



Original Article

Uptake of HIV Testing: Assessing the Impact of a Community-Based Intervention in Rural Nigeria

Adoption du test de dépistage du VIH : évaluation de l'impact d'une intervention communautaire dans le Nigeria rural

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ABSTRACT

Background. Voluntary counselling and testing (VCT) are the entry point for HIV/AIDS prevention and control for many community-based intervention programs. These VCT services are usually provided by Health care facilities. This study aims to assess the uptake of testing as a result of community-based intervention programs in a Nigerian rural community. **Methodology.** Quantitative survey that using a structured questionnaire among a sample of the general population aged 15 – 49 years. Demographic data (age, sex, education, occupation, marital status) and information related to HIV testing were sought. Data were analyzed using SPSS 25.0. **Results.** There were more male's respondents (53.3%, baseline and 54.2%, post-intervention survey). The level of awareness of the availability of VCT services increased from 65.1% and 63.8% in males and females at the baseline survey to 89% and 87% in the post-intervention survey. The willingness to have HIV tests was relatively high in both surveys. overall, 16.1% have been tested in the baseline survey, this increased to 32.4% due to the intervention program. Before the interventions, the majority of the villagers were willing to do an HIV test because they only wanted to know their status and some just to reduce fear and anxiety. Intervention changes these perceptions as respondents in the intervention arm were willing to take up the test for marriage purposes and to know their status. Those that were unwilling to get testes were either not at risk or did not see any benefit in knowing their HIV status. The case was different after the intervention because the majority have been tested while there was a drastic decline in the number of those who think they were not at risk. **Conclusion.** This study found that the community-based health intervention in Bonny Island significantly contributed to the improved knowledge of VCT, willingness to get tested, and HIV testing uptake. More intervention programs towards the prevention of the spread of HIV in Nigeria is advocated.

RÉSUMÉ

Introduction. Le counselling et le test volontaires (CTV) sont le point d'entrée pour la prévention et le contrôle du VIH / SIDA dans de nombreux programmes d'intervention à base communautaire. Ces services sont généralement fournis par les établissements de santé. Le but de cette étude était d'évaluer l'utilisation des tests à la suite des programmes d'intervention à base communautaire dans une communauté rurale nigériane. **Méthodologie.** Il s'agissait d'une enquête quantitative qui a utilisé un questionnaire structuré auprès d'un échantillon de la population âgée de 15 à 49 ans. Nous avons recueilli des informations démographiques (âge, sexe, éducation, profession, état matrimonial) et des informations relatives au dépistage du VIH. Les données ont été analysées à l'aide de SPSS 25.0. **Résultats.** nous avons interrogé plus d'hommes (53,3%, base et 54,2%, enquête post-intervention) que de femmes. Le niveau de sensibilisation à la disponibilité des services de CTV est passé de 65,1% chez les hommes et 63,8% chez les femmes à 89% et 87% respectivement après l'intervention. La volonté de subir des tests de dépistage du VIH était relativement élevée dans les deux enquêtes. Dans l'ensemble 16,1% de sujets ont été testés avant intervention, et 32,4% après. Avant intervention, les motifs du dépistage étaient la connaissance du statut ou la réduction de la peur et l'anxiété. Après l'intervention les motifs étaient le désir de mariage et la connaissance du statut. Ceux qui refusaient le test n'étaient pas à risque ou ne voyaient aucun avantage à connaître leur statut VIH. Après l'intervention, la majorité d'entre eux ont été testés alors qu'il y avait une baisse du nombre de ceux qui pensaient qu'ils n'étaient pas à risque. **Conclusion.** L'intervention de santé communautaire à Bonny Island a contribué à l'amélioration des connaissances sur le CTV, la volonté de se faire tester et l'adoption du dépistage du VIH. Davantage de programmes d'intervention visant à prévenir la propagation du VIH au Nigeria sont préconisés.

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INTRODUCTION

The reasons for setting up HIV testing programs is to allow those that are not aware of their status as well as those who are at risk of HIV to get tested and get connected to HIV prevention, treatment and care services (1,2). Its goal is to ensure that 90% of all people living with HIV (PLWH) are aware of their status by the year 2020, as stipulated in the UNAIDS' 90-90-90 Fast-Track Targets (1). Globally, about 75% of all HIV infections were diagnosed in 2017 (3,4) but the Middle East and North Africa, and in West and Central Africa had the least performances (1). In 2017, just 50% and 48% of the PLWH in these regions were aware of their (3). West Africa is far behind Western and Central Europe and America who are the closest to achieving 90% testing coverage with 86% of PLWH aware of their status by the end of 2016. Next to them are the East and Southern Africa with 81%, Latin America 77%, Asia 74%, Caribbean 73%, and Eastern and Central Europe with 73% coverage in 2017 (3). However, knowledge of HIV status in West and Central Africa increased fourfold from 2012 - 2016 compared to awareness from 2007 - 2011; better than the East and Southern Africa with two-fold over the same period (4).

A considerably high number of people who are most at risk of HIV are not accessing HIV testing (1). This is the reason for a very low positive test (3%) reported from 81 low- and middle-income countries between 2010 and 2014 (5).

Fear of stigmatization (6–9), being badly treated or lack (6,10,11) of confidentiality by healthcare workers (8)(12), or fears over HIV test confidentiality (9,13–15) are major obstacles to HIV testing among people. The criminalization and stigmatization some people such as the lesbian, gay, bisexual, transgender or intersex (LGBTI) (7), people abuse drugs (10,11), other men who have sex with men (12,16), people who sell sex (7,17) and sexually active adolescents (7), also stands as barriers to testing because they don't want to identify themselves to avoid ill-treatment and extortion (9,18). It was reported in a study on the factors preventing HIV testing in sub-Saharan Africa that the perceived psychological burden of living with HIV, cost of HIV testing (direct or indirect), gender inequality (women not free to decide on whether to get tested or not) were the major barrier to HIV testing (9).

Nigeria is yet to meet up with the 90% coverage of all PLWH and the number of recommended HIV testing and counselling sites as many people living with the diseases are still unaware of their status (1). Testing rate is very low in Nigeria; only 34% of adults living with HIV in Nigeria were aware of their status in 2018 (19), while just 15.1% of people aged 15-49 years knew their status in 2019 (20). This is far below the goal of reaching the UNAIDS target of 90% PLWH knowing their status by 2021.

The rate of HIV testing in Nigeria is low because only 60.4% of women and 70.8% of men knew where they could go for HIV tests in the country (21). The low rate of testing in Nigeria is not unconnected to some challenges such as problems with testing kits and

logistics challenges getting further supplies (20). Another challenge is the general belief that there are no separate testing centres for people who do not know their status but rather the HIV testing and counselling (HTCs) centres where the PLWHA also go to access care services (11).

Recently, Nigeria through the Minister of Health adopted self-testing and the country released policies that allow for self-testing, these testing kits are only available in some parts of the country (22). Voluntary counselling and testing (VCT) are the entry point for HIV/AIDS prevention and control for many community-based intervention programs. These VCT services are usually provided by Health care facilities in the communities. This study aims to assess the uptake of testing as a result of community-based intervention programs in a Nigerian rural community.

METHODOLOGY

This study was conducted on Bonny Island. The Island has been a popular business area over 400 years ago and this can be seen in its ethnic diversity. Bonny Island is located on the coast of Rivers State, occupying an area of 2.72 sq. km. along the eastern coastal line of the Niger Delta area in southern Nigeria. It is a traditional Kingdom characterized by simple rural life with an estimated 30,000 native Ibani people. In 2006, the Society for Family Health conducted the Ibani-Se HIV/AIDs pre-intervention survey which was used as an ideal document in the initiation of a three years (2008-2011) intervention program. To respond to the growing spread of HIV and AIDS, the Ibani-Se HIV/AIDS Initiative was formed as a non-governmental public-private partnership by the Bonny Community, the Joint Industries Companies (NLNG, SPDC & ExxonMobil), Merck Sharpe & Dohme, and Nigerian Government agencies at Federal and State levels (the National Agency for the Control of AIDS and the Rivers State Action Committee on AIDS) to respond to the HIV/AIDS situation in the Bonny Kingdom. The Initiative, in September/October 2006 conducted a Baseline Survey to evaluate the Knowledge, Attitudes, Practices and sexual behaviours of the target audience towards HIV prevention.

Critical to the development of any successful intervention program is putting in place a monitoring and evaluation process. This survey of HIV/AIDS-related information was important to create an effective HIV/AIDS intervention in the Island, accurate baseline data were obtained from the different risk and work-related groups. The interventions include enlightenment programs, training, free tests and logistics supplies. After three years of intervention, the effectiveness or benefit of the various kinds of interventions was assessed on key elements on knowledge, attitudes and practices and beliefs using information extracted from this post-intervention survey.

This quantitative survey employed a structured questionnaire among a representative sample of the general population aged 15 – 49 years. Also, data

collected from the household listing formed the basis for systematic and proportional sampling allocation and the sampling frame for the respondent's selection. Also, the availability of such vital statistics would be relevant for subsequent program planning and intervention. Data were inputted with CPro and transferred to SPSS version 20 for analysis. The following formula was used to determine the sample size for the target group (persons with multiple non-marital partners).

$$n = D \frac{\left[\sqrt{2P(1-P)Z_{1-\alpha}} + \sqrt{P_1(1-P_1) + P_2(1-P_2)Z_{1-\beta}} \right]^2}{\Delta^2}$$

Where: D = design effect; P_1 = the estimated proportion at the time of the first survey;

P_2 = the proportion at some future dates such that the quantity $(P_2 - P_1)$ is the size of the magnitude of change it is desired to be able to detect; $P = (P_1 + P_2) / 2$; $Z_{1-\alpha}$ = the z-score corresponding to the probability with which it is desired to be able to conclude that an observed change of size $(P_2 - P_1)$ would not have occurred by chance; and $Z_{1-\beta}$ = the z-score corresponding to the degree of confidence with which it is desired to be certain of detecting a change of size $(P_2 - P_1)$ if one occurred.

$$\alpha = 0.05 \quad (Z_{1-\alpha} = 1.96)$$

$$\beta = 0.20 \quad (Z_{1-\beta} = 0.84)$$

To determine the necessary sample size, and detect a change of at least 14 percent among people with multiple sexual partners and condom users within such relationships over a while when another survey will be conducted to assess program impact. We assumed $P_1=0.5$ which implies that $P_2=0.5 + 0.14$., the design effect is estimated at 1.5 for the cluster design to be used to sample the target groups. The level of precision is set at 0.05. Application of the above formula yields a sample size of 102 for each ward. Given a total of 12 wards in the entire Bonny Local government area, the total sample yield for the KAPB among the general population was $12 * 101=1212$ but 1215 were sampled. A sample of 1,379 persons 1,215 among the general population was selected for the general population. The procedure allows all eligible respondents in the local government to have equal probability (equal chance) of being selected for the survey.

Ethical approval was obtained from the National Health Research Ethics committee (NHREC), Federal Ministry of Health for the seroprevalence aspect of the study. Additionally, in line with the National Guidelines for mobile Voluntary Counselling and Testing (VCT), the respondents' informed consent was sought and signed before the test was administered. Respondents also had the option of opting out or up taking the test after the counselling process and confidentiality was strictly preserved with the client not forced to give out names as their VCT forms were assigned codes. Although the code was linked to the questionnaire number, however, this has no link to the person and confidentiality was guaranteed.

RESULTS

Socio-Demographic Profile of Respondents

This section attempts to compare the socio-demographic characteristics of the pre and post-intervention survey population. These background characteristics include age, sex, level of education, occupation, marital status. Knowledge of these background characteristics will enhance the understanding of the factors that are likely to reduce the spread of HIV infection. The study surveys were in two groups the first (pre-intervention) and the second (post-intervention) survey.

This study comprised male's respondents (53.3%, first and 54.2%, second survey), females (46.7%, first and 45.7%, second). More of the respondents had secondary education (54.7%, first and 61.5%, second), also more of the respondents were ever married (51.2%, first and 52.5%, second) than singles (48.8%, first and 44.2%, second) in both surveys.

Knowledge of where to get an HIV Test

In this survey, the respondents were asked if they knew of a place where they could get an HIV test. This was to assess the knowledge of the availability of VCT services in the community as compared in both surveys. The result below shows that the level of awareness of the availability of VCT services centre has tremendously increased from 65.1% and 63.8% in males and females at the first survey to about 89% and 87% in the second or post-intervention survey. It is noteworthy that this progress was evidenced in all age groups and across the various levels of education. The knowledge of VCT was increased with an increased level of education as shown in Table 1.

Table 1: Respondents who knew where to get an HIV test by socio-demographics

Characteristics	First survey		Second survey	
	%	Total	%	Total
Gender of the respondent				
Male	65.1	1019	88.9	585
Female	63.8	894	86.5	495
Age group				
15-24 yrs	61.7	794	83.4	338
25-34 yrs	69.7	630	89.7	341
35 yrs and above	62.9	450	90.0	400
Highest level of education				
No formal education	44.8	125	48.6	35
Primary	50.3	584	79.4	136
Secondary	72.0	1029	89.2	669
Graduate	81.7	109	94.4	177
Postgraduate	80.6	62	95.8	24
Marital status				
Single	65.6	931	90.8	478
Ever married	63.5	978	85.3	572
Total	64.5	1913	87.7	1,080

Respondent's willingness to get tested

Further to the knowledge of where HIV testing is available, respondents were asked if they were willing to take up HIV test. The results as presented in Table 2 shows that the willingness to have HIV tests was relatively high and the same in both surveys

Respondents who have been tested for HIV

The result of the baseline survey shows a very low proportion of the respondents who have been tested for HIV in both males and females and across all age groups though slightly higher among young adults aged 25-34 years (23.5%) as compared to other age groups.

Table 2: Respondents who would like to have an HIV test and has never been tested by socio-demographics

Characteristics	First survey		Second survey	
	%	Total	%	Total
Gender of the responden				
Male	75.4	1019	71.1	575
Female	69.9	894	71.6	497
Age group				
15-24 yrs	74.8	794	72.2	313
25-34 yrs	73.0	630	72.8	320
35 yrs and above	69.8	450	68.0	381
Highest level of education				
No formal education	66.4	125	65.5	29
Primary	72.9	584	75.3	85
Secondary	73.1	1029	73.5	423
Graduate	73.4	109	63.1	111
Postgraduate	79.0	62	53.8	26
Marital status				
Single	75.6	931	75.4	480
Ever married	70.4	978	68.4	569
Total	72.7	1913	71.4	1,072

The proportion of those who have been tested also increased with an increase in the level of education from 4.8% among uneducated respondents to 41.1% among graduates. A higher percentage of married (17.5%) respondents have also been tested than the single (14.5%). The post-intervention survey shows that a higher percentage of the villagers have been tested than the baseline survey. A higher number of adolescents (26.3%) got tested than older ones. Also, more of

respondents who attained secondary (36.5%) got tested than all other education levels (Table 3).

Respondents' willingness to take up HIV counselling and testing

Following the response of respondents about their willingness to have an HIV test, the reasons for desiring an HIV test are presented in Table 4. Before the interventions, the majority of the villagers were willing to do an HIV test because they only wanted to know their status and some just to reduce fear and anxiety. The survey after the intervention shows that the majority wanted the test for marriage purposes and to know their status. Also, more people would do HIV test to reduce fear and anxiety and for employment purposes than in the baseline.

Table 3: Socio-demographic distribution of the uptake of HIV testing

Characteristics	First survey		Second survey	
	%	Total	%	Total
Gender of the respondent				
Male	16.3	1019	31.9	174
Female	15.8	894	32.8	161
Age group				
15-24 yrs	10.7	794	26.3	103
25-34 yrs	23.5	630	22.7	99
35 yrs and above	15.8	450	25.1	133
Highest level of education				
No formal education	4.8	125	1.2	13
Primary	8.2	584	6.9	38
Secondary	17.9	1029	36.5	199
Graduate	41.3	109	13.2	58
Postgraduate	37.1	62	2.7	10
Marital status				
Single	14.5	931	23.6	126
Ever married	17.5	978	37.6	192
Total	16.1	1913	32.4	335

Table 4: Respondents desire to have an HIV test.

Demographic Characteristics	First survey				Total	Second survey				Total
	To reduce fear & anxiety	Required for employment	For marriage purposes	Want to know my HIV status		To reduce fear and anxiety	Required for employment	For marriage purposes	Want to know my HIV status	
Gender of the respondent										
Male	16.9	1.4	1.7	86.8	768	27.2	21.0	70.6	54.1	565
Female	15.5	0.2	1.4	87.0	625	18.2	19.6	76.0	50.0	473
Age group										
15-24 yrs	14.3	0.7	1.9	90.1	594	22.3	35.7	93.3	21.4	331
25-34 yrs	18.0	1.1	1.7	83.9	460	19.6	22.0	76.4	55.0	333
35 yrs and above	17.2	1.0	0.6	86	314	26.8	18.3	69.5	55.9	373
Highest level of education										
No formal edu.	13.3	0.0	0.0	86.7	83	21.4	35.7	93.3	21.4	25
Primary	14.6	0.7	0.9	85.4	426	25.6	24.4	81.0	41.0	143
Secondary	17.6	1.1	1.5	88.2	752	22.5	20	73.3	55.2	676
Graduate	17.5	1.3	6.3	86.3	80	26.1	20.5	63.7	56.9	158
Postgraduate	16.3	0	4.1	81.6	49	8.3	7.7	50.0	46.2	14
Marital status										
Single	16.5	1.1	2.3	87.2	704	23.8	20.8	72.3	54.5	479
Ever married	16.1	0.6	0.9	86.6	689	22.5	18.9	72.6	50.3	528
Total	16.3	0.9	1.6	86.9	1393	21.2	23.7	76.2	47.6	1,038

Table 5: Respondents who would not like to have an HIV test and reasons for not desiring the test

Characteristics	First survey					Second survey				
	Have already been tested	Nothing you can do about AIDS	I don't think I'm at risk	Can't see any benefit in knowing my status	Total	Have already been tested	Nothing you can do about AIDS	I don't think I'm at risk	Can't see any benefit in knowing my status	Total
Gender										
Male	10.3	3.2	56.6	56.6	251	61.5	10.4	36.3	18.7	588
Female	9.6	2.2	57.6	57.6	270	68.3	13.9	44.2	14.5	567
Age group										
15-24 yrs	7.9	2	61.5	17.5	200	55.3	12.1	41.5	11.5	375
25-34 yrs	14.1	5.3	51.8	19.4	170	76.8	11	42.1	15.8	324
35 yrs and above	8.1	0.7	56.6	23.5	136	63.2	13.1	37.7	21.6	456
Highest level of education										
No formal education	0	2.3	57.1	28.6	42	30.8	8.3	42.9	0	39
Primary	5	1.9	69.6	13.3	158	60.5	20	42.9	29.2	115
Secondary	12.6	3.2	51.3	22.4	277	61.3	13.8	41.3	21.5	696
Graduate	24.1	3.4	48.3	10.3	29	75.99	8.7	37.3	4.4	200
Postgraduate	15.4	0	46.2	23.1	13	90.0	0	55.6	0	36
Marital status										
Single	9.2	4.4	57.3	15.4	227	62.7	10.1	41.2	17	421
Ever married	10.7	1.4	56.7	2.5	289	65.6	14	40.7	17	675
Total	9.9	2.7	57.1	57.1	523	66.4	12.2	40.3	16.6	1,155

Respondents reasons for not willing to take up HIV counselling and testing

While some respondents' were willing to be tested for various reasons, some were not willing. When we inquired into the reason/s, the majority, especially the uneducated believed they were either not at risk or did not see any benefit in knowing their HIV status, so no reason to be tested. The case was different after the intervention because the majority have been tested while there was a drastic decline in the number of those who think they were either not at risk or did not see any benefit of knowing their status

DISCUSSION

Knowledge of where to get an HIV Test and willingness to get tested

This study aims to assess the uptake of testing as a result of community-based intervention programs in a Nigerian rural community. We found an improved level of knowledge of VCT service centres among the respondents as a result of the community-based intervention program. This improvement was observed across all ages, sex, education and occupation.

The respondents in both surveys showed a relatively high desire to get tested. Studies have reported

Respondents who have been tested for HIV

This study discovered a very low update of HIV testing among the baseline respondents and significant improvement after the intervention arm. Such low uptake of HIV testing without intervention have been reported in Nigeria some parts of Africa. For example, a study conducted among reported that only 43.7% of the respondents have been tested for HIV (23). Another study among men who had sex with men in Nigeria

revealed a very low testing uptake among this group which was as low as 28.5% and 17.5% in twelve and six months respectively (15). Similar low uptake (30.4%) was reported among university students in Nigeria (24). In a study conducted in another rural community in Rivers State, Nigeria, it was discovered that 13.6% of the respondents who had unprotected sexual exposures within the past 12 months have been tested (8) while a study that compared rural and urban settings found no difference in the uptake of HIV testing (25). Similarly, Also, VCT service utilization was reportedly low in Ethiopia with only 20% and 21% uptake among women and men respectively in Ethiopia (26). The implication of this is that many PLWHA would not be aware of their status.

The increased uptake of HIV testing found in our study might be due to the free and community testing made available during the intervention period while the poor testing uptake in the baseline might be a result of the distance to health facilities or testing centres. A similar increase in testing uptake has been reported in South Africa in a home testing intervention program (27). Also, distance to health facilities is an important barrier to HIV testing in some African rural communities (28). More adolescents (26.3% as against 10.7% in the baseline) took up HIV testing in the intervention arm and higher than the number of adults who took up the test. Also, the percentage of the uneducated who took up the testing in the intervention arm was significantly higher than the baseline. Overall, the uptake of HIV testing in the intervention arm was twice as high as the uptake in the baseline survey. It has been noted that adolescents and young adults are willing to take up HIV testing and other available health services than adults (11).

Respondents' willingness to take up HIV counselling and testing

We found a change of orientation of the community residents as a result of the intervention program. In the baseline survey, the major reasons for willing to take up HIV testing were to know their status and to reduce fear and anxiety. The post-intervention survey, however, revealed that they were not just willing to know their status, they also wanted to avoid getting married to HIV positive partners though more people were willing to be tested to reduce fear and anxiety than the baseline. The improved willingness to take up HIV test in the post-intervention survey could have been influenced by people's trust in the health care system and providers. A similar finding has been reported in sub-Saharan Africa (9). It can also be attributed to the increased awareness of the risks of HIV as a result of the intervention program. A similar study has reported that untested and unmarried people were more willing to be tested for marriage reasons than for other reasons (9). Our finding is in line with previous studies that have found an association between willingness to uptake HIV testing and the fear of being at risk of HIV (29).

The proportion of the population who were unwilling to take up HIV testing did so for various reasons, especially the uneducated; they opined that they were not at risk of contracting HIV. Some did not even see any benefit in knowing their HIV status. However, the impact of the intervention program was conspicuously felt in the responses we got in the post-intervention survey. This impact was seen in the proportion of those who have been tested after intervention as it has risen from 9.9% in the baseline to 66.4% in the final survey. There was also a sharp decline in the number of those who did not see any benefit of knowing their status from 57.1% in baseline to 16.6% in the intervention arm. Such decline was also observed in the number of those who believed they were not at risk from 57.1% baseline to 40.3% post-intervention. A study conducted in China reported reasons for unwillingness to take up HIV testing as the stigma associated with the testing as well as no perceived benefit of testing (16) while some believed they were healthy and could not be HIV positive (11).

CONCLUSION

This study found that the community-based health intervention in Bonny Island significantly contributed to the improved knowledge of VCT and HIV testing uptake in the community. There was also a significant improvement in the willingness to take up testing in the community. We, therefore, advocate for more intervention programs towards the prevention of the spread of HIV in Nigeria. This will enable the country to actualize the goal of reaching the UNAIDS target of 90% PLWH knowing their status by 2021.

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