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REGIONAL PATTERN AND CORRELATES OF HIV VOLUNTARY COUNSELLING AND TESTING (VCT) AMONG YOUTHS IN NIGERIA

BY

CHUKWUEMEKA EZEIKPE NWACHUKWU
STUDENT NUMBER: 0616961X

A RESEARCH REPORT SUBMITTED TO
THE FACULTY OF HEALTH SCIENCES,
UNIVERSITY OF THE WITSWATERSRAND, JOHANNESBURG,
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF SCIENCE (MEDICINE) IN
EPIDEMIOLOGY AND BIOSTATISTICS.

DECEMBER 2006.

DECLARATION

I, Chukwuemeka Ezeikpe Nwachukwu, declare that this research report is my own original work. It is being submitted for the degree of Master of Science (Medicine) in Epidemiology and Biostatistics of the University of the Witwatersrand, Johannesburg. To the best of my knowledge, it has not been submitted before in part or in full for any degree or examination at this or any other University.

.....

19th day of October 2007

DEDICATION

To God, who so loved the world that He made provisions for advancement in medical knowledge that all will not perish in illness.

And to all those who had sacrificed and made commitments, to alleviate the sufferings of the poor and the helpless all over the world.

ACKNOWLEDGEMENT

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Ben and Ezinne – You made life worth it in Johannesburg. May God enlarge your bans and accomplish your heart desires.

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Amaka – Your virtues are uncountable, not to be compared to rubies. If I will ever have to say 'I do' again, I will ask you once more.

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4. Map of Nigeria showing the six (6) regions and neighboring West African countries.

LIST OF ABBREVIATIONS

CI	Confidence Interval
NDHS	National Demographic and Health Survey
EA	Enumeration Areas
Chi2	Chi Squared statistic test
OR	Odds Ratio
AOR	Adjusted Odds ratio
PHC	Primary Health Care
PSU	Primary Sampling Unit
SPSS	Statistical Package for Social Scientists
VCT	Voluntary Counseling and Testing
NPC	National Population Commission
NACA	National Action Committee on AIDS
PCA	Presidential Council on AIDS

ABSTRACT

Voluntary counseling and testing (VCT) for HIV has been recognized as an effective strategy and an entry point to HIV control programs. Prevalence of voluntary counseling and testing (VCT) for HIV among young people in Nigeria is low and effort to improve this seem slow despite good knowledge of HIV among the people. Using the 2003 National Demographic and Health Survey (NDHS) of Nigeria, this study examines the regional prevalence, pattern and correlates of voluntary counseling and testing in HIV among young people aged 15 to 24 in Nigeria. The 2003 NDHS was a nationally representative cross sectional survey conducted among males aged 15-59 and females aged 15-49 and generated a probability sample of 11,050. The survey used a structured questionnaire to collect information on reproductive and child health issues in general from the respondents. Analysis of this study was based on 3573 observations, arrived at by selecting men and women aged 15-24 that had ever tested for HIV. Logistic regression model was used to estimate the effects of identified predictors of volunteering for HIV testing.

The results show a low uptake of VCT in Nigeria with only 2.6% of respondents having ever volunteered for HIV testing. The rate of VCT uptake varies by region of residence and other demographic and socio-economic factors. Respondents from the South East had the highest uptake (4.6%) while North East had the lowest (0.7%). It was also found that the higher the educational level of the respondents, the higher their percentage uptake of VCT.

Respondents who had 1 or 2 sexual partners in the year preceding the survey reported 7.52% of uptake of VCT while those with no partners and 3 or more partners reported uptake of 2.51% and 2.15% respectively. The youths who used condom in their last sexual intercourse before the survey were more likely to have volunteered for HIV testing (3.72%) than those who did not use condom (1.57%). Using stepwise logistic regression, seven critical predictors of voluntary testing for HIV were identified. These are age, sex, region, occupation, education, wealth index and self risk perception for HIV. These predictors, however, differ within the northern and southern regions and among the sexes. Age, region and occupation as predictors for males while region, education, wealth index and risk perception are predictors among the females.

The findings of this study have implications for HIV prevention policies and program planning in designing appropriate national programs to raise awareness through information, reduce stigma and encourage youths to periodically seek to know their HIV status as part of the HIV prevention strategies in Nigeria. The need for further research in this area, especially primaries studies to explore all the factors that influence the uptake of VCT in Nigeria is recommended.

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The results show a low uptake of VCT in Nigeria with only 2.6% of respondents having ever volunteered for HIV testing. The rate of VCT uptake varies by region of residence and other demographic and socio-economic factors. Respondents from the South East had the highest uptake (4.6%) while North East had the lowest (0.7%). It was also found that the higher the educational level of the respondents, the higher their percentage uptake of VCT.

Respondents who had 1 or 2 sexual partners in the year preceding the survey reported 7.52% of uptake of VCT while those with no partners and 3 or more partners reported uptake of 2.51% and 2.15% respectively. The youths who used condom in their last sexual intercourse before the survey were more likely to have volunteered for HIV testing (3.72%) than those who did not use condom (1.57%). Using stepwise logistic regression, seven critical predictors of voluntary testing for HIV were identified. These are age, sex, region, occupation, education, wealth index and self risk perception for HIV. These predictors, however, differ within the northern and southern regions and among the sexes. Age, region and occupation as predictors for males while region, education, wealth index and risk perception are predictors among the females.

The findings of this study have implications for HIV prevention policies and program planning in designing appropriate national programs to raise awareness through information, reduce stigma and encourage youths to periodically seek to know their HIV status as part of the HIV prevention strategies in Nigeria. The need for further research in this area, especially primaries studies to explore all the factors that influence the uptake of VCT in Nigeria is recommended.

CHAPTER 1

1.1 INTRODUCTION

HIV is a global pandemic, reported in almost all the countries of the world. Nearly 65% (25 million) of the infected people and 75% of the burden of death globally is in the sub-Saharan Africa (UNAIDS, 2004). Incidence of HIV in the sub-Saharan Africa is highest among youths aged 15-24 and who are also vulnerable to unsafe sex and sexual abuse. It is therefore important to target this group of people in HIV prevention and care strategies especially in developing countries. Various strategies to control HIV, especially among young people have been propagated. These include campaigns on safe sex, regular use of condom and voluntary counseling and testing (VCT) (Boswel and Baggaley, 2002). Knowledge of an individual's HIV status can potentially change sexual behavior through counseling, early treatment, care and support.

Factors identified to have contributed to the spread of HIV in Nigeria are: low access to information and education on sexual health, stigma and discrimination, poor healthcare services, harmful marriage practices and sex work (UNAIDS, 2006). People therefore ignorantly engage risky sexual behaviors, shy away from using healthcare services to know their HIV status and in some cases; such services may not even be available and/or affordable.

Nigeria is the most populous black nation with an estimated population of 140 million (Muogbo, 2007) and about 2.9 million people living with HIV/AIDS (UNAIDS, 2006). Despite its low adult prevalence of 4.4%, it ranked the third country in the world with the highest number of people living with HIV/AIDS in 2005. This has potential implications

not just on Nigeria but also on the neighboring West African countries and the continent at large if not controlled.

The return of democracy in Nigeria in 1999 had opened doors to development of new strategies by government towards prevention, treatment, care and support. This is evident in the setting up of the National Action Committee on AIDS (NACA) with states and local government committees and opening centers for voluntary counseling and testing (VCT). Prevalence of the use of voluntary counseling and testing services among young people in Nigeria is low, estimated at 10% (Adewole and Lawoyin, 2004). Efforts to improve uptake seems to be slow despite good knowledge of HIV among the population.

Global efforts at control of HIV/AIDS have made it possible to include information on HIV/AIDS in the data collection tools for the National Demographic and Health Surveys (NDHS) in Nigeria. Surveys were conducted in Nigeria in 1990, 1999 and 2003, the 2003 survey being the most comprehensive (NPC, 2004). This survey provides data for assessing disease prevalence, rates, patterns and correlates to benefit policy, planning, implementation of health programs and research in the country.

This research study on regional patterns and correlates of voluntary counseling and testing used secondary data from the Nigerian National Demographic and Health Survey 2003 and which includes information from such variables that demographically characterized young people aged 15-24 and their attitudes and knowledge towards HIV and voluntary counseling and testing.

1.2 BACKGROUND INFORMATION ON STUDY POPULATION

Nigeria is in the West African sub-region and lies latitudinally from $4^0$16' - $13^0$53' north and longitudinally from $2^0$40' - $14^0$41' east (NPC, 2004) with a total surface area of 923,768 square kilometers. It shares boundaries with the Republics of Niger, Chad, Cameroon and Benin to the north, north-east, east and west respectively. The Atlantic Ocean borders the south of the country.

The nation came into existence at the amalgamation of its northern and southern protectorates by the British colonial masters in 1914 but achieved independence and self-governance in 1960. It became a republic in 1963. The country has more than three hundred and fifty (350) ethnic groups with the Hausa, Igbo and Yoruba being the majority tribes. It has seven hundred and seventy four (774) Local Government Areas (LGAs) within thirty-six (36) states and a Federal Capital Territory (FCT). Politically, the country is grouped into six (6) geo-political zones (South South, South West, South East, North East, North Central and North West). These regions are characteristically diverse and different in terms of ethnicity, religion, culture, language and educational attainment resulting in unique and heterogeneous populations. On the average, two-third of Nigerians lives in the rural areas.

The country has a tropical climate with dry season characterized by cold, dry and dusty harmattan occurring from October to March and worse in the north while the wet season occurs from April to September (NPC, 2004). Rainfall is as high as 2,600 milliliters in southeast and south south, giving rise to a mangrove swamp forest and as low as 600 milliliters in the north with a sahel grassland vegetation. Agriculture is the main source of livelihood for the vast majority of rural dwellers. Diverse kinds of crops produced across

the country were a major source of foreign exchange earnings before the discovery of crude oil, which is now the mainstay of the economy.

The country's healthcare system is structured to recognize primary health care (PHC) as the pivot on which efforts to improve health care delivery will be hinged. The PHC services include health education, provision of portable water and good sanitation, reproductive health, immunization, control of diseases including prevention of HIV/AIDS and provision of essential drugs. Comprehensive health care facilities have been therefore established in various parts of the country, predominantly in the rural areas to achieve these objectives. There are, however, widespread differences in health care delivery across the regions due to differential availability of resources and distribution of service providers. With respect to HIV/AIDS, the National Action Committee on AIDS (NACA) was established in February, 2000 to coordinate all HIV/AIDS activities in Nigeria (NACA, 2006). Its aims are, among others, to coordinate, monitor and evaluate the implementation of the strategic national plan for the control of HIV/AIDS and present control plans to the Presidential Council on AIDS (PCA) for policy purposes.

Educational system and literacy levels in Nigeria have evolved over time in an effort to build a sustainable manpower and human resources for its developing economy. Every child was given the right to a free and compulsory primary education by the Universal Primary education formulated in 1976 (NPC, 2004). This has been aggressively followed by the National Literacy Program for Adults and Nomadic Education for the benefit of families that are migrant cattle rearers and fishermen in riverine areas. As a result of the literacy policy of the present democratic government formulated in October 1999 and christened Universal Basic Education (UBE), education is presently free up to junior

secondary school. Education facilities and teachers are, however, not equitably distributed across the regions in the country (FGN, 2005), which also reflects in enrolments and the declining quality of education in Nigeria.

1.3 STATEMENT OF THE PROBLEM:

HIV voluntary counseling and testing is an effective strategy in reducing the transmission rate of HIV especially among young people (Boswel and Baggaley, 2002; MacQuarrie and McCauley, 2001). There are limited studies assessing the regional variation of in the uptake of HIV testing in Nigeria. However, some studies have shown that despite high knowledge of HIV, VCT uptake is low (Adewole and Lawoyin, 2004; Adeneye et al, 2004). The NDHS (2003) reported that only about 10% of Nigerian youths had ever been tested for HIV, but it does not provide information on regional variations. Understanding regional patterns and differentials in voluntary counseling and testing is important for designing effective strategies to increase VCT uptake. For example, effective counseling and testing for HIV will help in identifying those at risk and promote behavior change strategies which will minimize the spread of HIV and sustain good quality of life for infected individuals.

1.4 JUSTIFICATION FOR THE STUDY:

Studies on voluntary counseling and testing (VCT) for HIV in Nigeria have reported largely on a highly selective group of people and within localities such as in pregnant women (Adeneye et al, 2004) and undergraduates (Adewole and Lawoyin, 2004), both in Oyo state (South West region). These studies may not reflect the true measure of VCT uptake in the country and provide a poor indicator of how youths are using VCT services. In other African countries such as Kenya and Uganda, VCT uptake among youths is high

and serves as a potential tool for monitoring the progress of HIV control programs (MacQuarrie and McCauley, 2001).

Given Nigeria's ethnic diversities and cultural complexities, understanding the regional variations in VCT service utilization will help to design more specific programs to promote access and use of VCT services by young people. There is therefore the need to examine the patterns and correlates of VCT use in Nigeria, with a focus on young people. This study will provide valuable information to strengthen existing national HIV/AIDS control/prevention policies and programs on VCT in Nigeria.

1.5 STUDY OBJECTIVES

1.5.1 GENERAL OBJECTIVE:

This study aims to examine the regional differences in prevalence, patterns and correlates of HIV voluntary counseling and testing among young people aged 15 to 24 in Nigeria in 2003.

1.5.2 SPECIFIC OBJECTIVES:

1. To determine regional variations in the utilization of voluntary counseling and testing for HIV among youths aged 15-24 in Nigeria.
2. To identify the critical factors influencing the uptake of voluntary counseling and testing among the youths in the various regions of Nigeria.

1.6 LITERATURE REVIEW:

Voluntary Counseling and Testing (VCT) is the process of providing counseling to an individual to enable him/her to make an informed choice about being tested for HIV infection. This decision must be entirely the choice of the individual, and he/she must be assured that the process will be confidential (FHI, 2004). VCT is an emerging HIV prevention strategy in Nigeria. It is an entry point to medical, social, preventive and therapeutic interventions in the control of HIV/AIDS. It facilitates behavior change promotion through counseling to those who test negative and provides an early cache for care, support, treatment and other social interventions for those who test positive (Boswell and Baggaley, 2002).

Assessing the spread and prevalence of HIV voluntary counseling and testing will help in developing programs that will create demand and increase the interest of young people to receive counseling and get tested for HIV. For example, surveys conducted in many African countries like Ghana, Kenya and Burkina Faso in 2003 reported that only an average of 8% of young people (aged 15-24) who had had sex in the past 12 months had tested for HIV. Uptake was higher in males than in females, and this result was consistent in all the countries surveyed (Measures DHS, 2006).

There are few epidemiological studies assessing the uptake and regional prevalence of HIV VCT in Nigeria. Literature search conducted in Medline through Pubmed and various journal portals in the health sciences library of the University of Witwatersrand yielded few studies on VCT in Nigeria. These are localized studies and do not reflect Nigeria's geo-cultural complexities. A study conducted in the South Western Nigeria

(Adeneye et al, 2004) among 804 women attending antenatal clinics showed that about 70% of respondents were ignorant of voluntary counseling and testing, however, 89% of these expressed willingness to be tested after information on VCT was provided. Uptake of VCT among this group was 6.0% despite a high HIV knowledge (84%). Those who volunteered for VCT had more education ($P<0.05$) and higher HIV knowledge score than those who did not. Respondents who did not volunteer cited the fear of social stigmatization and rejection. Similarly, among male undergraduate students, Adewole et al reported a low uptake of 8.3%. Those who volunteered had higher knowledge scores for HIV ($P=0.006$), parents in the higher socio-economic class ($P<0.00001$) and mothers who had completed secondary education ($P=0.02$). Another study among undergraduates reported an 11.9% VCT uptake (Falaye and Uwakwe, 2004). In this study, respondents' attitudes toward VCT were largely influenced by stigma and fear of discrimination.

The only national study which provides a national rate for VCT uptake is the 2003 NDHS. The focus of the survey, however, was not on VCT. The report (NPC, 2003) showed that an average of 10% of young people aged 15 to 24 (6% of women and 14% of men) had ever been tested and received the results of their HIV test. A hospital-based study in Northern Nigeria among patients aged between 24 and 45 showed a high uptake (88.3%), a result expected for ill patients (Isezuo and Onayemi, 2004). Illiyasu et al (2005) reported that reasons for avoiding VCT in Nigeria include fear of stigmatization and isolation and effect on marriage security. On the other hand, Solomon et al (2006) reported possible reasons for seeking VCT in developing countries include engagement in risk behaviors, developing suspicious symptoms, having a HIV-positive partner and following up on a previously negative test.

Studies in other countries show low VCT uptake. In Malawi, degraft-Johnson et al, (2005) reported a 9% uptake, and in Norway, Fylkesnes and Siziya (2004) reported an 11.8% uptake. A population survey in South Africa (Hutchinson and Mahlalela, 2006) showed VCT uptake to be positively associated with age, education, socio-economic status, living close to the clinic and low perception of stigma. The main reasons for seeking VCT included perceived risk of HIV infection and self reported decline in health status. A health facility based study in Uganda (Lukwago, 2005) conducted among pregnant women mostly aged 15 – 24 reported a 73% willingness to use VCT services. Utilization was however poor due to inability to afford the test, fear of knowing the result, stigma, attitudes of health workers and refusal of their partners to take an HIV test. Another household survey in Uganda among pregnant women aged 18 and above showed a 10% uptake of VCT, largely hindered by unavailability of VCT service centers, lack of counseling and perceived lack of benefits to mothers and their infants (Karamagi et al, 2006). Testing was associated with being a primigravida (OR 2.6, 95% CI 1.2–5.8), urban residence (OR 2.7, 95% CI 1.3–5.8) and experience of counseling before and after testing (OR 6.2, 95% CI 2.9–13.2).

The studies reporting on VCT in Nigeria lack detailed analysis and thus limit their utilization. Planning and implementation of HIV prevention strategies will also be impaired if data is not available to evaluate successes and deficiencies in the regional and national programs for HIV prevention, especially as VCT is a integral strategy linking prevention, care and support. This study, therefore, seeks to examine the regional prevalence, patterns and correlates of voluntary counseling and testing for HIV among the Nigerian youths.

CHAPTER 2

METHODOLOGY

This chapter discusses the methodology of the study including the study design, sample size and study population. The source of data, definitions of keywords and variables of interest and the study hypothesis are also stated. Also included are data management procedures and methods of analysis, the scope and limitations of the study and plan for dissemination of results.

2.1 STUDY DESIGN:

This study is a secondary data analysis using dataset from the Nigeria National Demographic and Health Survey (NDHS) of 2003.

2.1.1 ABOUT THE 2003 NDHS

The 2003 NDHS is the third survey in Nigeria, following up on the 1999 NDHS. The objective was to collect data and provide information on various health issues such as fertility, family planning, maternal and child health, HIV/AIDS. This is to guide policy makers, health program managers and researchers in planning, implementation, monitoring and evaluation of population and health programs to improve health services in Nigeria. The full report of the 2003 NDHS contains the details of the methodology used in the survey, which is summarized below.

2.1.2 SAMPLE DESIGN OF THE NDHS

The 2003 NDHS was sampled to provide estimates of population and various health indicators with urban and rural differentials for the six geopolitical zones and the country at large. The survey used a stratified, multi stage sampling method with the list of

enumeration areas (EA) developed for the 1991 national population census in Nigeria as a sample frame. The EAs are grouped by states, local government areas (LGA) within a state and localities within LGAs. The EAs were first stratified by urban and rural areas with localities less than 20,000 in population constituting a rural area. The primary sampling units (PSU) were clusters defined as consisting of one or more EAs such that each cluster contained a minimum of fifty (50) households.

In the sampling, three hundred and sixty five (365) clusters were first randomly selected, 165 in urban and 200 in rural areas. Then households were systematically selected for participation in the survey. A nationally representative probability sample of 7,864 households was eventually selected with estimates based on the response rate of the 1999 NDHS. This produced 11, 050 respondents as all eligible women aged 15 to 49 in every household and eligible men aged 15 to 59 in every third household were interviewed (NPC, 2004). Response rate was 99% of households, 95% of eligible women and 91% of eligible men.

2.1.2 DATA COLLECTION TOOL

Data for the 2003 NDHS was collected with questionnaires adapted from the model developed by the MEASURE DHS+ program during a technical workshop organized by the National Population Commission and attended by experts from governmental and non-governmental organizations and international donors. Three questionnaires – household, men and women questionnaires were translated into the three major languages (Igbo, Hausa and Yoruba) and pre-tested in November 2002.

The household questionnaires contained information on household's dwellings and ownership of facilities but was mainly used to identify eligible men and women for individual interviews. The men and women questionnaires were then used to collected information from eligible men aged 15 to 59 in every third household and women aged 15 to 49 in every household respectively.

2.1.3 FIELD WORK

Twelve (12) interviewing teams collected data from March to August 2003. Each team consisted of one (1) supervisor, one (1) field editor, three (3) female interviewers, one (1) male interviewer and one (1) driver. They were recruited from all the thirty six (36) states and the Federal Capital Territory (FCT) to reflect the language and cultural diversities in Nigeria.

An interviewer training was conducted from February 17 to March 8 2003 for all interviewers featuring lectures, presentations by outside experts, practical demonstrations and practice interviewing in small groups for three (3) days, conducted in English and the three (3) major languages and a few minor languages. All supervisors, field editors, quality control personnel and field coordinators finally participated in a series of special lectures.

2.1.4 QUALITY CONTROL

To monitor the quality of data collected, the field editor in each team reviewed all completed questionnaire for quality and consistency before leaving each cluster. The field editor and supervisor also occasionally sat on interviews while twelve staff members from the National Population Commission (NPC) and ORC Macro coordinated the field

work and regularly monitored the work. Quality control personnel also independently re-interviewed selected households while data management staff sent feedback to field staff since data were entered concurrently with the fieldwork.

2.1.5 DATA PROCESSING

Data processing began soon after the commencement of fieldwork at the head office of the National Population Commission (NPC) in Abuja. Completed questionnaires were periodically returned to the office where trained data processing personnel checked them for completeness from all clusters. They were then entered into the computer and edited for errors. Data entry and editing were completed by September 2003.

2.2 STUDY POPULATION:

The 2003 NDHS interviewed eligible men aged 15 to 59 and women aged 15 to 49 in Nigeria. This study involved analysis of data from both male and female participants aged 15-24 in 2003, spread across the regions and who were interviewed in the 2003 NDHS.

2.3 SAMPLE SIZE:

The 2003 NDHS sampling targeted 7,864 households to interview about 11,050 people, 8,250 women aged 15 to 49 and 2,800 men aged 15-59. A total of 7,985 women and 2,572 men were identified on the households for interview but 7,586 women and 2,340 men were successfully interviewed giving a total sample size of 9,927.

Young people aged 15 to 24 make up 36% of men aged 15 to 59 and 41% of women aged 15 to 49 from the Nigerian census of 1991 (NPC, 2006). Therefore the effective sample

size for this study will be approximately 4,000, calculated from the total sample in the NDHS. This corresponds with the sample size of 4,107 found in the dataset.

2.4 KEYWORDS AND VARIABLES OF INTEREST

2.4.1 KEY WORDS

- **Voluntary Counseling and Testing (VCT)** – "The process of providing counseling to an individual to enable him or her to make an informed choice about being tested for HIV. This decision must be entirely the choice of the individual, and he or she must be assured that the process will be confidential" (FHI, 2004). This study will regard VCT as those who requested for HIV testing on their own since information on pre and/or post test counseling were not provided in the dataset.
- **Youth** – Defined by the United Nations as persons between the ages of 15 and 24. (Ha Noi, 2003)

2.4.2 EXPLANATORY VARIABLES

Table 2.1 Variables used in the study and their definitions

VARIABLES	DEFINITIONS
Region	North Central(1), North East(2), North West (3), South East(4,) South South(5), South West (6)
Age	Current age of respondent
Age group	15-19 (1), 20-24(2)
Sex	Male (1), Female (2)
Age at sexual debut	Age the first time the respondent had sexual intercourse
Number of sex partners	Number of different persons the respondent had sexual intercourse with in the past 12 months. Re-categorized into None (1), 1 or 2 (2), 3 or more (3)
Marital status	Never married(0), Married(1), Living together (2), Widowed (3), Divorced (4), Not living together (5)
Residence	Urban (1), Rural (2)
Educational status	No education or Primary (0), Secondary (1), Higher (2)
Occupation	Not working (0), Professionals, Technical, Management (1), Skilled manual (including services) (2), Unskilled manual (including household and domestic) (3) Agriculture (self employed or employee) (4)
Religion	Christian (1), Islam (2), Other (3)
Wealth index	Lower (1), Middle (2), Upper (3)
Perception of risk for HIV	No risk at all (0), low risk (1), High risk (2), Don't know / unsure (3)
Condom use	No (0), Yes (1)
Knowledge of HIV	Knowledge of HIV/AIDS was assessed by the respondents' positive response to all of these four (4) questions used in the survey: "1. Have you ever heard of an illness of an illness called AIDS? 2. Can people reduce their chances of getting the AIDS virus by having just one sex partner who is not infected and who has no other partners? 3. Can people reduce their chances of getting the AIDS virus by using a condom every time they have sex? 4. Can a person reduce their chance of getting the AIDS virus by not having sex at all?" Poor knowledge(0), Good knowledge (1)

2.4.3 OUTCOME VARIABLE

The outcome variable is voluntary counseling and testing (VCT). This is a retrospective measure of uptake of voluntary counseling and testing for HIV derived by merging the respondents' response to the following two (2) questions: "I don't want to know the result, but have you ever been tested to see if you have the AIDS virus" and "The last time you had the test, did you yourself ask for the test, was it offered to you and you accepted, or was it required?" (NPC, 2003). The first option in the second question 'asked for the test' is taken as a response for volunteered testing. These questions were asked to all men aged 15 to 59 and women aged 15-49 in the survey. It is a binary variable categorized as 'Yes' if the respondent answered 'Yes' to the first question and 'asked for the test' in the second question and 'No' if otherwise. These questions were asked to all men and women aged 15-49 in the survey. Data was extracted for those aged 15-24 and used in the analysis.

2.5 HYPOTHESIS

The hypotheses to be tested are:

- Voluntary HIV testing in Nigeria is associated with region of residence.
- Socio-economic status affects voluntary HIV testing in Nigeria.
- Religious inclinations affect the uptake of voluntary counseling and testing for HIV in Nigeria.
- Respondents with multiple sexual partners are more likely to volunteer for HIV testing than those with single or no partners.
- Males are more likely to volunteer for HIV counseling and testing in Nigeria than women.

2.6 SCOPE AND LIMITATIONS:

- The survey was not conceived with this research in mind and so it is difficult to specifically ascertain the accuracy of the information on the variables used to derive the outcome variable.
- The outcome variable is a retrospective measure of the respondents' willingness to have ever volunteered for counseling and testing for HIV. It is prone to bias since those who tested positive may deny having ever been tested for fear of further probe to disclose their status and the stigma associated with it.
- Information of pre and post test counseling was not provided in the dataset. Results from this study may exaggerate the prevalence of HIV VCT in Nigeria.
- Other factors that may influence the uptake of voluntary counseling and testing (VCT) for HIV and which are not available in the dataset e.g. availability of designated VCT centers, closeness of the centers, cost of HIV testing, stigma, attitude of healthcare/VCT providers, etc will not be assessed. Available factors/variables are defined in table 2.1.
- The number of women included in the survey was about three (3) times more than that of men. This was a deliberate attempt in order to get enough information from the women on reproductive and fertility issues as well as data on their children, which were part of the main objectives of the NDHS. Observed differences in the sex categories may not represent the true situation because of this huge difference in sample size.
- Region of residence and self perception of risk for HIV were found to be confounders in assessing their influence on prevalence of HIV VCT and so were explored and adjusted for in analysis.

2.7 PLANS FOR UTILISATION AND DISSEMINATION OF RESULTS

The result of this study will be made available to the Federal Ministry of Health (FMoH) of Nigeria through the National Action Committee on AIDS (NACA). Institutions and other non-governmental organizations working towards prevention of HIV in Nigeria will also be advised on the findings of this study.

There is also plan to publish the result in a peer-reviewed international journal and present it at seminars and conferences focused on HIV treatment and prevention. ORC Macro, while approving data downloads pre-conditioned that it will receive copies of the study so as to advice relevant country agencies.

2.8 ETHICAL CONSIDERATION

The study analyzed secondary data whose report is already published and data available in the public domain with no link to individuals. It therefore has no risk of undue disclosure and other ethical considerations. The protocol was also presented to the University of the Witwatersrand ethics committee, which gave unconditional approval for the study (Protocol Number: M060917).

2.9 DATA MANAGEMENT

2.9.1 DATA SOURCE AND PROCESSING:

Written permission was obtained from ORC Macro (who provided technical support to the survey), through the *MEASURES DHS+* project, to use the data from the 2003 Nigerian demographic and health survey. Data was then downloaded from the *measuresdhs* dataset site in the rectangular file format and opened with the Statistical Package for Social Scientists (SPSS) version 10, which was its original software store.

A set of twenty six (26) identical variables was selected from the files containing the men and women data and saved in Microsoft excel from Microsoft office 2000. These are variables described in sections 2.5.2 and 2.5.3 and other variables used to derive them. The datasets were merged, the variables renamed and sex variable added in excel as well as selection of a subset of respondents aged 15 to 24 according to the objectives of this study resulting to four thousand one hundred and seven (4107) observations. It was then transferred from excel to Stata Release 9.0 (Stata Corporation, 2005) for analysis.

However, the derived outcome variable, voluntary counseling and testing (VCT) contained only 3573 observations. This is the number of respondents who responded to the question if they have ever been tested for HIV. Five hundred and thirty four (534) observations from the explanatory variables were therefore excluded to account for this difference and other variables with incomplete responses.

2.9.2 DATA ANALYSIS:

The data was analyzed using STATA 9. This software was preferred because the researcher is more familiar with it and feels that it is easier to manipulate than other common softwares.

To make analysis and interpretation simpler and more meaningful, some variables were regrouped from their original categories in the dataset. Some of those are: Marital status regrouped into never married, living together (comprising of married and living together to reflect any form of union) and not living together (comprising widowed, divorced and not living together). Wealth index was constructed from information on surveyed

households' ownership of assets such as television, radio, bicycle, car and characteristics of the dwelling such as source of drinking water, type of sanitation facilities, type of materials used on the roof and floor, etc. Each asset was then assigned a weight (factor score) generated through principal component analysis and standardized (Gwatkin et al, 2000). The scores for each asset were summed for each household and the individuals were classified according to their households. The sample was then divided into quintiles from one (lowest) to five (highest) (NDHS, 2003). For the purpose of this study, wealth index was re-categorized into lower (comprising classes poorest and poorer), middle and Higher (comprising richer and richest). Number of sexual partners, which was originally a continuous variable, was also categorized into none, 1 to 2 and 3 or more. This grouping made it easier to compare the influence of increasing number of partners to those not having partners and their uptake of voluntary counseling and testing (VCT) for HIV.

Data were analyzed in three levels, including stratification by sex to explore the effect of the difference in the sample size between males and females. The first was the univariate analysis of the baseline demographic and socio-economic characteristics of participants and prevalence rates of HIV VCT according to their region of residence. These were tabulated in proportions to show national figures and regional differences. Continuous variables were presented as means and standard deviation. There was then a bivariate analysis to examine all the explanatory variables for significant association with uptake of VCT for HIV using cross tabulations and univariate logistic regressions. Finally, multiple regression analyses were done by automatic stepwise selection of the variables associated with uptake of VCT. The data was first set to be a survey data in STATA, to account for possible inter cluster differences due to the sampling method used in the

survey. Logistic regression model was then fitted using the selected variables, exploring for interaction among the variables. This was used to determine which variables are significantly associated with uptake of VCT as well as adjusting for potential confounders and presented as adjusted odds ratios with corresponding p-values and 95% confidence intervals.

Logistic regression model was chosen because the outcome variable is binary (VCT - yes or no). It also allows for throwing all identified variables into the model as to control for all confounders at the same time, giving the magnitude and direction of association between the outcome variable and the explanatory variables.

A logistic regression model gives the probability that the outcome occurs as an exponential function of the independent variables. The basic logistic regression equation for the independent variables is thus:

$$\text{Logit}(p) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_i X_i$$

Where logit (p) is the log of the odds that the dependent variable is 1, α is intercept and $\beta_1, \beta_2, \ldots \beta_I$ are the regression coefficients (Knoke et al, 2002).

CHAPTER 3

RESULTS

3.1 UNIVARIATE ANALYSIS

The general objective of this study is to examine the regional prevalence, pattern and correlates of voluntary counseling and testing for HIV among young people in Nigeria while the first specific objective is to determine regional variations in the utilization of VCT for HIV among the Nigerian youths. A total of 3573 respondents aged 15-24 were included in the analysis. Table 3.1 below is the distribution of all 3573 respondents who did or did not take up voluntary counseling and testing for HIV by their demographic and socio-economic characteristics, showing national and regional figures.

The table shows variations in the characteristics of the respondents by their region of residence. Regional distributions of the respondents are: 606 (16.96%) North Central, 517 (14.47%) North East, 821 (22.98%) North West, 560 (15.67%) South East, 507 (14.19%) South South and 562 (15.73%) South West. Fifty two percent of the respondents were 15 – 19 years old while 58% were aged 20 – 24 years which are the average figures for all the regions. There are 76% percent of female respondents and 24% of males. This is because the NDHS purposively sampled more women than men to get enough information on reproductive and child health issues.

There is an average of 56% of rural dwellers and 44% of urban dwellers among the respondents while 56% of them are Christians, 43% Moslems and 1% belonging to other religions. There is, however, a higher percentage of Moslems in the Northern regions with Christians dominating the South. A large percentage of the respondents are working

as professionals or in the technical/management positions (77%) while about 14% are not working. More than half of the respondents (66%) are not married while 32% are either married or are living with a partner. There is a higher percentage of those who are married and /or living together in the Northern region than in the South.

An average of 54% of respondents have secondary education, 40% have either no education or primary education, while 6% have higher education. Again, this varies with those in the Southern regions having higher percentage of secondary and higher education than those in the North. A good fraction of the respondents occupy the high wealth index class (49%) with 30% in the low class and 21% in the middle class.

Ninety-three (2.6%) had ever volunteered for HIV counseling and testing while 3480 (97.4%) had never volunteered for HIV counseling and testing (Figure 3.1). The 2003 NDHS reported a prevalence of HIV testing of 10% among Nigerian youths. This is inclusive of those who tested voluntarily, those to whom testing was offered and they accepted and those who for one reason or the other required HIV testing. The uptake of VCT for HIV was highest in the South East (4.64%), followed by South South (3.35%), then South West (3.02%), North Central (2.97%), North East (1.74%) and North West (0.73%) (Figure 3.2). There is more uptake of VCT in the South than in the Northern Nigeria.

Table 3.1 Percentage distributions of all respondents by their demographic and socio-economic characteristics controlling for region of residence. (NDHS 2003).

VARIABLE	NC*		NE*		NW*		SE*		SS*		SW*		National	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Age group:														
15-19	299	49.3	265	51.3	425	51.8	298	53.2	280	55.2	280	49.8	1847	51.7
20-24	307	50.7	252	48.7	396	48.2	262	46.8	227	44.8	282	50.2	1726	48.3
Total	**606**	**100**	**517**	**100**	**821**	**100**	**560**	**100**	**507**	**100**	**562**	**100**	**3573**	**100**
Sex														
Male	158	26.1	114	22.1	202	24.6	112	20.0	117	23.1	149	26.5	852	23.9
Female	448	73.9	403	77.0	619	75.4	448	80.0	390	76.9	413	73.5	2721	76.1
Total	**606**	**100**	**517**	**100**	**821**	**100**	**560**	**100**	**507**	**100**	**562**	**100**	**3573**	**100**
Residence														
Urban	267	44.1	249	48.2	304	37.0	210	37.5	165	32.5	372	66.2	1567	43.9
Rural	339	55.9	268	51.8	517	63.0	350	62.5	342	67.5	190	38.8	2006	56.1
Total	**606**	**100**	**517**	**100**	**821**	**100**	**560**	**100**	**507**	**100**	**562**	**100**	**3573**	**100**
Marital status	431	71.1	230	44.5	310	37.7	497	88.8	426	84.0	463	82.4	2357	66.0
Unmarried	161	26.6	266	51.4	495	60.3	58	10.3	71	14.0	98	17.4	1149	32.1
L. together	14	2.3	21	4.1	16	2.0	5	0.9	10	2.0	1	0.2	67	1.9
Not together	**606**	**100**	**517**	**100**	**821**	**100**	**560**	**100**	**507**	**100**	**562**	**100**	**3573**	**100**
Total														
Education														
No or primary	235	38.8	329	63.7	573	96.8	101	18.0	91	18.0	108	19.2	1437	40.3
Secondary	337	55.6	173	33.4	205	25.0	423	75.5	385	75.9	412	73.3	1935	54.1
Higher	34	5.6	15	2.9	43	5.2	36	6.5	31	6.1	42	7.5	201	5.6
Total	**606**	**100**	**517**	**100**	**821**	**100**	**560**	**100**	**507**	**100**	**562**	**100**	**3573**	**100**
Occupation														
Not working	102	16.8	41	7.9	74	9.0	78	13.9	84	16.6	114	20.3	493	13.8
Prof/Tech	452	74.6	404	78.1	622	75.8	449	80.2	394	77.7	416	74.0	2737	76.6
Skilled	30	5.0	37	7.2	43	5.2	19	3.4	19	3.7	20	3.6	168	4.7
Unskilled	3	0.5	6	1.2	13	1.6	8	1.4	4	0.8	3	0.5	37	1.0
Agric	19	3.1	29	5.6	69	8.4	6	1.1	6	1.2	9	1.6	138	3.9
Total	**606**	**100**	**517**	**100**	**821**	**100**	**560**	**100**	**507**	**100**	**562**	**100**	**3573**	**100**
Wealth index														
Lower	192	71.1	222	43.0	287	35.0	144	25.7	129	25.4	105	18.7	1079	30.2
Middle	118	26.6	132	25.5	231	25.9	150	26.8	91	18.0	57	10.1	761	21.3
Upper	296	2.3	163	31.5	321	39.1	266	47.5	287	56.6	400	71.2	1733	48.5
Total	**606**	**100**	**517**	**100**	**821**	**100**	**560**	**100**	**507**	**100**	**562**	**100**	**3573**	**100**
Religion														
Christian	432	71.3	105	20.4	85	10.4	552	98.7	497	98.2	345	61.4	2016	56.5
Islam	170	28.1	411	79.6	735	89.6	2	0.4	6	1.2	214	38.1	1540	43.1
Traditional	2	0.3	0	0.0	0	0.0	5	0.9	3	0.6	3	0.5	14	0.3
Other	2	0.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.1
Total	**606**	**100**	**516**	**100**	**820**	**100**	**559**	**100**	**506**	**100**	**562**	**100**	**3573**	**100**

*NC=North Central; NE=North East; NW=North West; SE=South East; SS=South South; SW=South West

We explored the effect of the difference in sample size between the two sexes. The sampling method employed in the 2003 NDHS provided for more women than men to generate enough data for reproductive and child health which were the main objectives of the survey. Table 3.2 and appendix 1 show regional pattern and distribution of respondents aged 15 - 24 by their sexual behavior stratified by their region of residence and sex and national distributions stratified by sex respectively.

Mean national age of sexual debut is 16.48 years (SD=2.78), it is 16.84 years (SD=2.65) and 16.36 years (SD=2.78) for males and females respectively. The mean age of sexual debut was consistently higher in males than in females in the northern regions while the reverse is the case in the southern regions except in the South West. Seventy percent of the respondents have not had any sexual partners in the last 12 months preceding the survey while 26% had 3 or more partners within the same period. Across the regions, a higher percentage of respondents had no sexual partners compared to those with 1 or more partners, more so in the southern regions. An average of 54% of the respondents reported not using condom in their last sexual intercourse before the survey while 44% used condom. This result varied across the regions and within the sexes. The higher percentage of those not using condom may, however, have been influenced by their marital status.

The youths studied had good knowledge of HIV of 97% (100% in males and 96% in females). HIV knowledge is consistently above 90% in all the regions and sexes. About 61% of the respondents perceived themselves to be at no risk of HIV, 19% do not know whether they are at risk or not, 18% had low self perception of risk and 2% had high risk perception. The outcome varied across the regions and between males and females.

Table 3.2 Percentage distributions of respondents by their sexual behavior, controlling for sex and region of residence. (NDHS 2003).

VARIABLE	North Central				North East				North West			
	Male		Female		Male		Female		Male		Female	
	No	%	No	%	No	%	No	%	No	%	No	%
Age at sex debut												
Mean (SD)	16.84 (2.86)		16.21 (2.73)		17.15 (1.96)		15.90 (1.98)		17.11 (2.26)		15.25 (2.04)	
Observation	**86**		**209**		**47**		**174**		**27**		**184**	
Sex partners												
None	160	96.4	268	51.4	107	86.3	340	62.1	169	82.4	459	64.7
1 or 2	6	3.6	8	1.5	17	13.7	9	1.7	35	17.1	7	1.00
3 or more	0	0.00	245	47.0	0	0.00	198	36.2	1	0.5	244	34.3
Total	**166**	**100**	**521**	**100**	**124**	**100**	**547**	**100**	**205**	**100**	**710**	**100**
Condom use												
Yes	29	42.0	261	50.4	8	17.0	369	68.0	4	91.5	549	77.4
No	40	58.0	250	48.2	39	83.0	169	31.1	43	8.5	157	22.2
Don't know	0	0.00	7	1.4	0	0.00	5	0.9	0	0.00	3	0.4
Total	**69**	**100**	**518**	**100**	**47**	**100**	**543**	**100**	**47**	**100**	**709**	**100**
HIV Knowledge												
Good	158	95.2	319	97.0	114	91.9	279	98.3	202	98.5	471	94.4
Poor	8	4.8	10	3.0	10	8.1	5	1.7	3	1.5	27	5.6
Total	**166**	**100**	**329**	**100**	**124**	**100**	**284**	**100**	**205**	**100**	**499**	**100**
Risk perception												
No risk	49	31.0	302	67.6	63	55.3	254	63.0	171	84.7	338	54.5
Low	2	1.3	4	0.9	4	3.5	8	2.00	3	1.5	9	1.4
High	85	53.8	29	6.5	31	27.2	38	9.4	11	5.4	114	18.4
Don't know	22	13.9	112	25.0	16	14.0	103	25.6	17	8.4	159	25.7
Total	**158**	**100**	**447**	**100**	**114**	**100**	**403**	**100**	**202**	**100**	**620**	**100**

	South East				South South				South West			
	Male		Female		Male		Female		Male		Female	
	No	%	No	%	No	%	No	%	No	%	No	%
Age at sex debut												
Mean (SD)	16.29 (2.89)		17.22 (2.21)		16.49 (2.79)		16.11 (2.24)		17.30 (2.32)		17.04 (2.20)	
Observation	**56**		**180**		**71**		**269**		**83**		**214**	
Sex partners												
None	113	99.1	385	77.3	127	98.4	311	71.8	151	96.8	307	60.9
1 or 2	1	0.9	11	2.2	2	1.9	12	2.3	5	3.2	26	5.2
3 or more	0	0.00	102	20.5	0	0.00	112	25.9	0	0.00	171	33.9
Total	**114**	**100**	**498**	**100**	**129**	**100**	**433**	**100**	**156**	**100**	**504**	**100**
Condom use												
Yes	20	51.3	167	33.8	23	41.8	219	51.3	42	60.9	182	36.1
No	19	48.7	320	64.8	32	58.2	180	42.2	27	39.1	316	62.7
Don't know	0	0.00	7	1.4	0	0.0	28	6.5	0	0.00	6	1.2
Total	**39**	**100**	**494**	**100**	**55**	**100**	**427**	**100**	**69**	**100**	**504**	**100**
HIV Knowledge												
Good	112	98.3	384	95.6	117	90.7	268	98.2	149	95.5	345	94.8
Poor	2	1.7	16	4.4	12	1.3	5	1.8	7	4.5	19	5.2
Total	**114**	**100**	**364**	**100**	**129**	**100**	**273**	**100**	**156**	**100**	**364**	**100**
Risk perception												
No risk	51	45.5	189	42.3	70	59.8	241	61.8	111	74.5	348	84.3
Low	4	3.6	12	2.7	5	4.3	8	2.1	5	3.4	8	1.9
High	52	46.4	180	40.3	20	17.1	36	9.2	25	16.8	31	7.5
Don't know	5	4.5	66	14.7	22	18.8	105	26.9	8	5.3	26	6.3
Total	**112**	**100**	**447**	**100**	**117**	**100**	**390**	**100**	**149**	**100**	**413**	**100**

3.2 BIVARIATE ANALYSIS

The second objective was to identify critical factors influencing the uptake of voluntary counseling and testing for HIV among the Nigerian youths. Tables 3.3, 3.4 and appendix 2 showed that age group, sex, region of residence, place of residence (urban/rural), educational status, occupation, wealth index, religion, number of sex partners, condom use, risk perception and age at sexual debut are significantly associated with uptake of VCT among Nigerian youths. This, however, varied across the regions and within both sexes. Marital status and HIV knowledge were found not to be significantly associated with the uptake of VCT in the National data. The chi squared (x^2) test and its corresponding Pr (p-value) was used to differentiate the variables into those associated and those not associated with uptake of VCT. P-value<0.05 signifies significant association and difference between the different categories of the variable.

The chi-squared (x^2) statistics with the corresponding p-value of the cross tabulations of age group and VCT uptake showed significant association between the two variables (x^2=30, p-value=0.000). About 4% of young people aged 20-24 (7% of males and 2% of females) had ever volunteered for HIV testing while only 1% of those aged 15-19 had volunteered. This result is consistent in all the regions surveyed.

Within the regions, the highest uptake of VCT was in the South East (4.64%), followed by South South (3.35%) and South West (3.02). The lowest percentages were from North West (0.73%), North East (1.74) and North Central (2.97%). More males 5% than females (2%) had benefited from VCT, which is consistent in all the regions. About 3.8% of urban residents had taken up VCT while only 1.65% of their rural counterparts had done so. Uptake in the areas of residence is also higher in males than females.

A higher percentage of those who had higher education (11%) had volunteered for HIV counseling and testing compared to 3% and 1% for those with secondary and primary or no education respectively. There is higher percentage of uptake of VCT among males compared to females in all the education categories. This pattern is seen in the regions except for males in the South East and both sexes in the South South were respondents with primary or no education had higher uptake of VCT than those with secondary education. In the categories of occupation, most uptake of VCT was found among unskilled workers (8.1%), followed by skilled workers (4.2%) and those not working. The least uptake was among the professionals (2.1%) and agricultural workers (3.6%). Within the sexes, respondents who are professionals were more likely to volunteer for HIV testing (25%) than those in other occupations. These were, however, no so some of the regions. Males in unskilled labor in the North East (16.7%) and South West (33.3%) had higher percentages of uptake of VCT compared to other occupational groups.

Respondents in the higher wealth index class had the highest uptake of VCT (3.98%), followed by the middle class (1.58%) and the lower class (1.11%). This is consistently so in the regions and within both sexes except among males in the South South and South West were those in the lower class had more uptake than the middle class. Among the religious groups, 3.62% and 1.3% of respondents who are Christians and Moslems respectively had volunteered for HIV counseling and testing. More males (5.8% Christians and 3.1% Moslems) accepted HIV VCT than females (3% Christians and 0.7% Moslems) in the religious groups, seen in all the regions.

Exploring sexual behaviors, the higher the age at sexual debut, the less likely the respondents were to volunteer for HIV testing (OR=0.12; p-value=0.018) (Appendix 2).

Males (OR=0.01; CI=-0.14-0.13) were more less likely than females (OR=0.18; CI=0.06-0.31) to go for VCT at increasing age of sexual debut, though varied across the regions. 7.52% of respondents who had had 1 or 2 sexual partners within the last 12 months preceding the survey had volunteered for HIV testing while 2.51% and 2.15% of those who had no partners and those with 3 or more partners respectively had been so tested. This result is only consistent among males in the North Central and North East and females in all the southern regions. Respondents who used condom in their last sexual intercourse before the survey (3.72%) were more likely to have volunteered for HIV testing compared to those who did not use condom (1.57%) with a male to female ratio of 13.5 to 2.9. This is consistent in all the regions except in the North West (females) and South South (males) where those who did not use condom had higher uptake. About 4% of respondents with low self-perception of risk for HIV had taken up VCT for HIV, followed by those with no risk perception (2.88%) and those with high-risk perception (2.78%). Only 0.3% of respondents who do not know their risk perception status accessed VCT. This result varied across the regions and within the sex groups.

There was no significant difference in the uptake of VCT among respondents who were not married (2.98%), married and living together (2%) and those not living together (2.99%) in the national data. There were, however, significant differences seen among females in the South East and South West. Knowledge of HIV also had no significant association with VCT uptake. About 3% of those with good knowledge of HIV had accessed VCT while none of those with poor knowledge had, consistent in all the regions.

Table 3.3. Explanatory variables associated with uptake of VCT in Nigeria by region of residence, controlling for sex. (NDHS 2003) - Northern Nigeria.

	North Central		North East		North West	
	% uptake of VCT		% uptake of VCT		% uptake of VCT	
VARIABLE	Male(Total)	Female(Total)	Male(Total)	Female(Total)	Male(Total)	Female(Total)
Age group:						
15-19	2.67 (75)	1.34 (224)	5.77 (52)	0.47 (213)	1.06 (94)	0.00 (331)
20-24	10.84 (83)	1.79 (224)	8.06 (62)	0.00 (190)	1.85 (108)	1.04 (288)
Total	**6.96 (158)**	**1.56 (448)**	**7.02 (114)**	**0.25 (403)**	**1.49 (202)**	**0.48 (619)**
$X^2(1)$	**4.067**	**0.145**	**0.228**	**0.894**	**0.213**	**3.465**
P-value	**0.044**	**0.703**	**0.633**	**0.344**	**0.644**	**0.063**
Residence						
Urban	10.13 (79)	2.66 (108)	8.93 (56)	0.52 (193)	2.15 (93)	0.95 (211)
Rural	3.8 (79)	0.77 (260)	5.17 (58)	0.00 (210)	0.92 (109)	0.25 (408)
Total	**6.96 (158)**	**1.56 (448)**	**7.02 (114)**	**0.25 (403)**	**1.49 (202)**	**0.48 (619)**
$X^2(1)$	**2.442**	**2.535**	**0.616**	**1.091**	**0.522**	**1.424**
P-value	**0.118**	**0.111**	**0.433**	**0.296**	**0.470**	**0.233**
Education						
None or Primary	5.0 (40)	0.00 (195)	4.76 (42)	0.35 (287)	0.00 (110)	0.00 (463)
Secondary	4.72 (106)	2.6 (231)	7.35 (68)	0.00 (105)	1.37 (73)	1.52 (132)
Higher	33.33 (12)	4.55 (22)	25.0 (4)	0.00 (11)	10.52 (19)	4.17 (24)
Total	**6.96 (158)**	**1.56 (448)**	**7.02 (114)**	**0.25 (403)**	**1.49 (202)**	**0.48 (619)**
$X^2(2)$	**13.947**	**5.977**	**2.321**	**0.405**	**12.280**	**11.908**
P-value	**0.001**	**0.050**	**0.313**	**0.817**	**0.002**	**0.003**
Occupation						
Not working	6.86 (102)	-	4.88 (41)	-	2.7 (74)	-
Prof./Tech./Mgt.	50.0 (4)	1.56 (448)	0.00 (1)	0.25 (403)	33.33 (3)	0.48 (619)
Skilled	3.33 (12)	-	8.11 (37)	-	0.00 (43)	-
Unskilled	0.00 (3)	-	16.67 (6)	-	0.00 (13)	-
Agric	5.26 (19)	-	6.9 (29)	-	0.00 (69)	-
Total	**6.96 (158)**	**1.56 (448)**	**7.02 (114)**	**0.25 (403)**	**1.49 (202)**	**0.48 (619)**
$X^2(4)$	**12.359**		**1.287**		**23.432**	
P-value	**0.015**		**0.864**		**0.000**	
Wealth index						
Lower	2.27 (44)	0.00 (148)	5.66 (53)	0.00 (169)	0.00 (77)	0.00 (210)
Middle	6.67 (30)	1.14 (88)	6.25 (32)	0.00 (100)	2.38 (42)	0.00 (171)
Upper	9.52 (84)	2.83 (212)	10.34 (29)	0.75 (134)	2.41 (83)	1.26 (238)
Total	**6.96 (158)**	**1.56 (448)**	**7.02 (114)**	**0.25 (403)**	**1.49 (202)**	**0.48 (619)**
$X^2(2)$	**2.349**	**4.668**	**0.671**	**2.013**	**1.876**	**4.826**
P-value	**0.039**	**0.097**	**0.715**	**0.366**	**0.391**	**0.090**
Religion						
Christian	7.84 (102)	1.82 (330)	7.14 (28)	0.00 (77)	4.76 (21)	3.13 (64)
Islam	5.56 (54)	0.86 (116)	6.98 (86)	0.31 (325)	1.10 (18)	0.18 (554)
Other	0.00 (2)	0.00 (2)	-	-	-	-
Total	**6.96 (158)**	**1.56 (448)**	**7.02 (114)**	**0.25 (402)**	**1.49 (202)**	**0.49 (618)**
$X^2(2)$	**0.437**	**0.542**	**0.001**	**0.238**	**1.720**	**10.297**
P-value	**0.804**	**0.763**	**0.976**	**0.626**	**0.190**	**0.001**
Marital status						
Not married	6.58 (152)	0.72 (279)	5.94 (101)	0.00 (129)	1.81 (166)	0.69 (144)
Living together	25.0 (4)	2.55 (157)	20.0 (10)	0.39 (256)	0.00 (33)	0.43 (462)
Not together	0.00 (2)	8.33 (12)	0.00 (3)	0.00 (18)	0.00 (3)	0.00 (13)
Total	**6.96 (158)**	1.56 (448)	**7.02 (114)**	**0.25 (403)**	**0.25 (403)**	**0.48 (619)**
$X^2(2)$	**2.193**	**5.845**	**2.989**	**0.576**	**0.660**	**0.220**
P-value	**0.334**	**0.053**	**0.224**	**0.750**	**0.719**	**0.896**

Sex partners						
None	6.58 (152)	2.64 (227)	5.94 (101)	0.42 (238)	1.81 (166)	0.5 (398)
1 or 2	16.67 (6)	0.00 (8)	15.38 (13)	0.00 (9)	0.00 (35)	0.00 (7)
3 or more	-	0.47 (213)	-	0.00 (156)	0.00 (1)	0.47 (214)
Total	**6.96 (158)**	**1.56 (448)**	**7.02 (114)**	**1.25 (403)**	**1.49 (202)**	**0.48 (619)**
$X^2(2)$	**0.907**	**3.505**	**1.574**	**0.695**	**0.660**	**0.038**
P-value	**0.341**	**0.173**	**0.210**	**0.719**	**0.719**	**0.981**
Condom use						
Yes	24.14 (29)	3.13 (224)	12.5 (8)	0.35 (284)	25.0 (4)	0.42 (476)
No	10.26 (39)	0.00 (215)	11.43 (35)	0.00 (116)	0.00 (43)	0.71 (140)
Total	**16.18 (68)**	**1.59 (439)**	**11.63 (43)**	**0.25 (400)**	**2.13 (47)**	**0.49 (616)**
$X^2(1)$	**2.364**	**6.828**	**0.007**	**0.410**	**10.984**	**0.193**
P-value	**0.124**	**0.009**	**0.932**	**0.522**	**0.001**	**0.660**
HIV Knowledge						
Good	6.98 (158)	2.2 (318)	7.02 (114)	0.00 (0)	1.49 (202)	0.64 (470)
Poor	-	0.00 (10)	-	0.00 (0)	-	0.00 (28)
Total	**6.96 (158)**	**2.13 (328)**	**7.02 (114)**	**0.00 (0)**	**1.49 (202)**	**0.6 (498)**
$X^2(2)$	-	**0.225**	-	-	-	**0.180**
P-value	-	**0.635**	-	-	-	**0.672**
Risk perception						
No risk	2.04 (49)	1.66 (302)	11.11 (63)	0.39 (254)	1.17 (171)	0.59 (337)
Low	0.00 (2)	0.00 (4)	0.00 (4)	0.00 (8)	33.33 (3)	0.00 (9)
High	11.76 (85)	6.9 (29)	3.23 (31)	0.00 (38)	0.00 (11)	7.69 (52)
Don't know	0.00 (22)	0.00 (112)	0.00 (16)	0.00 (103)	0.00 (17)	0.00 (5)
Total	**6.96 (158)**	**1.57 (447)**	**7.02 (114)**	**0.25 (403)**	**1.49 (202)**	**7.14 (112)**
$X^2(3)$	**6.655**	**7.207**	**3.810**	**0.588**	**21.336**	**1.265**
P-value	**0.084**	**0.066**	**0.283**	**0.899**	**0.000**	**0.737**
Age at sexual debut						
OR	1.07	1.02	1.02	0.5	1.21	1.16
P|z|	0.556	0.886	0.917	0.331	0.685	0.746
95% CI	0.85 – 1.36	0.77 – 1.36	0.60 - 1.76	0.12 – 2.03	0.49 – 2.98	0.47 – 2.88
Observations	**84**	**188**	**46**	**128**	**27**	**164**

Table 3.4. Explanatory variables associated with uptake of VCT in Nigeria by region of residence, controlling for sex. (NDHS 2003) - Southern Nigeria.

VARIABLE	South East		South South		South West	
	% uptake of VCT		% uptake of VCT		% uptake of VCT	
	Male(Total)	Female(Total)	Male(Total)	Female(Total)	Male(Total)	Female(Total)
Age group:						
15-19	1.69 (59)	0.84 (239)	0.00-(62)	2.75 (218)	1.27 (79)	1.00 (201)
20-24	13.21 (53)	7.66 (209)	7.27 (55)	4.07 (172)	5.71 (70)	4.72 (212)
Total	**7.14 (112)**	**4.02 (448)**	**3.42 (117)**	**3.33 (390)**	**3.36 (149)**	**2.91 (413)**
X^2(1)	**5.579**	**13.443**	**4.670**	**0.518**	**2.264**	**5.066**
P-value	**0.018**	**0.000**	**0.031**	**0.472**	**0.132**	**0.024**
Residence						
Urban	8.89 (45)	8.48 (165)	2.78 (36)	4.65 (129)	2.25 (89)	3.53 (283)
Rural	5.97 (67)	1.41 (283)	3.70 (81)	2.68 (261)	5.00 (60)	1.54 (130)
Total	**7.14 (112)**	**4.02 (448)**	**3.42 (117)**	**3.33 (390)**	**3.36 (149)**	**2.91 (413)**
X^2(1)	**0.346**	**13.512**	**0.065**	**1.039**	**0.837**	**1.257**
P-value	**0.557**	**0.000**	**0.799**	**0.308**	**0.360**	**0.262**
Education						
None or Primary	8.33 (24)	2.6 (77)	4.55 (22)	2.9 (69)	4.17 (24)	0.00 (84)
Secondary	6.1 (82)	3.81 (341)	2.22 (90)	2.71 (295)	3.45 (116)	2.36 (29)
Higher	16.67 (6)	10.0 (30)	20.0 (5)	11.54 (26)	0.00 (9)	15.15 (33)
Total	**7.14 (112)**	**4.02 (448)**	**3.42 (117)**	**3.33 (390)**	**3.36 (149)**	2.91 (413)
X^2(2)	**1.007**	**3.224**	**4.638**	**5.826**	**0.364**	20.362
P-value	**0.604**	**0.199**	**0.098**	**0.054**	**0.834**	0.000
Occupation						
Not working	5.13 (78)	-	3.57 (84)	-	1.75 (114)	-
Prof./Tech./Mgt.	100 (1)	4.02 (448)	0.00 (4)	3.33 (390)	0.00 (3)	2.91 (413)
Skilled	5.26 (19)	-	5.26 (19)	-	5.0 (20)	-
Unskilled	12.5 (8)	-	0.00 (4)	-	33.33 (3)	-
Agric	16.67 (6)	-	0.00 (6)	-	11.11 (9)	-
Total	**7.14 (112)**	**4.02 (448)**	**3.42 (117)**	**3.33 (390)**	**3.36 (149)**	**2.91 (413)**
X^2(4)	**14.745**	-	**0.697**	-	**11.154**	-
P-value	**0.005**	-	**0.952**	-	**0.025**	-
Wealth index						
Lower	0.00 (27)	3.42 (117)	2.44 (41)	2.27 (88)	3.13 (32)	0.00 (73)
Middle	6.06 (33)	2.56 (117)	0.00 (10)	0.00 (81)	5.56 (18)	0.00 (39)
Upper	11.54 (52)	5.14 (214)	4.55 (66)	4.98 (211)	3.03 (99)	3.99 (301)
Total	**7.14 (112)**	**4.02 (448)**	**3.42 (117)**	**3.33 (390)**	**3.36 (149)**	**2.91 (413)**
X^2(2)	**3.650**	**1.449**	**0.727**	**4.954**	**0.306**	**4.599**
P-value	**0.161**	**0.485**	**0.695**	**0.084**	**0.858**	**0.100**
Religion						
Christian	7.27 (110)	4.07 (442)	3.48 (115)	3.14 (382)	4.55 (88)	3.11 (257)
Islam	-	0.00 (2)	0.00 (1)	20.0 (5)	1.64 (61)	2.61 (153)
Other	0.00 (2)	0.00 (3)	0.00 (1)	0.00 (2)	-	0.00 (3)
Total	**7.14 (112)**	**4.03 (447)**	**3.42 (117)**	**3.34 (389)**	**3.36 (149)**	**2.91 (413)**
X^2(2)	**0.157**	**0.212**	**0.072**	**4.412**	**0.983**	**0.175**
P-value	**0.692**	**0.899**	**0.965**	**0.110**	**0.333**	**0.916**
Marital status						
Not married	7.21 (111)	2.85 (386)	3.48 (115)	3.22 (311)	3.47 (144)	2.51 (319)
Living together	0.00 (1)	12.28 (57)	0.00 (2)	4.35 (69)	0.00 (5)	3.23 (93)
Not together	-	0.00 (5)	-	0.00 (10)	-	100 (1)
Total	**7.14 (112)**	**4.02 (448)**	**3.42 (117)**	**3.33 (390)**	**3.36 (149)**	**2.91 (413)**
X^2(2)	**0.078**	**11.666**	**0.072**	**0.579**	**0.180**	**33.629**
P-value	**0.781**	**0.003**	**0.788**	**0.749**	**0.672**	**0.000**

Sex partners						
None	7.21 (111)	2.06 (340)	3.48 (115)	2.15 (279)	3.47 (144)	2.10 (238)
1 or 2	0.00 (1)	27.27 (11)	0.00 (2)	10.00 (10)	0.00 (5)	11.54 (26)
3 or more	-	8.25 (97)	-	5.94 (101)	-	2.68 (149)
Total	**7.14 (112)**	**4.02 (448)**	**3.42 (117)**	**3.33 (390)**	**3.36 (149)**	**2.91 (413)**
$X^2(2)$	**0.078**	**23.309**	**0.072**	**4.721**	**0.180**	**7.441**
P-value	**0.781**	**0.000**	**0.788**	**0.094**	**0.672**	**0.024**
Condom use						
Yes	20.00 (20)	10.19 (157)	4.35 (23)	4.48 (201)	7.14 (42)	5.26 (171)
No	15.79 (19)	0.35 (282)	6.45 (31)	1.27 (157)	3.85 (26)	1.27 (236)
Total	**17.95 (39)**	**3.87 (439)**	**5.56 (54)**	**3.07 (358)**	**5.88 (68)**	**2.95 (407)**
$X^2(1)$	**0.117**	**26.14**	**0.111**	**3.038**	**0.315**	**5.522**
P-value	**0.732**	**0.000**	**0.739**	**0.081**	**0.574**	**0.019**
HIV Knowledge						
Good	7.14 (202)	4.89 (348)	3.42 (117)	4.12 (267)	3.36 (149)	3.50 (343)
Poor	-	0.00 (16)	-	0.00 (5)	-	0.00 (19)
Total	**7.14 (202)**	**4.67 (364)**	**3.42 (117)**	**4.04 (272)**	**3.36 (149)**	**3.31 (362)**
$X^2(1)$	-	**0.820**	-	**0.215**	-	**0.688**
P-value	-	**0.365**	-	**0.643**	-	**0.407**
Risk perception						
No risk	7.84 (51)	6.88 (189)	4.29 (70)	4.15 (241)	3.60 (111)	3.16 (348)
Low	0.00 (4)	0.00 (12)	0.00 (5)	12.5 (8)	0.00 (5)	0.00 (8)
High	7.69 (52)	2.78 (180)	5.00 (20)	0.00 (36)	4.00 (25)	3.23 (31)
Don't know	0.00 (5)	0.00 (66)	0.00 (22)	1.9 (105)	0.00 (8)	0.00 (26)
Total	**7.14 (112)**	**4.03 (447)**	**3.42 (117)**	**3.33 (390)**	**3.36 (149)**	**2.91 (413)**
$X^2(3)$	**0.754**	**7.976**	**1.267**	**4.490**	**0.504**	**1.109**
P-value	**0.861**	**0.047**	**0.737**	**0.213**	**0.918**	**0.775**
Age at sexual debut						
OR	1	1.38	1.37	1.04	0.66	1.09
P|z|	1.000	0.011	0.273	0.785	0.031	0.562
95% CI	0.76 – 1.32	1.08 – 1.76	0.78 – 2.41	0.80 – 1.35	0.45 – 0.96	0.82 – 1.45
Observations	**56**	**176**	**70**	**251**	**82**	**205**

3.3 MULTIVARIATE ANALYSIS

In order to identify critical factors influencing the uptake of VCT for HIV among Nigerian youths, all the variables found to be associated with it were used in an automatic stepwise selection analysis. Variables selected were age, sex, region, occupation, education, wealth index and risk-perception (Table 3.5) though it varied when stratified by region and sex (Table 3.6 and appendix 3). The regions were stratified into the northern and southern regions for the purpose of this multivariate analysis. This was done to retain a reasonable sample size in each stratum, so as to be able to fit a model.

Critical predictors of VCT uptake among youths in the northern Nigeria are sex, education, religion, occupation and self-perception of risk for HIV while predictors in the southern Nigeria are age group and education (Table 3.6). Age, region, occupation, wealth index and age at sexual debut were selected as predictors of VCT uptake in males though the last two were not significant at 95% confidence interval while region, education, residence, wealth index and risk perception were selected for the females and residence was not significant at 95% confidence interval (Appendix 3). These were used in the multivariate logistic regression to predict and determine the strength of association between the variables and voluntary counseling and testing for HIV.

Table 3.5 below shows the unadjusted and adjusted odds ratio, 95% confidence intervals and associated p-values of the critical factors influencing the uptake of VCT in this study population. This result gives effect of the various variables on voluntary counseling and testing for HIV, taking into consideration the other variables in the dataset that could also influence VCT.

From the tables, as age increases, respondents are more likely to access VCT (AOR = 2.9, CI = 1.73 – 4.8) and females in the study were less likely to go for VCT (AOR = 0.15, CI = 0.04 – 0.51) relative to their male counterparts. In the regions, uptake of VCT is less likely in all the regions compared to the North Central region. Adjusted odds ratios and confidence interval for the regions are: North East (0.58; 0.23 – 1.44), North West (0.09; 0.03 – 0.31), South East (0.26; 0.08 – 0.92), South South (0.08; 0.01 – 0.48) and South West (0.02; 0.002 – 0.22) which are not significant for North East and borderline significant for South East.

Respondents in the professional category of occupation (AOR = 4.28, CI = 1.15 – 15.94), unskilled workers (AOR = 1.87, CI = 0.48 – 7.24) and those working in the agricultural sector (AOR = 3.12, CI = 1.01 – 9.90) are more likely to go for voluntary testing for HIV than those not working. There is no difference in uptake of VCT between those in the skilled labour (AOR = 1.00, CI = 0.39 – 2.57) and those not working. The higher the level of education, the more likely the uptake of VCT. Respondents with higher education were much more likely to access VCT (AOR = 21.0, CI = 7.50 – 61.50) compared to those with no education.

The likelihood of uptake of VCT increases with increasing wealth index. Respondents in the middle (AOR = 1.28, CI = 0.55 – 2.98) and upper class (AOR = 2.43, CI = 1.19 – 4.95) of wealth index were more likely to access VCT relative to those in the lower class. For the respondents' self perception of HIV risk, those with low (AOR = 2.0, CI = 0.55 – 2.98) and high (AOR = 2.43, CI = 1.44 – 14.67) perception of risk are more likely to go for VCT than those with perception of no risk for HIV.

Table 3.5 Critical factors influencing the uptake of voluntary counseling and testing for HIV among youths in Nigeria. (NDHS 2003)

VARIABLE	Unadjusted Odds Ratio	P>|z|	95% CI	Adjusted Odds Ratios (AOR)	P>|z|	95% CI
Age**	1.32	0.000	1.209 – 1.435	1.26	0.000	1.143 – 1.379
Sex						
Male	1			1		
Female**	0.42	0.000	0.278 – 0.642	0.15	0.003	0.042 - 0.517
Region						
North Central	1			1		
North East	0.58	0.185	0.258 – 1.300	0.53	0.169	0.215 – 1.308
North West**	0.24	0.003	0.095 – 0.610	0.08	0.000	0.025 – 0.269
South East	1.59	0.137	0.862 – 2.934	0.30	0.055	0.086 – 1.027
South South**	1.13	0.716	0.578 – 2.222	0.09	0.007	0.015 – 0.505
South West**	1.02	0.956	0.520 – 2.000	0.02	0.002	0.002 – 0.227
Occupation						
Not working	1			1		
Prof./Tech./Mgt**	0.51	0.011	0.305 – 0.859	4.22	0.032	1.131 – 15.781
Skilled	1.02	0.950	0.427 – 2.477	1.00	0.985	0.393 – 2.587
Unskilled	2.09	0.253	0.590 – 7.374	1.81	0.398	0.458 – 7.156
Agriculture	0.89	0.818	0.327 – 2.414	2.91	0.066	0.930 – 9.134
Education						
None or primary	1			1		
Secondary	3.84	0.000	1.848 – 6.200	1.88	0.64	0.964 – 3.654
Higher**	13.46	0.000	6.665 – 27.193	4.42	0.000	1.979 – 9.878
Wealth index						
Lower	1			1		
Middle	1.42	0.389	0.637 – 3.188	1.27	0.576	0.549 - 2.069
Upper **	3.69	0.000	1.988 – 6.839	2.59	0.009	1.274 - 5.265
Risk perception						
No risk	1			1		
Low	0.96	0.959	0.230 – 4.014	0.44	0.297	0.092 – 2.069
High**	1.40	0.157	0.879 – 2.229	0.23	0.012	0.071 – 0.722
Don't know**	0.10	0.002	0.025 – 0.419	0.01	0.001	0.001 – 0.110

Observations	3571
LR chi2(19)	153.34
Prob>chi2	0.000
Log likelihood	-354.37293
PseudoR2	0.1779
Goodness of fit test	
Pearson chi2(1385)	1364.16
Prob>chi2	0.6500

** Statistically Significant for the adjusted odds ratio

Table 3.6. Summary of critical predictors of uptake of VCT in the Northern and southern regions of Nigeria, NDHS 2003.

VARIABLE	NORTH			SOUTH		
	Adjusted Odds Ratio	P>|z|	95% CI	Adjusted Odds Ratios	P>|z|	95% CI
Age group						
15 – 19	-	-	-	1		
20 - 24				3.18	0.010	1.313 – 7.701
Sex						
Male	1			-	-	-
Female	0.32	0.000	0.006 – 0.179			
Education						
None or primary	1			1		
Secondary	3.39	0.026	1.154 – 9.930	6.29	0.000	2.336 – 16.93
Higher	14.22	0.000	4.234 – 47.79	20.06	0.000	6.440 – 62.47
Religion						
Christian	1			-	-	-
Islam	0.46	0.054	0.208 – 1.012			
Occupation						
Not working	1					
Prof./Tech./Mgt.	10.69	0.008	1.860 – 61.47			
Skilled	1.42	0.576	0.418 – 4.809	-	-	-
Unskilled	1.80	0.597	0.203 – 16.01			
Agriculture	1.41	0.628	0.355 – 5.567			
Risk perception						
No risk	1					
Low	2.08	0.507	0.239 – 18.07	-	-	-
High	2.35	0.031	1.081 – 5.090			
Observations	1509			1944		
LR chi2	62.11			38.59		
Prob>chi2	0.000			0.000		
PseudoR2	0.1956			0.1154		
Log likelihood	-127.72802			-147.93264		
Goodness of Fit test						
Pearson chi2	31.26			0.71		
Prob>chi2	0.9925			0.7016		

CHAPTER 4

DISCUSSION

This study aims to examine the regional prevalence, patterns and correlates of voluntary counseling and testing (HIV) for HIV among young people in Nigeria. The results show a low national and regional prevalence in uptake of voluntary counseling and testing (VCT) for HIV in the sub-population used in the analysis. This is probably due to lack of spread of VCT dedicated centers in the country, low awareness of VCT services and perceived high cost of HIV tests. The 2003 NDHS did not report regional variations in the uptake of VCT for HIV or HIV testing in Nigeria, and existing literature in the databases searched did not yield any results on these variations, therefore the basis for comparing this and previous studies in Nigeria is lacking.

The 2003 NDHS reported that about 10% (14% of males and 6% of females) of youths aged 15 – 24 in Nigeria had ever been tested for HIV. The figure differs from the result of this study (2.6%) because it measured HIV testing in many circumstances – those who volunteered, those who were offered the test and they accepted and those who were required to do the test for any reason whatsoever. A survey in South Africa (Pettifor et al, 2004) reported that 20% of young people aged 15-24 had ever been tested for HIV with females being more likely to be tested than males (25% versus 15% respectively, $p<0.01$) unlike in the Nigerian population.

In this study, more males (4.6%) than female (2%) youths in Nigeria had volunteered for HIV counseling and testing unlike the South African survey that reported the reverse (Pettifor et al, 2004). This supports the hypothesis that males are more likely to volunteer for HIV counseling and testing in Nigeria compared to females. This may be explained

men being more open about their sexual behavior and do not need permission from anybody to decide on testing while women will often need the consent of their parents and spouses. Women may also decline information on their testing status for fear of stigma, discrimination and marriage insecurity.

Respondents aged 20-24 were more likely to volunteer for HIV testing compared with those aged 15-19 (4.11% versus 1.19%, p-value<0.001). This result is consistent in both sexes and in the six regions. The logistic regression results further confirm that those in the higher age group are more likely to go for VCT. This is similar to reported results from studies in Nigeria and other sub-Saharan African countries. For instance, Adewole (2004) reported that males of higher age groups responded more to voluntary HIV testing and Pettifor et al (2004) showed 12% and 29% of those aged 15-19 and 20-24 respectively volunteering for HIV testing. This age disparity may be due to the likelihood that younger youths have had a shorter sexual experience and are less informed on sexual issues than older youths. In traditional African societies, sex is often learnt about from peers and in schools rather than from family members.

In this study more urban dwellers (3.8%) than rural dwellers (1.65%) had voluntarily tested for HIV (p-value<0.001). This is similar that data reported from a Ugandan antenatal study (Karamangi et al, 2006) where urban dwellers were 2.7 times more likely to volunteer than their rural counterparts. It is known that more information and education campaigns on HIV occur in urban areas, and myths about HIV/AIDS are prevalent in rural areas. Also, the National Action Committee on AIDS (NACA) reports that most ARV centers and by implication, VCT centers in Nigeria are in the urban areas.

Regarding education, 11% of youths educated above secondary school volunteered for HIV testing compared to 3% and 1% of those who had secondary and primary or no education respectively (p-value<0.001). Logistic regression results also confirmed those with higher education as being 4.4 times more likely to volunteer for HIV testing than those with primary school or no education. This could be because youths with higher education are more aware of HIV and the risks it portends, have better sexual negotiation skills and could be more health conscious. These respondents could more likely be professionals, in the upper wealth index and therefore can afford unsolicited HIV testing to be assured of their status. The study by Adeneye (2004) among pregnant women also showed that those with post secondary education were more willing to be tested for HIV (93%) than those with no education (77%) (p<0.05). These results suggest that more HIV prevention strategies should be directed on rural and less educated populations.

Contrary to expectations, uptake of VCT was highest among unskilled workers at 8.11%, followed by skilled workers. Those working as professionals or in the management positions were least likely to volunteer for HIV testing (2.12%). However, this result is different when stratified by regions where professionals of both sexes were consistently more likely to take up VCT than the other categories. These differences could result from the low sample size for a national study of this magnitude.

This study also showed increasing likelihood to volunteer for HIV testing with increasing wealth status. Males more than females in the upper wealth class (3.98%) were more likely to have volunteered for HIV testing than those in the middle (1.58%) and lower (1.11%) classes in all the categories and regions (p-value<0.001). A similar trend was also reported in NDHS (2003) where respondents in the highest wealth quintile (26.3%)

were more likely to have been tested for HIV than those in the middle (6.85%) and lowest quintiles (4.45%). This may result from those in the higher wealth class being able to afford an HIV test, access testing centers, utilize private HIV testing services and have more exposure to relevant information for decision-making.

A higher percentage of Christians (3.62%) had voluntarily tested for HIV compared to Moslems (1.3%) (p-value<0.0001). The males in both religions showed more likelihood to volunteer for HIV testing than females (Christians – 5.82% versus 2.96%; Moslems – 3.13% versus 0.69%). Daniel and Oladapo (2006) reported Christianity as an independent predictor of acceptance of prenatal HIV testing in Nigeria compared to other religious groups. The most likely explanation is the higher tendency for attaining education and the greater distribution of educational institutions in the Christian dominated parts of the country (FGN, 2005).

It was also found that youths who had changed a sexual partner once within the 12 months preceding the survey (7.52%) were more likely to have gone for voluntary testing for HIV compared to those with no sexual partners (2.51%) and those with 3 or more sexual partners (2.15%) within the same period. This trend is not statistically significant among males: 4.84%, 4.56% and 0.00% (p=0.971), but was not significant among females (p=0.001) where those with 3 or more partners had higher uptake than those with no partners. It is surprising that those with no sexual partners were found to be slightly more likely to have accessed VCT than those with 3 or more partners though stratifying by sex revealed that this occurred among males and is the reverse in the females. Compared to women, men tend to be predisposed to having multiple sexual partners without perceiving themselves to be at risk of HIV infection. This tendency can be

described as that of men to handle relationships better than women and so can manage multiple relationships better. The concern here is that these young men are exposing themselves to higher risks for HIV and will more likely ignorantly infect their numerous partners which will further worsen the HIV prevalence in Nigeria, especially within this age group studied.

Regarding condom use, young people who used condom in their last sexual activity before the survey were more likely (3.72%) to have gone for voluntary HIV testing than those who did not use condom (1.57%) (p-value<0.001). This trend is consistent across most of the regions where males who used condom had higher uptake of VCT than female. Using condom may define youths who are more HIV-aware and are determined to protect themselves and thus seek to know their status from time to time.

Respondents who perceived themselves at high risk for HIV were more likely to go for VCT (3.99%) compared to those with no risk perception (2.88%) and those with low risk perception (2.78%) (p-value<0.001). The highest VCT uptake in females, however, was surprisingly found in those with no risk perception for HIV (2.51%) against 2.1% and 2.04% in the high and low risk perception group respectively. Daniel and Oladapo (2006) reported self-perception of no risk as an identified predictor of VCT uptake among pregnant women in Nigeria. This is not surprising because majority of pregnant women are married and/or in monogamous relationship and so tends to perceive themselves not to be at risk of HIV infection.

Marital status and HIV knowledge score of respondents were found not to be significantly associated with uptake of VCT. This is contrary to the report by Daniel and

Oladapo (2006) that being married is positively associated with volunteering for HIV testing. This report is however based on pregnant women presenting to the clinic for antenatal care and who understand the potential of HIV testing for reducing mother-to-child transmission, and believe that being married confers some level of protection. Only a percentage of respondents with good HIV knowledge (3.09%) had volunteered for HIV testing while none of those with poor knowledge had volunteered. This study also confirmed that even with good HIV knowledge, which should have been a driving force towards people ascertaining their HIV status and receiving counseling based on their status, VCT uptake is still low in Nigeria.

This study found age, sex, region, education, occupation, wealth status and self-perception of risk for HIV to be the critical predictors of uptake of voluntary counseling and testing (VCT) among youths in Nigeria (Table 3.5). There are slight differences in the predictors of VCT when stratified by sex (Appendix 3). Factors significantly predicting uptake of VCT in males in the multivariate analysis are age, region and occupation while that of females are region, education, wealth status and risk perception. Adewole and Lawoyin (2004) identified age (for males) while Iliyasu et al (2005) and Daniel and Oladapo (2006) identified education and risk perception respectively for females as factors influencing VCT uptake in Nigeria. None of the identified studies assessed uptake of voluntary HIV testing in both gender so that existing data about VCT in Nigeria is segregated by sex. Comparisons with this study, which assessed VCT in Nigeria in both gender, should therefore be carefully interpreted and applied in terms of programs implementations.

The Nigerian studies reported on other variables affecting VCT uptake but which are not discussed because they were not found in the dataset used. Some of those variables are stigma, experience of counseling, influence of partners, fear of discrimination and marriage security. This was identified as one of the limitations of this study in section 2.7. This study also lacked qualitative data to further probe specific responses of interest to the study and provide contextual insights into the findings.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSION

This study examined the regional prevalence, patterns and correlates of voluntary counseling and testing (VCT) for HIV among young people in Nigeria. Univariate, bivariate and multivariate analysis, stratified by region and sex, were done to explore these. Multivariate logistic regression was used to identify critical predictors of uptake of VCT among the study sample, and to show variations by region and sex. Critical predictors found in the study are age, sex, region, education, occupation, wealth status and risk perception. The predictors of VCT uptake in Nigeria varied in the northern and southern regions and by sex. The study supports the hypothesis that voluntary HIV testing is associated with region of residence and that socio-economic status, measured by wealth status, and gender differences affects uptake of voluntary HIV testing.

As expected, uptake of VCT increased with level of education. Those who were more educated were more likely to volunteer for HIV testing and shows that one of the effective ways to improve VCT uptake is to plan programs that increase literacy levels or at least, intensify campaigns on HIV prevention. These findings provide evidence and a basis for designing appropriate national programs in urban and rural areas and designed to meet the needs of male and female youths. Also, youths will benefit from mass HIV prevention campaigns to bridge information gap, proper training of health workers to become youth friendly and subsidized or free VCT services to improve access and utilization.

5.2 RECOMMENDATIONS

The findings of this study have implications for policy and planning, intervention programs and research. For policy and planning, the Presidential Council on AIDS (PCA) in Nigeria needs to enact policies that prioritize the response to HIV/AIDS control to that of prevention rather than the current emphasis on anti-retroviral therapy. This will be achieved by empowering state and local governments to conduct large-scale prevention programs and incorporate HIV prevention strategies into the educational curriculum, especially at the primary and secondary school levels. The current policy on Universal Basic Education for free education up to junior secondary is compulsory. Free and compulsory education until completion of senior secondary school will accelerate the rate of acquiring HIV related information, reduce unemployment and increase the wealth status of the youths; all of these contribute to better HIV prevention outcomes.

Designated VCT centers should be established in all government health facilities and by non-governmental organizations and trained staff deployed to manage them in order to provide more accessible, affordable and effective VCT services. This is irrespective of whether the centers are offering anti-retroviral treatment (ART) or no. Voluntary counseling and testing for HIV taking place in centers not offering ART will reduce stigma, offer more privacy and can serve as units of first contact in HIV prevention for young people. VCT providers should also be trained in counseling and skills in working with youths who may have peculiar problems, different from that of adults. Most HIV testing in Nigeria is presently not accompanied by detailed counseling because of lack of trained staff to do so. There is also a need to consider establishing and increasing the number of youth-friendly VCT services to provide privacy, confidentially and protect

young people seeking VCT form stigma and discrimination. Apart from including VCT awareness in school curricula, outreach activities to schools and youth organizations should be carried out routinely as a way of expanding programs on information, education and communication (IEC) on risk behaviors, safe sex practices and the importance of knowing ones HIV status.

In terms of research, this study revealed an important gap in research regarding uptake of VCT in Nigeria. It showed a very low uptake of VCT (2.6%) among young people in Nigeria, consistent in all the regions of the federation. There is need for a nationally representative primary study to determine regional correlates of VCT uptake in Nigeria, exploring all possible variables for young males and females. This should combine both qualitative and quantitative study designs to explore reasons and opinions on why young people are shying away from being voluntarily tested for HIV. The Ugandan HIV/AIDS control experience (Kilian, 2002) showed that even though about 70% of the youths were willing to be voluntarily tested for HIV, only 12% had been so testedThe result of such study can be used in the planning and implementation of programs to scale up VCT services and uptake, especially as the social context varies in the various geo-political zones. Further research should be carried out to find out why those who had multiple sexual partners were the least likely to have volunteered for VCT. Such study should explore such variables as age, sex, stigma, sex work and polygamy.

The regional differences in VCT uptake should also be explored, looking at the variations in the southern and northern regions. The study can independently assess whether the predictors of VCT uptake observed at the national level and in the different sex groups hold true for the various regions. This will shed more light on the different social, cultural

and religious factors that could influence VCT uptake and their impact on the lifestyles of the people.

Research will also be beneficial into the numbers of testing services for HIV that were accompanied by post and pre-test counseling and the quality of the counseling given. This will help in formulating policies and programs for effective VCT rollout, to effectively prevent the spread of HIV and improve access to treatment for infected individuals in Nigeria.

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APPENDIX 1

Percentage distributions of all respondents aged 15-24 by their sexual behavior, controlling for sex. (NDHS 2003)

VARIABLE	MALE		FEMALE		NATIONAL	
	Freq	%age	Freq	%age	Freq	%age
Age at sex debut						
Mean		16.84		16.36		16.48
SD		2.65		2.34		2.78
Observation		**365**		**1112**		**1477**
Sex partners						
None	789	92.61	1720	63.21	2509	70.2
1 or 2	61	7.28	71	2.61	133	3.7
3 or more	1	0.12	930	38.18	931	26.1
Total	**852**	**100**	**2721**	**100**	**3573**	**100**
Condom use						
Yes	126	39.50	1513	55.85		
No	193	60.50	1146	43.30	1339	44.2
Don't know	0	0.00	50	1.85	1639	54.1
Total	**319**	**100**	**2709**	**100**	50	1.7
					3028	**100**
HIV Knowledge						
Good	852	100	2024	96.06	2876	97.2
Poor	0	0.00	25	1.19	25	0.8
None	0	0.00	58	2.75	58	2.0
Total	**852**	**100**	**2105**	**100**	**2959**	**100**
Risk perception						
No risk	515	60.45	1871	61.46		
Low	23	2.70	49	1.80	2186	61.2
High	224	26.29	428	15.74	652	18.3
Don't know	90	10.50	571	21.00	72	2.0
Total	**852**	**100**	**2719**	**100**	661	18.5
					3571	**100**

APPENDIX 2

Explanatory variables associated with uptake of VCT among youths in Nigeria, controlling for sex. (NDHS 2003).

VARIABLE	Male			Female			Total		
	% Uptake of VCT			% Uptake of VCT			% Uptake of VCT		
	%	TOTAL	Chi^2 test (P value)	%	TOTAL	Chi^2 test (P value)	%	TOTAL	Chi^2 test (P value)
Age group:			**13.7**			**15.5**			**30.1**
15-19	1.90	421	**(0.000)**	0.98	1426	**(0.000)**	1.19	1847	**(0.000)**
20-24	7.19	431		3.09	1295		4.11	1726	
Total	**4.58**	**852**		**1.98**	**2721**		**2.60**	**3573**	
Sex									**17.2**
Male	-	-	-	-	-	-	4.58	852	**(0.000)**
Female							1.98	2721	
Total							**2.60**	**3573**	
Region			**10.6**			**28.8**			**23.9**
North Central	6.96	158	**(0.060)**	1.56	448	**(0.000)**	2.97	606	**(0.000)**
North East	7.02	114		0.25	403		1.74	517	
North West	1.49	202		0.48	619		0.73	821	
South East	7.14	112		4.02	448		4.64	560	
South South	3.42	117		3.33	390		3.35	507	
South West	3.36	149		2.91	413		3.02	562	
Total	**4.58**	**852**		**1.98**	**2721**		**2.60**	**3573**	
Residence			**1.5**			**16.89**			**16.6**
Urban	5.53	398	**(0.000)**	3.25	1167	**(0.000)**	3.83	1,567	**(0.000)**
Rural	3.74	454		1.03	1552		1.65	2,006	
Total	**4.58**	**852**		**1.98**	**2667**		**2.60**	**3,573**	
Education			**19.2**			**54.0**			**72.7**
None or Primary	3.05	262	**(0.000)**	0.43	1175	**(0.000)**	0.90	1437	**(0.000)**
Secondary	4.11	535		2.57	1400		3.00	1935	
Higher	16.4	55		8.90	146		10.9	201	
Total	**4.58**	**852**		**1.98**	**2721**		**2.60**	**3573**	
Occupation			**17.0**						**14.4**
Not working	4.06	493	**(0.02)**	0.00	0		4.06	493	**(0.045)**
Prof./Tech./Mgt.	25.0	16		1.98	2721		2.12	2737	
Skilled	0	168		0.00	0	-	4.16	168	
Unskilled	4.17	37		0.00	0		8.11	37	
Agric.	8.11	138		0.00	0		3.62	138	
Total	**4.58**	**852**		**1.98**	**2721**		**2.60**	**3573**	
Wealth index			**5.7**			**24.0**			**25.6**
Lower	2.19	274	**(0.059)**	0.75	805	**(0.000)**	1.11	1079	**(0.000)**
Middle	4.85	165		0.67	596		1.58	761	
Upper	6.05	413		3.33	1320		3.98	1733	
Total	**4.58**	**852**		**1.98**	**2721**		**2.60**	**3573**	
Religion			**3.7**			**17.7**			**18.9**
Christian	5.82	464	**(0.295)**	2.96	1552	**(0.000)**	3.62	2016	**(0.000)**
Islam	3.13	383		0.69	1155		1.30	1538	
Traditional	0.00	4		0.00	9		0.00	13	
Other	0.00	1		0.00	1		0.00	2	
Total	**4.58**	**852**		**1.99**	**2717**		**2.61**	**3569**	
Marital status			**0.5**			**0.8**			**2.42**
Not married	4.56	789	**(0.786)**	2.04	1568	**(0.683)**	2.89	2357	**(0.299)**
Living together	5.45	55		1.83	1094		2.00	1149	
Not together	0.00	8		3.39	59		2.99	67	
Total	**4.58**	**852**		**1.98**	**2721**		**2.60**	**3573**	

Sex partners			**0.06**			**24.3**			**13.5**
None	4.56	789	**(0.971)**	1.57	1720	**(0.000)**	2.51	2509	**(0.001)**
1 or 2	4.84	62		9.86	71		7.52	133	
3 or more	0.00	1		2.15	930		2.15	931	
Total	**4.58**	**852**		**1.98**	**2721**		**2.60**	**3573**	
Condom use			**3.83**			**18.29**			**12.73**
Yes	13.5	126	**(0.066)**	2.91	1513	**(0.000)**	3.72	1639	**(0.000)**
No	7.25	193		0.61	1146		1.57	1339	
Total	**9.72**	**319**		**1.92**	**2719**		**2.75**	**3028**	
HIV Knowledge						**2.1**			**2.7**
						(0.350)			**(0.266)**
Good	4.58	852	-	2.47	2024		3.09	2876	
Poor	0.00	0		0.00	25		0.00	25	
None	0.00	0		0.00	58		0.00	58	
Total	**4.58**	**852**		**2.37**	**2107**		**3.01**	**2959**	
Risk perception			**9.3**			**10.3**			**19.4**
	4.08	515	**(0.026)**	2.51	1671	**(0.016)**	2.88	2186	**(0.000)**
No risk	4.35	23		2.04	49		2.78	652	
Low	7.59	224		2.10	428		3.99	72	
High	0.00	90		0.35	571		0.30	661	
Don't know	**4.58**	**852**		**1.99**	**2719**		**2.60**	**3571**	
Total									
Age at sexual debut	**OR = 0.01 P>|z|=0.948** **95%CI= -0.14 - 0.13** **Observations = 365**			**OR = 0.18 P>|z|=0.005** **95%CI=0.06-0.31** **Observations = 1112**			**OR = 0.12 P>|z|=0.018** **95%CI =0.02 - 0.21** **Observations = 1477**		

APPENDIX 3

Critical factors influencing the uptake of voluntary counseling and testing for HIV among youths in Nigeria, controlling for sex. (NDHS 2003)

	MALE			FEMALE		
VARIABLE	**Adjusted Odds Ratio**	**P>|z|**	**95% CI**	**Adjusted Odds Ratios (AOR)**	**P>|z|**	**95% CI**
Age	1.38	0.007	1.186 – 1.607	-	-	-
Region						
North Central	1			1		
North East**	1.24	0.679	0.455 – 3.358	0.08	0.029	0.008 – 0.767
North West**	0.22	0.025	0.057 – 0.827	0.06	0.007	0.008 – 0.459
South East**	1.18	0.746	0.438 – 3.163	0.15	0.118	0.014 – 1.623
South South**	0.45	0.199	0.135 – 1.516	0.04	0.052	0.001 – 1.024
South West**	0.43	0.146	0.141 – 1.338	0.01	0.024	0.001 – 0.529
Occupation						
Not working**	1					
Prof./Tech./Mgt.	4.23	0.028	1.172 – 15.283			
Skilled	0.57	0.237	0.222 – 1.451	-	-	-
Unskilled	1.36	0.651	0.359 – 5.145			
Agriculture**	0.76	0.615	0.256 – 2.238			
Education						
None or Primary				1		
Secondary**	-	-	-	2.24	0.114	0823 – 6.107
Higher**				7.66	0.000	2.482 – 23.657
Wealth index						
Lower				1		
Middle	-	-	-	0.63	0.481	0.174 - 2.276
Upper **				2.34	0.065	0.950 - 5.771
Risk perception						
No risk				I		
Low	-	-	-	0.28	0.282	0.028 – 2.820
High**				0.13	0.064	0.016 – 1.127
Don't know**				0.05	0.005	0.0001 – 0.209
Observations	762			2719		
LR chi2	49.39			82.70		
Prob>chi2	0.0001			0.0000		
Log likelihood	-129.21035			-223.78979		
PseudoR2	0.1605			0.1560		
Goodness of fit test						
Pearson chi2	97.81			115.20		
Prob>chi2	0.0605			0.9453		

APPENDIX 4



Map of Nigeria showing the six (6) regions and neighboring West African countries
Insert: Nigeria in the map of Africa (NPC, 2004)