

# Who is more willing to Test for HIV? A Comparison of Community and School-Based Youth in Port Harcourt, Southern Nigeria

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## Abstract

**Introduction:** Young people bear a significant HIV/AIDS burden worldwide. Yet most do not know their HIV status or voluntarily test for HIV. This study compared willingness to test for HIV between community and school-based youth aged 10-24 years in Port Harcourt, south-south Nigeria, and the influence of selected socio-demographic and HIV/AIDS-related factors.

**Methods:** A comparative cross-sectional study was conducted in March 2006 in *Azubie*, a peri-urban community, and the College of Arts and Science in Port Harcourt. Multi-staged sampling was conducted; data was collected using pre-tested, structured questionnaires, analysed using Epi-Info v6.04d.

**Results:** Participants were 219 community and 201 college youths. Mean ages differed,  $18.2 \pm 3.9$  years versus  $20.1 \pm 2.1$  years ( $t$ -test  $p < 0.01$ ). Sex distributions were similar but educational status varied with 9.6% community youth having college-level education. Awareness of HIV/AIDS was lower among community than college youth: 85.4% versus 96.9% ( $\chi^2 = 16.59$ ,  $p < 0.01$ ). Also VCT awareness differed: community, 5.0% versus college, 14.9% ( $\chi^2 = 11.09$ ,  $p < 0.01$ ). More of the community youth, 76.2% (95% CI=69.8-81.8) indicated willingness to voluntarily test for HIV compared with 56.7% (95% CI=49.1-64.0) among school youth. The commonest reason given was desire to confirm HIV status. Age, sex, marital status, and awareness of VCT were not associated with willingness to test. However, educational level ( $\chi^2 = 45.61$ ,  $p < 0.01$ ), HIV awareness ( $\chi^2 = 23.86$ ,  $p < 0.01$ ) and history of previous HIV testing ( $\chi^2 = 4.5$ ,  $p = 0.03$ ) were associated with willingness to test.

**Conclusion:** A high level of willingness to test was observed, particularly among community-based youth who exhibited relatively less awareness and previous uptake of VCT. A scale-up of VCT services at community-level would increase opportunities for such young people to translate intent into actual decision to test. For school-based youth, who by default have greater exposure to HIV/AIDS interventions, opportunities should be maximized by reaching them with high-impact behaviour change interventions such as HIV Risk Assessment and VCT.

**Keywords:** HIV/AIDS; Voluntary HIV testing; Willingness to test; Youth; Nigeria

## Introduction

HIV/AIDS has grown to become one of the leading conditions of public health concern over a period of three decades since it emerged. The pandemic was once described as the “greatest health problem threatening the human race in our time” [1]. Current statistics estimate that 36.7 million people are living with the HIV virus globally, with 1.8 million new infections and 1 million AIDS-related deaths occurring in 2016 [2]. Sub-Saharan Africa still leads accounting for 64% of infections, but recorded an unprecedented 18% decline in infections [2]. The “youth” aged 15-24 years [3], bear a significant burden of the HIV pandemic, accounting for 20% and 14% of infections in adult females and males in 2015 [4]. The HIV epidemic in Nigeria is the second largest in the world after South Africa [2]; this is due to the sheer numbers of people living with the HIV virus despite a

remarkably low prevalence of 2.9%. In Nigeria, all subgroups of the population and geographic areas of the country are affected, albeit disproportionately [2]. In 2003, youth aged 20-24 years recorded the highest age-specific rate at 5.7%, while adolescents (15-19 years) recorded 4.1% [5]. These estimates have been reported to be lower at 3.2% and 2.9% respectively in the most recent National HIV & AIDS and Reproductive Health Survey (NARHS) report [6]. In Rivers State, the hub of the oil and gas industry in Nigeria, the crude prevalence of HIV has remained higher than the National average despite more than a decade of targeted HIV services including community-based HCT; 6.6% versus 5% in 2003 [7] and 15.2% versus 3.4% in 2012 [6].

The benefits of knowing one's HIV status is a key stroke in the fight against the spread of HIV/AIDS. For this reason, HIV counseling and testing (HCT) has long been recognized as an important intervention

for national control programmes to adopt [8,9]. There are several approaches to delivering HIV counseling and testing services, but Voluntary Counseling and Testing (VCT) was the first to be developed in a programmatic form [8,9]. VCT is an entry point to the range of available HIV services, and facilitates risk-reducing behavioral change whether or not the individual tests positive [10]. The deployment of VCT as a component of HIV prevention and care interventions in developed, as well as developing countries, has since grown [2]. The VCT strategy is based on the premise that counseling and testing increase people's perception of their vulnerability to HIV and is a motivating force to want to remain HIV-negative. This is predicated on one of the most established theories of behavior change, the Health Belief Model, which stipulates that a specific stimulus is necessary to trigger the decision-making process [11]. In this case, VCT is the stimulus; also termed the "cue to action" [11]. Random studies carried out in a few countries show change in behaviour among those who received VCT than those who received only basic HIV prevention information [12-15].

VCT's popularity and patronage among young people has also increased over the years; some African studies have shown that up to 60-90% of young people want to know their HIV status and thus demand for VCT [16-19]. Comparatively the proportion appear lower in Nigeria; the 2003 NARHS reported that 42.5% and 48.2% of people aged 16-19 and 20-24 years, respectively, desire to know their HIV status [1]. These lower figures probably support the logic that the demand for VCT would be higher in countries where HIV prevalence is higher [10]. Though, the last held NARHS of 2012 reported that 79.3% aged 15-19 years and 80% aged 20-24 years expressed the desire to have a HIV test [6]. Moreover, the experience suggests that desiring to be tested may not transform to actual uptake of VCT particularly when the opportunity to test is presented to people, especially young people [20]. Fylkesnes et al. [21] found that while the proportion initially willing to test among persons aged 15 years and above in Zambia was 37%, only 3.6% actually came for VCT. Thus, despite VCT being one of the most rapidly expanding HIV service in the world, majority of persons have not voluntarily taken a test. UNAIDS in 2014 estimated that only 19 million out of the 35 million people living worldwide were aware of their HIV status [22]; in Nigeria, a 90-90-90 target country, the latest estimate is 34% [2].

The importance of focusing on youth lies in the fact that they are at the center of the spread of the HIV epidemic, and are as such, crucial to its control. In addition, it has been observed that healthy sexual practices and attitudes such as voluntary testing are shaped more easily during youth than adulthood [23]. From a legal and human rights viewpoint, both the National HIV/AIDS Policy [24] and the National Policy on the Health & Development of Adolescents & Young People in Nigeria [25], assert that HIV testing and counseling services must be made available to this critical population upon giving their consent. A clearer understanding of the desire to test, and determinants of willingness among young people who would seek testing, thereby subscribing to the VCT model, would help inform appropriate HIV/AIDS programming for youth.

There are several reports on the level of awareness, willingness and uptake of VCT and associated factors among general populations of youth including peri-urban youth [26,27], urban youth [28,29], youth attending dedicated clinics [30], and in-school youth especially post-secondary [31-36]. There are few studies in the literature that explicitly set out to investigate differences in knowledge, willingness and/or uptake of VCT in school-based versus community-based youth. Social and behavioural theories have been used to explain the

potential influence of such factors on health actions like willingness to test for HIV [11]. The Social Ecological Model emphasizes that multiple levels of influence at individual, interpersonal, organizational, community, and public policy, (such as personal attitudes/beliefs/knowledge, community/societal peculiarities, previous health-seeking experiences, and availability or affordability of health services) can combine to shape people's behaviors [11].

The aim of this paper is to report the willingness to test voluntarily for HIV among subpopulations of youth aged 10-24 years living in Port Harcourt, Rivers State in southern Nigeria, and factors that influence this behavioral intent, which is a precursor for actual uptake of VCT services.

## Methods

### Study setting

The study was conducted in 2006 in Port Harcourt metropolis, the capital of Rivers State. Though, largely *Ikwerre* in its ethnicity, the city is known to be very cosmopolitan with many different ethnic populations living in it. Due to the oil and gas industry, the city is characterized by high mobility of persons from rural to urban areas and migration from within and outside Nigeria due to oil prospecting activities. The scenario thus provides a suitable environment for series of social interactions within the communities that can promote sexual risk behaviour especially among vulnerable youth.

The Rivers State College of Arts and Science (CAS) is the pioneer post-secondary education institution in Rivers State. It offers Advanced Level (A' Level) qualifications, and Ordinary Diplomas in courses ranging from Law to Computer Science. The number of course streams have increased to over 15 with an average of 120 students registered on each course. There is a high turn-over of students because the duration of study is between one and two years. The college has recently been renamed "The Port Harcourt Polytechnic". It has a Sick-Bay that provides primary care to both students and staff, and had also been a service point for some reproductive health programmes and research in the past. It was chosen as a study site mainly because of the prospect of health interventions by a Port Harcourt Adolescent Reproductive Health Network coordinated by a foremost youth-serving organization in Rivers State, Youth PRO-FILE.

Azuabie Ama or *Azubie* is a distinctly localized community located at the outskirts of the urban Port Harcourt. Originally a local fishing port, it evolved into a peri-urban settlement, hosting a variety of people seeking the prospect of the economic attraction of the inner city. The National Population Commission (NPC) census report of 1996 listed the population of "Azuabie Ama" as 9,618 [37], which were projected to 12,262 by 2006. Azubie is a densely populated suburbia; predominantly made of *Okrika* ethnic group, the original settlers. The community is within the vicinity of the "Trans-Amadi Industrial Area" of Port Harcourt where the offices and workshops of several oil and gas companies are located. The sources of health services are a few private clinics and several patent medicine stores.

### Sample

Persons between the ages of 10 and 24 years were the study population. Based on the UN age-based classification, this age group is defined as "young people", and comprise "adolescents" in age group 10-19 years (the second decade of life) and "youth" in the age group 20-24 years [3]. For the study, two comparable groups were identified; similar in age and sex but different by other characteristics including location (school-based versus community-based), educational background, social exposure, and opportunities for health awareness/

services. The school-based group was drawn from students from CAS, and the community-based from Azubie, most of whom were expected to be non-schooling, and engaged in several vocations including street hawking and apprenticeships.

A comparative cross-sectional study design was employed and the minimum sample size of 400 was calculated with EPITABLE\* in Epi-INFO version 6.04d [36]; it was based on detecting a difference of 15% in the chief outcome variable between two study groups at a margin of sampling error (alpha risk) of 5%, and power set at 80%. Adjustments were made for non-response of 10% and a design effect of 1.5. Simple random sampling was used to select A' Levels students from a class list at the college. In Azubie community, a multi-stage cluster sampling technique was employed.

The study tool was a structured questionnaire with questions developed into five sections. The first was on socio-demographic data, which included occupation for the community-based youth. The second section featured 13 questions on awareness/knowledge of HIV/AIDS and VCT. For awareness, respondents were simply asked the 'ever heard of' questions, whereas to test knowledge, respondents were asked to name ways HIV is/is not transmitted and what V.C.T. stands for. Correct answers were awarded 0-3 scores to rate knowledge. The third section on attitude towards HIV testing featured six questions, each with 5 graded responses; three questions had responses from 'I strongly agree' to 'I am Undecided' and the other three questions had responses from 'Very Likely' to 'I am Undecided'. Section four featured questions on past HIV testing: if ever, if pre-/post-counselling was done, the place of testing and reasons for testing. Section five elicited 'willingness to test' including reasons for and against.

The questionnaire was self-administered at the college but interviewer-administered in the community to take care of the lower level of literacy. Pretesting of the questionnaire was conducted among adolescents attending a youth-friendly centre, and its performance was rated high by two experts, though psychometric assessments were not performed. Subsequently, however, the knowledge questions were difficult to evaluate for the community youths and thus did not form part of this report.

### Statistical analysis

Data analysis was conducted using ANALYSIS\* in Epi-Info v6.04d and SPSS™ v20 [38]. Additional analysis was conducted using WinPepi version 11.65 [39]. Descriptive statistics including proportions, central tendencies, standard deviations and variances were computed. Differences in estimates were tested using Pearson's Chi-square test to compare proportions and Student's Independent t-test for means. To measure the relationships between independent variables and willingness to test for HIV, Chi-square test of independence was performed for bivariate analysis; Mantel-Haenszel chi-square test was also computed with stratification done by the study groups i.e. community versus college youth. For all statistical inference, the level of significance was set at p-value=0.05 or by assessing the 95% Confidence Intervals of test statistics.

### Ethical consideration

Ethical approval for the study was obtained from the Ethical Committee of the College of Health Sciences, University of Port Harcourt, Port Harcourt. Verbal informed consent was obtained from each of the eligible subjects during the survey.

### Results

A total of 420 subjects were interviewed; 219 in Azubie community, and 201 from the College of Arts and Science. Data was processed for

all respondents, though information obtained was not complete for all the variables in all cases.

### Socio-demographic characteristics

There was no youth less than 15 years among the college students thus the mean age of participants in the community was lower (t test=6.229, p=0.0) at 18.2 ± 3.9 years compared with 20.1 ± 2.1 years in the college. Table 1 shows a comparison of the frequency distribution, with 95% Confidence Intervals (CIs), of selected socio-demographic information between the two groups. Within each group, slightly more than half of the participants were females while most of them were single.

All the school-based youth from the college were in a tertiary educational institution. Whereas for the community youth, the educational status varied; majority (45.5%) had senior secondary education, and only 9.6% had attained tertiary level. For both groups, nearly all of the participants had an educated parent, with a similar majority having a parent with secondary level of education. However, the difference was in the percentage of a parent without a formal education; 14.9% among community youth and 3.8% in the college students.

Similarly, while all the participants at the college were students, the community youth were of a slightly mixed occupation. However, most of them (95.4%, n=209) were also students schooling in various institutions as indicated by their levels of education. The rest 4.6% were mainly trading apprentices, petty traders and unemployed.

### Awareness of HIV and VCT

The proportion of youth that had "heard of HIV/AIDS" was lower in the community than the college; 85.4% versus 96.9% ( $\chi^2=16.59$ ,

**Table 1:** Socio-demographic characteristics of community and college youth

	Community		College	
	Freq	Percent (95% CI)	Freq	Percent (95% CI)
<b>Age Group (years)</b>				
10-14	44	20.1 (15.0-26.0)	-	-
15-19	84	38.4 (31.9-45.1)	87	43.3 (36.3-50.4)
20-24	91	41.5 (35.0-48.4)	114	56.7 (49.6-63.7)
$\chi^2$ (p-value)		<b>26.42 (0.00)</b>		<b>7.25 (0.007)</b>
<b>Sex*</b>				
Females	115	51.6 (44.8-58.4)	109	54.5 (47.3-61.5)
Males	105	48.4 (41.6-55.2)	91	45.5 (38.5-52.7)
$\chi^2$ (p-value)		<b>0.45 (0.502)</b>		<b>3.24 (0.072)</b>
<b>Marital**</b>				
Single	199	91.3 (86.7-94.7)	189	98.4 (95.5-99.7)
Married	11	5.0 (2.5- 8.8)	3	1.6 (0.3- 4.5)
Co-habiting	8	3.7(1.6- 7.1)	0	0.0 (0.0-0.0)
$\chi^2$ (p-value)		<b>494.27 (0.00)</b>		<b>549.42 (0.00)</b>
<b>Level of Education</b>				
Primary	32	15.3(10.7-20.9)		
JSS	62	29.7(23.6-36.4)		
SSS	95	45.5(38.6-52.5)		
Tertiary	20	9.6(5.9-14.4)		
$\chi^2$ (p-value)		<b>86.07 (0.00)</b>		

\*missing data for 2 persons in the community and 1 in the college

\*\*missing data for 1 person in the community and 9 in the college

$p < 0.01$ ). Similarly, less proportion had “heard of VCT” among the community youth (5.0%,  $n=11$ ) than the college youth (14.9%,  $n=26$ ;  $\chi^2=11.09$ ,  $p < 0.01$ ). The few that were aware of VCT were also asked about places where VCT services existed. Only four out of the 11 in the community group mentioned the teaching hospital and specialist hospital in Port Harcourt, while nearly all the 26 from the college mentioned up to six specific places, which included the college “Sick Bay”.

### Attitude towards HIV testing

Responses to three questions explored attitudes towards HIV testing: *approval (support) of mandatory testing for HIV, approval of voluntary testing, and belief in HIV testing* i.e. agreed that testing is the way to know one’s status. The responses, were investigated on a 5-point scale (‘I Strongly Agree’, ‘I Agree’, ‘I Disagree’, ‘I Strongly Disagree’, and ‘I am Undecided’), and then collapsed to a Yes/No dichotomous scale. Most of the respondents (93.6% and 92.2%) in both community and college respectively ‘believed in HIV testing’ ( $\chi^2=0.23$ ,  $p=0.63$ ). Similarly, 82.1% and 89.1% ( $\chi^2=3.73$ ,  $p=0.054$ ) of community and college youth respectively, ‘approved of voluntary testing’. Likewise, though a slightly less majority (69.0% and 65.5% in community and college, respectively) did not “approve of mandatory testing” ( $\chi^2=0.51$ ,  $p=0.47$ ).

### Willingness to test for HIV

Up to three-quarters, 76.2% (95% CI=69.8-81.8) of community youth indicated willingness to voluntarily test for HIV compared 56.7% (95% CI=49.1-64.0) of the college youth ( $\chi^2=16.76$ ,  $p < 0.01$ ). The reasons for both willingness and unwillingness to test are displayed in table 2. For both groups, ‘desire/need to be sure of HIV status’ was the commonest reason for being willing to test (93.0%, community and 85.0%, College). ‘Obligatory reasons’ based on the advice/recommendations or instructions of others such as partner, doctor, church and school constituted the next commonest (5.7%, community; 10.0%, college). ‘Peer influence’ was the reason indicated by the rest that reported they would be willing if their friends were (1.3%, community; 5.0%, college).

The reasons for those unwilling to test, the commonest was ‘self-certainty’ i.e. being sure they were ‘not positive’ (63.8%, community; 85.3%, college). Two other closely related reasons were fear of “testing positive” (17.0%, community; 11.7%, college) and ‘fear of family rejection’ (6.4%, community; 1.5% college). One-tenth (10.6%) of the community youth gave their reason for being unwilling as doubts

of the ‘genuineness of the result’, no one expressed this among the college youth. ‘Cost’ was the reason given by one respondent each at community (2.1%) and college (1.5%).

Further examination of attitude towards testing was conducted. All respondents whether willing or not willing to test, were asked to rate the likelihood that three common reasons for unwillingness would deter them from testing for HIV. The results are presented in table 3. The community youth were more likely/very likely to be deterred by ‘fear of testing positive’ (27.8%), ‘stigma/abandonment by friends/family’ (29.9%) and cost (54.5%) than their college counterparts (16.3%, 23.7% and 30.5% respectively). It was observed that the progression of increase in unwillingness to test was the same in both study groups; from fear of a positive test to cost. That is, among the three reasons common reasons for unwillingness to test, ‘fear of positive test’ was the least likely, and ‘cost’ was the most likely deterrent for both community and school youth.

### Practice regarding VCT

The proportion of participants that had previously had a voluntary HIV test among the community youth was 3.9% (95% CI=1.7-7.6) compared with 9.2% (95% CI=5.1-14.9) among the college students. Six out of the eight community youth that had previously had a HIV test responded to the question on whether they were counseled or not; only one (16.7%) reported receiving both pre-/post-test counseling. Among the college youth, 42.9% ( $n=6$ ) of the 14 that had previously undergone testing reported receiving both pre-/post-testing counseling. Four (57.1%) among the community and 8 college (66.7%) youth that had been tested reported that testing had done them some good; while one community youth (14.3%) compared with four (33.3%) in the college felt there had been no good from conducting the test.

### Assessment of factors influencing willingness to test

The possible influence of some socio-demographic factors, specific HIV/AIDS-related factors, and previous testing for HIV, on willingness to test for HIV were evaluated. Chi-square test of independence with  $p$ -values are shown in table 4. As earlier mentioned, willingness to test was different, statistically, between the community and college youth ( $p=0.01$ ); with the latter being more likely to be willing to test. Thus, Mantel-Haenszel test chi-square was also computed with stratification done by study group.

The results showed that with or without the influence of the study group, age, sex, marital status, and being aware of VCT were not associated with willingness to test. However, educational level ( $\chi^2=45.61$ ,  $p < 0.01$ ), HIV awareness ( $\chi^2=23.86$ ,  $p < 0.01$ ) and previously tested for HIV ( $\chi^2=4.5$ ,  $p=0.03$ ) were associated with willingness to test, but only when stratification was done by study group, reflecting the influence of the group differences.

### Discussion

The level of HIV/AIDS awareness observed in this study can be judged to be high even among the community youth when compared with the 60% reported by the National survey conducted about the time of this study [1,40,41]. The most recent National surveys on health and HIV/AIDS related indicators show that levels of awareness and knowledge of HIV/AIDS have remained high in both urban and rural populations in Nigeria [6,42]. Several independent studies among various subpopulations also corroborate this [19,43,44]. Many intervention groups have begun to argue that very little may need to be done in the area of HIV/AIDS awareness-raising, since virtually everyone in the present times is expected to have “heard of HIV/

**Table 2:** Reasons for willingness and unwillingness to test for HIV

	Community (n=159)	College (n=100)	$\chi^2$ p-value
<b>Reasons for willingness</b>			
Desire to know status	93.1	85.0	0.04
Obligatory reasons	5.7	10.0	0.19
Peer influence	1.3	5.0	0.16*
<b>Reason for unwillingness</b>	(n=47)	(n=68)	
Self-certainty	63.8	85.3	0.01
Fear of positive test	17.0	11.7	0.42
Fear of family rejection	6.4	1.5	0.37*
Doubt of result	10.6	0.0	0.02*
Unaffordable cost	2.1	1.5	1.0*

\*Yates’ corrected chi-square ( $\chi^2$ ), Fisher’s Exact

**Table 3:** Frequency of common reasons for unwillingness to test on a likelihood scale of occurrence

Attitudinal scale	Fear of Positive Test		Stigma/Abandonment		Cost	
	Community (n=209)	College (n=175)	Community (n=204)	College (n=180)	Community (n=207)	College (n=181)
Very Likely	13.4	3.7	13.7	12.1	18.8	13.7
Likely	14.4	12.6	16.2	11.6	35.7	16.8
Not Likely	34.0	12.1	38.2	13.7	26.6	14.7
Not Very Likely	23.0	64.2	21.6	50.5	9.7	48.9
Undecided	15.3	5.3	10.3	11.6	9.2	5.3

**Table 4:** Relationship between willingness to test and socio-demographic and HIV-related factors

Variable	Willing n (%)	Not Willing n (%)	Pearson's chi-square (p-value)	Mantel-Haenszel test (p-value) df=1
<b>Age Group</b>				
10-19	136 (67.0)	67 (33.0)		
20-24	126 (67.4)	61 (32.6)	0.01 (0.94)	0.59 (0.44)
<b>Sex</b>				
Male	129 (69.0)	58 (31.0)		
Female	130 (65.0)	70 (35.0)	0.69 (0.41)	0.28 (0.60)
<b>Marital Status</b>				
Single	239 (66.2)	122 (33.8)		
Married/Co-habiting	17 (81.0)	4 (19.0)	1.34 (0.25)*	0.34 (0.56)
<b>Education</b>				
Primary	31 (96.9)	1 (3.1)		
JSS	57 (91.9)	5 (8.1)		
SSS	93 (97.9)	2 (2.1)		
Tertiary	121 (61.1)	77 (38.9)	-	45.61 (<0.01)**
<b>HIV Awareness</b>				
Yes	239 (68.3)	111 (31.7)		
No	22 (59.5)	15 (40.5)	1.19 (0.28)	23.86 (<0.01)
<b>VCT Awareness</b>				
Yes	23 (67.6)	11 (32.4)		
No	224 (67.5)	108 (32.5)	0.0 (0.98)	0.45 (0.51)
<b>Previously tested for HIV</b>				
Yes	17 (89.5)	2 (10.5)		
No	216 (66.5)	109 (33.5)	3.36 (0.07)*	4.51 (0.03)*

AIDS". Aid/health workers have expressed the opinion that efforts should be concentrated, therefore, on high-impact strategies such as VCT, STI control, and ARV treatment [45].

In apparent support of this move for targeted interventions, a relatively low level of awareness of VCT was observed among both community and college (5% and 15% respectively). These proportions are lower than the 19.8% reported among youth aged 15-29 years in Sagamu, a semi-rural community in Southwest Nigeria [27]. Though recent studies done in South South Nigeria where this study was done indicate that awareness of VCT has increased among youth in the area.

A difference was found in the level of awareness of HIV/AIDS and of VCT between the community youth and the college students, who were observed to be better informed. This may not be surprising owing to the influence of education and perhaps the prospect of better 'exposure' to HIV intervention for the more urban college youth. The relationship between formal education and knowledge of health information is well established [46]. Further to this, another explanation for the better informed college youth may be due to previous HIV/AIDS related intervention that had been carried out in the school two years before this study [20,47]. Though, it can be argued

that many of those that were exposed to the intervention may have concluded their studies and left the school. The school environment is notably a popular setting for health workers to reach young people with intervention or to conduct youth-based research. This is probably the basis for the comparative advantage of a higher level of awareness and sometimes uptake of health services in schooling youth [18,19,36,44].

A high proportion of the youth in this study had a positive attitude toward HIV testing; up to 93.6% and 92.2% in the community and college, respectively, agreed with testing to determine HIV status. There was even an overlap of about 20% of those who approved of both voluntary and mandatory testing or could not decide. This again may be related to the increasing level awareness of HIV/AIDS in many parts of Nigeria including the study sub-region. [1,6,40,41]. It appears that to some extent target populations (i.e. programme end-users) may not be averse to being “told” or ordered to test for HIV instead of by their own volition (i.e. given the choice to test or not to test). Musa et al. [33] had aimed to find out whether or not students in Nigerian tertiary institutions would accept pre-marital HIV screening, which is often mandated commonly by churches as part of their requirements to conduct marriages. It was reported that 85% of the students thought that pre-marital screening was necessary; 89.4% believed it was advantageous; and 57.2% actually expressed support for its enforcement. However, Nakchbandi et al. [48] had conducted a decision-analysis to compare mandatory HIV testing with voluntary testing among pregnant women in Pennsylvania, USA, and concluded that voluntary testing was the preferred model. It is of interest to observe that a similar study in the US had also employed decision-analysis models but one that used cost-effectiveness analysis to determine the screening strategies to be implemented for pregnant women; the subjects rated universal screening over ‘not screening’, and ‘voluntary screening’ [49].

The level of willingness to test for HIV was found to be lower – 76.2% and 56.7% in community and college youth, respectively. However, these proportions were higher than figures stated for young people in the National surveys in 2003, 2005 and 2007 [1,40,41]. But the last held National survey of 2012 reported that overall about 77% of Nigerians, 79.3% aged 15-19 years and 80% aged 20-24 years expressed the desire to have a HIV test [6]. Varied percentages have also been reported for young people in Nigeria by other studies. Musa et al. [33] in the North Central zone of Nigeria reported that only 24% of students of tertiary institutions aged 17-40 years showed willingness to be tested for HIV, though this was specifically for pre-marital screening. More recently and in Southeast Nigeria, Onyeonoro and colleagues [44] reported an equally high proportion of 78% also among students in tertiary institutions.

High proportions were also reported among youth in other parts of Africa [17,18,50], as well as in adults and special groups different from youth who have also reported comparatively high percentages of willingness to test. Liu et al. [51] found that 81% of rural residents in China reported willingness to test for HIV. Three-quarters (74%) of health workers in Nigeria also showed willingness to be screened for HIV [52], though this group can be argued to be, by default, a ‘more at risk’ and highly motivated population.

The most compelling reason given for being willing to test by the study subjects was the *desire to know one’s HIV status*. Several other studies have also highlighted this reason as the most important [44,53], but it is as well the motivation that appears to push the prospective client all the way to actual testing [54,55]. Conversely, reasons offered by those unwilling to test centered mainly on *self-certainty of a negative HIV status*, and *fear of a positive test result*. The later reason

underpins the rest of what constitutes fear of stigma, discrimination, family rejection and abandonment, which have been reported by a number of African studies earlier analyzed by Matovu et al. [16]. Self-certainty has also been reported among prospective clients who out-rightly refused testing [26,55,56] and not only among those who are unwilling to test. It may be explained as a defense mechanism often conjured mentally to justify the need not to go through testing, even among those who subsequently carry out testing. Jiraphongsa et al. [57] had reported that most of the 23% of 398 VCT participants who had previously been tested for HIV (and almost all were positive) had perceived that they had no chance of being infected with HIV. Similarly, a study conducted among persons aged 19-35 years living in peri-urban communities in Thailand found that among those who had never been previously tested for HIV, 66% believed they were not at risk, although 1.5% of them were HIV infected [26]. Fear of the repercussions of a positive test which includes ostracism and betrayal of confidence has been widely reported as reasons for being unwilling to test or for out-rightly refusing to test [44,58-61].

Cost of testing is another important reason why some people would not express desire to test or in fact decline testing. In this study, it was observed that fewer youth identified cost over other reasons for their unwillingness to test. However, further examination of their perception regarding cost demonstrated that it out-performed fear of positive test and stigma/discrimination on the attitudinal scale as a factor that would likely make them not undergo testing. Several other studies have also reported that cost was the reason for refusal of VCT [59,62,63]. Forsythe et al. [64] assessed the influence of cost on willingness to pay for VCT in Kenya, and reported that a contingent valuation study indicated that most VCT clients would be willing to pay at least \$2 USD for the service, but less than 5% would be willing and able to pay the full cost of about \$26 USD.

From the foregoing, it can be seen that there is a progression of the ‘influences’ from those factors that impinge on willingness/unwillingness to test (intent), to those that impact on the actual decision to test (action).

The higher level of willingness to test found among community youth compared to the college youth is an intriguing contrast to the expectation that the better educated, more opportune and enlightened urban college student ought to be more desirous of knowing their HIV status. The school environment is a far more popular setting for young people to be reached with any form of health intervention and research. Usually it is more convenient, provides easy access, and offers larger numbers of, often already primed, clientele of youth. Thus what underlies the socio-demographic differences between school-based youth and those from other settings with respect to health-related issues in general is the level of exposure to information, education and services.

The possible influence of level of education and other socio-demographic characteristics on willingness to test were also examined within the study groups. However, only *level of education* (among the community youth) was found to be associated with willingness to test, though also reflecting the differences between the two study groups. A study conducted among youth in semi-rural Sagamu found that those with at least a secondary education were more willing to be tested for HIV [27]. Several socio-demographic factors do correlate with acceptance or refusal of VCT. VCT acceptance has been reported to be associated with *older age* [28,56,65,66]; being unmarried [50]; higher level of *education* [56,67-69]; and even higher *parent’s level of education* [65]. Being a female has also been associated with both acceptance [70] and rejection of VCT [51,56].

However, HIV-AIDS related factors appeared to exert more influence on willingness to test among the study population than socio-demographic variables as the findings revealed. Awareness and previous HIV testing showed valid association with willingness to test, albeit reflecting more of the differences between the study strata. Awareness of VCT appeared to exert an influence but the association was not statistically valid. Sexual risk behaviours such as multiple partners, history of unprotected sex, and injection drug use, which was not studied amongst the study population and recognized as a limitation, have also been shown to correlate with seeking VCT by many studies [31,56,64,69].

This study found out that despite the relatively high level of desire to test less than 10% had previously tested for HIV. This finding is higher than 3.2% reported for adolescents in the 2003 National survey but compares well with the 8.3% found among male undergraduates in southwest Nigeria [65] also a few years before this study period. As earlier observed, with time there has been an increase also in the level of uptake of VCT to 12.7% and 24.5% among youth aged 15-19 years and 20-24 years respectively, in the 2012 National survey. A parallel survey, the Nigeria Demographic and Health Survey (NDHS) 2013 also reported the percentage that ever tested for HIV among 15-24 year olds as 9.9% and 19.2% in males and females, respectively [42].

Nonetheless, the study's primary aim and contribution to the literature, to investigate differences between community and college youth, revealed that more of the college youth had undergone VCT, even though they recorded a lower proportion of those willing to test than the community youth. They probably recorded higher 'previous testing' because of better opportunity to test given that development partners or non-governmental organizations often prefer carrying out health interventions in schools rather than community settings. This finding contrasts with the direction of difference in 'ever tested' between rural and urban 15-24 year olds reported by the 2013 NDHS: 8.3% versus 11.9% for males respectively; and 19.4% versus 44.6% for females [42]. Several independent studies corroborate high percentages among schooling youths. Peltzer et al. [34] reported that almost 20% of university students in America and South Africa admitted to having had a HIV test. In another study of four African universities that included the University of Ibadan [35], it was found that 17.3% of the students had had HIV testing. This 'aggregate' percentage may have belied the relatively smaller proportion reported in other Nigerian studies.

All said, this study also support the assertions that a great divide exists between desiring to test and actual testing; willingness does not necessarily translate to actually taking the test [21,68]. Fylkesnes et al. [21] found that while the proportion initially willing to test, among persons aged 15 years and above in Zambia, was 37%; only 3.6% actually came for VCT. A survey of university undergraduates in southern Nigeria similarly recorded 5% (18 persons) having ever done HIV testing, of which only 2 persons did so voluntarily [32]. Moreover, experience with working with youth suggests that desiring to be tested may not translate to the actual intention to test [20]. From the foregoing, there are issues for consideration regarding young people's willingness or desire to test for HIV and how this can proceed to an actual decision to test.

## Conclusion

This study investigated two groups of youth; one slightly older, better educated, more urban, and better informed. The two groups exhibited a high level of willingness to test for HIV, though very few of them had heard of VCT and had ever taken a previous test. It was

discovered that the most compelling reason for willing to test was the desire to be sure of their HIV status, but issues of cost and fear of the repercussions of a positive test were considered likely deterrents. *Level of education* and *previous HIV testing* was associated with willingness to test. But overall, the *community* youth were more likely to be willing to test for HIV than the college students, a finding that brings a different perspective and important implication to the conventional thinking on the design of tailored intervention programmes.

An upscale of VCT or HCT to locations beyond the convenience of schools, will greatly increase better opportunities for young people who appear to need to be faced with the prospect of testing for them to translate desire or intent to test to actual decision to test. Efforts should be directed at addressing the issue of stigma, discrimination and rejection. Peer education and use of change agents, some of whom may be persons living with HIV/AIDS can aid in helping to change negative attitudes regarding the condition. Lastly, advocacy for reduction in the cost of HIV testing and related services including subsidy for young people will give more opportunities for service uptake.

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