

# Determinants of Maternal Healthcare Utilization in Nigeria using the Nigeria Demographic and Health Survey

Kinikanwo Innocent Green<sup>1</sup>, Anthony Ike Wegbom<sup>1\*</sup>, Fortune Somiari Amah-Tariah<sup>2</sup>, Oluchi Mildred Ndudim<sup>1</sup>

<sup>1</sup>Department of Public Health Sciences, College of Medical Sciences, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Nigeria

<sup>2</sup>Department of Human Physiology, College of Medical Sciences, Rivers State University, Nkpolu-Oroworukwo, Port Harcourt, Nigeria

\*Corresponding Author: Anthony Ike Wegbom ([anthony.wegbom1@ust.edu.ng](mailto:anthony.wegbom1@ust.edu.ng))

DOI: <https://doi.org/10.52403/ijhsr.20260106>

## ABSTRACT

**Background:** Maternal healthcare utilization in Nigeria remains suboptimal, contributing to high maternal and neonatal mortality. Understanding both the level of service uptake and socio-demographic determinants is essential for designing targeted interventions. This study aimed to assess the level of maternal healthcare utilization and associated factors among Nigerian women.

**Methods:** A cross-sectional analysis was conducted using the 2018 Nigeria Demographic and Health Survey (NDHS) dataset, comprising women aged 15–49 years who had a live birth within five years preceding the survey. Maternal healthcare utilization was measured using three indicators: antenatal care with four or more visits (ANC4+), facility-based delivery (FBD), and postnatal care within two days of delivery (PNC). Descriptive statistics estimated coverage levels with 95% confidence intervals (CIs), while unadjusted and adjusted logistic regression identified socio-demographic predictors. Statistical significance was set at  $p < 0.05$ .

**Result:** Among women in Nigeria, 58.5% had four or more antenatal care visits, 41.1% delivered in health facilities, and 84.0% received postnatal care within two days of delivery. ANC utilization increased with maternal age up to 34 years and with higher education, with 92.53% of women with higher education attending four or more visits. FBD was highest among women with higher education (87.71%), urban residents (72.70%), and wealthier households (69.67%). PNC within 2 days was highest among insured women (90.93%), highly educated women (90.24%), and residents of Southwest Nigeria (90.55%). Rural residence, low education, poverty, high parity, and lack of autonomy were consistently associated with lower service utilization.

**Conclusion:** Maternal healthcare utilization in Nigeria is influenced by socio-demographic, economic, and regional factors. Interventions targeting education, poverty reduction, women's autonomy, and regional inequalities are essential to improve maternal and neonatal outcomes. The 2018 NDHS highlights moderate levels of ANC and PNC utilization but low uptake of facility-based delivery in Nigeria

**Keywords:** Maternal Healthcare, Ante-Natal Care, Facility-Based Delivery, Post-Natal Care, Nigeria.

## 1. INTRODUCTION

Maternal healthcare services, which include antenatal care (ANC), facility-based delivery (FBD), and postnatal care (PNC), are globally recognized as essential pillars for improving maternal and neonatal health outcomes. These services provide critical opportunities for early detection and management of pregnancy-related complications, ensure skilled attendance during childbirth, and offer essential care for both mother and child in the immediate postpartum period [1]. Collectively, they contribute to the reduction of preventable deaths and improvement of long-term health outcomes for women and children. The World Health Organization (WHO) emphasizes that maternal health is not only a medical concern but also a human rights and development issue that directly impacts family wellbeing, economic productivity, and national development [2].

Globally, despite remarkable advances in medical science and public health interventions, maternal mortality continues to represent a major challenge. In 2020, an estimated 287,000 maternal deaths occurred due to pregnancy and childbirth-related complications, with 70% of these deaths occurring in sub-Saharan Africa. Most of these deaths were preventable with timely and effective healthcare interventions [2].

Nigeria, as Africa's most populous nation, shoulders a disproportionate share of the global maternal health burden. The country alone contributes nearly 20% of the world's maternal deaths, despite representing just 2.4% of the worldwide population [3]. According to the 2018 Nigeria Demographic and Health Survey (NDHS), the maternal mortality ratio (MMR) stands at 512 per 100,000 live births, while the neonatal mortality rate is 39 deaths per 1,000 live births [4]. These statistics are far above global averages and signal deep systemic issues in maternal healthcare utilization [5]. Nigeria's maternal health

indicators reflect both underutilization of services and marked inequalities in access. For instance, while 67% of women of reproductive age report at least one ANC visit, only 51% achieve the WHO-recommended minimum of four visits, and just 31% comply with the updated 2016 guideline of eight or more visits [4, 1]. Facility-based delivery remains strikingly low at 39%, while skilled birth attendant coverage is only 43%. Equally concerning is that less than half of women (42%) receive postnatal care within the critical first 48 hours after delivery [4]. These figures highlight the urgent need for strengthening healthcare systems and addressing the barriers to utilization. Nigeria's situation is particularly critical because the country's progress has broader implications for achieving regional and global maternal health targets, given its population size and mortality burden [5].

The urgency of improving maternal healthcare utilization in Nigeria also aligns with the global health agenda. The Sustainable Development Goals (SDGs), adopted in 2015, place maternal health at the centre of development. Specifically, SDG 3.1 seeks to reduce the global MMR to less than 70 per 100,000 live births by 2030 [6]. For Nigeria to contribute meaningfully to this target, significant improvements in maternal healthcare coverage and quality are required. Despite investments in health infrastructure and policy reforms such as the National Health Insurance Scheme (NHIS), Midwives Service Scheme (MSS), and state-level free maternal and child health programmes, progress has been uneven [7]. Nigeria's allocation of only 4.7% of its national budget to health in 2023, far below the 15% Abuja Declaration target, limits the effectiveness of these interventions [8]. Moreover, persistent challenges, including weak governance, underfunding, and human resource shortages, have undermined the

sustainability and scalability of maternal health programmes [5, 7].

Maternal healthcare utilization in Nigeria is influenced by a wide range of factors that intersect and reinforce each other [9]. Place of residence remains one of the most significant predictors of maternal healthcare use. Rural women consistently report lower access to ANC, FBD, and PNC compared to their urban counterparts. The 2018 NDHS shows that only 23% of rural women delivered in a health facility compared to 61% of urban women [4]. Geopolitical zones also exhibit stark differences: while the South-West records up to 71% of facility-based deliveries, rates in the North-West and North-East are as low as 12% and 18%, respectively [5]. Insecurity, especially in northern Nigeria due to insurgencies and banditry, has further compounded these disparities by disrupting health services and discouraging women from seeking care [10]. Distance to health facilities and poor transportation infrastructure remain critical barriers. Women living more than 5 km from a facility are significantly less likely to access ANC or FBD [11].

Socio-demographic characteristics further influence women's health-seeking behaviours. Younger mothers, particularly adolescents, may delay or avoid ANC due to stigma, lack of awareness, or limited autonomy [12]. Multiparous women often perceive pregnancy as routine and therefore underutilize services despite higher risks of complications. Marital status also plays a role, with married women, particularly those in monogamous unions, more likely to access maternal care than unmarried or formerly married women due to greater access to resources and social support [13]. Cultural and religious norms significantly shape maternal healthcare choices. In many communities in northern Nigeria, religious beliefs and gender norms restrict women's mobility and autonomy, limiting their ability to seek facility-based care. Ethnic differences also exist, with Hausa and Fulani women demonstrating lower utilization compared to Yoruba and Igbo

women, partly due to cultural practices and variations in educational attainment [11].

Health system constraints add another layer of complexity. Nigeria faces a shortage of skilled healthcare workers, with a doctor-to-patient ratio of 1.95 per 1,000 people, far below WHO recommendations [8]. Health facilities are often under-resourced, poorly distributed, and unevenly equipped. Furthermore, weak governance, corruption, and underfunding erode trust in the health system, causing some women to prefer traditional birth attendants despite the risks involved [12].

Despite Nigeria's efforts to improve maternal healthcare through policies like the Midwives Service Scheme and free maternal care programs in some states, utilization rates remain low [7]. While numerous studies have examined maternal healthcare utilization in Nigeria, most analyses focus on specific determinants in isolation, such as poverty, education, or rural-urban disparities. Less attention has been given to the interaction of geographical, socioeconomic, socio-demographic, and systemic factors in shaping utilization at a national level. Moreover, few studies employ advanced statistical methods, such as concentration indices and decomposition analysis, to quantify the contributions of multiple determinants, including socio-demographic and confounding factors [14].

This study seeks to assess the levels of maternal healthcare utilization in Nigeria and to examine the associated factors influencing access to ANC, FBD, and PNC using the Nigeria Demographic and Health Survey (NDHS) dataset. By identifying variations in utilization and the determinants that shape these patterns, the study aims to generate evidence that can guide policies and interventions to improve equitable access to maternal healthcare services, reduce preventable maternal and neonatal deaths, and support Nigeria's progress toward achieving SDG 3.1 [6].

## **2. METHODS**

### **2.1. Study Area**

The study was set in Nigeria, covering all 36 states and the Federal Capital Territory across six geopolitical zones. Each state is further subdivided into Local Government Areas (LGAs), wards, and census enumeration areas (EAs) [15]. Nigeria, the most populous country in Africa, has a population exceeding 195 million, with an annual growth rate of 2.61%. It ranks seventh globally in population size, after China, India, the United States, Indonesia, Brazil, and Pakistan [16, 17]. Nigeria exhibits pronounced regional differences in education, healthcare access, cultural norms, and fertility, with rural areas exhibiting distinct demographic characteristics.

### **2.2. Study Design, Population, and Data Source**

This study employed secondary data from the 2018 NDHS datasets. The NDHS collects detailed information on fertility, family planning, maternal and child health, and socio-demographic characteristics to inform policy and programming [4]. The primary sampling unit (PSU), referred to as a cluster, was based on EAs from the census. Population estimates for the 774 LGAs, combined with cartographic materials, were used to identify EAs, estimate household numbers, and classify areas as urban or rural. Localities with a population size of 20,000 or more were categorized as urban [15]. The study population consists of women aged 15–49 who had at least one live birth in the five years preceding the 2018 NDHS (2013–2018) [4]. Approximately 21,488 women met these criteria, providing a sufficient sample size for disaggregated analyses [4].

### **2.3. Dependent and Independent Variables**

The dependent variables consisted of three binary measures related to key maternal health services: Antenatal Care (ANC), Facility-Based Delivery (FBD), and

Postnatal Care (PNC). These outcomes match global maternal health indicators and Nigeria's health policy priorities (Federal Ministry of Health, 2023). While the independent variables were place of residence, education, wealth index, employment status, age, marital status, religion, ethnicity, and confounding variables such as parity, media access, decision-making autonomy, participation in healthcare decisions, and health insurance.

### **2.4 STATISTICAL ANALYSIS**

All data extraction, cleaning, and recoding were performed using SPSS (version 25), while further analysis was conducted with the Stata statistical package (version 15). Additionally, design weights will be calculated to account for the complex nature of the NDHS sample design and to produce a nationally representative view of the survey results as provided by Measure DHS. Descriptive statistics, including frequencies and percentages, were used to summarize the data. Chi-square tests were used to analyze proportions and determine statistical significance ( $p < 0.05$ ).

## **3. RESULT**

### **Level of Maternal Healthcare Utilization**

The level of maternal healthcare utilization in Nigeria is shown in Table 1 below. The results highlight notable national variations in service for three key maternal healthcare indicators, antenatal care (ANC), facility-based delivery (FBD), and postnatal care (PNC), along with their 95% confidence intervals (CIs).

For antenatal care, about 58.5% of women had four or more ANC visits (95% CI: 56.9–60.1%), while 41.5% had fewer than four visits (95% CI: 39.9–43.1%). The CIs suggest that the estimates are precise and reflect a consistent pattern in the population. In contrast, the findings for facility-based delivery show a reverse pattern. Regarding facility-based delivery, only 41.1% of women delivered in health facilities (95% CI: 39.6–42.7%), whereas 58.9% delivered

outside health facilities (95% CI: 57.3–60.4%). Whereas, for postnatal care, 84.0% of women received a postnatal check within two days of delivery (95% CI: 82.9–85.0%),

while 16.0% had no postnatal care or received it later than recommended (95% CI: 15.0–17.1%).

**Table 1: Level of Maternal Healthcare Utilization**

Maternal Healthcare Utilization	Proportion (95% CI)
<b>Antenatal Care</b>	
< 4 visits	41.52 (39.93 – 43.11)
4+ visits	58.48 (56.89 – 60.07)
<b>Facility-Based Delivery</b>	
Non-facility	58.86 (57.29 – 60.41)
Facility	41.14 (39.59 – 42.71)
<b>Postnatal Care</b>	
No PNC/Delayed	16.00 (14.98 – 17.08)
PNC within 2 days	84.00 (82.92 – 85.02)

### Maternal Healthcare Utilization based on Socio-Demographic Characteristics

The maternal healthcare utilization based on socio-demographic characteristics is presented in Table 2. The analysis presents maternal healthcare utilization in Nigeria disaggregated by socio-demographic factors, including age, education, marital status, employment, parity, religion, place of residence, region, wealth, media exposure, decision autonomy, and insurance coverage. The results reveal substantial variations in antenatal care (ANC), facility-based delivery (FBD), and postnatal care (PNC) across different population groups.

Regarding age, the younger women (15–19 years) had the highest proportion of inadequate ANC (<4 visits, 55.8%; 95% CI: 52.1–59.5%) and the lowest proportion of facility-based delivery (27.9%; 95% CI: 24.8–31.2%). In contrast, women aged 30–34 years had higher ANC attendance (4+ visits, 63.6%; 95% CI: 61.5–65.7%) and facility-based delivery (45.6%; 95% CI: 43.4–47.9%), reflecting increasing utilization with age, likely due to experience, awareness, and perceived risk.

For educational level, maternal education strongly influenced service utilization. Women with no education had the lowest uptake of 4+ ANC visits (34.8%; 95% CI: 32.7–36.9%) and facility-based deliveries (15.1%; 95% CI: 13.9–16.5%), while women with higher education had the

highest utilization (4+ ANC: 92.5%; 95% CI: 91.0–93.8%; facility delivery: 87.7%; 95% CI: 85.6–89.6%). This pattern underscores the role of education in promoting health-seeking behavior.

Regarding marital status, married women had moderate utilization of ANC (4+ visits, 58.1%; 95% CI: 56.4–59.7%) and facility-based delivery (40.5%; 95% CI: 38.9–42.1%), whereas never-married and widowed/divorced women showed slightly lower facility delivery rates. Marital status may influence support, decision-making, and access to resources for maternal healthcare.

For employment, the employed women reported higher ANC (64.2%; 95% CI: 62.5–65.8%) and facility-based delivery (46.7%; 95% CI: 45.0–48.4%) compared with unemployed women, suggesting that financial independence improves access to maternal health services.

For parity, women with 5+ children were less likely to have 4+ ANC visits (49.2%; 95% CI: 47.2–51.1%) and facility-based deliveries (29.6%; 95% CI: 28.1–31.2%) compared to women with fewer children, indicating that higher parity may be associated with decreased utilization, possibly due to confidence from previous pregnancies or time and resource constraints.

For religion, Christian women had higher ANC attendance (4+ visits: 77.5%; 95% CI:

76.1–78.8%) and facility deliveries (65.8%; 95% CI: 63.6–67.8%) compared with Muslim women (4+ ANC: 46.9%; 95% CI: 44.7–49.0%; facility delivery: 26.0%; 95% CI: 24.3–27.8%), reflecting the influence of religious and cultural norms on maternal health-seeking behavior.

Regarding place of residence, urban women utilized maternal health services more than rural women. For instance, 46.4% of urban women delivered in health facilities (95% CI: 44.4–48.4%) versus 62.1% of rural women delivering outside facilities (95% CI: 59.6–64.5%). Similarly, ANC attendance and PNC within two days were higher in urban areas, highlighting the impact of geographic accessibility and infrastructure.

For the region, regional disparities were evident. The South-West and South-East showed high ANC attendance (4+ visits: 84.5–90.6%) and facility deliveries (76.2–87.7%), whereas northern regions, especially North-West, had lower ANC (4+ visits: 42.4%; 95% CI: 39.5–45.3%) and facility delivery rates (16.4%; 95% CI: 14.4–18.5%). These patterns reflect long-standing regional differences in health service availability, education, and cultural practices.

Regarding the wealth index, wealthier women had higher utilization. The richest

households had 4+ ANC visits (82.5%; 95% CI: 81.1–83.8%) and facility delivery (69.7%; 95% CI: 67.6–71.6%), while the poorest had lower ANC attendance (37.1%; 95% CI: 35.0–39.3%) and facility delivery (17.3%; 95% CI: 15.9–18.8%). This confirms that financial capacity is a key determinant of maternal healthcare use.

For Media Exposure and Decision Autonomy, women exposed to media at least weekly and those with decision-making autonomy had higher utilization of maternal health services. For instance, women with decision autonomy had 4+ ANC visits (74.6%; 95% CI: 73.0–76.1%) and facility delivery (57.9%; 95% CI: 55.9–59.8%), while those without autonomy had lower coverage (ANC 4+ visits: 46.7%; 95% CI: 44.7–48.6%; facility delivery: 28.5%; 95% CI: 26.9–30.2%).

Whereas for Insurance Coverage, women covered by health insurance had higher utilization of ANC (4+ visits: 80.6%; 95% CI: 71.3–87.4%) and facility-based delivery (71.6%; 95% CI: 62.4–79.2%) than uninsured women (4+ ANC: 58.0%; 95% CI: 56.4–59.6%; facility delivery: 40.5%; 95% CI: 38.9–42.0%), highlighting the positive effect of financial protection on maternal health service use.

**Table 2: Level of Maternal Healthcare Utilization desegregated by Socio-demographic Characteristics**

Variables	Ante-Natal Care		Facility-Based Delivery		Post-Natal Care	
	<4 visits Prevalence (95% CI)	4+ visits Prevalence (95% CI)	Non-facility Prevalence (95% CI)	Facility Prevalence (95% CI)	No PNC/Delayed Prevalence (95% CI)	PNC within 2 days Prevalence (95% CI)
<b>Age Group</b>						
15 – 19 yrs	55.84 (52.09 – 59.53)	44.16 (40.47 – 47.91)	72.09 (68.76 – 75.19)	27.91 (24.81 – 31.24)	18.59 (14.49 – 23.52)	81.41 (76.48 – 85.51)
20 – 24 yrs	45.06 (42.77 – 47.38)	54.94 (52.62 – 57.23)	64.61 (62.29 – 66.87)	35.39 (33.13 – 37.71)	18.32 (16.01 – 20.89)	81.67 (79.11 – 83.99)
25 – 29 yrs	40.83 (38.93 – 42.76)	59.17 (57.24 – 61.07)	57.65 (55.59 – 59.68)	42.35 (40.32 – 44.41)	16.74 (14.95 – 18.70)	83.26 (81.30 – 85.05)
30 – 34 yrs	36.36 (34.26 – 38.51)	63.64 (61.49 – 65.74)	54.38 (52.10 – 56.63)	45.62 (43.37 – 47.90)	15.15 (13.32 – 17.30)	84.85 (82.70 – 86.77)
35 – 39 yrs	39.01 (36.79 – 41.27)	60.99 (58.73 – 63.21)	53.67 (51.26 – 56.06)	46.33 (43.94 – 48.74)	15.40 (13.25 – 17.83)	84.60 (82.17 – 86.75)
40 – 49 yrs	43.73 (41.12 – 46.36)	56.27 (53.64 – 58.88)	61.65 (59.20 – 64.04)	38.35 (35.96 – 40.80)	12.48 (10.23 – 15.14)	87.52 (84.86 – 89.77)
<b>Educational Level</b>						
No Education	65.21 (63.10 – 67.27)	34.79 (32.73 – 36.90)	84.86 (83.50 – 86.13)	15.14 (13.87 – 16.50)	22.70 (20.35 – 25.24)	77.30 (74.76 – 79.65)
Primary	35.11 (32.65 – 37.65)	64.89 (62.35 – 67.35)	58.47 (56.25 – 60.66)	41.53 (39.34 – 43.75)	17.73 (15.24 – 20.54)	82.27 (79.46 – 84.76)
Secondary	20.79 (19.56 – 22.07)	79.21 (77.93 – 80.44)	35.49 (33.61 – 37.42)	64.51 (62.58 – 66.39)	15.60 (14.28 – 17.03)	84.40 (83.00 – 85.72)
Higher	7.47 (6.20 – 8.98)	92.53 (91.02 – 93.80)	12.29 (10.44 – 14.42)	87.71 (85.58 – 89.56)	9.76 (8.21 – 11.55)	90.24 (88.45 – 91.78)
<b>Marital Status</b>						
Never Married	35.68 (30.83 – 40.85)	64.32 (59.15 – 69.17)	44.41 (39.43 – 49.50)	55.59 (50.50 – 60.57)	13.71 (10.01 – 18.50)	86.29 (81.50 – 90.00)
Married/Living together	41.94 (40.30 – 43.60)	58.06 (56.40 – 59.70)	59.52 (57.91 – 61.11)	40.48 (38.89 – 42.09)	16.09 (15.02 – 17.22)	83.91 (82.78 – 84.98)
Previously Married	33.92 (30.00 – 38.09)	66.08 (61.91 – 70.00)	50.57 (45.80 – 55.34)	49.43 (44.66 – 54.20)	15.81 (11.86 – 20.76)	84.19 (79.24 – 88.14)
<b>Employment Status</b>						
Unemployed	53.88 (51.67 – 56.07)	46.12 (43.93 – 48.33)	70.89 (68.88 – 72.82)	29.11 (27.18 – 31.12)	16.82 (15.04 – 18.76)	83.18 (81.24 – 84.96)
Employed	35.80 (34.18 – 37.46)	64.20 (62.54 – 65.82)	53.29 (51.61 – 54.97)	46.71 (45.03 – 48.39)	15.77 (14.58 – 17.03)	84.23 (82.97 – 85.42)
<b>Parity</b>						
1 – 2	34.23 (32.40 – 36.10)	65.77 (63.90 – 67.60)	49.59 (47.52 – 51.65)	50.41 (48.35 – 52.48)	15.19 (13.86 – 16.63)	84.81 (83.37 – 86.14)
3 – 4	38.40 (36.43 – 40.42)	61.60 (59.58 – 63.57)	55.34 (53.25 – 57.42)	44.66 (42.58 – 46.75)	14.81 (13.28 – 16.48)	85.19 (83.52 – 86.72)
5+	50.84 (48.89 – 52.80)	49.15 (47.20 – 51.11)	70.38 (68.80 – 71.90)	29.62 (28.10 – 31.20)	18.70 (16.79 – 20.76)	81.30 (79.24 – 83.21)
<b>Religion</b>						
Christian	22.53 (21.20 – 23.91)	77.47 (76.09 – 78.80)	34.25 (32.18 – 36.37)	65.75 (63.63 – 67.82)	15.03 (13.80 – 16.36)	84.97 (83.64 – 86.21)
Muslim	53.15 (50.99 – 55.28)	46.85 (44.72 – 49.00)	74.02 (72.22 – 75.73)	25.98 (24.27 – 27.78)	17.18 (15.58 – 18.91)	82.82 (81.09 – 84.42)
Other	58.49 (46.82 – 69.28)	41.51 (30.72 – 53.18)	70.86 (57.10 – 81.63)	29.14 (18.37 – 42.90)	50.87 (32.91 – 68.61)	49.13 (31.39 – 67.09)
<b>Place of Residence</b>						
Urban	53.61 (51.61 – 55.59)	46.39 (44.41 – 48.39)	72.70 (70.99 – 74.34)	27.30 (25.66 – 29.00)	20.84 (19.32 – 22.44)	79.16 (77.56 – 80.68)
Rural	23.20 (21.38 – 25.13)	76.80 (74.87 – 78.62)	37.88 (35.46 – 40.36)	62.12 (59.64 – 64.53)	12.78 (11.43 – 14.26)	87.22 (85.74 – 88.57)
<b>Region</b>						
North Central	45.10 (42.13 – 48.10)	54.90 (51.90 – 57.87)	49.63 (46.28 – 52.99)	50.37 (47.01 – 53.72)	22.15 (20.09 – 24.35)	77.85 (75.65 – 79.90)
North-East	55.92 (52.67 – 59.13)	44.08 (40.87 – 47.33)	73.32 (69.96 – 76.42)	26.68 (23.58 – 30.04)	20.78 (17.50 – 24.49)	79.22 (75.51 – 82.50)

North-West	57.63 (54.67 – 60.53)	42.37 (39.47 – 45.33)	83.64 (81.47 – 85.59)	16.36 (14.41 – 18.53)	16.28 (13.65 – 19.29)	83.72 (80.71 – 86.35)
South-East	15.49 (13.61 – 17.57)	84.51 (82.43 – 86.39)	19.20 (16.15 – 22.67)	80.80 (77.33 – 83.85)	14.80 (12.55 – 17.36)	85.20 (82.64 – 87.45)
South-South	26.25 (23.43 – 29.28)	73.75 (70.72 – 76.57)	49.10 (45.06 – 53.14)	50.90 (46.86 – 54.94)	19.34 (16.07 – 23.09)	80.66 (76.91 – 83.93)
South-West	9.45 (7.66 – 11.61)	90.55 (88.39 – 92.34)	23.80 (21.06 – 26.77)	76.20 (73.23 – 78.94)	9.45 (7.55 – 11.76)	90.55 (88.24 – 92.45)
<b>Wealth Index</b>						
Poorest/Poorer	62.90 (60.71 – 65.03)	37.10 (34.97 – 39.29)	82.68 (81.17 – 84.09)	17.32 (15.91 – 18.83)	23.20 (20.89 – 25.68)	76.80 (74.32 – 79.11)
Middle	38.20 (36.01 – 40.44)	61.80 (59.56 – 63.99)	58.27 (55.50 – 60.99)	41.73 (39.01 – 44.50)	18.84 (16.84 – 21.02)	81.16 (78.98 – 83.16)
Richer/Richest	17.48 (16.18 – 18.86)	82.52 (81.14 – 83.82)	30.33 (28.38 – 32.35)	69.67 (67.65 – 71.62)	12.86 (11.55 – 14.29)	87.14 (85.71 – 88.45)
<b>Media Exposure</b>						
None/Less than weekly	53.02 (51.16 – 54.87)	46.98 (45.13 – 48.84)	71.42 (69.81 – 72.98)	28.58 (27.02 – 30.19)	20.06 (18.54 – 21.68)	79.94 (78.32 – 81.46)
At least weekly	24.17 (22.69 – 25.71)	75.83 (74.29 – 77.31)	39.90 (37.96 – 41.87)	60.10 (58.13 – 62.03)	13.08 (11.73 – 14.56)	86.92 (85.44 – 88.27)
<b>Decision Autonomy</b>						
No autonomy	53.33 (51.37 – 55.28)	46.67 (44.72 – 48.63)	71.49 (69.79 – 73.14)	28.51 (26.86 – 30.22)	17.46 (15.93 – 19.10)	82.54 (80.90 – 84.07)
Has autonomy	25.39 (23.87 – 26.98)	74.61 (73.02 – 76.13)	42.13 (40.19 – 44.09)	57.87 (55.91 – 59.81)	15.11 (13.55 – 16.80)	84.89 (83.20 – 86.45)
<b>Insurance</b>						
Not covered	42.01 (40.42 – 43.62)	57.99 (56.38 – 59.58)	59.54 (57.98 – 61.07)	40.46 (38.93 – 42.02)	16.28 (15.23 – 17.38)	83.72 (82.62 – 84.77)
Covered	19.44 (12.65 – 28.68)	80.56 (71.32 – 87.35)	28.45 (20.79 – 37.58)	71.55 (62.42 – 79.21)	9.07 (6.34 – 12.82)	90.93 (87.18 – 93.66)

**Table 3: Socio-demographic Factors associated with Maternal Healthcare Utilization desegregated**

Variables	Ante-Natal Care		Facility-Based Delivery		Post-Natal Care	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
<b>Age Group</b>						
15 – 19 yrs	1.000	1.000	1.000	1.000	1.000	1.000
20 – 24 yrs	1.54 (1.32 – 1.79) *	0.16 (-0.01 – 0.32)	1.41 (1.19 – 1.68) *	-0.10 (-0.33 – 0.13)	1.02 (0.72 – 1.44)	0.92 (0.63 – 1.34)
25 – 29 yrs	1.83 (1.58 – 2.13) *	0.16 (-0.03 – 0.35)	1.90 (1.61 – 2.24) *	-0.05 (-0.28 – 0.17)	1.14 (0.82 – 1.57)	0.88 (0.60 – 1.30)
30 – 34 yrs	2.21 (1.91 – 2.57) *	0.37 (0.17 – 0.57) *	2.17 (1.83 – 2.57) *	0.09 (-0.16 – 0.34)	1.28 (0.91 – 1.79)	0.97 (0.64 – 1.46)
35 – 39 yrs	1.98 (1.66 – 2.35) *	0.27 (0.06 – 0.49) *	2.23 (1.87 – 2.66) *	0.23 (-0.03 – 0.48)	1.25 (0.89 – 1.76)	1.01 (0.65 – 1.58)
40 – 49 yrs	1.63 (1.38 – 1.92) *	0.35 (0.14 – 0.57) *	1.61 (1.35 – 1.92) *	0.27 (0.01 – 0.54) *	1.60 (1.11 – 2.31) *	1.57 (0.98 – 2.53)
<b>Educational Level</b>						
No Education	1.000	1.000	1.000	1.000	1.000	1.000
Primary	3.47 (3.03 – 3.96) *	0.65 (0.52 – 0.78) *	3.98 (3.49 – 4.55) *	0.50 (0.36 – 0.65) *	1.36 (1.09 – 1.70) *	1.13 (0.87 – 1.45)
Secondary	7.14 (6.34 – 8.06) *	0.92 (0.78 – 1.07)	10.2 (8.9 – 11.5) *	0.95 (0.80 – 1.10)	1.59 (1.34 – 1.89) *	1.15 (0.92 – 1.44)
Higher	23.2 (18.6 – 28.9) *	1.59 (1.35 – 1.85)	39.9 (32.2 – 49.7) *	1.92 (1.67 – 2.17) *	2.72 (2.15 – 3.44) *	1.61 (1.17 – 2.22) *
<b>Marital Status</b>						
Never Married	1.000	1.000	1.000	1.000	1.000	1.000
Married/Living together	0.77 (0.61 – 0.95) *	0.78 (0.55 – 1.06)	0.54 (0.44 – 0.67) *	0.63 (0.47 – 1.01)	0.83 (0.57 – 1.20)	-

Previously Married	1.08 (0.80 – 1.46)	1.12 (0.90 – 1.19)	0.78 (0.59 – 1.03)	1.01 (0.79 – 1.20)		-
<b>Employment Status</b>						
Unemployed	1.000	1.000	1.000	1.000	1.000	1.000
Employed	2.09 (1.92 – 2.29) *	0.28 (0.18 – 0.37) *	2.13 (1.94 – 2.34) *	0.14 (0.03 – 0.25) *	1.08 (0.92 – 1.27)	-
<b>Parity</b>						
1 – 2	1.000	1.000	1.000	1.000	1.000	1.000
3 – 4	0.83 (0.76 – 0.91) *	-0.22 (-0.33 – -0.11)	0.79 (0.73 – 0.86) *	-0.21 (-0.3 – -0.1) *	1.03 (0.88 – 1.20)	1.05 (0.87 – 1.28)
5+	0.50 (0.47 – 0.54) *	-0.37 (-0.50 – -0.92)	0.41 (0.38 – 0.45) *	-0.43 (-0.6 – -0.3) *	0.78 (0.67 – 0.91) *	0.80 (0.64 – 0.99) *
<b>Religion</b>						
Christian	4.84 (3.01 – 7.79) *	0.73 (0.25 – 1.21) *	4.67 (2.54 – 8.57) *	0.45 (0.002 – 0.9) *	5.85 (2.77 – 12.4) *	4.89 (2.22 – 10.78) *
Muslim	1.24 (0.77 – 2.01)	0.44 (-0.04 – 0.92)	0.85 (0.46 – 1.57)	-0.1 (-0.53 – 0.41)	4.99 (2.34 – 10.63) *	4.25 (1.88 – 9.57) *
Other	1.000	1.000	1.000	1.000	1.000	1.000
<b>Place of Residence</b>						
Urban	3.82 (3.35 – 4.37) *	0.17 (0.04 – 0.31) *	4.37 (3.82 – 4.99) *	0.19 (0.05 – 0.34) *	1.80 (1.53 – 2.10) *	1.24 (1.02 – 1.51) *
Rural	1.000	1.000	1.000	1.000	1.000	1.000
<b>Region</b>						
North Central	1.000	1.000	1.000	1.000	1.000	1.000
North-East	0.65 (0.54 – 0.77) *	0.18 (-0.002 – 0.31)	0.36 (0.29 – 0.44) *	-0.4 (-0.6 – -0.2) *	1.08 (0.84 – 1.39)	1.20 (0.93 – 1.56)
North-West	0.60 (0.51 – 0.72) *	0.21 (0.03 – 0.40) *	0.19 (0.16 – 0.24) *	-1.1 (-1.3 – -0.9) *	1.46 (1.15 – 1.86) *	1.57 (1.20 – 1.04) *
South-East	4.48 (3.69 – 5.44) *	0.61 (0.41 – 0.81) *	4.15 (3.23 – 5.32) *	0.47 (0.22 – 0.72) *	1.64 (1.31 – 2.06) *	1.32 (1.02 – 2.04) *
South-South	2.31 (1.90 – 2.80) *	0.01 (-0.20 – 0.22)	1.02 (0.83 – 1.26)	-1.06 (-1.3 – -0.8) *	1.19 (0.92 – 1.53)	0.93 (0.70 – 1.24)
South-West	7.87 (6.07 – 10.2) *	1.17 (0.91 – 1.42) *	3.16 (2.56 – 3.88) *	0.18 (-0.05 – 0.4)	2.73 (2.07 – 3.59) *	2.01 (1.54 – 2.61) *
<b>Wealth Index</b>						
Poorest/Poorer	1.000	1.000	1.000	1.000	1.000	1.000
Middle	2.74 (2.43 – 3.09) *	0.48 (0.36 – 0.60) *	3.42 (2.97 – 3.94) *	0.63 (0.49 – 0.77) *	1.30 (1.08 – 1.57) *	1.09 (0.88 – 1.35)
Richer/Richest	8.00 (7.01 – 9.13) *	0.79 (0.65 – 0.93) *	10.9 (9.49 – 12.7) *	1.04 (0.87 – 1.19) *	2.05 (1.70 – 2.47) *	1.23 (0.97 – 1.55)
<b>Media Exposure</b>						
None/Less than weekly	1.000	1.000	1.000	1.000	1.000	1.000
At least weekly	3.54 (3.21 – 3.88) *	0.33 (0.24 – 0.43) *	3.76 (3.41 – 4.16) *	0.34 (0.23 – 0.45) *	1.67 (1.42 – 1.96) *	1.26 (1.07 – 1.48) *
<b>Decision Autonomy</b>						
No autonomy	1.000	1.000	1.000	1.000	1.000	1.000
Has autonomy	3.36 (3.03 – 3.71) *	0.27 (0.17 – 0.38) *	3.44 (3.10 – 3.82) *	0.04 (-0.07 – 0.14)	1.19 (1.00 – 1.42)	0.91 (0.75 – 1.09)
<b>Insurance</b>						
Not covered	1.000	1.000	1.000	1.000	1.000	1.000
Covered	3.00 (1.29 – 1.47) *	0.27 (0.17 – 0.37) *	3.70 (2.44 – 5.60) *	0.41 (0.11 – 0.71) *	1.95 (1.31 – 2.89) *	1.30 (0.86 – 1.98)

\*Significant at 5% level of significance

### **Socio-demographic Characteristics associated with Maternal Healthcare Utilization**

The logistic regression analysis of socio-demographic characteristics and maternal healthcare utilization is presented in Table 3 below. The results show both unadjusted and adjusted odds ratios (ORs) with 95% confidence intervals for the association between socio-demographic factors and maternal healthcare use in Nigeria, including antenatal care (ANC), facility-based delivery (FBD), and postnatal care (PNC).

**Age group:** In the unadjusted models, women aged 20–39 years had significantly higher odds of using ANC and FBD compared with adolescents (15–19 years). For example, women aged 30–34 years were more than twice as likely to attend ANC (OR = 2.21; 95% CI: 1.91–2.57) and to deliver in a facility (OR = 2.17; 95% CI: 1.83–2.57). However, after adjustment, most of these associations attenuated, with only the 30–39 and 40–49 age groups retaining significance for ANC and FBD. For PNC, age was not a consistent predictor after controlling for other covariates, suggesting that education and wealth largely account for observed age differences.

**Education:** Maternal education emerged as one of the strongest and most consistent predictors. Unadjusted models revealed a strong dose–response effect, with women of higher education having markedly greater odds of ANC (OR = 23.2), FBD (OR = 39.9), and PNC (OR = 2.72) compared to those with no education. After adjustment, higher education remained significantly associated with ANC (AOR = 1.59; 95% CI: 1.35–1.85), FBD (AOR = 1.92; 95% CI: 1.67–2.17), and PNC (AOR = 1.61; 95% CI: 1.17–2.22), underscoring education as a robust independent determinant.

**Marital status:** Being married or in union was associated with lower odds of FBD in the unadjusted model (OR = 0.54; 95% CI:

0.44–0.67), but this effect lost significance after adjustment. Similarly, widowed/divorced women showed no consistent association. This indicates that marital status may influence maternal health indirectly through social and economic resources rather than being an independent predictor.

**Employment and parity:** Employment was positively associated with ANC and FBD in the unadjusted models, with employed women having about 2.09 times higher odds of using ANC and 2.13 times higher odds of FBD compared with unemployed women. However, these associations were no longer significant after adjustment, suggesting that the effect of employment is largely mediated by factors such as wealth and education. Parity showed a clear inverse relationship: women with five or more children were significantly less likely to utilize ANC (AOR = –0.37) and FBD (AOR = –0.43), indicating that higher parity is associated with lower maternal healthcare utilization, possibly due to increased confidence from previous pregnancies or constraints related to time and finances.

**Religion:** Religious affiliation strongly influenced utilization. Christian women had higher odds of ANC, FBD, and PNC compared to Muslims or other groups, even after adjustment (e.g., AOR for PNC = 4.89; 95% CI: 2.22–10.78). This suggests that religious and cultural norms play a role in shaping maternal healthcare utilization.

**Place of residence:** Urban women were more likely to use all three services in unadjusted models (ANC OR = 3.82; FBD OR = 4.37; PNC OR = 1.80). After adjustment, the associations persisted, though weaker (ANC AOR = 0.17; FBD AOR = 0.19; PNC AOR = 1.24), highlighting persistent rural–urban disparities largely explained by structural inequities such as infrastructure and healthcare access.

**Region:** Regional inequalities were evident. Women in the South-East and South-West had significantly higher odds of ANC, FBD, and PNC, even after adjustment (e.g., South-West AOR for PNC = 2.01; 95% CI: 1.54–2.61). Conversely, women in the North-East and North-West were consistently disadvantaged, with the North-West showing the lowest odds for FBD (AOR = –1.1). These findings reflect long-standing disparities in health service availability, education, and cultural practices.

**Wealth index:** Household wealth was a strong predictor of utilization. In unadjusted models, women from richer households were up to 10 times more likely to use ANC and FBD compared to the poorest. After adjustment, wealth remained significant though attenuated (ANC AOR = 0.79; FBD AOR = 1.04), confirming that financial capacity independently facilitates service uptake.

**Media exposure and decision autonomy:** Women with weekly media exposure and those with decision-making autonomy had higher odds of ANC and FBD in unadjusted models (ORs  $\approx$  3.3–3.7). However, these associations weakened after adjustment, indicating partial mediation by education and wealth. For PNC, media exposure remained independently significant (AOR = 1.26; 95% CI: 1.07–1.48), suggesting that information access continues to play a role.

**Insurance coverage:** Health insurance showed a consistent positive influence. Insured women were significantly more likely to use ANC (AOR = 0.27) and FBD (AOR = 0.41), though the effect on PNC was weaker and not statistically significant. This demonstrates the protective effect of insurance in reducing financial barriers to maternal health service utilization. In summary, education, wealth, region, urban residence, religion, and insurance coverage were the most consistent independent predictors across outcomes.

The effects of age, marital status, employment, and autonomy were largely mediated through socioeconomic disparities.

## DISCUSSION

This study examined the levels and associated factors of maternal healthcare utilization in Nigeria across three critical service indicators: antenatal care with at least four visits (ANC4+), facility-based delivery (FBD), and postnatal care within two days of delivery (PNC). The findings confirm that utilization of maternal healthcare services in Nigeria remains suboptimal. The national average for facility-based delivery (39%) falls significantly below global targets, while only 51% of women attend four or more ANC visits and 42% access timely postnatal care [4]. These rates are strongly influenced by socio-demographic characteristics. Higher education, wealth, urban residence, media exposure, decision-making autonomy, employment, and insurance coverage consistently predict better utilization of ANC, FBD, and PNC, while younger age, higher parity, rural residence, lack of education, and poverty are associated with lower utilization [9].

This study analyzed maternal healthcare utilization using secondary data from the Nigeria Demographic and Health Survey (NDHS). The analysis focused on three critical indicators of maternal healthcare: antenatal care (ANC), facility-based delivery (FBD), and postnatal care (PNC). The confidence intervals around these estimates suggest that the patterns are reliable and representative of the population. For antenatal care, about two-thirds of women attended four or more ANC visits, while one-third attended fewer than four visits. This indicates that the majority of women engage with antenatal services during pregnancy, reflecting relatively high service coverage at the antenatal stage of the maternal care continuum. ANC uptake is a critical determinant of maternal and neonatal outcomes, as it provides opportunities for health education, risk

screening, immunization, and early intervention [1, 4]. However, while ANC coverage appears above average, the quality of care and adherence to the WHO's recommendation of eight contacts remain a concern [1, 15, 16].

This finding aligns with previous national reports, which consistently show that ANC is the most widely accessed maternal health service in Nigeria [4, 17]. It also corroborates evidence from other sub-Saharan African countries, where ANC attendance tends to exceed both facility delivery and postnatal care utilization [18, 19], though some studies present a greater proportion of ANC usage compared to the present study [20].

While encouraging, the fact that one-third of women attended fewer than four visits highlights persistent barriers to complete antenatal care. These barriers may include socioeconomic constraints, geographic inaccessibility, poor perceived quality of care, and lack of autonomy in health decision-making [21–25]. From a research perspective, these gaps indicate that high ANC uptake alone may not be sufficient to reduce maternal morbidity and mortality; rather, sustained engagement throughout the pregnancy period is necessary [26, 27].

In contrast, the study shows that only one-third of women delivered in health facilities, while the majority gave birth outside formal health settings. This finding reveals a substantial discontinuity in the maternal healthcare continuum, with a significant drop-off between antenatal engagement and facility-based delivery, which provides and ensures skilled delivery. Facility-based delivery (FBD), also known as Facility-Based Birth (FBB), entails skilled care provision during delivery at a health facility, an important intervention for reducing maternal deaths [28,29].

The findings corroborate reports from Nigeria and sub-Saharan Africa, where perceived low quality of care, long distances to facilities, financial limitations, and cultural practices limit facility-based delivery usage [30–34]. The majority of

women delivering outside health facilities reflects entrenched sociocultural norms and structural barriers that continue to impede progress towards safe motherhood goals [21]. This implies that antenatal care uptake does not automatically translate into facility-based delivery. Interventions must therefore target the continuum of care to ensure gains in ANC coverage translate into improved uptake of skilled delivery services.

For postnatal care, the study revealed that the majority of women received a postnatal check within two days of delivery, while one-third either missed care or received it later than recommended. This higher utilization compared with facility-based delivery may be influenced by women who deliver in facilities being assessed before discharge. These findings align with evidence from Nigeria and other sub-Saharan African countries, where factors such as perceived poor quality of care, long distances to facilities, financial constraints, and cultural practices hinder the utilization of facility-based delivery [30–34]. The predominance of home births reflects entrenched sociocultural norms and structural barriers, underscoring that antenatal care uptake does not automatically ensure skilled delivery [21].

This contradicts some studies from Nigeria and sub-Saharan Africa that revealed that postnatal care is often the least utilized component of maternal health services [31, 20]. Therefore, the observed majority coverage in this study may represent a partial improvement, possibly due to national health campaigns, community-based interventions, and increased awareness of maternal and neonatal risks in the immediate postpartum period. The fact that one-third of women did not receive timely postnatal care signals the need for expanded outreach and follow-up mechanisms, particularly for home deliveries. Strengthening postnatal care services across both urban and rural contexts remains essential for reducing

neonatal mortality and improving maternal health outcomes.

In summary, the findings revealed a drop-off along the continuum of maternal healthcare. The majority of women attend ANC and receive postnatal care, but only one-third deliver in health facilities. The confidence intervals around these estimates suggest that these patterns are population-level trends rather than random variation. This continuum of care disruption underscores persistent barriers in maternal healthcare utilization, highlighting the need for interventions that ensure women complete the maternal care pathway, from antenatal engagement, through skilled delivery, to timely postnatal follow-up. Addressing socioeconomic, cultural, and infrastructural barriers is critical to improving maternal and neonatal health outcomes in Nigeria [11, 18].

The study revealed that the maternal healthcare utilization in Nigeria is strongly influenced by socio-demographic characteristics. Higher education, wealth, urban residence, media exposure, decision-making autonomy, employment, and insurance coverage consistently predict better utilization of ANC, facility delivery, and PNC. This is consistent with a study on PNC in sub-Saharan Africa [35]. In contrast, younger age, higher parity, rural residence, lack of education, and poverty are associated with lower utilization.

The study found that younger women (15–19 years) had the lowest coverage of ANC and FBD, while utilization increased progressively among women aged 30–34 years. This pattern is consistent with findings from Uganda and northern Nigeria, which demonstrated that older women were more likely to attend ANC and deliver in facilities due to increased awareness, prior pregnancy experience, and perceived maternal risk [36, 18]. Conversely, a study in Ethiopia suggested that adolescent mothers sometimes accessed ANC early, although continuity and delivery care remained low [37]. Thus, while older maternal age generally improves utilization,

adolescents remain particularly disadvantaged in Nigeria.

Educational attainment emerged as one of the strongest determinants of service utilization. Women with no education had the lowest uptake of ANC and FBD, while women with higher education reported near-universal coverage. This finding is consistent with previous studies in Nigeria and sub-Saharan Africa, which emphasised that education enhances health literacy, decision-making power, and economic independence, thereby improving maternal health-seeking behavior [38–42].

Marital status was also an important factor, as married women recorded higher utilization compared to never-married or widowed/divorced women [11]. Similar observations were reported in Nigeria and Mali, where being married offered social support and financial stability that facilitated access to maternal health services [11]. However, unmarried adolescents often faced stigma and barriers that limited their use of health facilities, suggesting that sociocultural context mediates the influence of marital status on healthcare use.

Economic empowerment, reflected in both employment status and wealth index, showed a strong positive effect on maternal healthcare utilization. Employed women and those from wealthier households had greater access to ANC and facility delivery, supporting findings from Uganda, Tanzania, and Nigeria [43]. Conversely, women from poor households consistently reported the lowest utilization, confirming that poverty remains a major barrier to equitable access [19].

Parity influenced service uptake in the expected direction, as women with higher birth orders were less likely to seek skilled care compared with first-time mothers. This finding is consistent with evidence from Ethiopia and southwestern Nigeria [37, 19]. This suggests the need for targeted interventions for multiparous women to ensure consistent use of skilled care.

Religious affiliation was another significant factor, with Christian women reporting

higher utilization than Muslim women. This mirrors studies in northern Nigeria and Mali that linked lower utilization among Muslim women to restrictive cultural norms, gendered power dynamics, and reduced autonomy [10]. These results highlight the deep cultural underpinnings of maternal health disparities.

Geographic differences were equally pronounced. Urban women reported better utilization of ANC, facility delivery, and PNC than rural women, consistent with studies across Nigeria and other African countries [9, 19]. Regional disparities also emerged clearly, with southern regions reporting higher coverage than northern regions, where underutilization was attributed to socio-cultural norms, low education, and health system weaknesses [4, 9]. Media exposure and women's decision-making autonomy significantly boost utilization [44-47]. Lastly, insurance coverage was identified as a strong enabling factor. Insured women reported much higher utilization across all indicators compared to uninsured women, consistent with findings from Ghana and Nigeria, which indicated that financial protection through insurance schemes lowers cost-related barriers to maternal health services [9, 11].

Taken together, these findings confirm that maternal healthcare utilization in Nigeria is shaped by intersecting socio-demographic factors, with education, wealth, autonomy, and place of residence standing out as the most influential predictors. The results are largely consistent with existing evidence across sub-Saharan Africa, although regional and cultural variations remain significant. The persistence of inequalities suggests that achieving equitable maternal health outcomes and meeting the SDG 3.1 target of reducing maternal mortality will require integrated interventions that strengthen women's empowerment, expand financial protection mechanisms, and address structural and cultural barriers to care.

## **CONCLUSION**

This study examined the level of utilization of maternal healthcare services in Nigeria, specifically antenatal care (ANC), facility-based delivery (FBD), and postnatal care (PNC), with attention to variations across socio-demographic characteristics. The findings reveal that maternal healthcare utilization remains far from optimal, with wide disparities shaped by age, education, marital status, employment, parity, religion, residence, region, wealth, media exposure, decision autonomy, and insurance coverage. The study highlights that younger women, women with no education, those from poorer households, rural residents, women of higher parity, and those with limited autonomy consistently reported lower use of ANC, FBD, and PNC. Conversely, women who were older, educated, employed, wealthier, urban-based, autonomous in decision-making, and covered by health insurance were significantly more likely to access maternal health services. These findings confirm that maternal healthcare utilization in Nigeria is strongly socially patterned, with structural inequities perpetuating gaps in access and outcomes. Comparisons with other studies across Nigeria and sub-Saharan Africa show that these determinants are consistent with broader regional and global evidence. However, Nigeria's striking regional and religious disparities, particularly between the northern and southern zones, remain a critical barrier to achieving equitable maternal health. Such inequalities highlight the enduring influence of socio-cultural norms, poverty, and systemic weaknesses in health service delivery.

Based on the findings, the study highlights that improving maternal healthcare utilization requires more than individual-level interventions. It calls for integrated policies that address educational empowerment, economic inequalities, rural infrastructure, and cultural barriers, while strengthening health systems and expanding financial protection mechanisms such as health insurance. Addressing these

structural determinants is vital to advancing progress toward Sustainable Development Goal 3.1, reducing maternal mortality, and ensuring universal access to quality maternal healthcare in Nigeria.

### Abbreviations

ANC	Antenatal Care
FBD	Facility-Based Delivery
PNC	Postnatal Care
NDHS	Nigeria Demographic and Health Survey
WHO	World Health Organisation
SDG	Sustainable Development Goal
EA	Enumeration Area

### Authors' Contributions

Kinikanwo Innocent Green: Conceptualization, Data Curation, Software, Formal Analysis, Methodology, Writing Original Draft, Writing – review & editing  
Anthony Ike Wegbom: Conceptualization, Data Curation, Software, Validation, Methodology, Writing – original draft, Writing – review & editing  
Fortune Somiari Amah-Tariah: Conceptualization, Validation, Methodology, Writing – original draft  
Oluchi Mildred Ndudim: Validation, Methodology, Writing – review & editing

### Declaration by Authors

**Ethical Approval:** Approved

**Acknowledgement:** None

**Source of Funding:** None

**Conflict of Interest:** The authors declare no conflict of interest.

### REFERENCES

1. World Health Organization. (2020a). WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: WHO.
2. World Health Organization. (2022). World Health Statistics 2022: Monitoring health for the SDGs. Geneva: WHO.
3. Oweibia, M., Egberipou, T., Timighe, G. C., & Elemuwa, C. O. (2025). Predictors of Maternal Mortality in Nigeria: Public Health Policy and Practice.
4. National Population Commission [NPC] & ICF. (2019). Nigeria Demographic and Health Survey 2018. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF.
5. Okoli, C., Hajizadeh, M., Rahman, M. M., & Khanam, R. (2020). Geographical and socioeconomic inequalities in the utilization of maternal healthcare services in Nigeria: 2003–2017. *BMC Health Services Research*, 20(1), 849.
6. United Nations. (2020). The Sustainable Development Goals Report 2020. New York: United Nations.
7. Okeke, E. N., Abubakar, I. S., & De Allegri, M. (2021). The impact of free maternal healthcare policies in Nigeria: A quasi-experimental study. *Health Policy and Planning*, 36(7), 1023–1034.
8. Federal Ministry of Health. (2023). Nigeria Health Sector Strategic Plan 2023–2027. Abuja: Federal Ministry of Health.
9. Adewuyi, E. O., Auta, A., Adewuyi, M. I., Phili, A. A., Olutuase, V., Zhao, Y., & Khanal, V. (2024). Antenatal care utilization in Nigeria: assessing disparities between rural and urban areas—analysis of the 2018 Nigeria demographic and health survey. *medRxiv*, 2024-01.
10. Al-Mujtaba, M., Sam-Agudu, N. A., & Khatri, R. (2022). Impact of insecurity on maternal healthcare access in northern Nigeria: A mixed-methods study. *BMC Health Services Research*, 22(1), 987.
11. Fagbamigbe, A. F., Idemudia, E. S., & Adebowale, A. S. (2023). Spatial and socioeconomic inequalities in maternal healthcare utilization in Nigeria: Evidence from the 2018 NDHS. *PLoS ONE*, 18(4), e0284267.
12. Okonofua, F., Ntoimo, L., & Yaya, S. (2022). Cultural and social barriers to maternal healthcare utilization in rural Nigeria. *BMC Pregnancy and Childbirth*, 22(1), 345.
13. Yadav, A. K., Sahni, B., & Jena, P. K. (2021). Education, employment, economic status, and empowerment: Implications for maternal health care services utilization in India. *Journal of Public Affairs*, 21(3), e2259.

14. Adeyanju, O., Tubeuf, S., & Ensor, T. (2021). Socio-economic inequalities in access to maternal and child healthcare in Nigeria: changes over time and decomposition analysis. *Health policy and planning, 32*(8), 1111–1118. <https://doi.org/10.1093/heapol/czx049>
15. World Health Organization. (2016). WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: WHO.
16. Tunçalp, Ö., Pena-Rosas, J. P., Lawrie, T., Bucagu, M., Oladapo, O. T., Portela, A., & Metin Gülmezoglu, A. (2017). WHO recommendations on antenatal care for a positive pregnancy experience-going beyond survival. *BJOG: an international journal of obstetrics and gynaecology, 124*(6), 860–862. <https://doi.org/10.1111/1471-0528.14599>
17. Adedini, S. A., Odimegwu, C., Imasiku, E. N., & Ononokpono, D. N. (2015). Ethnic differentials in under-five mortality in Nigeria. *Ethnicity & health, 20*(2), 145–162. <https://doi.org/10.1080/13557858.2014.890599>
18. Doctor, H. V., & Dahiru, T. (2020). Utilization of maternal healthcare services in Nigeria: An analysis of regional differences. *African Population Studies, 34*(1), 23–39.
19. Lateef, M. A., Kuupiel, D., Mchunu, G. G., & Pillay, J. D. (2024). Utilization of Antenatal Care and Skilled Birth Delivery Services in Sub-Saharan Africa: A Systematic Scoping Review. *International journal of environmental research and public health, 21*(4), 440. <https://doi.org/10.3390/ijerph21040440>
20. Adedokun, S. T., Uthman, O. A., & Bisiriyu, L. A. (2023). Determinants of partial and adequate maternal health services utilization in Nigeria: analysis of cross-sectional survey. *BMC pregnancy and childbirth, 23*(1), 457. <https://doi.org/10.1186/s12884-023-05712-4>
21. Sumankuuro, J., Crockett, J., & Wang, S. (2018). Sociocultural barriers to maternity services delivery: a qualitative meta-synthesis of the literature. *Public health, 157*, 77–85. <https://doi.org/10.1016/j.puhe.2018.01.014>
22. Alibhai, K. M., Ziegler, B. R., Meddings, L., Batung, E., & Luginaah, I. (2022). Factors impacting antenatal care utilization: a systematic review of 37 fragile and conflict-affected situations. *Conflict and health, 16*(1), 33. <https://doi.org/10.1186/s13031-022-00459-9>
23. Maina, R. (2024). *Maternal Antenatal Care Access and Attendance: A Qualitative Study of Midwives' and Pregnant Women's Experiences in Kilifi, Kenya* (Doctoral dissertation, University of Salford (United Kingdom)).
24. Alam, C. E., Abou-Abbas, L., Ramadan, M. S., & Asmar, M. K. (2025). Exploring the barriers to accessing antenatal care at the primary health care center level of a tertiary hospital in Lebanon: a qualitative study. *BMC health services research, 25*(1), 304. <https://doi.org/10.1186/s12913-025-12444-y>
25. Bhutada, K., Venkateswaran, M., Atim, M., Munabi-Babigumira, S., Nankabirwa, V., Namagembe, F., Frøen, J. F., & Papadopoulou, E. (2024). Factors influencing the uptake of antenatal care in Uganda: a mixed methods systematic review. *BMC pregnancy and childbirth, 24*(1), 730. <https://doi.org/10.1186/s12884-024-06938-6>
26. Dada, S., Tunçalp, Ö., Portela, A., Barreix, M., & Gilmore, B. (2021). Community mobilization to strengthen support for appropriate and timely use of antenatal and postnatal care: A review of reviews. *Journal of global health, 11*, 04076. <https://doi.org/10.7189/jogh.11.04076>
27. Lee, S., Adam, E., Kanyike, A. M., Wani, S., Kasibante, S., Mukunya, D., & Nantale, R. (2024). Compliance with the WHO-recommended 8+ antenatal care contacts schedule among postpartum mothers in eastern Uganda: A cross-sectional study. *PLoS One, 19*(12), e0314769. <https://doi.org/10.1371/journal.pone.0314769>
28. Kikuchi, K., Ansah, E. K., Okawa, S., Enuameh, Y., Yasuoka, J., Nanishi, K., & Ghana EMBRACE Implementation Research Project Team. (2015). Effective linkages of continuum of care for improving neonatal, perinatal, and maternal mortality: a systematic review and meta-analysis. *PLoS one, 10*(9), e0139288.
29. Mzembe, T., Chikwapulo, V., Kamninga, T. M., Vellemu, R., Mohamed, S., Nthakomwa, L., ... & Chipeta, M. G. (2023). Interventions to enhance healthcare

- utilization among pregnant women to reduce maternal mortality in low-and middle-income countries: a review of systematic reviews. *BMC Public Health*, 23(1), 1734. <https://doi.org/10.1186/s12889-023-16558-y>
30. Birmeta, K., Dibaba, Y., & Woldeyohannes, D. (2013). Determinants of maternal health care utilization in Holeta town, central Ethiopia. *BMC health services research*, 13(1), 256.
  31. Dahiru, T., & Oche, O. M. (2015). Determinants of antenatal care, institutional delivery and postnatal care services utilization in Nigeria. *Pan African medical journal*, 22(1).
  32. Mshelia, S. E., Analo, C. V., & Booth, A. (2020). Factors influencing the utilization of facility-based delivery in Nigeria: a qualitative evidence synthesis. *Journal of Global Health Reports*, 2020(4).
  33. Pison, G., Couppié, E., & Caporali, A. (2022). The population of the world, 2022. *Population & Societies*, 603(8), 1-8.
  34. Al-Mujtaba, M., Shobo, O., Oyebola, B. C., Ohemu, B., Omale, I., Shuaibu, A., & Anyanti, J. (2025). Experiences with facility delivery services within the context of a maternal neonatal health project in Gombe State, Northeast Nigeria: a qualitative study. *The Pan African medical journal*, 51, 16. <https://doi.org/10.11604/pamj.2025.51.16.43132>
  35. Tessema, Z. T., Yazachew, L., Tesema, G. A., & Teshale, A. B. (2020). Determinants of postnatal care utilization in sub-Saharan Africa: a meta and multilevel analysis of data from 36 sub-Saharan countries. *Italian journal of pediatrics*, 46(1), 175. <https://doi.org/10.1186/s13052-020-00944-y>
  36. Bbaale, E. (2011). Factors influencing timing and frequency of antenatal care in Uganda. *The Australasian medical journal*, 4(8), 431.
  37. Fekadu, G. A., Ambaw, F., & Kidanie, S. A. (2019). Facility delivery and postnatal care services use among mothers who attended four or more antenatal care visits in Ethiopia: further analysis of the 2016 demographic and health survey. *BMC pregnancy and childbirth*, 19(1), 64. <https://doi.org/10.1186/s12884-019-2216-8>
  38. Ononokpono, D. N., & Odimegwu, C. O. (2020). Determinants of maternal healthcare utilization in Nigeria: A multilevel approach. *Journal of Biosocial Science*, 52(4), 567–582.
  39. Wang, H., Frasco, E., Takesue, R., & Tang, K. (2021). Maternal education level and maternal healthcare utilization in the Democratic Republic of the Congo: an analysis of the multiple indicator cluster survey 2017/18. *BMC Health Services Research*, 21(1), 850. <https://doi.org/10.1186/s12913-021-06854-x>
  40. Andegiorgish, A. K., Elhoumed, M., Qi, Q., Zhu, Z., & Zeng, L. (2022). Determinants of antenatal care use in nine sub-Saharan African countries: a statistical analysis of cross-sectional data from Demographic and Health Surveys. *BMJ open*, 12(2), e051675. <https://doi.org/10.1136/bmjopen-2021-051675>
  41. El-Shrqawy, E. H., Elnemer, A., & Mohamed Elsayed, H. (2024). Effect of antenatal education on pregnant womens knowledge, attitude and preferences of delivery mode. *BMC Pregnancy and Childbirth*, 24(1), 740. <https://doi.org/10.1186/s12884-024-06922-0>
  42. Raru, T. B., Ayana, G. M., Zakaria, H. F., & Merga, B. T. (2022). Association of Higher Educational Attainment on Antenatal Care Utilization Among Pregnant Women in East Africa Using Demographic and Health Surveys (DHS) from 2010 to 2018: A Multilevel Analysis. *International journal of women's health*, 14, 67–77. <https://doi.org/10.2147/IJWH.S350510>
  43. Wong, K. L. M., Radovich, E., Owolabi, O. O., Campbell, O. M. R., Brady, O. J., Lynch, C. A., & Benova, L. (2018). Why not? Understanding the spatial clustering of private facility-based delivery and financial reasons for homebirths in Nigeria. *BMC health services research*, 18(1), 397. <https://doi.org/10.1186/s12913-018-3225-4>
  44. Idris, I. B., Hamis, A. A., Bukhori, A. B. M., Hoong, D. C. C., Yusop, H., Shaharuddin, M. A., Fauzi, N. A. F. A., & Kandayah, T. (2023). Women's autonomy in healthcare decision making: a systematic review. *BMC women's health*, 23(1), 643. <https://doi.org/10.1186/s12905-023-02792-4>
  45. Mathur, S., Kirk, K., Dadi, C., & Dougherty, L. (2024). Women's involvement in decision-making and

- association with reproductive health behaviors: findings from a cross-sectional survey in Niger. *BMC Women's Health*, 24(1), 278. [https://doi: 10.1186/s12905-024-03115-x](https://doi.org/10.1186/s12905-024-03115-x).
46. World Health Organization. (2016). WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: WHO.
47. Tunçalp, O., Pena-Rosas, J. P., Lawrie, T., Bucagu, M., Oladapo, O. T., Portela, A., & Metin Gülmezoglu, A. (2017). WHO recommendations on antenatal care for a positive pregnancy experience—going beyond survival. *BJOG: an international journal of obstetrics and gynaecology*, 124(6), 860-862.
- How to cite this article: Kinikanwo Innocent Green, Anthony Ike Wegbom, Fortune Somiari Amah-Tariah, Oluchi Mildred Ndudim. Determinants of maternal healthcare utilization in Nigeria using the Nigeria demographic and health survey. *Int J Health Sci Res.* 2026; 16(1):41-58. DOI: [10.52403/ijhsr.20260106](https://doi.org/10.52403/ijhsr.20260106)

\*\*\*\*\*