

WEALTH STATUS AND SEXUAL PARTNERSHIP PATTERN AMONG NIGERIAN MEN:
EVIDENCE FROM THE 2007 NATIONAL HIV/AIDS AND REPRODUCTIVE HEALTH
SURVEY (NARHS)

BY

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MATRIC NO: 160167

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT FOR THE AWARD OF
MASTER OF SCIENCE (MSc.) IN BIostatISTICS


IN THE DEPARTMENT OF EPIDEMIOLOGY AND MEDICAL STATISTICS,
FACULTY OF PUBLIC HEALTH,
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JULY, 2012

CERTIFICATION

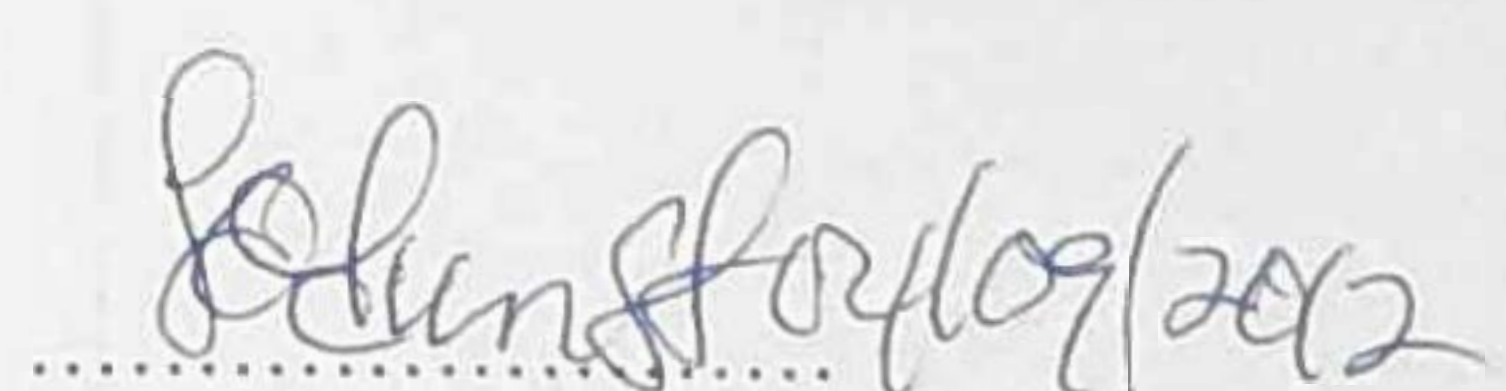
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DEDICATION

This project is dedicated to the ALL SUFFICIENT GOD, who has strengthened my feeble hands.

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Acknowledgements

My profound gratitude goes to Elshadai, the Lord who is more than enough for granting me everything needed to carry out this research work. You have been my sufficiency, and portion throughout my days, may your name be praised forevermore (Amen).

I am indebted to my supervisors, Dr O.M Akpa and Mr. J.O Akinyemi for not giving up on me; when I seem to be slow in yielding to corrections. Your constructive correction and encouragement are well appreciated.

My sincere appreciation goes to my parents Mr and Mrs J.O Ojo for their care, love, financial and moral support before and in the course of the programme, may God Almighty spare their lives to eat their fruits of their labour.

I wish to express my heartfelt thanks to Ps (Dr) S.P Ayodeji (FUTA), Dr F.B Adebola (FUTA), Mr and Mrs Misbaudeen Oyetunji, Egbeyemi S.Olukunle, Akinyoola J and my able aunty Mrs S.A Afolabi for their frequent calls to know how I was faring and the support they gave me throughout the programme. I am also grateful to Papa and Mama Dairo for accommodating me.

Also, to all my lecturers in the department : Prof(s) Ayeni, Bamgboye, Dr (Mrs) Yusuf, Dr(s) Amahia, Adebowale, Fagbamigbe and my sincere gratitude to Dr B.O Adedokun for providing the questionnaire used for this research work. May God bless you all.

I equally appreciate all my friends, the likes of Olabisi Victoria, Paul Millicent, Lasisi Omolara, Oladunjoye Taiwo, Anjorin Toyin, Oke F.T, Adeoye Igbagbodayo, Olajide Bambo, Oluwole P.A and my colleagues in the department especially Cheserem Leonard, Olatoregun Seun, Onwuka Onyinye, Latona Ope, Mr. Rahman and Mr Olawuwo, thank you all.

Lastly, to my lovely friend, Adeolu Dotun for his care, love and support in the course of this programme; you will never lack help in your life (Amen).

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ABSTRACT.

Sexual behaviour in Nigeria is guided by traditional norms and values which differ among ethnic groups. However, the decline in traditional values associated with urbanization, engaging in premarital and extramarital sex have increased due to availability of commercial sex workers (CSWs) in urban and rural areas thus increasing the number of potential partners for sexual partnership. The scantily investigated notion in Nigeria and some other regions in sub-Saharan Africa (SSA) that men are biologically different from women in their need for sex is played out in their risky sexual behaviour pattern like concurrency, multiple sexual partnership and inconsistent condom use with casual partners or CSWs. This study was designed to investigate correlate and pattern of sexual partnership among Nigerian men.

Data from 6165 sexually active men aged 15-64years who participated in the National HIV/AIDS and Reproductive Health Survey (NARHS) were extracted from the main data. Wealth index was computed from data on assets (household item) ownership from factor scores generated using Principal Component Analysis (PCA). Data were analyzed using Descriptive statistics and multilevel logistic regression models. Odds ratios with 95% confidence interval were obtained.

There were variations in sexual partnership across location, ethnic group, region and wealth status. Respondents from urban areas were mostly in the middle-class (47.8%) while rural dwellers (55.6%) and men from the northern region were mostly in the poorest group. Wealth status did not influence men's multiple sexual partnership. When contextual factors was controlled for, the odds of having multiple sexual partners was 5% (OR=1.05, (95%CI=0.89-1.25) higher for men in the middle class and lower (OR=0.95, 95%CI=0.76-1.18) for those in the poorest group compared to men in the richest group. The odds of having non-regular sexual partner was lower for men in the poorest group (OR=0.91, 95%CI=0.68-1.22) and 12% higher for men who were moderately rich (OR=1.12, 95%CI=0.88-1.41).

The hypothesis that wealth was associated with number and type of sexual partnership was not confirmed. The study concluded that the pattern of sexual partnership among Nigerian men varies according to individual characteristics and behavioural factors than their contextual characteristics.

Key words: Sexual behaviour, multiple sexual partnerships, Principal Component Analysis, wealth status.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND.

Sexual behaviour in Nigeria is guided by traditional norms and values which differ among her various ethnic groups. Since behaviors are not determined by instincts, but by socially organized institutions and assumptions, then people's attitudes towards high-risk sex in sub-Saharan Africa are determined by the sexual norms that regulate sexual behaviors before, during and after marriage and by the social conditions in which people live. With more than 389 ethnic groups in Nigeria, ethnic differentials and consequently cultural differences are critical in explaining interpersonal relationship, communication and sexual activities. The influence of this traditional norms and values are being mediated by urbanization and education especially in cities where people are more likely to abandon traditions and this is evident in Nigeria like other African countries that sexual behaviour is a reflection of cultural values and norms. However, with the decline in traditional values associated with urbanization, engaging in premarital and extramarital sex have increased due to the readily availability of commercial sex workers and a greater number of unmarried women in urban areas relative to rural areas (Oyediran, et al, 2010) thus increasing the number of potential partners for sexual partnership.

Certain cultural norms and social institutions promote and even institutionalize multiple and concurrent sexual partnerships as socially acceptable forms of sexual conduct. Rwenge (2004) found that cultural norms specific to ethnic groups play an important part in sexual behavior. Involvement in high-risk sexual behavior seems to be higher in societies in which sexual permissiveness is commonly tolerated as a reality for both males and females, where the family institution is relatively weak and where women enjoy a great deal of autonomy (Uchudi, et al, 2010).

Levels of concurrent sexual partnering are high in many African countries, and men are more likely than women to report having extramarital partners. The association between multiple sexual partnerships and individual/household socio-economic factors such as urban/rural residence, educational attainment, cash employment, media exposure and household wealth is generally weak among men, but there is a tendency for people who are individually more empowered (e.g., urban residents, the more educated, those in market employment, and those

with greater media exposure) to report a higher risk of multiple sexual partnerships. It has also been observed that men's multiple sexual partnerships are critical to the spread of HIV in sub-Saharan Africa. First, epidemiological studies in the region have consistently found that having multiple sex partners is a robust risk factor for HIV infection transmission among women and men (Chen *et al*, 2007). Second, the propagation of HIV depends both upon becoming infected and upon passing the infection to others (Aral and Holmes 1999), which obviously is facilitated by having multiple partners. Accordingly, mathematical models of the population dynamics of HIV typically use the rate of partner change as the key behavioural parameter (Anderson 1999). Moreover, theoretical models suggest that the extent of concurrency of multiple partnerships in sexual networks may increase the potential for the aggressive spread of HIV (Morris and Kretzschmar 1997; Halperin and Epstein 2004). Finally, 60 percent of HIV infections in sub-Saharan Africa are among women (UNAIDS 2008), implying that, on average, each infected man transmits HIV to 1.5 women, whereas each infected woman infects only 0.67 men. For these reasons, the proportion of men aged 15–49 who have had sexual intercourse with more than one partner in the past 12 months is a UNAIDS core indicator for monitoring HIV epidemics and the progress of transmission-prevention campaigns (UNAIDS 2007).

A study by Parkhurst (2000) to investigate the relationships between HIV prevalence and underlying structural factors of poverty and wealth in several African countries, it was found that prevalence of HIV infection correlates directly with wealth. Mishra *et al* (2007) analysed HIV prevalence by wealth group with national survey data for eight African countries (Burkina Faso, Cameroon, Ghana, Kenya, Lesotho, Malawi, the United Republic of Tanzania and Uganda) and concluded that there was a positive association between household economic status and prevalence of HIV. However, the findings from different researchers suggest that there is relationship between individual socioeconomic status and sexual risk-taking behaviour in sub-Saharan Africa. In 2005, however, a team of epidemiologists published their findings from Demographic and Health Survey (DHS) data from Kenya and Tanzania that HIV prevalence is highest among the wealthiest segments of those populations, and lowest among the poor.

There is an emerging evidence of three broad associations between wealth status and sexual risk-taking behaviour: positive, neutral and negative relationships. Firstly, it is believed that wealthy people especially males with more disposable income are more likely to be involved in extra

non-marital, non-cohabiting partnerships and to have wide social networks (Kimuna and Djamba, 2005, Luke, 2005). However, this relationship between socioeconomic status and a higher incidence of sexual risk taking behaviour challenges the views that poverty fuels sexual risk taking which is partly responsible for the rapid spread of HIV in sub-Saharan Africa. There is also the possibility that these wealthy men use their resources to obtain reliable information that will enable them to take protective measures against adverse outcomes or obtain medical services (Lopman, *et al*, 2007). Secondly, there is a blurred or no association between wealth and sexual risk taking behaviour as the covariates for HIV prevalence or sexual risk taking behaviour are expanded to include other dimensions such as biological pathways and behavioural and sociodemographic factors (Mishra *et al*, 2007). Finally, the negative association between wealth and sexual risk taking behaviour can arise as low socioeconomic status makes it difficult for the poor to pursue protective behaviour even if they have the knowledge about HIV prevention since they know that their financial dependence on their partners might reduce their negotiating power (Tladi, 2006). The high incidence of sexual risk-taking behaviour in non-poor populations and their vulnerability constitute two ends of a curve that can lead to a U-shaped or J-shaped relationship between wealth status and sexual risk taking behaviour which is consistent with the findings of Mishra *et al* (2007) who observed an inverted U-shaped relationship between wealth status and HIV infection for Ghana and Lesotho.

1.2 STATEMENT OF PROBLEM.

Epidemiological studies in sub-Saharan Africa have consistently found that having multiple sex partners is a robust risk factor for HIV infection transmission among women and men (Chen *et al*. 2007) In Nigeria and in other regions of sub-Saharan Africa, it is widely believed that men are biologically different from women in their need for sex. This has resulted in the perception that men may have unlimited sexual freedom. This cultural belief is played out in sexual behavioral patterns; for example, according to the 2003 National HIV/AIDS and Reproductive Health Survey (NARHS), 26% of all men surveyed reported having more than 1 sexual partner in the past year. Social and economic trends deemed to contribute to HIV risk for young people in sub-Saharan Africa include the lengthening period between childhood and adulthood, the “globalization” of youth culture, and worsening economic conditions. Shifting cultural values,

poor economic prospects, and high prevalence of HIV/AIDS along with low expectations of tangible changes in the near future may bring social disillusionment and encourage some young people, particularly those who are already socially or economically marginalized, to engage in unsafe sexual and health practices (Collins and Rau 2000). It has been reported that wealth index is positively associated with men extramarital sexual behaviour; then we can hypothesize that, wealthy Nigerian men are more likely to afford extramarital partners than their poorer counterparts. The association of wealth status and patterns of sexual partnership among Nigerian men has not been adequately explored. It is not clear whether the effect of wealth status on sexual partnership is attributable to specific contextual or individual level characteristics. It is on this note that this study will focus on the wealth status and sexual partnership patterns among Nigerian men.

1.3 RATIONALE FOR THE STUDY.

The level of knowledge about HIV/AIDS is generally high in Nigeria, a product of media and NGO publicity and intervention activities as well as increasing visibility of AIDS patients in most communities. For instance, more than 90 percent of Nigerian men have heard of HIV/AIDS, and over two-thirds know that HIV infection can be avoided by using condoms during sexual intercourse and being faithful to one partner, or limiting the number of partners (NARHS, 2003; NDHS, 2004). Similarly, the 2003 NDHS indicated that 63.4 percent of men know that using condoms during sexual intercourse could prevent HIV infection, and 80 percent reported that being faithful to only one sexual partner, or limiting the number of sexual partners, could also prevent the spread of the virus that causes AIDS.

Unfortunately, the high level of knowledge of HIV/AIDS, as highlighted above, has not translated into responsible or safer sexual practices. For instance, based on the 2003 NDHS, only 47 percent of men who reported high-risk sexual behaviour in the previous 12-month preceding survey used condom. Previous studies have shown evidence that HIV is not spread in monogamous relationships between uninfected and faithful partners, therefore, the level of casual sexual activity, particularly if unprotected, would determine the risk of heterosexual transmission of HIV. Casual sex or sex outside a stable relationship may be either premarital or extramarital, and often involves sex workers who exercise little precaution in their bid to make a

living. Together with minimum use of condom, the levels of sexually transmitted infections, and the incidence of male circumcision, sexual behaviour is probably “responsible for much of the differences in heterosexual epidemics among countries, as well as for the equally large differences among regions and demographic groups within countries (Bongaarts, 1995).

Surveys in different settings in sub-Saharan Africa have detected a wide variation in the relationship between HIV and wealth. (Asare and Ananim, 2008, Piot *et al*, 2007). For example, in eight African countries where surveys have been conducted (Burkina Faso, Cameroon, Ghana, Kenya, Lesotho, Malawi, Uganda and the United Republic of Tanzania), HIV prevalence is higher among adults in the wealthiest quintile than among those in the poorest quintile (Mishra *et al*, 2007). In five of six West African countries where survey data are available, women living in the wealthiest households have higher HIV prevalence than other socioeconomic groups of women, but the relationship between wealth and HIV is less clear for men in the subregion (Lowndes *et al*, 2008). Also, studies on sexual behavior in Nigeria have been focused largely on adolescents and women while neglecting men. This might result from the norms that men are in need of sexual satisfaction than their female counterparts or because of heterogeneity in cultural belief across the nation. It is on this note that we need to examine the relationship between wealth status of men and their sexuality pattern since this fuels HIV transmission.

1.4 OBJECTIVES OF THE STUDY.

1.4.1 Main objective

- The main aim of this study is to examine if there is relationship between wealth status of men and their sexual partnership pattern.

1.4.2 Specific objectives:

The specific objectives for this study includes:

- To describe the patterns of sexual partnership among Nigerian men.
- To explore the association between wealth status as well as other contextual and individual level characteristics and pattern of sexual partnership of Nigerian men.

1.5 RESEARCH QUESTIONS.

In order to give this study scientific direction, a few research questions were of interest:

- Is there any relationship between wealth status of men and their sexual partnership pattern?
- Does sexual partnership pattern vary across selected contextual and individual level characteristics?

1.6 DEFINITION OF TERMS

- **Sexuality**

Sexuality is a central aspect of being human throughout life and encompasses sex, gender identities and roles, sexual orientation, eroticism, pleasure, intimacy, and reproduction. Sexuality is experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behaviour, practices, roles, and relationships. Sexuality is influenced by the interaction of biological, psychological, social, economic, political, cultural, ethical, legal, historical, religious, and spiritual factors.

- **Sexual Partner**

Sexual partners refer to people who engage in consensual sexual activity together. The sexual partners can be of any gender or sexual orientation. They may be in a committed relationship, either on an exclusive basis or not, engage in the sexual activity on a casual basis, and commercial purposes.

- **Concurrency**

Concurrency is the overlapping sexual partnership in which sex with one partner occurs between two episodes of sex with another partner.

- **Multiple sexual partner**

Multiple sexual partner is when a person has more than one sexual partner.

- **Extramarital sex**

Extramarital sex is a form of risky sexual behaviour when a person has sex outside his/her marital union.

- **Wealth**

Wealth is defined literally as a state of having plenty or great possessions or money. Wealth status is the value of assets owned by a person or a community.

The Wealth Index is valuable in countries that lack reliable data on income and expenditures, it's the traditional indicators used to measure household economic status. Wealth Index allows for the identification of problems that are particular to the poor, such as unequal access to health care, as well as those particular to the wealthy, such as, in Africa, increased risk for infection with HIV.

- **Sexual partnership pattern.**

Sexual partnership pattern is the form of sexual behavior. In this study, sexual partnership pattern connotes two related items: (1) number of sexual partners (1 or more than 1) and (2) type of sexual partner (either regular or non-regular).

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION.

Sexual risk behaviors such as multiple sexual partnerships, sex at early age, and inconsistent condom use with casual partners are key drivers for the spread of the HIV epidemic in Nigeria (FMOH, 2005; Isiugo- Abanihe, 1994; Udoh, *et al*, 2009; UNAIDS, 2010) . A few studies at small scale levels estimate that over 50% of married men in Nigeria have extramarital sex (Isiugo-Abanihe,1994; Orubuloye, *et al*,1997a). The pervasive attitude of male dominance, norms around male sexual performance and gender inequality, is often reported as a contributing factor for extramarital sex and the spread of HIV (Smith, 2007). Predominant masculinity scripts found in rural Nigeria emphasize sexual experimentation and multiple partnerships as a feature of manhood (Izugbara, 2008, Omololu, *et al*, 2004).

2.1 SEXUAL BEHAVIOURS AMONG MEN

It is widely believed in Nigeria and in other regions of sub-Saharan Africa that men are biologically different from women in their need for sex. This has resulted in the perception that men may have unlimited sexual freedom, whereas women are expected to be faithful to only 1 partner at a time. This cultural belief is played out in sexual behavioural patterns; for example, according to the 2003 NARHS, 26% of all men surveyed reported having more than 1 sexual partner in the past year. Similarly, 16% of married men were reported to have had extramarital sexual relation in the 12 months prior to the 2003 NDHS, with an average of nearly 2 sexual partners, an indication of a high level of sexual networking among Nigerian men (NDHS, 2003).

Evidence from 2003 NDHS data suggest that individual, socio-economic and HIV/AIDs factors influence the sexual behaviour of middle-aged men (FMOH, 2008). It was also found out that higher proportion of men (71.2%) aged 40-59 years were sexually active; 12% engage in extramarital sex and more prevalent in rural(7.05%) than urban areas and 30% had multiple sex partners while condom use was very low.

2.1.1 Concurrent Sexual Partnerships.

Concurrency is defined as overlapping sexual partnerships in which sex with one partner occurs between two episodes of sex with another partner. Concurrent partnership can either be long term or short term partnership. Long term concurrency is one in which the overlaps last for months or years. It involves cases in which one person has regular sexual intercourse with more than one partner such as in a formal polygamous marriage involving a man and more than one wife or a woman with two husbands and in a less formal arrangement in which a man has two girlfriends or a wife and a girlfriend or a woman who has two regular boyfriends (Epstein and Morris, 2011). The partner may be spatially separated for defined periods as in the case of a man who has a wife at home and a girlfriend at a factory where he works for months; his wife may have a local boyfriend while he is gone and this would be concurrency too. Long term concurrency relationships are often characterized by strong emotional, social, and economic ties (Epstein and Morris, 2011). Numerous studies have suggested that condom use in such relationship tends to be much lower. Short term concurrency on the other hand involves cases in which a man or woman who has regular sexual contact with only one person and occasionally casual, one-off or commercial sex with others.(UNAIDS,2010)

From previous studies, it was established that concurrent partnerships carry a much greater risk of HIV transmission than the same number of sequential, non-overlapping multiple sexual partnerships. (Morris and Kretzschmar 1997, 2000; Kohler and HELLERINGER, 2006; Morris *et al.*, 2007). This is because having concurrent sexual partners in a dense sexual network increases the risk of HIV infection by allowing the virus to spread rapidly to others (Watts and May 1992; Hudson 1993; Kretzschmar and Morris 1996; Morris and Kretzschmar 1997, 2000; Kohler and HELLERINGER 2006; Morris *et al.* 2007).

In contrast, among non-overlapping sequential partners, the delay between ending one relationship and starting another one reduces the probability of HIV transmission (Pilcher *et al.* 2004). At the individual level, having concurrent partners increases the risk of transmitting HIV infection to the partners, while one's own risk of infection is the same whether partners are serial or concurrent. However, one's concurrency behaviours may be correlated with own risk of HIV infection to the extent his/her concurrency behaviours is a proxy for partners' concurrency behaviours or belonging to a higher-risk sexual network (Mah and Halperin 2008).

2.1.2 Multiple Sexual Partnerships.

It is an established truth that men's multiple sexual partnerships contribute to the spread of HIV in sub-Saharan Africa from previous studies (Chen, *et al*, 2007, Aral and Holmes, 1999,). Theoretical models suggest that the extent of concurrency of multiple partnership in sexual networks increase the potential for the aggressive spread of HIV (Morris and Kretzshmar, 1997, Halperin and Epstein, 2004). Bingenheimer 2010 suggested that men's multiple sexual partnership are influenced by institutionalized sources of men's authority over women and their access to certain economic resources (like farm land) which is consistent with previous studies (Dodoo and Frost, 2008). The level of multiple partnerships among men and the sociodemographic patterns of the partnership vary across countries in sub Saharan Africa. The prevalence of multiple partnerships among unmarried but cohabiting men in Cote d'ivoire, Rwanda and Senegal is higher compared to other countries in the region but the prevalence is higher among formerly married men in Cameroon, Tanzania, Kenya and Zambia (Bingenheimer ,2010).

Furthermore, it has been reported by Bingenheimer, that there is a strong and consistent relationship between household wealth and prevalence of men's multiple sexual partnership in West African countries where HIV prevalence is lower than in Eastern or Southern Africa. Also, in several countries in the sub Saharan Africa, men who are urban residents, men who live alone , men who travel away from home and those with higher level of education are more likely to report having multiple sexual partners (Bingenheimer ,2010).

2.1.3 Extramarital Sex.

Previous works suggested that in many parts of Africa, young men's sexual activities are often an attempt to display sexual competence or achievement to peers rather than acts of intimacy (WHO, 2001). In confirmation, Varga (2001) found out that a significant minority of young men in South Africa reported feeling obliged to have sex before marriage for social rejection. Levels of concurrent sexual partnering are high in many African countries and men are more likely than women to report having extramarital partners (Kimuna *et al*, 2005). It is believed that patterns of sexual behaviour formed during adolescence may influence behaviour in adult life. This pattern however, of using sexual behaviour as a mean to peer acceptance often continues into adulthood

and leads to extramarital sexual activity (Barker, 2000). Thus, extramarital relationships are often as much about masculinity or social class as about sex itself. In other case, men engage in extramarital sex simply to meet sexual desires. This might be as a result/product of social and cultural conditioning of male domination in relationships, espouses traditional ideals of virginity and fidelity for women and links men's social status to their sexual activities. Moreover, traditional ideals of masculinity often depict male sexual needs as uncontrollable multiple partners as evidence of sexual prowess and dominance over women as natural (Rivers and Aggleton , 1999). In contrast, women are expected to be financially dependent on and faithful to their husbands (Smith, 2002, Cornwall, 2002, Hunter, 2005). Thus, young men often have disproportionate power in intimate relationships with women. The consequences of such inequity include men's perpetration of violence toward women, lack of condom use within unions and participation in extramarital sex as a sign of social status and prowess (Campbell, 1997, Wood and Jewkes, 2001, Hunter, 2002). However, recent studies of extramarital sex in Africa have considered prolonged postnatal abstinence as a factor in men's extramarital sexual behaviour. For instance, a survey conducted in Cote d'ivoire revealed that husbands whose wives were observing postpartum abstinence engage in extramarital sex (Ali and Cleland, 2001). Also, findings from previous studies in Nigeria suggest that there is an association between extramarital sex and prepartum and postpartum abstinence by state. Lawoyin and Larsen (2002) found an association between polygny, postpartum abstinence and extramarital sex in Oyo state. This is so because of heterogeneity across ethnic groups, regions and religion (Ali and Cleland ,2001). Extramarital sex has been linked to HIV/AIDS risks, especially in regions where the rate of contraceptive use is relatively low (Cleland *et al*, 1999).

2.1.4 Unprotected Sex and Condom Use.

Unsafe sexual behaviours are significant with increasing level of education and it is more prevalent in the urban areas (Kirunga and Ntozi,1997, Mnyika *et al* 1997, Springer A *et al*, 2006, Kongnyuy,2006). However, Glynn and colleagues in a study in Yaounde reported that educated men were more prone to adopt safe sexual behaviour (Glynn *et al*, 2004). Condoms are believed to be efficient in preventing the transmission of HIV and other sexually transmitted diseases (Weller and Davies 2002, Slaymaker *et al*, 2004) and apart from total abstinence, any effort to prevent HIV infection without the use of condom is incomplete and will ultimately be ineffective

because condom is still regarded as reliable in preventing HIV universally (UNAIDS,2003). In a study carried out among men who attended an STI clinic in India, there was a protective association between reported condom use and HIV infection; an observation different from what is witnessed in African countries (Slaymaker, et al, 2004). These differences emanate from the fact that in African countries, condom use is often a sign for risky sexual behaviours. Condoms would also be protective if those in the HIV risky groups were initially more likely to use condoms.

2.2 ALCOHOL USE AND SEXUAL BEHAVIOUR AMONG MEN.

People who abuse alcohol are more likely to engage in unprotected sex even with a high risk partner (Davies et al, 2005). Corte and Sommers, confirmed this association in a review, and postulate that alcohol leads to unsafe sex only among persons who have sexual expectancies about the effects of alcohol prior to drinking (Corte and Sommers, 2005). This would imply that alcohol leads to unsafe sex for people who have the perception that alcohol will enhance sex or give them courage to approach their sex partners; but have no effect in people who do not have such preconceived ideas.

According to Gibney and colleagues (2003), there is a relationship between alcohol use and having sex with commercial sex workers among truck drivers in Bangladesh which is similar to findings from a study carried out in Cameroon (Kongnyuy 2007). Recently, Weiser *et al* (2006) found in a population based survey in Botswana that men who abuse alcohol were three to four times more likely to have multiple sex partners and unprotected sex and to engage in transactional sex than non drinkers.

2.3 SOCIO-DEMOGRAPHIC DETERMINANTS OF SEXUAL BEHAVIOUR.

This study addresses a number of key socioeconomic and demographic factors linked to risky sexual behaviours including age, education, religion, place of residence, marital status and occupation.

2.3.1 Age

Mitsunaga *et al* (2005) found that age at sexual debut correlate with male extramarital sex. In addition, men who had sex for the first time at age 21 or older were less likely to report risky sex than those who had been 15 or younger at that sex debuts, which implies that men who delay first sex possibly until after marriage are less prone than their peers to taking sexual risks (Stephenson, 2010).

Apart from that, Awusabo and Annim (2008) found that there is a significant relationship between sexual risk taking behaviours and wealth status for males and females in Ghana and for females in Kenya. It was also found to be higher among the youth than the older age groups (Awusabo and Annim, 2008). Sex outside of marriage was found to be associated with men's age with a greater proportion of 15-29yrs old (24%) than men of 40yrs and above (12%) (Kimuna and Djamba, 2005). This is consistent with previous research in other countries that men's tendency to have multiple sex partners tends to be higher at younger age (Hill Z, *et al*, 2004). From previous studies revealed that wealthier men engaged in partnerships characterized by small age differences between partners, which are associated with higher levels of condom use and lower levels of HIV infection (Glynn *et al*, 2001; Gregson *et al*. 2002; Kelly *et al*, 2003; Luke 2003)

2.3.2 Education attainment

People with higher education are more likely to be in a position that enables them to be relatively, well-off compared with those with no formal education. It is an underlying truth that 'individuals with higher education have access to capital or fungible economic resources which enable them to access preventive and protective measure towards HIV/AIDS' (Bingenheimer 2010). The educated have the cognitive apparatus to process information thereby seeking treatment of STD when they get infected (Asare and Annim, 2008). For example, a study in Yaoundé in Cameroon showed that educated men were more likely to adopt safer sexual behaviours (Kongnyuy, *et al*, 2006). However, unsafe sexual behaviours have been reported as significant with increasing level of education among Cameroonian men (Glynn, *et al* 2004). This is in harmony with the findings in 1997 in the Rakai district of Uganda (Kiniya and Ntozi, 1997).

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Also, Dewalgie and colleagues reported that although the risk for HIV infection increased with and level of education in south-western Uganda in 1989/1990, the trend reversed over the following decade such that in 1999/2000, the risk of HIV decreased with increasing education (de Walgie *et al*, 2005).

2.3.3 Religion

Religion imposes social control mechanism among its followers and thus tends to have a protective effect against risky sexual behaviours. The 2004 Cameroon DHS showed that animists have a lower HIV prevalence (1.2%) than Muslims (4.5%), Catholic (5.9%) and Protestants (6.3%) (Kongnyuy J, *et al*, 2006). Mitsunaga *et al*, (2005) also found that catholic and protestant men were more likely to engage in extramarital sex than Muslim men which is consistent with Kongnyuy (2006) that Christians engaged in more unsafe sexual practices may be as a result of Muslim man been polygynous. Other investigators have found that religiosity was positively associated with unsafe sexual behaviours, among injecting drug users (Hasnain *et al*, 2005). However, McCree *et al* (2003) reported that religious African-American adolescent girls are less likely to engage in unsafe sexual behaviours.

Religion is strongly embedded in culture and the level of being religious differs from country to country and across region (Kongnyuy, 2006). Moreover, aspects of traditional religion and culture are very influential among some Nigerians although some still adhere to Christian or Muslim religions (Orubuloye *et al*, 1997, Mitsunaga *et al*, 2005).

2.3.4 Type of Residence/Region of Residence

Region of residence, and whether a person lives in an urban or rural area, can determine the level of access to information and reproductive health services, which could influence sexual behaviour and perception of HIV risk (Akwara *et al*, 2003). Various studies have measures differently, factors such as travel, type of place of residence, region of residence and occupation or place of work. In most of the studies in which these factors were associated with HIV infection, they were acting as proxy measures for potential encounter with infected sexual partners (Auvert *et al*, 2001, Nunn *et al*, 1994, Slaymaker *et al*, 2004, Mercer *et al*, 2007). These factors are known to influence the number of sexual partners and proportion of available partners who are infected. Kimuna and Djamba (2005) suggested some ethnic norm to be an influence on

the regional pattern of extramarital sexual behaviours. However, in some studies conducted in the same country, different regions may show different sexual behaviours (Shepstone, 2011). Kongnyuy, *et al*, 2006, reported that unsafe sexual behaviours were more prevalent in urban than rural areas which is consistent with previous studies. In particular, Stephenson (2010), found out that rural residents in Chad were less likely to report sexual risk taking than men who lived in urban areas. However in the Nyanza province in Kenya, unsafe sexual behaviours were more prevalent in the rural areas (Voetan *et al*, 2004). Hladjk, *et al*, 2006 also reported increase in HIV prevalence in rural areas and a trend towards a decline in some cities. It can be deduced from this that different regions like for education, of the same country might be at different stages of HIV epidemics besides the different socio-cultural practices that influence a particular sexual behaviour (Asare and Annim, 2008).

2.3.5 Marital status

Married people are often considered to have sex more frequently than those who are not married. Any sex outside marriage is associated with a higher probability of HIV infection. This resulted from men acting as a bridge between the outside world and their household environment (Kimuna and Djamba, 2005). Although HIV cannot be spread through sexual intercourse in stable monogamous relationships between uninfected partners, but the presence and the nature of their partners' (married women) casual or extramarital sexual practices largely determines the risk of HIV transmission (Ahlburg *et al.*, 1997). It was observed by Asare and Annim, (2008) that sexual risk taking behaviour was associated with never having being married, not living with partner and being widowed or divorced for both males and females in Kenya and Ghana. Akwara *et al* (2005) supported this claim in a study of Ghana DHS 2005 that marriage does not seem to be protective of HIV infection for females, suggesting that those that have never married, divorcees and widowed may be caught up in a web of relationship. The absence of a regular partner can precipitate sexual networking with social and economic dimensions. This however, depends on how much concurrent sexual partnership occurs. There is a general variation by country in the proportion of married people engaged in concurrent sexual partnerships.

2.3.6 Occupation.

There are variations in the pattern of association between wealth status, occupation being associated with extramarital sexual relationship. A study among Zambian men and Cote d'ivore, occupation and household wealth were not significant correlates of men's extramarital sexual behaviour (Kimuna and Djamba, 2008, Ali and Cleland, 2001). However, this findings differs from a study carried out in Cameroon where it was found that married men who were absent from home for more than 1 month during the past year were 3 times more likely to engage in extramarital sex than those who reported no absence (Lydie et al, 2004). This is consistent with a study in Nigeria where the more time a man spends away from home the greater is his risk of extramarital sex (Mitsunaga et al, 2005).

2.3.6 Ethnicity.

Ethnicity may influence sexual behaviour through cultural beliefs and practices. For example, the practice of levirate marriage, where a dead man's widow is remarried to one of his brothers, is still being practised in some areas of sub-Saharan Africa, despite the high prevalence of HIV (Ocholla-Ayayo, 1997 and Degrees du Lou, 1999). Among the Luo and Luhya of Western Kenya, widows sometimes have sexual intercourse with a male relative of the deceased as ritual 'cleansing'. Also, among the Maasai of Kenya was reported another form of risky sexual behaviour: the practice of 'wife-sharing' (Lesthaeghe, 1989). The pressure to conform to cultural beliefs and practices may override concerns about HIV infection.

2.4 WEALTH AND SEXUAL BEHAVIOUR OF MEN

In sub-Saharan Africa, the more economically stable and wealthy nations like South Africa, and Botswana have higher HIV prevalence rates, showing a positive association between wealth status and HIV infection levels. However, difference exist at the individual or household level. Mixed patterns have been reported on the association between wealth status at the individual or household level and HIV infection levels. Individual or household background characteristics have been noted to be associated with risky sexual behaviours. The background characteristics influence the epidemic yet at the same time act as protective determinant (Asare and Annim, 2008).

At individual level, several studies on HIV prevalence rates derived from DHS samples and other population-based HIV surveys in some African countries revealed positive relationship between wealth and HIV prevalence (O'Farrell, 2001; Shelton et al, 2005). At macro level, poor nations often lack the resources to provide preventive and curative services, thus increasing their populations' susceptibility to HIV infection. However, the evidence for the relationship between poverty and sexual risk-taking appears mixed. Booyesen defined sexual behaviour as having sexual intercourse with a casual acquaintance, not using condoms and having multiple sexual partners in his study using South African DHS data to examine the link between poverty and risky sexual behaviour, found no association between wealth status (measured by quintiles) and women's risky sexual behaviour (Booyesen, 2004). On the other hand, Hallman who used different data from South Africa found a strong association between poverty and risky sexual behaviour (Hallman, 2004) which was consistent with a study carried out in Nairobi slums in Kenya found that women living in Nairobi slums had significantly higher levels of sexual risk-taking than other women (Zulu et al, 2002). This association appears more pronounced among females than males.

There has been evidence on the association between socioeconomic status of individuals and risky sexual behaviours in sub-Saharan Africa by several researchers. Asare and Annim (2008), found that wealthy men are more likely to engage in risky sexual behaviours than their poor counterparts. These wealthy men are able to do so because they tend to have wider social networks and have more disposable income to afford multiple sexual partners—particularly commercial sex workers, who were believed to be the main sources of HIV infection and therefore faced greater risk of acquiring the disease (Cleland et al, 1999). Through their engagement in commercial sex relationships, wealthy men helped channel HIV infection into the general population. Such findings are consistent with Bingenheimer (2010) who postulated the same, by noting that men with fungible economic resources are more likely to engage in multiple concurrent partnerships when compared with poor men.

Association between wealth and sexual behaviour has been supported by evidence from previous study in Cameroon, Ghana, South Africa (Fox,2010) and Nigeria (Smith,2007). Wealthier men in Cameroon were more likely to start sexual activity at an early age compared with poorer men,

they were likely to have unprotected sex with a non spousal non cohabiting partner, have multiple concurrent partners and also have multiple lifetime sexual partners (Kongnyuy, et. al, 2006). Mitsunaga, et.al (2005) reported similar results in Nigeria in which wealthy Nigerian men were more likely to engage in extramarital sex than their poorer counterparts. However, these findings was not consistent with a study carried out in Zambia where none of the proxies of wealth (education, occupation and household wealth index) were associated with negative sexual behaviour like extramarital sex (Kimuna and Djamba, 2005).

Qualitative studies carried out in some African nations have suggested that the informal exchange of money and gifts for sex has become an expected practice and common such that no woman would agree to have sex without receiving something in return sort (Goergen, Maier, and Diesfeld 1993). This was recognized by men too that exchanges of money and gifts were normal and that they may not attract sexual partners without offering a transfer i.e money or gift (Meekers and Calves 1997; Gage 1998; Goergen et al. 1998, 67; Kaufman and Stavrou 2004) which resulted in mottos such as “No money, no sex” or “No money, no love” by women in numerous locations (e.g., Komba-Malekela and Liljestrom 1994; Silberschmidt and Rasch 2001).

2.5 APPLICATION OF MULTILEVEL MODELLING IN HEALTH RESEARCH

Multilevel models allow the estimation of the relation between exposure and outcome of interest while controlling for covariates at different levels and the estimation of variation in the effect of the key exposures across levels of other variables. For example, a multilevel model can assess the relation between the quality of the neighbourhood built environment and likelihood of drug use activity while controlling for the differences between neighbourhoods in individual race/ethnicity and education (Hembree et al., 2005). Therefore, multilevel models represent an opportunity to quantify the determinants of health across levels, isolate characteristics of an individual's context (families, neighbourhoods, cities, states, or countries) that are associated with individual health behaviours and, in theory, provide guidance for evidence-based interventions targeting contextual factors as well as individual ones.

Although multilevel analysis is applicable to the study of a broad range of “groups” or contexts, the vast majority of applications in the health field have focused on geographically defined contexts, such as countries (Chung H, and Muntaner C,2007), states (Kim D, and Kawachi

l,2007), counties (Muntaner C, *et al*, 2006), and most commonly “neighbourhoods” defined in various ways, most commonly by smaller administrative areas (Chaix B, Rosvall M, Merlo J, 2007, Rundle A, *et al*, 2007). The types of group-level constructs investigated have included, for example, income inequalities (Subramanian S and Kawachi, 2006), social capital (Kim D, *et al*, 2006), residential segregations (Bell J, *et al*, 2006), women’s status (Chen Y, *et al*, 2005), and neighbourhood characteristics such as neighbourhood disadvantages or other measures of neighbourhood social and physical environments (Sundquist K, *et al*, 2006, Fone D, *et al*, 2007).

Neighbourhoods constitute a key determinant of health, as they shape individual opportunities and expose residents to multiple risks and resources over the life course (Leventhal and Brooks-Gunn, 2000, Sampson, 2003). For example, different authors have used multilevel methods to assess, among many others, the role of the urban built environment as a determinant of alcohol use behaviour (Bernstein *et al*, 2007), the link between neighbourhood socioeconomic status and heroin and cocaine use (Williams & Latkins, 2007), neighbourhood effects on drug program treatment efficacy (Yabiku *et al.*, 2007) and the relation between neighbourhood income inequality and drug overdose related mortality (Galea *et al.*, 2003).

Most studies have used multilevel analysis to isolate associations of group-level factors with individual-level health outcomes after accounting for individual-level confounders (i.e. individual level variables associated with the health outcomes and with group membership, and, therefore, with group characteristics). A smaller number have focused on the complementary objective of decomposing variance into between- and within-group components. Overall, the results of multilevel analyses published to date are consistent with main effects of a variety of group-level variables on individual-level outcomes that persist after controlling for individual-level variables. The strength of this main effect has varied substantially depending on the study and the research question investigated. The detection of these group effects is striking given their often very distal relationship to the health outcomes being studied, the misspecification of groups and group-level variables, and the often extensive adjustment for much better measured individual-level variables, many of which are mediators rather than true confounders of the group-level effects.

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In contrast, multilevel analysis allowed a relatively simple operationalization of the contributions of individual and group-level factors to both between individual and between-group variability, showing how individual-level and group-level factors can contribute to variability at both levels, and transcending the artificial dichotomy of individuals and groups.

Many studies have been undertaken to understand factors associated with risky sexual behaviours. A small number of them using multilevel analyses have shown that social and community-level factors are associated with risky sexual behaviours (Benefo, 2008, Uthman, 2008, Uthman and Kongnyuy, 2008). The prevalence of high-risk sexual behaviour in sub-Saharan Africa has been regarded as a major public health concern, mostly because of the increasing incidence of HIV/AIDS (Djamba, 2003). About 9 in 10 young people age 15–19 in Sub-Saharan Africa have heard of HIV/AIDS, but most are not familiar with the preliminaries of prevention: abstinence, being faithful (monogamy) and condom use (Bankole et al., 2004). Many adolescents, especially in rural areas, do not know where to obtain condoms (Bankole et al., 2004). Focusing on the individual alone ignores the broader social context within which sexual behaviours occur (Bajos, 1997).

2.6 WHEN TO USE MULTILEVEL MODELLING

In multilevel data, all levels present in the data are important in their own way. A multilevel problem is a problem that concerns the relationship between variables that are measured at a number of different hierarchical levels. For instance, how does a number of individual and group variables influence one single individual outcome variable?

Multilevel models require that the grouping criterion be clear and variables assigned unequivocally to their appropriate level. It also represents a compromise between modelling each unit separately and modelling all unit contexts simultaneously within the same model (Kreft & de Leeuw, 1998). These models obviate the forced choice of conducting either an individual-level analysis or group-level analysis. The objectives of multilevel model concerns inferences made about a model's structural parameters referred to as model fixed effect and secondly it concerns inferences about the unknown variance parameter in the model referred to as the random parameter (Morris, 1995).

2.7 ADVANTAGES OF MULTILEVEL MODELLING TECHNIQUES

A multilevel problem structures is concerned with population that is hierarchical in structure. A sample from such a population can be described as a multistage sample; first, a sample of units from higher level say a street and sample sub-unit from the available unit say individual from the street. In such samples the individual observations are in general not completely independent. For instance, individuals in the same street tend to be similar to each other because of selection processes. This clustering sampling scheme often introduces multilevel dependency or correlation among the observation that can have implications for model parameter estimates for multistage clustered samples, the dependence among observations often comes from several levels of the hierarchy the problem of dependencies between individual observations also occurs in survey research where the sample is not taken randomly but cluster sampling from geographical areas is used instead. In this case, the use of single-level statistical model is no longer valid and reasonable. (Hox, 2002)

The basic principle of multilevel modelling (MLM) is to analyse simultaneously the influence of individual factors and area factors. The data set is structured as a succession of nested levels. The ordinary regression technique disaggregates all data to the lowest level allowing for the assumption of independence. Random effect model can account for lack of independence across levels of nested data i.e individual nested within region. Conventionally, regression assumes that all experimental units (individuals) are independent in the sense that any variables influencing the pattern of men's sexuality have the same effect in all ethnic groups. Multilevel modelling relaxes this assumption and allows these variables effect to vary across the ethnic group (Atoyebi, 2010).

According to Heck and Thomas (2000), multilevel analysis is advantageous over traditional single-level univariate and multivariate approaches in several ways. Firstly, multilevel analysis helps researcher to avoid the choice of individual/group as the unit of analysis. It also helps researcher deals with complicated sampling strategies like that of single-level analyses based on assumption of simple random sampling that every individual has an equal chance of being selected in the sample instead such complex sampling strategies in multilevel create clustering effects that violate the assumption of simple random sampling. Multilevel model has a greater

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accuracy in calculating standard errors associated with parameter estimates than single-level analyses (Hox, 2002).

Also, variables are defined at their correct theoretical level of data hierarchy for example, in a two-level hierarchy, a variable such as school size can be determined with respect to the number of schools in the sample, while a variable like gender can be evaluated with respect to the number of individuals in the sample.

Finally, multilevel modelling allows researchers to ask more complex question about the data.

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CHAPTER THREE

METHODOLOGY

3.1 STUDY DESIGN

The study is an analysis of data from the 2007 National AIDS & Reproductive Health Survey (NARHS). The 2007 NARHS was a cross-sectional study containing data sources that address the nexus of HIV/AIDS and related areas of reproductive health.

3.2 DESCRIPTION OF NARHS 2007

The 2007 National HIV/AIDS and Reproductive Health Survey (NARHS) was designed to generate data that provide reasonable estimates of HIV prevalence among the general population especially at national and zonal levels. 2007 NARHS is the third survey in the series which included a biological component thereby earning the name NARHS plus. NARHS Plus is a naturally representative sample of females aged 15-49 years and male aged 16-64 years.

It was designed in order to obtain accurate HIV prevalence estimate and information on risk factors related to HIV infection at the national, zonal and to some extent at the state levels. It also provided information on the situations of reproductive and sexual health in Nigeria and variety of factors that influence reproductive and sexual health.

3.3 SAMPLE DESIGN AND SAMPLING TECHNIQUES

The sampling frame used for 2007 NARHS Plus was drawn from the updated master sample frame of rural and urban localities developed and maintained by the National Population Commission (NPC). Administratively, Nigeria is divided into 36 states of the federation and federal capital territory and 6 regions. Probability sampling was used for the survey and the sampling procedure was a four-level multi-stage cluster sampling. Data collection took place in December, 2007 with a total of 11521 respondents consisting of 6161 men aged 16-64 years and 5360 women aged 15-49 years.

All localities in a state were stratified into rural and urban localities with settlement less than or equal to 20,000 ($\leq 20,000$) inhabitants classified as rural while urban settlement were stratified into major towns and medium towns. One major and One Medium town were also selected with

probability proportional to size of the town. Then any number picked which is corresponding to the number picked was chosen for the formation of cluster and interviewed. The second stage involves the selection of enumeration area which were within the selected rural and urban localities while a list of eligible persons within households were selected at stage 3 and finally selection of actual respondent for interview and testing.

3.4 STUDY POPULATION

A nationally representative sample of a total of 11,525 respondents consisting of 6,165 men aged 16-64 years and 5,360 women aged 15-49 years. Due to the focus/direction of the present analysis, only information about men was used in the analyses.

3.5 VARIABLES DEFINITION

3.5.1 Outcome variable

The dependent variable in this study is the sexual partnership pattern among men. For the purpose of this study, the sexual partnership pattern of men referred to the type and number of sexual partners a man has.

The type of sexual partner a man has was grouped into two namely:

(i) Regular

(ii) Non-regular.

The regular sexual partners are those partners who are marital while the non-regular partners are non-marital. They can either be casual or commercial sex workers. While the number of sexual partner ranges from 0 to 22. Multiple sexual partner is considered in this study as having more than one sexual partner.

For the purpose of this study, the sexual partnership pattern is limited to the;

(a) Type of sexual partner:- This was measured in the 2007 NARHS by the question 'How many are non-marital?' This was collapsed into 2 categories of the same variable.

(i) Respondent with 0 number of non-marital partner was coded as having Regular partners.

(ii) Respondent with 1 to 22 number of non-marital partner were coded as having Non-regular partner.

(b) Number of sexual partners: This was measured in the 2007 NARHS by the question. 'Had more than one sex partner?'

(i) Yes implies > 1

(ii) No implies ≤ 1

3.5.2 Explanatory variable

Variables on individual-level characteristic and contextual-level characteristics were used. The independent variables used in this study were age, education attainment, religion, marital status, occupation, condom use, past alcohol use, wealth index, ethnicity, location and zone. These variables were grouped into two groups namely:

(i) individual variable and

(ii) area variable.

3.5.2.1 Individual-level characteristics

The independent variables used in this study were age, education attainment, religion, marital status, occupation, condom use, past alcohol use, wealth index, ethnicity, location and zone.

Age was categorized into 3 groups: ≤ 20 , 21-49 and 50 years or older.

Education attainment of respondent was recoded into 3 groups: No formal education is formulated from those who did not go to school at all and those with Quaranic only, Primary education and those with Secondary or Higher.

Marital status was grouped into two groups: currently married and living with sexual partner is recoded into 'in union' while never married, widow, separated and divorced was recoded as 'not in union'

Religion was grouped into 3 groups: protestant and catholic are recoded into Christian, islam and no religion, traditional and others was recoded as others.

(ii) Respondent with 1 to 22 number of non-marital partner were coded as having Non-regular partner.

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Marital status was grouped into two groups: currently married and living with sexual partner is recoded into 'in union' while never married, widow, separated and divorced was recoded as 'not in union'

Religion was grouped into 3 groups: protestant and catholic are recoded into Christian, islam and no religion, traditional and others was recoded as others.

Occupation was regrouped from 17 options to 4 groups: Director/upper management, other management, sales manager/representative/Insurance broker, Professional/Specialist, Self employed/Own small business, Blue collar skilled and semi-skilled and civil servant was recoded as Skilled, Self employed (Hawkers/Informal sector/Vendors), unskilled, Clerk, Farmer/Forestry/Fishing/Mining and trader was recoded as Unskilled, students stand alone as a form of occupation, Housewife, Pensioner, unemployed and others was recoded as Others.

Wealth index was computed from 22 household items such as having fridge, cars, washing machine etc using principal component analysis. Each variable was assigned a score and individual were ranked according to the score and divided into percentiles to form 3 groups of wealth index as Poorest, Middle class and Richest.

Ever use of condom was grouped into 2 groups: yes or no.

Alcohol use is also in 2 groups: yes or no.

3.5.2.2 Contextual characteristics

Contextual factors are variables on the location or vicinity where the respondent lived. They are region, place of residence/Location and the ethnic group the respondent belongs.

Location was grouped into 2 groups: urban and rural.

Region comprises of the main 6 geo-political zone as: Northwest, Northeast, Northcentral, Southwest, Southeast, Southsouth.

Ethnicity was recoded from 36 groups into 4 groups: Yoruba, Igbo, Hausa/Fulani and others were the ethnic groups that cannot stand alone i.e they have smaller sample size.

3.6 DATA ANALYSIS

Frequency tables were generated to describe categorical variables. Wealth index was computed from the 22 household items. The Chi-Square test was used to investigate associations between categorical variables. Variables that were significantly associated with the outcome variables were used in the multilevel logistic regression model to investigate if differences in the outcome variables are attributed to contextual or individual level characteristics of the subjects.

3.7 COMPUTATION OF WEALTH STATUS/INDEX

In the 2007 NARHS Plus data set, there was absence of survey questions on income or expenditures. So for the purpose of this study, data on assets ownership (e.g owning a fan or farmland e.t.c) were used to construct a wealth index. The problem of choosing appropriate weight was handled by using the procedure of Principal Component Analysis (PCA). PCA is a 'data reduction' procedure. It involves replacing a set of correlated variables with a set of uncorrelated 'principal components' which represent unobserved characteristics of the population. The principal components are linear combinations of the original variables; the weights are derived from the correlation matrix of the data or the covariance matrix if the data have been standardized prior to PCA. The first principal component explains the largest proportion of the total variance. If the first few principal components explain a substantial proportion of the total variance, they can be used to represent the original items, thus reducing the number of variables required in models. Intuitively, the first principal component of a set of variables is the linear index of all the variables that retain for the largest amount of information that is common to all of the variables.

Suppose we have a set of N variables a_{1j} to a_{Nj} representing the ownership of N assets by each household j. Principal components starts by specifying each variable normalized by its mean and standard deviation for example, $a_{ij} = (a_{ij}^* - a_i^*) / (s_i^*)$, where

a_i^* is the mean of a_{ij}^* across households and

s_i^* is its standard deviation.

These selected variables are expressed as linear combinations of a set of underlying components for each household j:

$$\left. \begin{aligned} a_{1j} &= v_{11}xA_{1j} + v_{12}xA_{2j} + \dots + v_{1N}xA_{Nj} \\ &\vdots \\ a_{Nj} &= v_{N1}xA_{1j} + v_{N2}xA_{2j} + \dots + v_{NN}xA_{Nj} \end{aligned} \right\} \dots \dots \dots 3.1$$

Where A_j are the components and v_j are the coefficients on each component for each variable.

The scoring factors from the model are recovered by inverting the system implied by equation 1 and yield a set of estimates for each of the N principal components:

$$\left. \begin{aligned} A_{1j} &= f_{11} X a_{1j} + f_{12} X a_{2j} + \dots + f_{1N} X a_{Nj} \\ A_{Nj} &= f_{N1} X a_{1j} + f_{N2} X a_{2j} + \dots + f_{NN} X a_{Nj} \end{aligned} \right\} \quad 3.2$$

The first principal component expressed in terms of the original variable is therefore an index for wealth index for each household based on the expression:

$$A_{1j} = f_{11} X (a_{1j}^* - a_1^*) / (s_1^*) + \dots + f_{1N} X (a_{Nj}^* - a_N^*) / (s_N^*) \quad 3.3$$

The survey includes data on 22 items namely fridge, radio, television, video, cable/satellite dish, washing machine, GSM phone i.e mobile phone, telephone, generator, gas/electric cooker, electricity, grinding machine, motorcycle, bicycle, fan, kerosene stove, cows, goats, own farmland, own boat or ship or canoe, own donkey or camel or horse. These variables were originally coded as 1= yes and 2= no; and was re-coded into 1= yes and 0= no.

Illustration: Have fridge in the house 1= yes
 0= no

Principal component analysis was used to generate factor scores for the computation of wealth index using SPSS version 20. Descriptive statistics for the factor score generated was performed, cut-off points were assigned for the percentiles as 20, 40, 80 and 100 and values were assigned for the index. Specifically, the last 40% was assigned to the poorest, the next 40% to the middle class and the top 20% to the richest. Thus, the wealth index was computed (Filmer and Pritchett, 2001).

3.8 MODELLING PROCEDURE

3.8.1 Description of Multilevel Modelling

Social and organizational research often involves problems that investigate the relationship between individual and the organization (social group) they belong to. The general concept is that individuals interact with the social contexts to which they belong i.e individual person are influenced by the social groups to which they belong and that the properties of those groups are in turn influenced by the individual who make up that group. Generally the individuals and the social groups are conceptualized as a hierarchical system of individual and groups, with individual and groups defined at separate levels of this hierarchical system thus leads to research into the interaction between variables characterizing individuals and variable characterizing groups known as multilevel research.

In multilevel research, variables can be defined at any level of hierarchy. Some of these variables may be measured directly at their own natural level. For example, school education provides a clear case of a system in which individuals are subject to influences of grouping. Students learn in the classes, classes are taught within the school and schools may be administered within the school board. The units in such a system are at four different levels of a hierarchy. A typical multilevel model of this system would assign pupil to level 1, classes to level 2, school to level 3 and board to level 4.

Also in public health research, variables can be defined at any level of hierarchy by focusing attention on the level of hierarchy in the population, multilevel modelling enables the researcher to understand where and how effects are occurring. It provides better estimate in answer to the simple question for which single-level analysis were once used and in addition allows more complex question to be answered. For example, Uthman and Kongnyuy (2008) used multilevel modelling show that wealth is associated with Nigerian women's sexual behaviour which is consistent with previous study among men by Kimuna S and Djamba Y (2005).

Multilevel regression models is known in the research literature under a variety of names such as 'Random coefficient models' (de Leeuw and kreft, 1986, Longford, 1993), 'Variance component models' (Longford 1987) and 'Hierarchical linear models' (Raudenbush & Byrk, 1986, 1988, 2002, Snijders & Bosker, 1999, Heck & Thomas, 2000 and Joop J. Hox 2002, 2005). This model

is also referred to as mixed-effects or mixed models by statistically oriented publications (Little, Milliken, Stropu & Wolfinger, 1996).

Furthermore, multilevel regression analysis can be applied to longitudinal data where the levels are defined by the measurement occasions nested within individuals.

3.8.2 Multilevel Modelling in SPSS.

The use of multilevel modelling in SPSS mixed program is flexible and can be used to estimate the number of different types of models with random intercept (i.e means that vary across groups) and random slope (i.e within-group regression coefficients that vary across groups). Also, multilevel modelling in SPSS mixed is useful in looking at individual change over repeated measurements or in studies of changes of individual within organizations over time.

There are several ways to develop models using SPSS mixed. It is either you use graphical user interface (GUI) or syntax statements to define the model. Graphical user interface are set up through the SPSS menu system. Syntax provides a record of what has been done previously. Syntax can be generated through the menu system.

There are three distinct steps in developing the multilevel model. The first step is to develop a null model with no predictor to partition the variance in the outcome into its within and between groups components. The empty model provides a measure of dependence within each level of unit by way of the intraclass correlation (λ). The ICC describes the proportion of variance that is common to each unit as opposed to variation that is associated with individuals within their units. It can be thought of as population estimate of the amount of variance in the outcome explained by the grouping structure (Hox, 2002). The proportion of variance found between groups can be calculated in SPSS by using either the variance components or mixed procedures. The ICC can be represented as

$$\lambda = \frac{\theta_B^2}{\theta_B^2 + \theta_W^2} \dots\dots\dots 3.4.$$

Where θ_B^2 represent the contextual variance and θ_W^2 represent the individual level variance respectively. Also, the ICC is the ratio of between groups variance to the total variance. The

higher the ICC, the more homogeneous are the units' variance. In linear model, the ICC is based on the clear distinction that exists between the individual level variance and the area level variance (Merlo et al, 2006)

In multilevel logistic regression, both the individual level and area level variances are expressed on the same scale (for example, mm Hg for systolic blood pressure). Therefore, partition of variance between different levels is easy to perform for detecting contextual phenomena. In multilevel logistic regression, the individual level variance and area level variance are not directly comparable because the area level residual variance θ_B^2 is on the logistic scale and the individual level residual variance θ_W^2 is on the probability scale. Consequently, the computation of the ICC in a multilevel logistic regression is given as:

$$ICC = \frac{V_A}{V_A + 3.29} \dots\dots\dots 3.5$$

Where V_A is the area random variance and $3.29 = \frac{\pi^2}{3}$ i.e individual level variance (Merlo et al, 2006).

3.7.3 Application of Multilevel Model in this study

The aim of this study is to investigate whether the wealth status of Nigerian men determines their sexuality pattern

Firstly, an empty model (intercept-only model) which serves as benchmark with which other models are compared will be estimated. i.e with no explanatory variables.

$$Y_{ij} = \alpha_{0i} + \mu_{ij} \dots\dots\dots 3.6$$

where κ_{ij} = Sexual partnership pattern of i th individual in the j th area.

μ_{ij} = Constant/ intercept

In model 2, individual-level factors will be included to investigate the extent to which these factors influence the pattern of Nigerian men sexuality.

It is represented as:

$$Y_{ij} = \alpha_{oi} + \sum_i \sum_j^{n \cdot r} \alpha_i X_j + \mu_{ij} \} \dots \dots \dots 3.7$$

Where X_j represent the predictor variable. (age, alcohol use, education, religion, marital status, occupation, wealth index, condom use.)

In model 3, contextual factors will be added to model two to investigate whether Nigerian men sexuality is influenced by their area.

$$Y_{ij} = \alpha_{oi} + \sum_i \sum_j^{n \cdot r} \alpha_i X_j + \mu_{ij} \} \dots \dots \dots 3.8$$

Where X_j represent the predictor variables and α_i are regression coefficients for the area level variables.

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CHAPTER FOUR

RESULTS

4.1 DEMOGRAPHIC AND BEHAVIOURAL CHARACTERISTICS OF RESPONDENTS.

Data on a total of 6161 respondents (males aged 15 to 64 years old) were analysed. From table 4.1, higher proportion of the respondents (65.6%) were from rural areas while 34.4% were from urban areas. Out of the 6161 respondents, 1551 (24.6%) were from the North-western region, 13.3% from the North-east, 18.0% from the North-central, 18.0% from the South-west, 15.5% from South-south and only 10.7% were from South-east. Also, table 4.1 further revealed that the proportion of respondents who were not in union (54.2%) was higher than those in union (45.8%). The ethnic composition of the extracted data were Hausa/Fulani (37.1%), Yoruba (19.9%), Igbo (14.4%) and others (28.6%). About three in twenty (24.2%) have no formal education, only 19.4% attained primary education and 56.4% have secondary or higher level of education. Half of the respondents practice Islam (50.6%), 47.9% were Christians and only 1.5% practice other forms of religion. More than half of them were in the age group 21-49 years, 26.4% were between 15-20 years while only 13.4% were in the age group 50-64 years. Of all the respondents from table 4.1, 40.0% were poor, 40.0% were in middle class and only 20.0% were in the richest group. Condom use was very low with only 33.4% being ever users. In terms of occupation, there were 26.6% skilled, 38.0% unskilled, 28.3% students and 7.1% with other forms of occupation. Alcohol use was reported by 23.6%. The prevalence of sexual partnership was very high among the respondents. 61.1% reported having multiple sexual partners while non-regular sexual partnering amidst them was 62.8% (table 4.1).

Table 4.1: Frequency distribution of respondents by demographic and behavioural characteristics.

| PARAMETER | FREQUENCY (N=6161) | PERCENTAGE |
|----------------------------------|-----------------------|------------|
| LOCATION | | |
| Urban | 2118 | 34.4 |
| Rural | 4043 | 65.6 |
| ZONE | | |
| North-West | 1514 | 24.6 |
| North-East | 818 | 13.3 |
| North-Central | 1105 | 18.0 |
| South-West | 1104 | 18.0 |
| South-East | 655 | 10.7 |
| South-South | 953 | 15.5 |
| ETHNICITY | | |
| Yoruba | 1107 | 18.0 |
| Igbo | 861 | 14.0 |
| Hausa/Fulani | 2371 | 38.5 |
| Others | 1822 | 29.6 |
| MARITAL STATUS | | |
| in union | 2818 | 45.8 |
| Not in union | 3331 | 54.2 |
| EDUCATION ATTAINMENT | | |
| No formal education | 1493 | 24.2 |
| Primary | 1193 | 19.4 |
| Secondary or Higher | 3475 | 56.4 |
| RELIGION | | |
| Islam | 3112 | 50.6 |
| Christianity | 2947 | 47.9 |
| Others | 95 | 1.5 |
| AGE-GROUP | | |
| ≤20 | 1624 | 26.4 |
| 21-49 | 3711 | 60.2 |
| ≥50 | 826 | 13.4 |
| WEALTH INDEX | | |
| Poorest | 2461 | 40.0 |
| Middle-Class | 2461 | 40.0 |
| Richest | 1230 | 20.0 |
| OCCUPATION | | |
| Skilled | 1636 | 26.6 |
| Unskilled | 2342 | 38.0 |
| Student | 1746 | 28.3 |
| Others | 437 | 7.1 |
| EVER USE CONDOM | | |
| Yes | 1639 | 33.4 |
| No | 3267 | 66.6 |
| ALCOHOL USE | | |
| Yes | 1444 | 23.6 |
| No | 4665 | 76.4 |
| NUMBER OF SEXUAL PARTNERS | | |
| ≤1 | 2397 | 38.9 |
| ≥2 | 3764 | 61.1 |
| TYPE OF SEXUAL PARTNERS | | |
| Regular | 2291 | 37.2 |
| Non-regular | 3870 | 62.8 |

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| ETHNICITY | | |
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4.2 RESULTS FROM PRINCIPAL COMPONENT ANALYSIS

Table 4.2 reports the scoring factors from the principal components analysis of the 22 household assets. The mean value of the index was 0 and the standard deviation was 1.0; because all asset variables take only the values 0 (if such asset is absent) and 1 (if such asset is present). A household that owns a fridge has an asset index higher by 0.29 than any household that does not; having electricity raises a household's asset index by 0.32 while having a bicycle and owning farmland lowers the asset index by 0.07 and 0.21 respectively.

From the PCA results, I sort individuals by the asset index and establish cut-off values for percentiles of the population. I then assign households to a group on the basis of their value on the index. The first 40% was referred to as 'poorest', the next 40% as 'middle class' and the top 20% was regarded as the 'richest' (table 4.2).

Furthermore, the last 3 columns of table 4.2 compared the average ownership of each asset across the poor, middle and rich households. There was variation across groups for almost all the assets. Having a television set was 3% for the poor, 77% for those in the middle class and 100% for the rich. Also, having cable/satellite dish was 27% for the rich, 2% for those in the middle class while the poor have none (0%). It was interesting to note that washing-machine across the groups was very low. It was only 3% for those in the richest group. In the same manner, there was a wide variation in gas/electric cooker ownership by these men across the group. 0% for the poorest, 3% for those in the middle class and 33% for the richest. Comparing ownership of phone to telephone across the groups from table 4.2, it was found that the use of telephone is becoming outdated (0% in the poorest group, 2% among the middle class and only 16% among the rich) while use of GSM was common across the groups; although it was still low among the poor (8%). Also, table 4.2 further revealed that ownership of farmland was prevalent among the poor (82%) and lowest among the rich (32%).

Table 4.2: Scoring factors and summary statistics for variables used in computation of first Principal Component.

| VARIABLES | ALL MEN IN NIGERIA | | | MEANS | | | |
|---------------------|--------------------|-------|-------|---------------------|-------------|------------------|-------------|
| | Scoring Factor | Mean | SD | Scoring Factor x SD | Poorest 40% | Middle Class 40% | Richest 20% |
| Fridge | 0.686 | 0.239 | 0.426 | 0.29 | 0.00 | 0.18 | 0.83 |
| Radio | 0.363 | 0.874 | 0.332 | 0.12 | 0.73 | 0.95 | 1.00 |
| TV | 0.819 | 0.519 | 0.500 | 0.41 | 0.03 | 0.77 | 1.00 |
| Car | 0.496 | 0.113 | 0.317 | 0.16 | 0.01 | 0.06 | 0.43 |
| Video | 0.779 | 0.401 | 0.490 | 0.38 | 0.01 | 0.52 | 0.95 |
| Cable/S. Dish | 0.440 | 0.060 | 0.238 | 0.10 | 0.00 | 0.02 | 0.27 |
| Washing machine | 0.140 | 0.010 | 0.097 | 0.01 | 0.00 | 0.01 | 0.03 |
| GSM | 0.716 | 0.484 | 0.500 | 0.36 | 0.08 | 0.65 | 0.95 |
| Telephone | 0.329 | 0.040 | 0.195 | 0.06 | 0.00 | 0.02 | 0.16 |
| Generator | 0.560 | 0.183 | 0.386 | 0.22 | 0.01 | 0.15 | 0.61 |
| Gas/Electric cooker | 0.456 | 0.077 | 0.267 | 0.12 | 0.00 | 0.03 | 0.33 |
| Electricity | 0.654 | 0.610 | 0.488 | 0.32 | 0.23 | 0.81 | 0.97 |
| Grinding machine | 0.244 | 0.060 | 0.238 | 0.06 | 0.02 | 0.05 | 0.17 |
| Motorcycle | 0.181 | 0.321 | 0.467 | 0.08 | 0.22 | 0.38 | 0.41 |
| Bicycle | -0.150 | 0.393 | 0.489 | -0.07 | 0.46 | 0.39 | 0.28 |
| Fan | 0.784 | 0.528 | 0.499 | 0.39 | 0.05 | 0.77 | 0.99 |
| Kerosene stove | 0.659 | 0.556 | 0.497 | 0.33 | 0.18 | 0.73 | 0.96 |
| Cow | -0.289 | 0.161 | 0.367 | -0.11 | 0.28 | 0.09 | 0.07 |
| Goat | -0.368 | 0.448 | 0.497 | -0.18 | 0.63 | 0.38 | 0.22 |
| Own farmland | -0.424 | 0.618 | 0.486 | -0.21 | 0.82 | 0.57 | 0.32 |
| Boat/Ship/Canoe | -0.041 | 0.051 | 0.220 | -0.01 | 0.06 | 0.06 | 0.03 |
| Donkey/Carmel/Horse | -0.212 | 0.046 | 0.209 | -0.04 | 0.09 | 0.01 | 0.02 |

S.D = standard deviation

4.3 DISTRIBUTION OF WEALTH ACROSS THE CONTEXTUAL CHARACTERISTICS.

Table 4.3 below shows the distribution of wealth across the contextual characteristics by the respondents. It was observed that highest proportion of the respondents from urban areas were moderately rich (47.8%) while only 10.3% were poor. Interestingly, rural dwellers were mostly from the poorest group (48.3%) and only 8.5% were rich.

Moreover, from table 4.3 there was variation in wealth status across the ethnic groups. Only 15.5% of Yoruba men were poor while only 29.3% were rich. They were mostly in the middle-class (55.2%) followed by Igbo men (45.9%) and 43.6% from other ethnic groups. Hausa/Fulani were mostly in the poorest group (61.2) while only 10.8% were rich.

Distribution of wealth varies across zone and the result was similar to that from ethnic group. Men from South-west (55.9%), South-east (47.0%), South-south (53.4%) and those from other ethnic groups (43.6%) were moderately rich while those from the northern region were mostly in the poorest group. (table 4.3).

Table 4.3: Frequency distribution of Wealth status across Contextual factors

| PARAMETER | WEALTH INDEX | | | |
|-----------|---------------|--------------|--------------|-------------|
| | Poorest | Middle class | Richest | |
| LOCATION | Urban | 217 (10.3%) | 1009 (47.8%) | 887 (42.0%) |
| | Rural | 2244 (55.6%) | 1452 (35.9%) | 343 (8.5%) |
| ETHNICITY | Yoruba | 171 (15.5%) | 609 (55.2%) | 324 (29.3%) |
| | Igbo | 186 (21.7%) | 393 (45.9%) | 278 (32.4%) |
| | Hausa/Fulani | 1450 (61.2%) | 666 (28.1%) | 255 (10.8%) |
| | Others | 654 (35.9%) | 793 (43.6%) | 373 (20.5%) |
| ZONE | North West | 906 (59.8%) | 425 (28.1%) | 183 (12.1%) |
| | North East | 541 (66.1%) | 212 (25.9%) | 65 (7.9%) |
| | North Central | 472 (42.8%) | 389 (35.3%) | 242 (21.9%) |
| | South West | 169 (15.3%) | 616 (55.9%) | 316 (28.7%) |
| | South East | 173 (26.6%) | 306 (47.0%) | 172 (26.4%) |
| | South South | 198 (20.8%) | 509 (53.4%) | 246 (25.8%) |

4.4 UNIVARIATE ANALYSIS OF INDIVIDUAL-LEVEL FACTORS ASSOCIATED WITH SEXUAL PARTNERSHIP PATTERN AMONG NIGERIAN MEN.

4.4.1 Age Groups.

Table 4.4 shows the association between age of respondents and sexual partnership pattern. Overall, about 62% of all men had more than one sexual partner. The practice was more common among young men aged less than or equal to 20 years (87.9%) compared to those aged 21-49 years (50.0%) and those aged 50 years and above (58.2%). The level of having non-regular sexual partner is highest (97.3%) in the age group less or equal to 20 years than any other age group followed by 36.7% in age group 21-49 years and 53.5% among those aged 50 years and above. Those in age group 21-49 years tend to have more regular sexual partners (63.3%) than any other age group. This pattern is statistically significant at $p < 0.05$.

4.4.2 Educational attainment.

Also from table 4.4, we observed that there is no significant association between the level of education attained by the respondents and the number of sexual partners they have ($p = 0.202$), however there was an association between type of sexual partnership and level of education ($p < 0.05$). There is fairly no association in the level of education attained by respondents and having multiple sexual partners. Out of 1,493 respondents with no formal education, 60.7% have more than one sexual partner while only 39.3% have one sexual partner. 59.1% of respondents with primary education have more than one sexual partner and 62.0% of respondents with secondary or higher as level of education have multiple sexual partners. Having non-regular sexual partners increases with increase in level of education of respondents. 45.5% of respondents with no formal education have non-regular sexual partners, 53.6% of those with primary education only and 73.4% with those with secondary or higher as the level of education attained. However, this pattern is significant at $p < 0.05$.

4.4.3 Marital status.

Moreover, as expected, respondents who were not in union have more than one sexual partner compared to respondents who were in union. Out of 2818 respondents who were in union, 42.1% have multiple sexual partners compared to 77.1% of those who are not in union. This association

was statistically significant at $p < 0.05$. Also, those who were in union have higher probability (74.6%) of having regular sexual partners compared to those who were not in union (5.6%). Thus, marital status is associated with sexual partnership pattern of men (table 4.4).

4.4.4 Religion.

From table 4.4, there was an association between religion and sexual partnership pattern. Higher proportion of respondents have multiple sexual partners and non-regular partner. 65.6% have more than one sexual partner and 34.4% have one sexual partners. Out of 2947 respondents who were Christians, 57.0% have more than one sexual partner and 54.7% of those who practice other forms of religion have more than one sexual partner. This association is statistically significant at $p < 0.05$. Whether a respondent have regular or non-regular sexual partner is associated with religion. The pattern shows that the prevalence of non-regular sexual partner is highest among respondents who were Christians (70.4%) and lowest among those who practice other forms of religion (45.3%). Out of 3,112 respondents who were Islam, 56.1% have non-regular sexual partners. Thus, religion is associated with sexual partnership pattern. ($p < 0.05$).

4.4.5 Occupation.

Table 4.4 further reveals that the prevalence of multiple sexual partnering was highest among students (80.9%), followed by other forms of occupation (59.0%), 56.1% of unskilled and least among skilled (47.7%). There is no significant association in the type of occupation of respondents and their sexual partnership pattern. This implies that occupation is associated with number of sexual partner a man has. ($p < 0.05$). It was observed that higher proportion of respondents who were students (97.0%) and those with other forms of occupation (67.3%) have non-regular sexual partner compared with skilled (46.2%) and unskilled (48.1%) forms of occupation. ($p < 0.05$).

4.4.6 Wealth Index.

With respect to wealth status of respondents (table 4.4), multiple sexual partnering is more prevalent among the poor (62.8%), followed by those who were moderately rich (61.5%) and least among the richest (56.7%) and this association is statistically significant at $p < 0.05$. However, having non-regular sexual partner increases with increase in wealth status of

respondent. The incidence was highest among the richest (67.6%) and least among the poorest (55.7%). The association is significant at $p < 0.05$.

4.4.7 Ever Used Condom.

Furthermore, incidence of multiple sexual partnering was highest among non-users of condom (63.6%) but in terms of type of sexual partnering; having non-regular sexual partner was highest among those who have used condom (68.6%). This association is statistically significant at $p < 0.05$.

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Table 4.4: Univariate Analysis Of Individual-Level Factors Associated With Sexual Partnership Pattern Among Nigerian Men.

| INDIVIDUAL CHARACTERISTICS | NUMBER OF SEXUAL PARTNERS | | χ^2 | TYPE OF SEXUAL PARTNER | | χ^2 |
|-------------------------------|---------------------------|--------------|-----------|------------------------|--------------|------------|
| | ≤ 1 | ≥ 2 | | Regular | Non-regular | |
| AGE | | | | | | |
| ≤ 20 | 197(12.1%) | 1427(87.9%) | 684.36** | 44(2.7%) | 1590(97.3%) | 1204.434** |
| 21-49 | 1855(50.0%) | 1856(50.0%) | | 1727(46.5%) | 1991(53.5%) | |
| ≥ 50 | 345(41.8%) | 481(58.2%) | | 516(63.3%) | 298(36.7%) | |
| EDUCATIONAL ATTAINMENT | | | | | | |
| No formal education | 587(39.3%) | 906 (60.7%) | 3.201* | 814 (54.5%) | 679 (45.5%) | 403.739** |
| Primary | 488 (40.9%) | 705 (59.1%) | | 554 (46.4%) | 639 (53.6%) | |
| Secondary or Higher | 1322 (38%) | 2153 (62%) | | 923 (26.6%) | 2552 (73.4%) | |
| MARITAL STATUS | | | | | | |
| In Union | 1632 (57.9%) | 1186 (42.1%) | 786.755** | 2102 (74.6%) | 716 (25.4%) | 3108.193** |
| Not in union | 763 (22.9%) | 2568 (77.1%) | | 187 (5.6%) | 3144 (94.4%) | |
| RELIGION | | | | | | |
| Islam | 1086 (34.9%) | 2026 (65.1%) | 43.017** | 1365 (43.9%) | 1747 (56.1%) | 144.033** |
| Christianity | 1266 (43.0%) | 1681 (57.0%) | | 873 (29.6%) | 2074 (70.4%) | |
| Others | 43 (45.3%) | 52 (54.7%) | | 52 (54.7%) | 43 (45.3%) | |
| OCCUPATION | | | | | | |
| Skilled | 855 (52.3%) | 781 (47.7%) | 435.781** | 880 (53.8%) | 756 (46.2%) | 1285.043** |
| Unskilled | 1029 (43.9%) | 1313 (56.1%) | | 1215 (51.9%) | 1127 (48.1%) | |
| Schooling | 334 (19.1%) | 1412 (80.9%) | | 53 (3.0%) | 1693 (97.0%) | |
| Others | 179 (41.0%) | 258 (59.0%) | | 143 (32.7%) | 294 (67.3%) | |
| WEALTH INDEX | | | | | | |
| Poorest | 915 (37.2%) | 1546 (62.8%) | 13.372** | 1090 (44.3%) | 1371 (55.7%) | 87.678** |
| Middle class | 948 (38.5%) | 1513 (61.5%) | | 801 (32.5%) | 1660 (67.5%) | |
| Richest | 533 (43.3%) | 697 (56.7%) | | 399 (32.4%) | 831 (67.6%) | |
| EVER USE CONDOM | | | | | | |
| Yes | 890 (54.3%) | 749 (45.7%) | 142.819** | 514 (31.4%) | 1125 (68.6%) | 40.928** |
| No | 1190 (36.4%) | 2077 (63.6%) | | 1331 (40.7%) | 1936 (59.3%) | |
| ALCOHOL USE | | | | | | |
| Yes | 713 (49.2%) | 731 (50.6%) | 88.880** | 556 (38.5%) | 888 (61.5%) | 1.431* |
| No | 1658 (35.5%) | 3007 (64.5) | | 1715 (36.8%) | 2950 (63.2%) | |

+ implies non-significance, *p<0.05, **p<0.01

4.5 UNIVARIATE ANALYSIS OF CONTEXTUAL FACTORS ASSOCIATED WITH SEXUAL PARTNERSHIP PATTERN AMONG NIGERIAN MEN.

4.5.1 Location

From table 4.5, multiple sexual partnering was more common among rural dwellers (62.4%) compared to their urban counterparts but the prevalence of non-regular sexual partners was highest among urban dwellers (66.2%). This association is statistically significant at $p < 0.05$.

4.5.2 Ethnicity

In addition, the practice of multiple sexual partnering varies across the group ($p < 0.05$). It is more prevalent among the Hausa/Fulani (65.2%) and least among other ethnic groups (56.5%). Having non-regular sexual partner is most common among Igbo (69.5%), followed by Yoruba (68.8%) and least among Hausa/Fulani (54.3%).

4.5.3 Geographical Region

In table 4.5, the prevalence of multiple sexual partnering is highest (67.5%) in the north-west region and lowest in the south-south (50.4%) but reverse was the case in terms of having non-regular sexual partner which was highest in the South-east (70.1%), followed by 69.7% in the South-west, 68.4% in the South-south, 67.0% in the North-central, 53.8% in the North-east and least in the North-west (53.0%) region. This association is statistically significant at $p < 0.05$.

Table 4.5: Univariate analysis of Contextual factors associated with Sexual Partnership Pattern among Nigerian men.

CONTEXTUAL CHARACTERISTICS

| LOCATION | NUMBER OF SEXUAL PARTNERS | | | TYPE OF SEXUAL PARTNER | | |
|----------------------------|---------------------------|--------------|----------|------------------------|-------------|-----------|
| | <=1 | >=2 | χ^2 | Regular | Non-regular | χ^2 |
| Urban | 875(41.3%) | 1243 (58.7%) | 7.864** | 764(34.0%) | 1483(66.0%) | 15.786** |
| Rural | 1522(37.6%) | 2468(62.4%) | | 1522(38.8%) | 2397(61.2%) | |
| ETHNIC GROUP | | | | | | |
| Yoruba | 406 (36.7%) | 791(64.4%) | 41.868** | 345 (31.2%) | 844(68.7%) | 121.834** |
| Igbo | 372 (43.2%) | 505(56.9%) | | 263 (30.5%) | 620(69.8%) | |
| Hausa/Fulani | 826 (34.8%) | 1504(65.7%) | | 1084 (45.7%) | 1237(54.1%) | |
| Others | 793 (43.5%) | 994(56.4%) | | 599 (32.9%) | 1178(66.9%) | |
| GEOGRAPHICAL REGION | | | | | | |
| North-west | 492 (32.5%) | 1022 (67.5%) | 78.778** | 712 (47.0%) | 802 (53.0%) | 149.17** |
| North-east | 318 (38.9%) | 500 (61.1%) | | 378 (46.2%) | 440 (53.8%) | |
| North-central | 433 (39.2%) | 672 (60.8%) | | 365 (33.0%) | 740 (67.0%) | |
| South-west | 399 (36.1%) | 705 (63.9%) | | 335 (30.3%) | 769 (69.7%) | |
| South-east | 276 (42.1%) | 379 (57.9%) | | 196 (29.9%) | 459 (70.1%) | |
| South-south | 473 (49.6%) | 480 (50.4%) | | 301 (31.6%) | 652 (68.4%) | |

+ implies non-significance, * p<0.05, ** p<0.01

4.6 MULTILEVEL LOGISTIC REGRESSION FOR PREDICTORS OF MULTIPLE SEXUAL PARTNERSHIP AMONG NIGERIAN MEN.

4.6.1 Individual and Contextual Characteristics.

From table 4.6 (model 2), respondents aged 15-20years are 1.3 times more likely to have multiple sexual partners compared to those of age group 50years or older (OR=1.32, 95%CI: 0.99-1.76). The odds of having multiple sexual partners was 41% lower among men aged 21-49years compared to those aged 50years and above (OR=0.59, 95%CI: 0.48-0.72).

Also, there is no association between education attainment and having multiple sexual partners. Respondents with primary education are 1.1 times more likely to have more than one sexual partner compared to those of Secondary or Higher level of education (OR=1.07, 95%CI: 0.89-1.27). The odds of having more than one sexual partner was 16% lower among respondents with no formal education compared to those of secondary or higher level of education (OR=0.84, 95%CI: 0.67-1.04).

Furthermore, respondents who were in union were 69% less likely to report having multiple sexual partners than those who are not in union (OR=0.31, 95%CI: 0.26-0.36). Religion is not statistically associated with multiple sexual partners. Christian respondents are 0.8 times more likely to have more than one sexual partner than respondents who practiced other forms of religion (OR=0.84, 95%CI: 0.51-1.40) and those who were muslim were 0.7 times more likely to have more than one sexual partner compared to those who practiced other forms of religion. (OR=0.70, 95%CI: 0.43-1.15). Being a student is statistically associated with having more than one sexual partner. They are 1.5 times more likely to have multiple sexual partners compared to those with other forms of occupation (OR=1.50, 95%CI: 1.14-1.98).

From table 4.6, wealth status is not associated with having more than one sexual partner as hypothesized. The odds of having multiple sexual partners was 3% higher among the poorest group compared to those in the richest group (OR=1.03, 95%CI: 0.85-1.26) while it was 10% higher among the middle class compared to those in the richest group (OR=1.10, 95%CI: 0.93-1.30). Ever use of condom is statistically associated with having more than one sexual partner. The odds of having multiple sexual partners was 95% higher among respondents who were ever users of condom (OR=1.95, 95%CI= 1.68-2.26).

Adding individual-level variables to the null model, there was increase in the value of intercept (2.32) although it still remains significant and there was decrease in the Akaike information criterion's value (21,591.258) which fits the model better than the empty model.

Inclusion of the contextual factors had little effect on the contribution of individual –level variables to the likelihood of having multiple sexual partners (model3). The effect of marital status, ever use condom, occupation (student), age (21-49years) remained statistically significant.

The odds of reporting having multiple sexual partner was 31% higher among men aged less or equal to 20years (OR=1.31, 95%CI:0.99-1.74), although this association was not significant. However, the odds of having multiple sexual partner was 58% lower among men aged 21-49years compared to those aged 50years and above; this association remains significant after control for area factors (OR=0.58, 95%CI: 0.48-0.71).

Although, wealth status was not associated with sexual partnering (table 4.5) but it was interesting that the odds of having multiple sexual partner by men in the poorest group decreased by 15% that of multiple sexual partnering by these men in model2 (OR=0.95, 95%CI: 0.77-1.18) compared to those in the richest group. For men in the middle class, the odds of reporting multiple sexual partner was 5% higher compared to those in the richest group (OR=1.05, 95%CI: 0.93-1.45).

Furthermore, table 4.6 revealed that after adding the contextual factors, education attainment still maintains not being statistically associated with having more than one sexual partner. Among respondents with no formal education, the odds of multiple sexual partnering was 84% lower compared to those with Secondary or Higher level of education. This association is not statistically significant. (OR=0.84, 95%CI: 0.67-1.04). Respondents with Primary education are 1.1 times more likely to have more than one sexual partner compared to those with Secondary or Higher level of education (OR=1.08, 95%CI: 0.90-1.29).

Also, there is consistency in marital status (not in union) being associated with multiple sexual partners (model 3). There was a negative association between marital status and sexual partnership. The odds of reporting multiple sexual partners was low (31%) among men who were in union than those who were not in union (OR=0.31, 95%CI: 0.26-0.36).

Adding individual-level variables to the null model, there was increase in the value of intercept (2.32) although it still remains significant and there was decrease in the Akaike information criterion's value (21,591.258) which fits the model better than the empty model.

Inclusion of the contextual factors had little effect on the contribution of individual –level variables to the likelihood of having multiple sexual partners (model3). The effect of marital status, ever use condom, occupation (student), age (21-49years) remained statistically significant.

The odds of reporting having multiple sexual partner was 31% higher among men aged less or equal to 20years (OR=1.31, 95%CI:0.99-1.74), although this association was not significant. However, the odds of having multiple sexual partner was 58% lower among men aged 21-49years compared to those aged 50years and above; this association remains significant after control for area factors (OR=0.58, 95%CI: 0.48-0.71).

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Also, there is consistency in marital status (not in union) being associated with multiple sexual partners (model 3). There was a negative association between marital status and sexual partnership. The odds of reporting multiple sexual partners was low (31%) among men who were in union than those who were not in union (OR=0.31, 95%CI: 0.26-0.36).

From table 4.6, location was not associated with multiple sexual partnership. Urban dwellers were 0.9 times more likely to report having more than one sexual partner compared to men in rural areas (OR=0.88, 95%CI: 0.76-1.03).

Moreover, there was no association between ethnicity and multiple sexual partnership. The odds of having multiple sexual partners was 1% lower among men who were Yoruba compared to respondents from other ethnic group (OR=0.99, 95%CI: 0.76-1.31). However, the odds of having multiple sexual partners among Hausa/Fulani men was 8% higher than any other ethnic groups (OR=1.08, 95%CI: 0.86-1.35).

Upon inclusion of contextual characteristics of respondents to model2 in table 4.6, there was an increase in the value of Akaike information criterion's value from 21,591.258 to 21,617.065 and the value of intercept also increases from 2.32 to 2.67 which implies that individual-level variables best fit the model, this effect however remains significant (95%CI: 1.40-5.10). In the null model, the variability in the sexual partnership was 0.06 but after adding the individual-level factors, the variability reduced to 0.05.

Table 4.6: Individual and Contextual factors associated with Multiple Sexual Partnership among Nigerian men.

| individual variables | Empty model | Model with individual variables | Model with individual and Contextual variables |
|------------------------------------|----------------------------------|---------------------------------|--|
| | Model 1 OR(95% CI) | Model 2 OR(95% CI) | Model 3 OR(95% CI) |
| Age groups | | | |
| <= 20 | | 1.32 (0.99-1.76) ⁺ | 1.31 (0.99-1.74) ⁺ |
| 21-49 | | 0.59 (0.48-0.72) ^{**} | 0.58 (0.48-0.71) ^{**} |
| >= 50 | | Reference | Reference |
| Educational attainment | | | |
| No formal education | | 0.84 (0.67-1.04) ⁺ | 0.84 (0.67-1.04) ⁺ |
| Primary | | 1.07 (0.89-1.27) ⁺ | 1.08 (0.90-1.29) ⁺ |
| Secondary or Higher | | Reference | Reference |
| Marital status | | | |
| In union | | 0.31 (0.26-0.36) ^{**} | 0.31 (0.26-0.36) ^{**} |
| Not in union | | Reference | Reference |
| Religion | | | |
| Christianity | | 0.84 (0.51-1.40) ⁺ | 0.81 (0.48-1.35) ⁺ |
| Islam | | 0.70 (0.43-1.15) ⁺ | 0.70 (0.43-1.14) ⁺ |
| Others | | Reference | Reference |
| Occupation | | | |
| Skilled | | 1.02 (0.79-1.31) ⁺ | 1.03 (0.79-1.32) ⁺ |
| Unskilled | | 1.09 (0.84-1.40) ⁺ | 1.07 (0.82-1.38) ⁺ |
| Schooling | | 1.50 (1.14-1.98) ^{**} | 1.50 (1.14-1.97) ^{**} |
| Others | | Reference | Reference |
| Wealth Index | | | |
| Poorest | | 1.03 (0.85-1.26) ⁺ | 0.95 (0.77-1.18) ⁺ |
| Middle class | | 1.10 (0.93-1.30) ⁺ | 1.05 (0.89-1.25) ⁺ |
| Richest | | Reference | Reference |
| Ever use condom | | | |
| Yes | | Reference | |
| No | | 1.95 (1.68-2.26) ^{**} | 1.95 (1.68-2.26) ^{**} |
| Alcohol use | | | |
| Yes | | 1.03 (0.88-1.21) ⁺ | 1.04 (0.88-1.22) ⁺ |
| No | | Reference | Reference |
| Contextual variables | | | |
| Location | | | |
| Urban | | | 0.88 (0.76-1.03) ⁺ |
| Rural | | | Reference |
| Ethnic group | | | |
| Yoruba | | | 0.99 (0.76-1.31) ⁺ |
| Igbo | | | 0.84 (0.62-1.14) ⁺ |
| Hausa/Fulani | | | 1.08 (0.86-1.35) ⁺ |
| Others | | | Reference |
| Intercept | 1.53 (1.254-1.856) ^{**} | 2.32 (1.24-4.34) ^{**} | 2.67 (1.39-5.10) ^{**} |
| Random effect | | | |
| Area random variance (SE) | 0.06 (0.04) | 0.05 (0.04) | 0.05 (0.04) |
| Variance partition coefficient (%) | 1.67 | 1.61 | 1.61 |
| Model fit statistic | | | |
| AIC | 26,376.298 | 21,591.258 | 21,617.065 |

⁺ implies not significant, ^{*} p<0.05, ^{**} p<0.01
SE implies standard error, AIC is Akaike information criterion

4.7 MULTILEVEL LOGISTIC REGRESSION FOR PREDICTORS OF NON-REGULAR SEXUAL PARTNERSHIP AMONG NIGERIAN MEN.

4.7.1 Model with Individual characteristics and type of Sexual Partner

From table 4.7, respondents aged 15-20years are 3.4 times more likely to have non-regular sexual partner compared to those of age group 50years or older (OR=3.42, 95%CI: 2.13-5.50). The odds of having non-regular sexual partner was 86% lower among respondents aged 21-49years compared to those of aged 50years or older (OR=0.86, 95%CI: 0.68-1.08)

Moreover, there was no association between educational attainment and having non-regular sexual partner. Respondents with no formal education are 0.7 times more likely to have non-regular sexual partner compared to those of Secondary or Higher level of education (OR=0.73, 95%CI: 0.55-0.97). Also, respondents with Primary education are 0.9 times more likely to have non-regular sexual partner compared to those of Secondary or Higher level of education (OR=0.92, 95%CI: 0.73-1.15).

Furthermore, marital status was negatively associated with non-regular sexual partnership while religion was positively associated. The odds of having non-regular sexual partner was 4% lower among men who were in union compared to those who were not. (OR=0.04, 95%CI=0.03-0.05). Interestingly, this association does not change after adding the area-level factors to model2 in table 4.7. The odds of having non-regular sexual partner was higher among muslim men (60%) and low among Christian men (13%).

Table 4.7 further revealed that, the prevalence of non-regular sexual partnering among students was very high. The odds of having non-regular sexual partner was 88% higher compared to those with other forms of occupation. (OR=2.88, 95%CI: 1.83-4.52). Across the occupation groups, there was no significant change when contextual factors was added to model2 in table 4.6. Ever use of condom is statistically associated with having non-regular sexual partner. The odds of having non-regular sexual partner was 75% lower among men who never use condom compared to those who were ever users (OR=0.75, 95%CI= 0.61-0.91) while the odds of having non-regular sexual partner was 16% higher among respondents who took alcohol (OR=1.16, 95%CI: 0.94-1.44).

Wealth index was not associated with non-regular sexual partnership. The odds of having non-regular sexual partner was 13% higher among men in the middle class (95%CI: 0.90-1.42) and 94% lower among the poor (95%CI: 0.72-1.23) compared to men in the richest group. After adding contextual factors, there was an association between having non-regular sexual partner and wealth status (middle class).

From table 4.7 (model 3), none of the contextual factors added is significant with having non-regular sexual partners. The odds of having non-regular sexual partner was 4% lower among the urban dwellers compared to rural dwellers (OR=0.96, 95%CI: 0.78-1.18). Ethnicity has a negative association with non-regular sexual partnership. Out of the 3 main tribes, the odds of reporting non-regular sexual partnership was lowest among Igbo men (95%CI: 0.61-1.35) compared to those from other ethnic group.

Inclusion of the contextual factors had little effect on the contribution of individual-level factors to the likelihood of having non-regular sexual partners. The effect of marital status, ever use condom, occupation (student), age (21-49years) remained significant. There was decrease in Akaike information criterion (AIC changes from 26,737.414 to 26,701.013) after adding the contextual factors implying that model3 fits better than model2.

Table 4.7: Individual and Contextual factors associated with Type of Sexual Partnership among Nigerian men.

| INDIVIDUAL VARIABLES | Empty model | Model with individual variables | Model with individual and Contextual variables |
|------------------------------------|-----------------------|---------------------------------|--|
| | Model 1 OR(95% CI) | Model 2 OR(95% CI) | Model 3 OR(95% CI) |
| Age groups | | | |
| <= 20 | | 3.42 (2.13-5.50)** | 3.38 (2.10-5.44)** |
| 21-49 | | 0.86 (0.68-1.08) ⁺ | 0.86 (0.68-1.08) ⁺ |
| >= 50 | | Reference | Reference |
| Educational attainment | | | |
| No formal education | | 0.73 (0.55-0.97) ⁺ | 0.74 (0.56-0.98) ⁺ |
| Primary | | 0.92 (0.73-1.15) ⁺ | 0.92 (0.73-1.15) ⁺ |
| Secondary or Higher | | Reference | Reference |
| Marital status | | | |
| In union | | 0.04 (0.03-0.05)** | 0.04 (0.03-0.05)** |
| Not in union | | Reference | Reference |
| Religion | | | |
| Christianity | | 1.13 (0.59-2.17) ⁺ | 1.19 (0.62-2.31) ⁺ |
| Islam | | 1.60 (0.86-2.99) ⁺ | 1.61 (0.86-3.00) ⁺ |
| Others | | Reference | Reference |
| Occupation | | | |
| Skilled | | 0.83 (0.60-1.15) ⁺ | 0.84 (0.61-1.16) ⁺ |
| Unskilled | | 1.10 (0.78-1.53) ⁺ | 1.10 (0.78-1.54) ⁺ |
| Schooling | | 2.88 (1.83-4.52)** | 2.88 (1.84-4.53)** |
| Others | | Reference | Reference |
| Wealth Index | | | |
| Poorest | | 0.94 (0.72-1.23) ⁺ | 0.91 (0.68-1.22) ⁺ |
| Middle class | | 1.13 (0.90-1.42) ⁺ | 1.12 (0.88-1.41) ⁺ |
| Richest | | Reference | Reference |
| Ever use condom | | | |
| Yes | | Reference | Reference |
| No | | 0.75 (0.61-0.91)** | 0.75 (0.62-0.92)** |
| Alcohol use | | | |
| Yes1 | | 1.16 (0.94-1.44) ⁺ | 1.15 (0.93-1.42) ⁺ |
| No2 | | Reference | Reference |
| Contextual variables | | | |
| Location | | | |
| Urban | | | 0.96 (0.78-1.18) ⁺ |
| Rural | | | Reference |
| Ethnic group | | | |
| Yoruba | | | 0.85 (0.60-1.21) ⁺ |
| Igbo | | | 0.91 (0.61-1.35) ⁺ |
| Hausa/Fulani | | | 0.82 (0.60-1.10) ⁺ |
| Others | 1.77(1.34-2.33)** | 8.05 (3.61-17.93)** | 6.80 (2.90-15.95) ⁺ |
| Intercept | | | |
| Random effect | | | |
| Area random variance (SE) | 0.11 (0.07) | 0.08 (0.06) | 0.08 (0.07) |
| Variance partition coefficient (%) | 3.3 | 2.3 | 2.5 |
| Model fit statistic (AIC) | 26,565.658 | 26,737.414 | 26,701.013 |

+ implies not significant, *p<0.05, **p<0.01

Table 4.8: Model with only Contextual factors associated with sexual partnership pattern among Nigerian men.

| CONTEXTUAL FACTORS | MULTIPLE SEXUAL PARTNERS | NON-REGULAR SEXUAL PARTNER |
|------------------------------------|--------------------------------|--------------------------------|
| | OR(95% CI) | OR(95% CI) |
| Location | | |
| Urban | 0.87 (0.77-0.97) ⁺ | 1.12 (0.99-1.25) ⁺ |
| Rural | Reference | Reference |
| Ethnic group | | |
| Yoruba | 1.03 (0.81-1.31) ⁺ | 0.91 (0.71-1.17) ⁺ |
| Igbo | 0.87 (0.67-1.14) ⁺ | 0.97 (0.73-1.29) ⁺ |
| Hausa/Fulani | 1.07 (0.90-1.27) ⁺ | 0.76 (0.64-0.91) ^{**} |
| Others | Reference | Reference |
| Intercept | 1.60 (1.29-1.99) ^{**} | 1.91 (1.51-2.41) ^{**} |
| Random effect | | |
| Area random variance (SE) | 0.05 (0.04) | 0.06 (0.05) |
| Variance partition coefficient (%) | 1.5 | 1.8 |
| Model fit statistic (AIC) | 26,399.283 | 26,587.203 |

+ implies not significant, *p<0.05, **p<0.01

SE implies standard error, AIC is Akaike information criterion

Table 4.8: Model with only Contextual factors associated with sexual partnership pattern among Nigerian men.

| | MULTIPLE SEXUAL PARTNERS | NON-REGULAR SEXUAL PARTNER |
|------------------------------------|---------------------------------|-----------------------------------|
| CONTEXTUAL FACTORS | OR(95% CI) | OR(95% CI) |
| Location | | |
| Urban | 0.87 (0.77-0.97) ⁺ | 1.12 (0.99-1.25) ⁺ |
| Rural | Reference | Reference |
| Ethnic group | | |
| Yoruba | 1.03 (0.81-1.31) ⁺ | 0.91 (0.71-1.17) ⁺ |
| Igbo | 0.87 (0.67-1.14) ⁺ | 0.97 (0.73-1.29) ⁺ |
| Hausa/Fulani | 1.07 (0.90-1.27) ⁺ | 0.76 (0.64-0.91) ^{**} |
| Others | Reference | Reference |
| Intercept | 1.60 (1.29-1.99) ^{**} | 1.91 (1.51-2.41) ^{**} |
| Random effect | | |
| Area random variance (SE) | 0.05 (0.04) | 0.06 (0.05) |
| Variance partition coefficient (%) | 1.5 | 1.8 |
| Model fit statistic (AIC) | 26,399.283 | 26,587.203 |

+ implies not significant, *p<0.05, **p<0.01

SE implies standard error, AIC is Akaike information criterion

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 DISCUSSION

This study investigated the determinants of sexual partnership pattern among Nigerian men with a focus on their wealth status using data from National HIV/AIDS and Reproductive Survey, 2007. The findings from this study show that mostly individual factors are associated with sexual partnership and not the contextual factors.

In this study, it was found that wealth was not associated with men's multiple sexual partnership. Compared to men in the poorest group, moderately rich men were more likely to have multiple and non-regular sexual partners. Thus, the high probabilities of sexual risk behaviour among the wealthier men may be linked to education status or their occupation. This result is consistent with findings from previous study conducted by Bingenheimer (2010), in 15 sub-Saharan African countries that 'men residing in wealthier households and those with wage-paying jobs are more likely to report having multiple sexual partnership'. Also, findings from a similar study carried out in Nigeria among women of reproductive age showed that women from poorer household were more likely to have multiple sexual partners (Uthman and Kongnyuy, 2008).

In general, there is inverse relationship between age and sexual partnership which confirms the fact that there is love for pleasure by younger men compared to older ones, which is consistent with previous study (Asare and Annim, 2008, Oyediran et al, 2010).

Interestingly, as wealth index is not associated with multiple sexual partners, level of education attained is not but there is no consistent relationship between forms of occupation and multiple sexual partners. In a similar study carried out among married men in 8 African countries (Nigeria inclusive), men with only primary education and those who worked for pay had increased odds of risky extramarital sex in some of the countries. (Stephenson, 2010)

In sub-Saharan Africa, one defining factor in multiple sexual partnership is the concurrent nature of sexual networks. (Morris and Kretemar 1997). The absence of regular partner is believed to hasten sexual networking with social and economical dimensions. (Asare and Annim, 2008). From the study, it was observed that most of the study participant were from rural areas and were

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not in union. Irrespective of individual and contextual factors, people in marital union are less likely to report having multiple sexual partner.

Among attitudinal and behavioural variable, alcohol consumption has been found to be significantly associated with men's extramarital sexual behaviour (Oyediran et al, 2010) and past alcohol use with women sexual behaviour (Uthman 2008) but from this study, there is no relationship between alcohol use and multiple sexual partnership but in type of sexual partner, the pattern is not consistent.

Moreover, ever use of condom is significantly associated with sexual partnership even after controlling for individual and contextual factors.

It was interesting to note that when contextual factors was controlled for in model3 in tables 4.5 and 4.6, none of these variables was significant but when contextual factors was used alone (table 4.7), residing in urban area was associated with multiple sexual partnership and this is similar to Mitsunaga findings where location was positively associated with extramarital sex by Nigerian men. However, this finding is in contrast with Oyediran's findings among married Nigerian men that place of residence on its own does not significantly influence extramarital sexual behaviour and that extramarital sex was negatively associated with extramarital sexual behaviour. Other similar studies carried out in other African countries (Cote d'Ivoire and Zimbabwe) revealed higher prevalence of extramarital sex in the urban area compared to rural areas (Ali and Cleland, 2001, Kimuna and Djamba, 2005).

Also, ethnicity was not associated with sexual partnership even when contextual factors was used alone. The odds of having multiple sexual partners was 3% and 7% higher among the Yoruba and Hausa/Fulani men while the odds of having multiple sexual partners was 87% lower among Igbo men. This variation however might result as a result of religion affiliation because muslim were less likely to engage in extramarital sex and men from Hausa/Fulani were predominantly muslims while Igbo are mostly Christians (catholic). Moreover, we understood from previous study, that ethnicity influences sexual behaviour in Africa and that urbanization and education influence traditional norms and values especially in cities where people are more likely to abandon traditions (Addai, 1997, Oyediran et al, 2010).

Furthermore, the odds of having non-regular sexual partner among Igbo men was 9% lower while among Hausa/Fulani's and Yoruba men, it was 18% and 15% lower respectively but when contextual-level factors was used alone, the odds of reporting non-regular sexual partnership decreased among Yoruba (9%) and Igbo (3%) but increases among Hausa/Fulani men (24%). Location was positively associated with non-regular sexual partnership. The odds was 12% higher when contextual-level factors only was used but the incidence was very low (3 in 1000 men) when both individual and contextual factor was controlled for.

A proxy for wealth is not only useful in examining effects of wealth but also is needed as a control variable in estimating effects of variables potentially correlated with household wealth like educational attainment. The data used in this study does not contain information on income or household consumption expenditures which are used as a measure of current and long-run household welfare. As a result, expenditure were routinely used in measuring poverty.

However, we overcame the absence of expenditure data using information collected on assets owned by household members to generate an asset index that proxies for wealth and hence for long-run economic status because asset ownership reflects smoothing and easier to measure (since it required a yes-no answer) than either income or expenditures. There were two major methods used for assessing household socioeconomic status: money-metric and other alternative ways but Economists preferred to use an indicator in money term like income or consumption to assess household's poverty and living standard. Thus, income and expenditure data are commonly used for proxy of the level of consumption utilized. However, in developing countries like Nigeria the accuracy of income measurement can be problematic since a large proportion of household's income is shared by informal sector and self employment both inside and outside agriculture.

Therefore, the concept of asset index was used since it relied on evidence that money-metric measure was too narrow for defining household welfare and asset index is consistent with financial means. Interestingly, the asset index requires less data intensive which possibly result in smaller measurement error. i.e it is quick to collect and reliable than income-level of respondents since it necessitates yes-no answer. The use of PCA provides plausible and defensible weights for an index of assets to serve as a proxy for wealth.

This study is without limitations. There was no cluster variable in the data which makes it difficult to objectively assess contextual factors. The wealth index computed is only a proxy and not the real economic status of the men. The data on sexual partnership is self-reported which is subject to bias in the information provided by the respondents.

5.2 CONCLUSION

The main objective of this study was to assess the association between wealth status and their sexual partnership pattern among Nigerian men. The hypothesis that wealth was associated with number and type of sexual partner was not confirmed.

This study revealed that the pattern of sexual partnership among Nigerian men varies according to individual characteristics and behavioral factors than their contextual characteristics. Also, findings from this study suggested that there was variation in wealth status across the region and ethnic groups among men. Poverty is very high in the northern region while those in the southern region are moderately rich. More than half of men in the rural areas are in the poorest group while urban dwellers were mostly in the middle class.

5.3 RECOMMENDATION.

To promote safe and healthy sexuality among Nigerian men, behavioural intervention on sexual partnership targeting on individuals (or at least people of like behaviours) should be incorporated in the reproductive health policy.

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