


# Assessment of the Affordability of Out-of-Pocket Payments among Some Selected People Living with HIV in Kano, Nigeria

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## Abstract

**Introduction:** With an estimated 1.8 million People Living with HIV (PLHIV), Nigeria's HIV response is still heavily donor dependent. However, with anticipated decline in donor funding for HIV/AIDS program as the country takes ownership of the program, understanding financing options for PLHIV is important. One of such financing options is affordability of out-of-pocket payments (OOP) for anti-retroviral drugs (ARV) by PLHIV. We assessed affordability of OOP payments for ARVs in Kano State, North-Western Nigeria. **Methods:** Four Hundred and sixty-nine PLHIV receiving donor-supported-free ARV in Kano, North Western Nigeria were systematically selected and interviewed during routine clinic visits. Affordability for ARV was assessed by a combination of variables including willingness and financial means to incur extra expense for full dose of ARV based on landing and distribution cost of 8.3 USD (about 3,000 NGN) per month dose. **Results:** Four hundred and sixty-nine respondents were interviewed. Of those, 72 (15.4%, 95% CI: [13.2 - 19.7]) can afford ARV OOP on monthly base. The proportion of males able to pay 3,000 NGN (8.3 USD) or more OOP for ARVs was not different from that of women (15.5% versus 15.2%). Attending school, education level, employment, monthly income and wealth have all been found to be associated with willingness and ability to pay for monthly dose of ARV OOP ( $p < 0.0001$ ). **Conclusion/recommendation:** Majority of PLHIV in Kano

State may not afford ARV OOP in the event of withdrawal of supports by international donors. Innovative sustainable financing mechanisms from domestic resources are needed for HIV program sustainability.

### **Keywords**

PLHIV, HIV Program Sustainability, HIV Out of Pocket Payments, Catastrophic HIV Expenditure

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## **1. Introduction**

Nigeria ranks fourth in HIV burden in the world after South Africa Mozambique and India with an estimated 1.8 million People Living with HIV (PLHIV) according to UNAIDS 2019 estimates [1]. The national prevalence of HIV stands at 1.3% among persons between the ages of 15 to 49 years [2]. Despite high HIV burden, Nigeria's response is substantially financed by international donor agencies. Since 2003 The U.S. President's Emergency Plan for AIDS Relief (PEPFAR) has been supporting countries across the globe to fight the epidemic with cumulative investment of over \$85 billion for the period 2003 to 2019 [3]. In Nigeria, PEPFAR invested over \$5 billion from 2004 to 2019 to support the national response to provide free HIV care and treatment services [4]. The mean cost of Anti-retroviral therapy (ART) per patient-year for a pediatric patient is estimated at \$837 while that for adult patient is \$747; PEPFAR, provides \$341 and \$312 to support pediatric and adult per patient-year costs for ART treatment respectively [5]. Nigeria contributes substantially to the routine public health service delivery such as human resource for health (HRH) and other related indirect costs that are part of routine healthcare management. However, donor funding for HIV/AIDS control efforts to Low and Middle Income Countries (LMICs) has been decreasing. Between 2015-2016, the funds provided by donors to support the HIV control efforts declined by about 7% [6]. In between there were fluctuations as countries approach epidemic control.

Since then, although funding increased in 2017 and 2018, the increases did not match pre-2015 levels, in fact, a further decline of \$165 million was recorded in 2019 compared to 2018 [7]. With this trend, there are concerns that as countries achieved epidemic control, ownership and sustainability may be a challenge by LMICs. Available data shows that only a few LMICs are able to make significant investments in their own country's HIV control efforts. For example, India and South Africa were reported to pay for about 90% and 70% respectively, of their country's HIV response [8].

In Nigeria, since 2010 domestic funding has consistently been on the decline (below 25% of total HIV funding), reaching its lowest level in 2018, where domestic resources accounted for less than 2% of the funding for the national response [9]. The government spending on health, which is the most significant source of financing to achieving the Universal Health Coverage (UHC)

has remained below 16% for over a decade now. In 2018, the government accounted for only 14.1% of the total health expenditure in the country, with out-of-pocket expenditure (OOPE) accounting for 77% of domestic health expenditure [10]. Government of Nigeria per capita spending was \$12.5 per capita as against the recommended \$86 per capita required to achieve UHC [11]. Nigeria is therefore unlikely to be able to put up additional resources that would be required to sustain HIV control efforts in the country. However, the National Agency for the Control of AIDS (NACA) is working with Nigerian Business Coalition against AIDS (NIBUCAAA) to establish an HIV Trust Fund which will be private sector driven to support the national response and HIV program sustainability thereby closing some gaps that will emerge with the eventual exit of the international donors [12]. Data on feasibility of shouldering out-of-pocket payments (OOP) by PLHIV in Nigeria were largely from Southern part of the country. Mbachu *et al.*, reported that PLHIV in the South will be willing to pay up to 15.3 USD per month dose of ARV drugs; willingness to pay was found to be associated with employment and higher socioeconomic status [13]. In another study, Adebimpe *et al.*, reported that 68% of the study population in the South were willing to pay up to 20 USD for a month dose of ARV drugs [14]. To our knowledge, there are no such data from the Northern part of the country. Considering the wide variability in poverty headcount between states in Nigeria's various zones across Northern and Southern regions [15], knowledge of the proportion of PLHIV from the North likely to shoulder OOP payments for ARVs in the absence of free services will guide and inform planning for HIV services sustainability in different regions of Nigeria. In this paper, we report affordability of out-of-pocket payments (OOP) for ARV drugs by PLHIV in Kano State, North-Western Nigeria.

## 2. Methods

### 2.1. Settings

This study was conducted in August 2018 in Kano State, North-West Nigeria. The state has a population of about 20 million, land mass of 20,131 km<sup>2</sup> and 89 HIV treatment centers. The poverty headcount index in Kano State is 55.1% which is above national average of 40.1% [15]. HIV prevalence in Kano is 0.8% which is lower than the National average of 1.3% [2]. However, it has an estimated 44,837 PLHIV, [16] of which 25,659 were identified and currently receiving free donor-funded HIV care and treatment services [17].

### 2.2. Study Sites and Design

This was a cross-sectional study involving PLHIV receiving comprehensive ART services in Kano State. Four healthcare facilities that account for 65% of the PLHIV on treatment in the state were purposively selected for the study: a tertiary (Aminu Kano Teaching Hospital), a secondary (Murtala Muhammed Specialist Hospital), an infectious disease (Infectious Diseases Hospital, Kano) and a

faith-based facility (Al-Noury Specialist Hospital, Kano). This selection provided good representation for different socioeconomic groups in the state. A total of 474 PLHIV were systematically selected from these four healthcare facilities proportionate to the number of PLHIV on treatment in each of them. The protocol for this survey was reviewed and approved by the ethical committees (Institutional Review Boards) of Kano State Ministry of Health and Aminu Kano Teaching Hospital.

### 2.3. Sample Size and Sampling Technique

The sampling frame was the pharmacy daily dispensing worksheets which provided accurate number of individuals who are active on treatment (ART). In the context of HIV/AIDS program, an active patient on ART is a patient who received ARV within the last 3 months. The minimum sample size estimated 351, after controlling for non-response rate and additional respondents who indicated interest to participate, the total number approached for consent was 474 (Table 1). The number enrolled in each facility was calculated by probability proportionate to size of number of PLHIV the facility has on treatment (Table 1). To minimize selection bias, systematic random sampling technique was used to select the respondents that were interviewed during each interview visit from list of patients scheduled for the clinic visit. Patients selected in previous visits were excluded. One out of every three of them was selected to participate. The random start was determined by using a random number application that was installed on the electronic data capture (EDC), thereafter *k*th number was determined by adding the selection interval (*k*).

### 2.4. Data Collection, Management, and Analysis

Data were collected electronically by trained interviewers using computer-assisted personal interviewing. Structured questionnaires were administered to participants who consented to participate in the study. The questionnaire included questions on respondent's background information (sociodemographic information), household possessions and means of transportation, health seeking behavior and

**Table 1.** Distribution of sampled PLHIV respondents by facility.

Facility	PLHIV on ART	Facility weight	Expected PLHIV to be sampled (after accounting for non-response)	Actual PLHIV sampled (individuals approached for consent)
Aminu Kano Teaching Hospital, Kano	7,749	0.4	190	204
Infectious Diseases Hospital Kano	5,779	0.3	141	147
Murtala Muhammed Specialist Hospital, Kano	3,592	0.2	88	91
Al-Noury Specialist Hospital, Kano	1,253	0.1	31	32
Total	18,373	1.0	450	474

Abbreviations: PLHIV—People Living with HIV; ART—Antiretroviral treatment.

other indirect expenses associated with seeking of HIV care. Additionally, respondents were asked how much in addition to routine HIV related expenses such as transportation, laboratory tests and treatment of opportunistic infections they could afford to incur for a month dose of ARV drugs if they were to pay out-of-pockets based on a range of additional expenses, from not able to afford OOP (none), to affordability below the amount needed to pay for ARV (less than 3,000 NGN [8.3USD]) and affordability equal or above 3,000 NGN (8.3USD). We thus defined affordability in the context of this study as willingness (yes or no) and ability of an HIV infected individual on ART to pay 3,000 NGN (8.3 USD) for a month dose of ARV beside all other expenses associated with management of HIV infection. Three thousand Naira (8.3 USD) at the time of the study is the landing and last mile distribution cost of a month dose of ARV including indirect cost associated with storage and dispensing at facility level (personal communication with Nigerian Agency for the Control of AIDS). Completed questionnaires were synchronized to a central server in real-time immediately after completion of each interview. Data was analyzed using STATA version 14.2 software. Frequency distributions and proportions of persons who are willing and can incur extra expenses above routine were computed. Baseline demographic and related covariates were examined in univariate analyses. Differences in proportions between the categorical groups were evaluated using Chi-square test to determine significance of associations between the groups. Two sided *P*-values of 0.05 or less were considered statistically significant.

For estimating the socio-economic status (SES), an SES index was developed using principal component analysis (PCA) as described by Edwards JH and Edwards AWF [18]. The input into the PCA was the information on households' ownership of key possessions. The index was used to divide the individuals into five SES groups (quintiles), namely Q1 (poorest), Q2 (second), Q3 (third), Q4 (fourth) and Q5 (wealthiest). Chi-square for trend analysis was applied for all disaggregation of key dependent variables by SES quintiles.

### 3. Results

Of the 474 respondents who indicated interest and approached for consent to participate in the study, 469 (98.9%) were interviewed. Mean age of the study participants was 39.8 (SD = 10.6). Men were older, mean = 44.2 (SD = 9.9) years compared to females: 37.6 (SD = 10.3) years. Majority of the men (77.6%) were married and 150 (83.3%) of them were married to one wife. Conversely only 115 (48.5%) of the women were married (**Table 2**). Men were more gainfully employed compared to women (87.5% versus 67.5%) and men were equally more educated (**Table 2**).

All respondents expressed willingness to pay OOP. However, only 72 (15.4%, 95% CI: [13.2-19.7]) can afford OOP for the monthly dose of ARV. Attending school, education level, employment, monthly income are found to be associated with OOP ( $p < 0.0001$ ) (**Table 3**).

Respondents who reported higher monthly income of 50,000 NGN or more are more likely to incur additional expenses for management of their HIV infection compared to those who reported lower monthly income of 10,000 NGN or less (30.0% versus 9.4%) A similar trend is seen among respondents in the richest wealth quintile compared to those in the poorest wealth quintile (23.1% versus 6.3%) (**Table 3**).

The proportion of males able to pay 3,000 NGN (8.3 USD) or more OOP for ARVs was not different from that of women (15.5% versus 15.2%) (**Table 4**).

**Table 2.** Socioeconomic and demographic characteristics of PLHIV in Kano State, North-Western Nigeria by sex, August 2018.

	Male		Female		Total	
	Frequency (N = 232)	Percent (%)	Frequency (N = 237)	Percent (%)	Frequency (N = 469)	Percent (%)
<b>Age (years)</b>						
<18	3	1.3	4	1.7	7	1.5
18 - 20	1	0.4	10	4.2	11	2.3
21 - 24	12	5.2	32	13.5	44	9.4
25 - 29	20	8.6	53	22.4	73	15.6
30 - 34	37	16	47	19.8	84	17.9
35 - 39	97	41.8	62	26.2	159	33.9
40 - 49	62	26.7	29	12.2	91	19.4
50+	-	-	-	-	-	-
Total	232	49.5	237	50.5	469	
Mean age (SD)	44.2 (9.9)		37.6 (10.3)			
<b>Marital status</b>						
Single	33	14.2	19	8	52	11.1
Married	180	77.6	115	48.5	295	62.9
Divorced	8	3.5	24	10.1	32	6.8
Widowed	11	4.7	78	32.9	89	19.0
Separated	-	-	1	0.4	1	0.2
<b>Employment status</b>						
Not employed	39	16.8	110	46.5	149	31.8
Employed	193	83.2	127	53.5	320	68.2
<b>Monthly income in NGN (USD)</b>						
<10,000 (<29)	61	31.7	69	54.8	130	40.6
10,000 - 20,000 (29 - 48)	47	24.4	24	18.5	71	22.2
20,001 - 50,000 (49 - 139)	52	27	26	20.2	78	24.4
50,001 -100,000 (140 - 278)	33	16.9	8	6.5	41	12.8

Abbreviations: PLHIV—People living with HIV; NGN—Nigerian Naira; USD—US Dollar.

**Table 3.** Correlates of out-of-pocket payments for ARV among PLHIV in Kano State, North-Western Nigeria, August 2018.

OOP in NGN (USD)/month	None	<500 (<1.4)	500 - <1000 (1.4 - <2.8)	1000 - <3000 (2.8 - <8.3)	3000 - <5000 (8.3 - <13.9)	5000 - 10,000 (13.9 - 27.8)	Total	Chi-square (P-Value)
<b>Characteristics</b>	<b>126 (26.9)</b>	<b>109 (23.2)</b>	<b>112 (23.9)</b>	<b>50 (10.7)</b>	<b>23 (4.9)</b>	<b>49 (10.4)</b>	<b>469 (100.0)</b>	
<b>Age</b>								
10 - 20	2 (28.6)	2 (28.6)	0 (0.0)	2 (28.6)	0 (0.0)	1 (14.3)	7 (100.0)	36 (0.065)
21 - 24	2 (18.2)	1 (9.1)	1 (9.1)	2 (18.2)	2 (18.2)	3 (27.3)	11 (100.0)	
25 - 29	6 (13.6)	14 (31.8)	12 (27.3)	3 (6.8)	2 (4.6)	7 (15.9)	44 (100.0)	
30 - 34	22 (30.1)	19 (26.0)	18 (24.7)	5 (6.9)	2 (2.7)	7 (8.6)	73 (100.0)	
35 - 39	23 (27.4)	18 (21.4)	21 (25.0)	8 (9.5)	9 (10.7)	5 (6.0)	84 (100.0)	
40 - 49	43 (27.0)	33 (20.8)	36 (22.6)	18 (11.3)	7 (4.4)	22 (13.9)	159 (100.0)	
50+	28 (30.8)	22 (24.2)	24 (26.4)	12 (13.2)	1 (1.1)	4 (4.4)	91 (100.0)	
<b>Sex</b>								
Male	51 (22.0)	46 (19.8)	60 (25.9)	39 (16.8)	10 (4.3)	26 (11.2)	232 (100.0)	26.3(0.000)
Female	75 (31.7)	63 (26.6)	52 (21.9)	11 (4.6)	13 (5.5)	23 (9.7)	237 (100.0)	
<b>Ever attended school</b>								
No	47 (48.0)	21 (21.4)	16 (16.3)	8 (8.2)	1 (1.0)	5 (5.0)	98 (100.0)	31.6 (0.000)
Yes	79 (21.3)	88 (23.7)	96 (25.9)	42 (11.3)	22 (5.9)	44 (11.9)	371 (100.0)	
<b>Level of education</b>								
Primary	37 (36.6)	30 (29.7)	23 (22.8)	6 (5.9)	2 (2.0)	3 (3.0)	101 (100.0)	43.2 (0.000)
Secondary	27 (19.0)	26 (18.3)	37 (26.1)	22 (15.5)	13 (9.2)	17 (11.9)	142 (100.0)	
Tertiary	15 (11.7)	32 (25.0)	36 (28.1)	14 (10.9)	7 (5.5)	24 (18.7)	128 (100.0)	
<b>Employment status</b>								
Not employed	61 (39.1)	42 (26.9)	29 (18.6)	9 (5.8)	6 (3.8)	9 (5.8)	156 (100.0)	
Employed	65 (20.8)	67 (21.4)	83 (26.5)	41 (13.1)	17 (5.4)	40 (12.8)	313 (100.0)	
<b>Monthly income in NGN (USD)</b>								
<10,000 (<27.8)	41 (32.0)	32 (25.0)	33 (25.8)	10 (7.8)	2 (1.6)	10 (7.8)	128 (100.0)	55.1 (0.000)
10,000 - 20,000 (27.9 - 55.6)	14 (20.3)	16 (23.2)	19 (27.5)	12 (17.4)	3 (4.4)	5 (7.3)	69 (100.0)	
20,001 - 50,000 (55.7 - 138.9)	8 (10.5)	12 (15.8)	20 (26.3)	15 (19.7)	9 (11.8)	12 (15.8)	76 (100.0)	
50,001 - 100,000 (139.0 - 277.8)	2 (5.0)	7 (17.5)	11 (27.5)	4 (10.0)	3 (7.5)	13 (22.5)	40 (100.0)	
<b>Wealth quintile</b>								
Poorest	46 (40.7)	26 (23.0)	27 (23.9)	7 (6.2)	2 (1.8)	5 (4.5)	113 (100.0)	53.9 (0.000)
Poorer	27 (31.0)	25 (28.7)	16 (18.4)	10 (11.5)	3 (3.5)	6 (6.8)	87 (100.0)	
Middle	16 (17.4)	26 (28.3)	28 (30.4)	9 (9.8)	6 (6.5)	7 (7.6)	92 (100.0)	
Richer	32 (25.6)	21 (16.8)	25 (20.0)	16 (12.8)	7 (5.6)	24 (19.2)	125 (100.0)	
Richest	5 (9.6)	11 (21.2)	16 (30.8)	8 (15.4)	5 (9.6)	7 (13.5)	52 (100.0)	

Abbreviations: ARV—Antiretroviral drugs; PLHIV—People living with HIV; NGN—Nigeria Naira; [1 USD = 360 NGN].

**Table 4.** Out-of-pocket payments for ARV by cost category by sex among PLHIV in Kano State, North-Western Nigeria, August 2018.

Total (male and female)

Categories (cost/month) in NGN	Frequency per category	Rel. frequency per category (%)	Lower bound on frequencies (95%)	Upper bound on frequencies (95%)
<500	109	23.2	19.4	27.1
500 - <1,000	112	23.9	20.0	27.7
1,000 - <3,000	50	10.7	7.9	13.5
3,000 - <5,000	23	4.9	3.0	6.9
5,000 - 10,000	49	10.4	6.2	14.6
None	126	26.9	22.9	30.9
<b>Male</b>				
<N500	46	19.8	14.7	25.0
500 - <1,000	60	25.9	20.2	31.5
1,000 - <3,000	39	16.8	12.0	21.6
3,000 - <5,000	10	4.3	1.7	6.9
5,000 - 10,000	26	11.2	4.7	17.7
None	51	22.0	16.7	27.3
<b>Female</b>				
<N500	63	26.6	21.0	32.2
500 - <1,000	52	21.9	16.7	27.2
1,000 - <3,000	11	4.6	2.0	7.3
3,000 - <5,000	13	5.5	2.6	8.4
5,000 - 10,000	23	9.7	4.3	15.1
None	75	31.6	25.7	37.6

Abbreviations: ARV—Antiretroviral drugs; PLHIV—People living with HIV; NGN—Nigeria Naira [1 USD = 360 NGN].

#### 4. Discussions

This study examined whether PLHIV in Kano State are willing and can afford to pay for a month dose of ARV out of pocket (OOP) based on landing and distribution cost of 8.3 USD (about 3,000 NGN) per month dose of adult ARV, which hitherto, they had been receiving free. Predictably, a very low proportion of the respondents were found to be able to afford the minimum extra expense although all indicated willingness to pay but the majority cannot afford. However, among those that can afford we did not see differences between male and female PLHIV. These findings may be a reflection of levels of poverty in the State. It has a poverty headcount index of 55.1% with over half of the state population living on less than 361 USD/year [15]. Majority of the respondents' monthly income is below 29 USD, which is less than a dollar (1USD = 360 NGN) per day. This may



have contributed to the lack of affordability of ARV OOP expense by the majority. Our findings show correlation between affordability of ARV OOP expense and education, employment and higher socioeconomic class. In South-Eastern Nigeria, a study by Mbatchu *et al.*, reported PLHIV can afford to pay up to 15.3 USD OOP expense per month dose of ARV drugs and affordability was also found to be associated with employment and higher socioeconomic status [13]. Another study in Osun State, South-Western Nigeria, 68% of the study population who expressed willingness to pay can afford to pay up to 20 USD OOP expense for a month dose of ARV drugs [14]. Therefore, affordability to pay for OOP expense for ARV drugs among PLHIV varies by region in Nigeria and appears to be predicted by levels of socioeconomic status of the populations, higher among PLHIV in the South and lower among those in the North [19].

Several studies have reported on the implication of HIV on households living standards in developing countries [20] [21] [22] whereby despite being on free ARV drugs, families are still being pushed to catastrophic health expenditures (CHE) due to costs associated with access to free HIV care services such as transportation costs and management of comorbidities. The WHO defines CHE as out-of-pocket spending for health care that exceeds a certain proportion of a household's income with the consequence that households suffer the burden of disease [23]. A vicious cycle of stigma, poverty and gender imbalance will continue to impact negatively on widowed PLHIV women thereby affecting their health outcomes in the context of HIV [24] [25] [26]. In South Africa, widow headed households are found to be subjected to series of financial, social, emotional and physical hardships and due to cultural issues, the households are rarely supported by relatives leaving them to rely heavily on government social supports, such as grants and pensions [27]. Unfortunately, such social welfares are not readily available or adequate in most African countries such as Nigeria.

In an effort to ensure sustainability of free HIV care and to stimulate country ownership in Nigeria, in October 2014 PEPFAR transitioned service provision to local indigenous organizations with substantial cuts in funding. Following this policy change by PEPFAR, there were observed reduction in quality of service at healthcare facilities due to reduced staff wages leading to decreased morale, increased patients lost to follow-up and inadequate laboratory monitoring of patients and introduction of user fees by over 90% of healthcare facilities [28]. This demonstrates the likelihood of potential catastrophic scenarios likely to happen to PLHIV especially in the North. Weak health system serves as major barrier to sustainability of public health interventions in developing countries as documented in reports from Mozambique, Rwanda and Zambia among others [29] [30] [31]. There is the need for states and Government of Nigeria to develop innovative sustainable financing mechanisms from domestic resources for HIV program sustainability.

Nigeria earmarks to health are mainly from payroll tax which is grossly inadequate [32]. Earmarking taxes on tobacco and vehicles or stores may be con-

sidered to support sustainability of free HIV care service in Kano as the majority PLHIV cannot afford minimum OOP for ARV. With only 4% of Nigerians covered by National Health Insurance Scheme (NHIS) [33] [34] [35] [36], health insurance may not be a reliable strategy at this time to sustain free HIV care in Nigeria although social insurance has contributed up to 69% and 60% of HIV financing in LMIC countries of Colombia and Chile respectively [37]. Very Important Person (VIP) HIV Clinics or Executive HIV Clinics in private hospital where by high and middle income PLHIV are charged higher depending on their socioeconomic status was found to work in some settings. The extra charges from the wealthy PLHIV were used to subsidize HIV care and treatment for the poor PLHIV [38].

Our study has two key limitations. First, this study was conducted only in facilities that are within Kano metropolis. This could introduce a selection bias given that PLHIV who live in the metropolitan cities are likely to earn more and by implication afford more. However, we believe that the facilities selected for this study attend to a diverse section of the people from rural and urban parts of the state and our sample is likely to represent PLHIV in the state. All the four facilities have very high patient turn-over rates. Due to high population density, and limited health facilities in other states surrounding Kano, for example Mur-tala Muhammed Specialist Hospital has a very high turnover of patients, estimated at 18,000, monthly [39]. Second, we only used ARV costs reported elsewhere in Nigeria to assess affordability because of common procurement sources for ARVs with limited intra-country cost variability. Although cross-country variability in ARV costs have been reported [40] [41], we believe this is not the case in Nigeria since a common pipeline is used to procure HIV medicines and commodities in the country [42]. Although there are inter-facility variabilities in other OOP expenditures incurred in accessing HIV services, these do not affect the unit cost of the ARV themselves.

## 5. Conclusion/Recommendations

Majority of PLHIV in Kano State may not afford to pay OOP for ARV. There is no difference by sex in affordability of OOP among PLHIV receiving free HIV services in Kano State. Innovative sustainable financing mechanisms from domestic resources to aid HIV program sustainability are needed especially in states with high poverty headcount index in Northern Nigeria.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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