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Willingness to pay for highly active antiretroviral (HAART) drugs and HIV treatment monitoring tests among People Living with HIV/AIDS in Enugu State, Nigeria

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RESEARCH

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ABSTRACT

Background
The HIV treatment programme in Nigeria is from international donors and this may come to an end soon.

Aims
To assess the willingness to pay for antiretroviral drugs and HIV treatment monitoring test among people living with HIV/AIDS in Enugu state, Nigeria.

Methods
A descriptive cross sectional study design was used. A two stage sampling technique was used to select 400 people who were receiving antiretroviral treatment in two of eight comprehensive treatment centres in Enugu, Nigeria. Willingness to pay was elicited via the contingent valuation method.

Results
Mean age of respondents was 36.6±10.0 years and male, female ratio of 1:1.2. The median willingness to pay for antiretroviral drugs and HIV treatment monitoring test was 500 Naira (USD 3.1) per month. Majority, 85.3 per cent were willing to pay however only a minor proportion, 1.8 per cent were willing to pay the actual amount for the services Predictors of respondents willingness to pay included being in low socio-economic group, (AOR 0.3, 95 per cent CI:0.2-0.7) and being on salaried employment, (AOR 3.0, 95 per cent CI:1.1-8.9).

Conclusion
Majority of people living with HIV/AIDS were willing to pay for antiretroviral drugs and HIV treatment monitoring tests but only a minor proportion were willing to pay the actual cost of services. This may adversely affect continuity of treatment and enrolment of new patients into the treatment programme. In-order to sustain the gains of the HIV treatment programme and achieve optimal treatment outcomes for patients on treatment in Nigeria there may be the need to subsidize antiretroviral treatment services for people living with HIV/AIDS.

Key Words
Willingness to pay, contingent valuation, antiretroviral treatment, HIV/AIDs, Enugu state, Nigeria

What this study adds:

1. What is known about this subject?
Nigeria has the second largest burden of HIV globally. The HIV treatment programme in Nigeria is largely donor driven.

2. What new information is offered in this study?
Majority of respondents were willing to pay for antiretroviral drugs and HIV treatment monitoring tests but

only a minor proportion were willing to pay the actual cost of the services.

3. What are the implications for research, policy, or practice?

The need to sustain the gains of the HIV treatment programme and achieve optimal treatment outcomes for patients on treatment in Nigeria.

Background

In 2015, an estimated 36.7 million people were living with HIV/AIDS worldwide with 2.1 million new HIV infections.[1] In the same year, the sub-Saharan African region accounted for 46 per cent of all new HIV infections.[1] Estimates by the Joint United Nations Programme on HIV/AIDS, (UNAIDS) has it that in 2015, 19 million people from this region were living with HIV/AIDS of which 10.3 million of them were on antiretroviral treatment.[1] These challenges notwithstanding, the world is committed to ending the AIDS epidemic by 2030 which is one of the targets of the Sustainable Development Goals.

Nigeria bears the second highest burden of HIV globally. The National HIV/AIDS and Reproductive Health Survey in 2012 reported a national HIV prevalence rate of 3.4 per cent.[2] In 2013, the number of people living with HIV/AIDS in Nigeria was 3.2 million,[3] and same time the number of persons requiring antiretroviral drugs was 1.4 million of which only 639,397 (45.7 per cent) were receiving treatment.[3] The eligibility criterion then for commencing antiretroviral treatment was a CD4 count of below 500cells/mm^3.

According to World Health Organization recommendations in 2016, all people living with HIV/AIDS are now eligible for antiretroviral treatment. Therefore the current coverage should be higher. Also, in Nigeria, the HIV funding is largely from international donors with government contribution accounting for 21.4 per cent of HIV funds in 2012.[2] The proportion of funding for HIV/AIDS national response spent on goods and services for people living with HIV/AIDS was 36 per cent.[4]

Within the Nigerian household, HIV infection has economic implications as a high proportion of the people live below the poverty line. Even though most HIV/AIDS services are free, the proportion of household income spent out-of-pocket by households with at least one HIV infected member, in assessing HIV services was 14.5 per cent and this undoubtedly is above the 10 per cent catastrophic threshold.[4] To further buttress the economic impact on households in assessing HIV care services, studies across Nigeria have shown that patients perceive the cost of HIV care and treatment as expensive and unaffordable and that willingness to pay for antiretroviral treatment and related services were suboptimal.[5,6]

The international donor support projects have a life span, many of which are winding up. The donor funds have decreased and there are indications of a national funding gap. Out of pocket payment for user charges though not an ideal financing option may be an inevitable stop gap if the donor funds stop for the beneficiaries who currently receive treatment at no cost to them. It is not certain how much the individual would be willing to pay for antiretroviral treatment within the limits of available resources. This study was designed to assess the willingness to pay for antiretroviral drugs and HIV treatment monitoring tests among people living with HIV/AIDS in Enugu state, Nigeria.

Method

Study Setting: The study was conducted in Enugu metropolis, capital of Enugu state, southeast Nigeria. It is made up of 3 Local Government Areas (LGAs) namely Enugu North, Enugu South and Enugu East LGAs and accounts for 22 per cent of the population of Enugu state.[7] It has a hilly topography with altitudes of about 2,000 meters above sea level at the highest point.[8] It has a total of eight comprehensive HIV treatment centres. The major occupations of the inhabitants are trading and formal employments. The inhabitants are mainly of Igbo ethnic nationality with mixture of other tribes and are predominantly Christains.

Study design: This was a descriptive cross sectional study that employed contingent valuation method with structured haggling technique to elicit willingness to pay for antiretroviral treatment and HIV treatment monitoring test among people living with HIV/AIDS.

Study instrument: The study instrument was a pre-tested interviewer administered questionnaire which was designed by the researchers.

Study participants: The study population were people living with HIV/AIDS who were receiving antiretroviral treatment and laboratory tests for monitoring of HIV treatment free in adult HIV comprehensive treatment centres selected for the study.

Sample size determination: The minimum sample size for the study was determined by the formula used for simple proportions.[9] A total of 400 respondents were included in

the study based on a type 1 error (α) of 0.05, a tolerable margin of error of 0.05 and a proportion of 90 per cent, representing the proportion of respondents willing to pay antiretroviral treatment in India.[10]

Sampling Technique: A two stage sampling technique was employed for the study. In the first stage, a simple random sampling technique of balloting was used to select two out of eight comprehensive HIV treatment centres in Enugu metropolis. In the second stage, a systematic random sampling technique was used to select the respondents as they presented on each day of data collection. The average attendance at the two comprehensive HIV treatment centres in the last six months served as the sampling frame (1,407) and by dividing this population by the sample size of 400, one out of every four individuals was selected. The index person was selected among the first four persons by a simple random sampling technique of balloting using the comprehensive treatment centre register of patients on each day of data collection.

Data collection methods: Data was collected using a pre-tested interviewer administered questionnaire which contained questions on demographic data and variables to elicit willingness to pay. Contingent valuation was used to elicit the willingness to pay using structured haggling technique.[11]Three iterations were used in the haggling depending on the answer to the starting-bid. The final response was an amount that indicated the respondents' maximum willingness to pay. A brief introductory explanation and scenario about antiretroviral drugs and HIV treatment monitoring test and impending withdrawal of donor support with introduction of user charges was provided to the respondents before determining their levels of willingness to pay for the services.

Data analysis: Data analysis was done using IBM Statistical Package for Social Sciences version 20. A socio-economic status index was created with STATA statistical software based on information on household income and ownership of durable household items. Frequency tables and cross tabulations were generated and level of statistical significance was determined by a p-value of <0.05. Multivariate analysis using binary logistic regression was used to determine the willingness of people living with HIV/AIDS to pay for antiretroviral drugs and HIV treatment monitoring tests. Variables that had a p value of <0.2 in bivariate analysis were entered into the logistic regression model to determine the willingness of people living with HIV/AIDS to pay for antiretroviral drugs and HIV treatment monitoring tests. The results were reported using Adjusted Odds Ratio, (AOR) and 95 per cent Confidence Interval.

Results

Table 1 shows the socio-demographic characteristics of the respondents. The mean age of the respondents was 36.6±10.0 years. Majority of the respondents were females, (54.0 per cent) and also married (65.5 per cent). A minor proportion of the respondents (9.3 per cent) had no formal education while 48.8 per cent had secondary education. Majority of the respondents, (55.5 per cent) were self-employed.

Table 2 shows the awareness of the respondents of the HIV treatment objectives. Majority of the respondents (87.3 per cent) were aware that treatment with highly active antiretroviral drugs was not to achieve complete cure and that antiretroviral treatment was lifelong, (76.3 per cent). However a minor proportion of the respondents, (28.8 per cent) were aware of the parameters for monitoring antiretroviral treatment and also the actual cost of monthly antiretroviral treatment (1.8 per cent).

Table 3 shows the willingness of the respondents to pay for highly active antiretroviral drugs and HIV treatment monitoring tests. Majority of the respondents, (90.5 per cent) were willing to pay for highly active antiretroviral drugs however only a minor proportion, (2.5 per cent) were willing to pay the actual prize for monthly antiretroviral drug supply. The median willingness to pay amount for monthly supply of antiretroviral drugs was 500 Naira (USD 3.1). Majority of the respondents, (87.0 per cent) were willing to pay for HIV treatment monitoring tests however only a minor proportion, (2.3 per cent) were willing to pay the actual prize for HIV laboratory tests for the monitoring of treatment. The median willingness amount for HIV treatment monitoring test was 500 Naira (USD 3.1) per month.

Table 4 shows the willingness of the respondents to pay for antiretroviral drugs and HIV treatment monitoring tests. Majority of the respondents, (85.3 per cent) were willing to pay for HIV treatment every month and the associated treatment monitoring tests every six months but only a minor proportion, 1.8 per cent were willing to pay the actual prizes of both services.

Table 5 shows factors that affected the willingness of people living with HIV/AIDS to pay for antiretroviral drugs and HIV treatment monitoring tests. The respondents who were in low socio-economic group were three times less

likely to be willing to pay for antiretroviral drugs and HIV treatment monitoring tests when compared with those who were in the high socio-economic group, (AOR 0.3, 95 per cent CI:0.2- 0.6). Also, respondents who were on salaried employment were three times more likely to be willing to pay for antiretroviral drugs and HIV treatment monitoring tests when compared with those who were self-employed, (AOR 3.0, 95 per cent CI:1.1-8.9).

Discussion

Majority of the respondents were aware that antiretroviral treatment could prolong life and at least one consequence of non adherence to antiretroviral drugs. This is encouraging because they could serve as motivations for people living with HIV/AIDS to seek treatment and possibly influence their willingness to pay for treatment services especially among those who earn moderate to high income. This finding is similar to one from a study in southwest Nigeria where majority of the respondents were aware that antiretroviral therapy would prolong their lives.[5] However, a minor proportion of the respondents were aware of the parameters for monitoring antiretroviral treatment and also the actual cost of antiretroviral drugs monthly. This could be attributed to the availability of free antiretroviral treatment for people living with HIV/AIDS in Nigeria at the time of this study.

The proportion of respondents who were willing to pay for antiretroviral drugs and HIV treatment monitoring tests were similar to that from a study in India.[10] Also, the proportion of respondents who were willing to pay for antiretroviral drugs was higher than those who were willing to pay for HIV treatment monitoring tests in the two studies. This is understandable as antiretroviral drugs could be easily perceived by the respondents as being of better value than treatment monitoring tests especially in the face of scarce resources.

The results of this study reveal that while majority of respondents expressed their willingness to pay for antiretroviral drugs and HIV treatment monitoring tests only a minor proportion of the respondents were willing to pay the actual cost of antiretroviral drugs and HIV treatment monitoring tests. There is evidence that willingness to pay for antiretroviral treatment is cost dependent.[12] This could explain why 40.9 per cent of HIV clients in a study in southwest Nigeria considered antiretroviral treatment expensive hence unaffordable and only 12.9 per cent of the respondents were willing to pay a maximum of 2,000 Naira for a monthly supply of drugs when the actual cost then was 13,000 Naira.[5]

Similarly, in a study in Abakaliki, southeast Nigeria it was found that the mean willingness to pay for antiretroviral drugs was lower than the estimated price.[6] It appears that the willingness on the part of clients to pay amounts less than actual cost of treatment is also manifested in other services related to HIV/AIDS. This is because in a study among undergraduates in southeast Nigeria, half of the respondents were willing to pay for voluntary counselling and testing for HIV and their mean willingness to pay was much lower than the actual cost of the services.[13]

The relatively low amounts the respondents were willing to pay for antiretroviral drugs and HIV treatment monitoring tests have serious implications for care and treatment services for HIV/AIDS in the event that user fees are introduced. If the free treatment programme funded by development partners wind up and patients are required to pay at the point of service for their tests and medicines, many already enrolled in treatment may withdraw. This has been demonstrated in a study in rural Cameroon where majority of the respondents discontinued the use of antiretroviral drugs after six months due to financial constraints.[12] It may also delay enrolment into the treatment programme by new clients and this may increase overall cost of treatment as it has been found that accessing treatment early after diagnosis of HIV has the effect of reducing the total treatment cost for HIV.[14] The natural consequence of withdrawing from treatment or delay in enrolment would be progression to full blown AIDS and perhaps eventual death. Also, while the patients are still alive and sexually active, the potential for new infections may increase and the gains so far recorded in reduction of incidence of HIV may be reversed.

The implication of lower levels of median willingness to pay for medicines and treatment monitoring tests for HIV is that the fund that would be generated from unsubsidized treatment programme may not be able to sustain the programme. The outcome maybe that attendance to clinics would reduce and the low turnover will further impact on the income generation from the programme. Also, quality of care may be compromised, for example a patient who is able to pay for monthly supply of antiretroviral drugs and cannot afford to pay for the treatment monitoring tests may continue to receive treatment but the provider will have no idea of the biological, immunological and biochemical indicators of adverse drug effects and response to treatment. There is therefore an urgent need to prepare for government funding or partial funding of care and treatment services for HIV in the event of winding up of the free treatment programme. In a study in southwest Nigeria,

respondents' suggestions on how to improve patients' ability to pay for antiretroviral treatment services included among others a reduction in cost of drugs and also HIV laboratory tests.[5]

A concern of policy-makers is to protect people from financial catastrophe and impoverishment as a result of use of health services. The World Health Organization is of the opinion that health expenditure is considered as catastrophic whenever it is greater than or equal to 40 per cent of a household's non-subsistence income. This non-subsistence income is defined as the. income that is available to the household after basic needs have been met.[15] Subsidizing the cost of antiretroviral drugs and HIV treatment monitoring tests will go a long way in preventing catastrophic expenditure among people living with HIV/AIDS in Nigeria and other low income countries of the world. This is of relevance as it has been observed that access to HIV treatment services is limited in Africa which unfortunately bears the greater burden of HIV infection.[16] Also, user fees has been recognized as the biggest obstacle to adherence to antiretroviral treatment.[17] Observations like this enabled the World Health Organization to advocate risk pooling prepayment approaches as alternatives to direct payments of medical fees in a bid to increase healthcare coverage.[18] Unfortunately, in Nigeria, only about three per cent of the population who are mainly employees of the federal government are covered by the National Health Insurance scheme,[19] and even at that antiretroviral treatment service is not included in the scope of coverage of the National Health Insurance scheme at presnt.[20]

From the results of our study respondents in high socio-economic group indicated a higher willingness to pay for antiretroviral drugs and HIV monitoring tests when compared with those in the low socio-economic group. On a general note, income has long being identified as a strong determinant of willingness of recipients of health services to pay for such services.[21] In a similar vein high socio-economic status has consistently been related to higher willingness to pay for antiretroviral treatment services as a similar result was obtained among people living with HIV/AIDS in southeast Nigeria.[6] Likewise, in a study in India, socio-economic factors were positively associated with payment capacity for antiretroviral treatment.[14] In another study in India, socio-economic status positively affected willingness to pay for antiretroviral drugs among the respondents,[10] while from a study in rural Malawi, income had a positive effect on willingness to pay.[22] Consequently, financial cost has been recognized as one of the militating factors against willingness to pay for antiretroviral treatment,[12] hence the impression among those in need of antiretroviral treatment that such services are expensive.[5]

Also those who were on salaried employment were three times more likely to pay for antiretroviral treatment and HIV treatment monitoring tests when compared to those who were on self employment. An explanation for this could be that those on salaried employment may be more enlightened hence able to appreciate the importance of antiretroviral treatment and the danger in discontinuing treatment when compared with those who were self employed. The result could be their willingness to pay for antiretroviral drugs and HIV monitoring tests. In a study in southeast Nigeria, formal employment was associated with higher willingness to pay for antiretroviral treatment.[6]

A major limitation of this study was that the focus of willingness to pay was on the actual cost of antiretroviral drugs and HIV treatment monitoring tests and not on the true cost of providing antiretroviral treatment which includes all direct and indirect costs related to such services. Suffice it to say that there are also other related costs which are paid directly by the recipients of antiretroviral treatment services which include among others transport fares to the clinic and income lost during clinic visits. Also, majority of the respondents were not aware of the cost of antiretroviral drugs due to the fact that the treatment was free at the time of the study. Under such circumstances, agreed willingness to pay may be different from the committed willingness to pay when the need for that arises. It is also expected that a qualitative component would have enabled a more robust exploration of the concept of willingness to pay for antiretroviral drugs and HIV treatment monitoring tests among people living with HIV/AIDS in the study area.

Conclusion

Majority of the clients were willing to pay but only a minor proportion were willing to pay the actual prize of antiretroviral drugs and HIV treatment monitoring tests. This may adversely affect continuity of treatment and enrolment of new patients into the treatment programme. In-order to sustain the gains of the HIV treatment programme in Nigeria there may be the need to subsidize antiretroviral treatment services for people living with HIV/AIDS.

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PEER REVIEW

Not commissioned. Externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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None

ETHICS COMMITTEE APPROVAL

Ethical approval for the study was obtained from the Health Research and Ethics Committee of University of Nigeria Teaching Hospital Ituku-Ozalla, Enugu with approval number NHREC/05/01/2008B-FWA0002458-IRB00002323. The respondents were required to sign or thump print to a written informed consent before responding to the questionnaire and the nature of the study was made known to them.

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency (N=400)	Per cent (%)
Age of respondents		
Mean ±(SD)	36.6±10.0	
Age of respondents in groups		
<30 years	104	26
30- 39 years	143	35.8
40- 49 years	101	25.3
≥ 50 years	52	13
Gender		
Male	184	46
Female	216	54
Marital status		
Single	138	34.5
Married	262	65.5
Ethnic group		
Igbo	367	91.8
Hausa	17	4.3
Yoruba	12	3
Others **	4	1
Religion		
Christianity	383	95.8
Islam	13	3.3
Traditional religion	4	1
Educational attainment		
No formal education	37	9.3
Primary education	69	17.3
Secondary education	195	48.8
Tertiary education	99	24.8
Employment status of respondents		
Unemployed	100	25
Salaried employment	78	19.5
Self employed	222	55.5
Household member who is HIV positive		
Yes	**18**	
No	**382**	
Socio-economic status		
Poorest	102	25.5
Very poor	99	24.8
The poor	101	25.3
Least poor	98	24.5

** Minority ethnic groups

Table 2: Awareness of antiretroviral treatment objectives

Variable	Frequency (N=400)	Per cent (%)
Aware antiretroviral treatment is not to achieve complete cure		
Yes	349	87.3
No	51	12.7
Aware antiretroviral treatment could prolong life		
Yes	305	76.3
No	95	23.7
Aware of at least one consequence of non-adherence to treatment		
Yes	340	85
No	60	15
Aware of parameters for monitoring antiretroviral treatment		
Yes	115	28.8
No	285	71.2
Aware of cost of monthly antiretroviral treatment		
Yes	7	1.8
No	393	98.3

Table 3: Willingness to pay for antiretroviral drugs and HIV treatment monitoring tests

Variable	Frequency (N=400)	Per cent (%)
Willingness to pay for antiretroviral drugs		
Willing	362	90.5
Not willing	38	9.5
Amount respondents were willing to pay		
Minimum amount (Naira)	100 (USD 0.62)	
Maximum amount (Naira)	14,000 (USD 86.8)	
Median willingness amount (Naira)	500 (USD 3.1)	
Willingness to pay for antiretroviral drugs at 7000 Naira[USD 43.75] (the prize of monthly ARV supply)		
Yes	10	2.5
No	390	97.5
Willingness to pay for HIV treatment monitoring tests every six months		
Willing	348	87
Not willing	52	13
Amount respondents were willing to pay		
Minimum amount (Naira)	100 (USD 0.62)	
Maximum amount (Naira)	20,000 (USD 125)	
Median willingness amount (Naira)	500 (USD 3.1)	
Willingness to pay for HIV treatment monitoring tests at 4,800 Naira (USD 30) every six months		
Yes	9	2.3
No	391	97.8

Table 4: Willingness to pay for antiretroviral drugs and HIV treatment monitoring tests

Variable	n=400 (Frequency)	Per cent (%)
Willingness to pay for antiretroviral drugs and HIV treatment monitoring tests		
Willing	341	85.3
Not willing	59	14.8
Willingness to pay the actual prizes of antiretroviral drugs and HIV treatment monitoring tests		
Yes	7	1.8
No	393	98.2

Table 5: Factors affecting willingness to pay for antiretroviral drugs and initial HIV treatment monitoring test among people living with HIV

Variable	Willingness to pay for antiretroviral drugs and initial HIV monitoring test N= 400		COR [95%CI]*	**p value	AOR [95%CI]***
	Willing to pay n (%)	Not willing to pay n (%)			
Age of respondents					
<40 years	215 (87.0)	33 (13.0)	1.4 [0.8-2.5]	0.198	1.4 [0.8- 2.6]
≥ 40 years	126 (82.4)	27 (17.6)			
Gender					
Male	157 (85.3)	27 (14.7)	1.0 [0.6-1.8]	0.968	NA
Female	184 (85.2)	32 (14.8)			
Marital status					
Single	119 (86.2)	19 (13.8)	1.1 [0.6-2.0]	0.688	NA
Married	222 (84.7)	40 (15.3)			
Educational status					
Primary education and less	87 (82.1)	19 (17.9)	0.7 [0.4- 1.3]	0.282	NA
Secondary education and above	254 (86.4)	40 (13.6)			
Employment status of respondents					
Unemployed	85 (85.0)	15 (15.0)	1.2 [0.7- 2.4]	0.022	0.9 [0.5- 2.0]
Salaried employment	74 (94.9)	4 (5.1)	4.1[1.4- 11.8]		3.0 [1.1- 8.9]
Self employed	182 (82.0)	40 (18.0)			
Socio-economic status					
Low socio economic	156 (77.6)	45 (22.4)	0.3 [0.1- 0.5]	<0.001	0.3 [0.2- 0.6]
High socio-economic	185 (93.0)	14 (7.0)			
Household member being HIV positive					
Yes	16 (88.9)	2 (11.1)	1.4 [0.3-6.3]	0.656	NA
No	325 (85.1)	57 (14.9)			

*Crude odds ratio (95% Confidence interval)

**p value on bivariate analysis

*** Adjusted odds ratio (95% Confidence interval)