.10 (0.86-1.41)	0.44
>Secondary	392	58.7	1.0 (<i>ref</i>)	
Employed				
No	638	52.5	1.0 (<i>ref</i>)	0.001
Yes	487	63.0	1.54 (1.21-1.96)	
Marital status				
Single	1,092	56.2	1.0 (<i>ref</i>)	0.003
Married	33	84.8	4.36 (1.67-11.4)	
Religion				
Christian	906	57.0	1.0 (<i>ref</i>)	0.88
Muslim	219	57.5	1.02 (0.76-1.38)	
Sexual identity				
Homosexual/gay	500	52.4	1.0 (<i>ref</i>)	0.005
Bisexual/straight	625	60.8	1.41 (1.11-1.79)	
Sexual Role				
Top	530	59.3	4.86 (3.41-6.94)	0.001
Bottom	226	23.0	1.0 (<i>ref</i>)	
Versatile	369	74.8	9.93 (6.73-14.7)	
Experienced Poverty				
No	155	56.1	1.0 (<i>ref</i>)	0.80
Yes	970	57.2	1.05 (0.93-1.76)	

Sexual Networking with African BMSM				
Yes	128	69.5	1.82 (1.23-2.71)	0.001
No	988	55.6	1.0 (<i>ref</i>)	
African WMSM				
Yes	62	80.6	3.30 (1.74-6.27)	0.001
No	1,054	55.8	1.0 (<i>ref</i>)	
Non-African WMSM				
Yes	149	67.1	1.63 (1.13-2.35)	0.009
No	968	55.6	1.0 (<i>ref</i>)	
Non-African BMSM				
Yes	65	69.2	1.74 (1.01-2.98)	0.046
No	1,045	56.5	1.0 (<i>ref</i>)	
Age of most MSM partners				
Mostly younger	227	60.4	1.24 (0.83-1.85)	0.29
Same age	176	55.1	1.0 (<i>ref</i>)	
Mostly older	722	56.5	1.06 (0.76-1.47)	0.74
Income most MSM partners				
Mostly higher	805	56.4	1.00 (0.74-1.37)	0.96
Same income	208	56.3	1.0 (<i>ref</i>)	
Mostly lower	108	63.0	1.32 (0.82-2.13)	0.25
Educ. of most MSM partner				
Mostly higher	708	33.9	1.08 (0.83-1.42)	0.55
Same	319	26.7	1.0 (<i>ref</i>)	
Mostly lower	92	42.9	1.09 (0.68-1.74)	0.72
Had URAI with MP				
No	691	49.9	1.0 (<i>ref</i>)	
Yes	434	68.4	2.17 (1.69-2.78)	0.001
Had UIAI with FP				
No	966	54.1	1.0 (<i>ref</i>)	0.001
Yes	159	74.8	2.52 (1.72-3.68)	
Used Drugs before sex				
Yes	53	58.5	1.06 (0.61-1.86)	0.83
No	1,072	57.0	1.0 (<i>ref</i>)	
HIV status				
Negative	940	52.9	1.0 (<i>ref</i>)	0.001
Positive	145	82.8	4.28 (2.73-6.71)	
Access to HCT				
No	839	56.5	1.0 (<i>ref</i>)	0.51
Yes	286	58.7	1.10 (0.84-1.44)	
Extent of Outness				
Closeted	1,051	56.7	1.0 (<i>ref</i>)	
Out of the closet	74	62.2	1.25 (0.77-2.04)	0.36
Experienced Hostility				
No	939	57.1	1.0 (<i>ref</i>)	
Yes	186	57.0	0.99 (0.73-1.37)	0.98

Internal Homophobia				
No	748	58.2	1.41 (0.89-1.46)	0.30
Yes	377	54.9	1.0 (<i>ref</i>)	
Perception				
Low	1,036	56.3	1.0 (<i>ref</i>)	0.07
High	89	66.3	1.53 (0.97-2.41)	
Knowledge of HIV status				
Unknown	870	56.9	2.0 (<i>ref</i>)	0.83
Known	255	57.7	1.03 (0.78-1.37)	
Self-Esteem				
Low	118	55.9	1.0 (<i>ref</i>)	0.79
High	1,007	57.2	0.95 (0.65-1.39)	
Social Support				
No	880	55.8	1.0 (<i>ref</i>)	0.07
Yes	234	62.4	1.31 (0.98-1.77)	

Table 28 Predictors of unprotected insertive anal intercourse (UIAI) with men

Variables in model	Model 1		Model 2		Model 3		Model 4		Final Model
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	P-values
URAI with men (ref=no)									
Yes	2.11	(1.64, 2.72)	2.13	(1.64, 2.76)	2.04	(1.57, 2.66)	2.02	(1.55, 2.63)	<0.001
UIAI with women (ref=no)									
Yes	2.52	(1.63, 3.51)	1.96	(1.31, 2.91)	1.87	(1.24, 2.81)	1.89	(1.25, 2.86)	0.002
Age (ref = 15-19 years)									
20-29 years			1.11	(0.80, 1.55)	1.09	(0.78, 1.52)	1.08	(0.77, 1.51)	0.64
>= 30 years			1.94	(1.11, 3.40)	1.92	(1.08, 3.42)	1.83	(1.02, 3.26)	0.04
Employment status (ref = unemployed)									
Employed			1.22	(0.94, 1.59)	1.21	(0.93, 1.58)	1.21	(0.93, 1.58)	0.16
Marital status (ref=single)									
Married			2.01	(0.72, 5.67)	1.82	(0.93, 1.58)	1.88	(0.66, 5.36)	0.24
Sexual identity (ref=gay/homosexual)									
Bisexual			1.26	(0.97, 1.63)	1.27	(0.98, 1.64)	1.26	(0.97, 1.64)	0.07
HIV risk perception (ref = low)									
High			1.83	(0.73, 1.91)	1.15	(0.71, 1.87)	1.15	(0.71, 1.88)	0.56
Sexual Network (ref=No)									
Black African Men					1.18	(0.73, 1.89)	1.14	(0.70, 1.83)	0.60
White African men					2.34	(1.08, 5.09)	2.44	(1.11, 5.40)	0.03
Non-African Black Men					0.86	(0.43, 1.73)	0.91	(0.45, 1.83)	0.79
Non-African White Men					0.89	(0.57, 1.40)	0.90	(0.57, 1.42)	0.65
Had social support (ref=Yes)									
No							1.18	(0.87, 1.61)	0.29
Model Fit									
Log likelihood (p-value)	738.83	(0.0001)	-726.14	(0.0001)	-717.52	(0.0001)	-710.99	(0.0001)	
R ²	0.0386		0.0551		0.0584		0.0594		
Homer Lemeshow goodness-of-fit			8.62	(0.3755)	3.33	(p=0.9116)	11.43	(p=0.1787)	

= Ind. level (psychologic factors)
 = Ind. level (socio-demographic factors)
 = Network level factors
 = Community level factors
 = Structural level factors)
 = High risk behaviours
 = Biological outcomes

6.15. Correlates of Unprotected Insertive Anal Intercourse (UIAI) with Women

In the year preceding study, 569 (50.6%) men reported sexual activities with women out of which 27.9% admitted to engaging in UIAI with their female partners in the last six months. To determine correlates of UIAI in women, the analysis was restricted to only men who had female sex partners. The bivariable crude analyses presented in Table 29 found a numbers of factors associated with UIAI with women including increasing age, tertiary level of education [OR 1.94; (95% CI 1.38 to 2.72)], being employed [OR 1.51; (95% CI 1.04 to 2.18)], married [OR 1.74, (95% CI 0.84 to 3.58)], Christian [OR 1.39; (95% CI 0.87 to 2.21)], self-identifying as versatile [OR 1.55; (95% CI 1.04 to 2.31)] were associated with UIAI with women. Other factors included using drugs before or during sexual encounters [OR 1.83; (95% CI 0.88 to 3.80)], douching [OR 2.41; (95% CI 1.48 to 3.93)], low self-esteem [OR 2.33; (95% CI 1.29 to 3.87)], awareness of HIV status of self [OR 1.66; (95% CI 1.10 to 2.49)]; engaging in URAI [OR 2.09; (95% CI 1.43 to 3.04)] and UIAI [OR 2.28; (95% CI 1.52 to 3.43)] with men were associated with UIAI with female partners. At the sexual network level, having sex with foreign male partners and engaging in sex with men who had higher educational levels (OR 1.63, 95% CI 0.93 to 2.86) and earned higher income (OR 2.30, 95% CI 1.21 to 3.41) were also associated with UIAI with women ($p < 0.20$). Community level factors associated with UIAI with women were access to HCT and being out of the closet.

The regression model which significantly predicted UIAI in women presented in Table 30 shows that only five factors were independently associated with UIAI with women. Engaging in URAI with men [AOR 2.1; (95% CI: 1.11-3.85)] and UIAI with men [AOR 1.64; (95% CI 1.05-2.56)] significantly increased the odds of UIAI with women. Increasing age [AOR 2.22; (95% CI:

(1.03-4.80)], self-identifying as bisexual [AOR 4.00; (95% CI 2.52-6.35)] were also significantly associated with UIAI with women. Men whose sexual network included non-African White MSM were two and half times more likely to engage in UIAI with women [AOR 2.45; (95% CI: 1.45–4.13)]. The odds of UIAI with women were more than doubled among MSM who were 30 years and older compared to those 15-19 years although this was not statistically significant [AOR 2.44; (95% CI 0.96–6.23)].

Table 29: Correlates of unprotected insertive anal intercourse with women

<i>Characteristics</i>	<i>Bivariable Analysis</i>			
	N at baseline	% UIAI	OR _{crude} 95% CI	P-value
Study Site				
Ibadan	85	24.7	1.0 (<i>ref</i>)	0.47
Lagos	484	28.5	1.22 (0.72-2.07)	
Age (yrs)				
15-19	65	12.3	1.0 (<i>ref</i>)	0.012
20-29	419	27.4	2.70 (1.25-5.82)	
>=30	85	42.4	5.23 (2.22-12.3)	
Education				
<=Secondary	345	23.8	1.0 (<i>ref</i>)	0.006
>Secondary	224	34.4	1.94 (1.38-2.72)	
Employed				
No	296	24.0	1.0 (<i>ref</i>)	0.03
Yes	273	32.2	1.51 (1.04-2.18)	
Marital status				
Single	536	27.2	1.0 (<i>ref</i>)	0.13
Married	33	39.4	1.74 (0.84-3.58)	
Religion				
Christian	443	29.3	1.39 (0.87-2.21)	0.16
Muslim	126	23.0	1.0 (<i>ref</i>)	
Geo-Political Zone				
North	39	25.6	1.0 (<i>ref</i>)	0.76
South West	307	23.5	0.89 (0.41-1.91)	
South East	104	33.7	1.47 (0.64-3.56)	
South South	114	34.2	1.51 (0.67-3.41)	
Sexual identity				
Homosexual/gay	80	32.5	1.29 (0.78-2.14)	0.33
Bisexual/straight	489	27.2	1.0 (<i>ref</i>)	

Sexual Role				
Top	312	24.7	1.0 (<i>ref</i>)	
Bottom	70	27.1	1.14 (0.63-2.04)	0.67
Versatile	187	33.7	1.55 (1.04-2.31)	0.03
Experienced Poverty				
No	74	32.4	1.28 (0.76-2.16)	
Yes	495	27.3	1.0 (<i>ref</i>)	0.36
Sexual Networking with African BMSM				
Yes	69	49.3	2.92 (1.75-4.88)	0.001
No	497	24.9	1.0 (<i>ref</i>)	
African WMSM				
Yes	38	55.3	3.53 (1.81-6.88)	0.001
No	528	25.9	1.0 (<i>ref</i>)	
Non-African BMSM				
Yes	32	50.0	2.74 (1.33-5.63)	0.01
No	535	26.7	1.0 (<i>ref</i>)	
Non-African WMSM				
Yes	89	52.8	3.69 (2.31-5.89)	0.001
No	477	23.3	1.0 (<i>ref</i>)	
Age of most MSM partners				
Mostly younger	116	28.4	1.33 (0.70-2.53)	0.38
Same age	87	23.0	1.0 (<i>ref</i>)	
Mostly older	366	29.0	1.37 (0.79-2.36)	0.27
Income most MSM partners				
Mostly higher	426	56.4	2.30 (1.21-3.41)	0.01
Same income	85	56.3	1.0 (<i>ref</i>)	
Mostly lower	56	63.0	1.08 (0.48-2.42)	0.86
Educ. of most MSM partner				
Mostly higher	364	30.5	1.63 (0.93-2.86)	0.09
Same	153	21.2	1.0 (<i>ref</i>)	
Mostly lower	49	17.9	0.81 (0.34-1.91)	0.63
Had URAI with MP				
No	368	22.6	1.0 (<i>ref</i>)	
Yes	201	37.8	2.09 (1.43-3.04)	0.001
Had UIAI with MP				
No	218	18.3	1.0 (<i>ref</i>)	
Yes	351	33.9	2.28 (1.52-3.43)	0.001
Douched before/after sex				
No	491	25.3	1.0 (<i>ref</i>)	
Yes	78	44.9	2.41 (1.48-3.93)	0.001
Used Drugs before sex				
No	537	27.2	1.0 (<i>ref</i>)	
Yes	32	40.6	1.83 (0.88-3.80)	0.104

Access to HCT				
No	413	24.7	1.0 (<i>ref</i>)	
Yes	156	36.5	1.76 (1.18-2.61)	0.005
Extent of Outness				
Closeted	540	27.4	1.0 (<i>ref</i>)	
Out of the closet	29	37.9	1.62 (0.75-3.51)	0.20
Experienced Hostility				
No	478	28.5	1.18 (0.74-1.96)	0.54
Yes	91	25.3	1.0 (<i>ref</i>)	
Internal Homophobia				
No	356	26.7	1.0 (<i>ref</i>)	0.50
Yes	213	30.0	1.14 (0.78-1.65)	
Perception				
Low	515	27.4	1.0 (<i>ref</i>)	0.36
High	54	33.3	1.33 (0.73-2.41)	
Knowledge of HIV status				
Known	147	37.4	1.66 (1.10-2.49)	
Unknown	422	24.6	1.0 (<i>ref</i>)	0.015
Self-Esteem				
Low	59	44.1	2.33 (1.29-3.87)	0.004
High	510	26.1	1.0 (<i>ref</i>)	
Social Support				
No	444	27.5	1.0 (<i>ref</i>)	0.81
Yes	119	28.6	1.06 (0.67-1.65)	

Table 30 Predictors of unprotected insertive anal intercourse with women

Variables in model	Model 1		Model 2		Model 3		Model 4		Final Model
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	P-values
URAI with men (ref=no)									
Yes	1.35	(0.9, 1.91)	2.20	(1.21, 4.02)	2.03	(1.10, 3.74)	2.07	(1.11, 3.85)	0.02
UIAI with men (ref=no)									
Yes	2.39	(1.63, 3.51)	1.75	(1.13, 2.71)	1.61	(1.03, 2.51)	1.64	(1.05, 2.56)	0.03
Age (ref = 15-19 years)									
20-29 years			2.42	(1.12, 5.22)	2.22	(1.03, 4.79)	2.22	(1.03, 4.80)	0.04
>= 30 years			2.92	(1.17, 7.32)	2.33	(0.93, 5.90)	2.44	(0.96, 6.23)	0.06
Educational level (ref<=secondary)									
>Secondary			1.48	(1.01, 2.18)	1.35	(0.91, 2.01)	1.36	(0.92, 2.03)	0.10
Employment status (ref = unemployed)									
Employed			1.30	(0.88, 1.91)	1.22	(0.82, 1.81)	1.23	(0.83, 1.82)	0.31
Marital status (ref=single)									
Married			1.98	(0.86, 4.54)	2.03	(0.87, 4.73)	2.00	(0.86, 4.65)	0.11
Religion (ref=Islam)									
Christianity			1.29	(0.81, 2.04)	1.19	(0.74, 1.90)	1.18	(0.74, 1.89)	0.48
Sexual identity (ref=homosexual/gay)									
Bisexual			4.15	(2.63-6.56)	4.07	(2.55, 6.47)	4.00	(2.52, 6.35)	<0.001
Sexual Role (ref=bottom)									
Top			1.79	(0.84-3.81)	1.85	(0.86, 3.99)	1.79	(0.83, 2.65)	0.14
Versatile			1.19	(0.64-2.21)	1.20	(0.64, 2.24)	1.15	(0.61, 2.15)	0.67
Used drugs before or during sex (ref=no)									
Yes			1.78	(0.87, 3.63)	1.54	(0.74, 3.21)	1.59	(0.76, 3.32)	0.21
Sexual Network (ref=No)									
Black African Men					1.42	(0.79, 2.54)	1.48	(0.83, 2.65)	0.19
White African men					1.35	(0.62, 2.91)	1.38	(0.64, 2.99)	0.41
Non-African Black Men					0.58	(0.24, 1.39)	0.59	(0.25, 1.41)	0.23
Non-African White Men					2.40	(1.43, 4.30)	2.45	(1.45, 4.13)	0.001
Extent of outness (ref = closeted)									
Out							0.60	(0.27, 1.32)	0.21
Model Fit									
Log likelihood (p-value)	-444.28	(0.0001)	-396.43	(0.0001)	-385.97	(0.0001)	-385.12	(0.0001)	
R ²	0.0306		0.1347		0.1516		0.1535		
Homer Lemeshow goodness-of-fit			7.94	(0.4397)	8.82	(p=0.3579)	9.75	(p=0.2833)	

6.16. Correlates of HIV Sero-positivity among MSM

Table 31 shows bivariable analyses of individual and other clusters of variables with HIV infection. At the individual level, HIV sero-positivity increased with age from 1.6% among MSM aged 15-19 years to 12.5% among those aged 20-29 years and 38.9% among those aged 30 years and above. Similarly, prevalence of HIV was higher among MSM who had tertiary level of education (17.8% vs. 11.1%); were employed (20.8% vs. 7.8%); married (39.3% vs. 12.7%) and among those who were non-Nigerians (36.4% vs. 13.1%). With regard to sexual identity, HIV infection was higher among men who self-identified as bisexual (14.6% vs. 11.8%). Furthermore, prevalence of HIV was higher among MSM who reported douching before or after sex (24.1% vs. 11.1%), experienced condom breakage (24.1% vs. 9.5%) and among those who had at least one STI in the last six months (28.2% vs. 11.6%). Prevalence of HIV was higher among MSM with higher perception of risk compared with those who had lower perception of risk (27.2% vs. 12.2%).

Network level factors associated with HIV infection included MSM whose sexual networks of sex partners included foreigners (i.e., black or white MSM from other African countries and beyond) and MSM with higher education and income. HIV infection was higher among respondents who self-identified as the receptive (21.9%) or versatile (17.5%) partners compared with those who identified as tops (6.7%).

Community level factors associated with HIV infection included experiencing internalized homophobia as a result of their sexual orientation compared with those who did not experience internalized homophobia (18.3% vs. 10.9%). HIV seropositivity was higher among those who were completely out of the closet compared to those who were completely closeted (34.3% vs.

11.9%). Prevalence of HIV was higher among MSM who reported ever testing for HIV (used as a proxy for access to health services).

At the structural level, men who experienced hostility had higher prevalence of HIV (19.4% vs. 10.7%). In contrast, those who did not experience poverty had higher HIV prevalence (19.0% vs. 12.5%).

In the multivariable logistic regression analyses predicting HIV sero-positivity, we estimated six models with clusters of variables sequentially included from the most proximal individual level variables to the most distal structural level variables according to the conceptual framework. In the final model (model 6), 23 predictor variables were included with R^2 value of 38.6% and HL of 7.02 ($p=0.53$) which indicates that model was a satisfactory fit to the data.

Individual level factors found to be independently associated with HIV sero-positivity included URAI with men [AOR 5.14; (95% CI 3.3-8.9)], UIAI with men [AOR=2.94; (95% CI 1.7-5.1)], and women [AOR=4.34; (95% CI 2.5-7.5)]. Compared with MSM aged 15-19 years, the odds of HIV infection were almost six times higher among 20-24 years [AOR 5.83 (95% CI 1.68-20.3)] and 13 times higher among those who were 25 years and above [AOR 13.1; (95% CI 3.3-52.8)]. Other factors that independently increased the odds of HIV infection were employment which doubled the odds of infection [AOR 2.08; (95% CI 1.3-3.4), self-identification as homosexual [AOR 2.21 95% CI (1.3-3.7)] and experiencing condom breakage during anal intercourse [AOR=1.87 (95% CI 1.14-3.07)].

For the network level variables, the odds of HIV infection were more than doubled among MSM whose sexual networks included non-African white men [AOR=2.53 (95% CI 1.4-4.7)] and MSM with higher education [AOR=2.97 (95% CI 1.4-6.1)].

When the community level factors were added to the logistic regression, MSM who experienced internalized homophobia two and half times more likely to be HIV infected than those who did not experience internalized homophobia [AOR 2.28; (95% CI 1.4-3.7)]. At the structural level experiencing poverty increased the odds of HIV infection although it did not achieve statistical significance [AOR=1.73 (95% CI 0.93-3.2)] ($p=0.07$). Variables that did not predict HIV seropositivity among MSM in this study after controlling for other variables were educational level, marital status, douching, risk perception, having at least one STI, ever testing for HIV and experiencing hostility.

Table 31: Correlates of HIV infection among MSM

<i>Characteristics</i>	<i>Bivariate</i>			<i>P-values</i>
	N at baseline	% HIV+	OR _{crude} 95% CI	
Study Site				
Ibadan	150	12.0	1.0 (<i>ref</i>)	0.60
Lagos	935	13.6	1.15 (0.68-1.95)	
Age (years)				0.001
15-19	188	1.6	1.0 (<i>ref</i>)	
20-29	784	12.5	8.81 (2.76-28.10)	
>=30	113	38.9	39.3 (11.8-130.8)	
Education				0.002
<=Secondary	714	11.1	1.0 (<i>ref</i>)	
>Secondary	370	17.8	1.75 (1.22-2.49)	
Employed				0.001
No	619	7.8	1.0 (<i>ref</i>)	
Yes	466	20.8	3.17 (2.16-4.53)	
Marital status				0.001
Single	1057	12.7	1.0 (<i>ref</i>)	
Married	28	39.3	4.45 (2.04-9.72)	
Experienced Poverty				0.03
Yes	943	12.5	1.0 (<i>ref</i>)	
No	142	19.0	1.64 (1.03-2.60)	
Nationality				0.02
Nigerian	1074	13.1	1.0 (<i>ref</i>)	
Non-Nigerian	11	36.4	3.78 (1.09-13.1)	
Sexual identity				0.18
Homosexual	482	11.8	1.0 (<i>ref</i>)	
Bisexual/straight	603	14.6	1.27 (0.89-1.82)	
Top or Bottom				0.001
Top	508	6.7	1.0 (<i>ref</i>)	
Bottom	223	21.9	3.93 (2.45-6.29)	
Versatile (deyda)	354	17.5	2.96 (1.90-4.61)	

Sex Networking				
African BMSM				
No	958	11.8	1.0 (<i>ref</i>)	
Yes	118	25.48	2.55 (1.61-4.0)	0.001
African WMSM				
No	54	12.1	1.0 (<i>ref</i>)	
Yes	1022	35.2	3.93 (2.18-7.09)	0.001
Non-African WMSM				
No	939	9.6	1.0 (<i>ref</i>)	
Yes	138	38.4	5.88 (3.92-8.82)	0.001
Non-African BMSM				
No	1022	12.6	1.0 (<i>ref</i>)	
Yes	57	28.1	2.70 (1.47-4.95)	0.001
Education of Partners				
Higher	681	17.2	4.44 (2.51-7.87)	
Same	314	4.5	1.0 (<i>ref</i>)	0.001
Lower	85	14.1	3.5 (1.56-7.94)	
Income of Partners				
Higher	775	14.4	1.97 (1.14-3.41)	
Same	203	7.9	1.0 (<i>ref</i>)	0.001
Lower	104	14.4	1.97 (0.93-4.16)	
UAI with Women				
No	938	8.96	1.0 (<i>ref</i>)	0.001
Yes	147	41.5	7.21 (4.84-10.7)	
UAI with Men				
No	468	5.3	1.0 (<i>ref</i>)	0.001
Yes	617	19.4	4.28 (2.72-6.70)	
URAI with Men				
No	669	5.53	1.0 (<i>ref</i>)	0.001
Yes	416	25.9	5.98 (4.03-8.91)	
CD Tore during AI				
No	794	9.45	1.0 (<i>ref</i>)	0.001
Yes	291	24.1	3.30 (2.27-4.82)	
Douched past year				
No	927	11.1	1.0 (<i>ref</i>)	0.001
Yes	158	26.6	2.89 (1.93-4.35)	
Drug use before sex				
No	1035	13.1	1.0 (<i>ref</i>)	0.33
Yes	50	18.0	1.45 (0.69-3.05)	
Had at least 1 STI				
No	968	11.6	1.0 (<i>ref</i>)	0.001
Yes	117	28.2	3.0 (1.9-4.7)	

Access to HTC				
Ever tested	267	21.7	2.33 (1.61-3.4)	0.001
Never tested	818	10.6	1.0 (<i>ref</i>)	
Extent of Outness				
Closeted	1015	11.9	1.0 (<i>ref</i>)	0.001
Out of closet	70	34.3	3.85 (2.27-6.54)	
Hostility				
No	755	10.7	1.0 (<i>ref</i>)	0.02
Yes	330	19.4	2.00 (1.40-2.86)	
Int. Homophobia				
No	718	10.9	1.0 (<i>ref</i>)	0.001
Yes	367	18.3	1.83 (1.28-2.61)	
Risk Perception				
Low	1002	12.2	1.0 (<i>ref</i>)	0.001
High	83	27.7	2.76 (1.65-4.63)	
Knowledge of HIV				
Poor	76	10.5	1.0 (<i>ref</i>)	0.58
Fair	471	12.7	2.7 (0.57-2.71)	
Good	538	14.3	1.42 (0.66-3.07)	
Self-Esteem				
Low	114	17.5	1.44 (0.86-2.42)	0.17
High	971	12.9	1.0 (<i>ref</i>)	
Social Support				
No	221	15.0	1.19 (0.79-1.81)	0.41
Yes	847	12.9	1.0 (<i>ref</i>)	

Table 32: Predictors of HIV infection among MSM in Nigeria

Variables in model	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Final Model
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	P-value
URAI with men (ref = no)													
Yes	5.99	(4.03, 8.91)	5.46	(3.56, 8.36)	5.33	(3.33, 8.55)	5.03	(3.09, 8.20)	5.47	(3.32, 9.04)	5.14	(3.25, 8.94)	<0.01
UIAI with men (ref = no)													
Yes			2.83	(1.75, 4.58)	2.50	(1.48, 4.22)	2.64	(1.53, 4.53)	2.85	(1.65, 4.94)	2.94	(1.69, 5.13)	<0.01
UAI with women (ref = no)													
Yes			6.52	(4.20, 10.12)	5.19	(3.13, 8.61)	4.50	(2.63, 7.69)	4.48	(2.60, 7.72)	4.34	(2.51, 7.50)	<0.01
Age (ref = 15-19 years)													
20-29 years					6.60	(1.92, 22.6)	5.48	(1.60, 18.7)	5.90	(1.70, 20.4)	5.83	(1.68, 20.3)	<0.01
>=30 years					17.2	(4.50, 65.8)	13.4	(3.45, 51.7)	12.6	(3.21, 49.5)	13.2	(3.31, 52.8)	<0.01
Educational level (ref<= secondary)													
> Secondary					1.26	(0.80, 1.99)	1.48	(0.90, 2.41)	1.46	(0.88, 2.45)	1.40	(0.84, 2.36)	0.20
Employment status (ref = unemployed)													
Employed					2.07	(1.32, 3.27)	2.17	(1.36, 3.48)	2.06	(1.27, 3.33)	2.08	(1.28, 3.39)	<0.03
Marital Status (ref=single)													
Married					1.35	(0.49, 3.71)	1.68	(0.57, 4.92)	1.79	(0.63, 5.39)	1.53	(0.53, 4.69)	0.42
Sexual identity (ref=bisexual)													
Homosexual					1.68	(1.05, 2.70)	1.87	(1.15, 3.06)	2.23	(1.32, 3.71)	2.21	(1.32, 3.71)	<0.01
Douched before/after sex (ref=No)													
Yes					1.68	(0.99, 2.86)	1.53	(0.88, 2.66)	1.40	(0.79, 2.47)	1.38	(0.78, 2.44)	0.27
HIV risk perception (ref = low)													
High					1.92	(0.99, 3.70)	1.70	(0.83, 3.47)	1.80	(0.88, 3.82)	1.83	(0.89, 3.11)	0.10
Had at least one STI in last year (ref=no)													
Yes					1.84	(1.02, 3.33)	1.83	(0.98, 3.42)	1.71	(0.91, 3.23)	1.64	(0.87, 3.11)	0.13
Had condom breakage (ref=no)													
Yes					1.92	(1.22, 3.03)	1.79	(1.11, 2.88)	1.78	(1.09, 2.91)	1.87	(1.14, 3.07)	0.013
Sexual Network (ref=No)													
Black African Men							0.76	(0.38, 1.54)	0.64	(0.31, 1.31)	0.61	(0.30, 1.25)	0.12
White African men							0.71	(0.27, 1.88)	0.79	(0.30, 2.08)	0.85	(0.32, 2.22)	0.74
Non-African Black Men							0.60	(0.22, 1.64)	0.61	(0.22, 1.64)	0.63	(0.23, 1.70)	0.36
Non-African White Men							2.70	(1.46, 5.00)	2.40	(1.28, 4.46)	2.53	(1.35, 4.72)	<0.01
Educ levels of male partners (ref=same)													
Mostly higher							3.23	(1.59, 6.55)	2.95	(1.44, 6.03)	2.97	(1.44, 6.12)	<0.01
Mostly lower							1.88	(0.70, 5.06)	1.56	(0.54, 4.79)	1.40	(0.49, 4.50)	0.49
Income of male partners (ref=same)													
Mostly higher							0.95	(0.52, 1.72)	1.05	(0.57, 1.94)	1.02	(0.56, 1.89)	0.85
Access to HCT (ref=no)													
Yes									1.55	(0.95, 2.54)	1.54	(0.94, 2.52)	0.09

Extent of outness (ref = closeted)						
Out				1.74 (0.84, 3.68)	1.73 (0.84, 3.78)	0.13
Experienced int homophobia (ref = no)						
Yes				2.27 (1.41, 3.67)	2.28 (1.42, 3.72)	<0.01
Experienced hostility (ref= No)						
Yes					0.62 (0.25, 1.52)	0.29
Experienced poverty (ref = Yes)						
No					1.73 (0.94, 3.22)	0.07
Model Fit						
Log likelihood (p-value)	-381.29	-330.93 (0.0001)	-284.46 (0.0001)	-269.27 (0.0001)	-260.80 (0.0001)	-258.55 (0.0001)
R ²	(0.0001)	0.2244	0.3331	0.3607	0.3808	0.3862
Homer Lemeshow goodness-of-fit	0.1064	4.46 (p=0.3476)	6.13 (p=0.6321)	9.08 (p=0.3353)	7.96 (p=0.4370)	7.02 (p=0.5346)

■ = Ind. level (psychologic factors)
 ■ = Ind. level (socio-demographic factors)
 ■ = Network level factors
 ■ = Community level factors
 ■ = Structural level factors
■ = High risk behaviours ■ = Biological outcomes

6.17. Correlates of HBV infection among MSM

Individual level factors found to be significantly associated with HBV infection in the bivariable analyses (see Table 33) included being employed (13.6% vs. 10.4%); married (22.2% vs. 11.5%); self-identifying as bisexual (12.2% vs. 8.5%) and engaging URAI with a man 14.4% vs. 10.0%); UIAI with a man (17.8% vs. 3.9%); high risk perception and HIV sero-positivity (17.5% vs. 10.9%). At the network level, sexual networks that included male partners who had higher income levels were associated with HBV infection. The only community level factor associated with HBV was never testing for HIV (12.7% vs. 8.7%). Similarly, experiencing poverty was the only factor associated with HBV at the structural level 12.2% vs. 8.5%). .

In the multivariable analysis, 14 predictor variables were included in the final model (Table 34). At the individual level, factors independently associated with HBV infection included UIAI with male sex partners. The odds of HBV-infection were 5 times higher among MSM who engaged in UIAI with other men than those who did not [AOR 5.22; (95% CI (3.04-9.00)]. MSM who reported low self-esteem were more likely to be HBV-infected [AOR 1.89, 95% CI 1.1-3.3]. Compared to MSM from the South South geo-political zone, the odds of HBV infection were significantly higher among MSM from the North [AOR 2.88, 95% CI 1.29-6.42] and Southwest [AOR 1.95, 95% CI 1.10-3.47] zones of Nigeria.

The odds of HBV infection were 50% higher among MSM whose sexual network mostly included men with higher income levels [AOR 1.54; 95% CI 0.94-2.5] although this was not statistically significant ($p = 0.08$). At the community level, the odds of HBV were 60% higher

among MSM who reported limited access to prevention services or HIV testing and counseling [AOR 1.60; 95% CI 0.97-2.7] although it did not achieve statistical significance ($p=0.07$). The final model had the best fit ($p=0.43$).

Table 33: Correlates of HBV (HBsAg) among MSM

<i>Characteristics</i>	<i>Bivariate</i>			<i>P-value</i>
	N at baseline	% HBV+	OR _{crude} 95% CI	
Study Site				
Lagos	931	10.6	1.0 (<i>ref</i>)	0.005
Ibadan	150	18.7	1.93 (1.22-3.06)	
Age (yrs)				
15-19	188	10.6	1.0 (<i>ref</i>)	0.421
20-29	783	11.5	1.18 (0.80-1.74)	
>=30	110	15.5		
Education				
<=Secondary	714	11.3	1.0 (<i>ref</i>)	0.555
>Secondary	366	12.6	1.12 (0.76-1.65)	
Employed				
No	618	10.4	1.0 (<i>ref</i>)	0.10
Yes	463	13.6	1.36 (0.94-1.98)	
Marital status				
Single	1054	11.5	1.0 (<i>ref</i>)	0.087
Married	27	22.2	2.20 (0.87-5.57)	
Geographic location				
North	70	20.0	3.06 (1.46-6.52)	0.019
SW	551	13.1	1.84 (1.07-3.15)	
SE	213	10.3	1.41 (0.73-2.70)	
SS	238	7.6	1.0 (<i>ref</i>)	
Experienced poverty				
No	141	8.5	1.0 (<i>ref</i>)	0.20
Yes	940	12.2	1.50 (0.80-2.80)	
Sexual Identity				
Homosexual	479	8.8	1.0 (<i>ref</i>)	0.007
Bisexual	602	14.1	1.71 (1.2-2.52)	
Outness				
Not out	1013	11.8	1.17 (0.52-2.62)	0.38
Out of closet	68	10.3	1.0 (<i>ref</i>)	

Sexual Networking				
African BMSM				
No	956	12.2	1.48 (0.75-2.91)	0.255
Yes	116	8.6	1.0 (<i>ref</i>)	
African WMSM				
No	1020	11.7	1.0 (<i>ref</i>)	0.418
Yes	52	15.4	1.38 (0.63-2.99)	
Non-African WMSM				
No	937	12.5	1.0 (<i>ref</i>)	0.798
Yes	136	11.7	1.07 (0.11-1.62)	
Non-African BMSM				
No	1020	12.2	1.0 (<i>ref</i>)	0.134
Yes	55	5.5	0.42 (0.13-1.36)	
Education of Partners				
Higher	680	12.9	1.59 (0.71-3.57)	0.291
Same	314	10.2	1.22 (0.42-2.86)	
Lower	82	8.5	1.0 (<i>ref</i>)	
Income of MP				
Higher	774	12.8	1.61 (0.94-.2.75)	0.09
Same	203	8.4	1.0 (<i>ref</i>)	
Lower	101	10.9	1.34 (0.60-2.97)	0.48
UIAI with FP				
No	934	10.7	1.0 (<i>ref</i>)	0.007
Yes	147	18.4	1.9 (1.2-3.0)	
UIAI with MP				
No	468	3.9	1.0 (<i>ref</i>)	0.0001
Yes	613	17.8	6.8 (3.4-13.6)	
URAI with MP				
No	668	10.0	1.0 (<i>ref</i>)	0.026
Yes	413	14.4	1.52 (1.05-2.21)	
Int. homophobia				
No	715	12.0	0.92 (0.62-1.37)	0.69
Yes	366	11.2	1.0 (<i>ref</i>)	
Perception				
Low	998	11.1	1.0 (<i>ref</i>)	
High	83	19.3	1.91 (1.07-3.41)	0.078
Self-Esteem				
Low	114	18.4	1.83 (1.1-3.07)	0.019
High	967	10.9	1.0 (<i>ref</i>)	
HIV Status				
Negative	938	10.9	1.0 (<i>ref</i>)	0.024
Positive	143	17.5	1.74 (1.08-2.80)	
Ever had HIV test?				
No	817	12.7	1.53 (0.95-2.46)	0.078
Yes	264	8.7	1.0 (<i>ref</i>)	

Social Support				
No	844	12.1	0.86 (0.54-1.38)	0.544
Yes	226	10.6	1.0 (<i>ref</i>)	
Condom Breakage				
No	793	10.7	1 (<i>ref</i>)	0.81
Yes	288	14.6	1.42 (0.96-2.12)	
Had at least 1 STI				
No	965	11.6	1.0 (<i>ref</i>)	0.675
Yes	116	12.9	1.13 (0.64-2.01)	
Experienced hostility				
No	902	11.8	1.0 (<i>ref</i>)	0.95
Yes	179	11.7	0.98 (0.48-2.01)	
Use drugs before sex				
No	1032	11.5	1.0 (<i>ref</i>)	0.31
Yes	49	16.3	1.49 (0.69-3.27)	

Table 34: Predictors of HBV infection among MSM in Nigeria

Variables in model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Final Model
	OR 95% CI	OR 95% CI	OR 95% CI	OR 95% CI	OR 95% CI	OR 95% CI	P-values
URAI with men (ref = no)							
Yes	1.52(1.05,2.21)	1.19 (0.81, 1.74)	1.27 (0.84, 1.91)	1.28 (0.86, 1.93)	1.26 (0.84, 1.91)	1.27 (0.84, 1.93)	0.45
UIAI with men (ref = no)							
Yes		5.04 (2.99, 8.50)	5.03 (2.93, 8.63)	5.24 (3.04, 9.008)	5.23 (3.04, 9.00)	5.22 (3.04, 9.00)	0.0001
UIAI with women (ref=no)							
Yes		1.42 (0.88, 2.29)	1.23 (0.71, 2.11)	1.23 (0.71, 2.14)	1.26 (0.72, 2.19)	1.27 (0.73, 2.21)	0.40
Employ status (ref =unemployed)							
Employed			1.10 (0.74, 1.65)	1.12 (0.75, 1.68)	1.12 (0.77, 1.73)	1.12 (0.76, 1.71)	0.64
Marital Status (ref=single)							
Married			1.19 (0.45, 3.17)	1.32 (0.49, 3.59)	1.33 (0.49, 3.63)	1.38 (0.50, 3.80)	0.49
Geo-political zone (ref =SS)							
North			3.00 (1.35-6.57)	2.93 (1.34-6.51)	2.92 (1.31-6.49)	2.88 (1.29-6.42)	0.01
SW			1.96 (1.11-3.46)	1.94 (1.10-3.43)	1.93 (1.09-3.42)	1.95 (1.10-3.47)	0.02
SE			1.37 (0.69-2.69)	1.38 (0.70-2.72)	1.41 (0.71-2.80)	1.42 (0.71-2.80)	0.32
Sexual identity (ref=homosexual)							
Bisexual			1.46 (0.95, 2.22)	1.39 (0.91, 2.13)	1.43 (0.93, 2.19)	1.44 (0.97, 2.29)	0.05
HIV risk perception (ref = low)							
High			1.75 (0.94, 3.28)	1.98 (1.04, 3.75)	1.94 (1.02, 3.67)	1.89 (1.01, 3.60)	0.048
Self-esteem (ref = high)							
Low			1.90 (1.10-3.29)	1.87 (1.07-3.26)	1.85 (1.06-3.22)	1.89 (1.08-3.29)	0.03
HIV Status (ref=negative)							
Positive			1.00 (0.56-1.78)	0.99 (0.55-1.76)	1.06 (0.59-1.91)	1.20 (0.69-2.08)-	0.53
Sexual Network							
Non African Black Men)ref=no)							
Yes				3.44 (1.02, 11.6)	3.22 (0.95, 10.9)	3.03 (0.96, 10.9)	0.06
Income of Mpartners (ref=same)							
Mostly higher				1.56 (0.97, 2.50)	1.56 (0.97, 2.50)	1.54 (0.96, 2.48)	0.08
Access to HCT (ref=Yes)							
No					1.60 (0.97, 2.65)	1.60 (0.97, 2.65)	0.07
Experienced poverty (ref = Yes)							
No						1.45 (0.75, 2.80)	0.27
Model Fit							
Log likelihood (p-value)	-388.75 (0.000)	-361.76 (0.0001)	-346.92 (0.0001)	-341.52 (0.0001)	-339.75 (0.0001)	-339.21 (0.0001)	
R²	0.0062	0.0752	0.1060	0.1176	0.1222	0.1236	
Homer Lemeshow goodness-of-fit		6.39 (p=0.1719)	4.18 (p=0.8404)	5.14 (p=0.7426)	9.08 (p=0.3354)	5.25 (p=0.7308)	

HL = Hosmer Lemeshow

6.18. Correlates of hepatitis C among MSM

Table 35 shows results of the crude bivariable analyses of factors associated with hepatitis C markers among MSM in Lagos and Ibadan. HCV infection was associated with being employed, married, sexually engaging with non-Nigerian men or mostly men with lower income and educational levels, experienced poverty, high risk perception and URAI and UIAI with men.

The final multivariable model (Table 36) predicting HCV infection among MSM in this study included 12 variables. Only URAI [AOR 2.44; (95% CI 1.2-5.10)] and engaging in sexual activities with mostly men with lower educational levels [AOR 4.21; (95% CI 1.57-11.3)] remained independently associated with increased risk of HCV infection after controlling for other factors including HIV status, probably because the sample lack enough power to detect differences in the estimates.

Table 35: Correlates of HCV infection among MSM

<i>Characteristics</i>	<i>Bivariate</i>			P-value
	N at baseline	% HCV+	OR _{crude} 95% CI	
Age (yrs.)				
15-19	188	2.97	1.0 (<i>ref</i>)	0.31
20-29	783	3.82	2.20 (0.66-7.34)	
>=30	110	4.5	2.94 (0.69-12.5)	
Education				
<=Secondary	714	3.22	1.0 (<i>ref</i>)	0.96
>Secondary	366	3.28	1.02 (0.50-2.07)	
Employed				
No	618	2.27	1.0 (<i>ref</i>)	0.04
Yes	463	4.54	2.05 (1.03-4.07)	
Experienced Poverty				
No	141	1.42	1.0 (<i>ref</i>)	0.21
Yes	940	3.51	2.52 (0.60-10.7)	

Marital status				
Single	1054	3.04	1.0 (ref)	0.03
Married	27	11.1	4.0 (1.14-13.9)	
Sexual Identity				
Gay	479	3.55	1.0 (ref)	0.61
Bisexual	602	3.0	1.2 (0.61-2.34)	
Sex Networking				
African BMSM				
No	956	2.8	1.0 (ref)	0.024
Yes	116	6.9	2.55 (1.13-5.75)	
African WMSM				
No	1020	3.04	1.0 (ref)	0.076
Yes	52	7.69	2.66 (0.90-7.84)	
Non-African BMSM				
No	1020	3.14	1.0 (ref)	0.35
Yes	55	5.45	1.78 (0.53-6.01)	
Non-African WMSM				
No	937	3.42	0.64 (0.19-2.11)	0.46
Yes	136	2.21	1.0 (ref)	
UIAI with Men				
No	468	2.1	1.0 (ref)	0.08
Yes	613	4.1	1.95 (0.93-4.1)	
URAI with Men				
No	668	2.1	1.0 (ref)	0.009
Yes	413	5.1	2.50 (1.26-4.97)	
Educ of Male Partners				
Higher	680	2.8	1.10 (0.48-2.54)	
Same	314	2.5	1.0 (ref)	0.03
Lower	82	9.8	4.14 (1.50-11.4)	
Income of M Partners				
Higher	774	3.2	2.22 (0.67-7.44)	
Same	203	1.5	1.0 (ref)	0.04
Lower	101	6.9	4.96 (1.26-19.6)	
HIV Status				
Neg.	938	3.00	1.0 (ref)	0.23
Pos.	143	4.90	1.67 (0.72-3.90)	
Ever tested for HIV				
No	817	2.94	1.0 (ref)	0.33
Yes	264	4.17	1.44 (0.69-3.00)	
Int. homophobia				
No	715	3.08	1.0 (ref)	0.68
Yes	366	3.55	1.16 (0.58-2.33)	
Extent of outness				
Closeted	1013	3.16	1.0 (ref)	0.58
Out	68	4.41	1.41 (0.42-4.74)	

Perception				
Low	998	3.01	1.0 (<i>ref</i>)	0.14
High	83	6.02	2.07 (0.78-5.48)	
Self-Esteem				
Low	114	3.41	0.51 (0.12-2.13)	0.34
High	967	1.75	1.0 (<i>ref</i>)	
Had at least 1 STI				
No	965	3.30	0.77 (0.23-2.57)	0.68
Yes	116	2.60		
Drug use before sex				
No	1032	3.2	1.0 (<i>ref</i>)	0.73
Yes	49	4.1	1.29 (0.30-5.53)	
Experienced hostility				
No	902	3.22	1.0 (<i>ref</i>)	0.33
Yes	179	3.35	1.69 (0.58-4.93)	
Social support				
No	226	3.54	1.11 (0.50-2.48)	0.80
Yes	844	3.25	1.0 (<i>ref</i>)	

Table 36: Predictors of HCV infection among MSM in Nigeria

Variables in model	Model 1		Model 2		Model 3		Model 4		Final Model P-value	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI		
URAI with men (ref = no)										
Yes	2.50 (1.26, 4.98)		2.29 (1.40, 4.61)		2.34 (1.14, 4.80)		2.26 (1.09, 4.69)		2.44 (1.17, 5.10)	0.02
UIAI with men (ref = no)										
Yes			1.67 (0.79, 4.61)		1.54 (0.71, 3.31)		1.51 (0.69, 3.23)		1.43 (0.65, 3.13)	
Employment status (ref = unemployed)										
Employed					1.76 (0.86, 3.60)		1.67 (0.81, 3.45)		1.65 (0.80, 3.41)	0.15
Marital Status (ref=single)										
Married					2.83 (0.77, 10.4)		2.21 (0.55, 8.78)		2.40 (0.59, 9.83)	0.17
HIV risk perception (ref = low)										
High					1.84 (0.68, 5.00)		1.63 (0.59, 4.56)		1.59 (0.57, 4.43)	0.35
HIV status (ref=negative)										
Positive					0.82 (0.33, 2.06)		0.82 (0.33, 2.06)		0.89 (0.35, 2.26)	0.81
Sexual Network										
With African BSM (ref=no)							2.03 (0.78-5.37)		2.17 (0.82-5.72)	0.12
With African WSM (ref=no)							1.43 (0.40-5.18)		1.34 (0.37-4.87)	0.66
Educ of male partners (ref=same/higher)										
Mostly lower							3.94 (1.46-10.7)		4.21 (1.57-11.3)	0.004
Income of male partners (ref=same)										
Mostly higher							1.21 (0.41, 3.60)		1.36 (0.46, 4.00)	0.51
Access to HCT (ref=Yes)										
No									-	
Experienced poverty (ref = Yes)									3.59 (0.80-16.2)	0.08
No										
Model Fit										
Log likelihood (p-value)	-150.9 (0.0227)		150.04 (0.0117)		-146.71 (0.0164)		-140.62 (0.0026)		-138.72 (0.0012)	
R ²	0.0288		0.0288		0.0503		0.0876		1.000	
Homer Lemeshow goodness-of-fit			6.53 (p=0.0382)		8.52 (p=0.2892)		10.56(p=0.1578)		11.28 (p=0.1268)	

HL = Hosmer Lemeshow

= Ind. level (psychologic factors)
 = Ind. level (socio-demographic factors)
 = Network level factors
 = Community level factors
 = Structural level factors)
 = High risk behaviours
 = Biological outcomes

6.19 Comparison of predictors across outcome variables

Table 37 compares different predictors across the outcome variables. No factor consistently predicted all the outcomes of this study. While URAI with men significantly increased the odds of HIV, HCV, and UIAI with men and women, its association with HBV was not statistically significant [AOR 1.27; (95% CI 0.8-1.9)]. In contrast, UIAI with men increased the odds of HIV, HBV, URAI and UIAI with women but not HCV. Interestingly, UIAI with women increased the odds of UIAI with men and HIV sero-positivity but not URAI with men, HBV and HCV.

Identifying as homosexual or gay increased the odds of URAI and HIV but decreased the odds of UIAI with men and women. Although identifying as gay also decreased the odds of HBV, this was not statistically significant. Older age (i.e. being 30 years and older) significantly increased the odds of UIAI with men and women and HIV but had no association with HBV and HCV even when age was analyzed as a continuous variable. Employment only significantly increased the odds of HIV but was not significantly associated with UAI, hepatitis B and C infections. The effect of marriage was also not significant across all outcomes. Douching before or after anal intercourse was only independently associated with URAI with men. Although it increased the likelihood of HIV, this was not statistically significant. Dissassortative sexual mixing across race (White African and non-African White men), age, educational and income levels increased the odds of at least one of the outcomes of this study. Internalized homophobia increased the odds of HIV infection but neither HBV nor HCV infections. Interestingly, a history of STI in the preceding 6 months, extent of disclosure of sexual identity, hostility, educational attainment, and sexual network characteristics (having male partners from other African countries irrespective of

the race or sex with non-African black men or men with higher income) were not significantly associated with any of the study outcomes.

Table 37: Comparisons of risk factors across various study outcomes

VARIABLES	URAI	UIAI with Men	UIAI with Women	HIV	HBV	HCV
URAI with men (ref = no)						
Yes	-	2.02 (1.55-2.63)	2.07 (1.11-3.85)	5.14 (3.25, 8.94)	NS	2.44 (1.17, 5.10)
UIAI with men (ref = no)						
Yes	2.19 (1.63-2.95)	-	1.64 (1.05-2.56)	2.94 (1.69, 5.13)	5.22 (3.04, 9.00)	NS
UAI with women (ref = no)						
Yes	NS	1.89 (1.25-2.86)	-	4.34 (2.51, 7.50)	NS	-
Age (ref = 15-19 years)						
20-29 years	NS	NS	2.22 (1.03-4.80)	5.83 (1.68, 20.3)	-	-
>=30 years	NS	1.83 (1.02-3.26)	2.44 (0.96-6.23)*	13.2 (3.31, 52.8)	-	-
Educational level (ref<= secondary)						
> Secondary	-	-	NS	NS	-	-
Employment status (ref = unemployed)						
Employed	NS	NS	NS	2.08 (1.28, 3.39)	NS	NS
Marital Status (ref=single)						
Married	-	NS	NS	NS	NS	NS
Religion (ref=Islam)						
Christianity	-	-	NS	-	-	-
Geo-political zone (SS)						
North	-	-	-	-	2.88 (1.29-6.42)	-
SW	-	-	-	-	1.95 (1.10-3.47)	-
SE	-	-	-	-	NS	-
Sexual identity (ref=bisexual)						
Homosexual	1.51 (1.13-2.03)	0.79 (0.61-1.03)*	0.25 (0.16-0.39)	2.21 (1.32, 3.71)	NS	-
Douched before/after sex (ref=No)						
Yes	3.68 (2.44-5.57)	-	-	NS	-	-
HIV risk perception (ref = low)						
High	NS	NS	-	NS	1.89 (1.01, 3.60)	NS
Had at least one STI in last year (ref=no)						
Yes	-	-	-	NS	-	-
Had condom breakage (ref=no)						
Yes	-	-	-	1.87 (1.14, 3.07)	-	-
HIV Status (ref=negative)						
Positive	5.09 (3.13-8.29)	-	-	-	NS	NS
Used drugs before or during sex (ref =no)						
Yes	NS	-	NS	-	-	-
Self-esteem (ref=high)						
Low	-	-	-	-	1.89 (1.08-3.29)	-
Sexual Network (ref=No)						
Black African Men	NS	NS	NS	NS	3.03 (0.96, 10.9)*-	NS
White African men	NS	2.44 (1.11-5.40)	NS	NS	-	NS
Non-African Black Men	NS	NS	NS	NS	-	-

Non-African White Men	NS	NS	2.45 (1.45-4.13)	2.53 (1.35, 4.72)	-	-
Age of Male Partners (ref=same age)						
Younger	NS	-	-	-	-	-
Older	1.88 (1.21-2.92)	-	-	-	-	-
Educ levels of male partners (ref=same)						
Mostly higher	NS	-	-	2.97 (1.44, 6.12)	-	-
Mostly lower	NS	-	-	NS	-	4.21 (1.57, 11.3)
Income of male partners (ref=same)						
Mostly higher	NS	-	-	NS	1.54 (0.96-2.47)*	NS
Mostly lower	NS	-	-	-	-	-
Access to HCT (ref=Yes)**						
No	NS	-	-	NS	1.60 (0.97-2.65)*	-
Social Support (ref=Ye)ο						
No	1.48 (1.06-2.08)	NS	-	-	-	-
Extent of outness (ref = closeted)						
Out	NS	-	NS	NS	-	-
Experienced int homophobia (ref = no)						
Yes	NS	-	-	2.28 (1.42, 3.72)	-	-
Experienced hostility (ref= No)						
Yes	NS	-	NS	NS	-	-
Experienced poverty (ref = Yes)						
No	NS	-	1.73 (0.94-3.22)*	NS	NS	NS

** used as a proxy for access to health care; a=not applicable, N.S. =non- significant * = marginally significant (p = 0.05-0.07)

■ = Ind. level (psychologic factors) ■ = Ind. level (socio-demographic factors) ■ = Network level factors ■ = Community level factors ■ = Structural level factors
 ■ = High risk behaviours ■ = Biological outcomes

CHAPTER 7

DISCUSSION

This chapter is organized around the research objectives entailing discussions regarding how the results of this study support, contrast, or add to the body of knowledge. The chapter also discusses various implications of the findings. Limitations of the research methods that relate directly to the research objectives are discussed at the end of the chapter.

Homosexuality, a Western concept

Homosexuality a taboo subject currently illegal in 38 countries in Africa except South Africa, Gabon, Burkina Faso, Chad and 12 other countries (Cape Verde, Central African Republic, Congo-Brazzaville, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Guinea-Bissau, Madagascar, Mali, Niger, Rwanda). In the 38 countries, homosexuality is considered a western concept imported by the West and Arabs on Africans (Parker 1998; Ehlers 2001; Murray 2001; Sharma 2004; Wade 2005). However, contrary to this view, this study confirms the existence of homosexuality in Nigeria and corroborates the findings from anthropological (Sanders 1997; Niang 2003; Allman 2007), clinical and pathological (Ajayi 1974; Ani 1983; Brody 2003) and the few existing epidemiologic studies (Niang C. 2004; Wade 2005; Lane 2006) that same-sex behaviour is neither borrowed concept nor is it a foreign culture. This view is based on the fact that the participants in this study represented adolescents (15-19 years), young (20-24 years) and older men from all but one state in Nigeria, with a wide carried socio-demographic and economic strata. Despite the hostile environment, these men have designated places where they meet and socialize with other men. Their social and sexual

networks include men from rural, peri-urban and urban areas within Nigeria and a few sexually engage with older, more educated, higher income earning men from outside of Nigeria. Rather than researchers, health care providers, donors and the Government of Nigeria denying the existence of this sub-population, it is pertinent that evidence emanating from the few available research is translated into relevant policies and programs that protect the fundamental rights, safety, dignity and confidentiality of all Nigerians irrespective of their religious, geographic sexual orientation.

Recruitment of MSM

One of the most critical methodological considerations in any form of research is the recruitment of a representative sample of the population of interest (Patel 2003; Binson 2007). Several studies have demonstrated the challenges and impacts of recruiting hidden populations (defined by their identity, social or sexual behaviours, and lack of sampling frame) on the quality of research data and the health and wellbeing of the research participants (Ehlers 2001; Silvestre 2006; Binson 2007; Johnston 2008; Kendall 2008; Malekinejad 2008). Furthermore, several barriers that hinder recruitment and participation of sexual minorities in research have been reported but the most recurring are mistrust of researchers and governments (McCaskill-Stevens 1999; Yancey 2006) and fear of disclosure (Corbie-Smith 1999).

Nigeria is one of the 38 countries in Africa where male same-sex behaviour is illegal and punishable by 14 years of imprisonment or death in some of the Northern states (<http://76crimes.com/76-countries-where-homosexuality-is-illegal/> ; Law of the Federation of Nigeria. 1990) (see Appendix 1 page 268). As a result, MSM remain hidden, socially ostracized, and hard-to-reach for research and program interventions (Allman 2007). Unfortunately, lack of

sampling frames limits the application of conventional probability sampling methods for the recruitment of representative samples of MSM into research studies (Binson 2007; Malekinejad 2008). Consequently, studies have employed different sampling techniques such as convenience, time-location, and snowball sampling methods, resulting in research findings that are limited in validity and generalizability (He 2008).

This study successfully recruited a large sample of MSM. This could be attributed to the fact that members of the MSM community were involved at every stage of the study planning, implementation and dissemination of preliminary results. Involving members of the MSM community could have contributed to building the trust and cooperation received from the community. Yancey and colleagues' review of recruitment and retention patterns of minority populations in ninety-five research studies revealed that including lay outreach workers from the target population and working with community-based organizations were common strategies to build trust and alleviate attitudinal barriers to community involvement (Yancey 2006).

Additionally, deploying the RDS recruitment strategy also contributed significantly to the successful recruitment of MSM in this study. The respondent driven sampling method is a quasi-random sampling method grounded in the 'small world' theory which posits that in any defined population, the most hidden persons can be potentially reached through at least six waves of recruitment in a chain referral sampling technique (Kilworth 1978; Heckathorn 1997; Heckathorn 2002; Salganik 2004; Johnston 2008). A systematic review of 123 studies, including seven from Africa, described RDS as an effective and efficient sampling technique for recruiting representative samples of key populations (MSM, persons who inject drugs (PWIDs), and sex

workers) (Johnston 2008; Malekinejad 2008). This study followed the key requirements of RDS as outlined by the originator, Heckathorn and his colleagues, to facilitate the recruitment of a representative sample (Heckathorn 1997; Salganik 2004; Johnston 2008).

A total of 38 seeds in Lagos (28) and Ibadan (10) recruited the study sample through a maximum of nine waves in Lagos and four waves in Ibadan. The pre-calculated sample size of 1,100 was surpassed by 2.3%. According to Johnston et al, of 118 studies that reported both pre-calculated and recruited sample sizes, 85% achieved 90% of their pre-calculated sample size (Johnston 2008). Factors that could influence the extent to which pre-calculated sample sizes are achieved include the target population of interest, use of primary¹⁹ and secondary²⁰ monetary incentives, the number of sites used for recruitment, and assigning expiry dates to the validity of coupons (Johnston 2008). This study provided token monetary incentives of N500 (\$5.00) to complete the interview and N200 (\$2.00) for each successful recruitment or N500 (\$5.00) for three successive recruits. Although monetary and non-monetary incentives have not been shown to impact the success or failure of RDS recruitment strategy (Bentley 2004; Kabore 2006; Johnston 2008; Semaan 2009), it is important to provide the right quantum of incentive if it is given. While offering high incentives can result in bartering and selling of coupons or in initial logistic challenges of coping with large turnout of recruits at the beginning of a recruitment exercise (Yeka 2006), low monetary incentives may slow down the recruitment process (Johnston 2008), thereby impacting negatively on the outcome of the RDS.

¹⁹ Incentives given to eligible recruits for consenting to participate in the study

²⁰ Additional incentives given to recruiters for recruiting eligible peers who consent to participate in the study

This study interviewed study participants at two pre-specified sites: the Lagos University Teaching Hospital (LUTH) in Lagos and the Alliance Rights of Nigeria (ARN) office, located within a quiet residential area in Ibadan. Subsequently, a rented hotel hall (Planet One) was introduced in the 11th week of the recruitment in Lagos as the third study site. Contrary to the expectations of RDS, the need for a third venue arose to diversify the study sample recruited despite the efforts put into purposively selecting a diverse set of seeds to initiate the recruitment process. As several other studies have demonstrated (He 2008), the majority of MSM (93.0%) recruited and interviewed at LUTH and the ARN office were significantly younger (under 25 years) [AOR 2.5; (95% CI 1.3-4.9)]; experienced poverty [AOR 2.4; (95% CI 1.1-6.5)]; unemployed [AOR 2.3; (95% CI 1.0-5.2)]; more likely to report sex with black male partners from other African countries [AOR 3.6; (95% CI 1.0-12.4)] but less likely with white male partners from other African countries [AOR 0.1; (95% CI 0.03-0.3)]; and less likely to report experiencing hostility [AOR 0.4; (95% CI 0.2-0.9)]. Additionally, they were less educated [AOR 0.5; (95% CI 0.2-1.2)]; more likely to be single [AOR 2.2; (95% CI 0.4-11.6)], more likely to be open and disclose their sexuality to others AOR 1.3; (95% CI 0.4-4.9)]; less likely to report URAI with women AOR 0.5; (95% CI 0.2-1.1)], and more likely to report internalized homophobia AOR 1.9; (95% CI 0.8-4.3)] although these differences in characteristics were not statistically significant.

In agreement with other studies (Kendall 2008), this study demonstrated that a monetary incentive (which is a key feature of the RDS) was not sufficiently attractive to MSM who were employed, older, belonging to higher socio-economic brackets, and less 'out' to others. As a result, they were unwilling to participate in the study in LUTH. To mitigate this challenge, Planet

One was introduced as the third venue to allow more flexible hours for data collection. In a comparative study of RDS, time location sampling (TLS) and snow ball sampling (SBS) of MSM in Brazil, RDS achieved the pre-calculated sample size faster and at a lower cost than TLS and SBS. However, the RDS sample included more MSM under 20 years old, with lower socioeconomic status and lower education than SBS and TLC (Kendall 2008).

Demographic characteristics of MSM populations

Prevalence of male same-sex behaviour in the general population is unknown in Nigeria. However, a few studies have reported prevalence in Kenya (0.03% - 0.9%); South Africa (0.06% - 3.6%) and Tanzania (2.3%) (Caceres 2008; Smith 2009). Although these estimates could have been significantly underestimated given the gross dearth of epidemiological data arising from the challenges in reaching this hidden sub-population in SSA. Nonetheless, consistent with other studies conducted among MSM in sub-Saharan Africa (Teunis 2001; Niang 2003; Attipoe 2004; Onyango-Ouma 2005; Wade 2005), the results of the feasibility and main study demonstrated that different sub-groups of men who identified as gay, bisexual, heterosexual and transgender (a volunteer who was excluded from the feasibility study) exist in Nigeria despite social ostracism by culture, religion, families, community, and political will. They exist in tightly knit social networks within which communication is channelled through body and spoken languages only understood by persons belonging to the network (Allman 2007).

In this study, we found two distinct groups of homosexual and bisexual men in Ibadan and Lagos: a larger sub-group of MSM in Ibadan [66.0% (95% CI 56.9-74.2)] and Lagos [78.2% (95% CI 75.5-80.8)] who were young men 15-24 years of age, predominantly unemployed with at least secondary education; and a smaller sub-group (30.0%) of relatively older, more educated,

employed, and wealthy men. In comparison with other national surveys, the distribution of men aged 15-24 years in the 2008 National HIV and AIDS and Reproductive Health Survey (NARHS) and 2009 Nigeria Demographic Health Survey (NDHS) were less, ranging from 35.5% to 38.2% respectively (FMOH. 2007; National Population Commission. 2009). Furthermore, this study had a higher proportion of MSM with tertiary (35.0%) compared with those in the general population NARHS (19.4%) and NDHS (14.3%) but compared well with the Nigerian population structure best described as a young population with nearly three-quarters of her population under 30 years of age (Leahy 2007).

As typified by the cosmopolitan nature of Lagos and Ibadan, 28 of the 37 states and all six geopolitical zones (Northwest, North-central, Northeast, Southwest, Southeast, and South-south) were represented in this study, although half of the respondents were from the southwest geopolitical zone. Nigeria is a country of rich ethnic diversity with more than 250 ethnic groups among which Yoruba (in the Southwest), Fulani and Hausa (in the North) and Igbo (in the Southeast) ethnic groups account for 68% of the Nigerian population. Most of the ethnic groups were represented in this study, although the Yorubas (57.4%) and Igbos (24.3%) predominated. With regard to religion, Nigeria is a highly religious country with a large number of denominations. Muslims (50%) slightly outnumber Christians (40%), and the remainder have beliefs in traditional or indigenous religions or atheism. In this study, Christians predominated with a ratio of 4:1 Christians to Muslims and the majority of the denominations were represented.

Male Circumcision

Circumcision is common in most African countries and almost universal in North and West Africa including Nigeria. The estimated prevalence of circumcision in Nigeria in 2006 was 90%

(WHO. 2007). Only six respondents (0.5%) reported not being circumcised in this study. Prevalence of circumcision was high (>99.0%) irrespective of age, educational status, employment, religion, marital status, sexual identity. However, fewer non-Nigerian MSM were circumcised (92.9%) compared with 99.5% of Nigerian MSM ($p=0.001$). Although prevalence of HIV and hepatitis B and C were higher among uncircumcised MSM (86.7%, 100%, 100%) than circumcised (80.0%, 88.2%, 96.7%) respectively, these were not statistically significant ($p>0.5$). Evidence from randomized controlled trials and meta-analyses conducted in Africa has demonstrated a 50% to 60% protective effect of male circumcision against female-to-male HIV acquisition (Auvert 2005; Bailey 2007; Gray 2007) and sexually transmitted infections (such as chlamydia, genital ulcer diseases and syphilis) (Moses 1998; Weiss 2006). Consequently, voluntary male circumcision (VMC) has been recommended as a biomedical intervention for HIV prevention (WHO. 2007). However, the efficacy of male circumcision in reducing HIV and STI acquisition among MSM remains controversial. Whereas some studies reported protection among MSM who exclusively engaged in insertive anal intercourse (Reisen 2007; Lane 2009; Templeton 2009), Millet and colleagues' meta-analysis did not demonstrate a protective effect of circumcision (Millett 2008).

Sexual experiences

Half of the respondents in Lagos (52.8%) compared with a third in Ibadan reported their first sexual encounter with a man. The median age of sexual debut was 17 years with women and 18 years with men, unlike in Senegal where the median ages of sexual debut were a year younger with both women (16 years) and men (17 years) (Wade 2005). Of note, more than half of the respondents' first male sex partners were older.

A significantly higher proportion of respondents reported being raped by a man (27.6%) and 17.7% by a woman in the year preceding the study unlike in Senegal where only 4% of MSM reported being raped by a man in the previous three months (Wade 2005) and 11.4% reported ever being raped in Botswana, Namibia, and Malawi (Baral 2009). Globally, rape, sexual molestations, assaults or abuses are widely perceived as crimes perpetrated by men against women. However, contrary to this notion, a few studies have documented the existence of these sexual phenomena by women against men (Sarrel 1982; Whatley 1993; Krahe 2003). Unfortunately, disbelief, cultural stigma, myths against male sexual abuse and the nonexistence of laws protecting male victims deter male victims from reporting cases and seeking help (Whatley 1993; Krahe 2003). Recognizing the increasing reports of rape and intimate partner violence by male victims within heterosexual and homosexual relationships by the U.S. Bureau of Justice Statistics, there has been a modification of the universal definition of rape in the United States Military in the United States Uniform Code of Military Justice [Title 10, Subtitle A, Chapter 47X, Section 920, Article 120]. Similar modifications need to be made to the existing Federation of Nigeria Criminal Code Acts Chapter 21 sub-section 224 which is currently only protective of women and does not recognise men as victims (see Appendix 1 page 268). Studies have demonstrated links between sexual coercion (often without a condom) experienced by men and increased vulnerability to HIV (Betron 2009).

Sexual identity

The vast majority of respondents (97%) in this study were single, although many (65%) reported a high chance of getting married to a woman in the future and more than half were sexually active with both men and women. Only a third of MSM in Lagos and 15% in Ibadan denied ever

having sexual relations with a female partner. Compared to 44.0% of the respondents who self-identified as homosexual or gay, prevalence of self-identified and behavioural bisexuality was high in this study with more than half (55.0%) of the respondents self-identifying as bisexual, 3.0% were married and 51.0% reported sexual relationships with female sex partners in the previous month. Studies show that black MSM are more likely than MSM from other races to self-identify as bisexual and be behaviourally bisexual (Doll L. 1997; Rodriquez Rust 2000; Montgomery 2003; King 2004; Millett 2005).

In Nigeria, as in most African countries, the status of both women and men is enhanced by marriage and procreation (Caldwell 1993; Orubuloye 1993; Magesa 1998; Luke 2006). In this study, 16.0% of gay identifying (80/500) and 78.2% of bisexual identifying (489/625) men reported sex with women in the previous year. Given the prevailing laws against homosexuality in Nigeria, most MSM irrespective of age marry, desire to marry or engage in sexual relationships with women to satisfy social pressures, to prove their masculinity and fertility, and to divert attention from their same-sex activities. Our findings are consistent with those of the first round of the Integrated Biological and Behavioural Surveillance Survey conducted in Nigeria a few months after this study was conducted (FMOH. 2007) and other studies in SSA (Millett 2005; Wade 2005; Allman 2007; Sanders 2007; Smith 2009).

In comparison to men who self-identified as gay/homosexual, those who identified as bisexual in this study were significantly older than 25 years [AOR 2.0; (95% CI 1.3-3.2)]; experienced internalized homophobia [AOR 1.8; (95% CI 1.2-2.8)]; reported episodes of condom breakage during anal intercourse [AOR 1.7; (95% CI 1.1-2.7)] and used recreational drugs [AOR 1.4;

(95% CI 1.0-2.2)];. In addition, self-identified bisexual men were less likely to engage with male sex partners from the same tribe as them [AOR 0.5; (95% CI 0.3-0.9)] and they were less likely to experience hostility [AOR 0.5; (95% CI 0.4-0.8)]. Self-identified bisexual men in this study were more likely to be married [AOR 3.5; (95% CI 0.7-16.7)] although not statistically significant because of the small sample size of married MSM in this study. In Senegal, MSM who self-identified as bisexual were older and married (Wade 2005).

Sexual Roles

Equally as important as sexual orientation are the various sexual roles MSM play within sexual relationships with other men. Yet, this has received little attention in the scientific literature globally and in SSA specifically (Carrier 1977). Self-labelling as 'top', 'bottom' or 'versatile' connoting preferences for insertive or receptive sexual practices during anal intercourse is commonplace in the MSM community worldwide (Carrier 1977; Wegesin 2000). Studies have demonstrated that preference for anal sexual role is inconstant but varies within sexual relations and over time for different personal, geographic, socio-cultural reasons (Carrier 1977). For instance, whilst majority of lower class Americans, Mexicans, Greeks, Brazilians, Turkish MSM dichotomously define preferences for top or bottom anal sex roles, in reality, personal preferences are often overridden by sexual gratification, sex partner preferences and other needs resulting in variations in patterns and prevalence of anal sex roles (Carrier 1977). MSM who play both insertive and receptive or versatile roles often do not do so with the same partners; rather, the role is defined by the degree of effeminacy or masculinity of prospective partners (Carrier 1977).

In this study, nearly half (47.1%) of the respondents preferred being *tops*, *inserters*, '*Kings*', or '*MTN*' compared with 20.1% (comprising 16.2% in Lagos and 22.0% in Ibadan) who self-identified as *bottoms*, '*receptors*', '*V-mobiles*', or '*agents*.' The rest (32.8%) self-identified as '*versatile*,' '*inserters and receptors*,' '*glo*,' '*rice and beans*,' or '*deydah*'. This agrees with the findings from our feasibility study (Allman 2007; Adebajo 2008).

Preference for the bottom position was highest among the 15-19 year olds (25.7%) decreasing to 19.6% among those 20-29 years and 15.1% among MSM aged 30 years and above ($p < 0.04$). MSM who were Yorubas (the predominant tribe in the Southwest of Nigeria) were overrepresented among those with preference for being top (53.4%) than other ethnic groups - Hausa (38.5%), Igbo (40.8%) and others (38.4) ($p < 0.001$). Similarly, 53.9% of self-identified bisexual men compared with 38.6% of self-identified gay or homosexual men expressed a preference for being the top ($p < 0.0001$) and 28.8% of self-identified homosexual men compared with 13.1% bisexual men reported a preference for the bottom sexual role. Nearly a third of MSM who reported being insulted and ridiculed (31.2%) compared with those who did not (17.9%) reported a preference for being the receptive partners. This study corroborates others which found that non-disclosing MSM (bisexual men) were more likely to indicate a preference for being top (96.6%) than bottom (85.8%) (Siegel 2008).

In this study, sexual role preference was associated with respondent's sexual behaviours in the last six months. For instance, 73.4%, 65.5% and 2.8% of MSM who self-identified as versatile, bottom and top respectively engaged in URAI with men ($p < 0.0001$). Similarly, 17.1% of versatile MSM vs. 14.5% of tops and 8.4% of bottoms reported UIAI with female partners ($p < 0.0001$). Further studies are required to deepen our understanding of sexual roles in sexual

behaviours and HIV vulnerability among MSM in Nigeria. As reported in Senegal, most of the receptive male partners in this study were typically effeminate (Wade 2005).

Psychosocial Responses

Internalized Homophobia

The concept of internalized homophobia is new in Nigeria. A third of MSM in this study experienced internalized homophobia; most of who were employed (36.6% vs. 31.2%) and identified as bisexual (41.6%) vs. gay (23.4%). Internalized homophobia was reported by higher proportions of men aged 30 years and above (42.9%) and 15-19 years (34.6%) than those aged 20-29 years (31.8%). Furthermore, a higher proportion of those who experienced internalized homophobia tested HIV positive (18.3%) and reported at least one STI in the previous six months (14.9%) compared to those who did not experience homophobia (10.9% and 8.4%) respectively. The high prevalence of internalized homophobia may be connected to internal conflicts resulting from the dual lives led by MSM as a result of the cultural norms attached to marriage. Additionally, the internal responses to non-disclosure of sexual identity, high levels of stigma, discrimination and homophobia against MSM could have reinforced risky behaviours (Zea 2003).

Hostility against homosexuality

Unsurprisingly, hostility against homosexuality was high in this study as nearly one-third of the men reported hostility as a result of their sexual orientation. It was reported more by men who had at least tertiary education (35.7% vs. 28.0%); were employed (36.6% vs. 26.3%); self-reported as gay (34.6%) vs. bisexual (27.7%); and as bottoms (39.8%) vs. tops (26.4%) as well

as by those who were out of the closet (15.0% vs. 2.8%) and lacked social support (33.3% vs. 28.1%). In addition, those who experienced hostility reported using drugs before or during sexual activities (6.6% vs. 3.9%); were HIV sero-positive (19.4% vs. 10.7%); had at least one STI in the last six months (13.3% vs. 9.4%). As HIV related stigma and discrimination, the presence of same-sex related hostility can create barriers to HIV testing, limit access to and utilization of prevention programs, and impede the adoption of safer and less risky sexual and social behaviors such as condom and lubricant use (Brooks 2005).

Disclosure of sexual orientation

Closely linked to hostility is non-disclosure of same-sex activities. More MSM in Lagos [66.4% (95% CI 62.0-70.5)] than in Ibadan [49.8% (95% CI 42.3-64.9)] did not disclose their sexual orientation to others. Only 74 respondents (6.6%) in this study disclosed their sexual orientation to anyone other than their male sex partners and MSM peers. In contrast, disclosure of sexual orientation to family was significantly higher in Malawi (17.0%), Namibia (44.5%) and Botswana (60.3%) (Baral 2009).

In this study, disclosure to non-MSM peers such as families and friends increased with age from 4.2% among the youngest age group 15-19 years to 5.3% among those 20-29 years to the highest among those aged 30 years and above (18.3%). Disclosure was also higher among MSM who had tertiary education (9.9% vs. 4.8%); were employed (8.0% vs. 5.5%), did not experience poverty (14.2% vs. 5.4%); who identified as gay (8.0%) vs. bisexual (5.4%) and among those who identified as bottoms (14.2%) vs. tops (3.4%). Higher proportions of MSM who disclosed their sexual orientation to others reported drug use before or during sexual encounters with men (17.1% vs. 6.1% who did not); ever tested for HIV (10.8% vs. 5.1%); engaged in URAI (10.4%

vs. 4.2%); experienced hostility (18.8% vs. 4.2%) and not experience internalized homophobia (7.5% vs. 4.8%) and were HIV sero-positive (16.6% vs. 4.9%). Studies have shown that fear of social repercussions of disclosure often result in reluctance among gay and bisexual men of color to identify as gay or bisexual but to identify as heterosexual, while secretly engaging in sex with men (Brooks 2005).

HIV Counselling and Testing

Most of the respondents in this study (70.2% in Ibadan and 75.3% in Lagos) had never had an HIV test. Thus, this study provided the first opportunity for HIV testing for a significant proportion of MSM in Lagos and Ibadan. This is higher than the 53.0% reported in the 2007 IBBSS report by MSM in Lagos (FMOH. 2007) which is not surprising given that this study preceded the IBBSS; hence, a significant proportion of MSM who would have been tested in our study would have reported previous testing. Testing pattern among MSM varied across the African continent with relatively better access to HIV testing and counseling (HCT) services in the Southern parts of SSA where 72.9% in Botswana, 59.4% in Namibia, and 35.2% in Malawi reported previous testing for HIV compared to 25.3% in Kenya, east of SSA. This may indirectly reflect the disparities in the extent of social stigma against homosexuality across SSA. For example, in high prevalence of HIV testing reported in Namibia could be attributed to recently suspended law against homosexuality (<http://76crimes.com/76-countries-where-homosexuality-is-illegal/>).

Respondents who had never been tested for HIV were more likely to be young (aged 15-25 years), have secondary education or less, be unemployed, single, gay, have a high-risk perception

and report URAI in the previous 6 months. Most barriers to accessing HCT are not unique to MSM but demonstrate that sexual orientation adds another layer of barrier to other factors that influence the utilization of HIV prevention, treatment, and care services. The role of HCT in reducing the burden of HIV among MSM cannot be overemphasized. Given that men generally have been shown to have poor health seeking behaviours (Braitstein 2008; Keiser 2008), effective MSM targeted HIV prevention strategies are urgently needed to increase uptake of HCT in line with the call for universal access.

High-transmission behaviours of MSM

The findings from this study highlight high levels of risky behaviours MSM engaged in with different types of male and female partners in Lagos and Ibadan.

The reported median number of lifetime partners was two for female partners and eight for male partners. In the preceding year, the median reported number of male sex partners was three (IQR 2-5) (range of 1-65) compared to one female sex partner (IQR 0-2) (range 0-32). In the same time frame, the median number of sex partners (male and female) was seven (IQR 6-9). In contrast, in a study in Senegal among MSM, the median reported lifetime female partners was four and lifetime male partners was six (Wade 2005).

Sex in exchange for money or gifts is commonplace among MSM in SSA where money or gifts are typically offered by the insertive, more socioeconomically advantaged sex partner to the receptive partner. To a lesser extent, receptive partners also offered money or gift items to insertive partners. In this study, a quarter of the men admittedly received money or gifts in

exchange for sex and more money was offered for sex without a condom. Similar trends have been reported in other studies in SSA (Clatts 2007; Broqua 2008; Caceres 2008; Smith 2009).

Epidemiologic studies have reported that consistent and correct use of condoms significantly reduces sexual transmission and acquisition of HIV and gonorrhoea (Davis 1999; Ahmed 2001; Holmes 2004; WHO. 2004) by at least 80% during heterosexual intercourse (Davis 1999; Aral 2002; Weller 2002). However, evidence of the effectiveness of condoms during anal intercourse is less certain because of the dearth of data (Silverman 1997). The oldest and largest study of condom use among 2914 MSM enrolled in the Multicenter AIDS Cohort Study (MACS) reported 70% lower HIV incidence among men who reported 100% condom use compared to those who did not use condoms (Detels 1989). More recently, a retrospective study among MSM who reported anal intercourse revealed condom effectiveness of 70% among MSM who reported consistent condom use compared to those who never used condoms (Smith 2013).

Most of the respondents (89.7%) in this study reported ever using condoms with their male sex partners. However, consistent condom use in the preceding year varied by the types of sex partners. Among those who had female partners, consistent condom use was 0% with regular female partners, 17.8% with non-regular female partners, and 79.5% with FSWs. With men, condom use in the last sex with regular male partners was 58.2%; 59.4% with non-regular male partners; 66.7% with commercial male sex partners; and 69.7% with male clients (i.e. clients from whom money or gift was received). According to a systematic review of the literature, condom use at last male-to-male anal sex varies widely from 0 to 82.0% across low and medium income countries (Caceres 2008). In another review, the global estimate of condom use weighted

by population size was 53% in SSA, higher than estimates derived for Southeast Asia (24%) (Adam 2009). Because low condom use increases vulnerability of MSM to HIV infection, there is an urgent need to establish and scale up comprehensive accessible, available, culturally acceptable, friendly, and affordable HIV prevention interventions for MSM in Nigeria. To facilitate this, social and structural impediments to reducing the vulnerability of MSM to HIV infection needs to be addressed.

Considerable sexual mixing was reported in this study. Sex with older men and more economically advantaged men was reported by a significant proportion of MSM (>60%). Furthermore, about a tenth of the respondents reported sexual relationships with foreign African and non-African white and black men. There were similar reports from Kenya, where the majority of MSM clients (93%) were non-Kenyans (Sanders 2007). Whilst the female partners of half of the respondents in this study were predominantly younger, male sex partners of most of the respondents were older; more educated, and earned higher incomes. Studies have demonstrated that the spread of HIV is enhanced when sexual relationships occur between socially differentiated groups (Morris 1997; Laumann 1999; Gregson 2002; Choi 2007). According to mathematical models of HIV transmission patterns among MSM, “between-group” or disassortative sexual mixing has a greater impact on population level sexual transmission of HIV than “within-group” or assortative sexual mixing (Gupta 1989).

About a third of the study population reported ever smoking cigarettes and drinking alcohol. Although many (63%) reported substance use, locally brewed concoctions were the most commonly used drugs. Very few respondents admitted to using marijuana and only two

respondents reported injecting drugs. Similar findings have been reported by other studies conducted in Nigeria demonstrating that alcohol, marijuana, and locally brewed stimulants often served as alcoholic drinks are the commonly used as recreational drugs in Nigeria (Oviasu 1976; Nevadomsky 1981; Adelekan 1989; Adelekan 2002). However, the literature is sparse on injecting drug use in Nigeria although there is a growing body of evidence in the past 25 years of an increase in the use of heroin and cocaine (Adelekan 2000; Dewing 2006; FMOH. 2007). Nigeria is considered an important drug trafficking route due to its geographic position between Asia and Latin America, which are two large drug producing regions (UNODC. 1999). The low prevalence of injecting drug use in this study could be a reflection of the sensitivity of the habit resulting in socially desirable responses. Because injecting and non-injecting drug use are considered to be illicit and criminalized in Nigeria, eliciting information about drug use is likely to be underreported (Gribble 2000). Exploring the use of other interviewing techniques other than the traditional face-to-face methods such as the audio or non-audio computer assisted self-interviewing (ACASI or CASI) techniques in future studies and in clinics where key populations are targeted in Nigeria may increase the likelihood of obtaining more accurate reporting of high-risk behaviours to inform improved risk reduction strategies to reduce HIV transmission.

Patterns and factors associated with unprotected anal intercourse (UAI) among MSM

Until this study, anal intercourse was neither explored by health care providers nor measured by researchers as a risk factor for HIV in Nigeria. This study characterised high-transmission risky sexual behaviours that predisposed MSM to increased risk of HIV and other STIs in Lagos and Ibadan and determined factors associated with URAI with men, UIAI with men and women.

URAI is the single most important risk factor for HIV transmission among MSM (Vittinghoff 1999; Millett 2006). This study documents high prevalence of unprotected anal intercourse (UAI) engaged in by MSM in Lagos and Ibadan. Over two-thirds of MSM in Ibadan (65.5%) and Lagos (69.7%) reported UAI with their male partners in the past 6 months. Of these, higher proportions of MSM in Ibadan (56.9%) and Lagos (57.1%) reported UIAI than URAI in Ibadan (33.0%) and Lagos (39.4%). In contrast, prevalence of URAI and UIAI were lower in other studies conducted in SSA (Wade 2005; Geibel 2008; Baral 2009; Lane 2009). In Senegal, 34.3% of MSM reported unprotected receptive anal intercourse with men and 43.0% reported unprotected insertive anal intercourse in the past 6 months (Wade 2005). Geibel and colleagues found that 64.0% of male sex workers in South Africa engaged in UAI (Geibel 2008). In a cross-sectional study of 537 MSM in Malawi, Botswana, and Namibia, UAI was reported as a common practice as only 3.3% of the men reported consistent use of condoms and water-based lubricants (Baral 2009). Similarly, among 199 Black MSM in South Africa, 27% reported UAI in the previous 6 months and this practice was three times more likely among men who self-reported heavy drinking (Lane 2008).

Factors found to be independently associated with URAI in this study included homosexual identity (AOR 1.51 [95% CI 1.13-2.03]); douching (AOR 3.68; [95% CI 2.4-5.6]); engaging in UIAI with men (AOR 2.19 [95% CI 1.63-2.95]); engaging in sexual activities with men who were mostly older (AOR 1.88; [95% CI 1.2-2.9]); having no social support (AOR 1.48; [95% CI 1.1-2.1]); and HIV seropositive status (AOR 5.09 [95% CI 3.13-8.29]).

For unprotected insertive anal intercourse with men, URAI with men (AOR 2.02; [95% CI 1.6-2.6]); UIAI with women (AOR 1.9; [95% CI 1.3-2.9]); older age of 30 years and above (AOR 1.83; [95% CI (1.02-3.26)]) and having non-African White men as sex partners (AOR 2.44; [95% CI 1.11–5.40]) were associated with UIAI with men. In contrast, factors associated with UIAI with women were URAI (AOR 2.07; [95% CI 1.11-3.85]) and UIAI with men (AOR 1.64; [95% CI 1.05-2.56]); older age (20-29 years) (AOR 2.22; [95% CI 1.03-4.80]); bisexual identity (AOR 4.00 [95% CI 2.52-6.35]); and having non-African White MSM as sex partners (AOR 2.45; [95% CI 1.45–4.13])).

Interestingly, homosexual identity was significantly associated with URAI while bisexual identity was associated with UIAI with women ($p < 0.001$) and with men ($p = 0.07$) in this study. This is not surprising because preference for receptive role during anal intercourse was reported by a higher proportion of self-identified gay or homosexual men (28.8%) than self-identified bisexual men (13.1%) and 43.8% of homosexual men vs. 34.4% of bisexual men actually engaged in URAI with men. Likewise, a higher proportion of bisexual identifying men (53.9%) than self-identified homosexual men (38.6%) endorsed a preference for the insertive role and 60.8% of bisexual men compared with 52.4% of homosexual men actually engaged in UIAI with men. Further analyses revealed that fewer self-identified gay or homosexual men reported a preference as “tops” (36.4%) than “bottoms” (63.7%) and versatile (44.2%). This implies that for these men, their reported sexual orientations were not consistent with actual sexual behaviour thus, corroborating the findings from other studies that explored relationships between self-reported sexual orientation and sexual behaviours (Wegesin 2000; Hart 2003; Washington 2006). In their study among HIV positive MSM, Hart and colleagues found that tops were less likely to

be gay-identified (67%) than were bottoms (90%) and versatiles (90%) (Hart 2003). In contrast, there was higher consistency between sexual role and sexual behaviour in this study as a higher proportion of bottoms engaged in URAI than tops (65.5% vs. 2.8%) and significantly more tops engaged in UIAI with men than bottoms (59.3% vs. 23.0%) ($p < 0.001$). With women, self-identified bisexual men were four times more likely to engage in UIAI than self-identified homosexual men ($p < 0.001$) and more tops (14.5%) and versatile (17.1%) than bottoms (8.4%) engaged in UIAI with women. Furthermore, significantly higher proportions of self-labelled versatile men reported UIAI with men (74.8%) and URAI (73.4%) than UIAI with women (17.1%) ($p < 0.001$) (Appendix 7 page 342). Pulling it together, this study reveals linkages between sexual orientation, sexual role or preferences and actual sexual behaviours. Thus, while gay-identified men were the more likely to be effeminate with higher preference for bottom sexual role, bisexual-identified men were more likely to be the more macho or masculine men who expressed a higher preference for the top sexual role and engaged in insertive anal intercourse with men and women. This agrees with the argument that sexual roles are associated with masculinity and femininity (Hart 2003). Further studies are needed to prospectively examine relationships between reported sexual orientation, preferred sexual role and sexual behaviours using less obtrusive methods of accurately eliciting sensitive self-reported behavioural information such as the audio-computer assisted interviewing (ACASI), internet-based or telephone interviewing methods.

Increasing age was significantly associated with UIAI with men and women in this study. Age is an important determinant in the selection of sex partners within same or opposite sex relationships (Adam 2000) and risk factor for HIV (Morris 1995). Studies in the published

literature have shown that young men in their twenties irrespective of their sexual orientation generally express preference for sex partners at least four years older than themselves and for older men, the age differential reverses in preference for younger men (Adam 2000). Adam's qualitative study among a diverse sample of 102 MSM provides insights into the reasons for the differential preferences. Younger men have a preference for older men in search for safety, emotional maturity, stability and mentorship (Adam 2000) and in some instances younger men seek for 'sugar-daddy' relationships for financial and material gratification (Niang 2002). In contrast, older men prefer younger men because they are perceived as more malleable, easily controlled and they often play the bottom sexual role (Adam 2000). This implies that with the continued increase in life expectancy of persons living with HIV as a result of improved access to ARVs, exposure to HIV transmission through intergenerational sexual mixing is likely to increase over time if relevant preventive interventions are not urgently provided.

In the year preceding this study, 15% (167/1125) of the respondents reported douching before and after sexual encounters with male sex partners using different combinations of solutions of such as alum, lime and salt; soap, water and alum; water, antiseptic and soap, water, herbs, and salt. Reasons provided for douching were to keep clean and to prevent STIs. Studies have found that ano-rectal douching before or after anal intercourse is associated with increased risk of HIV acquisition and transmission because of excoriation of the rectal lining (Schreeder 1982; Moss 1987; DiPalma 1989; Martino 2002; Carballo-Diequez 2008; Exner 2008). Black MSM are more likely than MSM from other races to report anal douching (Millett 2006). However, studies examining associations between douching and high-risk sexual practices in SSA are sparse. In this study, the odds of URAI were more than three times higher among MSM who reported

douching than those who did not. Many were unaware of the adverse effects of douching. Since douching is a common practice in this sub-population, it is important to correct the misconceptions and identify safer products and methods of application.

Interestingly, 28.0% of the 569 men who had female sex partners engaged in unprotected anal intercourse with their female partners. Studies in the United States (Ekstrand 1994; Stokes 1996; Malebranche 2003; Prabhu 2004; Siegel 2008; Zule 2009) and a few in SSA (Niang 2002; Wade 2005; Baral 2007; Sanders 2007) have reported the role behaviourally bisexual men play in the spread of HIV between high HIV prevalence sexual networks to lower prevalence female partners. It is unknown the proportion of HIV infections among women in Nigeria attributable to behaviourally bisexual men.

Prevalence and Correlates of Disease Outcomes

HIV infection among MSM

Despite various advances made in the HIV response globally, the infection has continued to spread among MSM across all continents of the world (Caceres 2005; Caceres 2006; Baral 2007; van Griensven 2007; Caceres 2008; Smith 2009; van Griensven 2009). Unfortunately research on same-sex behaviours has been largely neglected in sub-Saharan Africa. As at 2004, the only available studies on male-same sex behaviours in SSA were ethnographic (Niang 2002; 2003; Attipoe 2004; Caceres 2006). By 2009 (Appendix 12 page 353), the first twelve epidemiologic and a few other qualitative studies and systematic reviews were conducted in SSA and published in the scientific literature (Wade 2005; Angala 2006; Jewkes 2006; Zulu 2006; Allman 2007; Sanders 2007; Adebajo 2008; Burrell 2008; Johnston 2008; Lane 2008; Umar 2008; Baral 2009; van Griensven 2009). As highlighted in Van Griensven and Colleagues' systematic review of the

global HIV epidemic among MSM, prevalence of HIV among MSM in Africa were significantly higher among MSM than in the general population (van Griensven 2007) and there was marked heterogeneity in the prevalence of HIV across countries within the continent from the lowest (6.2%) reported in Egypt to the highest (30.9%) reported 30.9% in Cape Town (van Griensven 2009). Prevalence by region varied from the lowest in North Africa (6.2%- 9.3%), followed by East Africa (12.3%-24.6%), then West Africa (13.4%-25.0%) to the highest in Southern Africa (12.4%-30.9%) (van Griensven 2009). There are several reasons for the heterogeneity in HIV prevalence observed across countries. These include the differences in the prevalence of male circumcision, the predominant religion. The lowest prevalence in North Africa may not be unconnected to the high prevalence of circumcision and the predominant Muslim practices. Studies have demonstrated associations between HIV and both circumcision and religious practices (Bongaarts 1989; Cameron 1989; Moses 1990; Halperin 1999; Lavreys 1999; Auvert 2001; Gray 2004). In an ecological analysis of 118 studies conducted in developing countries the association between HIV and circumcision was confirmed independent of Muslim and Christian religion (Drain 2006). However, all these studies were conducted among heterosexual couples. It is unknown how this will play out among MSM. Other factors include the predominant modes of transmission of HIV and prevalence of HIV within sexual networks of MSM; stage of the epidemic, the access to and availability of prevention, early diagnosis and treatment of HIV and other STIs, prevalence of double or triple illegal and stigmatizing sexual and social practices i.e. same-sex activities and injecting drug use and transactional sex and the prevailing level of hostility and criminalization of MSM (Baral 2009; Smith 2009; Beyrer 2010).

Most of the respondents in this study (96.4%) consented to being tested for the HIV, HBV, HCV and syphilis. Consistent with other studies among MSM in sub-Saharan Africa, this study revealed a high burden of HIV among Nigerian MSM, with an estimated prevalence of 12.7% [95% CI 10.6-15.0] in Lagos and 11.2% [95% CI 5.7-17.0] in Ibadan and pooled prevalence of 13.4% [95% CI 11.4-15.4]. Prevalence varied considerably across the waves during the recruitment of respondents into the study. In Lagos, prevalence of 38.7% and 50% were recorded in the first and second weeks of recruitment in Lagos respectively followed by a decline to 5.5% in the 5-6th weeks, then another spike to 22.0% in the 8th week before the steady decline to lowest prevalence of <2.0% in the 14th week of recruitment. Although duration of recruitment in Ibadan was brief, nonetheless, a similar pattern was observed with the highest HIV prevalence of 10.4% in Ibadan recorded in the first week of recruitment. Because RDS involves recruitment of peers by peers, study participants control the sampling process (Frost 2006; Abramovitz 2009). Thus, it is possible that more HIV-infected seeds must have recruited other HIV-infected men into the study in the first wave since they are more likely to need health care services and remain closely connected than other men. Similar patterns have been observed in other studies where HIV-infected IDUs were significantly more likely than HIV negative IDUs to recruit other HIV-infected IDUs into a research (Frost 2006). Despite the positive features of the RDS methodology in recruiting populations with uncommon characteristics, this study underscores the need to adjust for differential recruitment biases in order to draw valid statistical inferences.

Prior to this study, three-quarters of MSM in this study had never had an HIV test. Of the 286 men (25.4%) ever tested for HIV, 53.5% had their last test in the year preceding the study, 25.5% two to five years and the rest (2.1%) over five years before the study. Discouragingly, only 9

MSM (0.8%) were aware of their HIV-infected status prior to the study. Of note, 10.6% of respondents who never received an HIV test compared with 20.8%, 24.6% and 16.7% whose last HIV test was within a year, 2-5 years and > 5 years prior to the study were HIV sero-positive. Prevalence of HIV in this sub-population was four times higher than the general population prevalence of 3.2% among men (FMOH. 2007). Other studies have also reported huge differences between HIV prevalence among MSM and the general population (Wade 2005; Baral 2007; Sanders 2007; Baral 2008). The results of a meta-analysis of 83 published studies across 38 low to high income countries revealed that the risk of HIV infection among MSM was 19.3 times higher than in the general population (Baral 2007).

The 2007 IBBSS conducted in three states in Lagos in the Southwest, Cross River in the South South, and Kano in the North Central of Nigeria reported a pooled HIV prevalence of 13.5% although Lagos recorded the highest prevalence of 25.0% (FMOH. 2007). Unfortunately, the IBBSS did not adequately apply the RDS key recruitment and analyses requirements; hence, the reported HIV prevalence may have been over or under-estimated. Though prevalence of HIV in this study is lower than those reported in other studies among MSM in SSA (Wade 2005; Baral 2009; Smith 2009), the significantly larger Nigerian population implies that the absolute numbers of MSM who are infected will be higher than in other countries in SSA.

HIV prevalence increased with age in this study. Compared with the 15-19 year olds, the odds of HIV infection significantly increased from 8.8 among 20-29 year olds to 39.3 among those 30 years and above. Similarly, an increasing trend in HIV prevalence was observed in the general population of men in the 2007 National HIV and AIDS Reproductive Health Survey (NARHS)

although the prevalence was several folds higher in corresponding age groups of MSM. HIV prevalence was 2.7% in the 20-29 year olds compared with 12.5% among MSM and 4.3% among men aged 30 years and above compared with 38.9% in the same age group among MSM (FMOH. 2007). An increasing trend in HIV prevalence with age was also reported in Malawi, Namibia, and Botswana where prevalence ranged from 8.3% among MSM aged 18-23 years; 20% among those aged 20-24 years and 35.7% among those older than 30 years (Baral 2009). Increasing age is associated with a cumulatively higher number of sexual partners and sexual exposure to HIV over time (Greenberg 1992; Seage 1997).

This study shows that the HIV epidemic is established within the MSM community in Lagos and Ibadan, and more men in the younger age bracket may become infected over time if appropriate prevention and treatment interventions are not urgently provided. Furthermore, with higher prevalence of HIV among older MSM who may be married and less open about their sexuality, it is pertinent that targeted HIV prevention messages and services be designed to avert new HIV and STI infections not only among young MSM and their male and female sex partners but also among older MSM who may require more innovative prevention strategies. For MSM already infected, there is a need to design targeted comprehensive positive health dignity and prevention (PHDP)²¹ programs to avert secondary HIV infections and transmission of infection to their sex partners.

The inverse relationship between socioeconomic status or wealth and different measures of health status is well established (Marmot 1978; Adler 2002; Mishra 2007; Fortson 2008).

²¹ PHDP entails activities centred on keeping HIV+ individuals physically and mentally healthy; preventing further transmission of HIV; and involving people living with HIV in prevention activities, leadership and advocacy WHO. (2007). Essential prevention and care interventions for adults and adolescents living with HIV in resource-limited settings. . Geneva, WHO.

However, the links between socioeconomic status (wealth) and HIV-related high-risk sexual behaviours as well as HIV infection remain conflicting in sub-Saharan Africa (Whiteside 2002; Gillespie 2007; Fortson 2008). Whilst most individual and ecological studies conducted in developed countries have reported an inverse relationship between socioeconomic status (measured as a composite index of education, income and occupation) and STIs including HIV (Fleming 1999; Fitzgerald 2000; Whiteside 2002; Fenton 2004; Mishra 2007), the converse is true in developing countries. In a systematic review of 36 studies that examined the relationship between socioeconomic status and HIV infection among women in South, Central and East Africa, twelve studies reported association between high socioeconomic status and HIV infection, eight found association between low socioeconomic status and HIV infection, and fifteen studies found no association (Wojcicki 2005). This study corroborates the empirical evidence that wealth among MSM independently correlates with HIV infection (Kongnyuy 2006; Gillespie 2007; Mishra 2007; Fortson 2008). Odds of HIV infection were doubled among MSM who were employed compared with those who were unemployed. Likewise, men who did not experience poverty were more likely to be HIV-infected although this was not statistically significant ($p=0.07$). The relationship between educational attainment and HIV infection is complex (Over 1993; Jukes 2005). Intuitively, higher educational attainment is often linked with better knowledge of preventive measures and access to health services, safer behaviour, type and scope of sexual contacts, and reduced HIV infection rates (Kilian 1999; Lagarde 2001; Hasnain 2007). However, this may be counterbalanced by lifestyle changes that accompany higher socioeconomic status (i.e., higher disposable cash, cars, cell phones, increased ability to travel from increased leisure time, increased sex partners, and transactional sex) that ultimately increase a man's vulnerability to HIV and STI infections (Hargreaves 2002). Tertiary

educational attainment was associated with HIV infection in this study although this did not achieve statistical significance ($p=0.2$). Further studies are needed to explore the relationship between socioeconomic status and vulnerability to HIV among MSM in SSA. Recognizing the existence of social class disparity even within the MSM community, there is a need to design culturally effective and appropriately targeted HIV prevention services that take into account the segmentation of the end users.

This study corroborates the fact that unprotected anal intercourse (UAI) is a risk factor for HIV transmission and acquisition (van Griensven 2009; Baggaley 2010). According to a meta-analysis conducted by Baggaley and colleagues, the risk of HIV transmission through receptive anal intercourse with a man or woman was 1.4% [95% CI 0.2-2.5] per-act and 40.4% [95% CI 6.0-74.9] per-partner; per-partner UIAI risk was 21.7% [95% CI 0.2-43.3] and combined URAI-UIAI risk 39.9% [95% CI 22.5-57.4] (Baggaley 2010). In agreement, our study showed that the odds of HIV infection was highest among men who engaged in URAI with men [AOR 5.14; (95% CI 3.3-8.9)] compared with those who engaged in UIAI with men [AOR 2.94; (95% CI 1.6-5.1)] and UIAI with women which increased the odds of HIV infection by fourfold [AOR 4.3; (95% CI 2.5-7.5)]. The high-risk sexual behaviours reported by MSM in this study with both men and women underscore the potential high rate of transmission of HIV likely to occur within MSM sexual networks and to the general population through lower risk female sexual partners if prevention interventions are not urgently provided. This calls for an urgent need for targeted, MSM-friendly, culturally sensitive HIV combination prevention services that incorporate behavioural, biomedical and structural prevention interventions in the private and public health sectors in Nigeria.

This study demonstrates high levels of multiple concurrent sexual partnering, concurrent bisexuality and high-risk behaviours. Half of the MSM in the study engaged in multiple concurrent sexual relationships with both men and women. In agreement with other studies (Millett 2005; Sanders 2007), the odds of HIV sero-positivity was two times higher among men who self-identified as homosexual men (AOR 2.2; 95% CI 1.3-3.7) compared with those who self-identified as bisexual. Nonetheless, the high prevalence of self-reported and behaviourally active bisexuality in this population points to the fact that MSM could serve as a viable channel of sexual transmission of HIV to the heterosexual population. Thus, by bisexual men being sexually active in both same-sex and opposite-sex relationships they become potential receivers and transmitters within both populations, thereby put themselves and others at increased risk of HIV and other sexually transmitted infections. Further qualitative research is needed to elicit a better understanding of sexual identities in the Nigerian context and to evaluate the relative attribution of homosexual and bisexuality to HIV infection in the general population. In addition, there is an urgent need for comprehensive targeted HIV behaviour change and communication messages that discourage both multiple concurrent homosexual and bisexual partnerships among MSM.

It is well documented by other studies and confirmed by this study that being the receptive partner increases the risk of HIV acquisition particularly with inconsistent condom use (Kingsley 1984; Carballo-Diéguez 2004). In this study, strong associations were observed between receptive and versatile roles and HIV prevalence. More than one-fifth of men who self-labelled as bottoms (21.9%) were HIV-infected compared with those who self-identified as the versatile

(17.5%) and those who self-identified as tops (6.7%). There is empirical evidence that sexual positioning is associated with gender roles among male-male sexual relationships. Early studies revealed that sexual positioning during anal intercourse between men may be associated with gender stereotypes of masculinity and femininity in the context of power dynamics between partners (Carrier 1977; Kippax 2001). Receptive positioning is often ascribed to MSM who display effeminate personality traits and assume female gender roles. Thus, a man may take the receptive role if he perceives his male partner to be more macho or masculine and vice versa (Carballo-Diéguez 2004). A higher proportion of MSM in this study whose sexual networks included foreigners (21.3% vs. 16.0%) reported a preference for being bottoms ($p < 0.0001$). Likewise, a higher proportion of MSM whose sexual networks included MSM with higher socioeconomic status reported a preference for being the bottoms ($p < 0.0001$) pointing to the power dynamics in ranking prospective sex partners by social class. Thus, the more masculine, the older and the higher the level of education or income of male sex partner, the more likely that MSM in this study would demonstrate a preference for playing the bottom role. This calls for health care providers to be more adept at eliciting more accurate sexual histories from men for appropriate risk profiling and designing of relevant prevention services tailored to MSM with the aim of increasing safer sexual practices. Unfortunately, healthcare providers are inadequately trained and sensitized to provide optimal prevention services including risk assessment for MSM. Thus, there is a need to sensitize healthcare providers through sexual diversity training and to incorporate sexual diversity training in the curricula of medical and nursing schools to raise awareness and improve HIV prevention services tailored to the specific needs of MSM in Nigeria.

The bidirectional causal relationship between STIs and HIV transmission and acquisition are universally acknowledged (Laga 1994; Ghys 1997; Gilson 1997; Rottingen 2001; Gorbach 2003). A systematic review of studies confirmed the higher transmission and acquisition of HIV in the presence of ulcerative than with non-ulcerative STIs particularly among men (Rottingen 2001). Similar associations have also been reported among black MSM in who the presence of anal and oral STIs further increases the risk of HIV infection (Millett 2006). In this study, reporting at least one STI in the previous year tripled the odds of HIV infection although the statistical significance disappeared in the multivariable analyses [AOR 1.64; (95% CI 0.9-3.11)]. Unfortunately, the combination of poor health-seeking behaviour and limited access to health care services for treatment of STIs could explain why MSM in this study resorted to self-medication and the indiscriminate use of antibiotics for prevention and treatment of STIs. More than a quarter (27.0%) of MSM in this study reported self-prescribed and procured antibiotics in the past 4 weeks to treat themselves for STIs. Decriminalization of same-sex behaviours in Nigeria will certainly promote better access of MSM to HIV prevention services.

As demonstrated by other studies conducted in high income countries (deWit 1993; van Griensven 1993; Buchbinder 1996; Stone 1999) and corroborated in this study, one-fifth of the men in this study experienced condom breakage at least once in the year preceding the study. Of these men, 24.1% tested HIV-infected with the odds of HIV infection almost doubling (AOR 1.9; 95% CI 1.14-3.1) compared to those who did not experience condom breakage. Condom failure due to condom breakage or slippage has been reported to be associated with HIV seroconversion among MSM in other parts of world (Buchbinder 1994; Stone 1999). In this study, condom breakage was more likely among MSM who were aged 30 years and older, who

had higher than secondary education, were married, self-identified as bisexual, engaged in UIAI with male and female partners, and had experienced sexual coercion. In another study, increased condom breakage was reported among MSM who engaged in anal intercourse under the influence of recreational drugs including alcohol (Stone 1999; Koblin 2006). Interestingly, condom breakage has also been reported among heterosexual couples, although to a much lower extent (Messiah 1997). HIV prevention messages should not only promote correct and consistent condom use with lubricants with both male and female sex partners but also emphasize proper condom storage and use.

There is mounting evidence of the impact of sexual mixing patterns on the spread of sexually transmitted infections including HIV (Anderson 1990; Morris 1995; Service 1995; Aral 1999; Gras 1999; Ford 2002; HELLERINGER 2007). Extensive disassortative mixing occurred between age, education, economic, ethnic, and regional groups resulting in increased risk of HIV infections across risk groups in this study. The odds of HIV infection was two and a half times higher among MSM who reported sexual relationships with non-African white men than those who did not. Similarly, men who reported sexual relationships with mostly men who had higher educational levels were three times more likely to be sero-positive. Discordance in sex partner characteristics may influence the adoption of preventive practices because of disparities in power dynamics between partners (Anderson 1990; Aral 1999; Gras 1999; Laumann 1999; HELLERINGER 2007). Furthermore, the high sexual mixing demonstrated between ethnic and racial groups within and outside Nigeria implies that MSM can bridge HIV and other STI transmission from within their sexual networks to other MSM sexual networks or to the general population through their male and female sex partners and vice versa. There is a need for further studies to better

understand the patterns of spread of HIV and other STIs within MSM sexual network structures in Nigeria.

Internalized homophobia was also found to be significantly associated with HIV infection in this study. The odds of HIV were two and half times higher among MSM who experienced internalized homophobia than among those who did not. Homophobia towards self may not be unconnected to internal conflicts arising from high levels of stigma and discrimination from families and the communities. If the presence of internalized homophobia creates negative feelings against self, this portends potential risks of self-destructive high-risk behaviours that predispose MSM to mental and psychosocial health outcomes and HIV (Herek 1997; Meyer 1998; Williamson 2000; Adebajo 2012). Studies have shown that the presence of internalized homophobia also creates barriers to access and uptake of healthcare services resulting in high STIs and HIV infection (Huebner 2002).

A critical component of any effective HIV prevention strategy in most developing countries including Nigeria is the provision of HIV counselling and testing (HCT) (WHO. 2010). Access to HCT increases knowledge of HIV status, safer sex options, and is an entry point to HIV care, treatment, and support services (Weinhardt 1999). Of concern, only a quarter of the MSM (286/1125) comprising 25.2% [22.2-28.4] in Lagos and 28.1% [21.9-37.0] in Ibadan had ever had an HIV test. Of those who ever tested, 56.4% (166/286) tested in the year preceding the study. Whilst almost 89% (255/286) of those who had ever tested reported a negative result, 3.2% (nine men) tested positive and the others (7.7%) did not receive their results. Thus, of the 1,085 respondents in the study who consented to being tested, only nine (0.83%) were HIV sero-

positive and were aware of their HIV-infected status prior to the study. Interestingly, men who had access to tested were more likely to be HIV-infected [AOR 1.54 (95% CI 0.94-2.52)] although this was not statistically significant ($p < 0.09$). It is possible that MSM who previously reported HIV-negative results may have begun engaging in unsafe sexual practices that led to HIV infection as a result of a false sense of security and misperceptions that they were at low risk or no risk of contracting HIV. Studies have shown that there is a significant association between sexual risk behaviour and HIV optimism (Van de Ven 1999; Vanable 2000; Katz 2002). Knowing that men have poor health seeking behaviours relative to women (Mansfield 2003; Galdas 2005; Smith 2006), it is critical to increase access and uptake of appropriate and effective HIV testing services for MSM in Nigeria in order to increase the population of MSM who are aware of their HIV status.

Previous studies have demonstrated that concealment of sexual orientation is associated with HIV acquisition and accelerated course of existing HIV infection because of low self-esteem, depression, and low or no use of prevention services (Stokes 1998; Kenamer 2000; Shehan 2003; Cole 2004; Iwasaki 2007). Paradoxically, being out of the closet was associated with increased odds of HIV infection in this study although this was not statistically significant (AOR 1.73 [95% CI 0.84-3.78]). The findings of this study are consistent with another among young MSM across six counties in the US, which found that HIV prevalence among non-disclosers and disclosers was 14% and 24%, respectively among black MSM and 8% and 11% among white MSM, respectively (Shehan 2003). Further analyses of our data revealed that MSM who disclosed their sexual orientation were more likely to self-identify as gay [AOR 1.51; (95% CI 0.9-2.43)]; less likely to experience poverty [AOR 0.39; (95% CI 0.2-0.8)] and internalized

homophobia [AOR 0.44; (95% CI 0.23-0.84)]; but were more likely to engage in sexual relationships with foreign black African [AOR 1.6; (95% CI 0.81-3.29)] and non-African white [AOR 2.1; (95% CI 1.1-4.3)] male sex partners. They were also more likely to self-identify as the receptive partners (AOR 2.92 [95% CI 1.64-5.28]) and to report condom breakage (AOR 2.5 [95% CI 1.4-4.5]). The coming out process is well documented to be a stressful experience for MSM with significant adverse consequences (Dank 1971; Iwasaki 2007). Putting it together, men who disclosed their sexual orientation to others or were out of the closet, were those who experienced internal conflicts from hostility, internalized homophobia, criminalization, and loss of peers to AIDS culminating in increased vulnerability to HIV-related risky sexual and social behaviours. Further research that examines depression in this group of individuals may shed more light on the inter-linkages between non-disclosure of sexual identity, internalized homophobia, HIV risk bearing behaviours and HIV among MSM in Nigeria.

Prevalence and Risk Factors of HBV

Globally, men who have sex with men exhibit higher HBV prevalence compared to the general heterosexual population (Dietzman 1977; Schreeder 1982; Kahn 2002). Hepatitis B is a vaccine-preventable viral infection however, because most MSM and health care providers are unaware of its risk and consequences, this subpopulation remains unvaccinated (Kahn 2002). To our knowledge, this was the first study in Nigeria and SSA to determine the prevalence of, and associated risk factors for hepatitis B (HBV) and C (HCV) infections among MSM. The only serologic marker of HBV tested among men in this study was hepatitis B surface antigen (HB_sAg) which detects current (acute or chronic infection). The study found that hepatitis B and C infections (HBV and HCV) were also prevalent among MSM. Prevalence of hepatitis B infection was significantly higher in Ibadan 17.7% [11.3-27.6] compared to Lagos 10.1% [8.2-

12.1]. Unfortunately, none of the respondents was aware of his HBV status prior to the study. Hepatitis B infection is endemic in Nigeria as it is in other countries in SSA because most infections occur in early childhood (Lawal 2009). Prevalence of hepatitis B surface antigen (HBsAg) ranges from 2.7% to 26.0% among different low-risk general populations in Nigerian (Whittle 1983; Durosinmi 1991; Bada 1996; Umolu 2005). Specifically, prevalence of HBsAg ranged from 4.6% among women and 7.4% among men in the general population (Adoga 2010); 11.0% among pregnant women (Mbaawuaga 2008) and 14.3% among healthy blood donors (Uneke 2005). Among higher risk sub-populations, prevalence of HB_sAg was 15.0%-26.0% among HIV-infected blood donors (Mustapha 2004; Uneke 2005; Lawal 2009); prisoners (23.0%) (Adoga 2009), 10.1% among adult females and 15.4% among adult males living with HIV (Otegbayo 2008). However, unlike in high-income countries where hepatitis B is predominantly acquired in adulthood through sexual transmission (Wright 1975; Murphy 1980; Schreeder 1982), hepatitis B infection attributable to sexual transmission is unexplored in Nigeria.

Only 2.3% of MSM in this study had HIV and hepatitis B co-infection. MSM with HIV infection had significantly higher HBV prevalence (19.7%) than HIV uninfected MSM (12.4%). Thus, men who were infected with HIV were more likely to be co-infected with HBV [AOR 1.89; (95% CI 1.1-3.3)]. It is estimated that 2-4 million people have HBV and HIV co-infection globally (Lawal 2009). HIV and HBV co-infection is associated with severe forms of liver disease and poor response to anti-retroviral therapy (Saves 1999; Mustapha 2004; Lawal 2009). Surprisingly, higher prevalence of co-infections (26.5-29.0%) have been reported among HIV-infected persons in Nigeria although there was no indication of the sexual orientation of the

participants in the studies (Sirisena 2002; Mustapha 2004). Other studies conducted among HIV-infected MSM in Sydney, Australia (Jin 2007), and Japan (Koike 2008) showed similar prevalence of co-infection. The reason for the significantly lower prevalence of dual HIV and HBsAg infection in this study relative to others is not clear. Although by limiting the screening to only one serologic marker HBsAg without anti-HBs (to detect antibody to HBsAg) and anti-HBc (to detect antibody to hepatitis B core antigen could have underestimated the magnitude of HBV prevalence in this study population. For instance, Schreeder et al in their study among 3,816 MSM in the U.S, he found that 6.1% had HBsAg, 52.4% had anti-HBsAg and 3.0% had anti-HBc. The rate of HBV sero-positivity indicated by the presence of the serologic markers was 61.5% (Schreeder 1982). In another study in the general population in Nigeria, whilst prevalence of HBsAg and anti-HBs was 72.5%, prevalence of HBsAg was 10% (Fakunle 1981). Nonetheless, given that 8-10% of persons with hepatitis B infection in endemic countries will ultimately progress to chronic liver disease, this portends a serious public health problem (Schreeder 1982; Kahn 2002; WHO 2002; WHO. 2004; Adoga 2010).

Risk factors for hepatitis B among MSM in this study included residing in Ibadan. Significantly more MSM in Ibadan than Lagos had hepatitis B infection. Furthermore, the odds of HBV sero-positivity were nearly three times higher among MSM from the Northern states [AOR 2.88; (95% CI 1.3-6.4)] and two times higher in the SW [AOR 1.95; (95% CI 1.1-3.5)] compared with the South-South geo-political zones. This is consistent with other studies that have reported higher prevalence of HBV in the northern than southern parts of Nigeria (Abiodun 1994; Harry 1994; Luka 2008). Although there is no obvious explanation for this observation, Ibadan is a conservative 'university city' where MSM may be more secretive about their sexuality, and

therefore, engage in higher risk sex than their counterparts in Lagos, thereby increasing their risk of hepatitis B. Also, because the Northern states are less developed than the Southern states, it is likely that exposure to hepatitis B is at an even earlier age than the Southern states. Clearly there is a need for further studies to deepen our understanding of the correlates of HBV infection among MSM in Nigeria.

This study found a strong independent association between sexual activity and HBV seropositivity. Self-identifying as bisexual increased the odds of hepatitis infection by 44% among MSM in this study ($p < 0.05$). Similarly, engaging in unprotected insertive anal intercourse with men significantly increased the odds of hepatitis B seropositivity [AOR 5.22; (95% CI 3.04-9.0)]. Consistent with other studies among MSM, higher prevalence of HBV was reported among bisexual men and among those who engaged in unprotected anal intercourse (Schreeder 1982; Seage 1997; Remis 2000).

Although not statistically significant, the more diverse the sexual network of respondents the higher the odds of HBV infection. Thus, MSM whose sexual networks included foreigners or men with higher income levels were more likely to be HBV seropositive probably because they engaged in more frequent and aggressive anal sexual practices that resulted in trauma to the rectal mucosa.

Given that chronic HBV infection leads to cirrhosis, liver failure, and hepatocellular carcinoma (Kahn 2002), it is critically important to avert HBV infections in the general and key populations. Current guidelines from WHO and CDC recommend that MSM receive immunizations against hepatitis A and B (WHO. 2004; CDC. 2008). In Nigeria, hepatitis B vaccine has been included in the national immunization program since the mid-1990s although it

only became available for infants and persons enrolled for HIV antiretroviral treatments in the early 2000s (Beasley 2009). Recognizing the increased vulnerability of MSM to hepatitis B infections particularly for those with limited access to health care services [AOR 1.60; (95% CI 0.97-2.65)], it is recommended that coverage of national immunization programs is expanded to include both HIV-infected and negative MSM sub-populations and their male and female sex partners since sex partners of chronically infected persons are also likely to have a high prevalence of HBV infection (Gateau 1974; Heathcote 1974).

Prevalence and Correlates of HCV Infection

This study has also demonstrated that MSM in Lagos and Ibadan are vulnerable to hepatitis C infection. Like hepatitis B sero-positivity, prevalence of HCV among MSM was higher in Ibadan 4.3% [95% CI 0 - 4.5] than in Lagos 2.8% [95% CI 1.9-4.0] although the confidence intervals overlapped in Ibadan. Most of the available studies on HCV in Nigeria were conducted among healthy blood donors with prevalence ranging from 5.0-12.0% (Bojuwoye 1997; Halim 2000; Jeremiah 2008; Udeze 2009), HIV infected persons (5.7%) (Inyama 2005), and among pregnant women and their babies (9.2% and 1.1%), respectively (Ogunro 2007). Compared to the estimated prevalence of HCV in SSA of 3.0% (Madhava 2002), prevalence among MSM in Ibadan was higher. Likewise, prevalence in this study was higher than 1.2%, 0.8%, and 0.6% reported among urban black, Asian, and white South Africans, respectively (Ellis 1990).

The main mode of transmission of HCV in high income countries is blood contact through parenteral exposures and injecting drug use (Buchbinder 1994; Bodsworth 1996; Alary 2005; Alter 2006; 2007; Calzavara 2007). Numerous studies have reported the increased risks of HIV

and other blood-borne infections associated with injecting and recreational drug use among MSM globally (Myers 2002; Crosby 2004; Bullock 2006; Drumright 2006; 2006; Hickson 2010; Bourne 2012). However, in SSA, only a few studies have explored drug use among MSM (Parry 2008; Baral 2009; Metcalfe 2009; Johnston 2010). Surprisingly, injecting and non-injecting drug use was rarely reported in this study. For instance, none of the 11 respondents who reported injecting opium (2), heroin (1) or cocaine (9) tested positive for HCV in this study. It is possible that drug use behaviours among those who did test positive for HCV were under-reported due to fear of disclosure associated with the double stigma and criminalization attached to same-sex activities and drug use in Nigeria.

The risk of sexual transmission of HCV is still unclear. While some studies have reported rare sexual transmission of HCV even in the presence of HIV co-infection within discordant heterosexual (Marincovich 2003) and homosexual couples (Alary 2005), other studies have reported the converse (Briat 2005; Cohen 2006). HCV infection is increasingly identified in HIV-infected non-drug using individuals in high-income countries (Ghosn 2004; Jones 2005; Danta 2007; van de Laar 2007; Fox 2008; Thomson 2009) suggesting HCV as a sexually transmitted infection among HIV-infected MSM. Reasons advanced for this trend is increased access to readily available antiretroviral drugs resulting in increased exposure to higher risk sexual behaviours and higher prevalence of ulcerative STIs among MSM that may also enhance sexual transmission of HCV (van de Laar 2007).

Richardson and colleagues compared the incidence of HCV among non-injecting MSM infected, MSM uninfected with HIV and MSM with unknown HIV status and found that the incidence of HCV ranged from the highest of 11.8 cases/1,000 person-years [95% CI 6.7-19.1] among HIV-

infected, to 2.0 cases/1,000 person-years [95% CI 0.6-5.2] among MSM with unknown HIV status and 1.5 cases/1,000 person-years [95% CI 0.5-3.5] among HIV-uninfected (Richardson 2008). In this study, prevalence of HCV was higher among MSM who tested positive to HIV (4.9%) than among those who were HIV-uninfected (3.0%) and prevalence of HIV-HCV co-infection was low among MSM in this study (0.6%). Reasons for the higher prevalence of HCV among HIV-infected MSM may not be unconnected to the higher viral load of HCV in seminal fluids as reported in other studies (Leruez-Ville 2000; Bourlet 2002; Briat 2005; Richardson 2008).

Unlike the synergistic relationship between HIV and HBV, although HIV infection is associated with rapid progression of HCV (Graham 2001; Ragni 2001; Blackard 2008; Thomson 2009), the effects of HCV on HIV is less clear (Greub 2000; Shepard 2005; Stebbing 2005). There is mounting evidence that the presence of HIV and other STIs facilitate sexual transmission of HCV (Browne 2004).

In agreement with several other studies (Browne 2004; Danta 2007; Richardson 2008), URAI was independently associated with HCV infection among MSM in this study [AOR 2.44; (95% CI 1.2-5.1)] even after controlling for HIV status. Although, sex is not an efficient route of transmission of HCV, it is possible that high risk sex MSM engage in with concomitant bruising in the rectal mucosa can facilitate HCV transmission. Furthermore, given that HCV has been isolated in semen among HIV infected men (Briat 2005) it is possible that the presence of HIV infection facilitates HCV infection (van de Laar 2007; Urbanus 2009) which could explain the higher prevalence of HCV among HIV sero-positive respondents compared with the non-infected. Other studies have suggested the influence of injecting or non-injecting drug use (van de Laar 2007) and past history of syphilis in facilitating HCV transmission (Turner 2006; Danta

2007; Urbanus 2009). Tattooing, piercing, acupuncture, traditional scarification are other possible parenteral routes of transmission of HCV which were not elicited in this study. The sexual transmission of HCV demonstrated in this study implies that MSM can also transmit HCV infection through aggressive unprotected anal intercourse to their female partners although this was not statistically significant in this study [AOR 1.33; (95% CI 0.6-3.3). nonetheless, it is important to establish and increase access of MSM to regular screening of blood borne viruses – HIV, HBV and HCV to enable early diagnosis and treatment.

Prevalence and Factors Associated with Syphilis Infection

Data from many parts of the world suggest that prevalence of syphilis is on the increase among MSM. Surprisingly, prevalence of syphilis infection was extremely low among MSM in this study (0.3%). A similar prevalence of (0.3%) was also reported among antenatal clinic attendees the national sentinel surveillance survey conducted in Nigeria in 2008 (FMOH. 2009). The low prevalence of syphilis in Nigeria could be attributed to the high and indiscriminate use of antibiotics that are readily available over the counter without a doctor's prescription (Agbaje 2003; Ogunsola 2006). There is also the possibility of cross-immunity from endemic non-venereal treponemes (other strains of the causative organism of syphilis) (Ogunsola 2006). Because MSM are susceptible to STIs including syphilis, it is critical to encourage high-risk MSM to routinely screen for sexually transmitted infections.

To the best of our knowledge, this was the first study to report prevalence estimates of hepatitis B, C, syphilis in addition to HIV among MSM in Nigeria. Currently in Nigeria, routine screening for HBV and HCV is restricted only to HIV-infected persons on their first visit to the ARV clinic. This implies that opportunities for screening and early detection of HBV and HCV among

high-risk HIV-uninfected MSM are remote. It is important for government, policy makers, donors, and prevention programmers to allocate appropriate resources and strategically plan for HBV, HCV, and HIV prevention, early detection and treatment interventions for MSM and their sex partners to prevent more expensive long term consequences.

Comparisons of predictors across various disease outcomes

Comparing the risk markers across the study outcomes has enabled the identification of factors that predictive of UAI, HIV, HBV, and HCV among MSM. Of all the risk markers analysed, URAI with men, UIAI with men and UIAI with women were significantly associated with at least two disease outcomes. Men who reported UIAI with women were more likely to engage in URAI with men and be HIV-infected. Although there was an association with HBV infection, it was not statistically significant. On the other hand, men who engaged in UIAI with men were more likely to also engage in URAI with men, UIAI with women and be HIV and HBV seropositive but not HCV seropositive. Injecting drug use was quite low among MSM in this study, and the findings from this study support the evidence of URAI with men but not UIAI as a risk factor for HCV infection.

Douching is a popular practice among MSM before or after condom protected receptive anal intercourse (Ndimbie 1996; Carballo-Diequez 2008) or intentionally without condoms or barebacking (Carballo-Die'quez 2009) and a risk factor for sexually transmitted infection (DeVries 2008) including HIV (Moss 1987; Carballo-Diequez 2008), HBV (Schreeder 1982; Koziol 1993), and HCV (Ndimbie 1996). Only 15% of this study population reported douching often for hygienic reasons. Douching was found to be associated with only URAI and not significantly with any of the viral infections. Further research is needed to explore the role of

douching in STI transmission and acquisition. Nonetheless, since douching particularly with harsh liquids and soaps can result in excoriation and loss of rectal epithelial lining, and thereby facilitate HIV transmission, it is important that history of douching and the types of fluids used are elicited from MSM for research and in clinical settings, and that appropriate education is provided to make douching safer.

Lack or limited access to prevention health care services including HIV testing and counseling increased the odds of HBV infections among MSM in this study, but not of HIV and HCV. None of the 35 men (3.2%) who tested positive to HCV in this study had ever received screening tested for HCV or was aware of HCV status prior to this study. This could have been due to the lack of symptoms or lack of access to medical care. Studies have shown that patients who lack access to basic medical care are several times more likely to be unaware of being infected (Volk 2009). Since MSM are at increased risk of HCV, with the advent of interferon-free treatment to prevent the long-term complications and mortality associated with HCV infection, it is imperative to improve access to treatment. However, access to treatment is impossible without improving access to testing.

Just as early detection and treatment of HIV is a recommended policy to reduce HIV community viral load, early detection and treatment of HBV and HCV should also be provided for MSM to reduce the risk of transmission and the short and long-term consequences.

This study has demonstrated that internalized homophobia was significantly associated with HIV infection but did not show a link with UIAI with men and women, HBV and HCV. Shernoff in his review found that internalized homophobia could contribute to condomless anal intercourse or barebacking because of the feeling of worthlessness it creates (Shernoff 2006; Blackwell

2008). There is no evidence in the scientific literature linking internalized homophobia to either hepatitis B or C acquisition.

Interestingly, sexual orientation predicted URAI, HIV and HCV infections but not HBV. This could be due to the small sample size of HCV-positive men. Homosexual identity predicted URAI and HIV infection whilst bisexual identity predicted UIAI with men and women. A large body of studies has demonstrated that male homosexuals have more feminine traits than male heterosexuals and male adolescents who exclusively have sex partners of the same sex are distinctly more effeminate than those with partners of the opposite sex (Udry 2002; 2006).

In agreement with Udry and Chantala's argument, it appears that Nigerian MSM also express their sexual orientation through their masculinity with gay or homosexual identified men being more effeminate preferring the bottom or receptive sexual position in URAI. Similarly, the bisexual men are the more masculine men who prefer the top sexual role and engage in UIAI with men and women. Thus, high-risk behaviour rather than sexual identity is a better predictor of HIV acquisition (Boles 1994).

Unsurprisingly, neither of the structural factors - experienced hostility nor experienced poverty significantly predicted any of the outcomes of this study. This could be because the study lacked adequate power to detect differences between those who experienced hostility or poverty and the study outcomes. Research that demonstrates associations between structural factors and HIV are sparse partly as a result of methodological measurement challenges. Because of the inherent complexity of structural factors and the multiple interactions with and beyond individual level factors to more distal social network, community and environmental level factors, it is important

that innovative measurement and analytic approaches such as structural equation modeling are explored to disentangle the influences of structural factors (Latkin 2005; Latkin 2010). Structural factors operate at different macro, meso, and micro levels. Whilst the more distal macro levels factors have the broadest coverage involving political structured, policies and legislations, the intermediate meso-level factors operate at community or neighbourhood levels. The more proximal micro-level factors operate at the immediate social and physical context within the sphere of influence of the individual. Recognizing these challenges, structural factors were limited to the micro and meso-levels and were elicited at the individual levels in this study.

Study strengths and limitations

Until 2006 when the Men's Study Nigeria (MSN) was conducted, there was a dearth of policies, research, and HIV prevention programs targeted at MSM in Nigeria.

A cross-sectional study design was employed to ascertain the prevalence and correlates of UAI, three blood borne viral infections and syphilis among 1,125 men who engaged in same-sex activities in Nigeria. Cross-sectional designs are best suited to explore key aspects of MSM sexuality, sexual behaviours and HIV/STI risk in Nigeria. However, given that data on the exposures and outcomes were obtained at the same point in time, this limits inferences of causality and temporality between the exposures and outcomes. For instance, it was difficult to ascertain whether exposures were not consequences of the outcomes resulting in reverse causality. A longitudinal study design would help to disentangle the temporal direction and causal effects between the variables. Temporal bias was minimized in this study by including

probing questions in the study instrument to guide the ascertainment of when respondents were first exposed to some of the variables.

Notwithstanding, it is believed that internal validity was high in this study because standardized instruments were administered by trained interviewers blinded to the outcomes of the study and respondents were also unaware of whether or not they were infected with any of the outcomes (HIV, HBV, HCV, syphilis). Recognizing that high levels of measurement errors could distort estimates of risky sexual behaviours and other outcomes (Catania 1990), efforts were made to minimise measurement error and participation bias. However, the possibility of biased responses cannot be ruled out given the sensitivities of sexual and social behavioural information elicited through self-reports from a marginalized highly stigmatized sub-population. Measurement error from self-reported sexual behaviours may have occurred from respondents refusing to answer some of the questions; underreporting their actual sexual and social activities and under or over-reporting of actual frequency or number of sexual partners respondents. Unfortunately it was difficult to examine over or underreporting of sexual behaviour because of the lack of gold standard validity index for self-reported sexual behaviour. If underreporting did occur, our assumption was it could have been in a downward direction to downplay behaviours that are culturally frowned at. Another possible source of bias was recall of past sexual activities. Strategies deployed to enhance recall in this study included limiting the recall period to an interval of the last sexual encounter to a maximum of the six months and number of sex partners to the last four. Although face-to-face (FTF) interviewing technique was employed, the questionnaires were anonymously administered with privacy and confidentiality assured by trained and experienced interviewers who were under an obligation to assure confidentiality.

FTF interview was used because it was endorsed by members of the MSM community and the community advisory board as the most affordable and acceptable interviewing technique at the time this study was conducted. To mitigate the effects of self-presentation bias, the questions were presented to respondents in a non-judgemental manner and some questions were included in the study instruments to verify the respondents' responses (Fisher 1998).

Considerable effort was also put into minimizing underreporting by training the interviewers, developing an interview protocol that ensured privacy and confidentiality, encouraging respondents to provide truthful information, and by providing memory aids to facilitate recall. Even if there was underreporting of some of the sensitive behaviours, it is believed that the effects on the risk estimates would have been reduced toward the null.

This study relied predominantly on peer recruitment through the respondent driven sampling recruitment method. Although, this approach successfully recruited a large heterogeneous study sample, the chances of participation bias could not be ruled out. It is possible that those who did not participate were eligible but intentionally declined to participate because of their sexual and social practices. The implication is that UAI and biological outcomes would have been underestimated. However, if measurement error did occur, it would have been non-differential resulting in underestimation of the true associations.

The dual incentives introduced in this study could have attracted ineligible participants and increased the potential for duplication and impersonation. To safeguard against this, respondents were screened at every stage of the study and all the study staff were trained to be vigilant.

Future studies are recommended to compare the impact of monetary with none monetary incentives such as referrals to prevention and treatment services, provision of condoms and lubricants etc.

Despite attempts made to recruit older men by diversifying the initial seeds and modifying the recruitment strategy, participants recruited into the study were predominantly young men. Older MSM may have other risk factors for HIV and other outcomes that may differ from what these data present. Nonetheless, RDS remains the most effective and efficient recruitment method for reaching MSM in poor settings (Heckathorn 1997).

This study could not explore patterns of drug use (injecting and non-injecting) and mental health status of MSM and their associations with UAI, HIV, HBV, and HCV because of the low prevalence of drug use. This is likely a result of the double-stigma and criminalization attached to homosexuality and drug use which are both illegal in many countries including Nigeria. Thus, it is possible that prevalence of injecting drug use could have been grossly underreported in this study.

By the design of this study, it was difficult to differentiate between incident (acute) and chronic HBV infections since respondents were screened only for chronic hepatitis B with hepatitis B surface antigen (HBsAg). Because of funding constraints, we did not screen for hepatitis B core antibody (anti-HBc) which identifies recent cases for early diagnosis and treatment.

Furthermore, information regarding HBV preventive vaccination coverage or other important modes of HBV acquisition, such as antecedent surgeries, blood transfusions, history of unsafe injections, tooth extractions, piercing, bloodletting, or tattooing practices were not obtained from this study. Hence, the effects of these potential explanatory variables could not be adjusted in the multivariable analyses.

Given that exposure to most of the risk markers relied on self-reported recall of exposures in last 6-12 months, it is difficult to ascertain what window period of exposure could have contributed to the outcomes e.g. HIV infection. Fortunately one-fifth of the respondents who tested HIV-infected received their last HIV tests in the year prior to the study, and another 24.6% received their last test at least two years before the study. Only one-tenth of those who never tested were HIV seropositive. This implies that at least 40% of the respondents would have had recent infections which could be attributed to exposure to the independent variables in the last 6-12 months. Barring the prohibitive cost of polymerase chain reaction (PCR) tests, future studies should deploy PCR tests for track incident cases of HIV infection.

This study attempted to examine the prevalence and correlates of high risk behaviours and biological outcomes among MSM going beyond proximal individual level factors to more distal level factors. For future studies, path analyses or structural equation modelling should be employed in addition to the traditional regression modeling to better understand the interrelations between measured variables and latent constructs.

Given the multiple outcomes and multiple analyses this study entailed, Bonferroni correction to reduce the chances of type-1 familywise errors (Shaffer 1995; Benjamini 2001) was attempted but had to be aborted because of the associated reduction in the power of the study.

Tying it all together, the results of the retest reliability of the study questionnaire corroborated by the findings from other studies (Coates 1986; Catania 1990) provide enough evidence to support the fact that observation bias is a less likely explanation of the results of this study. Whilst it is impossible to conclude that this study adjusted for all relevant confounding factors, it is believed that the results are not likely to be affected by confounding because the identified confounding factors were adequately dealt with during the data collection and the multivariable analyses. The adjusted odds ratios derived from the study suggest that attempts to further adjust the estimates from more comprehensive data on the same confounding factors is unlikely to significantly modify the results. Notwithstanding, there is the possibility of residual confounding from other factors not elicited or included in the regression models. Further studies are needed to validate the findings of this study and to examine the influences of other structural, network and psychosocial factors.

The effects of chance variation can also be excluded as a possible explanation of the results of this study because of the large sample size and the narrow confidence intervals around most of the estimates.

With regards to external validity, it is believed that the results of this study can be applied to other MSM who meet the same eligibility criteria set out for this study in Lagos and Ibadan.

Given that the few eligible men (8.2%) who did not participate in the study did not differ significantly from those who participated and both participants and interviewers were unaware of the outcomes of the study, there is little difficulty in generalizing the results to eligible population. Furthermore, since the eligibility criteria for recruitment into the study did not have differential bias for those who engaged in UAI or were infected compared to those who did not engage in UAI or were not infected, therefore, the findings of this study can be generalized to MSM in Lagos and Ibadan. Whether the results can be generalized to MSM from other parts of Nigeria is more difficult to ascertain given the exploratory nature of this study and the cultural, geographic, social, political and structural differences across states in Nigeria which may influence HIV vulnerabilities of MSM. Further studies are needed to provide more insights that will strengthen the empirical evidence from in this study.

Overall, this study has recorded several positive impacts in addressing many gaps. One of the major accomplishments of this study is the growing awareness and interest in MSM issues it has stimulated among researchers, programmers, government, and donors about the contributions of same-sex practices to the HIV epidemic in Nigeria.

In the last five years, over 12 peer-reviewed publications (Allman 2007; Merrigan 2011; Adebajo 2012; Adeyemi 2012; Okanlawon 2012; Stromdahl 2012; Adebajo 2013; 2013; 2013; 2013; George Eluwa 2013; Sheehy 2013; Tun 2013; Vu 2013) (see Appendix 11 page 349), several conference abstracts (Eki 2006; Odumuye 2007; Olowu 2007; Adebajo 2008; Adebajo 2013; Eluwa 2013; Ukwuije 2013), two rounds of the national Integrated Biological and Behavioural Surveillance Survey (IBBSS) (FMOH. 2007; 2010) and several program reports (Ofem 2008; NASCP. 2011; Council 2012; Enhancing Nigeria's Response to HIV and AIDS (ENR) Program.

2012; 2012; Population Council 2012; Population Council. 2012) have been written. Some of these publications used data from this study (Allman 2007; Adebajo 2008; 2008; Adebajo 2012; Adebajo 2013).

Additionally, the number of LGBTI organizations has increased from the initial one (Alliance Rights Nigeria) to four (International Center for Advocacy on Right to Health (ICARH), Improved Male Health Initiative (IMH-I), The Independent Program for Equal Rights (TIER) and Queer Alliance, Nigeria (QAN)).

The political will and commitment from the Nigerian Government towards addressing HIV and AIDS among MSM has also improved in the past 5 years. The current National HIV and AIDS Strategic Plan 2010-2015 clearly emphasizes behaviour change and prevention of new infections for key populations including MSM (FMOH. 2009). In addition, the national prevention plan now recognises MSM as a key population (FMOH. 2009) and has produced a peer education manual to guide the provision of behaviour change and communication (BCC) for MSM (NACA. 2010). The current national research agenda also includes key populations to include in research as a national research priority (NACA. 2010). Recently, a national HIV vaccine plan that articulates the processes and policies to guide clinical trials among various sub-populations including MSM in Nigeria was launched (NACA. 2012).

The U.S. Government, through the President's Emergency Plan for AIDS Relief (PEPFAR) (CDC, USAID, Henry Jackson Foundation), the UK's Department for International Development (DfID), the Global Fund, and the World Bank currently support four major MSM

focused HIV prevention, care, treatment, and support services in the country. These projects place emphases on strengthening the capacities of civil societies and the different tiers of the Nigerian government to ensure a unified, sustained response to the epidemic. In addition, several local civil society and international organizations are also very active in MSM-focused HIV programming. For example, Population Council established the Men's Health Network to improve MSM's access to reproductive health services, including HIV and STI testing and treatment and also conducts research to better understand MSM sub-populations and identify the most effective ways to encourage behaviour change. Other local organizations implementing targeted HIV prevention activities for MSM include the Center for Rights to Health, Family Health International, Heartland Alliance, Management Sciences for Health (MSH) and LifeLink.

A recent accomplishment was the establishment of two MSM-focused community-based clinics in Lagos and Kaduna (in North Central Nigeria) run by sensitized and MSM-friendly trained staff including members of the MSM community. At these clinics, comprehensive behavioural, biomedical, and structural interventions are provided including HIV testing and counseling, STI syndromic management, treatment, care, and psychosocial support, and distribution of condoms and lubricants. In addition, income generating activities are provided to build the skills and self-esteem of young MSM. Through an ongoing cohort study of 1,200 MSM, HIV and STI incidence and risk behaviours will be investigated as well as the impact of providing HIV medical and prevention services to Nigerian MSM at a trusted community center.

However, despite the achievements of this study, there were a few some backlashes. For instance through this study, a hitherto hidden community has been inadvertently exposed to the larger

Nigerian community. This could result in further labelling of MSM and worsening of stigmatization and discrimination. During the course of the data collection, the study staff and principal investigator were also labelled as promoters of homosexuality in Nigeria.

Furthermore, there are still gaps in the HIV response relating to MSM accessing comprehensive HIV prevention services including HIV and STI testing and counseling services. For the few who have access to these services, the quality is often poor and expensive.

Sadly, a same-sex marriage bill (Appendix 10 page 345) was recently signed into law on the 7th of January, 2014 (see appendix 13 page 355) by the President of the Federal Republic of Nigeria (Federal Government of Nigeria. 2013). This law prohibits same-sex marriages and the registration of gay clubs, societies, and organizations and any public show of same-sex amorous relationships. Violation of any of the offences attracts penalties ranging from 14 years imprisonment for persons who engage in same-sex activities and 10 years imprisonment for persons who register, operate, or participate in gay clubs, societies or organizations or directly or indirectly make public show of same-sex amorous relationship in Nigeria. Thus, this law potentially criminalizes every member of the LGBTI (lesbian, gay, bisexual, transgender, and intersex) population in Nigeria.

The passage of this law has health, development and human rights implications that are potentially far-reaching. Given that homosexuality is already criminalized in Nigeria, the Act further criminalizes the MSM community. Consequently, since the signing of the law, there have been reports of indiscriminate arrests, flogging, assaults, extortions meted on persons suspected or presumed to be LGBTI across the country by over-zealous law enforcement agencies. There are also reports of increased solicitations by MSM seeking asylum and low turnout of clients

accessing essential life-saving HIV prevention, treatment, care and support services for fear of being arrested. In addition, government agencies, ministries, non-governmental organizations (NGOs) and civil society organization (CSOs) that implemented HIV prevention interventions targeting MSM temporarily suspended such activities. The new law poses a serious threat to organizations such as the Population Council which work in close collaboration with MSM led community-based organizations (CSOs) in several states across Nigeria. This undermines the national response to HIV and AIDS which has in the last 5 years made significant strides in increasing its recognition of and attention to the HIV prevention and impact mitigation needs of key populations.

Only time will tell the far reaching implications of this law on the achievements made since this study was conducted.

CHAPTER 8

RECOMMENDATIONS

Research and prevention interventions for MSM have been limited by criminalization, social stigma, and lack of funding and commitment from the Nigerian government. Based on the findings of this study, the following are hereby recommended:

1. Comprehensive combination prevention, treatment, care and support intervention programs addressing all the drivers of the epidemic among MSM at the individual, community and structural levels should be urgently prioritized as a public health right and a critical component of Nigeria's comprehensive national HIV public health strategy.
2. To increase access to HIV and STI counselling and treatment programs, health care providers must be trained to provide quality, culturally sensitive and appropriate MSM-friendly services.
3. Recognizing the heterogeneity of the MSM sub-population, there is a need for targeted interventions for MSM who are homosexual, bisexual, married, and male sex workers.
4. Currently, medical and nursing students' training curricula do not include modules on sexual diversity and sexuality issues. The findings from this study strengthen the case for the incorporation of these topics in the medical and nursing curricula at both undergraduate and graduate levels.
5. The results of this study call for a paradigm shift in HIV prevention interventions with a focus on making high-risk sexual behaviours safer and not further stigmatizing MSM in Nigeria.

6. Additional research is needed to explore MSM sexual identity, perceived masculinity, and sexual relationships with men and women in Nigeria.
7. Based on the findings of this study, it is recommended that HIV-infected MSM receive routine screening for HCV and HBV. In addition, HIV-uninfected MSM who engage in high risk behaviours that increase their vulnerability to HIV and other STIs should be provided with opportunities for low-cost screening for blood borne hepatitis B and C.
8. Given the efficacy of biomedical interventions, there is an urgent need to scale up of evidence-informed biomedical interventions delivered as HIV counseling and testing (HCT), STI diagnosis; HIV treatment, pre-exposure prophylaxis (PrEP), treatment as prevention (TasP), post-exposure prophylaxis (PEP), rectal microbicides; HBV and HCV vaccinations and voluntary medical circumcision for MSM who are uncircumcised.
9. Accurate HIV data on incidence, prevalence and associated behaviours from MSM are essential for designing targeted prevention programs to reduce the further spread of the epidemic within the MSM community and to the general population.
10. Signing into law the current same-sex bill against male same-sex behaviour punishable by 10-14 years imprisonment will drive MSM further underground and beyond the reach of public health prevention efforts. This calls for Government of Nigeria to review its stance and uphold the rights to health for all Nigerians irrespective of their religion, sexual orientation, and gender.
11. Furthermore, there is an urgent need for the Government of Nigeria to create an enabling environment for the provision of and increased access to comprehensive HIV and STI combination prevention interventions targeted at men who engage in same-sex in Nigeria.

CHAPTER 9

CONCLUSION

This study confirms the existence of MSM in Nigeria and documents a high rate of risky sexual behaviours of a highly mobile and vulnerable sub-population in Nigeria that engages in HIV and STI related same-sex activities. The findings of this study suggest a high level of unmet need for innovative comprehensive MSM-friendly HIV prevention, care, and treatment services which incorporate behavioural, biomedical, and structural combination interventions including HIV testing. About three-quarters of MSM had never been tested for HIV and about half of the men have sex with women. Hence, targeted MSM-friendly prevention interventions must incorporate behaviour change communication information on safer sex for both men and women.

Further qualitative and quantitative studies using different methodologies and approaches are needed to validate and deepen our understanding of the correlates of HIV and other STI vulnerabilities among MSM in Nigeria. To urgently curtail the spread of HIV within MSM sexual networks and to the general population through female sex partners, it will be useful to explore the level of acceptance and possibilities of increasing access of MSM to new prevention technologies that reduce infectiousness such as oral pre-exposure prophylaxis (PrEP), post exposure prophylaxis and treatment as prevention in addition to increasing access to HIV testing and provision of condoms and lubricants.

The continued criminalization of same-sex behaviour in Nigeria constitutes a major structural barrier to effective HIV interventions that should be rescinded immediately.

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APPENDICES

APPENDIX 1

Criminal Code Act

Nigeria http://old.ilga.org/Statehomophobia/ILGA_State_Sponsored_Homophobia_2010.pdf

Male/Male Illegal Female/Female Legal*Criminal Code Act, Chapter 77, Laws of the Federation of Nigeria 1990 30

Section 214. —Any person who-

- (1) has carnal knowledge of any person against the order of nature; or
- (2) has carnal knowledge of an animal; or
- (3) permits a male person to have carnal knowledge of him or her against the order of nature; is guilty of a felony, and is liable to imprisonment for fourteen years.¶

Section 215. —Any person who attempts to commit any of the offences defined in the past preceding section is guilty of a felony, and is liable to imprisonment for seven years. The offender cannot be arrested without warrant.¶

Section 217. —Any male person who, whether in public or private, commits any act of gross indecency with another male person, or procures another male person to commit any act of gross indecency with him, or attempts to procure the commission of any such act by any male person with himself or with another male person, whether in public or private, is guilty of a felony, and is liable to imprisonment for three years. The offender cannot be arrested without warrant.¶

Note that several Northern Nigerian states have adopted Islamic Sharia laws, criminalising sexual activities between persons of the same-sex. The maximum penalty for such acts between men is death penalty, while the maximum penalty for such acts between women is flogging and/or imprisonment.

These laws differ from the federal law, as most of these also prohibit sexual relations between women.

The states which have adopted such laws are: 31 Bauchi (the year 2001), Borno (2000), Gombe (2001), Jigawa (2000), Kaduna (2001), Kano (2000), Katsina (2000), Kebbi (2000), Niger (2000), Sokoto (2000), Yobe (2001) and Zamfara (2000).

African countries where homosexuality is illegal: Algeria, Angola, Benin, Botswana, Burundi, Cameroon, Comoros, Egypt, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Kenya, Lesotho, Liberia, Libya, Malawi, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Sao Tome, Senegal, Seychelles, Sierra Leone, Somalia, South Sudan, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

APPENDIX 2

Feasibility Study

Feasibility and Development of the Study Instruments and Recruitment Strategies:

A preliminary study was conducted in August 2005 utilizing qualitative techniques to gather general opinions from members of the target population. Semi-structured in-depth interviews were conducted with 4 key informants and separate focus group discussions (FGDs) were held with 4 groups of MSM each representing different age groups and literacy levels (15-29 years and illiterate, 15-29 years and literate, 30-50 years and literate, 30-50 years and illiterate). Each focus group had between 15-20 participants.

The purpose of this phase of the study was to:

- Assess the feasibility of the study,
- Obtain profiles on the variations in the study population
- Explore highly personal and sensitive issues such as (i) the local and colloquial terms used for male same-sex activities in Nigeria; (ii) where men have sexual encounters with other men; (iii) what the expectations from family members, health care providers, and community are towards same-sex sexual activities; (iv) the role of religion; (v) issues of disclosure, stigma, discrimination at home, workplace, and school; (vi) social support; (vii) HIV testing experiences; (viii) availability of and accessibility to treatment; and (ix) culturally specific attitudes to condom use, sexual relationships, and marriage,
- Identify potential recruitment strategies
- Explore how to overcome barriers and challenges that may arise during the implementation phase of the study. Prior to commencing the in-depth interviews and FGDs, written consent was obtained from the participants. All sessions were conducted in private to ensure confidentiality and permission was sought to audio record the interviews.

METHOD

This is a report on the qualitative research activities conducted in Nigeria which comprised phase I of a multidisciplinary study seeking to examine patterns of male same-sex sexual activities and to understand their potential role in HIV and STI acquisition. The formative research described here reports on focus groups whose aim was to provide in-depth, qualitative understanding of the target population, and to assist in the development and conduct of a subsequent quantitative research phase of the project.

The goals of the qualitative research were to explore socio-demographic characteristics, sexual identities, and individual and community-level risk experienced by the target population. The discussion groups focussed on understanding the role of sexual identity within the context of Nigerian social life, how sexual identity and behaviour were experienced and concealed, and the roles of homophobia, stigma, discrimination, and social isolation as factors which may predispose Nigerian men who have sex with men to sexually transmitted infections and other physical and social harms.

These research activities provided a unique opportunity to explore and understand one corner of Nigerian society rarely studied; to provide data to help inform and direct health and social care activities appropriate for individuals who were behaviourally homosexual or bisexual and their families and communities, and to help guide future research activities targeted to these populations.

Working in collaboration with members of the Alliance Rights Nigeria, an advocacy organisation for Nigerian sexual minorities, structured focus groups incorporating anonymous self-completed questionnaires were conducted in secure locations in Nigeria. Male participants were recruited by word-of-mouth. Focus groups were organized by community members and conducted by three researchers. Participants were provided with refreshments and a small honorarium to cover costs associated with attending the focus group discussions. Groups lasted approximately 90 minutes. Discussions took place in secure and appropriate physical contexts within Nigeria, either within space provided by community agencies or in alternate spaces deemed as suitable by key informants. While English was the main language of research activities, as it is the country's official language and one most widely spoken and understood, informal translation between English and Yoruba and Ibo (two common indigenous languages) occurred between group members. The discussion guide was developed in consultation with key informants from the community. The research activities involved in this multi-phase project were reviewed for ethical conduct by the Research Ethics Board of the University of Toronto and the Central Ethics and Experimental Committee of the College of Medicine, University of Lagos. All participants provided informed consent to participate and to have the results disseminated in a variety of ways. The provision of informed consent was an active process achieved by discussing the research and consent process with participants point-by-point to ensure that all participants understood that their participation was wholly anonymous and confidential. As the research discussed here is sensitive within a Nigerian context, and as the need for complete anonymity is paramount, no identifying markers whatsoever are provided within this qualitative analysis.

The structure and conduct of focus groups was based on methodology suggested by Babbie (1999) and Ritchie and Lewis (2003). Focus group discussions were audio-recorded, transcribed and thematically analysed. Data coding was structured on qualitative data handling practice as described by Ritchie and Lewis (2003). This included initial coding to identify themes, the addition of a second coding layer to identify broader social concepts, and the utilization of a third analytic layer to move from initial concept identification to explanation. Techniques for analysis were further influenced by the grounded theory of Strauss (1987) and the open coding of Strauss and Corbin (1990). Descriptive data analysis of the self-completed questionnaires was compiled using SPSS software.

RESULTS

Five focus groups were conducted with a total of 58 men. Mean age was 27. A third of the participants (n=19) were between ages 16 and 24 and 12.3% (n=7) were above age 35. The oldest participant was 48. Almost all men were educated. Thirty-eight percent (n=22) had completed secondary education, 22.4% (n=13) college or technical school, 29.3% (n=17) had

completed a lower university degree and 8.6% (n=5) had completed postgraduate schooling. Forty four percent (n=25) of the participants were unemployed, 31.6% (n=18) were employed full-time and 24.6% (n=14) were in part time employment; 48.3% (n=28) were current students. Religious affiliation was described as Christian by 82.8% (n=48) and as Moslem by 15.5% (n=9). One man described himself as an atheist. Almost all participants identified with one of two major Nigerian ethnic groups; 56.9% (n=33) as Yoruba and 37.9% (n=22) as Igbo. Ninety-three percent of men (n=54) were born within Nigeria and 6.9% (n=4) were born elsewhere.

• **Socio-demographic characteristics of respondents**

Education			
	None	1	1.7
	Secondary	22	37.9
	College or Technical	13	22.4
	University	17	29.3
	Postgraduate	5	8.6
Employment			
	Full time	18	31.6
	Part-time	14	24.6
	Unemployed	25	43.9
Student			
	Yes	28	48.3
	No	30	51.7
Age			
	16-24	19	33.3
	25-34	31	54.4
	35 or more	7	12.3
	Mean age = 27 (median 26)		
Ethnicity			
	Yoruba	33	56.9
	Igbo	22	37.9
	Other	3	5.2
Religion			
	Christian	48	82.8
	Moslem	9	15.5
	Atheist	1	1.7
Country of birth			
	Nigeria	54	93.1
	Other	4	6.9
Sexual identity			
	Gay	18	31.0
	Bisexual	38	65.5
	Heterosexual	1	1.7

	Transgender	1	1.7
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Two-thirds of participants self-identified as bisexual (65.5%; n=38), and 31% (n=18) self-identified as gay. One man self-identified as heterosexual and one individual as transgender. Reporting on their sexual behaviour, 43.6% (n=24) indicated sexual activity with a woman in the previous 6 months, 21.8% (n=12) within the previous 6 to 12 months, 14.5% (n=8) within the previous one to five years, and 5.5% (n=3) more than five years ago. Eight men (14.5%) reported they had never had sex with a woman. In contrast, all participants reported sex with a man. Most (94.8%; n=54) reported sex with a man in the previous 6 months and the remainder (5.2%; n=3) within the previous 6 to 12 months. The mean number of female partners in the previous 6 months was 1.4. Forty-six percent of respondents (n=26) indicated no female partners in the previous 6 months; 17.5% (n=10) reported one female partner; 17.5% (n=10) reported two female partners; 12.3% (n=7) reported three female partners and 7% (n=4) reported four or more female partners within the previous 6 months. In contrast, 7% (n=4) reported no male sexual partners in the same time frame; 15.8% (n=9) reported one male partner; 21.1% (n=12) reported two male partners; 15.8% (n=9) reported three male partners; and 40.4% (n=23) reported 4 or more male partners. On average, participants reported 5.6 male sexual partners within the previous 6 months.

More than half of the respondents (55.2%; n=32) reported knowing no one who had died of AIDS; 27.6% (n=16) had known one or two people, 8.6% (n=5) knew three or four people and another 8.6% (n=5) had known five or more people who had died of AIDS. More than two-thirds of men (68.4%; n=39) reported knowing no one currently living with HIV or AIDS; 8.8% (n=5) knew one to two people, 12.3% (n=7) knew three to four people, and 10.5% (n=6) knew five or more people currently living with HIV.

Within the focus group discussions men were asked to discuss what it was like to be a man who had sex with men in Nigeria, and how homosexuality was considered within the Nigerian society. Men were asked what it was like to grow up and realise one was attracted to members of their own sex, how such realisation could be experienced within the community, the family and religious institutions. Men were asked to consider general community attitudes to marriage, and expectations for marriage from family and community members, and to consider how these attitudes could impact on relationships, sexual behaviours and health-seeking behaviours. Men discussed religious beliefs as they related to same-sex sexual behaviour, how men learned about sex; experiences men might have had at school or within the workplace and how aspects of national and community norms could structure and influence sexual experience. Participants discussed where men who have sex with men meet, and knowledge, attitudes and behaviour in regards to sexually transmitted infections, including HIV and AIDS. They discussed sexual and cultural practices as they related to STIs, and experiences that participants may have had in relation to HIV prevention, as well as access to HIV testing, treatment, care and social support.

Storytelling played a large role within these discussions, and men were quick to assume this role, while others within the groups seemed to welcome this. Such a storytelling dynamic was repeated often, and was anecdotally described as an element of the research process that men particularly appreciated.

All men agreed that within Nigerian society in general, homosexual behaviour was considered to be taboo and “like a curse.” It was recognised that Nigeria has a myriad of different cultural and ethnic groups and each could have a somewhat different view, so it could depend on which sector of Nigerian society one was considering. Yet, overall it was clearly expressed that homosexuality was definitely not embraced in Nigeria, and that it was not culturally accepted.

SUMMARY OF RESPONSES FROM FGDS

Questions Asked	Responses
<p>Q What other kinds of words are there for Penis?</p> <p>Q. How about for Vagina?</p> <p>Q How about the Anus?</p>	<ul style="list-style-type: none"> • Cock • Dick • Meat, eran • Gboro. • Egun • Burantashi • Kote • Banana, agbagba or plantain • Kundu • Hole • Pussy • Sex • Passage • Cunt • Ponmo • Awo • Guava • Ass • Yansh • The beautiful yansh • Terishiki • Arse hole • Cherryhole
<p>Q. In the West we say homosexuals, fags, but here in Nigeria, what are the kinds of words used to describe men who have sex with men?</p>	<ul style="list-style-type: none"> • In Western Nigeria CD is used by the top class. • Chop and Drop. • In the East they use the word *Lango.* • In the North it is Dan Daudu in Hausa which literally means a man who behaves like a woman. • In the South East, they use Oyweute. • They use market. The native ones, they say “Is he a market?” • They also use runs. “Is he a runs?” • There’s another one, *terry*. • Faggots

<p>What do you call men who have sex with men and women?</p>	<ul style="list-style-type: none"> • In the south-south Langwa is Mikod • TB • Gay • Fags • Homosexuals <p>Homosexuals</p>
<p>Q. In Nigeria, what are the different names for condoms?</p> <p>Q. What are the names of the condoms you use?</p> <p>Q. How much are the condoms?</p>	<ul style="list-style-type: none"> • Rubber • Balloon • CD • Dollar Raincoat. • Rough Rider • Gold Circle • Flavor • Love Guide • Erotic • Twin Lotus • Rough Rider – 3 for N150 (\$1.50) • Flavor - 3 for N100 (\$1.00) • Gold Circle - 4 for N20 (20c) • Love Guide - 3 for N100 (\$1.00) • Erotic - 3 for N100 (\$1.00) • Twin Lotus - 4 for N200 (\$2.00)
<p>Q. What words do you use Lubricants?</p>	<ul style="list-style-type: none"> • I once heard somebody say maggi. • Aloe vera. • KY Jelly used by the “big” boys. • Tomato – Derika • Oil. • Peau Claire - a bleaching cream • Honey • Soap • Commonly used is Vaseline which is cheap. • Shea butter • Saliva • Groundout oil • Olive oil

	<ul style="list-style-type: none"> • Water with detergent
Q. What kind of terminology is there for sex?	<ul style="list-style-type: none"> • For the Easterners they use Kuaka. • Sobo-Sobo*. • Rumble. • Loading • Fun-fun; loading • Rumble is sex. • Rollout is a new word
Q. What do you call penetration with a man?	<ul style="list-style-type: none"> • Enter • Wole. • Grinding. • Chop am • Digging.
Q. What about penetration with women?	<ul style="list-style-type: none"> • It's the same words
Q. What other sex acts are there?	<ul style="list-style-type: none"> • Mutual masturbation • Washing and setting • Touch-touch. • Romancing • Rousing is touching. •
Q. Any names for sexual acts involving the hand?	<ul style="list-style-type: none"> • Wanking
Q. What about finger to a vagina or anus?	<ul style="list-style-type: none"> • Fingering
Q. What about fisting?	<ul style="list-style-type: none"> • It's not common here. • Nobody will allow you to do it.
Q. What words are there to describe kissing?	<ul style="list-style-type: none"> • No. kissing is kissing.
Q. Are there terminologies for oral sex?	<ul style="list-style-type: none"> • They just call it oral sex • Licking • Blow job or BJ • They call it vanilla, like Coca Cola

	<ul style="list-style-type: none"> • Roro. • Rimming.
<p>Q. Let me ask you about different kinds of partners, female, regular partners, and casual relationships? What are the terminologies for a boyfriend?</p>	<ul style="list-style-type: none"> • Diya • Mikeon • The King • Oko • Baba • Honorable.
<p>Q. What about to describe a casual partner, someone you meet for a one-off?</p>	<ul style="list-style-type: none"> • Na market.
<p>Q. So there are different types of market?</p>	<ul style="list-style-type: none"> • There is chop and play market- a one night stand. Sharp-sharp. There's also short time. • Betta. • As you have the king, you also have the queen.
<p>Q. What are female partners called within this community?</p>	<ul style="list-style-type: none"> • Queen, Iya, Mama • We have *me*. Fish or eja. • For the general ones (outside the MSM community) we have babe. • Omo, omoge • This might be too harsh- hobo.
<p>Q. What about regular partners. Someone you are almost married to?</p>	<ul style="list-style-type: none"> • My husband, my wife, my king, my queen. • What he meant by my king and my king means we are into a serious relationship. That is why we say 'my'. In short term, we just say king and queen.
<p>Q. What about older partners? i.e. persons more mature by age. Are there different categories?</p>	<ul style="list-style-type: none"> • Aristo • Old cargo • Old mama. • Old asawo.
<p>Q. Any names for younger partners?</p>	<ul style="list-style-type: none"> • Omoge. • We have the *chick*
4. TOP OR BOTTOM OR VERSATILE	
<p>Top</p>	<ul style="list-style-type: none"> • King is the active partner. • MTN is the king
<p>Bottom</p>	<ul style="list-style-type: none"> • The queen is passive.

<p>Versatile</p>	<ul style="list-style-type: none"> • Vmobile for the girl • In Southern Nigeria, the receptive partner is referred to as ‘agent’. • Deydah. • Rice and beans. • Glo is both. • Autoreverse. •
<p>• WHETHER HOMOSEXUALITY IS LEARNT OR ACQUIRED?</p>	
<p>Q. Can someone learn to be homosexual?</p>	<ul style="list-style-type: none"> • You cannot learn to be homosexual • Some are taught to be MSMS, for example, I taught my landlord’s 2 sons • Some do it because of money.
<p>• DRUGS & ALCOHOL</p>	
<p>Q. What kinds of word or names are there for drugs, for beer, for wine, for champagne? Let’s categorize them so we get the local terms. Let’s start with alcohol.</p> <p>Q. These are all the traditional ones?</p>	<ul style="list-style-type: none"> • Ogogogoro • Sepe • Paraga • Kainkai • Sapele water • Yes • Sayo is beer. • Shak, is beer • Burukutu is like gin.
<p>Q. What drugs are readily available in the community?</p> <p>1. Sexual or non sexual? - Any one.</p>	<ul style="list-style-type: none"> • Poppers can be sexual • Marijuana <ul style="list-style-type: none"> ○ Ganja ○ Igbo ○ Weed ○ Dagoro • Burantashi - A sexual stimulant
<p>Q Do people sniff gum or gasoline?</p>	<ul style="list-style-type: none"> • It is not common.
<p>Q. What about cocaine?</p>	<ul style="list-style-type: none"> • No
<p>Q. What about heroin?</p>	<ul style="list-style-type: none"> • People use it but it’s not too common
<p>Q. Do people inject these drugs?</p>	<ul style="list-style-type: none"> • Sometimes
<p>Q. What about amphetamines?</p>	<ul style="list-style-type: none"> • No, it’s not common here.
<p>Q. What about gum?</p>	<ul style="list-style-type: none"> • It’s not too common here.
<p>5. WHERE MEN MEET</p>	
<p>Q. Where do people meet?</p>	<ul style="list-style-type: none"> • There is no particular place for MSM to meet.

<p>Q. Do you think younger men go to the same places as older MSMs?</p>	<ul style="list-style-type: none"> • You get men and go to your house. • Hotels, fast food joints • Parties • Internet i.e. gaydogs, gayromeo, gay.com, romeoandjuliet.com, • Barbing salons • The beach • Schools and Universities <p>More younger ones go these places. The older ones stay at home.</p>
<p>• WHERE MSM HAVE SEX</p>	
<p>Q. Where do people have sex?</p>	<ul style="list-style-type: none"> • At parties, • Around the compound • In the toilet. • At the beach • I've had sex in a primary school • Hotels • Uncompleted buildings. • In Nigeria, sex can take place anywhere because any little opportunity you have, you have sex.
<p>• NAMES OF STIS</p>	
<p>Q. Among the STIs we have Gonorrhoea, Chlamydia, Syphilis and HIV. Are there other names for these? In the West, we say gonorrhoea is the clap.</p>	<ul style="list-style-type: none"> • Staph - Scratch-scratch. • HIV- Obiora disease.
<p>• VIEWS OF GENERAL COMMUNITY OF MSM</p>	
<p>Q. How are MSMs regarded and understood by the larger society? What is like to be an MSM in Nigeria?</p>	<ul style="list-style-type: none"> • It's like a curse. • Generally it's a taboo. • It is not really embraced in Nigeria. • Treat us like overpampered children. • They see gay people as people with psychological problems. • The gay-friendly people look at it as a sexual abnormality and respect you for what you are so long you don't cross your boundaries. • They say, 'are you mad?' • Some people say, 'Don't you think that you can change?' • Some people will be like, "if you come to my church, God will forgive you." I won't go anymore because of all this

<p>Q. What do you mean by discrimination?</p>	<p>Sodom and Gomorrah stuff</p> <ul style="list-style-type: none"> • You can't really know say who likes you or hates you. You just have to behave neutral to everyone. • In Nigeria today, it is generally not accepted. • The biggest problem is that the rejection starts from the immediate family. The immediate family does not accept us as gay people and this translates into the larger society. They see a little bit of femininity in you and ask are you gay? If you say yes, that is the beginning of problems with that person. He'll think you are evil. • It also goes with hatred, bashing, discrimination and stigmatization. • Like if you are looking for a job with someone who is hetero., when they find out you are MSM you are automatically out of it even if you are qualified. • If you are having a village meeting and the villagers know who you are, they say shut up. • This transgender lady had a problem with Sun newspaper
<p>• RELIGION & MSM</p>	
<p>Q. How does religion play a role?</p>	<ul style="list-style-type: none"> • We have Pentecostal, we have Eckists, Hare Krishna and all that. We are highly religious. • As an Anglican church, co members think you are spiritually sick. • You're the only person they want to organize counselling for. Come for deliverance, this and that. They think you're sick spiritually sick. • People in my church tell me, "You behave like a girl". • Pentecostals, they make you go through counseling. From the onset, I tried fighting it, going for deliverance and all that. • As a Catholic, I'd go to confession.

	<p>After the confession, I pray that the Priest does not remember and he won't preach it at sermon the next Sunday or preach to you. He'll just try to help you make a positive change. They're just to help that person with prayer.</p> <ul style="list-style-type: none"> • In the Pentecostal church if you tell your pastor you are gay, he will encourage you and tell you about deliverance. But if you are friends with his brother, he will tell his brother, "That guy is gay, don't be friends with him again." If the pastor sees you with any church member, watch out. If you leave the church he will preach about you. Some people go to their pastors for deliverance. • From my experience I think the older churches like the Catholic churches are more accepting due to their historical background. than the younger Pentecostal churches. They don't condemn you out rightly. They try to counsel you and change you, reform you. But there is still the belief that homosexuality is against the doctrine of the church. They see homosexuals as people against the natural law or order. They try to reform you. But they should understand that there is a genetic background. They need to do a lot of study to see why homosexuals are the way they are. • In Kaduna, two men were sentenced to stoning past month. • They burnt 2 women to death in Kano. •
<p>Q. What about the dandaudus in Northern Nigeria?</p>	<ul style="list-style-type: none"> • Culturally, in Nigeria, if you are a rich man in Nigeria with 10 or 20 wives, if you don't have a man in the house you are not identified as a rich man. • Also in Kogi state. Sharia law has allowed homosexuality to reign. The men have their own section and the women too. Because of the deprivation, it is common, out of 'agros'.

	<ul style="list-style-type: none"> • They really don't want to make do with the men, so they have other ways of enjoying themselves so that when the men come, they will feel at par.
<p>• REACTIONS OF FAMILY</p>	
<p>Q. Let's focus on families. How does your family, if they know or not, how would they react?</p>	<ul style="list-style-type: none"> • The first time I had a problem, my mother said, "Are you sure you are gay?" Initially I said no. Later I told her the truth. The next question was, "When will you stop it?" If she sees any guy that walks a woman to our house, she says, "Is this one of them?" Our youngest has some traits and she says 'I hope he will not be like you'. • If my mother hears, she won't understand it. She will ask if I'm sure of what I'm saying. • My brother said, "Does this thing still exist?" I told my brother I am gay. He said, "Do your friends force you to have sex with them?" I said no. • I was at home once with someone, not knowing that my door was not locked. My brother barged in and he went back out. He was shaking when I met him. Up till now, only he and my father know. My grandfather was gay. • This family reaction issue is very sensitive. You think they don't know what you are or how you are living your life. My mother paid me a visit and one of my neighbors said, "Mama, Mama, talk to your son. • You don't know the pains I go through. Family reaction is a sensitive one. Till date, my family knows this boy is like this, but they don't have the courage to face me and say why are you living your life like this. But they accept me. I have a brother who is an accountant. My sister is a lawyer. • There are people in the family who if they have money and are gay, they will have a say. They suspect me, but they cannot say anything. If you don't have money, they'll give you problems.

	<ul style="list-style-type: none"> • 5. You don't have to reveal yourself. • They'll know when I move with friends who behave like girls. People that aren't gay know that people who are gay behave like girls • For those here who are homosexuals, it is easier than those who are transgender, born as the opposite sex. I went through a more difficult time than most of us because even though I came from an enlightened background, they could not understand-- why would I choose this cause? Why would I choose this life? I lost a lot of identification and support. They refused to identify with me. They refused to come to my aid. I could not go home in secondary school during holidays. It was really traumatic. They were not willing to accept me. It is much more difficult for the transgender than the average homosexual. • We gays, we don't look for ladies at all. If you don't bring girls, why won't your parents suspect you? I'm in this game, deeply into it, but I have a girlfriend and a boyfriend. • My mom is uncomfortable that I'm not bringing girls into the house. They tell my siblings, "Why can't you be like your brother? He doesn't bring girls into the house." • If you have a girlfriend and you are in this game, it would be difficult for your neighbours and parents to suspect you. • A typical African family needs continuity. Your parents want you to have a child
<ul style="list-style-type: none"> • SOCIAL STATUS & MSM 	
<p>Q. Does status have any influence in the way your family and the larger community treat or react to your sexual orientation?</p>	<ul style="list-style-type: none"> • What we are saying is that if you are financially comfortable, your family will be more tolerant • We gays, we convert some guys and convince them with money. • I'm one of them • What I'm saying is that if you don't

	<p>have money, how do you convince a straight guy? But if you have money, you can convince them</p> <ul style="list-style-type: none"> • Your status in society at times gives them total silence about your sexual orientation. In showbiz they practice it. Their fans know about it and they know, but they don't care because they know that my fame is there. If you have the money and fame and they can respect you, whether it is society or family, your status determines the tolerance. If you are just poor and you want them to accept you the way you are, you will be wretched. • I got into trouble one day in Festac, at West Side, a basketball court, where people hang out on weekends. Some people smoke hemp there. There is boy I am still crazy for and will dry my bank account for. A group of guys came and said, "That's him, that's him. You are the boy wey dey f*** yansh." I said "Yes, any problem with that?" They said they've wanted to harm me but would not because of the area chairman's influence. So, status matters. If you respect society, society respects you. You don't mess yourself around just because you are gay. • Even people at the top, politicians, a majority of them are gay. We have a lot of problems in Nigeria, so sexual problems cannot come first. We have problems with finances, management. We have social instability. If they say, "Let's give them their pride, let's legalize it." Is that the right question? Is it the right time? We are the ones walking together to make the pride, to legalize it. • Like America, Canada where everyone is white and has the same norms. It cannot be legalized because we are diverse.
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6. MSM & HIV RISK	
<p>Q. I want to talk about sex and risk. Within the MSM community in Nigeria, what do you see and experience as the risk of HIV transmission?</p>	<ul style="list-style-type: none"> • It was from my father that I learnt about STDs. I had education on it from an early age. Condoms don't prevent Aids or HIV. It can tear in the act.
7. HIV and STIs	
<p>Q. Any words for STIs? Like gonorrhoea, syphilis and HIV?</p> <p>Q. What about Chlamydia?</p> <p>What do you know about HIV and AIDS?</p>	<ul style="list-style-type: none"> • Atosi is gonorrhoea. Also called 'gono'. • Syphilis is not too popular. • What, never heard of it. • There are no other words except AIDS. • They can say "E don carry am" for someone infected •
8. MSM & MARRIAGE	
<p>Q. I understand you are married. What's it like to be married and MSM?</p> <p>Q. Are you planning to get married?</p> <p>Q. We get the impression that marriage is because of the culture. Do you want to?</p>	<ul style="list-style-type: none"> • I'm enjoying it. I share my time. • When I got married, I found that women might feel more comfortable with gay men because no woman will come and take their place. It depends on personality. Some will try to understand. • They will keep it to themselves. • We don't have a choice. • At a point the pressure from family, straight friends and neighbours will come in. you are old enough to get married, what are you waiting for? Especially if you are a bit wealthy, you have no excuse. • So we have to get married, but if there was an option, most people will not. • • I would still want to settle down. If same-sex marriages were legalized, I would rather settle with a woman and then cut my shows with a man. • The essence of me marrying a woman is to have children. If sex is the case, both parties can satisfy me equally.

MSM & WOMEN	
Q. How many of you have girlfriends?	<ul style="list-style-type: none"> • A lot of us have female sex partners.
9. MSM & PAID SEX	
<p>Q. Do younger men in Nigeria exchange sex for money?</p> <ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Very well • It depends on the relationship you are having. • If it is friendly person, the person might not demand anything from you, but if they are not really friends, he might ask for something. • A younger man going out with an elderly one; most do it for the money. • Some also do it for rituals to get more money. They use the semen as a sacrifice to get more money. • Not everyone does it just for fun.
10. AVAILABILITY OF CONDOMS	
<p>Q. You said you had noticed a lack of condoms.</p> <ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Yes, when I came to Nigeria, I started talking about it. No ball, no play. When I ask people if they use condoms, some say, “He won’t come inside me”. Some don’t understand the process. Before a blowjob, you shouldn’t brush your teeth. They don’t know. Most people are ashamed. You are going to buy a condom and they have never seen you with a girl and you think in your mind. If you are ashamed, you should buy condoms in another neighbourhood. • They are not 100% safe, especially Nigerian condoms. • I was told that after sex I should go to the toilet and pass everything out, so I don’t have to use condoms.
11. MSM & HEALTH CARE WORKERS	
<p>Q. With doctors or nurses, do you tell them that you have sex with men?</p>	<ul style="list-style-type: none"> • No we don’t. • Actually, past year, I went with a friend to see a doctor. I was trying to hide, but later I told him everything. He tested me for HIV and found I was negative. I was reluctant and ashamed to tell him

	<p>anything. If you don't say it out, your doctor will not know what the problem is or where your problem lies, so try to open up.</p> <ul style="list-style-type: none"> • The one I opened up to was female. • There was a day, I went to a clinic because blood was coming out from my anus. When the doctor took me into the clinic and I had to open up to him. They said they were going to stitch me. There were 2 auxiliary nurses and they said they liked me and gave me their phone numbers. I meet them and I do have sex with them till now. But they never knew I was gay. • Is it compulsory to open up to a doctor if you go for an HIV test? • It depends on the questions they ask. To me it's not important. Unless maybe you have a problem with your private part. •
<p>12. HIV TESTING</p>	
<p>Q. If you were to want to get tested for HIV where would you or someone in your community go?</p> <p>Q. Do you have access?</p>	<ul style="list-style-type: none"> • General Hospital • In my Local Government area, we have a place where you can go for a fee. • If we have a place where we can go for counseling. It is better they know your sexual background and counsel you. So that if you are negative, you can be cautious. • We don't. There is emotional and psychological embarrassment. • I quite disagree with you. We have private hospitals where they test. In Abuja, I saw personal HIV test kits for 650 naira. In communities, they do the tests. • When you have a unit, you need a verification unit. You are a professional from Canada and you can just set up and sell. There is no verification. • Well, go to a General Hospital set up by the government. It's 1000 naira • You don't go where you don't feel safe.

	<p>I know a professor. He doesn't know I'm gay.</p> <ul style="list-style-type: none"> You don't expect someone like me to walk down to LUTH. If it's a gathering like this where you can exchange freely I can do that.
<ul style="list-style-type: none"> LOCATON OF PROJECT SITE 	
<p>Q. Where would you want the project to be? In LUTH, a private clinic, your homes or where?</p>	<ul style="list-style-type: none"> I would embrace any forum that will help protect our community.
<p>Q. Would you prefer a male or female interviewer or does it matter?</p>	<ul style="list-style-type: none"> 55% would prefer male interviewers 45% were indifferent. Conclusion, it doesn't matter so long as the person is understanding.
<p>Q. If there was a clinical examination by a doctor who would you prefer – male or female?</p>	<ul style="list-style-type: none"> It doesn't matter, so long as it is one on one. Most preferred to have a male doctor.
<p>Q. Would you be willing to provide blood samples, urine samples or a rectal swab?</p>	<ul style="list-style-type: none"> Everyone said Yes
<p>Q. Do you prefer to have sex with your age?</p>	<ul style="list-style-type: none"> You won't enjoy it with a younger age group because there will be no understanding. What he means is maturity. They won't be mature enough.

APPENDIX 3

Respondents' Screening Form

Eligibility Criteria

Respondents MUST

- Be male
- At least 16 years old
- Admit to having sexual relationships to with other men
 - Admit to having sexual relations in the past year
- Be resident in Nigeria in the past 2 years
- Speak English or pidgin

Screening Questions

- How old were on your past birthday?
- When was the past time you had sex with a man?
- Show one way of identifying a man who has sexual relations with other men
- Name at least two very popular MSM in Nigeria

Table 2: Power calculations for Multivariate Analyses using lowest prevalence rate

Power Calculations for Multivariate Analysis using lowest annual prevalence of risk factors	annual prevalence of risk Factor (%)	Total no of Controls H	# of Controls exposed H1	# of controls not exposed H0	Odds Ratio Q	Total # of cases D	# of Cases exposed D1	# of cases not exposed D0	log of Odds ratio b	SD (log Q)	no. SD b/w E & null = b/(c+d)	c for alpha 5%	Z stats	Power (fr.Z table)
	unprotected anal sex	50	700	350	350	1.5	700	420	280	0.405465	0.10801	3.75387747	1.96	1.79387747
unprotected anal sex	25	700	175	525	1.55	700	238.462	461.538	0.438255	0.11823	3.70667645	1.96	1.74667645	96.0%
unprotected anal sex	15	250	37.5	212.5	1.55	700	150.346	549.654	0.438255	0.19961	2.19558271	1.96	0.23558271	60.0%
unprotected anal sex	15	700	105	595	1.75	700	165.169	534.831	0.559616	0.13831	4.04620406	1.96	2.08620406	98.0%
unprotected anal sex	10	700	70	630	2	700	127.273	572.727	0.693147	0.15961	4.34268389	1.96	2.38268389	100.0%
unprotected anal sex	5	700	35	665	1.75	700	59.0361	640.964	0.559616	0.2204	2.53914507	1.96	0.57914507	72.0%
unprotected anal sex	2.5	700	17.5	682.5	1.75	700	30.0613	669.939	0.559616	0.30556	1.83145179	1.96	-0.1285482	45.0%
chlamydia infection	4.8	700	33.6	666.4	2.75	700	85.2399	614.76	1.011601	0.21124	4.78895486	1.96	2.82895486	100.0%
gonococcal infection	2	700	14	686	2	700	27.451	672.549	0.693147	0.33287	2.08234245	1.96	0.12234245	55.0%
gonococcal infection	2	600	12	588	2	700	27.451	672.549	0.693147	0.35064	1.9767973	1.96	0.0167973	51.0%
gonococcal infection	2	500	10	490	2	500	19.6078	480.392	0.693147	0.39386	1.75990058	1.96	-0.2000994	42.0%
gonococcal infection	2	400	8	392	2	700	27.451	672.549	0.693147	0.40678	1.7040034	1.96	-0.2559966	38.0%
gonococcal infection	2	700	14	686	2	700	27.451	672.549	0.693147	0.33287	2.08234245	1.96	0.12234245	38.0%
Age at first sex <15years	32.7	700	228.9	471.1	1.75	700	321.682	378.318	0.559616	0.11065	5.05754592	1.96	3.09754592	100.0%
At least one non-spousal partner in previous year	35.8	700	250.6	449.4	2	700	369.072	330.928	0.693147	0.1093	6.34158113	1.96	4.38158113	100.0%
Sex in exchange for money in previous year	7.5	700	52.5	647.5	2.5	700	117.978	582.022	0.916291	0.17546	5.22220766	1.96	3.26220766	100.0%
Contact with commercial sex worker	4	700	28	672	3	700	77.7778	622.222	1.098612	0.2273	4.83324968	1.96	2.87324968	100.0%
Rectal trauma	13.9	700	97.3	602.7	3.5	700	252.727	447.273	1.252763	0.13465	9.30418626	1.96	7.34418626	100.0%
history of drug use	2.1	700	14.7	685.3	4	700	55.3151	644.685	1.386294	0.29852	4.64384906	1.96	2.68384906	100.0%
douching	50	700	350	350	4.5	700	572.727	127.273	1.504077	0.12376	12.1528127	1.96	10.1928127	100.0%
Frequency of condom use with non-spousal partners	20	700	140	560	5	700	388.889	311.111	1.609438	0.1213	13.2679747	1.96	11.3079747	100.0%
Partner had two or more partners in past 12 mths	29	700	203	497	2	700	314.729	385.271	0.693147	0.11274	6.1480019	1.96	4.1880019	97.0%
Interval between first sex and first marriage >9 yrs	27.6	700	193.2	506.8	2.5	700	341.584	358.416	0.916291	0.11343	8.07791043	1.96	6.11791043	100.0%
Seeks care from health facility with history of STD	42	700	294	406	3	700	479.348	220.652	1.098612	0.11173	9.8331324	1.96	7.8731324	100.0%
Low level of education	3.1	700	21.7	678.3	1.5	700	32.0532	667.947	0.405465	0.28329	1.43127863	1.96	-0.5287214	30.7%
HIV Positive spouse	9.3	700	65.1	634.9	4	700	203.597	496.403	1.386294	0.15447	8.97429258	1.96	7.01429258	100.0%

A Study of the Prevalence and Correlates of HIV, STIs and Risk Behaviours of MSM in Nigeria

Power Calculations for Multivariate Analysis using lowest annual prevalence of risk factors	Sample Size	annual prevalence of risk Factor (%)	Total no of Controls H	# of Controls exposed HI	# of controls not exposed HD	Odds Ratio Q	Total # of cases D	# of Cases exposed D1	# of cases not exposed D0	log of Odds ratio b	SD (log Q)	no. SD b/w E & null = b/(c+d)	c for alpha 5%	Z stats	Power (Fr Z table)
unprotected anal sex	1400	50	700	350	350	1.5	700	420	280	0.40546511	0.10801234	3.75387747	1.96	1.79387747	96.3%
unprotected anal sex	1200	50	600	300	300	1.5	600	360	240	0.40546511	0.11666667	3.47541521	1.96	1.51541521	93.5%
unprotected anal sex	1200	25	600	150	450	1.55	600	204.395604	395.604396	0.43825493	0.12770724	3.43171556	1.96	1.47171556	92.9%
unprotected anal sex	950	15	250	37.5	212.5	1.55	700	150.34642	549.65358	0.43825493	0.19960757	2.19566271	1.96	0.23566271	60.0%
unprotected anal sex	1200	15	600	90	510	1.75	600	141.573034	458.426966	0.55961579	0.14938795	3.74605704	1.96	1.78605704	96.3%
unprotected anal sex	1200	10	600	60	540	2	600	109.090909	490.909091	0.69314718	0.17240134	4.02054403	1.96	2.06054403	98.0%
unprotected anal sex	1200	5	600	30	570	1.75	600	50.6024096	549.39759	0.55961579	0.23805419	2.35079155	1.96	0.39079155	75.3%
unprotected anal sex	1200	2.5	600	15	585	1.75	600	25.7688712	574.231129	0.55961579	0.33004097	1.69556488	1.96	-0.2644051	40.0%
chlamydia infection	1200	4.8	600	28.8	571.2	2.75	600	73.0627306	526.937269	1.01160091	0.22816124	4.43371066	1.96	2.47371066	100.0%
gonococcal infection	1200	2	600	12	588	2	600	23.5294118	576.470588	0.69314718	0.35953958	1.92787449	1.96	-0.0321255	49.0%
gonococcal infection	1200	2	600	12	588	2	600	23.5294118	576.470588	0.69314718	0.35953958	1.92787449	1.96	-0.0321255	49.0%
gonococcal infection	1000	2	500	10	490	2	500	19.6078431	480.392157	0.69314718	0.39385587	1.75900058	1.96	-0.2000994	42.0%
gonococcal infection	1100	2	400	8	392	2	700	27.4509804	672.54902	0.69314718	0.4067757	1.7040034	1.96	-0.2559966	40.0%
gonococcal infection	1200	2	600	12	588	2	600	23.5294118	576.470588	0.69314718	0.35953958	1.92787449	1.96	-0.0321255	48.8%
Age at first sex < 15 years	1200	32.7	600	196.2	403.8	1.75	600	276.727766	324.272234	0.55961579	0.1195153	4.69237767	1.96	2.72237767	100.0%
At least one non-spousal partner in previous year	1200	35.8	600	214.8	385.2	2	600	316.34757	283.65243	0.69314718	0.1182956	5.87116327	1.96	3.91116327	100.0%
Sex in exchange for money in previous year	1200	7.5	600	45	555	2.5	600	101.123596	498.876404	0.91629073	0.18951891	4.88482482	1.96	2.87482482	100.0%
Contact with commercial sex worker	1200	4	600	24	576	3	600	66.6666667	533.333333	1.0961229	0.24951533	4.4747197	1.96	2.5147197	100.0%
Rectal trauma	1200	13.9	600	83.4	516.6	3.5	600	216.623377	383.376623	1.25276297	0.14543332	8.61400265	1.96	6.65400265	100.0%
history of drug use	1200	2.1	600	12.6	587.4	4	600	47.4129821	552.587018	1.38629436	0.32244137	4.2993688	1.96	2.3393688	100.0%
douching	1200	50	600	300	300	4.5	600	490.909091	109.090909	1.5040774	0.1336601	11.25131822	1.96	9.29131822	100.0%
Frequency of condom use with non-spousal partners	1200	20	600	120	480	5	600	333.333333	266.666667	1.60943791	0.13102163	12.2837577	1.96	10.3237577	100.0%
Partner had two or more partners in past 12 mths	1200	29	600	174	426	2	600	269.767442	330.232558	0.69314718	0.12177689	5.69194374	1.96	3.73194374	97.0%
Interval between first sex and first marriage > 9 yrs	1200	27.6	600	165.6	434.4	2.5	600	292.786421	307.213579	0.91629073	0.12252019	7.47869184	1.96	5.51869184	100.0%
Seeks care from health facility with history of STD	1200	42	600	252	348	3	600	410.869865	189.130135	1.0961229	0.1206774	9.10371162	1.96	7.14371162	100.0%
Low level of education	1200	3.1	600	18.6	581.4	1.5	600	27.4741507	572.525849	0.40546511	0.3059868	1.32510653	1.96	-0.6348935	26.4%
HIV Positive spouse	1200	9.3	600	55.8	544.2	4	600	174.511337	425.488663	1.38629436	0.16685093	8.30859045	1.96	6.34859045	100.0%

APPENDIX 5 – QUALITATIVE STUDY INSTRUMENTS

- **Pilot Focus Group Discussion Guide for Respondents and Stakeholder**
(To be modified depending on group composition and for individual interviews)

Introductions: Thank you very much for agreeing to participate in this study. We are conducting this meeting to have a better understanding of the experiences of Nigerian men who engage in same – sex sexual activities. Also, it will assist us in developing questions that are specific to issues men who have sex with men (MSM) may have. We would appreciate your full participation and your honest views of the difference subjects that will be discussed.

For the purpose of this meeting, please kindly tell us a name you will want us to call you (you do not have to use your real name).

A. Societal Views

How are men who have sex with men (MSM) regarded (understood) in Nigeria?

Probes:

- Is Homosexuality an issue in Nigeria?
 - Can you explain why or why not?
 - For whom?
- What are the differences in views that people have of men who have sex with men in Nigeria?
- Is Nigeria different from other African counties in this regard?
- What accounts for the differences in the (i) cultural, (ii) geographic and (iii) legal views (ways Nigerians think) about homosexuality?

B. Labels and Terminologies

How/what are men who have sex with men referred to or called in Nigeria?

Probes:

- Are different names used by different groups of people?
- How are the different names regarded? By whom?
- What cultural differences exist in the names used?

C. Impact

I. *Every community is guided by its values and culture. How has _____ influenced or impacted on Nigerian men who have sex with men?*

Probes:

- (i) Religion
- (ii) Attitudes to marriage, expectations from family members
- (iii) The role of men (views of masculinity) in the society and expectations of the society on men.
- (iv) HIV and AIDS

- (v) Expectations of Health Care Providers and the Community
- (iv) Others

II *For men who have sex with me in Nigeria, what issues impact on _____:*

Probes:

- Men's relationships,
- Sexual behaviours
- Risk taking
- HIV testing behaviour,
- Health seeking behaviour
- How the society or the community responds?

D. Responses and Sexual Behaviours

What is known or assumed about the expression of sexuality and the sexual behaviour of Nigerian men who have sex with men?

Probes:

- What are the different socialization, social behaviours and sexual behaviours of Nigerian men who have sex with men?
- What about men's disclosure of their sexual activities to (i) families, (ii) Health Care Providers
 - Explore variations in disclosure.
- Within the MSM community, how do you see the risks of transmission of HIV disease?
 - What contributes to this risk?
- What factors prevent risk of disease?
 - Probe specific individual social, sexual relationships and cultural practices

E. Socialization

Tell us about the places men who have sex with men meet to have sex?

Probes:

- What influences where men who have sex with men meet?
- Explore how the meeting places are determined by: (i) Age group (ii) Social Class

G. HIV Infection

I. *Growing up in Nigeria, how did _____ contribute to healthy sexual behaviours of MSM?*

Probes:

- (i) Religious beliefs
- (ii) Learning about sex
- (iii) Gender Roles
- (iv) Parental influences
- (vi) Experiences in School

- (vii) Workplace experiences
- (viii) Governmental laws or other aspects of government
- (ix) Health care providers
- (x) The Community

II. *Growing up in Nigeria, are you aware (in either your situation or other men who have sex with men's situations) of factors that could have contributed to unhealthy sexual behaviours of MSM?*

Probes:

- (i) Religious beliefs
- (ii) Learning about sex
- (iii) Gender Roles
- (iv) Parental influences
- (xi) Experiences in School
- (xii) Workplace experiences
- (xiii) The Government law? Or are there other aspects of government?
- (xiv) Health care providers
- (xv) The Community

H. HIV Experiences

Are you aware of the experiences of MSM who have HIV?

Probes:

- Explore the experiences in accessing treatment
- Accessing Care and Social Support

APPENDIX 6 – STUDY INSTRUMENT

Prevalence and Risk Factors of HIV/STI Infections and Sexual Risk Behaviours in Men in Nigerian

Interviewer Administered Questionnaire

March 2005

HIV Social, Behavioural, and Epidemiological Studies Unit
Faculty of Medicine, University of Toronto

Alliance Rights, Nigeria

College of Medicine
University of Lagos, Nigeria

INTRODUCTION TO INTERVIEW

Thank you very much for agreeing to participate in this study. We really appreciate your help as we try to understand issues surrounding the health and sexual behaviour of Nigerian men particularly men who engage in sexual activities with other men.

This interview is anonymous and confidential. This means that your name will not be required and no one apart from the research team will see your answers.

If you do not understand a question, or would like me to explain it further, please tell me. It is important that you are honest with your answers. If you feel you are unable to be completely honest when answering any of the questions, we would prefer you decline to answer that question instead of giving a false answer.

If at the end, you have any personal or medical questions that arise from the survey, I would be very happy to provide referrals.

For some questions, I will show you prompt cards to help you with your answers. Also, some questions may not apply to you. Kindly indicate which ones do not apply so we can move on to the next question.

Do you have any questions before we proceed?

INTERVIEW INFORMATION

A1. Participant ID _____

A2. Coupon serial # _____

A3. Date of interview ____/____/____
 dd mm yy

A4. Interviewer ID _____

A5. Interview Location

- (i) Lagos
- (ii) Ibadan

A5a Specific location:

- 1 CMUL/LUTH _____
- 2 Kuramo Clinic _____
- 3 Ibadan Clinic _____
- 4 Other (specify) _____

A6. Time interview started _____AM/PM

A7. What is your relationship to the person who *gave* you the coupon?

- (i) Friend
- (ii) Sexual partner
- (iii) Relative (specify) _____
- (iv) School or work colleague
- (v) Other (specify) _____

NOTE: ALL INSTRUCTIONS/EXPLANATIONS IN BOLD ARE INSTRUCTIONS FOR INTERVIEWERS.

DEMOGRAPHICS

I'd like to start by asking you some general questions about yourself.

AGE

B1. In what year were you born? / __/ __/ __/ __/

77✓ Don't know

99✓ Declined

EDUCATION

B2. What is your highest level of education? **DON'T READ LIST.**

- 1✓ No formal education
- 2✓ Primary
- 3✓ Secondary
- 4✓ College of Technology
- 5✓ Undergraduate (First university degree)
- 6✓ Post graduate training (MA, MSc, PhD etc)
- 7✓ Other (specify) _____

B2a. In total, how many years of education have you completed to date?

_____ years completed

77✓ Don't know

99✓ Declined

B3. Are you currently enrolled in a school, college or university?

- 1✓ No
- 2✓ Yes, a student, full time
- 3✓ Yes, a student, part time

EMPLOYMENT

B4. Are you currently employed (whether full-time or part-time)?

- 1✓ Yes
- 2✓ No (*Skip to question B7*)

B5. What is your current work status? (*Please mark only one option*)

- 1✓ Employed full time
- 2✓ Employed part time (i.e. casual employee)
- 3✓ Self-employed (businessman)
- 4✓ Retired
- 5✓ Unemployed
 - (a) Never worked
 - (b) Currently unemployed

6∇ Other (specify) _____

B6. What is your current occupation? _____

INCOME

B7 What was your total personal income (for the whole year) past year?

- 1∇ Not Applicable
- 1∇ Less than N100,000
- 1∇ N100,000 – N199,999
- 1∇ N200,000 – N299,999
- 1∇ N300,000 – N399,999
- 1∇ N400,000 – N499,999
- 1∇ N500,000 – N599,999
- 1∇ N600,000 – N699,999
- 1∇ N700,000 – N799,999
- 1∇ N800,000 – N899,999
- 1∇ N900,000 – N999,999
- 1∇ N1m – 2.5m
- 1∇ More than 2.5m
- 77∇ DK
- 99∇ Declined

EXPERIENCES OF POVERTY OR FINANCIAL HARDSHIP (Unique)

Show flash card 1 1∇ *Always* 2∇ *Sometimes* 3∇ *Never* 99∇ *Declined*

(Circle the option that applies)

B8a. In the past 12 months, how often did you go without food for a whole day because you did not have money? 1 2 3 99

B8b. In the past 12 months, how often have you had difficulty acquiring clothes and shelter because you didn't have money? 1 2 3 99

B8c. In the past 12 months, how often did you borrow money from a *stranger* to survive? 1 2 3 99

B8d. In the past 12 months, how often have you had to borrow money from a *friend* to survive? 1 2 3 99

NATIONALITY & ETHNICITY

B9. What is your Nationality?

- 1✓ Nigerian
- 2✓ Other specify_____

B10. Which ethnic group do you most identify with?

- 1✓ Yoruba
- 2✓ Hausa
- 3✓ Igbo
- 4✓ Others specify_____

B11. What is your State of Origin? _____

RELIGIOSITY

B12. What, if any, is your current faith or religion? (*Please circle only one*)

- 1✓ Christianity (specify)
 - 1. Anglican
 - 2. Baptist
 - 3. Pentecostal
 - 4. Presbyterian
 - 5. Catholic
 - 6. Methodist
 - 7. Lutheran
 - 8. Cherubim and Seraphim
 - 9. 7th Day Adventist
 - 10. Other specify_____
- 2✓ Islam
 - 11. Ansarudeen
 - 12. Ahmadiya
 - 13. Nasfat
 - 14. Other specify_____
- 3✓ African Traditional
- 4✓ Others (specify) _____
- 5✓ No religious preference (Agnostic)
- 6✓ Atheist
- 77✓ DK
- 99✓ Declined

B13. Over the past 12 months, how often have you attended religious services?

- 1✓ Never
- 2✓ Sometimes (i.e. on special occasions)
- 3✓ Always or regularly
- 4✓ Others (specify)_____

B14. How important is religion in your life? (Bullock, EAS, OMS)

- 1✓ Not at all important

- 2∇ Somewhat important
- 3∇ Very important
- 77∇ Don't know
- 99∇ Declined

PARTNERSHIP STATUS

Provide definitions in brackets only if required.

- B15. What is your current marital status? **PROBE** (EAS)
- 1∇ Married (i.e. marriage between a man and woman)
 - 2∇ Living with girlfriend as if married
 - 3∇ Living with boyfriend
 - 4∇ Separated (you are no longer living with your spouse, for reasons other than illness or work and have not obtained a divorce)
 - 5∇ Divorced (you have obtained a legal divorce and have not remarried)
 - 6∇ Widowed (you have lost your spouse through death and have not remarried)
 - 7∇ Single (never been married) (*Go to question B19*)
 - 8∇ Other (please specify) _____
 - 77∇ DK
 - 99∇ Declined
- B16. How long have you been _____ (status mentioned above)?
- 1∇ _____ months 2∇ _____ years
- B17. Are you currently married to more than one person?
- 1∇ Not applicable
 - 2∇ No
 - 3∇ Yes How many? _____
 - 4∇ Declined
- B18. If you are currently unmarried (i.e. single, separated, divorced or widowed), how would you rate your likelihood of eventually getting married (to a woman)? (*Skip if married, to question B19*)
- 1∇ Very unlikely
 - 2∇ Undecided
 - 3∇ Very likely
- B19. How many children do you have? _____ (*If none, skip to question B21*)
- B20. How old is your oldest child? _____ Years (*then skip to question B22*)
- B21. Do you plan to have children?
- 1∇ Yes 2∇ No 77∇ Don't know

B22. Why *do you have or desire* to have children? _____

TYPE OF ACCOMMODATION

B23 How would you describe the place where you live? (*Tick appropriate answer*).

- 1✓ A house (how many rooms)? _____
- 2✓ A flat (apartment) (how many rooms)? _____
- 3✓ Tenement accommodation (“face me I face you”)?
- 4✓ Student hostel (Institution) (specify) _____
- 5✓ No fixed place of abode
- 6✓ You live in the streets
- 7✓ Other (specify) _____

B24 Do you own the dwelling, or is it rented? (*Tick appropriate answer*).

- 1✓ Owned by self/spouse
- 2✓ Owned by family member
- 3✓ Renting
- 4✓ Squatting (living with a friend)
- 5✓ Other (specify) _____
- 77✓ Don’t know
- 99✓ Declined

B25 Including yourself, how many people live with you in your home? _____
 (*If you live alone, then go to question C1*)

B26 Who do you currently live with? (*Do not read out list. Circle all that apply*)

- 1✓ Wife
- 1✓ Girl friend
- 1✓ Boyfriend (same-sex partner)
- 1✓ Father
- 1✓ Mother
- 1✓ Children # _____
- 1✓ Sisters/Brothers # _____
- 1✓ Grandparents # _____
- 1✓ In-laws # _____
- 1✓ Other Relatives # _____
- 1✓ Friends/Roommates # _____
- 1✓ Other (specify) _____

SEXUAL IDENTITY AND SEXUAL BEHAVIOUR

The following are personal questions, which address your sexual attractions and behaviours.

SEXUAL ATTRACTIONS AND FEELINGS

Now I would like you to describe yourself, in terms of your sexual attractions.

- C1 Which of the following statements best describes your sexual attractions in the *past 5 years?* (Bisex) (*Please choose only one option*)
- 1✓ Only attracted to women
 - 2✓ Mostly attracted to women, but occasionally to men
 - 3✓ Equally attracted to men and women
 - 4✓ Mostly attracted to men, but occasionally to women
 - 5✓ Only attracted to men
 - 77✓ Don't know
 - 99✓ Declined
- C2 Which of the above statements best describes your sexual attractions in *the past 12 months?* (Bisex) (*Please choose only one option*) _____
- C3 How old were you when you first became aware of your sexual attractions towards men?
_____ Years
- 77✓ DK
 - 99✓ Declined

SELF-PERCEIVED SEXUAL IDENTITY (modified Bisex & OMS)

- C4 How would you describe yourself (i.e. your sexual identity)? (*Circle only one option*)
- 1✓ Heterosexual
 - 2✓ Homosexual
 - 3✓ Bisexual
 - 4✓ Gay
 - 5✓ Transgender
 - 6✓ Other (specify) _____
 - 77✓ Don't know
 - 99✓ Declined
- C5 How long have you thought of yourself in this way?
- 1✓ Less than 6 months
 - 2✓ Between 6 months and 11 months
 - 3✓ Between 1 and 2 years
 - 4✓ Between 3 and 5 years
 - 5✓ Between 6 and 10 years
 - 6✓ Over 10 years
 - 7✓ All your life

LEVEL OF INVOLVEMENT WITH SAME-SEX COMMUNITY

The next questions are about where and how you socialize.

- C6 In the past 12 months, where have you made contact with your male partners?
Rank each meeting place as (1) Always (2) Sometimes (3) Never (Modified Dual Risk, OMS)
- | | | | | |
|-----|---|---|---|-----|
| 1∇ | Dances, bars, events or parties organized for only men who have same-sex activities | 1 | 2 | 3 |
| 2∇ | Cinemas | 1 | 2 | 3 |
| 3∇ | Swimming pools | 1 | 2 | 3 |
| 4∇ | Night clubs | 1 | 2 | 3 |
| 5∇ | Cyber cafes/internet | 1 | 2 | 3 |
| 6∇ | Offices | | 1 | 2 3 |
| 7∇ | Schools | 1 | 2 | 3 |
| 8∇ | Straight Bars (i.e. bars that are not restricted) | 1 | 2 | 3 |
| 9∇ | House parties | 1 | 2 | 3 |
| 10∇ | Parks, beaches | | 1 | 2 3 |
| 11∇ | Public Toilets | 1 | 2 | 3 |
| 12∇ | Personal Adverts | 1 | 2 | 3 |
| 13∇ | Introduction from friends | 1 | 2 | 3 |
| 14∇ | Video clubs | 1 | 2 | 3 |
| 15∇ | Barber shops | 1 | 2 | 3 |
| 16∇ | Others (please specify) _____ | | | |

C7 Of these places, which is your most favourite meeting place? (Unique)

C8 Approximately how many other men do you personally know (i.e. by name) who have sexual relationships with other men? _____

SEXUAL HISTORY & BEHAVIOURS

SEXUAL HISTORY

You will now be asked questions about your actual sexual activities.

FIRST (PENETRATIVE OR NON-PENETRATIVE) SEXUAL EXPERIENCE

Sex or Sexual acts could be (i) penetrative when the penis penetrates the vagina and anus (e.g. anal or vaginal intercourse) (ii) non-penetrative which involves touching, licking or sucking the sex organs of your partner or having yours touched, licked or sucked leading to arousal with or without orgasm (e.g. oral sex).

- D1 Who did you have your first sexual encounter with?
- 1∇ A man
 - 2∇ A woman

- 3∇ Both
- 4∇ Other _____
- 77∇ Don't know
- 99∇ Declined

D2 What was your relationship to the person you had your first sexual encounter with? (Polaris)

- 1∇ Wife _____
- 2∇ Family member (specify relationship) _____
- 3∇ Friend (specify whether male or female) _____
- 4∇ Family Friend (specify whether male or female) _____
- 5∇ Stranger
- 6∇ Someone in authority i.e. Boss, professor, teacher
- 7∇ Sex worker whom you paid
- 8∇ Client who paid you
- 9∇ Other (specify) _____

D3 At what age did you have your first sexual encounter? _____ Years of age

D4 On the **first** occasion with a **man**, was it penetrative or non-penetrative?

- 1∇ Not Applicable (**Never had sex with a man**)
- 2∇ Penetrative
- 3∇ Non-Penetrative
- 4∇ Other (please specify) _____
- 77∇ Don't know
- 99∇ Declined

D5 On the **first** occasion with a **woman**, was it penetrative or non-penetrative?

- 1∇ Penetrative
- 2∇ Non-Penetrative
- 3∇ Other (please specify) _____
- 77∇ Don't know
- 99∇ Declined

D6 Which one of the following statements best describes your **actual sexual activities** in the past 5 years? (modified Bullock, Bisex & Dual Risk)

- 1∇ You only have sex with women²² (***Please see footnotes***)
- 2∇ You mostly have sex with women, but occasionally with men
- 3∇ You have sex about equally with men and women
- 4∇ You mostly have sex with men, but occasionally with women
- 5∇ You only have sex with men
- 99∇ Declined

²² ***If the respondent claims he has sex with only women, or has never has sexual contact with anyone, the interview must be terminated as he does not meet the criteria for inclusion in this study.***

- D7 Has this changed in the past 12 months? 1✓Yes 2✓No (*skip to question D10*)
- D8 If yes, please indicate which of the above statements best describes your actual sexual activities in the past 12 months _____
- D9 Altogether, how many sex partners (male and female) have you had in the past 12 months? (modified Bullock, Bisex & Dual Risk)
- 1✓ 500 or more
 - 2✓ 100 – 499
 - 3✓ 50 – 99
 - 4✓ 20 – 49
 - 5✓ 11 – 19
 - 6✓ 6 – 0
 - 7✓ 3 – 5
 - 8✓ Two
 - 9✓ One
 - 10✓ None (*Please see footnotes*)
- D9a On average, how many were males? _____
- D9b On average, how many were females? _____

ABOUT SEXUAL ACTIVITIES WITH MEN

The following questions are based on when your were growing up.....

- D10 Have you ever: (Unique) (*Please mark all that apply*)
- 1✓ Attended same-sex schools? 1✓ Yes 2✓ No
 - 1✓ Been imprisoned? 1✓ Yes 2✓ No
 - 1✓ Worked with the Nigerian Army, Navy or Air Force? 1✓ Yes 2✓ No

If answer to all the above questions is NO, then skip to question D12

- D11 If yes, did you engage in same-sex sexual activities with a man whilst(Unique)
- (a) In same-sex school? 1✓Yes 2✓No 3✓Not Applicable 99✓Declined
 - (b) In prison? 1✓Yes 2✓No 3✓Not Applicable 99✓Declined
 - (c) In the Nigerian Army, Navy or Air Force? 1✓Yes 2✓No 3✓Not Applicable 99✓Declined
- D12 Approximately how old *was the first male person* you had penetrative sex with?(Unique)
- 1✓ Older than you _____
 - 2✓ About same age as you
 - 3✓ Younger than you _____
 - 77✓ Don't know
 - 99✓ Declined

SEXUAL ROLE

D13 For **anal** sex with a man, are you a ‘top’, ‘bottom’ or ‘deyda’? (Unique)

- 1✓ Top
- 2✓ Bottom
- 3✓ Deyda (versatile)
- 4✓ Not Applicable (Never had anal sex with a man)
- 77✓ Don’t know
- 99✓ Declined

D14 For **oral** sex with a man, are you a ‘giver’ ‘receiver’ or ‘both’? (Unique)

- 1✓ Giver
- 2✓ Receiver
- 3✓ Both (versatile)
- 4✓ Not Applicable (**Never had oral sex with a man**)
- 77✓ Don’t know
- 99✓ Don’t know

SEXUAL PREFERENCE

D15 If you had a choice, who would you prefer to have sex with? (***Circle only one option***) (Unique)

- 1✓ A man (same-sex)
- 2✓ A woman (opposite sex)
- 3✓ Both
- 4✓ Other e.g. transgender
- 77✓ Don’t know
- 99✓ Declined

SEX PARTNER CHARACTERISTICS

D16 Are the male partners you have had sexual encounters with in the past 5 years mostly close to your age, older or younger? (Unique) (***Circle only one option***)

- 1✓ Mostly the same age
- 2✓ Same age and older
- 3✓ Mostly older
- 4✓ Mostly younger
- 5✓ same age and younger
- 77✓ Don’t know
- 99✓ Declined

D17 Are the female partners you have sexual encounters with in the past 5 years mostly close to your age, older or younger? (Unique) (***Circle only one option***)

- 1∇ Mostly the same age
- 2∇ Same age and older
- 3∇ Mostly older
- 4∇ Mostly younger
- 5∇ same age and younger
- 6∇ Not Applicable
- 77∇ Don't know
- 99∇ Declined

D18 Where do the men you have sex with come from? (Unique) (*Circle all that apply*)

- 1∇ Same tribe Yes No
- 1∇ Outside my tribe Yes No
- 1∇ Black African Yes No
- 1∇ White African Yes No
- 1∇ Non Africa white Yes No
- 1∇ Non African black Yes No

D19 Would you say that the men you have had sex with are mostly..... (Unique)

- 1∇ Same educational level as you?
- 2∇ Higher educational level as you?
- 3∇ Lower educational level as you?
- 4∇ Educational level is unknown
- 5∇ Others (please specify) _____

D20 Would you say that the men you have had sex with are mostly at....(Unique)

- 1∇ Higher income level as you?
- 2∇ Same income level as you?
- 3∇ Lower income level as you?
- 4∇ Income level is unknown
- 5∇ Others (please specify) _____

CIRCUMCISION STATUS

D21 Are you circumcised? 1∇Yes 2∇No

D22 How many times have you had sex with a man who is uncircumcised?

- 1∇ Never (*Please skip to question E1*)
- 2∇ Once
- 3∇ Occasionally
- 4∇ Several times
- 5∇ Others (please specify) _____

D23 Where was/were these (uncircumcised) persons from?

- 1∇ Nigerians

- 2✓ African Blacks
- 3✓ African Whites
- 4✓ Non African Blacks
- 5✓ Non African Whites
- 5✓ Others (please specify) _____

SEXUAL BEHAVIOURS

The following questions ask about your sexual behaviours and specific sexual acts with your male and female sexual partners.

Please refer to the definition of sexual acts on the flash card

A sexual partner could be REGULAR; CASUAL, CLIENT or SEX TRADE WORKER.

SEXUAL BEHAVIOUR WITH FEMALE PARTNERS

E1 Over the course of your *lifetime*, approximately how many female partners have you had sexual contact with? (Bullock, Dual Risk)

- 1✓ 20 or more
- 2✓ 11 – 19
- 3✓ 6– 10
- 4✓ 3 – 5
- 5✓ Two
- 6✓ One
- 7✓ None (*Go to question F1*)

E2 In the past 12 months, how many female partners have you had sexual contact with?

E3 Think about *ALL* the female partners you have had in the past 12 months, how many were:

- 1✓ Your spouse(s) or live-in sexual partner(s) – [**REGULAR PARTNER(S)**]?
_____ 77✓ Don't know 99✓ Declined
- 1✓ Partner(s) with whom you had sex in exchange for money – [**COMMERCIAL SEX PARTNER**]?
_____ 77✓ Don't know 99✓ Declined
- 1✓ Sexual partner(s) that you are not married to and have never lived with and did not pay [**NON REGULAR PARTNER(S)**]
_____ 77✓ Don't know 99✓ Declined

A REGULAR FEMALE PARTNERS

A regular female partner is a woman with whom you have had sex with on more than one occasion. (Modified Polaris, Dual Risk).

- E4 When was the past time you had penetrative sex with a regular female partner? (Bullock)
- 1∇ Never (Don't have a regular female partner) ***Skip to question E13***
 - 2∇ A few days ago (specify how many days) _____
 - 3∇ Within the past month (specify how many weeks) _____
 - 4∇ 2-3 months ago (specify how many) _____
 - 5∇ 4-6 months ago (specify) _____
 - 6∇ 7-12 months ago (specify) _____
 - 7∇ 1-5 years ago (specify) _____ ***(If more than 1 year ago, please skip to E13)***

E5 In the past 12 months, how often did you participate in the following sexual acts with your regular female partners and with what number of partners?

<i>Sexual Acts</i>	Always (1)	Sometimes (2)	(3) Never
Deep Kissing	1	2	3
Mutual masturbation?	1	2	3
Crural or thigh sex?	1	2	3
ORAL SEX			
You lick her vagina	1	2	3
She gives you a blow job	1	2	3
ORAL-ANAL SEX			
You lick her ass?	1	2	3
She licks your ass?	1	2	3
ANAL SEX			
You insert your penis in her anus <i>with</i> a condom?	1	2	3
You insert your penis in her anus <i>without</i> a condom?	1	2	3
VAGINAL SEX			
Vaginal intercourse <i>with</i> a condom?	1	2	3
Vaginal intercourse <i>without</i> a condom?	1	2	3

If you currently have regular female partners, think of the one you have had the most frequent sex with in the past 12 months.

- E6 Are you married to this person? 1∇Yes 2∇ No

- E7 How long have you been in a relationship with this partner?
 1∇ Years _____
 2∇ Months _____
 3∇ Weeks _____
- E8 Are you currently living together? 1∇ Yes 2∇ No
- E9 How satisfied are you with your sexual life with this partner? Would you say.....?
 1∇ Satisfied
 2∇ Indifferent
 3∇ Dissatisfied
 77∇ Don't know
 99∇ Declined
- E10 Which of the sexual activities in question E5 (*show prompt card 11*) have you *NOT* practiced with this partner?
 1∇ None
 2∇ _____; 3∇ _____; 4∇ _____
- E11 Think of the past time you had penetrative sex with this partner, was a condom used?
 1∇ Yes
 2∇ No
 3∇ No penetrative sex
 77∇ Don't know
 99∇ Declined
- E12 In the past 12 months, how often did you use a condom with your regular female partners?
 1∇ Always
 2∇ Sometimes
 3∇ Never
 77∇ Don't know
 99∇ Declined

B. NON-REGULAR FEMALE PARTNERS

A non-regular female partner is one with whom you have had sex on only one occasion or less than once a month including one-night stands, and casual encounters.

- E13 When was the past time you had sex, with a casual female partner? (Bullock)?
 1∇ Never (Don't have a casual female partner) *Skip to question E18*
 2∇ A few days ago (specify how many days) _____
 3∇ Within the past month (specify how many weeks) _____
 4∇ 2-3 months ago (specify how many) _____

- 5∇ 4-6 months ago (specify) _____
 6∇ 7-12 months ago (specify) _____
 7∇ 1-5 years ago (specify) _____ *(If more than 1 year ago, please skip to E18)*

E14 In the past 12 months, how often did you participate in the following sexual acts with your **non-regular female** partners and **with what number of partners?**

<i>Sexual Acts</i>	Always	Sometime s	Never
Deep Kissing	1	2	3
Mutual masturbation?	1	2	3
Crural or thigh sex?	1	2	3
ORAL SEX			
Did you lick her vagina?	1	2	3
She gives you a blow job?	1	2	3
ORAL-ANAL SEX			
You lick her ass?	1	2	3
She licks your ass?	1	2	3
ANAL SEX			
You insert your penis into her anus <i>with</i> a condom?	1	2	3
You insert your penis into her anus <i>without</i> a condom?	1	2	3
VAGINAL SEX			
Vaginal intercourse <i>with</i> a condom?	1	2	3
Vaginal intercourse <i>without</i> a condom?	1	2	3

E15 The past time you had sex with a non-regular female partner did you use a condom?

- 1∇ Not applicable 2∇ Yes 3∇ No 77∇ Don't know 99∇ Declined

E16 Think of the past time you had penetrative sex with a non-regular female partner, was a condom used?

- 1∇ Yes
 2∇ No
 3∇ No penetrative sex
 77∇ Don't know
 99∇ Declined

E17 In the past 12 months, how often did you use a condom with your non-regular female partners?

- 1∇ Always
- 2∇ Sometimes
- 3∇ Never
- 77∇ Don't know
- 99∇ Declined

C FEMALE COMMERCIAL SEX PARTNERS

E18 When was the past time you had sex, with a female commercial sex partner? (Bullock)?

- 1∇ Never (*Skip to question F1*)
- 2∇ A few days ago (specify how many days) _____
- 3∇ Within the past month (specify how many weeks) _____
- 4∇ 2-3 months ago (specify how many) _____
- 5∇ 4-6 months ago (specify) _____
- 6∇ 7-12 months ago (specify) _____
- 7∇ 1-5 years ago (specify) _____ (*If more than 1 year ago, please skip to F1*)

E19 In the past 12 months, how often did you participate in the following sexual acts with your *commercial female sex* partners and **with what number of partners?**

<i>Sexual Acts</i>	Always	Sometime s	Never
Deep Kissing	1	2	3
Mutual masturbation?	1	2	3
Crural or thigh sex?	1	2	3
ORAL SEX			
Did you lick her vagina?	1	2	3
She gives you a blow job?	1	2	3
ORAL-ANAL SEX			
You lick her ass?	1	2	3
She licks your ass?	1	2	3
ANAL SEX			
You insert your penis into her anus <i>with</i> a condom?	1	2	3
You insert your penis into her anus <i>without</i> a condom?	1	2	3
VAGINAL SEX			
Vaginal intercourse <i>with</i> a condom?	1	2	3
Vaginal intercourse <i>without</i> a condom?	1	2	3

- E20 The past time you had sex with a commercial female sex partner did you use a condom?
 1∇ Not applicable 2∇ Yes 3∇ No 77∇ Don't know 99∇ Declined
- E21 Think of the past time you had penetrative sex with a commercial female sex partner, was a condom used?
 1∇ Yes
 2∇ No
 3∇ No penetrative sex
 77∇ Don't know
 99∇ Declined
- E22 In the past 12 months, how often did you use a condom with your commercial female sex partners?
 1∇ Always
 2∇ Sometimes
 3∇ Never
 77∇ Don't know
 99∇ Declined
- E23 Do you by any chance know the HIV status of any of your female partners?
 1∇ Yes
 2∇ No (*Skip to question F1*)
 77∇ Don't know
 99∇ Declined
- E24 If yes, how many are/were (*Refer to answer questions E2*)
 1∇ HIV Negative _____
 2∇ HIV Positive _____ (*Skip to question F1*)
 3∇ Unknown Status _____
 77∇ Don't know
 99∇ Declined

SEXUAL BEHAVIOUR WITH MALE PARTNERS

I will like to ask you some questions about your sexual behaviour and specific acts with your male sex partners.

- F1 Over the course of your *lifetime*, how many male partners have you had sexual contact with? (Bullock, Dual Risk)
 1∇ 500 or more
 2∇ 100 – 499
 3∇ 50 – 99
 4∇ 20 – 49
 5∇ 11 – 19

- 6✓ 6– 10
- 7✓ 3 – 5
- 8✓ Two
- 9✓ One
- 10✓ **None (Go to question H1)**

F2 In the past 12 months, how many *male* partners have you had sexual contact with?

E3 Think about **ALL** the male partners you have had in the past 12 months, how many were:

1✓ Your live-in sexual partner(s) – [**REGULAR PARTNER(S)**]?
_____ 77✓ Don't know 99✓ Declined

1✓ Partner(s) with whom you had sex in exchange for money – [**COMMERCIAL SEX PARTNER**]?
_____ 77✓ Don't know 99✓ Declined

1✓ Sexual partner(s) that you have never lived with and did not pay [**NON - REGULAR PARTNER(S)**] _____ 77✓ Don't know 99✓ Declined

F4 Have you ever used a condom when having sex with a man?

- 1✓ Yes
- 2✓ No, never

F5 During the past year, did any of your sexual partners force you to have sex with them even though you did not want to have sex?

- 1✓ Yes
- 2✓ No
- 77✓ Don't know
- 99✓ Declined

F6 Have you ever discussed HIV and AIDS/STIs with any of your male partners?

- 1✓ Yes, all
- 2✓ Yes, some
- 3✓ No, never**

- 77✓ Don't know
- 99✓ Declined

A **REGULAR MALE PARTNERS**

A regular male partner is a man with whom you have had sex with on more than one occasion.
(Modified Polaris, Dual Risk).

F7 When was the past time you had penetrative sex with a *regular male partner*? (Bullock)

- 1✓ Never (**Skip to question F10**)
- 2✓ A few days ago (specify how many days) _____
- 3✓ Within the past month (specify how many weeks) _____
- 4✓ 2-3 months ago (specify how many) _____
- 5✓ 4-6 months ago (specify) _____

- 6✓ 7-12 months ago (specify) _____
 7✓ 1-5 years ago (specify) _____ *(If more than 1 year ago, please skip to F10)*

F8 In the past 12 months, how often did you participate in the following sexual acts with your **regular male partners** and **with what number of partners?**

<i>Sexual Acts</i>	Always	Sometimes	Never
Deep Kissing?	1	2	3
Mutual masturbation?	1	2	3
Crural or thigh sex?	1	2	3
ORAL SEX			
He gives you a blow job and you cum in his mouth?	1	2	3
You give him a blow job and he cums in your mouth?	1	2	3
He gives you a blow job and you don't cum in his mouth?	1	2	3
You give him a blow job and he doesn't cum in your mouth?	1	2	3
ORAL-ANAL SEX			
You lick his ass?	1	2	3
He licks your ass?	1	2	3
ANAL SEX			
You insert your penis in his anus with a condom?	1	2	3
You insert your penis in his anus without a condom?	1	2	3
He inserts his penis in your anus with a condom?	1	2	3
He inserts his penis in your anus without a condom?	1	2	3

F9 The past time you had anal sex with your regular partner did you use a condom?
 1✓ Not applicable 2✓ Yes 3✓ No 77✓ Don't know 99✓ Declined

B. NON-REGULAR MALE PARTNERS

A non-regular male sex partner is a man with whom you have had sex with on ONLY one occasion or less than once a month.

- F10 When was the past time you had sex with a non-regular male sex partner?
 1✓ Never (*Skip to question G1*)
 2✓ A few days ago (specify how many days) _____
 3✓ Within the past month (specify how many weeks) _____
 4✓ 2-3 months ago (specify how many) _____
 5✓ 4-6 months ago (specify) _____
 6✓ 7-12 months ago (specify) _____

7∇ 1-5 years ago (specify) _____ (*If more than 1 year ago, please skip to G1*)

F11 On average, in the past 12 months, how often did you engage in the following sexual activities and with approximately how many *non-regular male* partners?

<i>Sexual Acts</i>	Always	Sometime s	Never
Deep Kissing	1	2	3
Mutual masturbation?	1	2	3
Crural or thigh sex?	1	2	3
ORAL SEX			
He gives you a blow job and you cum in his mouth	1	2	3
You give him a blow job and he cums in your mouth?	1	2	3
He gives you a blow job and you don't cum in his mouth?	1	2	3
You give him a blow job and he doesn't cum in your mouth?	1	2	3
ORAL-ANAL SEX			
You lick his ass	1	2	3
He licks your ass	1	2	3
ANAL SEX			
You insert your penis in his anus with a condom?	1	2	3
You insert your penis in his anus without a condom?	1	2	3
He inserts his penis in your anus with a condom	1	2	3
He inserts his penis in your anus without a condom	1	2	3

F12 The past time you had anal sex with a *non-regular* male partner did you or your partner use a condom?

1∇ Not applicable 2∇ Yes 3∇ No 77∇ Don't know 99∇ Declined

SEX IN EXCHANGE FOR MONEY, DRUGS, SHELTER, CLOTHING OR OTHER GOODS AND SERVICES (MALES AND FEMALES)

The next set of questions concerns sex exchanged for money, or other goods such as clothing, shelter, drugs, protection.

A sex client is a male sex partner who may or may not be known to you but pays you money, drugs, clothing or other goods and services in order to have sex with you.

A commercial sex partner is a male partner you do not know (e.g. someone you encountered at a park, a hustler) who receives money, drugs or other goods and services from you in exchange for sex.

G1 In the past 12 months, have ***you given*** a man clothing, meals, or shelter in exchange for sex?

- 1✓ Yes, how many? _____
- 2✓ No
- 77✓ Don't know
- 99✓ Declined

G2 In the past 12 months, have you ***received*** goods, clothing or shelter from a man in exchange for sex?

- 1✓ Yes, how many? _____
- 2✓ No
- 77✓ Don't know
- 99✓ Declined

G3 In the past 12 months, have you ***paid*** a man ***money*** for sex?

- 1✓ Yes, how many? _____
- 2✓ No
- 77✓ Don't know
- 99✓ Declined

G4 In the past 12 months, have you ***received money*** from a man in exchange for sex?

- 1✓ Yes, received from a man. How many? _____
- 2✓ No
- 77✓ Don't know
- 99✓ Declined

G5 Have you ever discussed HIV and AIDS/STIs with any of your male partners you have paid or received money, shelter or clothing from?

- 1✓ Yes, all of them
- 2✓ Yes, some of them
- 3✓ No, none of them
- 77✓ Don't know
- 99✓ Declined

G6 In the past 12 months, how often did you participate in any of the following sexual activities with the ***male partners you paid or received money or goods from in exchange for sex?***

<i>Sexual Acts</i>	Always	Sometime s	Never
Deep Kissing	1	2	3

Mutual masturbation?	1	2	3
Crural or thigh sex?	1	2	3
ORAL SEX			
He gives you a blow job and you cum in his mouth	1	2	3
You give him a blow job and he cums in your mouth?	1	2	3
He gives you a blow job and you don't cum in his mouth?	1	2	3
You give him a blow job and he doesn't cum in your mouth?	1	2	3
ORAL-ANAL SEX			
You lick his ass	1	2	3
He licks your ass	1	2	3
ANAL SEX			
You insert your penis in his anus with a condom?	1	2	3
You insert your penis in his anus without a condom?	1	2	3
He inserts his penis in your anus with a condom	1	2	3
He inserts his penis in your anus without a condom	1	2	3

- G7 The past time you had anal sex with this type of partner was a condom used?
 1∇ Not applicable 2∇ Yes 3∇ No 77∇ Don't know 99∇ Declined
- G8 In the past 12 months, have your male clients offered you more money in order *not to use* condoms for anal sex? (Modified Dual Risk)
 1∇ Not applicable 2∇ Yes 3∇ No 77∇ Don't know 99∇ Declined
- G9 In the past 12 months, when you expected to have sex with a male sex client how often did you prepare yourself by having condoms with you? (Dual Risk, Bullock)
 1∇ Never (**Go to question H1**)
 2∇ Some of the time
 3∇ Always
 77∇ Don't know
 99∇ Declined
- G10 In the past 12 months, when you had male sex client(s) and brought condoms with you, how often did you end up using the condoms with the man or men you had sex with? (Dual Risk)
 1∇ Never (**Go to question H1**)
 2∇ Some of the time
 3∇ Always
 77∇ Don't know

99∇ Declined

CONDOMS, LUBRICANTS, & DOUCHING

CONDOMS

H1 With what frequency did you or your regular male partner use a condom for oral sex in the past 12 months?

- 1∇ Never
- 2∇ Sometimes
- 3∇ Always
- 77∇ Don't know
- 99∇ Declined

H2 Which one of the following groups of people were you *most likely* or *unlikely* to use the condom with in the past 12 months? (*For each, insert either likely or unlikely*)

- 1∇ Regular male partners _____
- 2∇ Regular female partners _____
- 3∇ Non regular male partners _____
- 4∇ Non regular female partners _____
- 5∇ Commercial female partners _____
- 6∇ Commercial male partners _____
- 7∇ Male clients _____

H3 Which of the following statements best describes who bought the condoms on the occasions when you had sex with a condom with your *female partners* in the past 12 months? (*Circle only one option*)

- 1∇ I always bought condoms
- 2∇ I mostly bought condoms, and my partner did some of the time
- 3∇ We both equally bought condoms
- 4∇ My partner mostly bought condoms; I did some of the time
- 5∇ My partner always bought the condoms
- 6∇ Not applicable
- 77∇ Don't know
- 99∇ Declined

H4 Which of the following statements best describes who bought the condoms on the occasions when you had sex with a condom with your *male partners* in the past 12 months? (*Circle only one option*)

- 1∇ I always bought condoms
- 2∇ I usually bought condoms, and my partner did some of the time
- 3∇ We both equally bought condoms
- 4∇ We purchased condoms together before having sex
- 5∇ My partner usually bought condoms, I did some of the time
- 6∇ My partner always bought the condoms
- 7∇ Not applicable

- 77✓ Don't know
99✓ Declined
- H5 Can you recall ever having sexual intercourse without using any condom with any commercial male partner or non regular male partner?
1✓ Yes 2✓ No 77✓ Don't know 99✓ Declined
- H6 In the past 12 months during anal sex with any of your *male partners* (regular, non-regular or commercial sex partners), did the condoms you were wearing get torn during sex?
1✓ Not applicable
2✓ Yes, once
3✓ Yes, more than once
4✓ No
77✓ Don't know
- H7 In the past 12 months, during sexual encounters with any of your *male partners* did the condom you were wearing slip off during sex?
1✓ Not applicable
2✓ Yes, once
3✓ Yes, more than once
4✓ No
77✓ Don't know
- H8 Which of the following have you done in the past 12 months? (*Please mark all that apply*)
1✓ Unrolled the condom before putting it on
1✓ Did not use any lubricant
1✓ Used saliva as a lubricant
1✓ Put a lot of lubricant inside the condom before putting it on
1✓ Did not use water-based lubricant on the inside of the condom
1✓ Used a condom that was too short (specify the name _____)
1✓ Used a condom that was too tight (specify the name _____)
1✓ Used a condom that was too loose (specify the name _____)
1✓ Continued having sex for over half an hour without changing the condom.
1✓ Other (specify) _____
1✓ None of the above

ATTITUDES TOWARD CONDOM USE

Tell me how much you agree or disagree with each statement.

Show prompt card 1: (1) Disagree (2) Neutral (3) Agree (4) Don't know

- | | | |
|----|--|----------------|
| H9 | 1✓ Using a condom takes the pleasure out of sex | <u>1</u> 2 3 4 |
| | 1✓ A condom is not necessary if you know your partner | 1 2 3 4 |
| | 1✓ Finding a partner who will agree to using a condom is difficult | 1 2 3 4 |

- 1∇ A condom is not necessary if you are sure that the other person does not have a sexually transmitted infection 1 2 3 4
- 1∇ I wouldn't mind if my partner brings up the idea of using a condom 1 2 3 4
- 1∇ People will laugh at me if I want to have safe sex 1 2 3 4
- 1∇ Condoms are too expensive 1 2 3 4
- 1∇ Nigerian condoms don't work 1 2 3 4
- 1∇ I lose my erection with the condom 1 2 3 4
- 1∇ Finding condoms in Nigeria is a problem 1 2 3 4
- 1∇ Nigerian condoms are not strong enough 1 2 3 4
- 1∇ I insist on using a condom for anal sex with any male partner 1 2 3 4

H10 There are many reasons why people have sexual intercourse without using condoms. In the past 12 months what are your reasons for having intercourse without a condom with your *male* partners? _____

H11 There are many reasons why people have sexual intercourse without using condoms. In the past 12 months what were your reasons for having intercourse without a condom with your *female* partners? _____

LUBRICANTS

H12 If you engaged in anal sex with your *female* partners in the past 12 months, how often did you use lubricants?

- 1∇ Never
- 2∇ Some of the time
- 3∇ Always
- 4∇ Not applicable
- 77∇ Don't know
- 99∇ Declined

H13 If you engaged in anal sex with your *male* partners in the past 12 months, how often did you use lubricants? _____ (insert on of the above options)

If lubricants have never been used for both male and female partners then skip to Question H17

H14 If used, what types of lubricants have you used with your sexual partners in the past 12 months? (*indicate all that apply*)

	Male		Female	
	Yes	No	Yes	No
K-Y Jelly				
Vaseline				

Cooking Oil				
Baby oil				
Wet				
Hair cream				
Body lotion				
Saliva				
Soap/detergent				
Others (specify)				

H15 How often do you use lubricants with a condom? _____

- 1∇ Never
- 2∇ Some of the time
- 3∇ Always
- 4∇ Not applicable
- 77∇ Don't know
- 99∇ Declined

H16 Why do you not use lubricants? (*Circle all that apply*)

- 1∇ Not applicable
- 1∇ Partner objects
- 1∇ Afraid to use it
- 1∇ Can't afford to buy it
- 1∇ Don't like lubricants
- 1∇ Other (specify) _____
- 77∇ Don't know
- 99∇ Declined

RECTAL DOUCHING (ENEMA)

H17 Have you ever done anal douching or enema?

- 1∇ Yes, when you have anal sex with a male partner
- 2∇ No (**Go to question K1**)

H18 If yes, for all the sexual encounters you have had with your *male* partners, how often did you douche or have an enema?

	Never	Some of the time	Always
Before anal sex			
After anal sex			

H19 If yes, for all the sexual encounters you have had with your *female* partners, how often did you douche or have an enema?

	Never	Some of the time	Always

		time	
Before anal sex			
After anal sex			

H20 What kinds of liquids do you use for douching or enema? _____

H21 Why do you douche? (*probe*) _____

SOCIAL HABITS & SEX

SMOKING

The next questions are about behaviours that may affect a person's health. Please remember that everything you tell me is completely confidential.

K1 Have you ever smoked cigarettes?
 1 Yes 2 No (*Skip to question K4*)

K2 How many cigarettes do you smoke in a day? _____

K3 At the present time, how often do you smoke cigarettes?
 1 Daily
 2 Regularly, but not daily
 3 Occasionally
 4 Not at all
 99 Declined

ALCOHOL

Now I have some questions for you about alcohol consumption. When I refer to a drink, I mean:

- One 0.6l bottle or 0.35l can of beer or stout
- One glass of alcoholic wine
- A drink or cocktail with 1 and 1/2 ounces of liquor
- A drink of traditional liquor.
- A drink does not include fully de-alcoholised or 0.5% beer

K4 During the past 12 months, on average how often have you drunk alcoholic beverages?
 (Modified Bullock, EAS & Dual Risk)
 1 None (*Go to question K7*)
 2 Less than once a month (rarely)
 3 Once a month
 4 2-3 times a month
 5 Once a week
 6 2-3 times a week

- 7✓ 4-6 times a week
- 8✓ More than once a day
- 77✓ DK
- 99✓ Declined

K5 When you drink, how many drinks do you usually have? (Modified Dual Risk)

- 1✓ 1 or 2
- 2✓ 3 or 4
- 3✓ 5 or 6
- 4✓ 7 or 9
- 5✓ 10 or more
- 77✓ Don't know
- 99✓ Declined

K6 Do you drink alcohol before or during sexual encounters?

- 1✓ Yes
- 2✓ No (**Go to question K9**)
- 77✓ Don't know
- 99✓ Declined

K7 How often do you drink alcohol in the following situations?

Circle one of the options for each situation (1) Never (2) Sometimes (3) Always

- 1✓ Before or during sexual encounters with men? 1 2 3
- 1✓ Before or during sexual encounters with women? 1 2 3
- 1✓ After having sex with men? 1 2 3
- 1✓ After having sex with women? 1 2 3
- 1✓ When you are alone 1 2 3

K8 Do you drink more, less or about the same amount of alcohol when you have sex with men than with women? (**Circle only one option**)

- 1✓ More
- 2✓ Less
- 3✓ About the same
- 4✓ Not Applicable
- 77✓ Don't know
- 99✓ Declined

DRUGS

Now I am going to ask you some questions about drug use.

K9 Which of the following have you used and for how long? (EAS)

Ever Tried	Have you used any of the following in
------------	---------------------------------------

	or Used	the past 12 months?
a. Marijuana, or cannabis (<i>Indian hemp, igbo, ganja</i>)	1✓Yes 2✓No	1✓Yes 2✓No
b. Cocaine or raw form of cocaine(<i>“coke”, powder</i>)	1✓Yes 2✓No	1✓Yes 2✓No
c. Sleeping tablets (e.g. <i>Valium</i>)	1✓Yes 2✓No	1✓Yes 2✓No
d. Others (specify):	1✓Yes 2✓No	1✓Yes 2✓No

K10 Do you use any drugs before or during sexual encounters?

- 1✓ Yes
2✓ No (*Skip to question L1*)
77✓ DK
99✓ Declined

K11 Do you use more, less or about the same amount of drugs when you have sex with men than with women?

- 1✓ More
2✓ Less
3✓ About the same
77✓ Don't know
99✓ Declined

KNOWLEDGE AND ATTITUDES TO SEXUALLY TRANSMITTED INFECTIONS (STIs)

Sexually transmitted Infections (STIs) are of various types and can manifest in various ways.

L1 Have you heard about diseases that can be transmitted through sexual intercourse?

- 1✓ Yes 2✓ No

L2 The next questions are about the STIs you ever thought you had.

Do you know what is?	Response	Have you had it in the past 12 months?
Gonorrhoea	1✓ Yes 2✓ No	1✓ Yes 2✓ No 77✓ DK
Chlamydia	1✓ Yes 2✓ No	1✓ Yes 2✓ No 77✓ DK
Syphilis	1✓ Yes 2✓ No	1✓ Yes 2✓ No 77✓ DK
Genital Herpes	1✓ Yes 2✓ No	1✓ Yes 2✓ No 77✓ DK
Genital Warts	1✓ Yes 2✓ No	1✓ Yes 2✓ No 77✓ DK
Hepatitis B	1✓ Yes 2✓ No	1✓ Yes 2✓ No 77✓ DK
Others _____	1✓ Yes 2✓ No	1✓ Yes 2✓ No 77✓ DK

GENITAL ULCER DISEASE

***Genital or anal discharge* is discharge of pus, or blood from either the penis or anus often as a result of STIs. A *genital or anal ulcer* is an open sore located on any part of the penis, around the groin and the anus also as a result of STIs.**

L3 In the past 12 months have you had a visible genital discharge or ulcer?

- 1∇ Yes, genital ulcer
- 2∇ Yes, genital discharge
- 3∇ Yes, both
- 4∇ Neither genital discharge nor ulcer
- 77∇ Don't know
- 99∇ Declined

L4 Have you had a visible ***anal*** discharge or ulcer in the past 12 months?

- 1∇ Yes, anal discharge
- 2∇ Yes, anal ulcer
- 3∇ Yes, both
- 4∇ Neither anal discharge nor ulcer
- 77∇ Don't know
- 99∇ Declined

KNOWLEDGE OF STIs

L5 **In a MAN**, what signs and symptoms would lead you to think that he has an STI? (***Circle all that are mentioned. More than one answer is possible.***)

- 1∇ Discharge from penis
- 1∇ Burning pain on urination
- 1∇ Genital ulcers/open sores
- 1∇ Swellings in genital area
- 1∇ Blood in the urine
- 1∇ Failure to pass urine
- 1∇ No symptoms
- 1∇ Others (specify) _____
- 1∇ Don't know

L6 Indicate whether ***true*** or ***false***. Someone who has contracted a sexually transmitted infection will always have symptoms 1∇ True 2∇ False 77∇ Don't know

L7 Can people get an STI in the following ways? Check one option for each item.

- 1∇ Through oral-anal sex 1∇ Yes 2∇ No 77∇ DK
- 1∇ Through someone inserting his penis into your anus without a condom 1∇ Yes 2∇ No 77∇ DK

L12 ***For each statement, please indicate whether it is true 1✓ T or false 2✓ F or don't know 77✓ DK. If you do not know, please do not guess; instead circle don't know.***

- 1✓ A person can get HIV from a toilet seat
- 1✓ HIV can be spread by mosquitoes
- 1✓ Anal sex is a less risky form of sex than vaginal sex for the spread of HIV
- 1✓ Spread of HIV is less when a man has sex with men than when a man has sex with women
- 1✓ A person can get HIV by sharing a glass of water with someone who has HIV
- 1✓ A pregnant woman with HIV can pass the virus to the baby
- 1✓ Pulling out the penis before a man climaxes or cums keeps a person from getting HIV during sex
- 1✓ A woman can get HIV if she has anal sex with a man
- 1✓ A man can get HIV if he has anal sex with a man
- 1✓ Eating healthy foods can keep a person from getting HIV
- 1✓ Using latex condom can lower a person's chances of getting HIV
- 1✓ A person can be infected with HIV and not know he/she is infected
- 1✓ There is a vaccine that can stop people from getting HIV
- 1✓ AIDS can be cured
- 1✓ A person can get HIV by giving blood
- 1✓ You can usually tell if someone has HIV by looking at them
- 1✓ A person will not get HIV if he or she is taking antibiotics
- 1✓ A person can get HIV by swimming in the same pool with a person who has HIV
- 1✓ A person can get HIV through contact with saliva, tears, sweat or urine
- 1✓ Taking vitamins keeps a person from getting HIV
- 1✓ Coughing or sneezing can spread HIV

ATTITUDES TO HIV

L13 ***Please indicate your extent of agreement or disagreement with each statement below.***
 1✓ *Agree* 2✓ *Disagree* 77✓ *Don't know* 99✓ *Declined*

- 1✓ AIDS is the result of God's punishment (Divine Retribution)
- 1✓ HIV is a problem for the following people:
 - Homosexuals
 - Unmarried women
 - Prostitutes
 - Students
 - Married women
 - Men
 - Injection drug users
- 1✓ It is not so easy to catch the AIDS virus as the experts are making us to believe
- 1✓ Using condoms to avoid HIV is too much trouble
- 1✓ I will shake the hands of an HIV infected person

- 1✓ AIDS is a white man's disease
- 1✓ AIDS affects mainly poor people
- 1✓ People with AIDS have got what they deserve
- 1✓ HIV is a major health problem in Nigeria
- 1✓ HIV and AIDS have made people a lot more careful about whom they have sex with
- 1✓ I believe I have enough information about HIV and AIDS to protect myself in my sexual life

HIV RISK PERCEPTION

L14 What do you think are your chances of getting HIV? **(If HIV positive, skip to M1)**

- 1✓ Very unlikely
- 2✓ Unlikely
- 3✓ Neutral
- 4✓ Likely
- 5✓ Very likely
- 77✓ Don't know
- 99✓ Declined

HEALTH CARE UTILIZATION

Now I will like to ask you some questions about your health and contact with health professionals.

M1 Compared to other people your age, how would you rate your current physical health?

- 1✓ Excellent
- 2✓ Very good
- 3✓ Good
- 4✓ Fair
- 5✓ Poor
- 77✓ Don't know

M2 Who do prefer to see when you visit a health care facility?

- 1✓ A female doctor or nurse
- 2✓ A male doctor or nurse
- 3✓ Indifferent
- 4✓ I don't go to the health care facility

M3 When was the past time you saw a doctor?

- 1∇ Never
- 2∇ Less than a 1 year ago
- 3∇ One year to less than 2 years ago
- 4∇ Two years to less than 3 years ago
- 5∇ Three years to less than 4 years ago
- 6∇ Four years to less than 5 years ago
- 7∇ Five or more years ago
- 77∇ DK
- 99∇ Declined

M4 Which of the following services have you used in the past year?

- | | | |
|----------------------------------|-------|------|
| 1∇ Hospital emergency | 1∇Yes | 2∇No |
| 1∇ STD clinic | 1∇Yes | 2∇No |
| 1∇ AIDS clinic | 1∇Yes | 2∇No |
| 1∇ Government clinics | 1∇Yes | 2∇No |
| 1∇ Private clinic | 1∇Yes | 2∇No |
| 1∇ Dentist | 1∇Yes | 2∇No |
| 1∇ Traditional healer | 1∇Yes | 2∇No |
| 1∇ Chemist/Pharmacist | 1∇Yes | 2∇No |
| 1∇ Others (please specify) _____ | | |

M5 Where you admitted **to a** hospital in the past 12 months? 1∇ Yes 2∇ No 77∇ DK

M6 Have you ever received counselling about your sexuality from anyone?

- 1∇Yes 2∇No (*Go to question M8*)

M7 If yes, from whom?

- | | | |
|---------------------------------|-------|------|
| 1∇ Doctor/nurse | 1∇Yes | 2∇No |
| 1∇ Church/mosque | 1∇Yes | 2∇No |
| 1∇ Pharmacist | 1∇Yes | 2∇No |
| 1∇ Traditional healer/herbalist | 1∇Yes | 2∇No |
| 1∇ Psychiatrist | 1∇Yes | 2∇No |
| 1∇ Social Worker | 1∇Yes | 2∇No |
| 1∇ Elder in the family | 1∇Yes | 2∇No |
| 1∇ Others (specify) _____ | | |

M8 Does your doctor or health care provider know your sexual orientation?

- 1∇ I am sure he/she knows
- 2∇ I think so
- 3∇ I don't know
- 4∇ I don't think so
- 5∇ I am sure he/she doesn't know

M9 Have the health care providers you have seen been able to give helpful advice, or support, with regards to

- 1✓ Your sexual health? 1✓Yes 2✓No
 1✓ Your sexual orientation? 1✓Yes 2✓No

M10 How much of a problem are the following for you at the present time?

1✓ *Not a problem* 2✓ *A small problem* 3✓ *A big problem*

- 1✓ Feeling uncertain about your future 1✓ 2✓ 3✓
 1✓ Finding sex partners 1✓ 2✓ 3✓
 1✓ What others say about you 1✓ 2✓ 3✓
 1✓ Feeing alone 1✓ 2✓ 3✓
 1✓ Being treated differently or rejected because of sexual Orientation
 1✓ 2✓ 3✓

M11 During the past 12 months, was there ever a time when you felt that you needed health care but you didn't receive it? 1✓Yes 2✓No (*Go to question N1*)

M11 Thinking of the most recent time that happened, why didn't you get care? (*Circle all that apply*)

- 1✓ No available health care where you live
 1✓ Not available at the time required
 1✓ Waiting time usually too long
 1✓ You felt the type of care you would receive was going to be inadequate
 1✓ Could not afford the cost
 1✓ You were too busy to go
 1✓ You had transportation problems
 1✓ You did not know where to go
 1✓ You had personal or family responsibilities
 1✓ Dislike seeing doctors
 1✓ You decided not to seek care
 1✓ You were concerned about discrimination
 1✓ Others please specify) -----

STI SCREENING AND HIV TESTING

Now I will ask you some questions about tests you may have had when seeing a health professional.

N1 Have you ever been tested for HIV?

- 1✓Yes
 2✓ No (*Go to question N9*)
 77✓ DK

99✓ Declined

N2 If yes, when was the past time you were tested?
 _____ / _____ 77✓ DK 99✓ Declined
 Month Year

N3 Where did you go for the test?
 1✓ Doctor's clinic
 2✓ Hospital
 3✓ Anonymous HIV test site
 4✓ NGO/other blood donor service
 5✓ Other (specify) _____

N4 How often do you get tested for HIV?
 1✓ 2 or more times a year
 2✓ About twice a year or every 6 months
 3✓ About once a year or every 12 months
 4✓ About once every 2 years
 5✓ About once every 3 years
 6✓ More than 3 years between tests
 7✓ I don't test regularly for HIV
 77✓ Don't know

N5 How many times did you get tested for HIV in the past 1 year? _____

N6 What was the result of your (*most recent*) HIV test?
 1✓ I did not receive the result
 2✓ I do not know
 3✓ HIV negative
 4✓ HIV positive
 5✓ The result is pending

N7 If you are positive, when was the **first** time that you tested HIV positive?
 _____ / _____
 year month

N8 Why did you go for the HIV test? _____

If you have taken an HIV test before, skip question to P1

N9 There are many reasons why people decide not to get tested for HIV. Please tell me why you have not had an HIV test to date? _____

N10 If you have never taken the test for HIV, what do you think your HIV status is?
 1✓ HIV negative

- 2✓ HIV positive
- 77✓ Don't know
- 99✓ Declined

PSYCHOSOCIAL RESPONSES TO SEXUAL IDENTITY

PERCEIVED DISCRIMINATION & HOSTILITY

- P1 Has any of the following ever happened to you *at school* because of your sexual orientation?
- 1✓ You were asked to leave or withdraw from your school? 1✓Yes 2✓No
 - 1✓ You were asked to leave a school residence? 1✓Yes 2✓No
 - 1✓ You were denied a scholarship? 1✓Yes 2✓No
 - 1✓ Others (specify) _____
- P2 Has any of the following ever happened to you *at the workplace* because of your sexual orientation?
- 1✓ You were refused employment 1✓Yes 2✓No
 - 1✓ You were denied a promotion 1✓Yes 2✓No
 - 1✓ You lost a job, or were dismissed or laid off 1✓Yes 2✓No
 - 1✓ Others (specify) _____
- P3 Have you ever experienced any of the following *with financial and public services* because of your sexual orientation?
- 1✓ You were denied a bank loan 1✓Yes 2✓No
 - 1✓ You were refused Service 1✓Yes 2✓No
 - 1✓ You received sub-standard service 1✓Yes 2✓No
 - 1✓ You were denied entry into a country 1✓Yes 2✓No
 - 1✓ Others (specify) _____
- P4 Have you ever experienced any of the following *with housing* because of your sexual orientation?
- 1✓ You were refused housing 1✓Yes 2✓No
 - 1✓ You were forced out of a neighbourhood 1✓Yes 2✓No
 - 1✓ Others (specify) _____ 1✓Yes 2✓No
- P5 Have you ever experienced any of the following *with the health care services* because of your sexual orientation?
- 1✓ You were refused health care 1✓Yes 2✓No
 - 1✓ You received sub-standard health care 1✓Yes 2✓No
 - 1✓ You were treated with less courtesy or respect than others 1✓Yes 2✓No
 - 1✓ Others (specify) _____

P6 Have you ever experienced any **social hostility and victimization** (such as the following) because of your sexual orientation?

- | | | | |
|----|--|-------|------|
| 1∇ | You were hassled by the police | 1∇Yes | 2∇No |
| 1∇ | You were hit or beaten | 1∇Yes | 2∇No |
| 1∇ | You were a target of violence | 1∇Yes | 2∇No |
| 1∇ | You were insulted, threatened or ridiculed | 1∇Yes | 2∇No |
| 1∇ | Others (specify) _____ | | |

P7 Have you ever experienced any of the following with your **religion** because of your sexual orientation?

- | | | | |
|----|--|-------|------|
| 1∇ | You were excommunicated from Religious Affiliation | 1∇Yes | 2∇No |
| 1∇ | You were denied privileges | 1∇Yes | 2∇No |
| 1∇ | You were told not to tell others | 1∇Yes | 2∇No |
| 1∇ | You were a target of gossip | 1∇Yes | 2∇No |
| | Others (specify) _____ | | |

DISCLOSURE

The following questions attempt to determine the extent to which you have ‘come out’ or been open about your sexuality to others

P8 Who knows you have sex with men? If yes, did you tell the person?

- | | | | | | | |
|----|--------------------------|-------|------|-------------|-------|------|
| 1∇ | No one | 1∇Yes | 2∇No | <u>3∇DK</u> | 1∇Yes | 2∇No |
| 1∇ | Wife (married) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Girl friend(s) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Boyfriend(s) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Parent(s) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Partner’s parent(s) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Children | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Sisters/Brother(s) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Other Relative(s) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Friends/Roommate(s) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Co-worker(s) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Church/Spiritual leaders | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Church member(s) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Health Care provider(s) | 1∇Yes | 2∇No | 3∇DK | 1∇Yes | 2∇No |
| 1∇ | Other (specify) _____ | | | | | |

P9 On a scale of 1 to 5, to what extent would you say you are “out of the closet” with regards to having sex with other men? **‘Out of the closet’ means you let others know that you are sexually attracted to men.** (CDC/MMWR)

- | | |
|----|-----------------------------------|
| 1∇ | 1 (Not out to anyone) |
| 2∇ | 2 |
| 3∇ | 3 (Out to half the people I know) |

- 4√ 4
- 5√ 5 (Out to everyone)
- 77√ Don't know
- 99√ Declined

SOCIAL SUPPORT

Social support can mean many things. For the purpose of the study, by social support I mean getting advice on personal matters, talking to someone about feelings that are very personal and private or getting together with someone just to have fun and relax.

- S1 In the past 12 months, did you have anyone you could depend on when you needed help?
(Circle all that apply)
- 1√ No one
 - 2√ Yes, a friend
 - 3√ Yes, a spouse or cohabitant
 - 4√ Yes, a parent or other family member
 - 5√ Yes, a colleague at work
 - 6√ Yes, others (please specify) _____
- S2 What kind of help did you seek? _____
- S3 Were you satisfied with this help? 1√ Yes 2√ No
- S4 In the past 12 months, did you have anyone you could really count on to help you feel relaxed when you were under pressure?
- 1√ No one
 - 2√ Yes, a friend
 - 3√ Yes, a spouse or cohabitant
 - 4√ Yes, a parent or other family member
 - 5√ Yes, a colleague at work
 - 6√ Yes, others (please specify) _____
- S5 Were you satisfied with the support you received? 1√ Yes 2√ No
- S6 In the past 12 months, did you have anyone who accepted you totally, for who you really are?
- 1√ No one
 - 2√ Yes, a friend
 - 3√ Yes, a spouse or cohabitant
 - 4√ Yes, a parent or other family member
 - 5√ Yes, a colleague at work
 - 6√ Yes, others (please specify) _____

- S7 Were you satisfied with the support you received? 1✓ Yes 2✓ No
- S8 In the past 12 months, did you have anyone you could count on to care about you, regardless of what was happening to you?
- 1✓ No one
 - 2✓ Yes, a friend
 - 3✓ Yes, a spouse or cohabitant
 - 4✓ Yes, a parent or other family member
 - 5✓ Yes, a colleague at work
 - 6✓ Yes, others (please specify) _____
- S9 Were you satisfied with this support? 1✓ Yes 2✓ No
- S10 In the past 12 months, did you have anyone you could count on to discuss issues about your sexual relationships?
- 1✓ No one
 - 2✓ Yes, a friend
 - 3✓ Yes, a spouse or cohabitant
 - 4✓ Yes, a parent or other family member
 - 5✓ Yes, a colleague at work
 - 6✓ Yes, others (please specify) _____
- S11 Were you satisfied with this support? 1✓ Yes 2✓ No
- S12 In the past 12 months, did you have anyone you could count on to console you when you were very upset?
- 1✓ No one
 - 2✓ Yes, a friend
 - 3✓ Yes, a spouse or cohabitant
 - 4✓ Yes, a parent or other family member
 - 5✓ Yes, a colleague at work
 - 6✓ Yes, others (please specify) _____
- S12 Were you satisfied with this support? 1✓ Yes 2✓ No
- S13 On the whole, do you think the social relationships you have with friends, relatives, co-workers etc have been:
- 1✓ Mostly more supportive than stressful
 - 2✓ Somewhat more supportive than stressful
 - 3✓ About equally supportive and stressful
 - 4✓ Somewhat more stressful than supportive
 - 5✓ Mostly more stressful than supportive

COMMUNITY INVOLVEMENT/PARTICIPATION

The next questions are about your contacts with the community around you, including religious, social and other organizations.

- S14 How often have you turned to religion, prayer, or spiritual support in times of personal or family difficulty or crisis? Would you say.....
- 1∇ Never
 - 2∇ In severe crisis only
 - 3∇ Some of the time
 - 4∇ Most of the time
 - 5∇ All of the time
- S15 Are you a member of any voluntary organizations or associations, such as church and school groups, labour unions, gay organizations, HIV and AIDS organizations or social, civic and fraternal clubs? 1∇ Yes 2∇ No
- S16 To what organizations or associations do you belong? (*Circle all that apply*)
- 1∇ Church/religious/spiritual groups
 - 1∇ School Groups
 - 1∇ Labour Unions
 - 1∇ Gay/bisexual organizations
 - 1∇ HIV and AIDS organizations or support groups
 - 1∇ Ethnic groups meetings
 - 1∇ Political organizations
 - 1∇ Sport/music clubs
 - 1∇ Professional organizations
 - 1∇ Others please specify) _____
- S17 Do you regularly participate in activities or attend meetings of any of these organizations or associations? 1∇ Yes 2∇ No

Show prompt card 6: 1∇ *Never* 2∇ *Once a month or less* 3∇ *Several times a month*
4∇ *About once a week* 5∇ *Several times a week or daily* 99∇ *Declined*

- S18 In the past 12 months, how often have you read or a gay oriented paper, magazine or website? _____

SELF ESTEEM

The next series of statements is about how you feel about yourself. Please indicate the extent to which you agree or disagree with each statement as it applies to you (Polaris)

Show prompt card 1: 1∇ *Disagree* 2∇ *Neutral* 3∇ *Agree* 77∇ *Don't know* 99∇ *Declined*

- S19 1∇ On the whole I am satisfied with myself _____
1∇ At times I think I am no good at all _____

- 1∇ I feel that I have a number of good qualities _____
- 1∇ I am able to do things as well as most other people _____
- 1∇ I feel that I do not have much to be proud of _____
- 1∇ I certainly feel useless at times _____
- 1∇ I feel that I am a person of worth _____
- 1∇ All in all, I am inclined to feel that I am a failure _____
- 1∇ I take positive attitude toward myself _____

S20 Serial numbers of the coupons respondent is given to recruit others:

- (i) _____
- (ii) _____
- (iii) _____

S21. Biometric Measures of identification:

- (i) Weight? _____ Kg
- (ii) Height _____ m

WILLINGNESS TO PARTICIPATE IN THE PHYSICAL MEDICAL EXAMINATION

& HIV/STI PREVALENCE COMPONENT

T1 Would you be willing to provide a finger prick blood sample as part of this study to ascertain the prevalence of HIV among men who have sex with other men?

- 1∇ Yes
- 2∇ No

This brings us to the end of the interview. Thank you very much for your time and patience and for working so hard on the questions. If you would like, I have an information pamphlet about HIV and AIDS that you can have. Also, I have a list of HIV testing locations in Lagos (Ibadan).

TICK HERE IF RESPONDENT TOOK INFORMATION

Q_1 Do you have any comments about the survey and how you felt about answering the questions? Any suggestions you provide will help us to improve future studies. **PROBE.**

INTERVIEW INFORMATION, END

Q_2. Time interview completed _____

Q_3. Interruption/breaks

1✓ Yes

2✓ No

Q_4. Total length of interview (minus interruptions):

_____ hours and _____ minutes

Q_5. Was anyone else besides the interviewer and the respondent present during the interview?

1✓ Yes if yes, indicate who? _____

2✓ No

Q_6. *Assessment of interview (Complete after interview is completed)*

1✓ Respondent understood all questions, no problem answering

2✓ Respondent had some difficulty answering questions, answers generally reliable

3✓ Respondent had difficulty answering many of the questions, data may be unreliable

4✓ Respondent was uneasy about some questions, answers are generally reliable

5✓ Respondent was resistant, some data may be unreliable

Q_7 **Interviewer's comments** on perception of how the interview went and if there were any problems or issues to be address _____

Appendix 7

Proportion of MSM Engaging in Unprotected Anal Intercourse

	Self-label			Sexual Orientation	
	Top (%)	Bottom (%)	Versatile (%)	Gay	Bisexual
URAI	2.8	65.5	73.4	43.8	34.4
UIAI with men	59.3	23.0	74.8	52.4	60.8
UIAI with women	14.5	8.4	17.1	5.2	21.3



APPENDIX 8 – ETHICS APPROVAL A

UNIVERSITY OF TORONTO

Office of the Vice-President, Research and Associate Provost
Ethics Review Office

Prof. Ted Myers
HIV Social, Behavioural & Epidemiological
Studies Unit
Public Health Sciences
155 College St.
Toronto, ON M5T 3M7

Dr. Sylvia Adebajo
HIV Social, Behavioural & Epidemiological
Studies Unit
Public Health Sciences
155 College St.
Toronto, ON M5T 3M7

PROTOCOL REFERENCE #14896 now #16969

April 10, 2006

Dear Prof. Myers and Dr. Adebajo:

Re: Your research protocol entitled “A Study of the Prevalence and Determinants of HIV/STI Infections and Sexual Risk Behaviours in Nigerian Men”

We are writing to advise you that a member of the HIV and AIDS Research Ethics Board has granted approval to an amendment (received March 6, 2006) to the above referenced research study. *This amendment involves the submission of the completed questionnaire.*

A handwritten signature in black ink, appearing to read 'Jenny Peto'.

During the course of the research, any significant deviations from the approved protocol (**that is, any deviation which would lead to an increase in risk or a decrease in benefit to participants**) and/or any unanticipated developments within the research should be brought to the attention of the Ethics Review Office.

Best wishes for the successful completion of your project.

Yours sincerely,

Jenny Peto
Ethics Review Coordinator

APPENDIX 9

College of Medicine, University of Lagos Ethics Approval



COLLEGE OF MEDICINE
UNIVERSITY OF LAGOS
P.M.B. 12003, LAGOS, NIGERIA



Provost: **STEPHEN O. ELESHA**, MB,BS (Lagos), DABPATH (USA), FACP (USA),
FWACP (Lab. Medicine), FNMCPATH.

Telephone: LAGOS 5453760-74 (15 Lines)
Fax: 234-01-5851432.

Deputy Provost: **R.O.ABIDOYE**, M.A. (Columbia), Ph.D (Howard)

College Secretary: **O.O. AMODU (MRS.)**, B.A. (Hons.) PGDPA (Ife), MINIM.
CM/COM/8/VOL.XIX

July 28, 2005

Dr. Sylvia Adebajo
Department of Community Health
College of Medicine
University of Lagos
Lagos, Nigeria

Dear Dr. Adebajo,

**RE: A STUDY OF THE PREVALENCE AND DETERMINANTS OF HIV/STIS
AND RISK BEHAVIOURS IN NIGERIAN MEN**

The Research Grants and Experimentation Ethics Committee of the College met on Thursday, July 28, 2005 and considered your application for Ethical Clearance to conduct the above titled research.

On behalf of the Committee, I will like to inform you that approval has been given for you to conduct the research titled "A Study of the Prevalence and Determinants of HIV/STIs and Risk Behaviours in Nigerian Men"

Thank you.

Yours sincerely,

Prof. R.O. Abidoye
**Chairman, Research Grants and
Experimentation Ethics Committee**

APPENDIX 10 – Same Sex Bill

A BILL FOR AN ACT TO PROHIBIT MARRIAGE OR CIVIL UNION ENTERED BETWEEN PERSONS OF SAME SEX, SOLEMNIZATION OF SAME AND FOR OTHER MATTERS RELATED THEREWITH. (HB. 197)

PROVISIONS OF THE BILL

RECOMMENDATION OF THE COMMITTEE
OF THE WHOLE

Commencement

Enacted by the National Assembly of the Federal Republic of Nigeria as follows-

Prohibition of marriage or civil union by persons of same gender

1-(1) Marriage Contract or civil union entered between persons of same Gender is hereby prohibited in Nigeria.

(2) Marriage Contracts or civil union entered between persons of same gender are invalid and shall not be recognized as entitled to the benefits of a valid marriage.

(3) Marriage Contract or civil union entered between persons of same gender by virtue a certificate issued by a foreign country shall be void in Nigeria, and any benefits accruing there from by virtue of the certificate shall not be enforced by any court of law in Nigeria.

Solemnization of same sex marriage in places of worship

2-(1) Marriage or civil union entered between persons of same Gender shall not be solemnized in any place of worship, either Church or Mosque in

or any other place in
Nigeria.

(2) No marriage certificate issued to parties of same sex marriage or civil union in Nigeria shall be valid

Recognized Marriage in Nigeria.

3. Only marriage contract between a man and a woman either under Islamic Law, Customary Law and Marriage Act is recognized as valid in Nigeria.

Registration of Homosexual Clubs and Societies

4.-(1) The Registration of gay clubs, societies and organisations, their sustenance, processions and meetings are hereby prohibited.

(2) The public show of same sex amorous relationship directly or indirectly is hereby prohibited.

Offences and penalties.

5-(1).Persons that entered into a same gender marriage or civil union contract commit an offence and are jointly liable on conviction to a term of 14 years imprisonment each.

(2). Any person who registers, operates or participates in gay clubs, societies and organisations, or directly or indirectly make a public show of same sex amorous relationship commits an offence and shall each be liable on conviction to a term of 10 years imprisonment

(3).Any persons or group of persons that witnesses, abet and aids the

advertisers

2

screens, shields

solemnization of a same sex marriage contract or civil union or supports the registration of gay clubs, societies and organisations, processions or meetings in Nigeria commits an offence and liable on conviction on conviction to a term of 10 years imprisonment

Jurisdiction.

6. The High Court of a State or of the Federal Capital Territory shall have jurisdiction to entertain matter arising from the breach of the provisions of this Bill.

Interpretation

7. In this Bill, unless the context otherwise requires –

“Marriage” here relates to a legal union entered between persons of opposite sex in accordance with the Marriage Act, Islamic and Customary Law.

“Court” means High Court of a State or of the Federal Capital Territory.

“Same Sex Marriage” means the coming together of persons of the same sex with the purpose of living together as husband and wife or for other purposes of same sexual relationship.

“Witness” means those who sign, witness to the solemnisation of the marriage.

“Civil Union” means any arrangement between persons of the same sex to live together as sex partners, and shall include such descriptions as adult independent relationships, caring partnership, civil solidarity pacts,

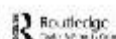
- domestic partnerships, reciprocal beneficiary relationships, registered partnership, significant relationship, stable unions, etc.

Citation

8. This Bill may be cited as Same Sex Marriage (Prohibition) Bill, 2013

APPENDIX 11 – Published Papers

Culture, Health & Sexuality, March–April 2007; 9(2): 153–168



Challenges for the sexual health and social acceptance of men who have sex with men in Nigeria

DAN ALLMAN¹, SYLVIA ADEBAJO¹, TED MYERS¹,
OLUDARE ODUMUYE² & SADE OGUNSOLA³

¹*HIV Social, Behavioural and Epidemiological Studies Unit, Department of Public Health Sciences, University of Toronto, Canada,* ²*Alliance Rights Nigeria, Lagos, Nigeria,* and ³*Department of Microbiology, College of Medicine, University of Lagos, Nigeria*

Abstract

Little research exists regarding men who have sex with men and sexual risk in Nigeria. Prior to the implementation of a targeted HIV/STI prevalence study, structured focus groups incorporating anonymous questionnaires were conducted with members of this population in secure locations in Nigeria. A purposive sample of men was recruited by word-of-mouth. Five focus groups were conducted with a total of 58 men. Mean age was 27 years (range 16–58); 60% had post-secondary education; 56% were employed full or part-time; 83% were Christian; 16% were Muslim; 66% self-identified as bisexual; 31% as homosexual. Participants' experiences were diverse, with ethnic, religious and class distinctions strongly structuring sexual expression. Same-sex community networks were hidden, with social activities taking place in non-commercial, private venues. Socially ostracized by culture, religion, and political will, the risks embodied within same-sex activity are high. For Nigeria — a nation culturally rich and religiously devout — the implications for public health policy are complex. However, these research findings suggest that immediate action is vital to mitigate the impacts of HIV and other STIs.

Résumé

Peu de recherches ont été menées sur les hommes qui ont des rapports sexuels avec des hommes et sur les risques liés à leurs pratiques au Nigeria. Préalablement à la réalisation d'une étude ciblée de prévalence du VIH et des IST, des groupes cibles structurés, incorporant des questionnaires anonymes, ont été menés avec des personnes issues de cette population dans des lieux sûrs au Nigeria. Un échantillon choisi à dessein a été constitué grâce au bouche à oreille. Cinq sessions d'entretiens en groupe ont été menées avec un total de 58 hommes. L'âge moyen des participants était de 27 ans (16 – 58) ; 60 % d'entre eux avaient un niveau d'éducation post-secondaire ; 56 % avaient un emploi à temps plein ou partiel ; 83 % étaient chrétiens ; 16 % étaient musulmans ; 66 % s'identifiaient comme bisexuels ; 31 % comme homosexuels. Les expériences des participants se sont révélées diverses, avec une expression sexuelle fortement structurée par des distinctions ethniques, religieuses et relatives aux classes sociales. Les réseaux communautaires de personnes ayant des rapports sexuels avec des personnes de même sexe sont cachés, et les activités sociales ont lieu dans des lieux privés, non commerciaux. Socialement stigmatisés par la culture, la religion et la détermination politique, les risques inhérents aux activités sexuelles entre personnes du même sexe sont élevés. Pour le Nigeria — une nation culturellement riche et religieuse — les implications de ces résultats pour les politiques de

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Link to full article: <..\..\..\MHN\Personal\Sylvia's Publications\Sylvia's Scanned Published Papers\NMS Paper.pdf>

ORIGINAL RESEARCH ARTICLE

Prevalence of Internalized Homophobia and HIV Associated Risks among Men who have Sex with Men in Nigeria

Sylvia B Adebajo^{*1,2}, George I. Eluwa¹, Dan Allman², Ted Myers², Babatunde A. Ahoon¹

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Abstract

This study assessed the level of internalized homophobia and associated factors among men who have sex with men (MSM) in Nigeria. Using respondent driven sampling, MSM were recruited in Lagos and Ibadan between July and September, 2006. Internalized homophobia was assessed as a negative composite score using an 11-item scale. A total of 1,125 MSM were interviewed. About 44.4% self-identified as homosexual or gay while 55% regarded themselves as bisexual. About a third of the respondents 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]. As internalized homophobia impedes acceptance of HIV prevention programming, identifying MSM who experience internalized homophobia is integral to the success of HIV prevention programming in Nigeria (*Afr J Reprod Health* 2012; 16(4): 21-28).

Résumé

Cette étude a évalué le niveau de l'homophobie intériorisée et les facteurs qui y sont liés chez les hommes qui ont des rapports sexuels avec des hommes (HSH) au Nigeria. A l'aide d'un échantillonnage basé sur les interviews, les HSH ont été recrutés à Lagos et à Ibadan entre les mois de juillet et septembre, 2006. L'homophobie intériorisée a été évaluée par un indice négatif composite en utilisant une échelle de 11 items. Au total, 1.125 HSH ont été interviewés. À peu près 44,4% se sont identifiés comme des homosexuels tandis que 55% se considéraient comme des bisexuels. Environ un tiers des interviewés ont signalé l'homophobie intériorisée. En se servant des hommes homosexuels comme référence, les interviewés qui se sont identifiés comme bisexuels avaient deux fois plus la possibilité [AOR 2,1; IC 95: 1,6 - 2,9, p <0,001] de signaler l'homophobie intériorisée. Ceux qui étaient séropositifs avaient également deux fois plus la possibilité de signaler l'homophobie intériorisée par rapport à ceux qui étaient séronégatifs [AOR: 1,8; IC à 95%; 1,2 - 2,7, p = 0,004]. Étant donné que l'homophobie intériorisée empêche l'acceptation de la prévention de la programmation du VIH, l'identification des HSH qui éprouvent l'homophobie intériorisée fait partie intégrante de la réussite de la prévention de la programmation du VIH au Nigeria (*Afr J Reprod Health* 2012; 16(4): 21-28).

Keywords: Men who have sex with men, Internalized homophobia, Nigeria, Bisexuality, Gay

Introduction

Nigeria with an estimated population of over 167 million people in 2011¹ has the second highest burden of HIV and AIDS in sub-Saharan Africa. Current estimates suggest approximately 3 million Nigerians are living with HIV². The modes of HIV transmission study undertaken in Nigeria attributed 23% of new infections to three most-at-risk populations (comprising men who have sex with men (MSM), injecting drug users (IDUs) and

female sex workers (FSWs), with MSM alone contributing about 10%³.

HIV prevalence among MSM is the second highest in Nigeria⁽⁴⁾ after female sex workers, yet funding and policies for HIV prevention interventions, care and treatment are severely inadequate in quantity and quality. Without adequate and appropriate interventions, MSM will continue to be at risk for HIV transmission and infection. MSM in Nigeria continue to experience extremely high levels of stigma, discrimination and criminalization which result in them becoming

African Journal of Reproductive Health December 2012; 16(4): 21

Link to full article: http://www.mhn.org/Manuscripts/Internalized_Homophobia/2012_Dec_Edition_Vol_16_4_article_3.pdf

HIV and sexually transmitted infections among men who have sex with men (MSM) in Nigeria

S. Adebajo¹, T. Myers¹, D. Allman¹, R. Remis¹, L. Calzavara¹, S. Ogunsola², O. Odumuye³, P. Sandstrom⁴, M. Wawer⁵, R. Gray⁶, Men's Study Nigeria

Background: The epidemiology of HIV/STIs among MSM remains understudied in much of sub-Saharan Africa. This report presents the results of the first sero-epidemiological study of MSM in Nigeria and factors associated with HIV, syphilis and hepatitis B/C prevalence.

Methods: Men who self-identified as MSM were recruited from two metropolitan cities in South West Nigeria using Respondent Driven Sampling. Data were collected using interviewer-administered standardized questionnaires. For men who consented, venous blood was collected and tested for HIV, syphilis, hepatitis B and C.

Results: 1125 MSM were recruited between April and July 2006. The median age of first sex with a woman was 16.7±3.5yrs and 17.7±3.9yrs with a man. Prevalence of HIV was 13.4%, and the prevalence of syphilis, hepatitis B and hepatitis C were 0.3%, 11.7% and 3.2% respectively. HIV positive men were significantly older (27.4±5.31) than uninfected MSM (22.9±4.2) (p<0.0001). HIV prevalence was associated with having higher education (OR 1.74 [CI 95% 1.22-2.49]; being employed (OR 3.13 [CI 95% 2.16-4.53]; being non-Nigerian (OR 3.80 [CI 95% 1.09-13.1]; being married (OR 4.46 [CI 95% 2.04-9.72]; having sexual relationships with MSM outside the tribe (OR 1.74 [CI 95% 1.22-2.49]; and having sex with uncircumcised men (OR 1.74 [CI 95% 1.22-2.49]. Only 6.2% were aware of their HIV positive status prior to our study. Most respondents (72.4%) reported vaginal or anal sex with women in their lifetime and 50% in the previous 12 months. Condom use was low both with men and their female partners.

Conclusions: This study confirms high levels of HIV and other STIs among MSM in Nigeria. The prevalence of HIV among study participants was 3.5 times higher than the reported national prevalence in Nigeria. HIV Preventive intervention programs targeting this population are urgently needed given the high vulnerability and the high proportion who engage in unprotected sex with both men and women.

*AIDS 2008 - XVII International AIDS Conference
Abstract no. MOPE0411*

Suggested Citation

"S.Adebajo, et al. HIV and sexually transmitted infections among men who have sex with men (MSM) in Nigeria. : AIDS 2008 - XVII International AIDS Conference: Abstract no. MOPE0411"

O045

RECRUITMENT OF MSM INTO AN HIV/STI SEXUAL AND BEHAVIORAL STUDY IN NIGERIA: A SUCCESS STORY

SB Adebajo¹, T Myers¹, D Allman¹, R Remis¹, S Ogunsola², L Calzavara¹, M Nwafor¹, D Odumuye (Deceased)³
1Toronto, ON; 2Lagos, Nigeria; 3Ibadan, Nigeria

Objectives: The epidemiology of HIV/STIs in MSM remains understudied across much of sub-Saharan Africa (SSA) despite considerable evidence of a long-standing history in Africa. In Nigeria, where male same-sex sexual behavior is criminalized, the lives of MSM are characterized by denial, secrecy, violence, stigmatization and marginalization. With regards to research MSM are an invisible and hard-to-access population. This paper presents preliminary results comparing the sociodemographic characteristics of MSM in Nigeria recruited by multiple recruitment sampling strategies.

Methods: Socio-demographic, sexual, lifestyle, other contextual characteristics were elicited using interviewer-administered questionnaires. Also, consenting respondents were tested for HIV/STI and their health status was assessed.

Results: Almost three quarters of the men (73.3%; n=825) were recruited through RDS respondent driven sampling (RDS) and others (26.7%; n=300) via out-reaches, word-of-mouth and mobilization parties. MSM recruited by RDS were significantly younger, more likely to be single, less educated and from relatively lower socio-economic status than men recruited by other methods ($p < 0.0001$). They were also less likely to interact with MSM who were non-Nigerians. Numbers of male and female sex partners were similar irrespective of the recruitment method ($p > 0.05$). Although men recruited by RDS were significantly less likely to report always using condoms with their male partners ($p < 0.001$), there was no significant difference in condom use of condoms with their female partners ($p > 0.05$). Similarly, there were no significant differences in the proportions of MSM who experienced stress, hostility, stigma and disclosure of sexual identity ($p > 0.05$).

Conclusion: The use of multiple sampling techniques has enabled the successful recruitment of the largest epidemiological study of 1125 MSM in SSA. Different recruitment methods were required to recruit a broader spectrum of men. Despite differences in some characteristics, MSM recruited shared many similarities. This study serves as a catalyst to encourage more work on MSM in Nigeria and other countries in SSA.

Adebajo SB, Myers, T., Allman, D., Remis, R., Ogunsola, F. T., Calzavara, L., Nwafor, M., Odumuye, O.O., . Recruitment of MSM into an HIV/STI Sexual and Behavioural Study: A Success Story. ; 2008; Montreal, Canada.

Sexual health, HIV testing and health seeking behaviour of men who have sex with men (MSM) in Nigeria

S. Adebajo¹, T. Myers², D. Allman², R. Remis², L. Calzavara², S. Ogunsola³, O. Odumuye⁴, P. Sandstrom⁵, M. Wawer⁶, R. Gray⁷

Background: While Nigeria has private and public health services available, little is known about access, health care needs and the sexual health status of MSM. We present results of a study of the sexual health status and use of health care services for HIV testing and treatment of MSM in Nigeria.

Methods: Between April and July 2006, a survey including an interviewer-administered questionnaire, physical examination and HIV/STI testing were carried out among self-identified MSM. Men were recruited through Respondent Driven Sampling from two cities in South West Nigeria. Participation and testing were voluntary and anonymous.

Results: 1125 MSM were recruited. Only 25.4% of the study population had been previously tested for HIV. Although most (96.4%) provided blood samples for this study, only (10.3%) returned for their test results. Of 145 (13.4%) who tested HIV positive, only 9 (6.2%) knew they were infected. Ninety-six (8.5%) reported either anal or genital discharge in the previous 12 months, of which only 18.8% sought treatment from an accredited health care facility. Only 84 (7.5%) had ever disclosed their sexual identity to their health care providers. Among the 695 who consented to a physical examination, the prevalence of genital discharge, ulcer and warts was 1.9%, 3.7% and 1.9% respectively. The reasons given for low health care use included high costs (77.6%), homophobic attitudes of health care providers (17.0%), and fear of being 'outed' (6.1%).

Conclusions: MSM in our study were highly vulnerable to HIV and STIs yet, their health seeking behaviors were poor. There are few opportunities for MSM to access preventive programmes. It is a matter of urgency to recognize the sexual and health risks confronting MSM in Nigeria and the substantial benefits cost-effective targeted intervention programmes could deliver. To reduce the spread of HIV/STI, health care services need to address treatment costs and homophobia.

*AIDS 2008 - XVII International AIDS Conference
Abstract no. MOPE0643*

Suggested Citation

"S.Adebajo, et al. Sexual health, HIV testing and health seeking behaviour of men who have sex with men (MSM) in Nigeria. : AIDS 2008 - XVII International AIDS Conference: Abstract no. MOPE0643"

At the end of the day: findings from a multidisciplinary study of men who have sex with men (MSM) in Nigeria - phase I

D. Allman¹, S. Adebajo¹, T. Myers¹, O. Odumuye², S. Ogunisola³, S. Akanmu⁴, R.S. Remis¹, M. Wawer⁵, R. Gray⁶, P. Sandstrom⁷, J. Payne⁸

Background: Little research exists regarding MSM and sexual risk in Nigeria. Prior to the rollout of a targeted HIV/STI prevalence study, in-depth focus groups were conducted with this population.

Methods: Structured focus groups incorporating anonymous questionnaires were conducted in secure locations in Nigeria. Male participants were recruited by word-of-mouth. Quantitative data were analyzed with SPSS. Qualitative analysis located thematic dimensions within focus group transcriptions, which pertained to knowledge, attitudes, sexual activity, health care including HIV testing, and social, cultural and religious norms.

Results: Five focus groups were conducted with a total of 58 men. Mean age was 27 years (range 16 - 58); 60% had post-secondary education; 56% were employed full or part-time; 48% were students; 83% were Christian; 16% were Muslim; 66% self-identified as bisexual; 31% as homosexual; 95% reported sex with a man in the previous 6 months, and of these, 44% reported sex with women in the same time frame. The participants' experiences were diverse, with ethnic, religious and class distinctions strongly structuring sexual expression. MSM community networks were hidden, with social activities taking place in non-commercial, private venues. Understandings of HIV, safer sex practices and related issues were low and frequently misguided. Access to HIV testing was seldom available and treatment for those infected with HIV was wholly inaccessible.

Conclusions: The realities with regards to HIV risk for MSM and inevitably their sexual partners in Nigeria are critical. Socially ostracized by culture, religion, and political will, the risks embodied within same-sex activity are high. While levels of education and employment were notable, access to HIV-specific resources for prevention and care were virtually nonexistent. The implications for public health policy within a nation which is culturally rich and religiously devout are complex, yet these research findings suggest that immediate action is vital to mitigate the impacts of HIV and AIDS.

*AIDS 2006 - XVI International AIDS Conference
Abstract no. WEPE0644*

Suggested Citation

"D.Allman, et al. At the end of the day: findings from a multidisciplinary study of men who have sex with men (MSM) in Nigeria - phase I. : AIDS 2006 - XVI International AIDS Conference: Abstract no. WEPE0644"

Appendix 12. HIV Prevalence among MSM in Africa 2002 and 2011



Modified from von Gienewitz, Sorel, et al. The Global Epidemic of HIV Infection among Men who have Sex with Men. *Current Opinion on HIV/AIDS*, 2009