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Provider-initiated (Opt-out) HIV testing and counselling in a group of university students in Ile-Ife, Nigeria

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ABSTRACT **Objectives** The Provider Initiated HIV (Opt-out) Testing and Counselling model has rarely been tested in Nigeria. This study assessed its feasibility and uptake among a sample of Nigerian university undergraduate students.

Methods Two hundred and fifty-two Nigerian university students were offered rapid 'opt-out' HIV tests. The participants were also interviewed using a self-administered questionnaire. Data were analysed using descriptive statistics.

Results Two hundred and fifty-one (99.6%) students accepted to be tested and only one (0.4%) refused testing. The commonest reason given for accepting rapid 'opt-out' testing was the desire to find out HIV status (93.2%). Only 24 (9.5%) students had previously ever been tested for HIV; among the 228 (90.5%) respondents who had not, the commonest reasons given for not testing were lack of knowledge of where to go to (25%), fear of testing positive (24%), and perception of being unlikely to have been exposed to HIV (18%).

Conclusion HIV 'opt-out' testing holds the prospect for rapidly increasing the coverage of HIV testing and other preventive interventions among university students in Nigeria. However, waiting time before testing and the poor disposition of medical staff to add on the burden of HIV 'opt-out' tests remain potential barriers to its roll-out.

KEY WORDS HIV, Opt-out testing, Acceptance, University Students, Nigeria

INTRODUCTION

Globally, an estimated 33 million people were living with HIV/AIDS at the end of 2008, and sub-Saharan Africa contributed 67% of this total and 71% of all new infections¹. Nigeria, the most populous country in sub-Saharan Africa with a population estimate

of 149,000,000 in 2007 has the highest number of persons living with HIV/AIDS in West Africa². With an estimated 3.6% sero-prevalence³, 3.3 million people living with the virus, approximately 220,000 deaths and 2.5 million AIDS orphans in 2009⁴, the HIV

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epidemic in Nigeria has become generalised, affecting all geo-political zones. The gap in burden of infection between the urban and rural areas has narrowed down considerably, with infections no longer being confined to populations at higher risk (e.g., commercial sex workers) but affecting all segments of the population.

To reduce the spread of HIV in Nigeria, people have to be aware of their HIV status. Being informed about one's HIV status has numerous advantages, both with regard to treatment and care, and preventive intervention. HIV-infected individuals can only begin to access HIV treatment, care and support services when they are aware of their status. Studies have shown that knowing one's status enhances behaviour change, especially among HIV-infected persons⁶⁻⁹. Similarly, ignoring one's HIV status has grave consequences. HIV-infected individuals who are unaware of their status can unknowingly transmit the virus to their sexual or drug injecting partners¹⁰, and they are more likely to present with AIDS, thus increasing morbidity and mortality from the disease. In Nigeria, only 9% of adults 15-49 years old received an HIV test and knew their results in 2005¹¹. Many Nigerians do not get tested because of the stigma and discrimination that are still associated with the disease in the country, while others do not do so for lack of access to testing and counselling services⁵.

The traditional approach to HIV testing has been *voluntary counselling and testing* (VCT), which required pre- and post-test counselling, with written informed consent. While VCT has been successful in many population groups across countries, evidence suggests that there are many missed opportunities to diagnose HIV infection and counsel individuals at health facilities on a daily basis^{12,13}. In addition, previous HIV testing strategies had focused on high risk groups. However, with the changing demographics of the HIV/AIDS epidemic in Nigeria, and elsewhere, there have been calls for a change in HIV testing strategies. The foregoing prompted the World Health Organization and the Joint United Nations Program on HIV/AIDS to develop guidelines for implementing provider-initiated HIV testing with an 'opt-out' approach in addition to continued scale-up of VCT (also called client-initiated testing)⁵. In 2006, the United States Centers for Disease Control (CDC) issued similar guidelines recommending HIV screening for patients in all health-care settings after their having been notified that testing will be performed unless they should decline¹⁴.

Provider-initiated HIV testing and counselling (PITC) has been introduced in some African countries, including

South Africa, Malawi, Botswana, Kenya, Uganda and Zambia¹⁵⁻²⁰. Data from these countries indicate that pregnant women accepted testing if they felt it would benefit their baby. In generalised epidemics such as the one in Nigeria, health care providers should offer HIV testing to all adults and adolescents presenting in health facilities – public, private, in-patient and out-patient settings. With the increasing availability of and accessibility to antiretroviral (ARV) drugs through the President's Emergency Plan for AIDS Relief (PEPFAR) programme in many public health facilities such as tertiary institutions, the enabling environment and resources are provided for the implementation of PITC. However, to our knowledge, this is not the case and we are not aware of any studies of the provider-initiated 'opt-out' HIV testing programme in Nigeria; whereas, a 2004 study in Benin has suggested the need for universal HIV testing with an 'opt-out' strategy in the country²¹.

University students, who are typically young, engage in high risk behaviours and are therefore disproportionately affected by HIV. In Nigeria, only 22.4% of men and 13.2% of women between 15 and 49 years old who had had more than one sexual partner in the previous twelve months reported that they used a condom during their last sexual intercourse¹¹. Increased HIV testing among young people is therefore urgently required. This study is aimed at assessing the feasibility and uptake of PITC among a sample of university students in Nigeria by providing rapid 'opt-out' HIV testing and counselling to students presenting at the university health centre. The specific objectives are to determine the proportion of participants accepting an HIV test using the rapid PITC approach, ascertain participants' reasons for accepting or refusing HIV testing, and identify barriers and facilitators to implementing PITC among the participants.

METHODS

Setting

The study was conducted at the health centre of the Obafemi Awolowo University (OAU), Ile-Ife, Nigeria. The Obafemi Awolowo University is a Nigerian first generation university with a student population of about 25,000. The OAU health centre serves primarily the student population, although staff members are also attended. The university had offered VCT services

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specimen is left totally immersed in the developer solution for the entire duration of the test. The test results are interpreted after 20 minutes of the introduction of the specimen into the developer solution. It is highly accurate with greater than 99% agreement with confirmatory Western blot²⁴. The reliability of the OraQuick test kit was validated by using it to test the oral fluids of five randomly selected HIV-positive patients confirmed by the Western blot test from the adult HIV clinic of the OAUTHC. There was 100% agreement between the results of the two test methods.

The survey questionnaire was self-administered. The instrument gathered information on socio-demographic data such as age, sex, religion, tribe, marital status, year of study, place of residence, and on HIV risk behaviours such as history of unprotected (vaginal or anal) sexual intercourse, lifetime number of sexual partners, and history of sex under the influence of alcohol and illicit drugs. It further asked questions on history of HIV testing and reasons for accepting or declining 'opt-out' testing among others. The HIV risk behaviour questions were adapted from an instrument previously used among college students. The psychometric properties of the instrument have been reported elsewhere²⁵. The HIV testing questions were adapted from the CDC standardised HIV testing questions²⁶. Each questionnaire had an identification number only and HIV test results were recorded on it, without any identifying information. HIV prevention educational materials, male and female condoms, and contact information of the investigators for further questions were made available to all participants.

Participants who tested positive were to be referred for confirmatory western blot test and follow-up by the haematologist. All participants who tested negative were to receive appropriate post-test counselling about retesting (to accommodate the window period) and HIV prevention. The investigators recorded observed barriers and facilitators to providing 'opt-out' testing.

Data analysis

Data were analysed using the SPSS software version 16. Continuous variables were summarised as means and standard deviations. Discrete variables were presented using frequencies and percentages. Meaningful bivariate and multivariate analyses between the acceptors and non-acceptors of rapid 'opt-out' HIV testing

were precluded due to the extremely small proportion of non-acceptors in the study.

RESULTS

Sample demographics

Of all the students who were approached, only five declined enrollment into the study for lack of time. Two hundred and fifty two students, comprising 142 males (56.3%) and 110 females (43.7%), took part in the study (Table 1). Their ages ranged from 16 to 36 years, with a modal age group of 20–29 years (58%). Almost 70% of them were freshmen while the others were returning students. They were largely Christians, 50% of them being Christians of the Pentecostal faith while 20% of them were Muslims. Eighty-eight per cent of them were Yorubas, the predominant tribe in

Table 1 Socio-demographic characteristics of the assessed Obafemi Awolowo University students (*n* = 252)

Socio-demographic variables	Frequency	Percentage
Age group (years)		
10–19	99	39.3
20–29	146	58.0
30–39	7	2.7
Sex		
Male	142	56.3
Female	110	43.7
Length of stay		
Fresh student	175	69.4
Returning student	77	30.6
Religion		
Catholic	29	11.5
Protestant	47	18.7
Other Christians (Pentecostals)	126	50.0
Muslim	50	19.8
Tribe		
Yoruba	223	88.5
Igbo	11	4.4
Hausa/Fulani	1	0.4
Others	17	6.7
Marital status		
Single	239	94.8
Married	8	3.2
Separated/divorced/widowed	5	2.0

to students and staff for more than five years prior to the study, but uptake had been less than 10 individuals in all (personal communication). The OAU Teaching Hospital (OAUTHC), a receiver of the PEPFAR fund, is also situated in close proximity to the university and serves as a referral facility to the OAU health centre where HIV positive patients needing further care can be referred to and cared for by specialists. The study protocol was approved by both the Institutional Review Board at the Chicago State University and the Research and Ethics Committee at the OAUTHC, Ile-Ife.

Study design

The study employed a cross-sectional descriptive design comprising two parts: HIV testing and a questionnaire survey.

Study participants and sample selection

Study participants were OAU students who presented for care at the health centre. About 100 of them are seen at the health centre daily. Sample size was determined using the sample size formula for estimating single proportion as described by Armitage and Berry and cited in Abramson and Gahlinger²². Accepting a 95% level of confidence, a population size of 25,000, an HIV testing rate of 9% among adults 15–49 years in Nigeria¹¹ as an estimate of the true proportion, and a maximum acceptable difference from true proportion of 3.7%, a minimum sample size of 228 was calculated. This number was rounded up to 250. Participants were serially recruited into the study as they presented at the doctors' offices daily for consultation until a total number of 252 participants had been enrolled.

Recruiting and consent process

Participation in this study was voluntary and the participants had the option to withdraw from the study at any time for any reason, even after they had agreed to participate. Recruitment and data collection took place at the university health centre over a two-week period in July 2009. Students presenting for care at the health centre were informed by the attending physician that an HIV test would be performed alongside all other care services on offer, and that only if

the student declined testing, would the test not be done. A note was attached to each student's investigation request form indicating acceptance or rejection of enrollment into the study. Two principal investigators and four research assistants arrived at the health centre each day ahead of the potential participants. Each student was approached in the laboratory waiting room by a principal investigator after the completion of the physician-patient encounter. Students whose willingness to partake in the study had been indicated on their investigation request forms were informed that an HIV test would be performed and that they would be requested to complete a 10–15 minute survey after the test.

Students who expressed willingness to continue with the study at this point were moved individually to a private room, where the HIV counsellor asked for verbal informed consent in the presence of a principal investigator. Once consent was obtained, the participant received pre-test counselling and the HIV test. A research assistant then gave the participant the survey to fill out while waiting for the test result. After the survey had been completed, with only the HIV counsellor present, the participant received the test result, appropriate post-test counselling, and referral to the haematologist (for immediate consultation) if the test result was positive. Participants who declined HIV testing were approached to fill out the questionnaire only. Participants were given the opportunity to ask questions regarding any aspect of the study and they had all of their questions answered.

Data collection method/instrument

HIV testing procedures followed WHO guidelines for implementing 'opt-out' HIV counselling and testing in health facilities. HIV tests were conducted using the OraQuick ADVANCE[®] HIV-1/2 Rapid Antibody Test manufactured by OraSure Technologies, Inc., Bethlehem, PA, USA²³. OraQuick ADVANCE[®] HIV-1/2 Rapid Antibody Test is a manually performed, visually read, 20-minute immunoassay for the qualitative detection of antibodies to HIV-1 and HIV-2 in human oral fluid. It comprises a single-use test device and a single-use vial containing a pre-measured amount of buffered developer solution. An oral fluid specimen is collected using the flat pad on the test device, followed by the insertion of the test device into the vial of developer solution. The

specimen is left totally immersed in the developer solution for the entire duration of the test. The test results are interpreted after 20 minutes of the introduction of the specimen into the developer solution. It is highly accurate with greater than 99% agreement with confirmatory Western blot²⁴. The reliability of the OraQuick test kit was validated by using it to test the oral fluids of five randomly selected HIV-positive patients confirmed by the Western blot test from the adult HIV clinic of the OAUTHC. There was 100% agreement between the results of the two test methods.

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Married	8	3.2
Separated/divorced/widowed	5	2.0

Table 3 Reasons for acceptance or refusal of HIV opt-out testing among students of the Obafemi Awolowo University

<i>Reasons for accepting HIV testing (n= 251)</i>	<i>Frequency</i>	<i>Percentage</i>
Just wanted to find out HIV status	234	93.2
Deferred to the offer of the doctor to be tested	10	4.0
Worried might be infected with HIV	5	2.0
Sex partner had asked participant to test for HIV	1	0.4
No response	1	0.4
<i>Reason for refusing HIV testing (n= 1)</i>		
Was not ready to know HIV status yet	1	100

number of medical personnel. Despite the fact that at least five study personnel were on the ground daily to take the burden of testing off the medical consulting and laboratory staff, the students still queued and overlapped while waiting to be tested (average duration of testing being 20 minutes). This drew a lot of criticisms from them, and it took repeated appeals from the study personnel to dissuade many students from leaving. The other barrier was the unwilling disposition of the

medical consulting and laboratory staff who felt that by adding the offer of an 'opt-out' HIV test to the package of care offered the patient, extra burdens were being added to their already very busy schedules. The observed facilitators were the 'rapid nature' of the HIV tests whereby test results were ready within 20 minutes under the same roof, without clients having to come back and the fact that the test was charge free.

DISCUSSION

Principal findings

We demonstrate that PITC is feasible among university students in Nigeria as all but one (99.6%) of our respondents accepted HIV testing. This was a clear departure from the trends in the same health centre where only about ten individuals (staff and students inclusive) ever accessed client-initiated VCT for HIV in the five years preceding the survey. There are no previous studies of acceptance of PITC in any segment of the Nigerian population on record, but figures from other African countries, where PITC has been implemented, revealed similar levels of almost universal acceptance. Between November 2004 and February 2006, Mbarara and Mulago teaching hospitals in Uganda offered routine testing to inpatients admitted to participating medical and surgical units,

Table 4 HIV testing history of the students of the Obafemi Awolowo University

<i>HIV testing behaviour (n= 252)</i>	<i>Frequency</i>	<i>Percentage</i>
Ever tested for HIV (all indications)	24	9.5
• Tested as part of screening for blood donation	7	3.1
• Tested outside of screening for blood donation	17	6.7
Number of times ever tested before		
• Once	21	8.3
• Twice	1	0.4
• Thrice	1	0.4
• Five times	1	0.4
Never tested before	228	90.5
<i>Reasons given by those who never tested before (n= 228)</i>		
Did not know where to test	57	25.0
I was afraid to find out if I was HIV positive	55	24.1
I felt I was unlikely to have been exposed to HIV	42	18.4
I don't like needle pricks	20	8.8
I didn't trust the results will be kept confidential	18	7.9
I was afraid of losing my job/friends/insurance	5	2.2
No response	31	13.6

the southwestern part of Nigeria and about 95% of them were never married. Ninety percent lived in students' hostels on the university campus. One hundred and eleven (44%) students came to the health centre for their routine pre-registration health screening, while the others reported varying symptoms such as fever, headaches, cough, cold and catarrh, cuts and toothache (results not shown).

Acceptance of HIV testing and reasons for acceptance/refusal

Two hundred and fifty one (99.6%) study participants accepted HIV testing using the rapid opt-out testing and counselling approach while only one (0.4%) female student opted out of testing, although she participated in the questionnaire survey (Table 2). All 251 students who accepted opt-out testing tested negative for HIV. Rate of acceptance or refusal of testing neither differed by sex (Table 2), nor by any of the other characteristics of age, length of stay in the university, religion or tribe of the students (results not shown). Among the students who accepted HIV testing, the commonest reason given for accepting HIV testing was the desire to know their HIV status (93.2%), followed by a deferral to the offer of the doctor to get tested (4%) (Table 3). Only five (2%) students agreed to be tested because they were worried they might be infected with HIV. The only female student who opted out of testing adduced her decision to not being ready yet to know her HIV status (Table 3).

HIV testing history of the students

When asked if it was important that every student gets tested for HIV, 249 (98.8%) responded in the affirmative. However, only 24 (9.5%) of the 252 students had ever been tested for HIV prior to the study, irrespective of what the motive of the testing was,

while 228 (90.5%) had never been tested (Table 4); seven (3.1%) had been tested in connection with blood transfusion and 17 others (6.7%) for a variety of different reasons. Twenty one (8.3%) students ever tested only once before while one student each (0.4%) had ever tested twice, thrice and five times. During their last episode of HIV testing, only one student was previously tested using a rapid home-based test kit; 17 (6.7%) had blood tests that returned results within 24 hours while five students (2%) had a blood test that provided results within a few days.

HIV-related risk behaviour

The prevalence of HIV-related risk behaviour was low among the study participants. Only one student each reported a lifetime use of alcohol and marijuana respectively, while no student reported the use of cocaine or other illicit drugs. Sixty-six (26.2%) students reported being sexually experienced, with age at first sexual intercourse ranging between 10 and 27 years, while only 19 (7.5%) reported that they were currently sexually active (results not shown). Twenty-four (9.5%) students reported a history of unprotected sexual intercourse in the 12 months preceding the survey, 36 (14.3%) reported having had at least two lifetime sexual partners while nine students gave a history of having had four or more lifetime sexual partners.

Barriers and facilitators to opt out HIV testing and counselling

Although acceptance rate for opt-out HIV testing was remarkable among the study participants, some potential barriers to the implementation and scale-up of the programme were identified. These included the waiting time of clients prior to testing due to the large numbers who accepted testing and the inadequate

Table 2 Percentage distribution of acceptance of HIV 'opt-out' testing by sex among students of the Obafemi Awolowo University

HIV test acceptance status	Sex			
	Male	Female	Total	
Accepted testing	142 (100%)	109 (99.1%)	251 (99.6%)	<i>Fisher's exact probability = 0.44</i>
Refused testing	0 (0%)	1 (0.9%)	1 (0.4%)	
Total	142 (100%)	110 (100%)	252 (100%)	

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I was afraid of losing my job/friends/insurance	5	2.2
No response	31	13.6

the general students' population (as there was no guarantee anyone randomly selected will eventually utilise the health centre for services) nor even from students visiting the health centre (because all clients who visit any health facility should ideally be offered PITC by design). Yet the study participants did represent what a typical sample of PITC clients should be under natural conditions, i.e. clients involved in the physician-patient encounter, irrespective of the motive behind the patient's visit to the health facility. It was desirable to invite all the students who presented at the health centre daily during the two-week lifespan of the study to participate. But as resources (especially the OraSure test kits) were limited, the number of participants had to be kept within the range of the sample size calculated. Besides, while the health centre opens to students 24 hours a day, study personnel were only available for eight hours during the day and they could only recruit a proportion of all eligible students.

Strengths and weaknesses in relation to other studies

To the best of our knowledge, there are no studies of the provider-initiated 'opt-out' HIV testing programme in the literature in Nigeria. However, our findings on the uptake of the strategy by the study population compares favourably with those from other African countries as has been earlier cited^{16,27,28}.

Only 24 students or 9.5% of our sample had ever been tested for HIV prior to the study, irrespective of the motive for testing. This was slightly lower than the national average percentage ever tested of 13% among never married men and women in Nigeria that was reported in the 2008 Nigeria Demographic and Health Survey (NDHS)³⁴ and much lower than the figures reported by other African countries where 'opt-out' testing has been institutionalised such as Botswana (40%)²⁰ and Uganda (19%)²⁷. This was not a surprising finding as the gains of routine 'opt-out' testing have been widely documented to include an increase in the proportion of individuals who are aware of their HIV status, thereby reducing 'HIV exceptionalism'.

Even though young people are generally believed to experiment with sex and engage in high risk sexual behaviours that may predispose them to contracting HIV, the prevalence of HIV-related sexual behaviour was low among the study participants, none of whom subsequently tested positive for HIV. This might not

be unconnected with the fact that 69% of our sample comprised freshmen, who might not have been properly integrated into the social networks of the university, and may therefore largely be primary or secondary abstainers from sex. This fact, nonetheless, does not make them less fit for recruitment into a study of PITC uptake as has been earlier discussed. Furthermore, studies from other African countries with high prevalence of HIV and sexually active study populations have also revealed almost universal acceptance of PITC^{16,27,28}. Besides, the sexual behaviour of our study participants was not an isolated finding. Daniyam et al., assessing the sexual demeanour of senior medical students in Jos University, Nigeria, found that 62% of them had never had sex, and less than 30% were sexually active; 6% had multiple sexual partners and only 1.9% practised homosexuality³⁵. Above all, whether the whole student population (that comprises both senior students and freshmen) will overwhelmingly accept PITC as the present sample did can only be verified in future studies of PITC uptake among Nigerian students.

Meaning of the study and implications for policy

Although our study findings revealed almost universal acceptance of HIV testing using the rapid 'opt-out' testing approach, there were still potential barriers to implementation which would have substantially reduced the proportion of study participants who finally submitted to testing, but for the tenacity of the study personnel. Top on the list of barriers was client's waiting time before testing due to busy clinic schedules and inadequate numbers of medical personnel. Study participants who came to the health centre for entirely different reasons but eventually accepted to be tested for HIV did not see any reason why they should spend extra time waiting to be tested and several of them got impatient and wanted to leave. At the same time, the consulting and laboratory staff at the university health centre also expressed concern about the extra burden of work the introduction of routine HIV testing will translate into their already busy routines, and such fears have always been expressed about PITC programmes since inception³². Beyond the consulting staff introducing the subject to the students and referring them to the laboratory for testing, the study personnel saved the situation by bearing the burden of testing of the study participants. We suspect that

and their relatives. The study revealed a test acceptance rate of 98%, and 81% of those tested had not been previously tested²⁷. Similarly, in western Kenya, an emergency department-based routine PITC programme demonstrated a 97% testing acceptance rate with 82% of HIV-infected patients attending their first post-test follow-up clinic visit²⁸. Figures from the South African study of the early introduction of routine 'opt-out' HIV testing into the antenatal clinic as part of the prevention of mother-to-child transmission of HIV also revealed an acceptance rate of 95%¹⁶. Other available studies from Zimbabwe and Botswana^{19,20} did not include opt-out HIV testing but only investigated the attitudes of the population to 'opt-out' testing and evaluated the determinants of testing. However, it must be pointed out that almost half of our sample was not made out of sick patients but of university freshmen who came to the health centre only to officially register with the university health services. Whether the general population of patients (in-patients, out-patients, young and old) in Nigeria will overwhelmingly accept PITC as the sample of university students did in this cross-sectional study is still a subject of further research in future randomised controlled trials.

Strengths and weaknesses of the study

Some authors have questioned the ethical implications of implementing PITC in health facilities and expressed concerns that routine opt-out approaches to HIV testing pose human rights challenges^{20, 29-31}. Others have also raised the concern that patients might be intentionally or unintentionally coerced into accepting HIV testing given the substantial social status of health providers in many societies and that patients cannot really opt-out of PITC sessions³². This, it is said, makes it difficult to interpret the success of 'opt-out' programmes where the vast majority of patients agree to be tested. Yet, others have expressed fears that aggressive testing in health facilities will decrease care seeking in general following the introduction of PITC for HIV, in order to avoid testing³². In this study, it is very unlikely that the participants overwhelmingly agreed to uptake opt-out testing because of coercion. They were asked if it was important for every student to get tested for HIV and 99% answered in the affirmative. When further invited to partake in PITC but with the option of opting out,

the question mostly asked by the participants was whether the test was going to be free of charge and painless. Once they got the assurance that the test was free and would cause neither physical pain nor discomfort, a lot of them remarked that it was an opportunity to get tested, bearing in mind that about 25% of the study participants who had never tested for HIV before reported that they never tested because they did not know where to go for testing. This might not be unconnected with the fact that about half of the respondents were freshmen who might not have been acquainted with the operations of the university health centre and the availability of VCT services there. Furthermore, when asked the reasons for accepting HIV tests, 234 (93%) respondents reported that they just wanted to know their HIV status and only 10 (4%) remarked that they accepted testing in deference to their doctors.

In this study, we upheld and adhered to the best standards for counselling and testing to prevent any form of coercion, but we may not know to what extent the high rate of acceptance of testing represents an accurate surrogate for favourable clients' perceptions of PITC, since several factors have been documented to confound a patient's decision making at the point of HIV testing^{29,33}. Unfortunately, the available literature on the implementation of PITC programmes also reported that there are currently no data documenting health facility attendance after the roll out of PITC, and there is only very little documentation of actual patient and community perceptions of particular PITC projects, or their willingness to present for general medical care after PITC roll-out^{20,32}. We therefore suggest further research into the subject of PITC implementation in Nigeria and the post-implementation evaluation of such projects, including patients' perceptions of routine HIV testing in health facilities.

Our serially recruited sample may be small and unrepresentative of either the total population of students at the Obafemi Awolowo University, or even the population of students attending the health centre daily, it nonetheless sufficed for the purpose of the study and demonstrated that uptake of PITC is feasible in the study 'cohort'. The sample (as in most other studies of uptake of PITC)^{16,27,28} was purposively selected, being part of students who presented for care services at the health centre while the study lasted. They could neither have been randomly selected from

the general students' population (as there was no guarantee anyone randomly selected will eventually utilise the health centre for services) nor even from students visiting the health centre (because all clients who visit any health facility should ideally be offered PITC by design). Yet the study participants did represent what a typical sample of PITC clients should be under natural conditions, i.e. clients involved in the physician-patient encounter, irrespective of the motive behind the patient's visit to the health facility. It was desirable to invite all the students who presented at the health centre daily during the two-week lifespan of the study to participate. But as resources (especially the OraSure test kits) were limited, the number of participants had to be kept within the range of the sample size calculated. Besides, while the health centre opens to students 24 hours a day, study personnel were only available for eight hours during the day and they could only recruit a proportion of all eligible students.

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these potential barriers will remain in other PITC projects in the country and should be given adequate consideration in the planning stages.

Because the test is likely to be free and the acceptance rate high, there must be adequate planning, including the deployment of sufficient numbers of medical personnel (doctors, nurses and laboratory staff) in anticipation of programme implementation. Previous investigators of 'opt-out' HIV testing in Zimbabwe¹⁸ and Botswana²⁰ had similarly expressed such concern for staffing as PITC projects were implemented. The situation in most primary and many secondary health facilities in Nigeria whereby there is only one consulting physician and one or no laboratory staff to provide laboratory services will be most inadequate for the enforcement of PITC services. The staff must also be sufficiently motivated to deliver the services, no matter how routinely integrated into everyday care PITC programmes become. Test kits must be of the rapid nature, giving results within 20 minutes to reduce patient waiting time, and they must be provided free as the participants in this study had expressed.

Unanswered questions and future research

We conclude that although previous uptake of client-initiated voluntary counselling and testing for HIV was generally low among the study participants,

provider-initiated (opt-out) testing was acceptable and quite feasible among them, and it may hold the prospect for rapidly increasing the coverage of HIV testing and other preventive interventions among university students in Nigeria. Because a sizeable proportion of our study participants were freshmen who did not exhibit sexual behaviours typical of young undergraduate men and women, we would not know if the general population of students, and indeed the larger population of Nigerians, will overwhelmingly accept PITC as the study sample did. We therefore suggest further studies of PITC uptake among the various segments of the Nigerian population.

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