

# Determinants of HIV Infection in Nigeria: A synthesis of the literature

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## Abstract

**Background:** Nigeria has an estimated 3.5 million HIV positive individuals, ranking third worldwide. This study analyzed the determinants of HIV infection to improve HIV programming in Nigeria and developing countries.

**Methodology:** The methodology used was a literature review of grey and electronic databases of reviewed journals, and application of Dahlgren and Whitehead (1991) determinants of health model. A total of 45 publications (21 reports and 24 articles were reviewed).

**Results:** New infections are emerging at increasing rates among individuals engaging in sexual relationships such as men having sex with men (MSM) and female sex work (FSW). The level of political commitment to HIV control is extremely low: currently, the government of Nigeria provides less than 10 percent of the funding for HIV control efforts in Nigeria, the rest coming from foreign sources and private sectors. Political, work environment, gender, healthcare service and lifestyle determinants are predominant over others.

**Conclusion:** HIV control in Nigeria is financially over-dependent on foreign interventions. Political actions are required to address sexual orientations. Most-at-risk populations require education, legal requirements, and healthcare services in order to minimize new infection.

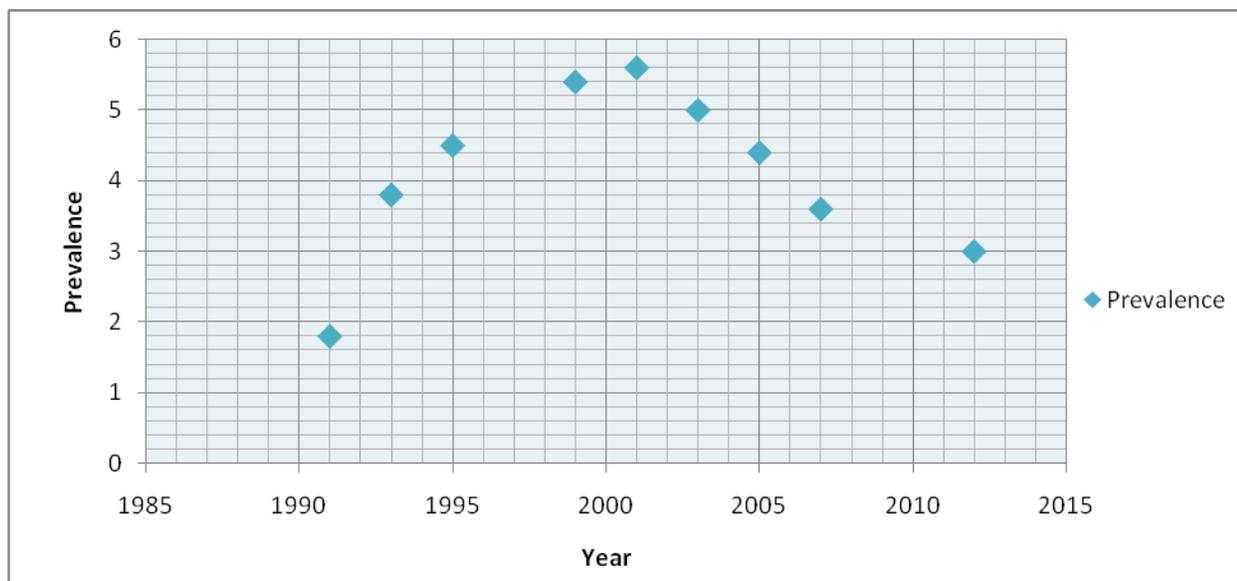
**Keyword:** HIV, Infection, Determinant, Dahlgren and Whitehead

## INTRODUCTION:

The human immunodeficiency virus (HIV) is a retrovirus that infects cells of the immune system, destroying their function. Sub-Saharan Africa continues to bear a disproportionate share of the global HIV burden. In mid-2010, about 68 percent of all people living with HIV resided in sub-Saharan Africa, a region with only 12 percent of the global populations (UNAIDS 2011).

It was estimated that 3.5 million people are living with HIV (PLWHIV) in Nigeria in 2012, ranking the country third among countries with the highest burden of HIV infection in the world after India and South Africa (NARHS 2012). Figure 1 shows Nigerian sero-prevalence rates during the period from 1991 to 2012. National prevalence is gradually declining according to NARHS, which measured a 3 percent

prevalence in its 2012 survey as against 3.6 percent in 2007. NARHS 2012 also provided information for several demographics as follows. Urban prevalence was 3.2 percent, compared with 3.6 percent for rural areas. Among Nigeria's six geopolitical zones, South South had the highest prevalence at 6.3 percent, while South East had the lowest at 1.3 percent. The age groups with highest and lowest prevalence were 35-39 (3.6 percent) and 15-19, 40-44 and 45-49 (2.7 percent), respectively. There was no significant difference between female (3.4 percent) and male (3.3 percent) prevalence.



**Figure 1 Trends in national HIV sero-prevalence rate, Nigeria, 1991-2012 (Source: NACA, 2009).**

There has been a shift from viewing HIV risk as predominantly an individual behavior to viewing it as impacted by social, economic, political, and/or cultural determinants (Weine and Kashuba, 2012). Several social and economic factors have been shown to have significant impact on prevalence. According to NARHS (2012), prevalence was higher (3.0 percent and above) among people with primary and higher education compared with people who had no formal education (2.5 percent) or among Qur'anic (2.4 percent). Similarly, out of five wealth categories a prevalence of about 3.6 percent was recorded in the two wealthiest categories as compared to 2.9 percent for the poorest. NDHS 2008 reveals that respondents with highest wealth quintile had highest comprehensive knowledge that condom use will protect against HIV and that HIV-negative faithful partner can reduce chances of getting the AIDS virus. However, risky sexual practices are higher among men and women in the highest wealth quintile. By marital status, widows had the highest prevalence (6.2 percent).

A number of studies have focused on special subpopulations. According to IBBSS (2010), HIV prevalence was highest among brothel-based female sex workers (BBFSW) (27.4 percent), followed by 21.7 percent and 17.2 percent among non-brothel-based female sex workers and men who have sex with men (MSM), respectively. Other subpopulations include: injecting drug users (IDU) (less than 5 percent), transport workers (2.4 percent), military (2.5 percent) and police (2.6 percent). According to Muhammad et al (2010) among male prison inmates the age groups with highest and lowest prevalence were 10-20 (7.1 percent) and 41-50 years (4.0 percent), respectively.

The leading route of HIV transmission in Nigeria is heterosexual intercourse, accounting for over 80 percent of new infections, followed by mother-to-child transmission. Of new adult infections, 38 percent can be attributed to IDU, MSM and BBFSW (who may get infected by their partners), which constitute 3.5

percent of the adult population (FMOH, 2010 and NSP 2010-2015). Additionally, IDU and MSM are growing in importance (NSP 2010-2015).

Some studies have focused on the social and economic impacts resulting from high HIV infection rates. A study conducted by Riskey, Drake & Pundy (2012) revealed an estimated 340,940 Nigerian teachers living with HIV, which negatively impacts the quality of education since PLWHIV experience increased illness and absenteeism from work (FHI, 2004). A study conducted by Canning et al (2006) details the serious economic challenges that HIV-affected households in Nigeria are likely to face compared to their HIV-negative counterparts. These include the likelihood of substantial income losses, increased burden of care-giving, as well as higher out-of-pocket health care spending.

The need to study the determinants of HIV infection in Nigeria arose due to the spread of the virus particularly through marginalized social groups such as IDU, MSM, and FSW.

**Objective:**

To analyze the determinants of HIV infection in Nigeria using Dahlgren and Whitehead’s model of determinant of health; based on review of journal articles published between 2000 and 2015.

**METHODOLOGY:**

A literature review of relevant material on HIV and determinants of health was conducted. PubMed (Medline), Google Scholar, and e-Library were the search engines used. The search strategy paired the search term “nigeria hiv infection” with various search terms related to the different factors indicated by Dahlgren and Whitehead’s model. A comprehensive list of the search terms used is given in the Appendix. Reference sections of reviewed literature were also examined to identify additional sources.

Nine country-specific reports on HIV were reviewed: NDHS 2008, NSF 2010-2015, IBBSS 2008 and 2010, NARHS Plus 2007 and NARHS Plus II 2012, NACA report, UNAIDS, and PEPFAR (see “References” section for complete citations). Cited articles were searched for references to additional studies, and priority was given to primary source articles. A total of 45 publications were reviewed, including the nine reports listed above.

**Delimiter:** 2000 – 2015 English language journal articles, books and report were examined. **Reason:** within the chosen year range there were substantial and related materials

Determinants identified were analyzed according to Dahlgren and Whitehead’s model of determinants of health, depicted in Figure 2 below. Not all of these determinants were investigated, due to non-availability of relevant articles.

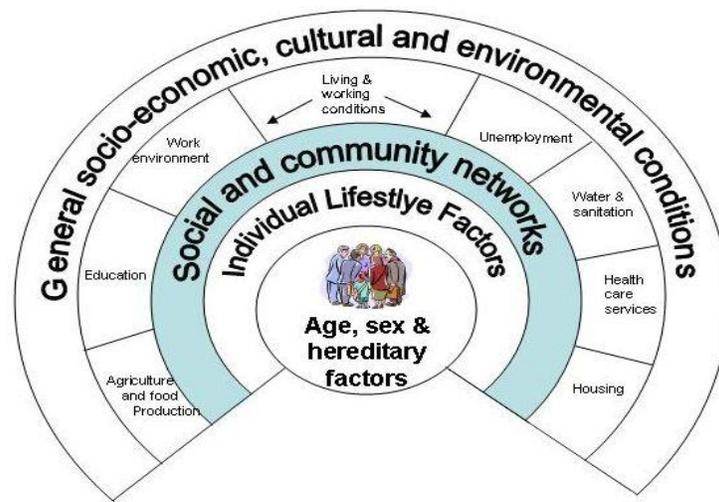


Figure 2: Dahlgren and Whitehead's model of determinants of health (from [www.healthknowledge.org.uk](http://www.healthknowledge.org.uk))

## RESULTS

### Political

The National Agency for the Control of AIDS (NACA) is at the apex of linked government institutions in the multisectoral HIV/AIDS response architecture; it is mandated to provide overall coordination of the national response. However, the financial commitment from the Nigerian government has been low, and funding is externally dependent. In 2007 and 2008, 85.4 percent and 92.3 percent (respectively) of funding for HIV/AIDS activities in Nigeria came from international organizations (FGN, 2013).

At the state and local government levels, there are critical shortfalls in managerial capacity. Political interference in coordination structure distorts relationships and linkages of institutions at several levels (NACA, 2005). Examples of adverse political influence include the overconcentration of HIV prevention efforts in urban communities, as against rural where knowledge is grossly inadequate; and the inadequate level of programme implementation focusing on youth categories such as in-school, out-of-school and students at higher learning institutions (NACA, 2009).

Little progress has been made on the implementation of National HIV/AIDS policy which also includes HIV/AIDS workplace policy. This encompasses rights of employees particularly PLWHIV and their families, such as issues of confidentiality, healthcare, testing, benefits and discrimination due to stigma (FGN, 2009). Gender inequities in HIV programming (PEPFAR operation plan report, 2012) are not surprising, given the gender inequity that is prevalent in Nigerian public service.

### Socioeconomic

Even with subsidies and free healthcare services such as HIV counseling and testing, antiretroviral therapy and care from support groups, direct and indirect annual per capita income losses from ill health for PLWHIV were estimated at 21,589 naira (U.S. \$116), as compared to 3,853 naira (\$21) for HIV negative individuals (Mahal et al 2004). Similarly, the annual hospitalization rate is 27.04 percent for PLWHIV as against 4.44 percent for HIV negative persons. Frequency of illness in PLWHIV is 4 times higher than for HIV negative persons. Annual estimated healthcare expense for PLWHIV is 10,729 Naira (\$58) per capita;

versus 1,329 Naira (\$7) for HIV negative persons (Mahal et al 2004). Inability of infected persons to meet socioeconomic demands in Nigeria contributes to the spread of the infection.

### **Cultural practice**

Female genital cutting (FGC) includes procedures that intentionally alter or cause injury to the female organs for non-medical reasons (WHO, 2013). Findings from NARHS 2005 shows that female genital cutting is more prevalent in the southern part of Nigeria than the northern part, with South West and South East each recording over fifty percent of the females circumcised (see Table 5 in the Appendix). According to UNICEF 2010, FGC in Nigeria is often carried out by traditional birth attendants using unsanitary knives and other sharp instrument in an unhygienic conditions which could transmit HIV. In addition, Monjok, Essien & Laurens (2007) illustrated how FGC increases risk of HIV infection.

Similarly, a study conducted by Ugwu (2009) describes harmful traditional practices such as polygamy and wife inheritance, facial marking/tattooing (the use of contaminated instrument increases risk of infection) and ghost marriage (in which a deceased husband's relative steps in as sexual partner for the widow). Women due to culture or gender inequalities could not negotiate condom use with their husbands or sex partners- this fact should be interpreted in light of findings from NARHS Plus II 2012 that HIV infection is significantly higher (5 percent) among respondents that reported not using condoms. The practice of sex in exchange for gifts also promotes higher risk of HIV infection: the risk was more pronounced for males in rural areas, and for females in urban areas (NARHS Plus II 2012).

### **Work environment**

Work environment including brothels constitute one of the highest environmental risks for HIV infection. A study on condom use rate in brothels in Nigeria conducted by Anyanti et al (2004) reveals that only 57 percent of BBFSW used condoms consistently with all clients. Adherence to condom use depended on the level of intimacy with the sex partner, and the amount paid by the client for sex.

According to Aisien and Shobowale (2005), exposures of healthcare workers to blood-borne pathogens including HIV persist due to manipulative use of needles from strings; only 20.2 percent use 'hand-free' technique for disposing of instruments during surgical procedures.

A study on HIV infection by Azuonwu and Obire (2011) conducted among patients at the Nigeria army hospital, Air force clinic and Police clinic in the Niger Delta of Nigeria shows that HIV prevalence was highest among Air Force personnel (20 percent) while Army and Police were 12 percent respectively. The study also showed slightly higher HIV prevalence amongst female (16.7 percent) than male (14.3 percent) counterparts, although the difference was not statistically significant.

Aniebue and Aniebue (2011) reported that HIV screening is still low amongst Nigerian long distance truck drivers (LDTD), despite their high-risk sexual conduct. Also, Sunmola (2010), shows that only 32.3 percent of LDTD reported ever used a condom in sexual relationships.

### **Education**

NDHS 2008 shows that among women and men of age 15-49, those with higher education engaged in higher levels of high-risk sexual behavior in the previous year. NARHS Plus II 2012 shows a similar correlation between higher education and higher HIV prevalence. Therefore, acquired knowledge does not inhibit infection, but right application of knowledge gained.

## **Unemployment**

According to Agaba et al 2014, among socio demographic, risk and biological parameters of HIV patients who present themselves for care and treatment, unemployment status ranked one of the highest in late presentation (84.3 percent) and in advanced HIV disease (61.4 percent). Unemployment (34 percent) was also identified as one of key demographic factors that influence spread of the infection (Desilva et al 2008).

## **Health care service**

BBSW and MSM constitute key most at-risk populations (MARPs) in the spread of HIV infection in Nigeria (IBBSS 2010). MSM behavior is seen as a taboo in Nigeria, and is prohibited by law (Allman et al 2007). Therefore, in health services there is stigmatization, and there is also self-stigma by MSM themselves and therefore less use of health care.

One author's (Awoloye J.O.) experience as a research coordinator for Global Fund Round 5's HIV counseling and testing (HCT) component confirms that HCT is the entry point for client's knowledge of HIV status which invariably leads to treatment for positive patients. But because of stigmatization and discrimination, HCT service points at health centers are shunned by many that might benefit. The poor thus go without testing, while the rich travel abroad for testing and treatment that they could obtain in Nigeria. A study by Reis C, et al (2005) reveals that health professionals display discriminatory attitudes and unethical behaviour towards patients with HIV, including denial of care and breach of confidentiality. Faced with these possible consequences, people prefer to remain untested, thereby increasing the infection rate.

In Nigeria, traditional birth attendants (TBA) play a significant role in the delivery of babies. However, over 22 percent of TBAs proffer unprofessional methods for prevention of mother to child transmission (MTCT) while only 34.3 percent show interest in knowing HIV status of their pregnant patient (Balogun and Odeyemi 2010).

## **Social Network**

NACA 2005 indicates that some of the critical indicators of the social determinant of the epidemic are: stigmatization of and discrimination against people living with HIV (PLWHIV). Also, a study conducted by Obi, Ifebunandu & Onyebuchi (2010) shows that the HIV-positive group had more divorced/separated and widowed/widower individuals than the HIV-negative group. As a result of these, PLWHIV will not want to disclose their status, thereby increasing the possibility of infection.

## **Sex and Gender**

In Nigeria, gender roles are in every sector which increases or reduces chances of HIV infection. Particularly, women are vulnerable to the infection because of factors relating to their procreation and most often subordinate position in society. They typically lack equal access to education, health, training, independent income, property and legal rights which have serious implications for their right to access to knowledge on HIV/AIDS. These measures can be taken to prevent transmission of the HIV infection, as well as their ability to protect themselves (NSF 2010-2015).

One author's (Awoleye J.O.) experience in HIV counseling and testing (HCT) research shows that women are motivated to undertake HCT before delivery, due to their concern for their babies. This observation supports the FMOH 2006 report that the results of periodic national surveys among ante-natal clinic attendees show a progressive increase in the adult HIV sero-prevalence rate. Similarly, a study by Akhigbe, Bamidele & Abodunrin (2010) illustrates that there is a marginal gender preference in the prevalence of HIV seen in females due to a higher number of the gender utilizing the HIV counseling and testing (HCT) service.

A qualitative study conducted by Mbonu, Borne & Vries documents significant differences in attitudes towards HIV-positive individuals based on the infected person's sex. Typically HIV-positive women are blamed and labeled as "flirts"; while HIV-positive men are excused, and their infection is attributed to nonsexual causes such as a haircut (Mbonu, Borne & Vries, 2010: 6).

NARHS Plus II 2012 shows that among women with symptoms of STI (including HIV) 15.8 percent have never married, as compared to 6.4 percent for their male counterparts. This can be attributed to inadequate knowledge of STIs among women as compared to men, as well as the vulnerability (eg. procreation) of women (NARHS Plus II 2012).

Male circumcision (MC) has been practiced for centuries. In resource-poor settings, most circumcisions are still done outside the formal health sector as a rite of passage into adulthood or as a religious observance (WHO report 2006). A study conducted by Illiyasu et al (2012) reveals that 368 of 375 respondents reported being circumcised. The majority (97.8 percent) favour continuation of the practice, while approximately 73 percent of the respondents agreed that circumcised men still need to employ condoms during sex for protection against STIs, including HIV. A total of 22.1 percent respondents pointed out problems associated with the availability and the standardization of circumcision services at health facilities, which explains widespread reliance on traditional circumcisers (see Table 3 in the Appendix).

### **Individual lifestyle**

Sexual habits are decisive determinants of the risk of HIV infection. According to IBBSS Nigeria (2010), the HIV prevalence among MSM is 17.2 percent. Ankomah et al (2013) reported that in Nigeria, as in many other countries where HIV is transmitted mostly through heterosexual activities, the risk of transmission of HIV is largely determined by sex outside stable relationships. For individuals engaging in such practices, the risk is heightened when no protection is used. Thus the authors concur with Ankomah A. et al (2013) that promotion of condom use for those engaging in higher-risk sexual activities should therefore be a major preventive strategy (see appendix for Tables 1 & 2).

### **CONCLUSION/DISCUSSION**

The result of analysis identified political, work environment, gender, healthcare service and lifestyle determinants as predominant over others. In Nigeria, there are HIV control political structures at all Government levels (Local, State, and Federal) established to model identified determinants of health through comprehensive HIV control programmes including behavioral change communications and healthcare services. However, effectiveness has been limited due to political interference and inadequate political will as evidenced by underfunding by the government.

Determinant such as health care service for MARP are limited due to stigma, discrimination and recent prohibition of MSM in Nigeria. Despite the legal status of MSM, its continued presence within society is documented by research (IBBSS), and should not be ignored. This appeared like a contradiction as they have network and meeting place. . MSM also contributes to HIV prevalence among heterosexuals, due to bisexual behavior.

Infection through work environment would have been minimized with adherence by employers to a national HIV workplace policy. Unfortunately some employers especially in the private sector ignored the policy such that they carry out mandatory pre-employment and employment HIV testing. Also, FSW either brothel-based or non-brothel is not considered as work due to associated stigma and they contribute to infection in Nigeria.

The promotion of condom use is one strategy that could significantly decrease infection rates. No research was found on the use of female condoms, but awareness and utilization are limited in Nigeria.

Finally, the study reveals that attention needs to be paid to predominant determinants as identified above. More political actions are required including financial commitment from each level of Government to empower coordinating agencies. To prevent MTCT of HIV at health facilities and TBAs, multi-stakeholder approaches are required.

### **Limitations**

Dahlgren and Whitehead's determinant of health model was helpful in suggesting possible determinants of infection. However, not all of these factors were used due to non-availability of related articles. Furthermore, this study is restricted to factors designated in the model, and does not consider the possibility of other factors.

### **Contributions**

OJA conducted journal article and report collections and drafted the initial manuscript. CT contributed to sourcing of journals and review of article. And International course in health development of the Royal Tropical Institute Amsterdam, The Netherlands approved the model for analysis.

### **Conflict of interest**

The author declares no conflict of interest

### **ACKNOWLEDGEMENT**

This study was supervised by the International course in health development of the Royal Tropical Institute, Amsterdam, The Netherlands. And National Agency for the Control of AIDS (NACA) in Nigeria made available national reports for the study.

## APPENDIX

### Search strategies used for PubMed (Medline)

#### Key words: 1) nigeria hiv infection AND gender norms

((("nigeria"[MeSH Terms] OR "nigeria"[All Fields]) AND ("hiv infections"[MeSH Terms] OR ("hiv"[All Fields] AND "infections"[All Fields]) OR "hiv infections"[All Fields] OR ("hiv"[All Fields] AND "infection"[All Fields]) OR "hiv infection"[All Fields])) AND (("sex"[MeSH Terms] OR "sex"[All Fields] OR "gender"[All Fields] OR "gender identity"[MeSH Terms] OR ("gender"[All Fields] AND "identity"[All Fields]) OR "gender identity"[All Fields]) AND norms[All Fields]) AND ("2003/10/07"[PDat] : "2013/10/03"[PDat])).

#### 2) nigeria hiv infection AND age factor

("nigeria"[MeSH Terms] OR "nigeria"[All Fields]) AND ("hiv infections"[MeSH Terms] OR ("hiv"[All Fields] AND "infections"[All Fields]) OR "hiv infections"[All Fields] OR ("hiv"[All Fields] AND "infection"[All Fields]) OR "hiv infection"[All Fields])) AND ("age factors"[MeSH Terms] OR ("age"[All Fields] AND "factors"[All Fields]) OR "age factors"[All Fields] OR ("age"[All Fields] AND "factor"[All Fields]) OR "age factor"[All Fields]) AND ("2000/01/01"[PDAT] : "2013/12/31"[PDAT])).

#### 3) nigeria hiv infection AND (social support or social network)

((("nigeria"[MeSH Terms] OR "nigeria"[All Fields]) AND ("hiv infections"[MeSH Terms] OR ("hiv"[All Fields] AND "infections"[All Fields]) OR "hiv infections"[All Fields] OR ("hiv"[All Fields] AND "infection"[All Fields]) OR "hiv infection"[All Fields])) AND ("social support"[MeSH Terms] OR ("social"[All Fields] AND "support"[All Fields]) OR "social support"[All Fields] OR ("social"[All Fields] AND "network"[All Fields]) OR "social network"[All Fields]))

#### 4) nigeria hiv infection AND education

((("nigeria"[MeSH Terms] OR "nigeria"[All Fields]) AND ("hiv infections"[MeSH Terms] OR ("hiv"[All Fields] AND "infections"[All Fields]) OR "hiv infections"[All Fields] OR ("hiv"[All Fields] AND "infection"[All Fields]) OR "hiv infection"[All Fields])) AND ("education"[Subheading] OR "education"[All Fields] OR "educational status"[MeSH Terms] OR ("educational"[All Fields] AND "status"[All Fields]) OR "educational status"[All Fields] OR "education"[All Fields] OR "education"[MeSH Terms]))

#### 5) nigeria hiv infection AND socioeconomic

((("nigeria"[MeSH Terms] OR "nigeria"[All Fields]) AND ("hiv infections"[MeSH Terms] OR ("hiv"[All Fields] AND "infections"[All Fields]) OR "hiv infections"[All Fields] OR ("hiv"[All Fields] AND "infection"[All Fields]) OR "hiv infection"[All Fields])) AND socioeconomic[All Fields])

#### 6) nigeria hiv infection AND politics

("hiv"[MeSH Terms] OR "hiv"[All Fields]) AND ("nigeria"[MeSH Terms] OR "nigeria"[All Fields]) AND ("politics"[MeSH Terms] OR "politics"[All Fields])

#### 7) nigeria hiv infection AND government

("hiv"[MeSH Terms] OR "hiv"[All Fields]) AND ("nigeria"[MeSH Terms] OR "nigeria"[All Fields]) AND ("government"[MeSH Terms] OR "government"[All Fields])

## List of Tables

Table 1 (Ankomah A. et al 2013)

Demographic characteristics of men who engage in extramarital relationships		
Variables	Frequency n = 642	Percentage
Age of respondents (years)		
15–19	16	2.5
20–24	59	9.2
25–34	254	39.6
35–49	261	40.7
50–64	52	8.1
Condom use during last extramarital sex		
Did not use condom	345	53.7
Used condom	297	46.3
Education level		
No formal education	52	8.1
Primary	203	31.6
Secondary and higher	387	60.3
Religion		
Islam	191	29.8
Christianity	424	66
Traditional/others	27	4.2
Ethnicity		
Hausa	46	7.2
Igbo	62	9.7
Yoruba	191	29.8
Others	343	53.4
Residence		
Rural	398	62
Urban	244	38
Multiple nonspousal sex		

No	317	58.4
Yes: have sex with nonspouse	325	41.6
Sex in exchange for gift		
Never had sex for gift	479	74.6
Have had sex for gift	163	25.4
Alcohol consumption		
Every day	89	13.9
Once a week or less	267	41.6
Others	286	44.5
Away from home for more than 1 month in the last 12 months		
No	370	57.6
Yes	272	42.4
Do you agree or disagree that condoms are easy to obtain?		
Disagree	123	19.2
Agree	519	80.8

(Ankomah A. et al 2013)

Table 2 (Ankomah A. et al 2013)

Bivariate analysis of condom use in extramarital sex				
	Condom use in extramarital sex (%)		Total	P-value from $\chi^2$
	Used condom	Did not use		
Variables				
Respondents' age (years)				0.187
15–19	56.3	43.7	16	
20–24	45.8	54.2	59	
25–34	48.4	51.6	254	
35–49	46.7	53.3	261	

50–64	30.8	69.2	52	
Education				<0.0001
No formal education	23.1	76.9	52	
Below secondary	36.9	63.1	203	
Secondary and higher	54.3	45.7	387	
Locality				<0.0001
Rural	39.4	60.6	398	
Urban	57.4	42.6	244	
Religion				0.813
Islam	44.5	55.5	191	
Christian (Catholic and Protestant)	47.2	52.8	424	
Others	44.4	55.6	27	
Ethnicity				0.03
Hausa	39.1	60.9	46	
Igbo	46.8	53.2	62	
Yoruba	55	45	191	
Others	42.3	57.7	343	
Alcohol intake				0.484
Every day	43.8	56.2	89	
Sometimes	49.1	50.9	267	
Never	44.4	55.6	286	55.6
Away from home for more than 1 month in the last 12 months				0.037
Yes	42.7	57.3	370	
No	51.1	48.9	272	
Motivation variables				
Self-assessment/appraisal of contracting HIV				0.513
High risk	41	59	39	
Others	46.6	53.4	603	

Condom protects against STI/HIV and prevents unwanted pregnancy				<0.0001
Agreed	51.2	48.8	541	
Disagreed	19.8	80.2	101	
Are you embarrassed to buy condoms?				<0.0001
Not embarrassed	52.1	47.9	401	
Embarrassed	36.5	63.5	241	
Misconception about HIV transmission				0.004
Yes	40.8	59.2	338	
No	52.3	47.7	304	
Opportunity variables				
Condom affordability				<0.0001
Agreed	53.2	46.8	536	
Disagreed	11.3	88.7	106	
Condoms easy to obtain				<0.0001
Agreed	52.6	47.4	519	
Disagreed	19.5	80.5	123	
Know how to wear a condom?				<0.0001
Yes	62.7	37.3	445	
No	9.1	90.9	197	
Ability variables				
Know someone who died of AIDS				0.108
Yes	51.7	48.3	172	
No	44.3	55.7	470	
Know that AIDS has no cure				0.012
Yes	48.6	51.4	529	
No	35.4	64.6	113	
Know that healthy-looking persons can be HIV-positive				<0.0001

Yes	50.8	49.2	510	
No	28.8	71.2	132	
UNAIDS				
Condom use and remain with one uninfected partner				<0.0001
Yes	51.9	48.1	503	
No	25.9	74.1	139	
Discussed condom with partner?				<0.0001
Yes	69	31	381	
No	13	87	261	
Can convince partner to use condom?				<0.0001
Yes	60.7	39.3	460	
No	9.9	90.1	182	
Abbreviations: AIDS, acquired immunodeficiency syndrome; HIV, Human Immunodeficiency Virus infection; STI, sexually transmitted infection.				

(Ankomah A. et al 2013)

**Table 3.** Prevalence of Male Circumcision by Sociodemographic Characteristics, 2011

Characteristics	Male circumcision; n (%)		Total	$\chi^2$ P value
	Yes	No		
<b>Age-group (years)</b>				
<20	34 (97.1)	1 (2.9)	35 (100.0)	.26 <sup>a</sup>
20-29	99 (97.1)	3 (2.9)	102 (100.0)	
30-39	158 (98.1)	3 (1.9)	161 (100.0)	
≥40	77 (100.0)	—	77 (100.0)	
Total	368 (98.1)	7 (1.9)	375 (100.0)	
<b>Religion</b>				
Muslim	330 (98.2)	6 (1.8)	336 (100.0)	.73
Christian	38 (97.4)	1 (2.6)	39 (100.0)	
Total	368 (98.1)	7 (1.9)	375 (100.0)	
<b>Ethnicity</b>				
Hausa	228 (98.3)	4 (1.7)	232 (100.0)	.62 <sup>a</sup>
Fulani	70 (98.6)	1 (1.4)	71 (100.0)	
Yoruba	25 (98.2)	1 (3.8)	26 (100.0)	
Igbo	11 (100.0)	—	11 (100.0)	
Others	34 (97.1)	1 (2.9)	35 (100.0)	
Total	368 (98.1)	7 (1.9)	375 (100.0)	
<b>Marital status</b>				
Single	354 (98.1)	7 (1.9)	361 (100.0)	
Ever married	14 (100.0)	—	14 (100.0)	
Total	368 (98.1)	7 (1.9)	375 (100.0)	

a. Fisher exact after converting to 2 × 2 tables. Age-groups were recategorized into <30 and ≥30 years while Hausa and Fulani were merged. Other Nigerian tribes were also placed in one category.

Illiyasu Z et al (2012)

**Table 5: Knowledge and Prevalence of FGM**

Zone	Percentage of women who heard of FGM	Percentage of women circumcised	Types of circumcision		
			Type 1	Type 2	Type 3
North Central	36.0	9.6	1.2	64.6	2.5
North East	40.1	1.3	-	-	-
North West	25.1	0.4	-	-	-
South East	87.1	40.8	0.3	12.2	2.7
South south	82.5	34.7	3.0	66.0	7.5
South West	85.7	56.9	2.2	36.3	1.3

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