



## Prevalence of human immunodeficiency virus among women assessing ante-natal care at a tertiary health facility in Enugu State, Nigeria

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### Abstract

Human Immunodeficiency Virus (HIV) is a pandemic with high prevalence rates worldwide with Sub-Saharan Africa's worst hit. This study aimed to determine the prevalence of HIV among pregnant women attending Ante-Natal Clinic (ANC) at a tertiary health facility in Enugu State Nigeria. This was a prospective hospital-based study that involved all the women that attended ANC of a tertiary health facility in Nigeria. All the data were retrieved from the patient's ante-natal cards and entered into a pro forma. Data were analyzed using SPSS version 25 and variables were presented as frequencies, percentages, means, and standard deviation. Chi-square test was used to determine factors that affected the prevalence of HIV, and this was performed with the level of significance set at  $p \leq 0.05$ . All the women that attended ANC in the hospital were tested for HIV and the prevalence was 1.8%. Women between ages 21 – 30 years, married, had secondary education and with 3-4 children had the highest prevalence of HIV. The occupation was the only factor that significantly affected the prevalence of HIV with unskilled workers having the highest prevalence of 12.5%. HIV prevalence among pregnant women was relatively low.

**Keywords** Ante-natal clinic, Enugu State, HIV, Nigeria, pregnant women, prevalence

### Introduction

Human Immunodeficiency Virus (HIV) that causes infection in humans belongs to the genus of Lentivirus. It damages the cells of the immune system leading to a weak immune system and reduction in the ability to fight infections and diseases. Since the first report of HIV and Acquired Immuno-Deficiency Syndrome (AIDS) in the early 1980s, the epidemic has continued with an estimated 75.7 million people infected and 32.7 million deaths (UNAIDS, 2020). In 2019, 690,000 people died of AIDS-related illnesses (UNAIDS, 2020). The vast majority of people living with HIV reside in low- and middle-income countries. Of the 4500 people who contract HIV every day in the world, 59% live in Sub-Saharan Africa. (UNAIDS, 2020) UNAIDS and WHO estimates that the covid-19 pandemic could cause more than 500,000 additional AIDS-related deaths in Sub-Saharan Africa from 2020-2021 if treatment is completely disrupted and even a 20% disruption could cause an additional 110,000 deaths. (UNAIDS, 2020).

Young women (aged 15-24) are especially at risk, with around 5,500 new infections each week occurring in this group.

In Sub Saharan Africa young women accounted for one in four new infections in 2019 despite making up about 10% of the total population and are twice as likely to be living with HIV when compared with men. (UNAIDS, 2020) Significant progress has been made in the prevention of mother-to-child transmission of HIV. In 2019, 85% of all pregnant and breastfeeding mothers living with HIV had access to treatment to prevent transmission of HIV to their babies. This was more than 2010 levels when just 45% of pregnant and breastfeeding women received Anti-Retroviral Therapy. (UNAIDS, 2020) Prevention of Mother-To-Child Transmission (PMTCT) programs have been successful at identifying pregnant women infected with HIV when they present for their first Ante-Natal Care (ANC) visit and initiating preventive measures to limit the transmission of HIV to their babies.

Data suggests that pregnancy is associated with a higher risk of HIV acquisition compared to non-pregnant women. (Thomson et al., 2018; Egbe et al., 2016) Physiological changes in women during pregnancy, including immune and hormonal alterations and shifts in the vaginal microbiome, are

hypothesized as potential drivers of increased susceptibility to infection. (Mofenson, 2018; Kinuthia et al., 2015) A meta-analysis of data from 19 African studies estimated that the HIV incidence rate during pregnancy was 4.7 per 100 person-years and 2.9 per 100 person-years during the postpartum period. (Drake et al., 2014) In addition, acute HIV infection is characterized by a high viral load and may increase the risk of HIV transmission to infants. (Drake et al., 2014) New maternal HIV infection among pregnant women contributes significantly to Maternal-To-Child-Transmission (MTCT) of HIV. (Drake et al., 2014; CDC, 2014; Hollingsworth et al., 2008) In 2019, new maternal HIV infection during pregnancy was reported to be the second major cause of perinatal HIV transmission globally. (UNAIDS, 2020).

Nigeria was reported to have the second-largest HIV epidemic in the world. (National Agency for the Control of AIDS, NACA, 2020) Although HIV prevalence among adults in Nigeria (1.4% in 2019) is much less than other Sub-Saharan African countries such as South Africa (19%) and Zambia (11.5%), the size of Nigeria’s population means that 1.9million people were living with HIV in 2019. UNAIDS estimates that around two-thirds of new HIV infections in West and Central Africa in 2019 occurred in Nigeria. Together with South Africa and Uganda, the country accounts for half of all new HIV infections in Sub-Saharan Africa every year. This is despite achieving a 13% reduction in new infections between 2010 and 2019 (UNAIDS, 2020). Enugu state has the 6<sup>th</sup> highest prevalence in Nigeria (2.1%). (NACA, 2020) About a quarter (26.9%) of all cases of MTCT of HIV in the world occur in Nigeria. (UNAIDS, 2018) PMTCT of HIV program as seen in some Nigerian hospitals provides an opportunity to document and monitor HIV prevalence among pregnant women. (Agboghoroma et al., 2013) The objective of this study was to determine the prevalence of HIV and socio-demographic characteristics that affected the prevalence among pregnant women accessing ANC at a tertiary health facility in Enugu State, Nigeria.

**Materials and Methods**

**Study area**

The study was carried out at the Ante-Natal Clinic of Enugu State University Teaching Hospital (ESUTH) Park Lane Enugu. ESUTH is one of the tertiary health facilities in Enugu State, Nigeria that provides tertiary services for patients within Enugu and its environs. It also serves as a referral center. It is located within the Enugu Metropolis.

**Study design**

This was a prospective hospital-based study

**Study population**

All the women that attended ANC of ESUTH Park Lane Enugu within the time of data collection (1<sup>st</sup> June 2020-31<sup>st</sup> May 2021) were included in the study.

**Data collection methods**

Data were collected for 12 months (1<sup>st</sup> June 2020-31<sup>st</sup> May 2021). Two trained research assistants were used to collect the data. Data were retrieved from the patient’s ante-natal cards and entered into a pro forma. Information retrieved included maternal socio-demographic characteristics and HIV status.

**Data management**

**Independent variable**

Socio-demographic characteristics.

**Dependent variables**

HIV status of mothers

**Statistical analysis**

All the data were imputed into SPSS version 25 and edited for errors by generating frequencies. Categorical variables were summarized using frequencies and percentages. Chi-squared test was used to test for associations between socio-demographic characteristics and HIV status of mothers with significant levels placed at p-value ≤0.05.

**RESULTS**

**Table 1: Socio-demographic characteristics of the women**

Variable	Frequency	Percentage
<b>Age</b>		
Mean± SD	29.78±4.70	
Range	16-46	
<b>Age in group</b>		
≤20years	30	1.9
21-30	878	56.0
31-40	646	41.2
41-50	14	0.9
<b>Marital status</b>		
Married	1519	96.9
Single	49	3.1
<b>Ethnicity</b>		
Igbo	1554	99.2
Yoruba	2	0.1
Hausa	10	0.6
others	2	0.1
<b>Religion</b>		
Christianity	1560	99.5
Islam	8	0.5
<b>Occupation</b>		
Civil servants	869	55.4
Agricultural workers	12	0.8
Crafts and related trades	171	10.9
Unskilled workers	24	1.5
Unemployed	492	31.4
<b>Educational level</b>		

Tertiary	984	62.8
Secondary completed	574	36.6
Primary completed	10	0.6
<b>Parity</b>		
1-2	1082	69.0
3-4	400	25.5
Above 4	86	5.5
<b>HIV Status</b>		
Negative	1540	98.2
Positive	28	1.8

Data shows the socio-demographic characteristics of the women. The mean age of the women was 29.78±4.70 while most of them were aged 21-30years 878(56.0%). The majority were married 1519(96.9%), Igbos 1554(99.2), and Christians 1560(99.5%). About a third of them were unemployed 492(31.4%). The majority of them 984(62.8%) had tertiary education and of low parity 1082(69.0%). The prevalence of HIV was 1.8%

## Discussion

All the women that attended ANC at the hospital were tested for HIV as it is a prerequisite for booking. The HIV prevalence among the studied women was 1.8%. This was similar to the report of other studies from India (1.03%), (Sibia et al., 2016) South Africa (1.5%) (Woldesenbet et al., 2021), and Damaturu, Northern Nigeria (Khanam., 2019) but lower than the report of similar studies in Abuja, Northern Nigeria (11.5%), (Aghoghoroma & Iliyasu, 2015) Ibadan, Southern Nigeria (26.4%) (Okonkwo et al., 2019), and Cameroun 13.1%. (Fouedjio et al., 2017) A Brazilian study reported a much lower finding 0.38%. (Pereira et al., 2016) The lower prevalence observed among pregnant women in this study could be explained by the progress in the scale-up of combination prevention interventions in the state. The study population might have contributed to the low prevalence as more than half of them had tertiary education and were civil servants. Studies have shown that illiteracy and poverty contribute to a higher prevalence of HIV. (Isichie et al., 2015; NACA, 2016)

There was no significant association between age and HIV status of mothers in our study but the highest prevalence was found among mothers aged 21-30years. Other studies reported similar findings. (Okonkwo et al., 2019; Ochejele et al., 2004) This is in contrast to the global statistics which show that about 15% of HIV-positive females were aged 15 – 24 years. This group bears a disproportionate burden of infection having a higher prevalence than their male counterparts. (UNAIDS, 2015) In Africa, it has been reported that girls within 15 – 24 years were about two times more likely to be infected with HIV than any other age group. Moreover, 3 out of every 4 newly infected individuals in Africa are young women aged between 15 and 19 years old. (UNAIDS, 2018) Other studies also reported an association between maternal age and HIV status. (Aghoghoroma & Iliyasu, 2015; Fouedjio et al., 2017 )

There was no case of HIV among the single mothers in our study. Other studies reported higher prevalence among single and co-habiting women. (Woldesenbet et al., 2021; Kim et al., 2016; Anoubissi et al., 2019) The small proportion of single women (3.1%) among our study population might have affected the result. Our study also found out that women with tertiary education had a lower prevalence of HIV when compared to those with secondary education. Also, civil servants had a lower prevalence of HIV when compared to other classes of workers except for agricultural workers. Thus, those with tertiary education and civil servants can be said to be in the higher social class. Highly educated persons and those of high social class may be the first to respond positively to preventive messages and also take measures to reduce HIV infections. Other studies corroborated our findings. (Fylkesnes et al., 2001; Michelo et al., 2006) There was no statistical association between parity and HIV status of mothers. Another study corroborated this. (Woldesenbet et al., 2021) while another study reported a decreasing trend of HIV prevalence with increasing parity. (Galadanci et al., 2008)

## Conclusion and recommendations

Our study indicated that the HIV prevalence among pregnant women in Enugu State is relatively low and lower than the prevalence among adults in the state. The highest prevalence was found among women aged 21-30 years while maternal occupation was the only factor that significantly affected the prevalence of HIV among the studied women. Also, HIV testing among pregnant women was 100%. More efforts should be made using combined strategies to reduce HIV prevalence among women of reproductive age in the state.

## Ethical considerations

Ethical clearance for the study was obtained from the Research and Ethics Committee of ESUTH Park Lane. Anonymity was maintained by ensuring that the client's name was not recorded on the pro forma. All the collected data were kept confidential.

## Conflict of Interest

The author hereby declares no conflict of interest.

## Consent for publication

The author declares that the work has consent for publication.

## Funding support

The author declares that they have no funding support for this study.

**Table 2: Factors that affected HIV prevalence among the studied women**

Variable	HIV Status		X <sup>2</sup>	P value
	Negative N (%)	Positive N (%)		
<b>Age in years</b>				
≤20	30(100.0)	0(0.0)	2.084	0.555
21-30	859(97.8)	19(2.2)		
31-40	637(98.6)	9(1.4)		
≥41	14(100.0)	0(0.0)		
<b>Marital status</b>				
Married	1491(98.2)	28(1.8)	0.920	0.338
Single	49(100.0)	0(0.0)		
<b>Ethnicity</b>				
Igbo	1526(98.2)	28(1.8)	0.257	0.968
Yoruba	2(100.0)	0(0.0)		
Hausa	10(100.0)	0(0.0)		
Others	2(100.0)	0(0.0)		
<b>Religion</b>				
Christianity	1532(98.2)	28(1.8)	0.146	0.702
Islam	8(100.0)	0(0.0)		
<b>Educational level</b>				
Tertiary	970(98.6)	14(1.4)	2.318	0.314
Secondary completed	560(97.6)	14(2.4)		
Primary completed	10(100.0)	0(0.0)		
<b>Occupation</b>				
Civil servants	864(99.0)	9(1.0)	20.323	<0.001*
Agricultural workers	12(100.0)	0(0.0)		
Crafts and related trades	167(97.7)	4(2.3)		
Unskilled workers	21(87.5)	3(12.5)		
Unemployed	476(97.5)	12(2.5)		
<b>Parity</b>				
1-2	1065(98.4)	17(1.6)	3.968	0.137
3-4	389(97.3)	11(2.8)		
>4	86(100.0)	0(0.0)		

Table shows the factors that affected the HIV prevalence among the studied women. Only maternal occupation had a significant association between HIV status ( $\chi^2=20.323$ ,  $p<0.001$ ).

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