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Socio-Demographic Distribution of HIV Infections in Ondo and Akure Local Government Areas of Ondo State, Nigeria

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Abstract
Nigeria has one of the largest HIV epidemics in the world, with a significant impact on the country's public health and economy. Despite interventions, there continues to be an increase in the incidences of HIV infection in Nigeria. Understanding the trends of its occurrence across various factors may be essential to guiding decisions on subsequent interventions for positive outcomes. This study examines the socio-demographic distribution of HIV infections among individuals receiving highly active antiretroviral therapy (HAART) in Akure and Ondo Local Government Areas (LGAs) of Ondo State, Nigeria. 348 participants receiving care at HIV care and support clinics in Mother and Child hospitals and State specialist Hospitals in Ondo and Akure cities of Ondo State were enrolled. The sample comprised 171 individuals from Akure South, 55 from Akure North, 75 from Ondo West, and 47 from Ondo East. Participants' ages ranged from 0 to 70 years, with a mean age of 35.5 ± 13.2 years; adults aged 31–50 years accounted for the majority (60%), while children ≤15 years constituted 16%. Women predominated in the cohort (74%), and most participants were married (63%). Educational attainment showed that 58% had at least secondary education. Occupation data revealed that artisans and traders (47.7%) were the dominant group, followed by students (15.2%), civil servants (7.5%), and farmers (4.0%), while 25.6% were unemployed. Although statistically significant factors associated with HIV occurrence among the study participants are employment and type of residence, the age profile of the patients shows clearly that Ondo state has a good number of HIV patients excluding no age group, a pointer to likely instance of mother-to-child transmission of the infection. The socio-demographic details were extensively discussed offering valuable insights for targeted interventions and public health planning.

Keywords: *HIV infections; Socio-demographic Factors; Distributions; Ondo Central*

Introduction

Globally, by the end of 2018, an estimated 37.9 million people were living with HIV and 43% of them were women of reproductive age. Nigeria is the region most affected with an estimated 61% of new infections according to the report of the United Nations for AIDS (2019). Kendall and Daniel (2014) confirm that HIV disease is responsible for one-quarter of deaths during pregnancy and the six-week postpartum period in sub-Saharan Africa. Nigeria has the second largest HIV epidemic in the world and has one of the highest new infection rates in sub-Saharan Africa. UNAIDS (2016), reported that an estimated 60% of new HIV infections in western and central Africa in 2015 occurred in Nigeria and that the country registered the lowest percentage of reduction in new HIV infections among children since 2009. According to the report, Nigeria has only 36% of her HIV-infected pregnant women receiving ART and just 21% reduction in new HIV infections among children. This rate Nigeria the lowest in the prevention of mother-to-child transmission progress against the 2015 global plan targets in some selected priority countries and it further confirms HIV infection, as a disease condition still on the increase in Nigeria. According to the report of studies by Daniel *et al*., (2017), Ondo State is one of the ten states in Nigeria with increasing HIV prevalence. The state is equally ranked third out of the south-western states according to the report of the survey on the prevalence of HIV in Nigeria carried out in 2018 by the Federal Ministry of Health (FMH, 2019). A reliable epidemiological data in Ondo Central Senatorial District, where state of the art health facilities with HIV care and support programs are provided is therefore important to understand the distribution of HIV infections across various socio-demographic factors to have a basis for a robust and effective decision-making on measures that gives better hope for positive improvements. Hence this study is aimed at analysing the socio-demographic distribution of HIV in Akure and Ondo Local Government Areas of Ondo State, Nigeria

Methodology

The study covers four Local Government Areas in Ondo State, which forms the major parts of its Central Senatorial District. Ondo State was created in 1973 and is located in the Southwest geopolitical zone of Nigeria, lying within Latitude 5º45'and 8º 15' to the North and longitude 4º45' and 6' to the East. The state has eighteen local government and is predominantly occupied by the Yorubas who speak various dialects of the language such as the Akoko, Akure, Apoi, Idanre, Ijaw, Ikale, Ilaje, Ondo and the Owo. The state is with a population of 3,441,024 comprising 1,761,263 males and 1,679,761

females (National population commission, 2006).392 individuals were recruited into this study but only 348 individuals have complete records some patients such as pregnant women and patients whose infection has progressed into an advanced stage were excluded from participating. Therefore 44 of them were tagged patients with inconclusive data. Consenting patients were assured of confidentiality

Each patient was administered a well-structured questionnaire to obtain socio-demographic, behavioural, and other relevant information. The data obtained were analysed using SPSS version 23.0 for windows. The prevalence of HIV occurrence across the various socio-demographic factors was done using simple percentage analysis and a Pearson Chi-square test was used to measure the level of significance of the factors to the occurrence of HIV infection among Ondo and Akure populace. *P*-values less than 0.05 were considered statistically significant.

Ethical clearance to conduct the study was obtained from the Ondo State Ministry of Health after a thorough scrutiny of the study procedure before its commencement. Patients' consent was sought before their enrolment in the study.

Results

A total of 392 people living with HIV (PLWHIV) and on highly active antiretroviral therapy (HAART) were approached while recruiting patients for this study but 88.8% of the patients with completed data were eventually enrolled. This comprises 171 individuals from Akure South, 55 from Akure North, 75 from Ondo West and 47 from Ondo East (Figure 2). The participants were between ages 0 and 70 (figure 1) with a mean age of 35.5 ± 13.2 years. The majority (60%) of them were adults of aged between 31 and 50 while 16% were children aged less or equal to 15 years. Most (74%) of the HIV patients were females and 63% of them were married. Those with at least a secondary level of education were slightly the majority (58%). The predominant occupations were artisans and traders (47.7%), students (15.2%), civil service (7.5%) and farming (4.0%) while 25.6% of them were unemployed. They were largely of Yoruba ethnicity (92.5%) and mostly (85.1%) urban dwellers. Other socio-demographic details especially in relative to the LGAs are described in table 1.

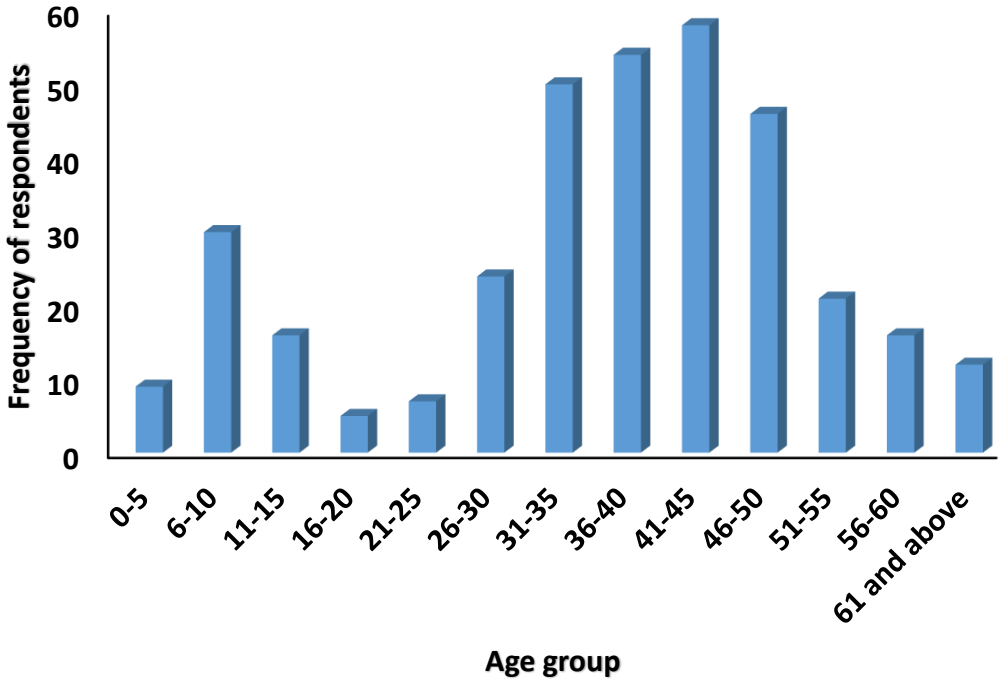

Figure 1: Distribution of HIV infection by age among all the consenting patients

	Akure LGAs N=226 (%)	Ondo LGAs N=122(%)	Total N=348 (%)
Age (years)			
1-10	25 (11.1)	14 (11.5)	39 (11.2)
11-20	13 (5.8)	6 (4.9)	21 (6.0)
21-30	21 (9.3)	10 (8.1)	31 (8.9)
31-40	66 (29.2)	38 (31.1)	104 (29.9)
41-50	71 (31.4)	34 (27.9)	105 (30.2)
51-60	22 (9.7)	15 (12.3)	37(10.6)
61-70	8 (3.5)	4 (3.3)	12 (3.4)

Sex			
Male	64 (28.3)	28 (22.9)	92 (26.4)
Female	162 (71.7)	94 (77.0)	256 (73.6)
Marital status			
Married	146(64.6)	75(61.5)	221(63.5)
Divorced	43 (19.0)	29 (23.8)	72 (20.7)
single	37 (16.4)	18 (14.8)	55 (15.8)
Education			
Primary	76 (33.6)	47 (38.5)	123(35.3)
Secondary	132 (58.4)	69 (56.6)	201(57.8)
Tertiary	18 (8.0)	6 (5.0)	24 (6.9)
Employment			
Student	37 (16.4)	16 (13.1)	53(15.2)
Civil Servant	19 (8.4)	7 (5.7)	26 (7.5)
Self-employed	103 (45.6)	63(51.6)	166(47.7)
Farming	3 (1.3)	11 (9.0)	14 (4.0)
Not Employed	64 (28.3)	25 (20.5)	89 (25.6)
Residence			
Urban	203(89.9)	93(76.2)	296(85.1)
Rural	23 (10.2)	29(23.8)	52 (14.9)
Ethnicity			
Yoruba	210(92.9)	112(91.8)	322(92.5)
others	16 (7.1)	10 (8.2)	26 (7.5)

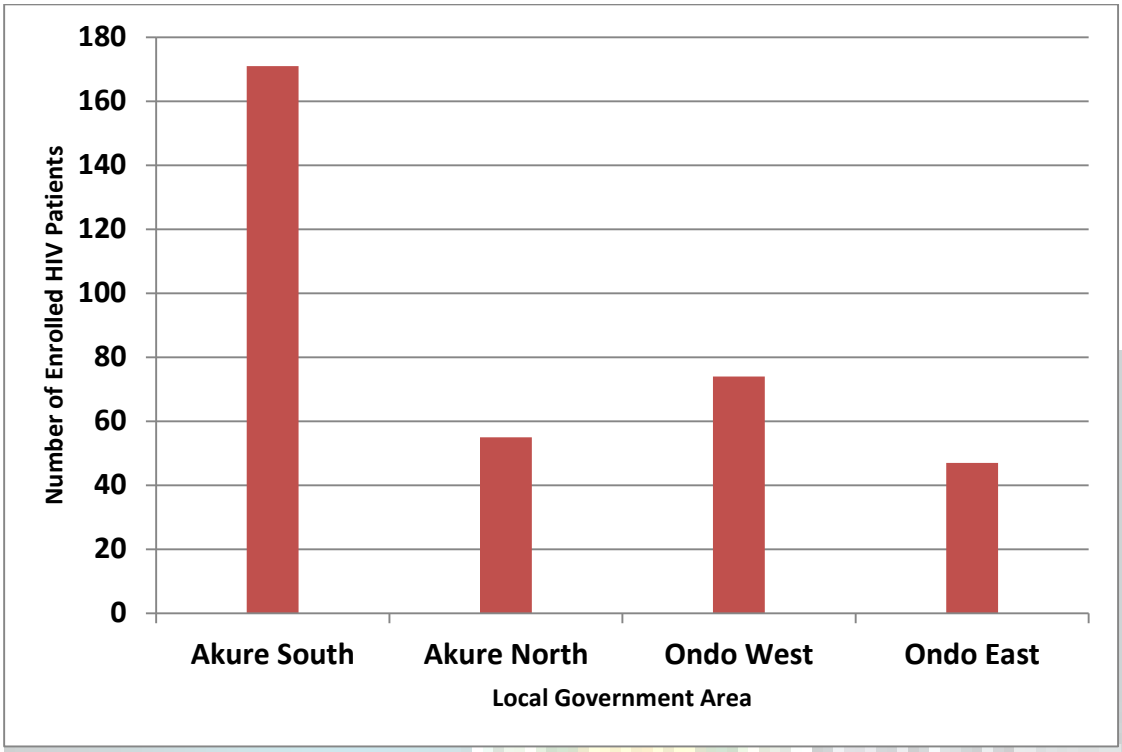

Fig. 2: Distribution of PLWHIV across Akure and Ondo LGAs

TABLE 2: Socio-demographic characteristics of PLWHIV in Akure and Ondo LGAs

Table 2: Analysis of the Socio-demographic Characteristics of PLWHIV Akure and Ondo LGA of Ondo State

Characteristics	Location			X^2	*P*-value
	Akure LGAs N=226 (%)	Ondo LGAs N=122(%)	Total N=348 (%)		
Age (years)				1.152	0.979
1-10	25 (11.1)	14 (11.5)	39 (11.2)		
11-20	13 (5.8)	6 (4.9)	21 (6.0)		
21-30	21 (9.3)	10 (8.1)	31 (8.9)		
31-40	66 (29.2)	38 (31.1)	104 (29.9)		
41-50	71 (31.4)	34 (27.9)	105 (30.2)		
51-60	22 (9.7)	15 (12.3)	37(10.6)		
61-70	8 (3.5)	4 (3.3)	12 (3.4)		

Sex				0.914	0.339
Male	64 (28.3)	28 (22.9)	92 (26.4)		
Female	162 (71.7)	94 (77.0)	256 (73.6)		
Marital status				1.115	0.573
Married	146(64.6)	75(61.5)	221(63.5)		
Divorced	43 (19.0)	29 (23.8)	72 (20.7)		
single	37 (16.4)	18 (14.8)	55 (15.8)		
Education				1.651	0.438
Primary	76 (33.6)	47 (38.5)	123(35.3)		
Secondary	132 (58.4)	69 (56.6)	201(57.8)		
Tertiary	18 (8.0)	6 (5.0)	24 (6.9)		
Employment				15.459	0.004
Student	37 (16.4)	16 (13.1)	53(15.2)		
Civil Servant	19 (8.4)	7 (5.7)	26 (7.5)		
Self-employed	103 (45.6)	63(51.6)	166(47.7)		
Farming	3 (1.3)	11 (9.0)	14 (4.0)		
Not Employed	64 (28.3)	25 (20.5)	89 (25.6)		
Residence				10.474	0.001
Urban	203(89.9)	93(76.2)	296(85.1)		
Rural	23 (10.2)	29(23.8)	52 (14.9)		

Level of significance is at P<0.05

Discussion

The enrolment of 348 individuals living with HIV in this study within few weeks of patients' recruitment in just four local government areas of Ondo state suggested that the fight against the spread of HIV is far from being won in Nigeria and particularly Ondo-State. This observation aligns with the report of Daniel *et al*., (2017), which analyses the spatial distribution of HIV across the country and shows that the prevalence of HIV in Ondo state increased almost exponentially from 2.3% in 2010 to 4.3% in 2012 making it one of the ten states with increased HIV prevalence. In the same vein, the state ranked third out of the south-western states according to the report of the survey of the prevalence of HIV in Nigeria carried out in 2018 by the Federal Ministry of Health (FMH, 2019). In this study, HIV was found to affect all age groups but the highest prevalence was recorded among adults aged between

31 and 50. This contradicts the submission of Entonu and Agwale (2007) while reviewing the epidemiology, prevention and treatment of HIV in Nigeria and records that youth between ages 20-29 are generally more infected. However, this study being facility-based may be a reflection of the poor health-seeking habits of youths living with HIV within the Local Government Areas examined. The result also affirms the 2017 report of the United Children's Education Fund (UNICEF) that just a few adolescents test for HIV regularly despite their elevated risk. The national agency for the control of AIDS listed certain factors such as negative attitudes of healthcare providers towards young people, their sexual activities, limited access to youth-friendly services, low awareness of HIV and fear of stigma as being key challenges preventing young people from taking up sexual health services, especially in public facilities (NACA, 2015). The fact that almost two-thirds of the enrolled patients are females supports the argument that the female gender tend to keep medical appointments and confirms the assertion of the World Health Organization that females are more vulnerable to HIV due to certain socio-cultural and biological factors (WHO, 1998). However, it is also a shred of evidence that men remain under-represented in most Antiretroviral therapy (ART) programs in sub-Saharan Africa with consequently less favorable programme outcomes as observed by Rubaihayo *et al*., (2016). Results of this study reveal that the highest HIV prevalence was recorded among the married participants. This confirms the report of Sagay *et al*., (2005) who observed that the risk of HIV increased among women of multiple marriages and in women married to bankers or accountants as well as those whose husbands keep multiple sexual partners. The report is also consistent with Ibrahim *et al*., (2019) findings who reported that 81% of the HIV-infected people examined in Abuja and Jigawa states were married and also Laah and Ayiwulu, (2010) who reported 60.3% of people living with HIV examined in Nassarawa Eggon were married. Meanwhile, Odimayo *et al*., (2010) made a contrary record having observed that HIV prevalence was highest among the divorcee in Benue state. However this was supported by the assertion of Fagbamigbe *et al*., (2016) who reported that HIV prevalence among divorcees was significantly higher than among their married counterparts and concluded that being a divorcee could be a strong predictor for HIV especially among women.

The majority of the individuals living with HIV in this study were those whose highest level of education was secondary or below. Factors responsible may be related to their low understanding of the knowledge of HIV/AIDS transmission or their unwillingness and inability to utilize such information in making informed decisions related to HIV/AIDS prevention. The observed lower HIV

prevalence among individuals with post-secondary education in this study may, therefore, be attributed to being well-informed on the mode of HIV transmission and preventive measures. This observation is similar to the findings of Odimayo *et al*., (2010) and it is also comparable to lower prevalence reported by Ibrahim *et al*., (2019) among highly educated subjects.

Employment status and the kind of residence (urban or rural) are the two socio-demographic factors statistically associated with high HIV prevalence among the study participants. As regards employment, the breakdown showing that most of the people living with HIV are self-employed raised concern on whether they were adequately engaged in good profit generating businesses or they were underemployed. This was also buttressed by the prevalence among unemployed individuals coming second in chronological order. This is similar to the report of Ibrahim *et al*., (2019) and it may be a pointer to the fact that efforts at stress reduction resulting from unattained goals and the need of money to buy basic life necessities may facilitate trading of sex for money and may be a major factor for higher HIV prevalence among this group of subjects. Ability to assert self and relative financial independence may be important factors in lowering the rate of HIV prevalence as seen among civil servants in this study.

Conclusion

Employment status is a significant factor associated with high HIV prevalence in this study, therefore interventions should be targeted towards improving the socio-economic status of women by providing them with affordable low interest loans for medium and small scale businesses. The increasing number of people living with HIV in the study area sparing no age group especially children despite efforts geared towards ensuring generations free of HIV should be controlled by ensuring affordable health care services for pregnant women and sensitizing them on the need to prioritize modern health care during childbirth.

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