

## **IMPACT OF HIV/AIDS PREVALENCE ON RURAL FARM HOUSEHOLDS IN NIGER STATE, NIGERIA**

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### **ABSTRACT**

The goal of this study is to determine the impact of HIV/AIDS infection on the socio-economic profiles of the farmers in Shiroro Local Government Area of Niger State. The study used survey data to describe the socio economic characteristics of the households, the infection status of the households, the labour input of households in farm activities, the income of the households and the poverty level of the households. Data were also analysed using the Foster Greer Thorbecke metric equation for poverty. The result shows that the farm enterprise is family based and the predominant tenure system is by inheritance. Also, 17% of the respondents and 18% of the households were infected with the disease although there likelihood that the number is under-reported since another 28% of the respondents were not too confident of their status. There was 30% rise in medical expenditure and 30% fall in annual income of those suffering from the disease. In view of the fore-going, it is recommended that there is need to transit the farming enterprise from family-based to commercial venture as envisioned in the agricultural transformation agenda. In addition, farm support infrastructure, like access roads, farm gate markets, and easy access to modern farm equipment encourage commercialisation. The government should ensure that voluntary testing is enhanced and those living with HIV are supported in every way possible especially by subsidizing the cost of treatment and reducing stigmatization.

**Keywords:** HIV/AIDS; prevalence; household; infection; income; poverty.

### **INTRODUCTION**

The HIV/AIDS is an infectious disease of the human immune system caused by HIV. The first case of AIDS in Nigeria was reported in 1986 thereby establishing the presence of the epidemic in the country. A latest estimate from the joint UN Programme on HIV/AIDS (UNAIDS, 2012) showed 34 million people in Nigeria living with HIV in 2011, a jump from 29.4 million in 2001 with Sub-Sahara having the most number of infected people. The main consequences of HIV/AIDS in affected countries are that HIV/AIDS illness and death affect people in their most productive years (between 15 to 49yrs) (WHO, 2002). This implies that HIV/AIDS affects the productive members of the society (teachers, farmers, traders, extension workers). Therefore prevalence of HIV/AIDS in the rural households poses a serious threat to supply of farm labour. HIV/AIDS is characterized by recurrent period of sickness and loss of labour which eventually erodes agricultural production, food security nutritional balance (Louwenson and Whiteside, 2001). A study of an impact of HIV/AIDS on household families in the Free State province of South Africa found that household members spends 7.5hr/day to take care of the infected (Booyesen, 2003). Households with AIDS infected patients are burdened with high costs of managing the condition and adoption of coping mechanism against reduction of consumption of basic needs including food (Pitayanon et al., 1997). The long period of absenteeism by an infected worker and the losses

in skills and experience when an infected worker dies tends to shift production to a younger but less experienced workforce. This also shortens skills and increases the cost of training. Balyamujura et al., (2000) argued that intensive agriculture will be severely impacted through the loss of specialized labour especially for harvesting and processing. Sub-Sahara Africa's 25 most affected countries have lost 7m agricultural workers from AIDS epidemic since 1985 and 16m more may die by 2020 (Brough, 2001, FAO, 2000). Therefore HIV/AIDS can be a cause of food insecurity and also a consequence of food insecurity. For example during periods of food insecurity such as drought, individuals may be forced to engage in survival strategies like selling their farm and household assets; land and property assets; commercial sex worker and practice unprotected sex thereby increasing their the rate of infection(Rugalema et al., 2003). Once a household member develops AIDS, increased medical and other costs such as transportation to and from health facilities/services occur simultaneously with reduced capacity to work creating a double economic burden (Lovelife, 2000).

In many cases AIDS leads to the dislocation/dispersal of households as children are sent to relatives for their care and upbringing following the death of their parents. A study in rural South Africa suggested that households in which an adult had died from AIDS were four times likely to dissolve (Hosegood et al., 2004). AIDS straps families of their assets and income earners long before death and dissolution occurs. In Botswana it was estimated that on average, the income earner is likely to acquire one additional dependent over the next ten years due to AIDS epidemic. A dramatic increase in destitute households – those with no income earners is also expected (UNAIDS, 2006). The rural households' productions are divided into family consumption and for sale in the market. The urban households on the other depend on the rural households' for production. In a case where most of the rural households are infected with HIV, it then means that there will be limited supply for the urban households as there will be reduced productivity. Also, there will be reduced income for the rural households to cover their expenses. All these interactions affect the economy of any country. With the prevalence rate of HIV/AIDS rising in Nigeria, it is necessary to therefore check the impact of this infection. The goal of this study is to determine the impact of HIV/AIDS infection on the socio-economic profiles of the farmers in the study area. The specific objectives are to describe the socioeconomic characteristics of rural farm households, the HIV/AIDS status of rural farm households and the labour input of households in farm operations, determine the income of rural farm households and estimate the poverty level of rural farm households. The various determinations were then compared between the infected families and non-infected families.

## **METHODOLOGY**

This study was conducted in Shiroro LGA of Niger State. Niger State is located between latitudes 8<sup>0</sup> 21' N and 11<sup>0</sup> 30' N and longitude 3<sup>0</sup> 30' E and 7<sup>0</sup> 20' E with a land area of 76,363 km<sup>2</sup>. The State shares boundaries with Kaduna Sate and the Federal Capital Territory (FCT) in the North East and South East, Kebbi and Zamfara State in the North, Kwara and Kogi State in the South West and South respectively. The state experiences a distinct dry and wet seasons respectively. The wet season is between April and October while the dry season is between November and March although the State also experiences a dry cold weather accompanied with thick cloud cover and dust (harmattan) between December and February. The mean annual rainfall in the south is 1600mm while it is 1100mm in the north. Niger State

has a population of 4,924,729<sup>1</sup> (NPC, 2006) while Shiroro LGA has an area of 5,172km<sup>2</sup>, has about 80% of its population of 303,202 in the rural areas.

Giving the nature of the subject under study, the study area was carefully selected by reviewing medical records to ensure that the intended sample is included. Therefore, five (5) communities identified as areas with history of infection were selected for the study. From each of the communities, twelve households were randomly selected giving a total of 60 respondents in all.

This study made use of primary data obtained by cross sectional survey of the respondents with the use of structured questionnaire administered by oral interviews to obtain information from the selected households. Data was collected with the assistance of community health assistants and extension agents attached to each of the selected communities. The data collected included socio-economic characteristics of the households (such as age, education level, household size, marital status, gender, etc.) as well as the quantity of labour, production, inventory, income, HIV/AIDS status of each household.

The data collected were analyzed using descriptive statistics such as percentage and frequency distribution, gross income and Foster-Greer-Thorbeckes (FGT) metric of poverty measure. The gross income is given in equation (1).

$$GI = TFR + HC + CI \quad (1)$$

Where TFR = Total Farm receipts = Total Sales + Home consumption, GI = Gross Income, HC = Home consumption, CI = Change in Inventory.

The incidence (headcount), depth (or gap) and severity of poverty among the sample respondents were measured using FGT. The model for the indices is given in equation (2).

$$P_\alpha = \frac{1}{N} \sum \left( \frac{G_i}{z} \right)^\alpha, (\alpha \geq 0) \quad (2)$$

Where  $z$  = chosen poverty line (USD1=NGN160),  $N$  = Sample size,  $H$  = number of poor (those with daily consumption expenses at or below  $z$ ),  $y_i$  = individual daily consumption expenses,  $\alpha$  = sensitivity parameter (0, 1, 2). the equation (1) yields headcount, when  $\forall=1$ , then equation (1) yields poverty gap and when  $\forall=2$ , then equation (1) yields poverty severity.

$G_i = z - x_i$ ,  $G_i = 0$  if  $x_i > z$

All the quantities determined were then compared using t-ratio.

## RESULTS AND DISCUSSION

The socio-economic characteristics of the respondents are presented on Table 1 while Table 2 is a presentation of the educational attainment of the members of the household and the socio-economic profile of the children of the respondents in the study area is presented on Table 3. Table 4 shows the distribution of the households heads based on their farm size and Table 5 is the profile of the various farm holdings of the respondents. The various methods of acquiring the various farm plots by the respondents is shown on Table 6 while Table 7 shows the nature of access roads to the various farm plots and Table 8 show the ownership structure of various livestock by the respondents during the 2012/2013 farming season. Tables 9 and 10 shows the average total and family labor input for the various farm operations in man/days while Table 11 shows the awareness on HIV/AIDS and status of the respondents and their family members and Table 12 give the comparison between the labor

<sup>1</sup> 2013 estimate

input of infected and non-infected households while Table 13 gives the various indicators of impact of HIV/AIDS infection of the households and Table 14 presents the poverty metrics.

The findings on Tables 1-3 relating to the socio-economic profiles of the respondents and members of his family is not different from results of earlier studies in this area except for a larger household size (Nmadu and Peter, 2010). The larger household size could be attributed to early marriage as almost all the respondents are married at the mean age is 39. This is in fact evidenced by some of the household whose children are married at about 12 years of age (Table 3). That might also have contributed to the low level of formal educational achievement by the respondents and their family members. Most of the families did not acquire more than secondary education which is likely to affect their farming enterprise since they have to wait for those who are exposed to let them know about more recent production technologies. Low educations is also said to be a negative factor in adoption of improved technology but it remains to be proven whether the advantage of the 18 years of farming experience could outweigh the perceived impact of low educational achievement (Nmadu *et al.*, 2015). The larger household size might be an indication that in spite of some level of HIV/AIDS infection, the reproductive activities are not hampered.

The results on Tables 4-7 relating to farm holding of the respondents with combined mean size of 4.87ha give a clear indication that they are all small scale. The results further revealed that over 60% of them have five hectares or less located about 8.34km away from the settlements and 14.60km to the nearest main market. The respondents spend close to two hours (116.08 minutes) to walk to the various farm plots. The predominant method of land acquisition is the traditional family inheritance while only about 25% of the plots are accessible all season. The results are very much in line with other findings especially with regards to farm size and method of acquisition (e.g. Nmadu and Peter, 2010; Nmadu *et al.*, 2015). The result clearly show that land markets are poorly developed in this area and this contributes low commercialization of farm enterprises since most transactions are based on social and cultural inclinations. In the traditional production system, the farmers produce and transport the products to the nearest primary market. If the respondents use two hours to trek to the farm holdings, it means double that time is used to access the market and since the access roads are not all season, then the means of transporting the produce to the market is head portage or some other indigenous innovations. If this is done once in a week, it means the farmer uses about 312 hours annually to access the farm plots and the markets in the communities. This might impact negatively on productivity and efficiency especially when the additional time loss to access medical facilities for treatments of various ailments, including HIV/AIDS as well as other social and cultural engagements is added.

The results on Table 8 gives that there is low adoption of improved livestock production as the predominant livestock under production in this communities are the traditional ones i.e. cattle, sheep and goat, local chicken and pigeons. However, there seems to be a sharp difference between the rates of theft in this community compared to a similar finding in a different study within Niger State where the rate of theft was reported to be around 50% (Nmadu, 2013). The results on Tables 9 and 10 show that the major sources of labor input for farming operations is hired and the main consumer of supplied labor is processing operations, followed by land preparation and then weeding. This has shown that the major farm operations are done through manual means, although mechanization of production has not been achieved with yam production which is the major crop produced in this area.

Table 1 Socioeconomic Characteristics of the respondents

Variables	Frequency	%
<i>Age</i>		
21-30	11	18.3
31-40	24	40
41-50	21	35
51-60	4	6.7
Mean	39	
<i>Sex</i>		
Female	2	3.3
Male	58	96.7
<i>Marital Status</i>		
Single	9	15.0
Married	50	83.3
Widowed	1	1.7
<i>Household Size</i>		
1-5	12	20
6-10	27	45
11-15	20	33
16-20	1	1.7
Mean	10	
<i>Level of Education</i>		
Primary Education	12	20
Secondary Education	13	21.7
Tertiary Education	0	0
Adult Education	2	3.3
No formal Education	24	40.0
No response	9	15.0
<i>Years of farming experience</i>		
5-10	21	35
11-15	7	11.67
20	15	25
25	7	11.67
30	3	5
35	4	6.67
40	3	5
Mean	18	

Table 2 Educational attainment of the members of the household

	No formal education (%)	Primary education (%)	Secondary education (%)	Post- secondary education (%)	Total
Number of household members below 16 years old	22.26	27.59	10.39	5.045	65.28
Number of household members 16- 60 years old	18.99	1.19	13.95	0.59	34.72
Number of household members above 60 years old	0	0	0	0	0
Total	41.25	28.78	24.33	5.64	100

Table 3 Socio-economic profile of the children of the respondents in in the study area

Child	Gender (%)		Average Age	Attending School (%)		Current level (%)			Ever married (%)		
	Male	Female		Yes	NO	Primary	Secondary	Tertiary	No	Yes	No
1	24	3	20	24	2	3	17	3	3	5	22

2	13	12	16	23	3	8	15	1	2	3	23
3	12	8	14	17	2	9	8	1	1	3	16
4	6	9	12	11	5	7	3	1	4	1	14
5	4	5	11	4	4	3	2	1	3	0	8
6	2	0	10	2	0	2	0	0	0	0	2
7	1	1	7	1	1	0	1	0	0	0	2

Table 4 Distribution of the households heads based on their farm size

Size	Freq.	Percent	Cum.
1.5	2	3.33	3.33
2	8	13.33	16.67
2.5	8	13.33	30.00
3	9	15.00	45.00
3.7	1	1.67	46.67
4	7	11.67	58.33
4.5	1	1.67	60.00
5	2	3.33	63.33
5.5	1	1.67	65.00
6	1	1.67	66.67
7	4	6.67	73.33
7.5	2	3.33	76.67
8	8	13.33	90.00
8.5	1	1.67	91.67
10	2	3.33	95.00
11	2	3.33	98.33
12	1	1.67	100.00

Table 5 Profile of their farm holdings

Plot	Average size in ha	Average cost of rent or purchase or lease	Average distance from village (km)	Average distance of farm to main market (km)	Average time taken to trek from village to farm (mins)
1	2.28	0	3.67	6.19	48
2	1.97	3333.67	4.19	6.86	47.45
3	1.84	9250.25	3.15	5.37	53
4	2.00	0	0.56	2.88	40
5	0	0	0	0	0
Mean, combined	4.87	783.33	8.34	14.60	116.08

Table 6 Method of acquisition of the various farm plots

Plot	Inheritance (%)	Community land (%)	Rented (%)	Leased (%)	Purchased (%)	Total
1	41.61	2.19	0.00	0.00	0.00	43.80
2	32.85	0.73	2.19	0.00	0.00	35.77
3	11.68	1.46	0.00	0.00	1.46	14.60
4	5.84	0.00	0.00	0.00	0.00	5.84
5	0.00	0.00	0.00	0.00	0.00	0.00
Total	91.97	4.38	2.19	0.00	1.46	

Table 7 Nature of access road to the various farm plots

Plot	Motorable seasonal (%)	Motorable all season (%)	Graded and surfaced but not tarred (%)	Tarred (%)	Total

1	16.67	8.33	15.28	1.39	41.67
2	9.72	11.11	11.81	1.39	34.03
3	7.64	5.56	5.56	0.00	18.75
4	5.56	0.00	0.00	0.00	5.56
5	0.00	0.00	0.00	0.00	0.00
Total	39.58	25.00	32.64	2.78	100.00

Table 8 Livestock ownership structure by the respondents during the 2012/2013 farming season

Livestock	Number still available	Number consumed	Number sold	Gifts	Number of death	Number stolen	Total
Cow	147	10	51	1	1	0	210
Bull/Oxen	126	0	34	0	0	0	160
Sheep	152	2	63	0	0	0	217
Goat	189	3	81	0	0	0	273
Local chicken	317	31	116	0	0	0	464
Agric chicken broiler	0	0	0	0	0	0	0
Agric chicken layer	25	4	15	0	3	0	47
Agric chicken	0	0	0	0	0	0	0
Cockerel	0	0	0	0	0	0	0
Turkey	4	0	4	0	0	0	8
Pigeon	280	12	51	2	0	0	345
Ducks	27	2	6	0	0	0	35
Guinea fowl	82	21	31	0	0	0	134
Donkeys	0	0	0	0	0	0	0
Horses	0	0	0	0	0	0	0
Dogs	7	0	0	0	0	0	7
Swine	27	2	6	3	0	0	38
Others	0	0	0	0	0	0	0

Table 9 Total labor input for the various farm operations in average man/days

	plot 1	Plot 2	Plot 3	Plot 4	Plot 5
Land clearing	13.29	14.09	14.97	7	0
Ploughing	15.42	9	2	0	0
Ridging	18.78	19.04	24.51	20	0
Planting	13.9	11.35	13.44	16.86	0
First fertilizer application	7.43	1204	2	0	0
Second fertilizer application	8.48	0	3	0	0
staking of yam	14.52	17.89	14.85	0	0
First weeding	20.14	21.22	22.87	17.33	0
Second weeding	16	21.25	10.5	9.89	0
Third weeding	15.65	15.59	11.77	0	0
Harvesting	14.77	11.14	11.83	8.04	0
Processing	122.61	10.55	9.18	13.8	0
Threshing	10.54	10.69	9.32	6.66	0
Winnowing	12.58	9.89	16.67	6.78	0
Bagging	7.78	8.54	6.64	4	0
Transportation	9.53	8.4	5.58	4	0
Others	0	0	0	0	0

Table 10 Family labor inputs in the various farm operations in the study area in average man/days

	plot 1	Plot 2	Plot 3	Plot 4	Plot 5
Land clearing	2.5	2.5	4.14	2	0
Ploughing	6	0	0	0	0

Ridging	3.06	3	4	0	0
Planting	2.91	2	5.36	5	0
First fertilizer application	2	2	2	0	0
Second fertilizer application	2	0	0	0	0
staking of yam	4.21	3.74	3.64	0	0
First weeding	5.13	2.8	4	2	0
Second weeding	4	4	4	0	0
Third weeding	3.08	2.67	2	0	0
Harvesting	2.62	2.25	3	0	0
Processing	2.79	2.6	3	4.63	0
Threshing	1.9	2	2.17	0	0
Winnowing	3.95	2.39	5	0	0
Bagging	2	2.23	2	0	0
Transportation	1.97	2.07	2	0	0
Others	0	0	0	0	0

Table 11 Awareness on HIV/AIDS and status of the respondents in Niger State, Nigeria

	Yes		No	
	Freq.	%	Freq.	%
Have you ever heard of HIV?	57	95.00	3	5.00
How did you get to know about HIV?				
Friends	24	40.00		
Family members	4	6.67		
Newspaper	12	20.00		
Radio & Television	45	75.00		
Others	0	0.00		
Are you HIV positive?	10	16.67	50	83.33
Is there any member of your family who has tested positive?	11	18.33	49	81.67
Would you like to have a test to find out your status?	44	73.33	16	26.67
Reasons for agreeing to have HIV/AIDS test				
To reduce anxiety	47	78.33	13	21.67
More than one partner	8	13.33	52	86.67
Would you rate your chances of getting HIV/AIDS?	27	45.00	33	55.00
Risk level of infection				
High risk	10	16.67		
Low	17	28.33		
No risk	32	53.33		
Why do you think you have low chance of infection?				
More than one partner	10	16.67		
I share sharp object	8	13.33		
I have non	41	68.33		
When last were you tested for HIV/AIDS?				
Less than 12 month ago	34	56.67		
12-23 month ago	18	30.00		
24 months ago	6	10.00		

Table 12 Comparison of the various labor inputs

Variables	infected households		non-infected households		t-ratio
	Mean	SD	Mean	SD	
Total Family labor	30.45	19.2	24.65	22.73	0.642
Total Hired Labor	72.55	31.08	78.49	50.01	-0.359
Total Communal Labor	87.09	39.67	132.33	335.34	-0.756
Total Labor	190.09	59.87	235.47	335.01	-0.688
n	11		49		



Table 13 Impact of HIV/AIDS infection on the respondents in Niger State, Nigeria

Information on household Impact	Total	Mean	Maximum	Minimum	SD	t-ratio
Gross farm income (infected)		183636.36	350000	80000	75534.46	11 -
Gross farm income (Non infected)		216530.61	350000	100000	67901.61	49 1.013
Gross farm income (Both)		210500	350000	80000	69877.01	60
Medical expenses before the infection	568,500.00	9,475.00	41,000.00	3,000.00	6,003.83	60
Medical expenses after infection	1,465,500.00	24,425.00	100,000.00	6,000.00	17,945.97	60 -4.84
Family labor input daily before HIV/AIDS infection	282	4.78	10	2	2.27	59
Family labor input daily after HIV/AIDS infection	170	4.47	10	1	2.27	38 0.46
Household members employed in the farm before the infection	184.00	4.00	16.00	2.00	3.41	36
Household members are employed to work after infection	19.00	3.17	6.00	2.00	1.60	6 0.68
Household income before infection	15,430,000.00	257,166.67	1,500,000.00	80,000.00	205,171.21	60
Household income after infection	5,930,000.00	348,823.53	550,000.00	100,000.00	131,856.09	17 -1.57

Table 14 Distribution of respondents according to their household income

Variables	Freq.	Mean	Standard Deviation	Minimum	Maximum
At or below Poverty line	16	96.65	41.51	19.7	155.14
Above poverty line	34	398.58	172.57	163.77	754.99
Poverty head count		26.7%			
Poverty gap		- 0.910			
Poverty severity		0.530			

The results on Tables 11-13 shows that 95% of the respondents are aware of the existence of HIV/AIDS and the main channel of awareness is the mass media, particularly radio and television. About 17% of the respondents claimed to be infected with HIV/AIDS while 18% claimed that a family member is suffering from the disease. The average age of those infected is 27years and a total of 26 members were reportedly lost due to HIV/AIDs from two households. The disease was first reported in Nigeria in 1986 hence, it is most likely that those suffering from the disease now must have acquired it from birth. The level of awareness must have been responsible for low level of new infections in these particular communities. Of the number that claimed to be free from the disease (i.e. 83%), only 73% wants to know their status in order to reduce anxiety. This suggests that some of the respondents might actually be infected but are hiding their status, perhaps for fear of stigmatization. In terms of the risk of infection, 53% say they have no risk of infection while the 17% that are infected also claimed high risk of infection. The major problem is with the 28% who claimed low risk of infection; it is possible that they might have exposed themselves to the risk factors thereby not being too sure whether they are infected or not. The pattern is also shown by the response as to when last a test was carried out where 57% have had the test in the last 12 months prior to this study. The results further show that only medical expenses and level of income are significantly impacted as a result of being

infected. It was observed that medical expenses rose by over 30% while household income declined by 30%. Given this level of impact, there is strong reason to suspect that the number of those infected is under-reported.

The results on Table 14 show that there is a significant difference between the mean daily consumption of households at or below the poverty line of NGN96.65 and that of those living above the poverty line of NGN398.58. However, the depth of poverty between the two groups is very low. The difference in the amount is likely attributable to the extra expenses incur in treating HIV/AIDS and the various opportunistic infections.

## CONCLUSIONS

This study examined the impact of HIV/AIDS infection on labor supply for various farm operations, income and medical expenditure of farming households in Niger State, Nigeria. The data used was collected from five communities with history of infection from Shiroro Local Government Area of the State. The data were analyzed using descriptive statistics, t-ratio and FGT. The results show that the level of educational achievement among the respondents is low but the household size is high. The predominant tenure system for land acquisition is through inheritance which indicates that land markets are poorly developed in these communities. In addition, the mass media is very effective in sensitizing the communities on the existence of HIV/AIDS which must have resulted in low level of infection. However, there was more than 30% fall in annual income and 30% rise in medical expenses. Although there was a significant difference in the daily mean expenditure of those below and those above the poverty threshold, the gap between the poor and non-poor was very low. Therefore, it can be concluded that the fight against the spread of HIV/AIDS through the mass media is being won although there is a greater need to assure individuals of the benefits of confirming their status because it is suspected that some of the respondents might have hidden information about their status. In view of the fore-going, it is recommended that there is need to transit the farming enterprise from family-based to commercial venture by enacting enabling laws that will make land acquisition easy and transparent. In addition, farm support infrastructure, like access roads, farm gate markets, easy access to modern farm equipment should be provided to reduce time wastage in production and marketing. The government should ensure that those living with the disease are supported in every way possible especially by subsidizing the cost of treating and reducing stigmatization, making it easy for those who are still in the hide to come open.

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