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**REGIONAL PATTERNS AND CORRELATES OF GENDER DIFFERENCES IN
HIV RISK BEHAVIOUR AMONG NIGERIAN ADOLESCENTS AND YOUNG
ADULTS**

RESEARCH REPORT

BY

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ABSTRACT

Context: Heterosexual transmission has been found to be the major route of HIV infection in Nigeria. Thus prevention of HIV infection by reducing risky behaviors has been identified as a public health priority. This study examines regional pattern and correlates of gender differences in HIV risk behaviors among Nigerian youths aged 15-24 years. As different geo-political regions have specific gender ideologies and practices, there is need to find out if gender differences in Nigeria regions drive HIV risk behaviors among youths.

Method: Data from the 2003 Nigeria Demographic and Health Survey were analyzed for never married, sexually experienced 342 males and 630 females. Multiple sex partnerships and pattern of condom use were the HIV risk behaviors examined. Respondents were asked the number of sexual partners in the last 12 months while pattern of condom use is a composite variable of four items in the 2003 NDHS. Univariate, bivariate, and multivariate analyses were done using STATA 9.5E. Binary and multinomial logistic models were used for multivariate analyses.

Results: The study shows that there is high level of risk behaviours in the population. This cuts across gender and regions. For instance, 54% of males and 69% of females engage in inconsistent condom use and 30% of males and 9% of females in multiple sex partnership. This pattern is consistent across the regions.

It is also shown that while correlates of HIV risk behaviours vary by gender, its regional variation by gender is inconsistent. The study highlights inconsistent gender differentiation by regions. Further investigation is necessary to explain this observation.

DECLARATION

I, Nkechi Obisie-Nmehielle declare that this research report is my original work. It is being submitted to the Faculty of Humanities and Social Sciences, University of the Witwatersrand, Johannesburg in partial fulfillment of the requirement for the Degree of Masters in Arts in the field of Demography and Population Studies. It has not been submitted either in part or in full for any Degree or examination at this or any other University.

----- Day of ----- 2007.

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TABLE OF CONTENTS

| | |
|--|-------------|
| ABSTRACT | II |
| DECLARATION..... | II |
| ACKNOWLEDGEMENT..... | IV |
| TABLE OF CONTENTS | V |
| LIST OF FIGURES | VIII |
| LIST OF TABLES..... | IX |
| LIST OF APPENDICES..... | X |
| LIST OF ABBREVIATIONS | XI |
| CHAPTER 1 | 1 |
| INTRODUCTION | 1 |
| 1.1 Background of the Study | 1 |
| 1.2 Statement of the Problem | 2 |
| 1.3 Research Questions | 3 |
| 1.4 Objectives of the Study | 4 |
| 1.5 Justification of Study..... | 4 |
| 1.6 Organization of the Study..... | 5 |
| CHAPTER 2 | 6 |
| LITERATURE REVIEW AND THEORETICAL FRAMEWORK..... | 6 |
| 2.1 Introduction | 6 |
| 2.2 Previous Studies on Sexual and HIV Risk Behavior among Nigerian Youths | 6 |
| 2.3 Identified Gap..... | 9 |
| 2.4 Theoretical and Conceptual Framework..... | 10 |

| | |
|--|-----------|
| 2.5 Explanation of the Conceptual Framework | 12 |
| 2.6 Hypotheses..... | 16 |
| CHAPTER 3 | 17 |
| METHODOLOGY | 17 |
| 3.1 Introduction | 17 |
| 3.2 Sources of Data..... | 17 |
| 3.2.1 Study Design | 17 |
| 3.2.6 Study Population | 19 |
| 3.2.7 Sample Size | 19 |
| 3.2.8 Variable Definition and Measurement..... | 20 |
| 3.3 Data Analysis | 25 |
| CHAPTER 4 | 28 |
| DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS OF RESPONDENTS..... | 28 |
| 4.1 Introduction | 28 |
| 4.2 Univariate Analysis | 28 |
| 4.3 Bivariate Analysis..... | 31 |
| CHAPTER 5 | 39 |
| CORRELATES OF HIV RISK BEHAVIOR AND CONDOM USE..... | 39 |
| 5.1 Introduction | 39 |
| 5.2 Correlates of HIV Risk Behaviour and Condom Use..... | 40 |
| 5.3 Correlates of Condom Use..... | 44 |
| 5.4 Summary | 50 |
| CHAPTER 6 | 51 |
| DISCUSSION, CONCLUSSION AND RECOMMENDATIONS | 51 |

| | |
|--|-----------|
| 6.1 Introduction | 51 |
| 6.2 Summary of Major Findings/Discussion | 51 |
| 6.3 Conclusion | 57 |
| 6.4 Recommendations..... | 58 |
| REFERENCES | 61 |
| APPENDICES..... | 64 |

LIST OF FIGURES

| | |
|--|----|
| Fig 1: Conceptual Framework of Regional Patterns and Correlates of Gender Differences in HIV Risk Behavior among Nigerian Young People | 15 |
|--|----|

LIST OF TABLES

| | |
|---|----|
| Table 3.1 Categories and codes of variables | 21 |
| Table 4.1 Distribution of Never Married, Sexually Experienced Nigerian Youths, by Selected Characteristics..... | 28 |
| Table 4.2 Never Married, Sexually Experienced Nigerian Youths Reporting Multiple Sexual Partnerships by selected socioeconomic and HIV-related variables | 31 |
| Table 4.3: Male and Female Nigerian Youths who Reported Low and Never use of condom by Selected Socio-demographic and HIV-Related variables | 35 |
| Table 4.4 Multiple sexual Partnerships and Pattern of Condom use Among Sexually Experienced Nigerian Youths | 38 |
| Table 5.1 Adjusted Odds Ratio (and 95%) Confidence Interval from binary logistic regression analyses assessing predictors of multiple sex partnerships by never married, sexually experienced Northern Nigerian Youths..... | 41 |
| Table 5.2 Adjusted Odds Ratio (and 95%) Confidence Interval from binary logistic regression analyses assessing predictors of multiple sex partnerships by never married, sexually experienced Southern Nigerian Youths..... | 42 |
| Table 5.3 Adjusted Odds Ratio (and 95%) confidence interval from binary logistic regression analyses assessing predictors of multiple sex partnerships by never married, sexually experienced Nigerian Youths..... | 43 |
| Table 5.4: Multinomial logistic model (odds Ratios and 95% confidence Interval) predicting Pattern of condom use by never married, sexually experienced Northern Nigerian youths | 45 |
| Table 5.5: Multinomial logistic model (odds Ratios and 95% confidence Interval) predicting Pattern of condom use by never married, sexually experienced Southern Nigerian youths | 47 |
| Table 5.6: Multinomial logistic model (odds Ratios and 95% confidence Interval) predicting Pattern of condom use by never married, sexually experienced Nigerian youths | 49 |

LIST OF APPENDICES

Appendix 1: Binary logistic regression: Model 1

Appendix 2: Binary logistic regression: Model 2

Appendix 3: Stepwise logistic regression: Model 3

Appendix 4: Multinomial logistic regression: Model 1

Appendix 5: Multinomial regression: Model 2

Appendix 6: Multinomial regression: Model 3

LIST OF ABBREVIATIONS

| | |
|------|--|
| AIDS | Acquired Immune Deficiency Syndrome |
| CI | Confidence Interval |
| DHS | Demographic and Health Survey |
| NDHS | Nigerian Demographic and Health Survey |
| HIV | Human Immunodeficiency Virus |
| WHO | World Health Organization |
| OR | Odds ratio |
| RC | Reference Category |
| STIs | Sexually Transmitted Infections |

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Adolescence is the period of physical and psychological development from the onset of puberty to maturity. The World Health Organization (WHO) defines people in the period of life between 10-19 years as adolescents, and those between 15-24 years are called youths. Since the issue of adolescent sexuality attracted the first international attention at the Bucharest Conference on Population in 1974, there has been considerable concern in many countries about the sexual and reproductive health of adolescents and young people. This is partly due to their increased vulnerability to the risk of sexually transmitted infections (STIs) including human immunodeficiency virus/ acquired immune deficiency syndrome (HIV/AIDS) and the negative consequences of early and non-marital childbearing (UNAIDS, 1998; WHO, 1995; Rivers and Aggleton, 1999; Odimegwu et al, 2002).

Adolescents aged 15-19 years and young adults aged 20-24 years account for 19% of the total population in Nigeria (NDHS, 2003). The adult HIV/AIDS prevalence rate was 5.0% in 2003 (UNAIDS, 2003) and 3.9% in 2005 (UNAIDS, 2006). The national HIV prevalence from the 2003 Sentinel survey was highest in the age group 20-24 years (5.6%). In 2005, the median HIV prevalence for young men and young women aged 15-24 years were 2.7 and 0.9 respectively (UNAIDS/WHO, 2006), using data from national population-based surveys. The observed decrease in prevalence is due to improvement in surveillance, mostly as the rural areas which are known to have lower HIV prevalence were included in the survey. This resulted in lower estimates of overall HIV prevalence for the country (UNAIDS, 2006).

Existing studies on adolescent sexuality have focused on the role of gender in the explanation of sexual behavior. Izugbara (2004) sees “the agenda of cultural socialization to be that of locating men and women in specific places in heterosexuality and endorsing

the belief that the natural order of things is for men to control women”. Sexual behavior is influenced by cultural socialization. Young girls are socialized to be silent or ignorant about sexuality while boys are socialized from adolescence to be sexually experienced and risk-taking. These cultural socializations place young people at risk of HIV infection, as boys who may be poorly informed about sexuality are unable to seek information because sexual ignorance is not acceptable. Girls on the other hand are also unable to seek information or negotiate sex, as it is socially unacceptable for them to speak openly or be knowledgeable about sex.

Gender-based norms, sexual and cultural norms all increase the vulnerability of young people to HIV infection. The socialization of Nigerian adolescents and young adults does not provide sufficient skills to enable them deal with their sexuality, thereby exposing them to unsafe sexual and HIV risk behaviors and the associated health consequences. Adolescents also tend to downplay or underestimate their risks of HIV infection. Carefree attitudes about risky sexual behaviors, as well as insufficient or lack of information about the consequences of the risks, make many youths less likely to avoid risky sexual behaviors.

1.2 Statement of the Problem

The adult HIV prevalence rate in Nigeria increased from 1.8% in 1991 to 5.8% in 2001(UNAIDS, 2002), 5.0% in 2003 (FMOH, 2004) and then decreased to 3.9% in 2005 (UNAIDS, 2006). This infection rate is a cause for concern when considered in the context of Nigeria’s relatively large population in relation to the population of adolescents and young adults. Young people aged between 20-24 years account for 5.6 % of new infections in 2003. In the same vein, adolescents and young people constitute a total of 42% maternal births in 2003; 39.5% of adolescents aged 19 years had begun childbearing in 2003 (NDHS, 2003).

The period of adolescence is characterized by frequent changes in sexual partners along with lack of concern and feeling of invulnerability, which combine to expose adolescents to the risk of HIV infection and other STIs. The early age of sexual debut, multiple sexual

partners, age of sexual partner as well as condom use during sexual intercourse are risk behaviors that predispose young people to HIV infection. Young men (7.9%) and young women (20.3%) of 15-24 years had sex before 15 years of age in Nigeria (UNAIDS, 2006). Nigeria, being a patriarchal society, young men are socialized to dominate decision-makings including sexual and reproductive health; dominant ideologies encourage young men to seek sexual experience with a variety of sexual partners. Girls on the other hand are socialized to be ignorant and/or quiet about sexuality, be a virgin till marriage, be silent about sex matters and be submissive to the man. These different socializations make the youths not to seek information, as young men do not want to be associated with ignorance, and young women do not want to be seen as “loose” or “wayward”. How these cultural ideologies and practice impact on the sexuality of Nigerian youths aged 15-24 years need to be examined.

In this study, it is important to emphasize regional differences, as different regions have different ethnic groups and cultures. The pertinent question is: With different geopolitical regions with specific gender ideologies and practices, do gender differences drive HIV risk behaviors in the various Nigerian regions? A study of regional variation in HIV risk behavior will therefore reveal some of the HIV risk behaviors characteristic to young people in a particular region.

Studying the age group 15-24 years is important because of their proportion in the total population. Turning the tide against the spread of HIV infection in Nigeria depends on this population.

1.3 Research Questions

1. Do gender differences in Nigerian regions drive HIV risk behavior among Nigerian youths aged 15-24 years?
2. What are the correlates of gender differences and HIV risk behaviors among Nigerian adolescents and young adults?

1.4 Objectives of the Study

General Objective

To examine regional patterns and correlates of gender differences in HIV risk behaviors among youths aged 15-24.

Specific Objectives

1. To determine the level and patterns of HIV risk behaviours among Nigerian male and female youths aged 15-24.
2. To examine gender differences in HIV risk behavior among Nigerian adolescents and young adults.
3. To investigate the correlates of gender differences in HIV risk behavior across the regions.

1.5 Justification of Study

A study of HIV risk behavior in Nigerian adolescents and young adults is very important for the following reasons. Firstly, the size of the population of adolescents and young adults (15-24 years) and secondly, the prevalence of HIV infection among Nigerian youths and thirdly, preventing HIV infection by reducing risky sexual behavior has been identified as a public health priority (Society for Family Health, 2002).

Sexual and HIV risk-related behaviors have been documented by studies in Nigeria, including unprotected sex with multiple partners [Araoye and Adegoke (1996)]; Owolabi et al (2005); Asuquo et al (2005); Olley and Rotimi (2003)]. When it is considered that 62.6% of the Nigerian population is less than 25 years of age (NDHS 2003); 1.3-4.4% of females and 0.9-1.5% of males between the ages 15-24 years are infected with HIV in relation to the total number of the entire population at risk of this infection, one recognizes that HIV/AIDS represents a devastating pandemic among Nigerian youths. These reasons point to the need for research on HIV risk behavior of adolescents aged 15-19 years and young adults aged 20-24 years. Knowledge gained from this research will help in identifying and planning

appropriate age specific and gender-specific interventions to prevent HIV/AIDS risk behavior among young Nigerians.

A study of regional patterns of gender differences in HIV risk behavior among youths (15-24 years) has become very crucial in identifying region-specific drivers of the infection. This study attempts at explanation of regional patterns and correlates of HIV risk behaviors in Nigeria, which will guide in planning region-specific interventions as well as gender-specific interventions for the prevention of HIV risk behaviors. Moreover, behavioral HIV/AIDS prevention measures may be more successful among a young population, as opposed to adults who already have rooted sexual behavior that is difficult to change.

1.6 Organization of the Study

This study is made up of five main chapters: Introduction, Literature review and conceptual framework, Methodology, Results, Discussion and Conclusion. These sections are distributed into six chapters. Chapter one contains the Introduction, statement of the problem, research objectives, justification of the study and area of study.

Chapter two contains literature review, theoretical and conceptual framework, and research hypotheses. Chapter three is the section on research methodology, and contains study design, study population, sample size. It also contains variable definition and measurement as well as data analyses and study limitations. Chapter four consists of the univariate and bivariate analyses, while chapter five has the multivariate analyses. In chapter six, results are discussed, conclusions are drawn and necessary recommendations are made based on policy implications of the study.

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

HIV risk behaviors can be defined as behaviors that “create, enhance and perpetuate” the probability that a person may acquire HIV infection either by having unprotected sex or multiple sex partnerships (WHO, 2002). Several studies showed history of sexual risk behavior among Nigerian youths.

2.2 Previous Studies on Sexual and HIV Risk Behavior among Nigerian Youths

2.2.1 HIV Risk Behavior among Nigerian Youths

Makinwa-Adebusoye (1992) studied sexual behavior of young urban Nigerians. The study found 41% of urban youths aged 12-24 to be sexually experienced. Of these sexually experienced young people, more males (58%) than females (32%) reported having had more than one sexual partner. The study also showed that 8% and 7% of sexually experienced females and males respectively initiated sex before 15 years of age. Ladipo (2004) studied adolescents aged 15-19 years and found that gender differences exist in sexual behavior, and boys were five times more likely to have concurrent sexual partners than girls. Owolabi et al (2005) studied adolescents aged 10-19 years in Ilesa, Nigeria. The study found the median age of sexual debut to be 12 years, 16.3% of females and 33% of males reported having had two or more partners two months preceding the survey, and 50% reported condom use at last sex.

These studies show that Nigerian youths engage in sexual and HIV risk behaviors by initiating sex at an early age, having multiple sex partners and inconsistent or lack of condom use. Sunmola et al, 2003 studied sexual behavior among adolescents aged 11-25 years in Niger state. The study found 54% of the sexually experienced adolescents had more than one sexual partner; females had earlier age at sexual debut than males. Among the sexually active males, the age of first sexual intercourse was between 14 and 20 years, while among the sexually active females, the age at first sexual intercourse was

between 11 and 13 years. The implication of early sexual debut is that many young Nigerians commence sexual activity when they have inadequate information about the consequences of their actions, thereby increasing their risk of contacting HIV/AIDS, STIs as well as unwanted pregnancies.

Iwuagwu et al (2000) studied sexual behavior and negotiation of the use of male condom by female students of a Nigerian University. The study found a significant association between condom negotiation and number of sexual partners; students with more lifetime partners negotiated for condom use. The study concluded that only a few students used condom consistently. Adedimeji et al (2005) studied young people aged 15-24 years in urban slum residence of Ibadan, Nigeria, found risky behaviors to be common. All the respondents had engaged in unprotected sex three months preceding the survey and some engaged in transactional sex. Similarly, 48% of males and 12% of females reported multiple sex partnerships three months before the survey.

2.2.2 Correlates of Sexual Behavior among Nigerian Youths

Several studies have examined the effect of socio-economic status on sexual/HIV risk behavior among youths. Isiugo-Abanihe and Oyediran (2001) found that adolescents and young people who had access to media information and from high socio-economic status homes were more sexually active than their counterparts who did not have access to media information or those from low socio-economic homes. On the other hand, Adedimeji et al (2005) showed poverty as a constraint to protective behavior for young urban slum dwellers in Nigeria. He argued that: “economic deprivation considerably affects ability to negotiate or adopt protective behavior, especially among young women whose partners are usually older, richer and more powerful for fear of losing the economic benefits; and among young men who engage in transactional sex with older women”. Some studies have shown high socioeconomic status to predict increased HIV risk behaviors among men. In Nigeria, Mitsunaga et al (2005) found the risk of extramarital sex was greater the wealthier the respondent was. This study showed the effect of socioeconomic status on sexual risk behavior.

Uche and Vincent-Osaghae (2001) studied adolescents from two villages in Anambra and Rivers states of Nigeria. They found that knowledge and preventive measures of HIV infection is low among the adolescents. The study however found that those who have lived in urban areas before age 12 were more informed and more sexually active. Nichols et al (1986) also recognized that sexual activity may be on the increase among unmarried youths in urban areas of Nigeria. These studies therefore show that high knowledge of HIV infection in urban areas in Nigeria does not necessarily reduce risky sexual behaviors. Data from UNAIDS (2006) showed that HIV prevalence in Nigeria is 1.7 times greater in the urban areas compared to rural areas. These findings beg the question of the protective effect of rural residence, probably as a result of traditional cultural socialization or low level of research in the rural areas. It is expected that HIV risk behavior will be lower among urban dwellers, exposed to better information and health care facilities.

Omoteso (2006) examined sexual behavior of university undergraduate students in South Western Nigeria and found that age had no significant effect on sexual risk behavior. The reports by Omoteso (2006) contradicts the fact that the younger ones are fun-seeking, show more carefree attitudes and are more prone to sexual coercion. The present study will clarify this argument, as it will examine the effect of age on risky sexual behavior among Nigerian adolescents and young adults.

Level of education is expected to greatly influence sexual and HIV risk behavior among adolescents. Studies carried out by Iwuagwu et al (2000) among female students of the University of Ibadan, Nigeria, found that only 34% of the students used condom consistently during sexual intercourse. Similar study conducted by Olley and Rotimi (2003) among students at the University of Ibadan found more males (30%) than females (11%) had never used condoms. Van Rossem et al (2001) found an increase in consistent condom use with the level of education especially among women in Nigeria. From the available literature, it is difficult to tell the effect of education on HIV risk behavior, as high percentages of university students mentioned above did not use condoms during

intercourse. However, a higher level of education is expected to increase knowledge of respondent thereby promoting acceptability of HIV education messages.

Religion is a main dividing line in Nigeria. There are predominantly two religious groups: Christianity and Islam; though there are many fractions under each. Studies have found religion and religiosity as well as parental involvement or family background as correlates of HIV risk behaviors in Nigeria. Odimegwu (2005) studied the effect of religion on adolescent sexual attitudes and behavior among Nigerian university students in Eastern and Western parts of the country. The study found a strong relationship between religiosity and adolescents' sexual attitudes and behaviors. This finding does not agree with the findings of Omoteso (2006) who like Odimegwu (2005) studied sexual behavior of Nigerian university undergraduate students in Southwestern Nigeria and found that religion had no influence on the sexual behavior of students. One would however expect religion to have an effect on the sexual behavior of adolescents, as religious affiliation can be said to be a lifestyle in Nigeria, and to ultimately define sexual behavior as both Christianity and Islam discourage premarital sex. Christianity discourages polygyny, encourages monogamy and faithfulness to ones spouse, both on the part of the man or the woman. The question is the level of commitment of those affiliated with the religion to these teachings.

2.3 Identified Gap

Ladipo (2004) studied gender differences in the sexual and reproductive health of adolescents aged 15-19 years, using data from the National AIDS/HIV and Reproductive Health Survey conducted as a baseline for the Promoting Sexual and reproductive Health and HIV/AIDS. The study however did not include young adults aged 20-24. The present study includes both age groups. Inclusion of age group 20-24 is very important, as this is the age group with the highest HIV prevalence in the country. Also a comparative study of these two age groups will show the effect of age in HIV risk behaviors. Taking into account the HIV prevalence in age group 15-24 years in the country, effective HIV risk reduction programs will need to understand not only HIV risk behaviors in adolescents but also in young adults aged 20-24 years. Sunmola et al (2003) pointed to the fact that

most of the studies on adolescent sexual behaviour have limited national coverage in their sample populations.

This study employs a nationally representative data. It will therefore seek to clear the discrepancies between scholars on the effect of correlates, such as religion, as a result of the use of a nationally representative data. Finally, the correlates of HIV risk behaviors in different regions will serve as indices in planning specific interventions for the different regions. Previous literatures show that there are gender differences in HIV risk behaviour. However, we do not know if these differences continue in a multiethnic society like Nigeria with diverse cultures. The present study will clarify this.

2.4 Theoretical and Conceptual Framework

This study is based on cultural, socialization and feminist theories. Culture is a very important aspect of an individual's life and impacts gender roles. Theorists have two different schools of thought about the sexually-based division of labor and the inequality between male and female roles. The first maintains that this is determined to some degree by "biologically or genetically based differences between men and women", while the other school of thought argues that "gender roles are culturally determined and inequality between the sexes result from socially constructed power relationships". Tiger and Fox (1972 in Haralambos and Heald, 1984) argued that "compared to women, men are aggressive and dominant, these characteristics being genetically-based, as a result of male and female hormones. Women on the other hand are programmed by their biogrammars to reproduce, and care for children".

Murdock (1949 in Haralambos and Heald, 1984) however sees biological differences between men and women as the basis of the sexual division of labor in a society. He suggests that 'biological differences, such as the greater physical strength of men and the fact that women bear children lead to gender roles out of sheer practicality'. The second school of thought assumes that "Human behavior is largely directed and determined by culture, that is, the learned recipes for behavior shared by members of a society. Thus norms, values and roles are culturally determined and socially transmitted." This shows that culture rather than biology determines gender roles and as such, individuals learn

their roles either as males or females based on cultural influence (Haralambos and Heald, 1984).

Sexual and HIV risk behavior among Nigerian adolescents and young adults are indeed a product of culture. In Nigerian culture boys are expected to be sexually expressive while girls are expected to be quiet and not sexually adventurous. This increases the tendency for boys to have many sexual partners with little or no caution and the tendency for girls to continue to be ignorant about their sexuality and its consequences. Culturally speaking boys and young men refuse to use condoms on the premise that it is not natural, deprives one of sexual pleasure, hindering actual contact between male and female and thus not part of their culture (Jegede and Odumosu, 2003). One would therefore agree with Ehrhardt and Wasserheit (1991) in Shearer et al, (2005) that “cultural values about gender roles may influence the behavior of men and women in sexual situations at a number of levels: gender roles may influence sexual behavior at the relationship level by defining the general behavior of men and women toward each other in relationships and by playing a role in how sexual behavior is negotiated and ultimately enacted.”

Similarly, sexual and HIV risk behavior is impacted by different socialization of boys and girls. In Nigeria social norms and values affect the sexual and HIV risk behavior of adolescents and young adults. Where social norms and values encourage expressive sexual attitude, there is the likelihood of increased risk behavior. Thus, polygyny, early marriage of girls, exchange of sex for money and other such social norms influence how adolescents and young adults respond to sexual and HIV risk behaviors in Nigeria. Researchers on “sexual scripts” of men and women have shown that differential socialization of boys and girls or young men and women, has the tendency to affect their sexual values and behavior [Andersen et al (1999) in Shearer et al, 2005].

Male dominance also impacts the patterns of sexual risk behavior in Nigeria among adolescents and young people. In this context patriarchy, which is a prevalent power relation feature in Nigeria is central. Unequal distribution of power between men and women is one feature that has an effect on traditional gender roles (Amaro, 1995). Most women lack access to critical resources such as information, skills, technology, services,

social support and income. This increases their vulnerability to HIV infection and other STIs (Weiss and Gupta, 1998). With regard to Nigeria, most women lack decision making and negotiation powers and have limited access to economic and tangible property. The net effect of this lack of decision-making power of women is an increase in their dependence on their male partners or males in general in relations to sexual relationships. For example, girls and young women often are unable to negotiate condom use with their sexual partners during sexual intercourse, cannot inherit land, lack access to resources, and lack necessary information, among others.

2.5 Explanation of the Conceptual Framework

The conceptual framework in this study identifies two HIV risk behaviors as the dependent variables. These are: number of sexual partners and pattern of condom use during intercourse. The correlates of HIV risk behaviors are age group, sex, region of residence, religion, place of residence, socioeconomic status and level of education of respondents.

The model shows that the correlates could directly affect HIV risk behaviour, or operate through a number of factors such as social norms, cultural factors, and knowledge of HIV/AIDS transmission as well as personal perception of HIV/AIDS. Sex and age of a respondent could directly affect HIV risk behaviour or operate through social norms, socialization and cultural beliefs. Sex of the respondent has an important effect on HIV risk behavior. Males seem to exhibit more HIV risk behaviors, because of the social norm that identifies HIV risk behaviors mentioned above with being a man. The fact that gonorrhoea, a sexually transmitted infection is called “gentleman’s disease” shows that social norms have effect on sexual risk behaviors among Nigerian men. Most Nigerian youths, both males and females are not well informed about sexuality. The society expects the males to be informed in sexual matters without a proper channel of information. This expectation makes many youths, especially males not to ask questions or seek information on sexuality. They do not seek information on how to protect themselves from HIV/ AIDS and other sexually transmitted diseases because of societal expectation. In the same vein, young women are expected to be quiet and ignorant about

their sexuality. They do not equally seek information about safe sex for fear of being called “wayward”, neither can they negotiate safe sex for the same reason. These lead to increased HIV risk behaviors among Nigerian youths, both males and females.

Age group of respondents could directly affect HIV risk behavior or operate through social norms, knowledge of HIV transmission and risk perception of HIV infection to affect HIV risk behavior. Adolescents aged 15-19 years are expected to be more fun-seeking, show care-free attitude towards sexuality, less experienced and less knowledgeable about sexuality, thus increasing their HIV risk behaviors. Young adults, aged 20-24 years on the other hand, are expected to be more sexually experienced, have better knowledge of HIV/AIDS transmission and prevention, and have good perception of their risks of contacting HIV/AIDS.

Socioeconomic factors could operate directly or through a number of cultural factors to affect HIV risk behavior. The model shows that religion could contribute to HIV risk behavior if different religions have different policies/beliefs in sexual behavior. Region of residence may increase HIV risk behaviors through different cultural beliefs and socialization, as a result of the heterogeneity of each region. The geopolitical regions have cultural practices and beliefs that are specific to them. HIV risk behaviors will increase where cultural practices and beliefs favor multiple sex partner, early age at first sex and inconsistent or non-condom usage. Also, place of residence could operate through cultural factors, social norms and socialization, as well as knowledge of HIV transmission and prevention to increase HIV risk behaviors. Rural youths have lesser sources of information, as well as limited access to condom. Rural residence may also increase HIV risk behavior as rural youths are more likely to view condom use as not being natural. Urban youths also have the tendency to have multiple sex partners, as they are more exposed to media sources, exposing them to more sexual scenes. Secondly, the practice of sexually active urban youths going to the rural areas during festive periods may have the tendency of increasing HIV risk behaviors of rural youths. This is because the sexually active urban youth, some of which are already infected entice the rural youths, especially the females with money and gifts in exchange for sex. This increases the chances of rural youths exhibiting HIV risk behaviors, and inability to negotiate

condom use. Level of education could operate through social norms as well as knowledge of HIV transmission and prevention to affect HIV risk behaviors. An individual with a high level of education is expected to be more knowledgeable about the transmission and prevention of HIV/AIDS. Those with lower education may have little knowledge of the correct methods of transmission and therefore may harbor a lot of misconception about the routes of transmission of HIV/AIDS.

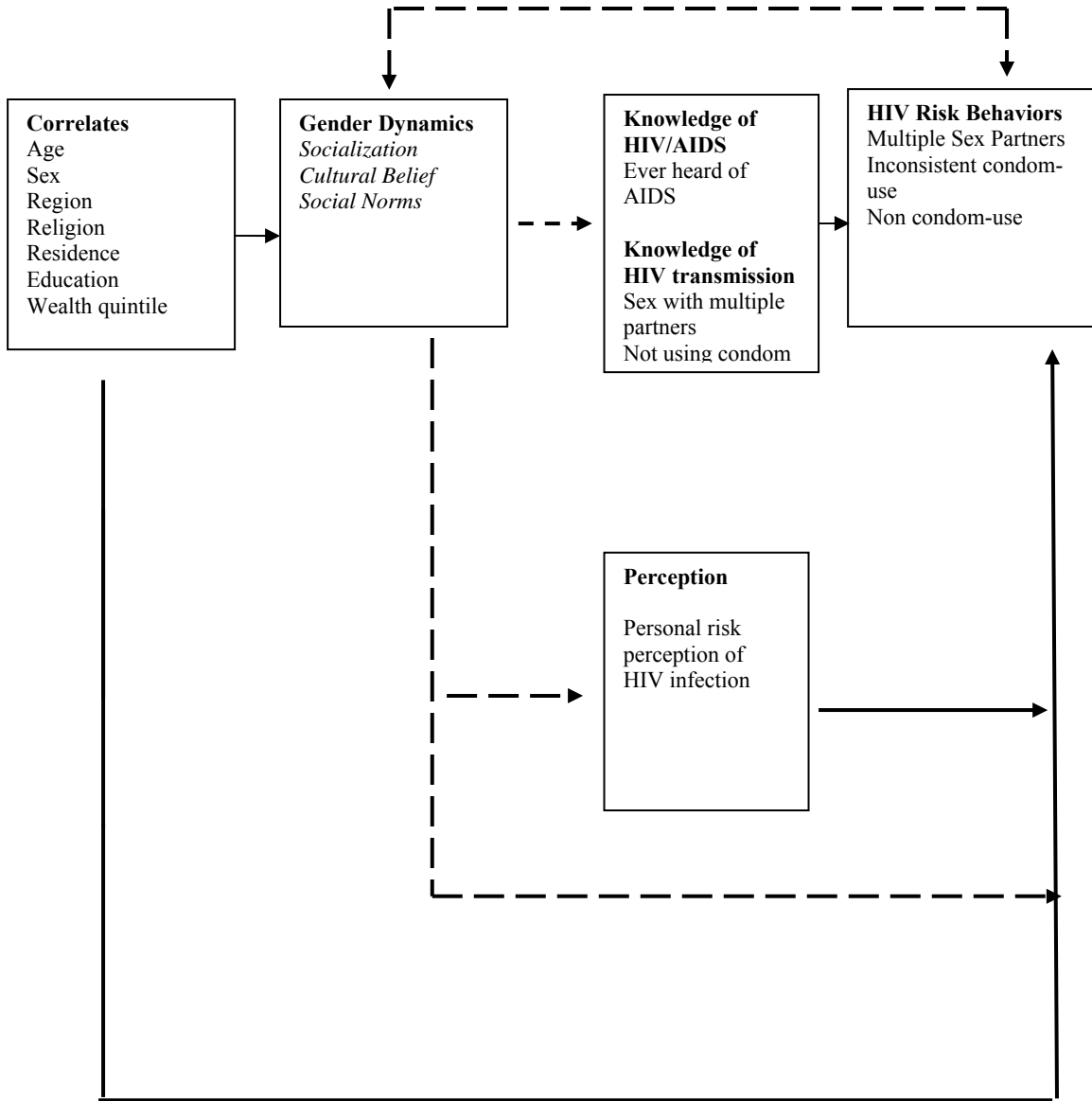


Fig. 1 Conceptual Framework of Regional Patterns and Correlates of Gender Differences in HIV Risk Behavior Among Nigerian Adolescents and Young Adults. The solid lines and arrow represent associations that are measured in this study, while the dotted lines and variables in italics are not measured

2.6 Hypotheses

1. There is regional variation in HIV risk behaviors among Nigerian adolescents and young adults.
2. Gender differences in HIV risk behaviors among Nigerian youths vary by age, region, religion, level of education, socio-economic status, and rural-urban residence.
3. Knowledge and perceptions of HIV/AIDS affect HIV risk behaviors of Nigerian adolescents and young adults.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter discusses the research methodology used in this study. It contains the sampling design, study population, sample selection, variables and variable measurement, data management and analyses.

3.2 Sources of Data

This study is based on secondary data analysis of male and female datasets of the Nigeria Demographic and Health Survey (NDHS) 2003. The NDHS was a nationally representative sample of women aged 15-49 and men aged 15-59 years. The main objective of the 2003 NDHS was to obtain and provide information on fertility, fertility preferences, use and knowledge of family planning methods, maternal and childhood mortality, knowledge of HIV/AIDS, and other health issues. Technical support was provided by ORC Macro (NDHS, 2003).

3.2.1 Study Design

The NDHS of 2003 was a nationally representative cross-sectional survey covering a population defined as the universe of all women aged 15-49 years and all men aged 15-59 years in Nigeria.

The sample for the 2003 NDHS was designed to provide estimates of population and health indicators for the country as whole, urban and rural areas, and six major subdivisions which are the six geo-political zones. A representative probability sample of 7,864 households was selected for the sample. The sample was selected in two stages. In the first stage, 365 clusters were selected from a list of enumeration areas developed from the 1991 population census. In the second stage, a complete listing of households was carried out in each selected cluster. Households were then systematically selected for participation in the survey.

All women age 15-49 who were either permanent residents of the households or visitors

present in the household on the night before the survey were eligible to be interviewed. In addition, in a sub-sample of one-third of the households selected for the survey, all men aged 15-59 were eligible to be interviewed if they were either permanent residents or visitors present in the household on the night before the survey.

3.2.2 Sample Selection

The 2003 NDHS sample was selected using a stratified, two-stage cluster design. A total of 365 clusters were selected; 165 in the urban and 200 in the rural areas. Households were allocated to each state by urban and rural areas. In each urban or rural area in a given state, clusters were selected systematically with equal probability.

Household interviews were completed for 99% of the occupied households. A total of 7,985 eligible women were found in these households, and 95% of them were successfully interviewed. The overall response rate for women was 94%. A total of 2,572 eligible men from every third household were identified for the individual interviews and 91% were successfully interviewed. The overall response rate for men was 90%. There was no difference by rural-urban residence in overall response rates for eligible women and men. By region, the overall response rate for eligible women varied a little, with the exception of the South-South region, which had 88%. The lowest overall response rate for men was in the South-South and South-East regions with 83% each.

3.2.3 Questionnaire Design

Three questionnaires were used: the household questionnaire, the women's questionnaire and the men's questionnaire. The content of these questionnaires was based on the model questionnaires developed by the MEASURE DHS+ program for use in countries with low levels of contraceptive use. The questionnaires were adapted during a workshop organized by the National Population Commission (NPC) to reflect relevant issues in population and health in Nigeria. The adapted questionnaire was translated from English into the three major languages (Hausa, Igbo and Yoruba) and piloted during November 2002.

3.2.4 Training of Field Staff and Field Work

Over 100 people were recruited by the NPC to serve as supervisors, field editors, male and female interviewers, quality control personnel and reserve interviewers. They all participated in the main interviewer training, which was conducted from February to March 2003.

3.2.5 Quality Control

Special care was taken to monitor the quality of data collection. The field editor was responsible for reviewing all questionnaires for quality and consistency before the team's departure from the cluster. The field editor and supervisor also sat on interviews periodically. Twelve staff assigned from the NPC coordinated fieldwork activities and visited the teams at regular intervals to monitor the work. In addition, quality control personnel independently re-interviewed selected households after the departure of the teams. These checks were performed periodically throughout the duration of the fieldwork. An additional innovation was the concurrent processing of data even as fieldwork was ongoing. This served as a quality control measure by facilitating field checks for errors.

3.2.6 Study Population

The study population comprises of Nigerian male and female, never married, sexually experienced adolescents aged 15-19 years and young adults aged 20-24 years in 2003, who were interviewed during the 2003 NDHS.

3.2.7 Sample Size

The sample size comprises of all sexually experienced, never married males and females, aged 15-24 years who were interviewed by the NDHS in 2003. 630 females and 342 males met the selection criteria. Four hundred and seven (407) respondents were in the age group 15-19 years, while 565 were in the age group 20-24 years.

3.2.8 Variable Definition and Measurement

The variables used in this study are categorized as dependent and independent variables as shown in Table 3.1.

Dependent Variables

The dependent variable in this study is HIV risk behaviors. This is defined as those behaviors that expose an individual to the risk of HIV infection. These behaviors include: non and inconsistent condom use during sexual intercourse, as well as multiple sex partnerships. The dependent variables are measured by two variables: number of sexual partners in the last 12 months and pattern of condom use in the same period.

The variable “number of sexual partners” was derived from one of the questions. For both men and women questions were asked thus: “In total, with how many different men/women have you had sex in the last 12 months?”. This variable is then recoded into “one partner” and more than one partner.

The variable “Pattern of condom use” is a composite variable of four different variables. It was computed from responses to the following questions for the women: “The first time you had sexual intercourse, was a condom used?”; “The last time you had sexual intercourse, was a condom used?”, “The last time you had sexual intercourse with another man, other than the first man, was a condom used?” and “The last time you had sexual intercourse with another man other than the two men mentioned previously, was a condom used?”. Similar questions were asked for men concerning condom use during sexual intercourse and with different women. All four variables have binary response Yes/No. The variables are recoded “0” for “No” and “1” for “Yes”.

The new variable called “Pattern of condom use” has three categories: “High, low and never users of condoms”. The “never user” category are the sexually active male and female youths who reported having never used condom during any intercourse. When rated on a scale of 0 to 4, the “High condom users” are those who used condoms two out of four times (2/4) and three out of four times (3/4). “Low condom users” are those who reported having used condoms one out of four times (1/4) while the “Never users of

condoms” are those who reported having never used condoms at any sexual intercourse. The total percentage of those who reported having always used condom (4/4) was 0.1% of the total sample.

Table 3.1 Categories and Codes of Variables

| Variable | Category | Code |
|--|------------------------|------|
| Dependent Variables | | |
| Number of sexual partners | One partner | 0 |
| | 2+ partners | 1 |
| Pattern of condom use | High condom user | 0 |
| | Low condom use | 1 |
| | Never user of condom | 2 |
| Social and demographic variables | | |
| Sex | Male | 1 |
| | Female | 2 |
| Age group | 15-19 | 1 |
| | 20-24 | 2 |
| Region of residence | North | 1 |
| | South | 2 |
| Place of residence | Rural | 1 |
| | Urban | 2 |
| Religion | Christian | 1 |
| | Islam and others | 2 |
| Level of education | Primary/None | 1 |
| | Post primary education | 2 |
| Wealth index | Low | 1 |
| | Middle | 2 |
| | High | 3 |
| Age at first sex | <15 years | 1 |
| | > 15 years | 2 |
| HIV-related variables | | |
| Knowledge of HIV/AIDS Ever heard of HIV/AIDS | No | 1 |
| | Yes | 2 |
| Can get HIV/AIDS through sex with many partners | No | 1 |
| | Yes | 2 |
| Can get HIV/AIDS by not using condom | No | 1 |
| | Yes | 2 |
| Personal risk perception of HIV/AIDS | Perceive risk | 1 |
| | No risk at all | 2 |
| | Don't know/unsure | 3 |

Independent Variables

The independent variables consist of the individual, socio-economic, demographic and HIV-related variables used in the conceptual framework for this study. The independent variables as pointed out in the conceptual framework are: sex, age group, region of residence, place of residence, religion, education, wealth index, knowledge of HIV/AIDS transmission, attitude towards people living with HIV/AIDS, personal risk perception of HIV/AIDS.

As mentioned earlier, different datasets were used for the male and female respondents. The datasets were appended to a combined dataset. Males and females were then recoded as shown in Table 3.1. The dataset was sorted by age group to include respondents aged 15-24 years. It was then sorted by marital status, and only never married respondents were included. This reduced the sample size from 4107 respondents aged 15-24 years, to 2663 respondents who were never married and aged 15-24 years. Furthermore, the dataset was stratified by sexual experience, and never married respondents aged 15-24 years who had no sexual experience were excluded from the dataset. This reduced the sample size to 972 sexually active, never married male and female respondents aged 15-24 years.

Region of residence consist of the six geo-political regions: the North-Central, the North-East, the North West, the South-East, the South-South and the South-West regions. The three regions from the Northern part of the country were merged to form the “Northern regions”, and the three regions from the Southern part of the country were merged to form the “Southern regions”. This merging was as a result of noted homogenous pattern among respondents across the geo-political regions.

The variable “level of education of respondents” was derived from the questions: “Have you ever attended school?” “What is the highest level of school you attended: Primary, secondary, or higher?” Only 2.8% reported themselves as having “no education” and only 10% reported having “higher education”. As a result of the low frequencies, those with no education were combined with those with primary education to form “Primary/None”

category, while those with “higher education” were combined with “secondary education” to form the “post-primary” category.

Respondents were asked: “What is your religion?” there were six categories of response: “Catholic”, “Protestant”, “Other Christian”, “Islam”, “Traditionalist” and “Other”. The Catholics, Protestants, and Other Christians were merged to form the variable ‘Christian’ as a result of the homogeneity of the respondents. The traditionalists and others were 0.5% and 0.2% respectively, while those who of Islamic religion were 19.3%. Respondents belonging to the traditionalist and other religions were merged with those belonging to Islamic religion to form the category “Islam/Others”.

The variable “wealth index” is an indicator of household income. “It is an indicator of the level of wealth that is consistent with expenditure and income measures”(Rustein 1999 in NDHS 2003). According to NDHS 2003, “the wealth index was constructed using household asset data and principal component analysis”. Asset information was collected in the 2003 NDHS Household questionnaire and covers information on household ownership of a number of consumer items such as television, radio, car etc; as well as dwelling characteristics such as source of drinking water, type of sanitation facilities etc. Gwatkin et al, 2000 in NDHS 2003 assigned each asset a weight (factor score) generated through principal component analysis, and the resulting asset scores were standardized in relation to a standard normal distribution with a mean of zero and a standard deviation of one. Each household was then assigned a score for each asset; the scores were summed for each household; individuals were ranked according to the total score of the household in which they resided. The sample was then divided into five categories: Poorest, Poorer, Middle, Richer, and Richest. For ease of analysis and homogeneity of the wealth index of respondents, the poorest and poorer categories were merged to form the category “Low”, while the richer and the richest categories were merged to form the category “High”. Wealth index thus has categories “High”, “Middle” and “Low”.

Age at first sex was derived from the question: “How old were you when you first had sexual intercourse (if ever)?” The responses were “never had intercourse”, and responses ranging from 7 to 24 years, and at first union. The “never had intercourse” category was

removed as this study is focused on sexually experienced respondents. Similarly, the category “at first union” was removed as this study is focused on never married respondents. The mean age at first sex among never married, sexually experienced male and female adolescents and young adults age 15-24 years in this study was 16.8 years. The variable age at first sex was therefore categorized into “<15 years” and “>15 years”, based on those who had their first sex before the mean age at first sex for the study population, and those who had their first sex including and after the mean age at first sex.

Knowledge of respondents about HIV/AIDS was abstracted from the question: “Have you ever heard of an illness called AIDS?” This has a binary response: Yes/No. Knowledge of transmission of HIV/AIDS was derived from the question: “How can a person get AIDS- sexual intercourse with multiple partners?” and “How can a person get AIDS- not using condom?” these questions all have binary responses Yes/No.

Attitude to those living with HIV/AIDS was derived from the question “If a relative of yours became sick with the virus that causes AIDS, would you be willing to care for her or him in your own household?” The response was in three categories: “No”, “Yes” and “Don’t know”. Those who reported “Don’t know” were less than 5.3% and were merged with those reported “No”, as the characteristic of those who reported “don’t know” is very similar to those responding “No”.

Personal risk perception of HIV infection was obtained from the question: “Do you think your chances of getting AIDS are small, moderate, great, or no risk at all?” the responses were in five categories: “Small”, “Moderate”, “Great”, “No risk at all”, and “Don’t know/unsure”. The categories small, moderate and great were merged because moderate and great had frequencies less than 5% each to form a new category called “Perceive risk”. There are now three categories: Perceive risk, No risk at all, and Don’t know.

3.3 Data Analysis

Data analyses were done at three levels: univariate, Bivariate and multivariate. In the first instance, univariate analysis provided the summary of respondents' social and demographic characteristics, HIV/AIDS-related variables and HIV risk behavior variables. It used frequency and percentage distribution of variables of interest.

Bivariate analysis used cross-tabulation of the dependent variables (HIV risk behavioral variables) against the social, demographic and other HIV-related variables. This was done to show if there is association between any of the independent variables and each of the dependent variables. By using the chi-square statistics, the existence of a relationship between row and column variables within contingency tables was investigated.

Finally, two logistic regression models were used: binary and multinomial logistic regressions.

Binary logistic regression model is used to examine the covariates of the likelihood that never married, sexually experienced adolescents and young adults will engage in HIV risk behavior by having multiple partnerships. The covariates are the social, demographic and HIV-related variables. For a binary response variable y , the general logistic regression model is:

$$\ln \left\{ \frac{P_i}{1 - P_i} \right\} = \alpha + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki}$$

where, $P_i / 1 - P_i$ is the odds ratio

$i = 1, 2, \dots, n$

P_i represents the probability of occurrence of the dependent variables

x_{1i} , x_{2i} and x_{ki} represent the independent variables (age, residence, education, socioeconomic status, religion).

β_1, \dots, β_k represent the slopes of the variables x_1, \dots, x_k respectively.

Multinomial logistic regression is used where a categorical dependent variable has more than two categories. The multinomial regression model allows for multiple outcomes that are nominal in nature, rather than ranked in some meaningful ways. The multinomial regression model breaks the regression up into a series of binary regressions, comparing each group to a baseline group. Pattern of condom use has 3 groups: high condom use, low condom and never use condom. High condom use is set to be the baseline group. Multinomial regression will assess the odds of low condom use versus high condom use, and having never used condom versus high condom use. The multinomial regression model would have 2 sets of results, and relative risk ratio (RRR), very similar to odds ratio would predict the odds of being a low condom user as compared to high users, and the odds of being a never user of condom as compared to high users. The general model for multinomial regression is denoted by:

$$pr(y_i = m|x_i) = \frac{\exp(x_i\beta_m)}{1 + \sum_{j=2}^J \exp(x_i\beta_j)}$$

Where: j is the number of levels of dependent variables (3 in this study), x represents the independent variables ranging from i to n and m represents each of the dependent variables. The multinomial regression model generates j-1 sets of parameter estimates, comparing different levels of the dependent variable to a reference group. Models for each dependent variable can be written as:

Pr. $y=1/ X = 1 / 1 + \exp(\beta_1X) + \exp(\beta_2X)$ (first category, high use)

Pr. $y=2/ X = \exp(\beta_2X) / 1 + \exp(\beta_1X) + \exp(\beta_3X)$ (second category, low use)

Pr. $y=3/ X = \exp(\beta_1X) / 1 + \exp(\beta_2X) + \exp(\beta_3X)$ (third category, never use)

(The first category is the reference group).

Four models were fitted in this analysis. The first model examined the relationship between multiple partnership and socio-demographic variables. The second model examined the relationship between multiple partnership and HIV-related variable. The third model examined the relationship between pattern of condom use and socio-demographic variables while the fourth model examined the relationship between pattern

of condom use and HIV-related variables. Model selection was done and adjusted odds ratio was used to examine the nature and strength of association between socio-demographic and HIV-related variables and the two measures of HIV risk behaviours.

3.3.1 Study Limitations

There is no control over the questions that were asked during the survey because this is a secondary data analysis. Respondents were asked about condom use at first sex and last sex. This does not show the consistency of condom use. Some variables were constructed from other variables in the original dataset in order to explore pattern of condom use.

Women were asked some questions while men were not asked the same questions, thereby making comparison between sexes impossible. An example is the question on age mixing, whereby women were asked questions about the age of their sexual partners. Men however were not asked the same question. Some data were also missing. Lack of qualitative tools to explore determinants of HIV risk behaviors are limitations in this study.

Questions on sexual behavior may be biased as it involved retrospective measure of sexual risk behaviors, and respondents may not recall sexual behavior over 12 months correctly. There is the possibility of underestimation of sexual risk behaviors among women as Nigerian females are very shy to discuss issues around sexuality. Report bias of sexual activity and number of sexual partners may lead to under reporting.

CHAPTER 4

DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS OF RESPONDENTS

4.1 Introduction

This chapter discusses the socioeconomic and demographic characteristics, HIV risk behavior characteristics, and knowledge and perception of HIV/AIDS of never married, sexually experienced male and female youths aged 15-24 years in the 2003 NDHS. It also shows the results of bivariate analyses of the independent variables with the HIV risk behavior variables. Results are presented according to region and gender, as the main objective of this study is to examine regional patterns and correlates of gender differences in HIV risk behaviors among Nigeria adolescents aged 15-19 years and young adults aged 20-24 years.

4.2 Univariate Analysis

Table 4.1 shows the result of univariate analysis of never married, sexually experienced Nigerian youths, aged 15-24 years with reference to their socioeconomic characteristics, HIV risk behavioural characteristics and HIV-related variables.

Table 4.1 Percentage Distribution of Never Married, Sexually Experienced Nigerian Youths, by Selected Characteristics, According to Region and Gender, NDHS 2003

| Characteristic | North | | South | | Total | |
|---|-----------------|-------------------|-----------------|-------------------|-----------------|-------------------|
| | Male (N=140) | Female (N=163) | Male (N=202) | Female (N=467) | Male (N=342) | Female (N=630) |
| Total | 46.2 | 53.8 | 30.2 | 69.8 | 35.2 | 64.8 |
| <u>Socioeconomic and demographic characteristics</u> | | | | | | |
| Age group | | | | | | |
| 15-19 | 36.4 | 49.7 | 34.7 | 43.9 | 35.4 | 45.4 |
| 20-24 | 63.6 | 50.3 | 65.3 | 56.1 | 64.6 | 54.6 |
| Residence | | | | | | |
| Rural | 53.6 | 47.9 | 54.0 | 51.4 | 53.8 | 50.5 |
| Urban | 46.4 | 52.1 | 46.0 | 48.6 | 46.2 | 49.5 |
| Religion | | | | | | |
| Christian | 49.3 | 74.2 | 83.7 | 89.5 | 69.6 | 85.6 |
| Islam/Others | 50.7 | 25.8 | 16.3 | 10.5 | 30.4 | 14.4 |
| Education | | | | | | |
| Primary/None | 27.9 | 25.2 | 17.3 | 15.4 | 21.6 | 17.9 |
| Post primary | 72.1 | 74.8 | 82.7 | 84.6 | 78.4 | 82.1 |

| | | | | | | |
|--|------|------|------|------|------|------|
| Wealth Index | | | | | | |
| Low | 35.7 | 31.3 | 25.7 | 21.8 | 29.8 | 24.3 |
| Middle | 17.2 | 19.6 | 15.4 | 15.9 | 16.1 | 16.8 |
| High | 47.1 | 49.1 | 58.9 | 62.3 | 54.1 | 58.9 |
| Mean age at first sex | | | | | | |
| | 17.0 | 16.6 | 16.7 | 16.8 | 16.8 | 16.7 |
| Age at first sex | | | | | | |
| <16 years | 27.1 | 35.6 | 28.2 | 29.1 | 27.8 | 30.8 |
| 16+ years | 72.9 | 64.4 | 71.8 | 7.9 | 72.2 | 69.2 |
| <u>HIV Risk Behavior characteristics</u> | | | | | | |
| Number of sexual partners | | | | | | |
| 1 | 67.3 | 95.3 | 71.4 | 89.9 | 69.8 | 91.3 |
| 2+ | 32.7 | 4.7 | 28.6 | 10.1 | 30.2 | 8.7 |
| Pattern of condom | | | | | | |
| High | 20.7 | 12.3 | 28.3 | 13.9 | 25.2 | 13.5 |
| Low | 17.1 | 11.0 | 23.9 | 20.4 | 21.1 | 18.0 |
| Never | 62.1 | 76.7 | 47.8 | 65.7 | 53.7 | 68.5 |
| <u>HIV-Related Variables</u> | | | | | | |
| % Aware of HIV/AIDS | 97.9 | 89.6 | 99.0 | 94.2 | 98.5 | 93.0 |
| % Agree that HIV/AIDS can be contacted via multiple sex partnerships | 47.9 | 28.2 | 17.4 | 24.5 | 29.9 | 25.5 |
| % Agree that HIV/AIDS can be contacted by not using condom | 25.7 | 4.3 | 8.0 | 3.7 | 15.3 | 3.8 |
| Personal risk perception | | | | | | |
| Perceive risk | 46.7 | 14.4 | 37.5 | 22.9 | 41.2 | 20.8 |
| No risk at all | 33.6 | 56.2 | 55.5 | 58.9 | 46.6 | 58.2 |
| Don't know | 19.7 | 29.4 | 7.0 | 18.2 | 12.2 | 21.0 |

4.2.1 Socioeconomic and Demographic Characteristics

As the above table shows, slightly more than one-third (35%) of respondents were males while 65% were females. A little more than half of females (56%) and 65% of males in the total study population were 20-24 years old. Similar pattern is seen among respondents in the Northern and the Southern regions. Seventy percent of males were Christians and 30% were of the Islamic/other religions. Among females, 86% were Christians while the remaining 14% were either of Islamic or other religions. The level of education of respondents show that on average, over 75% of male respondents had post-

primary education while it is over 80% among females. Considering the wealth index, majority of males and females (54% and 59%) reported coming from high income households. The mean age at first sex is slightly higher for men than for the women. A slightly higher percentage of men than women had their first sexual intercourse from 16 years and above.

4.2.2 HIV Risk Behavioral Characteristics

In the total sample, 30% of males and 9% of females reported having two or more sexual partners. The proportion of Southern females that reported having two or more sexual partners is twice the proportion of Northern females reporting two or more sexual partners. In the total sample, 54% of males and 69% of females reported that they have never used condoms. Seventy-seven percent of Northern females reported having never used condom. Overall, there is high level of never use of condoms as well as low condom use among never married, sexually experienced Nigerian youths. Risky sexual behaviors are more prevalent among Northern men than Southern men. Males engage in more risky sexual behavior than females, irrespective of the region.

4.2.3 HIV-Related Characteristics

Awareness of HIV/AIDS is high among the youths, but correct knowledge of its transmission route is very low. It is shown that 99% of men and 93% of women in the total sample population were aware of HIV/AIDS. Awareness is high across regions. No significant gender differences, though about 10% of females from the North reported less awareness of HIV/AIDS. In the North, male youths are more aware than the females. There is low knowledge of routes of transmission of HIV/AIDS across the regions. Only 3 out of 10 men and a quarter of women agreed that HIV could be transmitted through sex with multiple partners. Across the regions, more males than females agreed that HIV/AIDS can be contacted by not using condoms. More males than females perceived themselves to be at risk of contacting HIV/AIDS across the regions. Personal risk perception is however lower among Northern females compared to other regions. More females across the regions perceived themselves not to be at any risk at all.

4.3 Bivariate Analysis

4.3.1 Social and Demographic Characteristics and Multiple Sex Partnerships among Never Married, Sexually Experienced Youths

Table 4.2 shows the socio-demographic characteristics and multiple sex partnerships among never married, sexually experienced Nigerian youths aged 15-24 years. From the table, the percentage of males in this study that engaged in multiple sex partnerships is 3.5 times higher than the females (30% versus 9%). More females from the South engaged in multiple sex partnerships than females from the North.

Table 4.2 Percentage of never married, sexually experienced Nigerian youths who reported multiple sexual partnerships by selected socioeconomic and HIV-related variables, controlling for region and gender, NDHS 2003

| Characteristic | North | | South | | Total | |
|--|------------------------|-------------------------|------------------------|--------------------------|------------------------|--------------------------|
| | % Male with 2+ N=34 | % female with 2+ N=6 | % Male with 2+ N=44 | % female with 2+ N=38 | % Male with 2+ N=78 | % female with 2+ N=44 |
| Total | 32.7 | 4.7 | 28.6 | 10.1 | 30.2 | 8.7 |
| <u>Socio-economic characteristics</u> | | | | | | |
| Age group | | | | | | |
| 15-19 | 32.4 | 0.0 | 14.9 | 7.0 | 22.6 | 5.2 |
| 20-24 | 32.8 | 9.0* | 34.6* | 12.8 | 33.9 | 11.8* |
| Residence | | | | | | |
| Rural | 44.6 | 4.9 | 22.5 | 11.5 | 31.6 | 9.9 |
| Urban | 18.8** | 4.4 | 35.1 | 8.7 | 28.7 | 7.6 |
| Religion | | | | | | |
| Christian | 26.9 | 4.4 | 29.9 | 10.7 | 29.1 | 9.3 |
| Islam/Others | 38.5 | 5.3 | 22.2 | 5.4 | 32.9 | 5.3 |
| Education | | | | | | |
| Primary/None | 33.3 | 2.9 | 21.7 | 8.9 | 27.7 | 6.7 |
| Post primary | 32.5 | 5.3 | 29.8 | 10.3 | 30.8 | 9.2 |
| Wealth Index | | | | | | |
| Low | 51.4 | 5.1 | 23.8 | 11.9 | 36.7 | 9.8 |
| Middle | 40.0 | 0.0 | 20.0 | 10.0 | 28.6 | 6.8 |
| High | 17.3** | 6.5 | 32.6 | 9.5 | 27.1 | 8.9 |
| Age at first sex | | | | | | |
| <16 years | 8.7 | 4.4 | 46.0 | 17.7 | 31.7 | 13.6 |
| 16+ years | 39.5** | 4.8 | 23.1** | 7.3** | 29.8 | 6.7* |
| <u>HIV-Related Variables</u> | | | | | | |
| % Unaware | 0.0 | 6.3 | 0.0 | 11.5 | 0.0 | 9.5 |
| % Aware | 33.0 | 4.4 | 29.0 | 10.0 | 30.6 | 8.7 |
| HIV/AIDS can be contacted via | | | | | | |

| | | | | | | |
|--|---------------------|-----|------|--------------------|---------------------|-------------------|
| multiple sex partnerships | | | | | | |
| % Disagree | 31.9 | 5.6 | 27.4 | 9.4 | 28.7 | 8.5 |
| % Agree | 33.3 | 2.6 | 34.5 | 11.4 | 33.7 | 8.7 |
| HIV/AIDS can be contacted by not using condom | | | | | | |
| % Disagree | 19.4 | 4.9 | 28.1 | 8.9 | 25.1 | 7.9 |
| % Agree | 62.5 ^{***} | 0.0 | 35.7 | 33.3 ^{**} | 54.4 ^{***} | 23.8 [*] |
| Personal risk perception | | | | | | |
| Perceive risk | 29.6 | 6.3 | 38.5 | 11.1 | 34.0 | 10.3 |
| No risk at all | 21.4 | 1.5 | 23.3 | 7.9 | 22.9 | 6.3 |
| Don't know | 57.1 [*] | 9.4 | 30.0 | 15.4 | 48.4 [*] | 13.4 |

* P < 0.05, ** P < 0.01, *** P < 0.001

In total, multiple sexual partnerships are higher among age group 20-24 years, among both male and females than among adolescents aged 15-19 years. This pattern of association is observed in all the regions. The association between multiple sex partnerships and age group is statistically significant among Northern females and Southern males.

In total, and across the regions, rural youths both males and females engaged more in multiple sex partnerships than urban youths. Both in the rural and urban areas, more males than females engage in multiple sex partnerships.

Among male respondents in total, multiple sex partnership is slightly higher among those of Islamic and other faiths than among Christians (33% versus 29%). However, female Christian youths engaged in more multiple sex partnerships. In the North, multiple sex partnerships is higher among males of Islamic/other religion than among Christian males (39% vs. 27%). There is no much difference among female Christian and Islam in the North. A contrasting pattern is seen in the South, where multiple sex partnerships are higher among Christian males than males belonging to Islamic religion and other religion. In the South, more females who reported Christian engage in multiple sex partnerships than Islam.

More male youths with primary, no education, or post primary education had multiple sex partnerships compared to their female counterparts. This is consistent with what is expected. Among Southern males and females, there is an increase in multiple sex partnerships as the level of education increases.

The study shows that poor male youths from the North and the total sample population are more likely to have multiple sex partners, while rich male youths from the South have higher multiple sexual partners. Among the females in the Northern region, the proportion with multiple sex partnerships is higher among respondents from the wealthy households. Among Southern females, poor female youth (15-24 years) engage in more multiple sexual partnerships. This result shows that in the Southern region, the wealthier males become, the more sexual partners they acquire, thereby increasing their HIV risk

behavior. On the other hand, the poorer Southern female youths, the higher their multiple sexual partnerships.

As Table 4.2 shows, none of the male respondents with multiple sex partners was unaware of HIV/AIDS. Thirty-one percent of males who were aware of HIV/AIDS had multiple sex partners. Awareness of HIV/AIDS is low among the female respondents. Only about 9% of females with multiple sex partners were aware of HIV/AIDS. In the North, only 4% of females with multiple sex partners were aware of HIV/AIDS.

Across the regions, one-third of male youths who agreed that HIV/AIDS can be transmitted through sex with multiple partners have multiple sex partnerships. In the North, 63% of males who agreed that HIV/AIDS can be transmitted by not using condoms have multiple sex partners, compared to 36% males in the South. In the North, none of the females with multiple sex partners agreed that HIV/AIDS can be transmitted by not using condoms compared to 33% of Southern females with multiple sex partners. Across the regions, more males with multiple sex partners do not know their personal risk perception.

4.3.2 Pattern of Condom Use

As shown in Table 4.3, the percentage of male and female youths who reported having never used condom is high across the regions. It is higher among the females compared to the males, and Northern females reported highest percentage of having never used condom. As age of male and female youths increase, there is tendency for condom use to increase during sexual act in all the regions. In the age group 20-24, Southern males reported the lowest percentage of having never used condom (40%), while Northern females reported the highest percentage (71%).

Table 4.3: Percentage of Male and Female Nigerian Youths who Reported Low and Never use of condom by Selected Socio-demographic and HIV-Related variables, Controlling for Region and Gender, NDHS 2003

| Variable | Male | | | | | | Female | | | | | |
|--------------------------------|-------|---------|-------|---------|-------|---------|--------|-------|-------|--------|-------|--------|
| | North | | South | | Total | | North | | South | | Total | |
| | Low | Never | Low | Never | Low | Never | Low | Never | Low | Never | Low | Never |
| Total | 17.1 | 62.1 | 23.9 | 47.8 | 21.1 | 53.7 | 11.0 | 76.7 | 20.4 | 65.7 | 18.0 | 68.5 |
| Socioeconomic variables | | | | | | | | | | | | |
| Age group | | | | | | | | | | | | |
| 15-19 | 13.7 | 72.6 | 25.7 | 62.9 | 20.7 | 66.9 | 9.9 | 82.7 | 17.1 | 66.3 | 15.0 | 71.0 |
| 20-24 | 19.1 | 56.2 | 22.9 | 39.7*** | 21.4 | 46.4*** | 12.2 | 70.7 | 23.0 | 65.1 | 20.4 | 66.5 |
| Residence | | | | | | | | | | | | |
| Rural | 13.3 | 70.7 | 25.9 | 55.6 | 20.8 | 61.8 | 11.5 | 79.5 | 14.2 | 73.2 | 13.6 | 74.8 |
| Urban | 21.5 | 52.3 | 21.5 | 38.7** | 21.5 | 44.3** | 10.6 | 74.1 | 26.9 | 57.7** | 22.4 | 62.2** |
| Religion | | | | | | | | | | | | |
| Christian | 7.7 | 87.1 | 20.0 | 74.3 | 13.5 | 81.1 | 2.4 | 92.7 | 13.9 | 77.8 | 9.7 | 83.2 |
| Islam/Others | 20.8 | 52.5*** | 24.7 | 42.2*** | 23.2 | 46.1*** | 13.9 | 71.3* | 21.6 | 63.5 | 19.8 | 65.3** |
| Education | | | | | | | | | | | | |
| Primary/None | 23.2 | 60.9 | 25.6 | 50.6 | 24.9 | 53.6 | 11.6 | 75.2 | 18.9 | 68.1 | 17.3 | 69.7 |
| Post primary | 11.3 | 63.4 | 15.2 | 33.3 | 12.5 | 53.9 | 9.5 | 81.0 | 32.7 | 44.9** | 22.0 | 61.5 |
| Wealth Index | | | | | | | | | | | | |
| Low | 6.0 | 78.0 | 23.1 | 65.4 | 14.7 | 71.6 | 3.9 | 90.2 | 14.9 | 75.3 | 11.2 | 80.3 |
| Middle | 8.3 | 70.8 | 23.3 | 56.7 | 16.7 | 63.0 | 12.5 | 81.3 | 18.9 | 71.6 | 17.0 | 74.5 |
| High | 28.8 | 47.0** | 24.4 | 37.8** | 26.0 | 41.1*** | 15.0 | 66.3* | 22.7 | 60.8 | 21.0 | 62.0** |
| Age at first sex | | | | | | | | | | | | |
| <16 years | 5.3 | 84.2 | 31.6 | 57.9 | 21.0 | 68.4 | 10.3 | 81.0 | 14.7 | 72.1 | 13.4 | 74.7 |
| 16+ years | 21.6 | 53.9** | 20.8 | 43.8** | 21.1 | 48.0*** | 11.4 | 74.3 | 22.7 | 63.0 | 20.0 | 65.8 |
| HIV-Related Variables | | | | | | | | | | | | |
| % Aware | 17.5 | 61.3 | 24.1 | 47.2 | 21.4 | 53.0 | 11.6 | 75.3 | 21.2 | 64.7 | 18.8 | 67.4 |
| HIV/AIDS can be | | | | | | | | | | | | |

| | | | | | | | | | | | | | |
|--|------|--------------------|------|------|------|---------------------|------|-------------------|------|---------------------|------|---------------------|--|
| contacted via multiple sex partnerships | | | | | | | | | | | | | |
| % Agree | 23.9 | 55.2 | 17.1 | 48.6 | 21.6 | 52.9 | 15.2 | 69.6 | 29.0 | 50.0 ^{***} | 25.0 | 55.6 ^{***} | |
| HIV/AIDS can be contacted by not using condom | | | | | | | | | | | | | |
| % Agree | 27.8 | 36.1 ^{**} | 20.0 | 13.3 | 25.5 | 29.4 ^{***} | 14.3 | 42.9 [*] | 41.2 | 29.4 ^{**} | 33.3 | 33.3 ^{**} | |
| Personal risk perception | | | | | | | | | | | | | |
| Perceive risk | 25.0 | 48.4 | 21.3 | 56.0 | 23.0 | 52.5 | 9.5 | 85.7 | 21.8 | 62.4 | 19.7 | 66.4 | |
| No risk at all | 13.0 | 69.6 | 26.4 | 39.1 | 22.4 | 48.1 | 12.2 | 73.2 | 22.4 | 62.9 | 19.9 | 65.4 | |
| Don't know | 7.4 | 77.8 | 21.4 | 64.3 | 12.2 | 73.2 | 11.6 | 74.4 | 16.5 | 73.4 | 14.8 | 73.8 | |

* P < 0.05, ** P < 0.01, *** P < 0.001

Rural male and female youths are predominantly never users (62%vs. 75%). This is consistent across regions. In the total sample of male and female, urban youths are more likely to use condoms than rural youths, as expected. It is shown that Christian youths of both sexes were predominantly never users of condom (81% versus 83%). This is consistent across the regions. On the other hand, Muslim youths were more condom users than Christians across the regions. This is different from what is expected, as Islam does not support condom use. It could also be that there is an over sampling of Catholics and evangelical Christians.

The table also shows that among male and female youths from the North, higher level of education does not increase condom use. There is an interesting relationship between poverty and likelihood of condom use. Youths from low income households are more likely to be never users in all the regions.

It is interesting to observe from the table that youths who are aware of HIV/AIDS and its transmission routes reported never use of condoms in their sexual act. For example, 53% males and 67% females who reported awareness of HIV/AIDS never used condoms. A little above half of males (53%) and females (56%) who reported route of transmission of HIV/AIDS through multiple sex partner never used condoms. About 53% of male and 66% of female youths who reported either high or low personal risk perception of HIV/AIDS never used condoms. Across the regions, males and females who reported not knowing their self-assessed risk, were predominantly never users of condom.

4.3.3 Relationship between Multiple Sex Partnerships and Pattern of Condom Use

Here it is pertinent to examine multiple sex partnerships by pattern of condom use. Table 4.4 shows that among male and female youths that reported multiple sex partnerships, 31% of males and 46% of females never used condom. Gender differences exist in pattern of condom use and multiple sex partnerships in Nigeria and across the regions. In the North, more males with multiple sex partners are never users while in the South, more

females with multiple sex partners are never users of condoms. In Nigeria generally, more females with multiple sex partners are never users of condoms.

Table 4.4 Relationships between Multiple sexual Partnerships and Pattern of Condom use Among Sexually Experienced Nigerian Youths According to Region and Gender, NDHS 2003

| Characteristic | North | | | South | | | Total | | |
|----------------------------------|-------|------|-------|-------|------|-------|-------|------|-------|
| | High | Low | Never | High | Low | Never | High | Low | Never |
| Multiple sex partnerships | | | | | | | | | |
| % Male 2+ | 35.3 | 17.7 | 47.1 | 52.3 | 29.6 | 18.2* | 44.9 | 24.4 | 30.8* |
| % Female 2+ | 16.7 | 50.0 | 33.3* | 31.6 | 21.1 | 47.4* | 29.6 | 25.0 | 45.5* |

* P < 0.05, ** P < 0.01, *** P < 0.001

CHAPTER 5

CORRELATES OF HIV RISK BEHAVIOR AND CONDOM USE

5.1 Introduction

This chapter discusses the result of multivariate regression analyses of correlates of gender differences in HIV risk behaviors among never married, sexually experienced Nigerian adolescents and young adults across the geopolitical regions and the country in total. As noted in Chapter 3, two sets of logistic regression were implemented. One is the binary logistic model which was used to examine the predictors of multiple sexual partnerships, because it is a binary dependent variable. The multinomial logistic model was used to predict the correlates of patterns of condom use among sexually experienced Nigerian youths interviewed in the 2003 round of DHS.

Twelve binary logistic models are used to identify the correlates of multiple sex partnerships. Six of these identified the socio-demographic correlates of multiple sex partnerships among males and females in the Northern region, males and females in the Southern region; males and females in the total sample. The other six identified HIV-related variables and multiple sex partnerships by sex and by region as explained above. Similarly, twelve multinomial logistic models are used to identify the correlates of pattern of condom use. Six of these identified the socio-demographic correlates of pattern of condom use by sex and by the regions, while the other six multinomial regression models identified HIV-related variables and pattern of condom use by sex and by region. Six final models identified the correlates of multiple sex partnerships (social, demographic and HIV-related variables) across the regions and by gender. Another six final models identified the correlates of pattern of condom use by region and by gender.

5.2 Correlates of HIV Risk Behaviour and Condom Use

5.2.1 Correlates of Multiple Sex Partnerships

Table 5.1 shows the socio-demographic and HIV-related characteristics that determine multiple sex partnerships among Northern youths. The main determinants of multiple sex partnerships among Northern male youths are knowledge of transmission of HIV/AIDS by non-use of condoms, household income and age at first sex. Among Northern females, the main determinant of multiple sex partnership is personal risk perception of HIV/AIDS. In the South, Table 5.2 shows that the main determinants of multiple sex partnerships among Southern male youths are age group and age at first sex, while among Southern females the correlates are age group, knowledge of transmission by non-use of condoms, age at first sex and personal risk perception of HIV/AIDS. Overall, the correlate of multiple sex partnerships among Nigerian male youths is transmission by non-use of condoms while for Nigerian females, the correlates are age group, age at first sex, transmission by non-use of condoms and personal risk perception of contacting HIV/AIDS (Table 5.3). This shows that among Nigerian male youths, knowledge of transmission of HIV/AIDS by non-use of condoms are the main correlates of multiple sex partnerships in the North and generally in Nigeria, but not in the South. Among the females, however, the correlates of multiple sex partnerships are the same overall and in the South but only personal risk perception in the North. This could be as a result of over sampling of Southern females.

Table 5.1 Adjusted Odds Ratio (and 95%) confidence interval from binary logistic regression analyses assessing predictors of multiple sex partnerships by never married, sexually experienced Northern Nigerian Youths aged 15-24, controlling for gender, NDHS 2003

| Variables | Male | | | Female | | |
|---|----------|----------|----------|---------|---------|---------|
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| Socio-demographic characteristics | | | | | | |
| Age group | | | | | | |
| 20-24 | 0.59 | | | | | |
| Residence | | | | | | |
| Urban | 0.81 | | | 0.60 | | |
| Religion | | | | | | |
| Islam/Others | 1.48 | | | 1.34 | | |
| Education | | | | | | |
| Post primary | 1.61 | | | 2.64 | | |
| Wealth Index | | | | | | |
| Middle | 0.37 | | | | | |
| High | 0.12 ** | | 0.14 *** | 1.22 | | |
| Age at first sex | | | | | | |
| 16+ years | 16.32 ** | | 9.79 ** | 0.34 | | |
| <u>HIV-Related Variables</u> | | | | | | |
| HIV/AIDS | | | | | | |
| can be contacted via multiple sex partnerships | | | | | | |
| % Disagree | | RC | | | RC | |
| % Agree | | 1.39 | | | 0.48 | |
| HIV/AIDS | | | | | | |
| can be contacted by not using condom | | | | | | |
| % Agree | | 7.52 *** | 6.93 *** | | | |
| Personal risk | | | | | | |

| | | | | |
|-------------------|-------|--|------|-------|
| perception | | | | |
| No risk at all | 1.22 | | 0.22 | |
| Don't know | 4.47* | | 1.46 | 0.10* |

Note: The reference categories are: age 15-19, Rural, Christian, Low, <16 years, and the opposites of the HIV variables. P < 0.05, ** P < 0.01, *** P < 0.001

Table 5.2 Adjusted Odds Ratio (and 95%) confidence interval from binary logistic regression analyses assessing predictors of multiple sex partnerships by never married, sexually experienced Southern Nigerian Youths aged 15-24, controlling for gender, NDHS 2003

| Variables | Male | | | Female | | |
|---|---------|---------|---------|---------|---------|---------|
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| Socio-demographic characteristics | | | | | | |
| Age group | | | | | | |
| 20-24 | 4.99** | | 4.24** | 2.90** | | 3.66** |
| Residence | | | | | | |
| Urban | 2.26 | | | 0.67 | | |
| Religion | | | | | | |
| Islam/Others | 0.57 | | | 0.50 | | |
| Education | | | | | | |
| Post primary | 1.92 | | | 1.74 | | |
| Wealth Index | | | | | | |
| Middle | 0.90 | | | 0.82 | | |
| High | 0.87 | | | 0.90 | | |
| Age at first sex | | | | | | |
| 16+ years | 0.22** | | 0.24** | 0.25*** | | 0.23** |
| <u>HIV-Related Variables</u> | | | | | | |
| HIV/AIDS | | | | | | |
| can be contacted via multiple sex partnerships | | | | | | |
| % Agree | | 1.41 | | | 1.28 | |

| | | | |
|---|------|--------|--------|
| HIV/AIDS | | | |
| can be contacted by not using condom | | | |
| % Agree | 1.47 | 5.89** | 7.28** |
| Personal risk perception | | | |
| No risk at all | 0.48 | 0.50 | 0.41* |
| Don't know | 0.67 | 1.34 | |

Note: The reference categories are: age 15-19, Rural, Christian, Low, <16 years, and the opposites of the HIV variables. P < 0.05, ** P < 0.01, *** P < 0.001

Table 5.3 Adjusted Odds Ratio (and 95%) confidence interval from binary logistic regression analyses assessing predictors of multiple sex partnerships by never married, sexually experienced Nigerian Youths aged 15-24, controlling for gender, NDHS 2003

| Variables | Male | | | Female | | |
|--------------------------------|---------|---------|---------|---------|---------|---------|
| | Model 1 | Model 2 | Model 3 | Model 1 | Model 2 | Model 3 |
| Socioeconomic variables | | | | | | |
| Age group | | | | | | |
| 20-24 | 1.92* | | | 3.95*** | | 5.01*** |
| Residence | | | | | | |
| Urban | 1.14 | | | 0.65 | | |
| Religion | | | | | | |
| Islam/Others | 1.29 | | | 0.58 | | |
| Education | | | | | | |
| Post primary | 1.37 | | | 1.78 | | |
| Wealth Index | | | | | | |
| Middle | 0.68 | | | 0.76 | | |
| High | 0.54 | | | 1.07 | | |
| Age at first sex | | | | | | |
| 16+ years | 0.77 | | | 0.27*** | | 0.23*** |

| HIV-Related Variables | | | | |
|---|--------|---------|--------|--------|
| HIV/AIDS | | | | |
| can be contacted via multiple sex partnerships | | | | |
| % Agree | 1.04 | | 1.09 | |
| HIV/AIDS | | | | |
| can be contacted by not using condom | | | | |
| % Agree | 3.11** | 3.48*** | 4.15** | 4.72** |
| Personal risk perception | | | | |
| No risk at all | 0.67 | | 0.49 | 0.38** |
| Don't know | 1.76 | | 1.25 | |

Note: The reference categories are: age 15-19, Rural, Christian, Low, <16 years, and the opposites of the HIV variables. P < 0.05, ** P < 0.01, *** P < 0.001

5.3 Correlates of Condom Use

5.3.1 Correlates of condom use in the North

Model 1 of Table 5.4 shows religion and wealth index as the significant predictors of low condom use compared to high condom use among Northern males. Similarly, the significant predictor of never use of condom compared to high condom use was level of education among males from the North. Northern males of the Islamic faith were less likely to be low condom users compared to high users of condoms. Also, those from high income households were 8 times more likely to be low condom users compared to high condom users. Level of education was a significant predictor of having never used condom compared to high condom users. Northern males with post primary education were less likely to be never users of condom. In model 2, correct knowledge of route of transmission of HIV/AIDS was the only significant predictor of never having used condom compared to high condom users. In model 3, religion, wealth, education and

knowledge of route of transmission of HIV/AIDS were the correlates that significantly predicted pattern of condom use among Northern males. Among Northern females, knowledge of route of transmission of HIV/AIDS remained the only significant predictor of condom use.

Table 5.4: Results from multinomial logistic model (odds Ratios and 95% confidence Interval) predicting Pattern of condom use by never married, sexually experienced Northern Nigerian youths aged 15-24, controlling for gender, NDHS 2003

| Variable | Male | | | | | | Female | | | | | |
|---|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| | Model 1 | | Model 2 | | Model 3 | | Model 1 | | Model 2 | | Model 3 | |
| | Low vs. High | Never vs. High | Low vs. High | Never vs. High | Low vs. High | Never vs. High | Low vs. High | Never vs. High | Low vs. High | Never vs. High | Low vs. High | Never vs. High |
| <u>Socio-demographic characteristics</u> | | | | | | | | | | | | |
| Age group | | | | | | | | | | | | |
| 20-24 | 0.69 | 0.64 | | | | | 0.52 | 0.37* | | | | |
| Residence | | | | | | | | | | | | |
| Urban | 0.32 | 0.51 | | | | | 0.46 | 1.03 | | | | |
| Religion | | | | | | | | | | | | |
| Islam/Others | 0.27* | 0.55 | | | 0.20* | | 1.36 | 1.36 | | | | |
| Education | | | | | | | | | | | | |
| Post primary | 0.31 | 0.11** | | | | 0.11** | 2.19 | 0.35 | | | | |
| Wealth Index | | | | | | | | | | | | |
| Middle | 1.68 | 1.16 | | | | | 4.82 | 1.05 | | | | |
| High | 8.19* | 1.01 | | | 7.71* | | 2.07 | 0.29 | | | | |
| Age at first sex | | | | | | | | | | | | |
| 16+ years | 1.89 | 0.33 | | | | | 0.80 | 1.20 | | | | |
| <u>HIV-Related Variables</u> | | | | | | | | | | | | |
| HIV/AIDS can be contacted via | | | | | | | | | | | | |

| | | | | | | |
|--|------|--------|--------|------|-------|-------|
| multiple sex partnerships | | | | | | |
| % Agree | 2.08 | 0.98 | | 1.11 | 0.64 | |
| HIV/AIDS can be contacted by not using condom | | | | | | |
| % Agree | 0.91 | 0.21** | 0.18** | 0.27 | 0.11* | 0.11* |
| Personal risk perception | | | | | | |
| No risk at all | 1.01 | 1.47 | | 0.32 | 0.18 | |
| Don't know | 0.67 | 3.24 | | 0.32 | 0.20 | |

Outcome High condom use is the comparison group. *P < 0.05, ** P < 0.01, *** P < 0.001, reference categories include age 15-19, Rural, Christian, Low, <16 years, and the opposites of the HIV variables.

5.3.2 Correlates of condom use in the South

As shown in Table 5.5, among Southern males, the significant correlates of low condom use compared to high condom use were age group, level of education, and age at first sex. Southern males aged 20-24 who had post-primary education, and initiated sex from 16 years and above, were less likely to be low condom users. The predictors of never use of condoms compared to high condom use were similarly age group, religion, education, wealth index, age at first sex, knowledge of transmission of HIV/AIDS and personal risk perception. This result shows that poverty, primary or no education, sexual initiation before 16 years of age, lack of correct knowledge of route of transmission of HIV/AIDS belonging to the Christian religion and personal risk perception of contacting HIV/AIDS were the significant correlates of never having used condoms among Southern male youths (Model 3). Among Southern females, the significant correlates of low condom use were place of residence, transmission through multiple sex partnerships and transmission through lack of condom use. This result shows that Southern females who reside in urban

areas were more knowledgeable of the routes of transmission of HIV/AIDS and therefore less likely to report having never used condoms (Table 5.5, Model 3).

Table 5.5: Results from multinomial logistic model (odds Ratios and 95% confidence Interval) predicting Pattern of condom use by never married, sexually experienced Southern Nigerian youths aged 15-24, controlling for gender, NDHS 2003

| Variable | Male | | | | | | Female | | | | | |
|---|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|
| | Model 1 | | Model 2 | | Model 3 | | Model 1 | | Model 2 | | Model 3 | |
| | Low vs. High | Never vs. High | Low vs. High | Never vs. High | Low vs. High | Never vs. High | Low vs. High | Never vs. High | Low vs. High | Never vs. High | Low vs. High | Never vs. High |
| <u>Socio-demographic characteristics</u> | | | | | | | | | | | | |
| Age group | | | | | | | | | | | | |
| 20-24 | 0.26* | 0.15*** | | | 0.29* | 0.18** | 1.80 | 1.55 | | | | |
| Residence | | | | | | | | | | | | |
| Urban | 0.74 | 0.85 | | | | | 1.99 | 0.87 | | | 2.25* | |
| Religion | | | | | | | | | | | | |
| Islam/Others | 0.26* | 0.24* | | | | 0.28* | 0.96 | 0.36* | | | | |
| Education | | | | | | | | | | | | |
| Post primary | 0.17* | 0.07** | | | 0.17* | 0.08** | 0.75 | 0.47 | | | | |
| Wealth Index | | | | | | | | | | | | |
| Middle | 0.44 | 0.38 | | | | | 1.28 | 1.10 | | | | |
| High | 0.36 | 0.21* | | | | 0.19* | 0.60 | 0.61 | | | | |
| Age at first sex | | | | | | | | | | | | |
| 16+ years | 0.22** | 0.25* | | | 0.20** | 0.23* | 1.29 | 0.77 | | | | |
| <u>HIV-Related Variables</u> | | | | | | | | | | | | |
| HIV/AIDS can be contacted via multiple sex | | | | | | | | | | | | |

| | | | | | | |
|--|------|--------|-------|------|-------|-------|
| partnerships | | | | | | |
| % Agree | 0.58 | 0.98 | | 0.87 | 0.45* | 0.49* |
| HIV/AIDS can be contacted by not using condom | | | | | | |
| % Agree | 0.32 | 0.10** | 0.16* | 0.93 | 0.24* | 0.21* |
| Personal risk perception | | | | | | |
| No risk at all | 0.82 | 0.44* | 0.37* | 1.14 | 1.28 | |
| Don't know | 1.64 | 1.92 | | 1.16 | 1.73 | |

Outcome High condom use is the comparison group. *P < 0.05, ** P < 0.01, *** P < 0.001, reference categories include age 15-19, Rural, Christian, Low, <16 years, and the opposites of the HIV variables.

5.3.3 Correlates of Condom Use in Nigeria

As Table 5.6 shows, age group, religion, education, wealth index, age at first sex, knowledge of route of transmission of HIV/AIDS and personal risk perception of contacting HIV/AIDS are the significant correlates of having never used condom among Nigerian males in this study (Model 3). This result shows that poverty, poor knowledge of route of transmission of HIV/AIDS, belonging to Christian religion, in the age group 15-19 years, having primary or no education, sexual initiation before the age of 16 years and perception of risk of contacting HIV/AIDS among Nigerian males predicted having never used condoms.

Among Nigerian females generally, the significant correlates of condom use were level of education, wealth index, and knowledge of routes of transmission of HIV/AIDS through multiple sex partners and by not using condoms. Nigerian female youths from high income households, with post-primary education, who agreed to correct routes of transmission of HIV/AIDS through multiple sex partners and by not using condom were less likely to report having never used condom. Among Nigerian females, poverty,

primary or no education, agreeing to the correct routes of transmission of HIV/AIDS, were the predictors of having never used condom.

Table 5.6: Results from multinomial logistic model (odds Ratios and 95% confidence Interval) predicting Pattern of condom use by never married, sexually experienced Nigerian youths aged 15-24, controlling for gender, NDHS 2003

| Variable | Male | | | | | | Female | | | | | |
|--|---------|---------|---------|-------|---------|---------|---------|-------|---------|-------|---------|-------|
| | Model 1 | | Model 2 | | Model 3 | | Model 1 | | Model 2 | | Model 3 | |
| | Low | Never | Low | Never | Low | Never | Low | Never | Low | Never | Low | Never |
| | vs. | vs. | vs. | vs. | vs. | vs. | vs. | vs. | vs. | vs. | vs. | vs. |
| High | | High | | High | | High | | High | | High | | |
| <u>Socio-demographic characteristics</u> | | | | | | | | | | | | |
| Age group | | | | | | | | | | | | |
| 20-24 | 0.39* | 0.29*** | | | 0.36* | 0.28** | 1.40 | 1.16 | | | | |
| Residence | | | | | | | | | | | | |
| Urban | 0.55 | 0.73 | | | | | 1.45 | 0.95 | | | | |
| Religion | | | | | | | | | | | | |
| Islam/Others | 0.32* | 0.53 | | | 0.29** | 0.10*** | 0.96 | 0.60 | | | | |
| Education | | | | | | | | | | | | |
| Post primary | 0.24* | 0.10*** | | | 0.22* | 0.42* | 0.93 | 0.42* | | | | 0.34* |
| Wealth Index | | | | | | | | | | | | |
| Middle | 0.77 | 0.67 | | | | | 1.37 | 1.11 | | | | |
| High | 1.12 | 0.36* | | | | 0.36* | 0.74 | 0.49 | | | | 0.45* |
| Age at first sex | | | | | | | | | | | | |
| 16+ years | 0.44 | 0.31** | | | | 0.28** | 1.12 | 0.81 | | | | |
| <u>HIV-Related Variables</u> | | | | | | | | | | | | |
| HIV/AIDS can be contacted via multiple sex partnerships | | | | | | | | | | | | |
| % Agree | | | 1.03 | 1.08 | | | | 0.94 | 0.53* | | | 0.51* |
| HIV/AIDS | | | | | | | | | | | | |

| | | | | | | |
|---|------|---------|---------|------|--------|--------|
| can be contacted by not using condom | | | | | | |
| % Agree | 0.55 | 0.19*** | 0.19*** | 0.73 | 0.22** | 0.21** |
| Personal risk perception | | | | | | |
| No risk at all | 0.73 | 0.61 | 0.50* | 0.99 | 1.03 | |
| Don't know | 0.97 | 2.82* | | 0.92 | 1.31 | |

Outcome High condom use is the comparison group. *P < 0.05, ** P < 0.01, *** P < 0.001, reference categories include age 15-19, Rural, Christian, Low, <16 years, and the opposites of the HIV variables.

5.4 Summary

This section has shown that there are different correlates of HIV risk behaviors in Nigeria and across the regions.

CHAPTER 6

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter discusses the findings of this study and relates the work to other studies and findings in the area. It discusses regional patterns and determinants of HIV risk behaviors among never married sexually experienced Nigerian male and female youths aged 15-24 years. Recommendations based on the findings are also made. The results of this study support the research hypotheses that there are regional variations in HIV risk behaviors among Nigerian youths; and gender differences in HIV risk behaviors cut across all the regions. It also shows that, as hypothesized, age, level of education, religion, socio-economic status, rural-urban residence as well as knowledge and perception of HIV/AIDS affect HIV risk behaviors. Lack of qualitative tool is an important limitation in this study. The derivation of pattern of condom use (composite of four different variables), need to be revisited

6.2 Summary of Major Findings/Discussion

The main research questions for this study is whether gender differences in HIV risk behaviour reported in literature exist across Nigeria's different regions. Thus the main objective of this study is to examine regional pattern and correlates of gender differences in HIV risk behaviors among never married; sexually experienced Nigerian youths aged 15-24 years. This study shows a high prevalence of HIV risk sexual behaviour among sexually active youths in Nigeria. Consistent condom use is very negligible among youths in this study. The study further shows that there are gender differences and regional variations in HIV risk behaviors among these youths. Generally, male youths reported having multiple sex partnerships than female youths ((Ladipo, 2004, Makinwa-Adebusoye, 1992, Owolabi et al 2005, Osho and Olayinka 1999 and Van Rossem et al, 2001). However by region, it is shown that male youths in the North engage in multiple sex partnerships than their female counterparts. The pattern is the same in the South.

High multiple partnerships seen in this study is not surprising, as most male youths usually put up a defense that multiple sex partnerships is as a result of quest for variety and a demonstration of power. The patriarchal system that prevails in Nigeria also empowers men to have multiple sex partners as against women. More females from the South engaged in multiple sex partnerships than females from the North. This could be due to more liberal nature of the South compared to the North where the practice of child betrothal and early marriage is prevalent.

There is also a high level of inconsistent condom use as a high proportion of youths reported having never used condoms across the regions. The present result however differs from findings by Olley and Rotimi (2003), which found more males than females who reported having never used condoms. The inconsistent and never use of condoms in the general sample may be as a result of deep rooted gender and sexual norms which allows male dominance over females in sexual decision-making, lack of condom negotiation power by the females for fear of losing their partners, who most of the time equate condom use to unfaithfulness of the woman, as well as socio-cultural barriers to condom use which increased its unacceptability in Nigeria.

This study shows that there is an association between pattern of condom use and multiple sex partnerships, as number of sexual partners increase with condom use among male youths. A higher percentage of male youths who reported multiple sex partnerships reported themselves as high condom users (45%), while 31% of males and 46% of females reported never users of condom. Never married youths who are condom users may engage more in multiple sex partnerships due to the dual protective effect of condom against HIV/AIDS and other STIs, as well as unwanted pregnancies. It can therefore be inferred that condom use promotes sexual promiscuity among never married youths.

Awareness of HIV/AIDS is very high among the youths, but correct knowledge of its transmission routes is very low. This has been reported by other studies (Uwalaka and Matsuo, 2002; Araoye et al, 1996). Gender differences occur in the knowledge of transmission routes of HIV/AIDS. More males agreed that HIV can be contacted through

sexual intercourse without condoms than females across the regions. High level of awareness of HIV/AIDS did not translate into high level of personal risk perception of contacting HIV/AIDS. This study shows a clear gender difference in personal risk perception in favor of males. Asuquo et al (2004) and Adedimeji et al (2005) found significant gender differences in HIV risk perception in favor of males in their studies in different settings in Nigeria, while Ladipo (2004) however found low HIV risk perception among Nigerian adolescents, with more females perceiving risk. Reasons given for low risk perception among females by Adedimeji et al are that “most females do not associate any significant risk with their partner, either because they are unwilling to acknowledge that their partners pose a risk or because they are not fully aware of their partners’ sexual practices”. Generally, denial could be a reason for reported low personal risk. Many Nigerians associate HIV/AIDS with commercial sex workers and homosexuality. A report of self perceived risk may therefore be seen as implying “bad” sexual behavior.

This study also shows knowledge of route of transmission of HIV/AIDS to be the most important correlate of multiple sex partnerships among Nigerian male youths. Male youths who agreed that HIV can be transmitted by non-use of condoms reported more likelihood of having multiple sex partners. The findings of this study show that there are gender differences as well as regional variations in multiple sex partnerships in Nigeria. among Nigerian male youths, the correlate of multiple sex partnerships is agreeing that HIV can be transmitted by not using condoms while among the females, the correlates are age group, age at first sex, agreeing that HIV can be transmitted by not using condoms and personal risk perception of contacting HIV/AIDS. Regionally, among Northern males, the correlates are household income, route of transmission by non-use of condoms and age at first sex while among Northern females; the correlate is personal risk perception of contacting HIV/AIDS. This shows that poverty has a stronger effect on multiple partnerships among males in the North as it appears that poverty does not allow the knowledge of HIV/AIDS transmission to be translated into action. Omoteso (2006) found poverty to increase the odds of male and female having multiple sexual partners. Northern females who perceived no risk at all were less likely to have multiple sex

partners compared to those who perceive risk. Females who are culturally socialized may have traditional beliefs that multiple sex partnerships is acceptable for males, therefore they may not perceive themselves to be at risk. Also, as polygyny is more prevalent in the North, never married females may not attribute risk of contacting HIV/AIDS to their male partners with multiple sex partners due to its cultural acceptance.

Age group and age at first sex were the predictors of multiple sex partnerships among Southern males. The study shows that male youths aged 20-24 who had first sex before the age of 16 years were more likely to engage in multiple sex partnerships. This result shows that age matters indeed in HIV risk behavior. Age group as a predictor of multiple sex partnership agrees with findings by Adedimeji et al (2005). The finding that youths aged 20-24 years engaged more in multiple sex partnerships was not expected, as youths aged 15-19 years were expected to be fun-seeking, show more care-free attitudes towards sexuality, and expected to be more prone to sexual coercion as a result of lack/low knowledge of safe sex. The finding that lower age at sexual debut increases multiple sex partnerships agrees with findings by Glick and Shan (2005) which showed that youths with younger age at sexual initiation do not have enough information about HIV/AIDS, have a longer period of exposure to premarital sex and they are subject to exploitation and sexual coercion by older people. This means that among male youths in the South, age matters.

Similar to the findings among Southern males, age matters so much in determining multiple sex partnerships among Southern females. This study has shown that there is regional variation as well as gender differences in the correlates of multiple sex partnerships as HIV risk behavior among Nigerian youths, probably as a result of the multi-cultural and multi-ethnic nature of the country.

The predictors of having never used condom among Nigerian male youths were age group, religion, level of education, household income, age at first sex, transmission of HIV/AIDS by not using condom and personal risk perception of contacting HIV/AIDS. In this study, gender differences exist in the correlates of non-use of condoms in Nigeria

generally and within the regions. Among Nigerian females, household income and level of education predispose young women to HIV risk behavior by having never used condoms. In the North, the predictors of having never used condom were level of education and transmission of HIV by not using condoms. Poor Nigerian males youth aged 15-19 years, with primary or no education, who disagreed that HIV can be transmitted by not using condoms, who had first sex before 16 years of age, are more likely never to use condoms despite the perception of risk of contacting HIV/AIDS. This is because they lack correct information about sexual health, are not receptive to the message of HIV education, and most of the time having peers as sources of information about sexuality. These peers pass wrong information to these youths age 15-19 years, who as a result of lack of sexual education do not seek information from correct channels. As a result of poverty, they are unable to afford male condoms. In the same vein, they are unable to access available reproductive health service because of wrong source of information. They are most likely to adhere strongly to traditional gender norms, sexual norms as well as beliefs from their cultural socialization which makes them not to accept condom as a way of preventing HIV. This finding also shows those who reported belonging to Christian religion as having never used condoms. This could be because most of the youths classified as Christians are mainly Catholics and Evangelicals whose believe do not support condom use. This shows that Christian leaders have to accept the fact that many youths who are never married are sexually experienced, and there is need for the church leadership to incorporate teachings of safe sex for those who, contrary to the principle of the church, engage in premarital sex. This is important as most Nigerian youths find the church as their basis for social support.

Among Nigerian females, poverty and primary or no education predisposes the women to HIV risk behavior by having never used condoms. Lack of proper education restricts the young females from having information about safe sex as explained above. It also makes them not to be receptive to HIV education. Poverty combines with lack of information about routes of transmission and prevention of HIV/AIDS and makes these females engage in HIV risk behaviors. Poverty increases their dependency on men for money in exchange for unprotected sex. They are unable to afford condoms and even where

condoms are available, they cannot negotiate condom use with their sex partners. As a result of their lack of education, knowledge of HIV transmissions, they hold traditional gender norms, sexual norms and cultural socialization very strongly.

In the North, the predictors of low condom use were religion and wealth index, while the predictors of having never used condom were level of education and knowledge of route of transmission of HIV by not using condoms. Poor Northern males of Islamic/other religion were less likely to be low condom users. Isiugo-Abanihe and Oyediran (2001) did not find a significant association between Islamic religion and condom use. Northern males with post primary education having correct knowledge of route of transmission of HIV/AIDS by not using condoms were less likely to report having never used condoms. Post primary education increases the level of information of youths, as most interventions on HIV education are targeted towards youths in secondary and tertiary education, promoting correct route of transmission of HIV/AIDS as well as condom use. This agrees with findings by Van Rossen et al (2001) that consistency of condom use increases with increase level of education of study participants. Among Northern females, transmission route of HIV/AIDS predicted having never used condom, as women who know that condom can protect against HIV/AIDS were less likely to be never users of condoms. This agrees with findings by Van Rossem et al (2001) and Osho and Olayinka (1999). Northern female youths need to be well educated on the correct routes of transmission of HIV infection, especially on the protective effect of condoms.

Among Southern male youths, age group, religion, level of education, wealth, age at first sex, knowledge of HIV transmission by not using condom and personal risk perception were the significant predictors of having never used condom. The factors predicting having never used condom among Southern males are intricately woven. An adolescent with primary or no education is not exposed to sources of information on HIV education provided in secondary and tertiary institutions of learning, and thus lacks the correct knowledge of routes of HIV transmission. Even where information is available to the public, he may not be able to understand the dual protection message of condoms. Initiating sex before the age of 16 years and being poor, he may not be able to afford

condoms even when he perceives himself to be at risk of contacting HIV/AIDS. Van Rossem et al (2001) and Glick and Shan (2005) showed that education has positive impacts on condom use. Religion and religiosity play important parts in people's lives in Nigeria. Catholicism, one of the Christian religions, frowns at condom use, Islam equally discourages condom use. It is therefore difficult to clearly say why Southern males who reported to be of Islamic religion are less likely to report having never used condom. As suggested by Odimegwu (2005), "religious commitment of youths will be a more important determinant of sexual behavior, than religious affiliation".

Among females from Southern Nigeria, place of residence was the only predictor of low condom use. Urban residence predicting condom use among Southern females is expected because females in urban areas are better exposed to HIV/AIDS education, reproductive health facilities and media. Most urban females do not follow the traditional sexual and gender norms prevalent in the rural areas.

The predictors of having never used condom among Southern females were knowledge of routes of HIV/AIDS transmission through multiple sex partnerships and by not using condoms. Southern females who have correct knowledge of transmission of HIV/AIDS were less likely to be never users of condoms. This agrees with Osho and Olayinka (1999) that knowledge of correct routes of transmission played a role in frequency of condom use. Correct knowledge of routes of transmission as a result of correct information enables Southern females to adapt the message of safe sex by using condoms and not engaging in multiple sex partnerships. It is very important based on the finding of this study for Southern females to have special educational/social support group where they can be taught correct routes of transmission of HIV/AIDS as a way of reducing their HIV risk behaviors.

6.3 Conclusion

In this study, never married, sexually experienced Nigerian youths engage in HIV risk behaviors, including multiple sex partnerships, as well as low and never use of condoms. The findings show that gender differences in HIV risk behaviors exist in Nigeria

generally and gender differences drive HIV risk behaviors in different regions in Nigeria. More males engage in multiple sex partners than females across the regions. Regional variations and gender differences also occur in pattern of condom use among Nigerian youths. More males than females reported inconsistent condom uses while more females than males reported having never used condoms. The major determinants of never having used condom among Nigerian male youths were age group, religion, education, household income, age at first sex, knowledge of HIV transmission by not using condom and personal risk perception. Among Nigerian female youths, the determinants of never having used condom were level of education, household income and knowledge of routes of transmission of HIV/AIDS.

6.4 Recommendations

This study has policy implications. The prevailing multiple sex partnerships, lack of condom use, and inconsistent condom use shown in this study have roots in social norms, gender norms and cultural socialization of male and female youths in the country. Programs need to have gender-specific interventions to address the prevailing gender norms and promote equality between males and females. There is need to re-orientate young men, especially, so that they will understand the risks involved in multiple sex partnerships, lack of and inconsistent condom use. An active promotion and advocacy is needed to let young men know that engaging in multiple sexual relationships and not using condoms does not make a “real man”. Also there is need for a change in the negative norms and ideas shared in different peer groups about condom use.

Apart from gender specific intervention groups, there is need for age group specific interventions whereby different strategies can be used and emphasis placed for male youths aged 15-19 years and 20-24 years. Similar age specific interventions need to be used for females also. This will address the effect of age in HIV risk behaviours seen in this study.

HIV education programs need to find better ways of disseminating correct knowledge of routes of transmission of HIV/AIDS throughout the country, as this was shown to be lacking in many Nigerian youths. Activities that dispel the existing myths and encourage correct routes of transmission among youths should be incorporated into youth programs, in the form of drama, talks and other means that are interesting to youths.

Females also need to be educated about their sexual rights to insist on a man using condoms during sex. They need to be taught skills of condom negotiation, and made to know that asking a man to use condoms during sex is the right thing to do. There is need to create gender-specific peer groups in the communities where females and males alike, will be taught how to use condoms, reasons for consistent condom use, and where males may be gender-sensitized.

Different life skills as well as professional skills need to be taught to the youths, as this will reduce poverty, which was a determinant of both multiple sex partnerships and low condom and never having used condoms. Youths need to be economically empowered in order to reduce poverty and its effect on HIV risk behaviors.

As religion was a determinant of inconsistent and never use of condom in Nigeria, with more Christian males reporting inconsistent and having never used condoms, leaders of Christian organizations in Nigeria need to find means of educating their followers, especially, youth who cannot adhere to the abstinence message to start using condoms in order to reduce their risks of HIV/AIDS. There is need for public health programs and HIV education programs to involve religious leaders in their youth campaigns, as this will encourage the youths to accept the messages of prevention, knowing their religious leaders are in support of such messages. If this has already started, it has to be intensified.

As education is one of the determinants of having never used condoms, government should put more effort in ensuring that both males and females get at least a secondary education. This can be made more realistic by increasing education subsidy, and incorporating life skills in primary school curriculum, where primary school children can be taught about how to prevent HIV risk behaviors, gender equality and gender

sensitivity. This will make it easy for them to adapt to as they grow older. Programs need to organize education and other life skill activities for youths who lack education or are out of school, making the language as simple as possible for ease of understanding of this special group. HIV prevention programs need to target youths from Northern Nigeria, as HIV risk behaviors are more prevalent in the North compared to the South.

Finally, more research needs to be done to find out specific socio-cultural factors responsible for observed regional pattern in HIV risk behaviors.

Future research should explore the use of qualitative research tools. In-depth study needs to be done to explore the specific socio-cultural factors responsible for observed gender differences in HIV risk behaviors across regions in Nigeria.

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APPENDICES

APPENDIX 1: BINARY LOGISTIC REGRESSION: MODEL 1

Northern males

| | | | |
|-----------------------------|---------------|---|--------|
| Logistic regression | Number of obs | = | 104 |
| | LR chi2(7) | = | 29.28 |
| | Prob > chi2 | = | 0.0001 |
| Log likelihood = -51.083529 | Pseudo R2 | = | 0.2228 |

| nopart1 | Odds Ratio | Std. Err. | z | P> z | [95% Conf. Interval] | |
|--------------------|-----------------|-----------------|--------------|--------------|----------------------|-----------------|
| agegp | .5895836 | .321541 | -0.97 | 0.333 | .2024537 | 1.716979 |
| res | .8066289 | .5487196 | -0.32 | 0.752 | .2126342 | 3.059951 |
| religion | 1.478128 | .7482133 | 0.77 | 0.440 | .5480783 | 3.986407 |
| edul | 1.61388 | 1.00948 | 0.77 | 0.444 | .4736373 | 5.499165 |
| _Iwealth1_1 | .3728859 | .2736963 | -1.34 | 0.179 | .0884705 | 1.571641 |
| _Iwealth1_2 | .1163727 | .0900101 | -2.78 | 0.005 | .0255551 | .5299379 |
| ages1 | 16.31715 | 14.69411 | 3.10 | 0.002 | 2.793253 | 95.31872 |

Northern females

| | | | |
|-----------------------------|---------------|---|--------|
| Logistic regression | Number of obs | = | 53 |
| | LR chi2(5) | = | 1.84 |
| | Prob > chi2 | = | 0.8711 |
| Log likelihood = -17.798986 | Pseudo R2 | = | 0.0491 |

| nopart1 | Odds Ratio | Std. Err. | z | P> z | [95% Conf. Interval] | |
|-------------|------------|-----------|-------|-------|----------------------|----------|
| res | .6023829 | .6479539 | -0.47 | 0.637 | .0731605 | 4.95985 |
| religion | 1.340565 | 1.400662 | 0.28 | 0.779 | .1729528 | 10.39078 |
| edul | 2.636764 | 3.492976 | 0.73 | 0.464 | .1965473 | 35.3733 |
| _Iwealth1_2 | 1.216604 | 1.369197 | 0.17 | 0.862 | .134025 | 11.04365 |
| ages1 | .3415047 | .336714 | -1.09 | 0.276 | .0494466 | 2.358616 |

Southern males

| | | | |
|-----------------------------|---------------|---|--------|
| Logistic regression | Number of obs | = | 154 |
| | LR chi2(7) | = | 23.28 |
| | Prob > chi2 | = | 0.0015 |
| Log likelihood = -80.493022 | Pseudo R2 | = | 0.1263 |

| nopart1 | Odds Ratio | Std. Err. | z | P> z | [95% Conf. Interval] | |
|--------------|-----------------|-----------------|--------------|--------------|----------------------|-----------------|
| agegp | 4.992831 | 2.610192 | 3.08 | 0.002 | 1.792045 | 13.91056 |
| res | 2.262367 | 1.075603 | 1.72 | 0.086 | .8909927 | 5.744497 |
| religion | .5732856 | .3248668 | -0.98 | 0.326 | .1888062 | 1.740708 |
| edul | 1.918553 | 1.148268 | 1.09 | 0.276 | .5936403 | 6.200462 |
| _Iwealth1_1 | .8957798 | .6412418 | -0.15 | 0.878 | .220227 | 3.64361 |
| _Iwealth1_2 | .866232 | .4669016 | -0.27 | 0.790 | .3011855 | 2.491348 |
| ages1 | .2195129 | .1026713 | -3.24 | 0.001 | .0877674 | .5490182 |

Southern females

| | | | |
|---------------------|---------------|---|-------|
| Logistic regression | Number of obs | = | 375 |
| | LR chi2(7) | = | 18.92 |

Log likelihood = -106.26734

Number of obs = 140
 LR chi2(14) = 46.21
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.1786

| cdusel | RRR | Std. Err. | z | P> z | [95% Conf. Interval] | |
|--------------------|-----------------|-----------------|--------------|--------------|----------------------|-----------------|
| 1. Low | | | | | | |
| agegp | .6886221 | .4618965 | -0.56 | 0.578 | .1849411 | 2.564061 |
| res | .319934 | .2501438 | -1.46 | 0.145 | .0691098 | 1.48109 |
| religion | .2689525 | .1626062 | -2.17 | 0.030 | .0822332 | .8796383 |
| edul | .3109626 | .3124474 | -1.16 | 0.245 | .0433952 | 2.228303 |
| _Iwealth1_1 | 1.68096 | 1.901688 | 0.46 | 0.646 | .183056 | 15.43586 |
| _Iwealth1_2 | 8.189615 | 8.115042 | 2.12 | 0.034 | 1.174391 | 57.11026 |
| ages1 | 1.893737 | 1.813242 | 0.67 | 0.505 | .2899343 | 12.36915 |
| 2. Never | | | | | | |
| agegp | .6441769 | .352063 | -0.80 | 0.421 | .2206971 | 1.880242 |
| res | .5147737 | .338399 | -1.01 | 0.312 | .1419248 | 1.867129 |
| religion | .5545457 | .2681665 | -1.22 | 0.223 | .2149386 | 1.430738 |
| edul | .1096522 | .0871509 | -2.78 | 0.005 | .0230934 | .5206518 |
| _Iwealth1_1 | 1.155694 | .8587275 | 0.19 | 0.846 | .2693799 | 4.958156 |
| _Iwealth1_2 | 1.01217 | .7576209 | 0.02 | 0.987 | .2334098 | 4.389223 |
| ages1 | .3300916 | .2118105 | -1.73 | 0.084 | .0938517 | 1.160985 |

(Outcome cdusel==0. High is the comparison group)

Northern female

Multinomial logistic regression

Number of obs = 163
 LR chi2(14) = 24.47
 Prob > chi2 = 0.0401
 Pseudo R2 = 0.1066

Log likelihood = -102.56349

| cdusel | RRR | Std. Err. | z | P> z | [95% Conf. Interval] | |
|--------------|-----------------|-----------------|--------------|--------------|----------------------|-----------------|
| 1. Low | | | | | | |
| agegp | .5155978 | .3962044 | -0.86 | 0.389 | .1143448 | 2.324908 |
| res | .4600162 | .3431281 | -1.04 | 0.298 | .1066248 | 1.984669 |
| religion | 1.356295 | 1.144715 | 0.36 | 0.718 | .2593813 | 7.092012 |
| edul | 2.193172 | 2.919347 | 0.59 | 0.555 | .1614477 | 29.79294 |
| _Iwealth1_1 | 4.820578 | 6.424807 | 1.18 | 0.238 | .3536945 | 65.7007 |
| _Iwealth1_2 | 2.065222 | 2.297623 | 0.65 | 0.514 | .2333347 | 18.27908 |
| ages1 | .8040718 | .6673551 | -0.26 | 0.793 | .1580605 | 4.090404 |
| 2. Never | | | | | | |
| agegp | .3655799 | .2188393 | -1.68 | 0.093 | .1130956 | 1.181732 |
| res | 1.032776 | .6279652 | 0.05 | 0.958 | .31365 | 3.400693 |
| religion | 1.358066 | .889364 | 0.47 | 0.640 | .3762619 | 4.901757 |
| edul | .3533229 | .2942146 | -1.25 | 0.212 | .0690828 | 1.807064 |
| _Iwealth1_1 | 1.047266 | 1.061901 | 0.05 | 0.964 | .143536 | 7.641054 |
| _Iwealth1_2 | .2872268 | .2272947 | -1.58 | 0.115 | .0609022 | 1.354617 |
| ages1 | 1.202986 | .7869263 | 0.28 | 0.778 | .3337734 | 4.335799 |

(Outcome cdusel==0. High is the comparison group)

Southern male

Multinomial logistic regression

Number of obs = 201
 LR chi2(14) = 71.14
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.1682

Log likelihood = -175.94647

| cdusel | RRR | Std. Err. | z | P> z | [95% Conf. Interval] | |
|--------|-----|-----------|---|------|----------------------|--|
|--------|-----|-----------|---|------|----------------------|--|

Multinomial logistic regression Number of obs = 335
 LR chi2(6) = 17.63
 Prob > chi2 = 0.0072
 Log likelihood = -331.74721 Pseudo R2 = 0.0259

| cdusel | | RRR | Std. Err. | z | P> z | [95% Conf. Interval] |
|-------------|--|-----------------|----------------|--------------|--------------|--------------------------|
| 1. Low | | | | | | |
| get5 | | 1.060189 | .3782276 | 0.16 | 0.870 | .5268813 2.133308 |
| get7 | | .5934116 | .2351174 | -1.32 | 0.188 | .27296 1.29007 |
| pcp2 | | .8894809 | .2170493 | -0.48 | 0.631 | .5513509 1.434978 |
| 2. Never | | | | | | |
| get5 | | 1.20124 | .3605646 | 0.61 | 0.541 | .667011 2.16335 |
| get7 | | .2483263 | .091229 | -3.79 | 0.000 | .1208682 .5101917 |
| pcp2 | | 1.19951 | .2424248 | 0.90 | 0.368 | .8071852 1.78252 |

(Outcome cdusel==0. High is the comparison group)

Nigeria female

Multinomial logistic regression Number of obs = 583
 LR chi2(6) = 24.23
 Prob > chi2 = 0.0005
 Log likelihood = -486.7981 Pseudo R2 = 0.0243

| cdusel | | RRR | Std. Err. | z | P> z | [95% Conf. Interval] |
|-------------|--|-----------------|-----------------|--------------|--------------|--------------------------|
| 1. Low | | | | | | |
| get5 | | .9421131 | .2894662 | -0.19 | 0.846 | .5159049 1.720428 |
| get7 | | .7303013 | .3869854 | -0.59 | 0.553 | .2584948 2.063252 |
| pcp2 | | .9616015 | .2245513 | -0.17 | 0.867 | .608449 1.519729 |
| 2. Never | | | | | | |
| get5 | | .5193644 | .137054 | -2.48 | 0.013 | .3096352 .8711522 |
| get7 | | .215852 | .1135354 | -2.91 | 0.004 | .0769901 .6051698 |
| pcp2 | | 1.141765 | .2237886 | 0.68 | 0.499 | .77757 1.676541 |

(Outcome cdusel==0. High is the comparison group)

APPENDIX 6: MULTINOMIAL REGRESSION: MODEL 3

Northern male

Multinomial logistic regression Number of obs = 137
 LR chi2(22) = 64.66
 Prob > chi2 = 0.0000
 Log likelihood = -95.593072 Pseudo R2 = 0.2527

| cdusel | | RRR | Std. Err. | z | P> z | [95% Conf. Interval] |
|--------------------|--|-----------------|-----------------|--------------|--------------|--------------------------|
| 1. Low | | | | | | |
| agegp | | .722337 | .5146385 | -0.46 | 0.648 | .1787682 2.918701 |
| res | | .2903199 | .2404525 | -1.49 | 0.135 | .0572643 1.471872 |
| religion | | .2034196 | .1343246 | -2.41 | 0.016 | .0557592 .7421108 |
| edul | | .2172408 | .2284904 | -1.45 | 0.147 | .0276478 1.706953 |
| _Iwealth1_1 | | 1.348002 | 1.598828 | 0.25 | 0.801 | .1318571 13.78089 |
| _Iwealth1_2 | | 7.70715 | 7.877848 | 2.00 | 0.046 | 1.039537 57.14099 |

| | | | | | | |
|-------------|-----------------|-----------------|--------------|--------------|-----------------|-----------------|
| ages1 | 2.321585 | 2.303378 | 0.85 | 0.396 | .3320923 | 16.2297 |
| get5 | 2.875416 | 1.936233 | 1.57 | 0.117 | .7682861 | 10.76164 |
| get7 | 1.064135 | .7353794 | 0.09 | 0.928 | .2746421 | 4.123126 |
| _Ipcp2_1 | .8080315 | .6082067 | -0.28 | 0.777 | .1848108 | 3.532882 |
| _Ipcp2_2 | 1.109405 | 1.167034 | 0.10 | 0.921 | .1411471 | 8.719833 |
| ----- | | | | | | |
| 2. Never | | | | | | |
| agegp | .543184 | .3257667 | -1.02 | 0.309 | .1676684 | 1.759717 |
| res | .3612492 | .2550016 | -1.44 | 0.149 | .0905636 | 1.440987 |
| religion | .667813 | .3673135 | -0.73 | 0.463 | .2272339 | 1.962621 |
| edu1 | .1057849 | .0906953 | -2.62 | 0.009 | .0197079 | .5678146 |
| _Iwealth1_1 | 1.26718 | .9948503 | 0.30 | 0.763 | .2719997 | 5.90348 |
| _Iwealth1_2 | 1.233538 | .9996227 | 0.26 | 0.796 | .2519786 | 6.038668 |
| ages1 | .3572237 | .2480178 | -1.48 | 0.138 | .091613 | 1.392911 |
| get5 | 1.369648 | .7604593 | 0.57 | 0.571 | .4613207 | 4.066447 |
| get7 | .1770444 | .1102154 | -2.78 | 0.005 | .0522617 | .5997642 |
| _Ipcp2_1 | 1.315378 | .8281122 | 0.44 | 0.663 | .3829714 | 4.517882 |
| _Ipcp2_2 | 3.95578 | 3.155353 | 1.72 | 0.085 | .8284491 | 18.88854 |

(cdusel==0. High is the base outcome)

Northern female

Multinomial logistic regression

Number of obs = 146

LR chi2(22) = 31.37

Prob > chi2 = 0.0888

Log likelihood = -90.760187

Pseudo R2 = 0.1473

| cdusel | RRR | Std. Err. | z | P> z | [95% Conf. Interval] |
|-------------|-----------------|-----------------|--------------|--------------|---------------------------------|
| ----- | | | | | |
| 1. Low | | | | | |
| agegp | .6098028 | .5070486 | -0.59 | 0.552 | .119514 3.111431 |
| res | .3128073 | .2533541 | -1.43 | 0.151 | .0639525 1.530017 |
| religion | 2.236269 | 2.167081 | 0.83 | 0.406 | .3347016 14.94137 |
| edu1 | 1.208542 | 1.836412 | 0.12 | 0.901 | .0614948 23.75118 |
| _Iwealth1_1 | 2.901217 | 4.043813 | 0.76 | 0.445 | .188863 44.56701 |
| _Iwealth1_2 | 2.205518 | 2.587135 | 0.67 | 0.500 | .2213231 21.97831 |
| ages1 | .9823305 | .8998443 | -0.02 | 0.984 | .1631291 5.915397 |
| get5 | .8440152 | .6635515 | -0.22 | 0.829 | .1807794 3.940503 |
| get7 | .1407024 | .1951588 | -1.41 | 0.157 | .0092823 2.132777 |
| _Ipcp2_1 | .1573513 | .2457031 | -1.18 | 0.236 | .0073743 3.357506 |
| _Ipcp2_2 | .1840289 | .2960048 | -1.05 | 0.293 | .007866 4.30544 |
| ----- | | | | | |
| 2. Never | | | | | |
| agegp | .4425246 | .2959669 | -1.22 | 0.223 | .1193003 1.641471 |
| res | .7963102 | .5322231 | -0.34 | 0.733 | .2148681 2.951159 |
| religion | 2.173088 | 1.756569 | 0.96 | 0.337 | .4456837 10.59566 |
| edu1 | .2115293 | .2367992 | -1.39 | 0.165 | .0235767 1.897837 |
| _Iwealth1_1 | .9887308 | 1.061285 | -0.01 | 0.992 | .1206187 8.104787 |
| _Iwealth1_2 | .3424066 | .2988703 | -1.23 | 0.219 | .0618827 1.894589 |
| ages1 | .9507305 | .7017691 | -0.07 | 0.945 | .2237455 4.039807 |
| get5 | .4523063 | .2891609 | -1.24 | 0.215 | .1291983 1.583466 |
| get7 | .1105203 | .1119335 | -2.17 | 0.030 | .0151829 .8045038 |
| _Ipcp2_1 | .0951883 | .1321509 | -1.69 | 0.090 | .006264 1.446491 |
| _Ipcp2_2 | .0754265 | .1073459 | -1.82 | 0.069 | .0046356 1.227275 |

(cdusel==0. High is the base outcome)

Southern male

Multinomial logistic regression

Number of obs = 198

LR chi2(22) = 81.39

Prob > chi2 = 0.0000

Log likelihood = -168.58031

Pseudo R2 = 0.1944

Nigeria male

Multinomial logistic regression

Number of obs = 335
 LR chi2(22) = 118.34
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.1737

Log likelihood = -281.39246

| cdusel | RRR | Std. Err. | z | P> z | [95% Conf. Interval] |
|-------------|----------|-----------|-------|-------|----------------------|
| 1. Low | | | | | |
| agegp | .3646657 | .1482718 | -2.48 | 0.013 | .1643612 .8090784 |
| res | .5262739 | .2138398 | -1.58 | 0.114 | .2373258 1.167021 |
| religion | .2873184 | .1210263 | -2.96 | 0.003 | .1258387 .6560132 |
| edul | .2170486 | .1396823 | -2.37 | 0.018 | .0614842 .7662147 |
| _Iwealth1_1 | .6701947 | .4189386 | -0.64 | 0.522 | .1968407 2.281849 |
| _Iwealth1_2 | 1.07964 | .5532354 | 0.15 | 0.881 | .3954591 2.947519 |
| ages1 | .4472001 | .2057077 | -1.75 | 0.080 | .1815338 1.101657 |
| get5 | 1.468629 | .5700351 | 0.99 | 0.322 | .6863185 3.142666 |
| get7 | .6488516 | .2901512 | -0.97 | 0.333 | .2700897 1.558773 |
| _Ipcp2_1 | .7087521 | .2605452 | -0.94 | 0.349 | .3448126 1.456819 |
| _Ipcp2_2 | 1.513838 | 1.092055 | 0.57 | 0.565 | .3681612 6.224733 |
| 2. Never | | | | | |
| agegp | .2836057 | .1049641 | -3.40 | 0.001 | .1373031 .5858003 |
| res | .6664538 | .2529957 | -1.07 | 0.285 | .3166951 1.402486 |
| religion | .5729126 | .2042412 | -1.56 | 0.118 | .2848644 1.152228 |
| edul | .1000161 | .0582665 | -3.95 | 0.000 | .0319289 .3132963 |
| _Iwealth1_1 | .6104899 | .3209513 | -0.94 | 0.348 | .2178605 1.710718 |
| _Iwealth1_2 | .3552424 | .164892 | -2.23 | 0.026 | .1430292 .8823176 |
| ages1 | .2843369 | .1208818 | -2.96 | 0.003 | .1235825 .6541984 |
| get5 | 1.440278 | .5115322 | 1.03 | 0.304 | .7180121 2.889089 |
| get7 | .1883259 | .0863049 | -3.64 | 0.000 | .0767054 .4623746 |
| _Ipcp2_1 | .495755 | .1679355 | -2.07 | 0.038 | .2552261 .9629617 |
| _Ipcp2_2 | 2.768946 | 1.724777 | 1.64 | 0.102 | .8167717 9.38703 |

(cdusel==0. High is the base outcome)

Nigeria female

Multinomial logistic regression

Number of obs = 583
 LR chi2(22) = 58.43
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.0586

Log likelihood = -469.69962

| cdusel | RRR | Std. Err. | z | P> z | [95% Conf. Interval] |
|-------------|----------|-----------|-------|-------|----------------------|
| 1. Low | | | | | |
| agegp | 1.486945 | .4805147 | 1.23 | 0.220 | .789268 2.801338 |
| res | 1.474486 | .4981918 | 1.15 | 0.250 | .7603984 2.859172 |
| religion | 1.13674 | .4812987 | 0.30 | 0.762 | .4957468 2.606526 |
| edul | .6051716 | .3530494 | -0.86 | 0.389 | .192885 1.89871 |
| _Iwealth1_1 | 1.327276 | .785398 | 0.48 | 0.632 | .4161729 4.233002 |
| _Iwealth1_2 | .6513222 | .3112425 | -0.90 | 0.370 | .2552927 1.661702 |
| ages1 | 1.067803 | .3977027 | 0.18 | 0.860 | .5145904 2.21575 |
| get5 | .8528615 | .2788278 | -0.49 | 0.626 | .449359 1.61869 |
| get7 | .7797401 | .4274209 | -0.45 | 0.650 | .2662912 2.283195 |
| _Ipcp2_1 | .9868877 | .3735081 | -0.03 | 0.972 | .4700163 2.072157 |
| _Ipcp2_2 | .8932297 | .4352295 | -0.23 | 0.817 | .3437258 2.321209 |
| 2. Never | | | | | |
| agegp | 1.172968 | .3182751 | 0.59 | 0.557 | .6891592 1.996423 |
| res | .9835603 | .2794471 | -0.06 | 0.953 | .563585 1.716495 |
| religion | .795382 | .303186 | -0.60 | 0.548 | .3768013 1.678956 |
| edul | .3354227 | .1692678 | -2.16 | 0.030 | .1247504 .901868 |
| _Iwealth1_1 | 1.134252 | .5740754 | 0.25 | 0.803 | .4206238 3.05862 |
| _Iwealth1_2 | .450308 | .1794921 | -2.00 | 0.045 | .2061684 .983552 |
| ages1 | .7711548 | .2378911 | -0.84 | 0.400 | .4212667 1.411647 |
| get5 | .5073492 | .1446663 | -2.38 | 0.017 | .290131 .8871965 |

| | | | | | | | |
|-------------|--|-----------------|---------------|--------------|--------------|----------------|-----------------|
| get7 | | .2050132 | .11384 | -2.85 | 0.004 | .069044 | .6087489 |
| _Ipcp2_1 | | .9930569 | .3227066 | -0.02 | 0.983 | .5252491 | 1.877513 |
| _Ipcp2_2 | | 1.112132 | .4547418 | 0.26 | 0.795 | .4990072 | 2.478596 |

(cdusel==0. High is the base outcome)