

## Uptake of HIV counseling and testing services among Nigerian women attending antenatal care between 2007 and 2017

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### ABSTRACT

**Introduction:** HIV testing among women attending antenatal care (ANC) is a principal way of preventing mother-to-child Transmission. This study aimed to assess the uptakes of HIV counselling and testing (HCT) among Nigerian women attending antenatal care from between 2007 and 2016/17.

**Methodology:** The research used data for the years 2007, 2011, and 2016/2017 from the United Nations Children's Fund (UNICEF). Data were analyzed using IBM-SPSS version 25.0. The association of uptake of HCT with demographic profiles of the women was determined using logistic regression.

**Results:** The study comprised 1021, 2927, and 4155 in 2007, 2011, and 2016/17 women respectively. The majority of the women were within age 25–34 (57.8%), married (94.2%), attained secondary education (75.6%), lived in urban areas (51.6%), and 80.4% had good knowledge of PMTCT. HCT uptake during ANC was 72.9%, 73.8%, and 71.8% in 2007, 2011 and 2016/2017 respectively. Four factors were identified as responsible for the decline in the use of HIV counselling and testing. These factors include poor knowledge of PMTCT, lower age category, lack of education, and living in areas. Good knowledge of PMTCT (AOR=1.29, 95% CI=1.15-1.46; P<0.01), age 35- 44 years (AOR=1.49, 95% CI=1.09-1.480; P = 0.002) and higher education attainment (AOR=1.51, 95% CI=1.23-1.84; P<0.01) were the factors that positively influenced the use HCT during ANC.

**Conclusion:** Despite the increased number of women attending ANC in Nigeria from 2007 to 2016/17, there was a decline in the uptake of HCT between 2011 and 2016/17. It is crucial that the ANC facilities for women are strengthened in terms of consistency and that all women who utilize ANC services are tested for HIV.

### KEYWORDS

HIV counselling and testing; Antenatal care; Reproductive

### CORRESPONDING

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## INTRODUCTION

Human immunodeficiency virus (HIV) counselling and testing during pregnancy provide an opportunity for identification of HIV-positive women and prompt initiation of treatment, care, and support to minimize the risk of infant infection. However, several factors influence the uptake of HIV counselling and testing (HCT) among pregnant women including access to testing sites, lack of confidentiality, and stigma.<sup>[1,2]</sup> There is some evidence to show that women are willing to take up HIV testing services during ANC visits, but this evidence has not matched actual uptake of services in studied populations.<sup>[3]</sup> One suggestion for this disparity between intent and action is the multilevel barriers to uptake of services that impact not just HIV testing but maximization of other prevention of mother-to-child-transmission (PMTCT) services.<sup>[3-5]</sup>

To improve access to testing, several countries have integrated HIV testing into their pre- and post-natal services. Evidence from high-income countries shows that MTCT has been reduced greatly due to the standardization of HIV testing at regular prenatal visits, and similar experiences have been reported in countries in sub-Saharan Africa, though the rates are less significant than those seen in industrialized nations.<sup>[5,6]</sup> Additionally, the adoption of the Option B+, a universal treatment strategy for the prevention of mother-to-child transmission of HIV by priority countries in sub-Saharan Africa has contributed significantly to the increase in HIV testing among pregnant women during ANC in these countries.<sup>[7]</sup>

Although HIV testing is generally done when women first present at ANC or during labour and delivery,<sup>[4]</sup> women in low resource settings have been known to boycott ANC or attend in late pregnancy, which presents a challenge to timely antiretroviral initiation.<sup>[8]</sup> To close this HIV testing gap, routine (opt-out) testing is done at delivery points. But due to the urgency of the situation, HIV testing at delivery does not allow for proper counselling, and the fear of possible infection often drives health care workers to carry out testing of women perceived as a high risk without informed consent.<sup>[9,10]</sup>

Despite a rise in HIV testing in ANC in the current dispensation of option B+, uptake and retention along later stages of PMTCT cascade have been low.<sup>[7]</sup> Cultural norms such as the preference for TBAs have also contributed to the low uptake of HIV testing within formal health sectors.<sup>[11]</sup> More than 50% of births in Nigeria still occur at homes under the assistance of untrained or trained TBAs or family members who have little to no knowledge of HCT or PMTCT.<sup>[11]</sup> This study aims to assess the levels of uptake of HIV counselling and testing among Nigerian women attending antenatal care from between 2007 and 2016/17.

## METHODOLOGY

The study utilized secondary data collected from residents of Nigeria in 2007, 2011 and 2016/2017 from the United Nations Child Fund (UNICEF) Multiple Indicator Cluster Surveys (MICS). The data were retrieved from UNICEF's electronic data management system. Before using the downloaded data, UNICEF approval was obtained through online registration and acceptance via e-mail. Data were collected from women of reproductive age who have had a live birth within two years before the survey. Data with incomplete information were removed from the abstracted data during the data cleaning stage.

The study population included women who have attended ANC more than once at the time of the survey. This group is considered suitable for this study to enable us to determine the uptake of HIV counselling and testing among the women.<sup>[12]</sup>

The UNICEF used multiple stages to identify and select respondents for the MICS surveys. These steps involved random sampling of areas identified for the study which was selected based on the size of the areas selected. This is followed by the random selection of 20–30 households from each selected area. All women that were within 15–49 years age bracket were finally selected and were interviewed in each household. There were 27,093 women interviewed in 2007, 33,699 in 2011 and 36,176 in 2016/2017.

## DATA ANALYSIS

Data analysis was done using IBM-SPSS version 25.0 for windows after eliminating incomplete data and the data were classified into categories and properly coded for analysis. Statistical analysis done include descriptive statistics and multivariate regression to determine the relationships between dependent and independent variables, setting the level of significance at P less than 0.05. Permission was obtained from the UNICEF to use the round three, four and five MIC survey data.

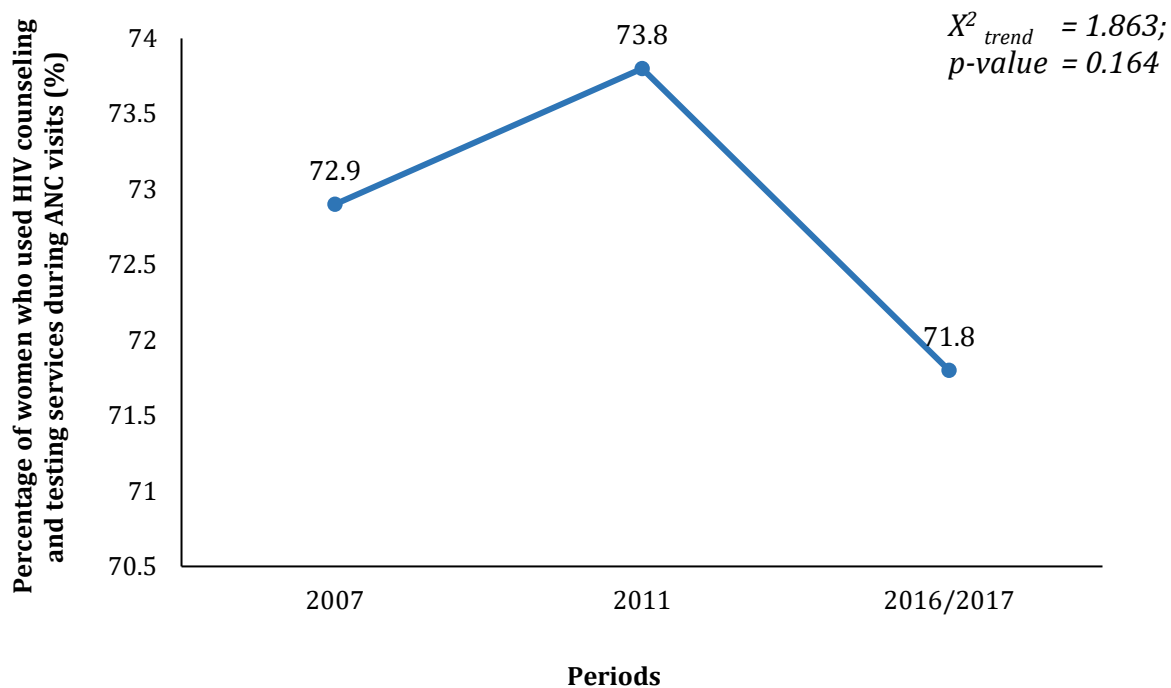
## RESULTS

The number of women attending ANC and met the inclusion criteria for this study was 8,103 with an increasing number from 1021 (12.6%) in 2007 to 2927 (36.1%) in 2011 and 4155 (52.9%) in 2016/17. The majority of the women were within age 25 – 34 (57.8%), were married (94.2%), attained secondary education (75.6%) and lived in urban areas (51.6%) as shown in Table 1. Slightly over four-fifth (80.4%) had good knowledge of PMTCT (80.4%).

The proportion of women who utilized HCT services during ANC was 72.9%, 73.8%, and 71.8% for 2007, 2011 and 2016/2017 respectively. More women used HCT services in 2011 than in 2007 and 2016/2017 although these differences were not statistically significant ( $p > 0.05$ ), Figure 1.

Across the three time periods, there was no statistically significant association between knowledge of PMTCT and ANC attendance at health facilities.

Uptake of HCT was significantly higher among women with good knowledge of PMTCT (73.9%), ( $p < 0.001$ ) and increased significantly with an increase in age of women from 67.1% among women aged 15 – 24 years to 74.7% among older women 45 years or more ( $P < 0.001$ ). Other factors associated with higher uptake of HCT were education attainment and area of residence ( $p < 0.05$ ) whereas no significant relationship was observed between marital status and uptake of HCT ( $p > 0.05$ ).



**FIGURE 1:** Trend in use of HIV counselling and testing services during ANC visits among reproductive-aged women over three periods.

**TABLE 1:** Factors influencing Women's Use of HIV Counseling and Testing During Antenatal Care at Health Facility Over Three Periods

Variables	HIV counselling and testing during ANC visits			$\chi^2$ (p-value)
	Yes n (%)	No n (%)	Total n (% column)	
<b>Periods</b>				
Year 1	744 (72.9)	277 (27.1)	1021 (12.6)	1.863 (0.164)
Year 2	2161 (73.8)	766 (26.2)	2927 (36.1)	
Year 3	2983 (71.8)	1172 (28.2)	4155 (52.9)	
<b>Knowledge of PMTCT</b>				
Good	4813 (73.9)	1703 (26.1)	6516 (80.4)	24.115 (0.001)*
Poor	1075 (67.7)	512 (32.3)	1587 (19.6)	
<b>Age category (years)</b>				
15 - 24	1162 (67.1)	571 (32.9)	1733 (21.4)	35.079 (<0.001)*
25 - 34	3478 (74.3)	1204 (25.7)	4682 (57.8)	
35 - 44	1174 (73.9)	415 (26.1)	1589 (19.6)	
≥45	74 (74.7)	25 (25.3)	99 (1.2)	
<b>Marital status</b>				
Currently married	5561 (72.9)	2071 (27.1)	7632 (94.2)	2.639 (0.104)
Not married	327 (69.4)	144 (30.6)	471 (5.8)	
<b>Educational level</b>				
No formal education	282 (61.7)	175 (38.3)	457 (5.6)	89.584 (<0.001)*
Primary/Secondary	4370 (71.3)	1755 (28.7)	6125 (75.6)	
Tertiary	1236 (81.3)	285 (18.7)	1521 (18.8)	
<b>Area of residence</b>				
Rural	2811 (71.7)	1112 (28.3)	3923 (48.4)	3.906 (0.048)*
Urban	3077 (73.6)	1103 (26.4)	4180 (51.6)	

\*Statistically significant ( $p < 0.05$ )

Women who had good knowledge of PMTCT were more likely to use HCT services (AOR = 1.29, 95% CI = 1.15-1.46;  $P < 0.01$ ) than their counterparts who were not aware of the program. Women within 35- 44 years old (AOR = 1.49, 95% CI = 1.09-1.480;  $P = 0.002$ ) and those within 25 - 34 years (AOR = 1.28, 95% CI = 1.13 - 1.45;  $P < 0.01$ ) were more likely to use HCT during ANC than those below 25 years. Across the three periods, education significantly predicted the use of HCT services. Women who attained primary and secondary (AOR = 1.51, 95% CI = 1.23-1.84;  $P < 0.01$ ) or tertiary level of education (AOR = 2.48, 95% CI = 1.96-3.13;  $P < 0.01$ ) were more likely to use HCT services compared to their uneducated counterparts (Table 2).

**TABLE 2:** Binary Logistic Regression Showing Factors influencing the uptake of HIV Counseling and Testing During Antenatal Care for Each Year

Variable	OR (95% C.I.)	p-value	AOR (95% C.I.)	p-value
<b>Knowledge of PMTCT</b>				
Poor	1.00	<0.001	1.00	<0.001
Good	1.35 (1.20 - 1.52)		1.29 (1.15 - 1.46)	
<b>Age category (years)</b>				
15 - 24	1.00		1.00	0.932
25 - 34	1.42 (1.26 - 1.60)	<0.001	1.28 (1.13 - 1.45)	
35 - 44	1.39 (1.20 - 1.82)	<0.001	1.27 (1.09 - 1.48)	
≥45	1.46 (0.91 - 2.31)	0.114	1.49 (0.93 - 2.38)	
<b>Level of Educational</b>				
No formal education	1.00		1.00	<0.001
Primary/Secondary	1.55 (1.27 - 1.88)	<0.001	1.51 (1.23 - 1.84)	
Tertiary	2.69 (2.14 - 3.38)	<0.001	2.48 (1.96 - 3.13)	
<b>Area of residence</b>				
Rural	1.00		1.00	0.502
Urban	1.10 (1.00 - 1.22)	0.048	1.04 (0.94 - 1.14)	

Note. \*Statistically significant ( $P < 0.05$ ); R = Reference category; CI = Confidence Interval

## DISCUSSION

HIV testing among women attending antenatal care is a principal way of preventing mother-to-child Transmission. The finding of this study showed a slight increase in the use of HCT services in 2011 among women attending ANC in Nigeria. Despite the increasing proportion of women attending ANC from 2011 to 2016/17, a large proportion of the women attending ANC in this period were not tested. This decline from 73.8% to 71.2% in 2016/17 is quite worrisome and deserves attention as this is still far below the national target of 80% set for HIV testing among pregnant and women attending ANC by 2021.<sup>[13]</sup>

This study identified four factors responsible for the decline in HIV counselling and testing among respondents, these include knowledge of PMTCT, age of the women, education attainment, and area of residence. There are other two possible explanations to this decline: the first is that women could refuse the tests because they do not want to know their HIV status for the fear of what the outcome may be.<sup>[14,15]</sup> The second reason could be that the ANC service providers fail to offer HIV tests to the women during their ANC visits due to non-availability of the required test-apparatus or neglect of duties.<sup>[16]</sup>

Though the levels of uptake of HCT among women attending ANC in 2016/2017 is below the targeted mark of 80%, there was still some improvement from 53% of women attending ANC who were tested for HIV in 2013 as derived from the National Demographic Health Survey.<sup>[16]</sup> It is also higher than 68.8% obtained in Southern Ethiopia in 2019.<sup>[10]</sup> With 2021 around the corner, there is still more work to do to enable the country to meet up with the 80% target by 2021. There is a need to encourage and educate more women about the importance and benefits of HIV testing during ANC. To improve the use of HCT among women, the role of service providers is important.

Our study showed that the uptake of HCT was minimum among adolescents aged 15 – 24 years which is similar to what was reported by Udoh and Ushie<sup>[16]</sup> and this has been the case since about a decade as previously reported since 2007 that the level of acceptance of HIV services is low among adolescents.<sup>[17]</sup> There was a significant positive association between higher educational attainment and antenatal attendance, use of HCT services in this study. Women with secondary education or higher were more likely to utilize HCT services. This could be as a result of a better understanding of health messages and the implication of preventive measures to the woman's health and that of her child.<sup>[18]</sup> This is similar to other studies where higher education was correlated with the use of ANC and other PMTCT related services.<sup>[2,19]</sup> Having higher education could imply a better understanding of health messages which enhances engagement with health systems. Also, educated women are more likely to be in paid employment and as such, would be financially independent and able to afford obstetric charges at formal health care facilities. Several studies have shown that women who were financially dependent on their husbands had to wait to get approval or funds to enable them access maternal health services at health facilities.<sup>[1,2,18]</sup>

It is not unexpected that the finding of this study showed that women attending ANC in urban areas utilized HCT services more than their counterparts in rural areas due to higher knowledge of where to access HCT services among urban dwellers than those residing in rural areas.<sup>[4,20,21]</sup> A similar finding was also reported among pregnant women attending ANC in a recent study conducted in Nigeria.<sup>[16]</sup>

In contrast to the findings of Udoh and Ushie<sup>[16]</sup>, this study found that women who were aware of PMTCT were more likely to utilize HCT compared to those who did not know about it. Studies have shown that awareness and perception can influence people's response to certain diseases.<sup>[22-24]</sup> Lack of understanding of the nature of PMTCT programs provided for women during ANC is itself indicative of low utilization of the services. Consequently, advice on tests and training on the risk of MTCT from HIV and available ARVs are important for women during ANC as women are partly involved in decision-making.

## LIMITATIONS

There are limitations in this study. Since the study used secondary data, it could not determine other factors (such as fear of result outcome, providers attitude, and accessibility) responsible for the declining uptake of HIV counselling and testing apart from the four factors identified in the study which are knowledge of PMTCT, age of the women, education attainment, and area of residence. Another major limitation of this study is that it could not assess the regional variation of the uptake of HCT among women attending ANC in these periods. Also, the study could not assess the quality of counselling and testing offered to the women which can have a great influence on the decision to test for HIV. The influence of religious belief was not also accounted for as this may also influence the women's decision to utilize the HCT services. However, the study has shown the trend in the uptake of HCT services among women attending ANC in the past ten years in Nigeria and has significantly provided insight into some of the salient factors affecting the uptake of HCT among women attending ANC in Nigeria in our quest to control and eradicate MTCT of HIV.

## CONCLUSION

Findings of this study showed that despite the increased number of women attending ANC in Nigeria from 2007 to 2016/17, there was a sharp decline in the uptake of HCT services between 2011 and 2016/17. Socio-demographic factors such as knowledge of PMTCT, higher levels of education, residing in urban areas, and age advancement were found to have a positive effect on women's uptake of HCT services in Nigeria, while marital status did not influence the uptake of the services. In the context of the findings of this study, it is important to adequately increase the public awareness of HIV/AIDS, especially among women in rural areas, to encourage positive and informed decisions and the uptake of HCT during ANC and to promote PMTCT. It is crucial that the ANC facilities for women are strengthened in terms of consistency and that all women who utilize ANC services are tested for HIV. Health service providers in Nigeria must be diligent in ensuring that all women presented for ANC are tested for HIV. Further study is needed to identify the causes of the decline in order to take necessary interventions and corrective policies.

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