



**PATTERN AND PREDICTORS OF MATERNAL HEALTH SERVICES UTILIZATION IN JIGAWA STATE, NORTH-WESTERN NIGERIA**

**BABANDI, Z.S.<sup>1\*</sup>, YAHAYA, U.<sup>1</sup>, EGBO, R.A.<sup>2</sup>, TILDE, A.A.<sup>1</sup>, GOBIR, A.A.<sup>1</sup>, UMAR, A.A.<sup>1</sup> AND IDRIS, S.H.<sup>1</sup>**

<sup>1</sup>Department of Community Medicine, Ahmadu Bello University, Zaria, Nigeria

<sup>2</sup>1 Division, Nigerian Army Hospital, Kaduna, Nigeria.

**ABSTRACT**

Maternal mortality has remained a problem, especially in developing countries where women continue to die from pregnancy and childbirth-related complications. Maternal health is the health of women during pregnancy, childbirth, and the postpartum period. It encompasses the healthcare dimensions of family planning, preconception, antenatal care (ANC), delivery, and postnatal care (PNC). The study aimed to assess the pattern and predictors of utilization of maternal health services in Jigawa State. A cross-sectional study was conducted using quantitative data collection methods. WHO “30 by 7” cluster sampling technique was used to select 630 mothers of children under five across different communities from three Local Government areas in Jigawa State. Data was collected with the aid of pretested interviewer-administered questionnaires. Data was analyzed using IBM SPSS version 25. Ethical approval was obtained from Ahmadu Bello University Teaching Hospital, Zaria. Most (93.3%) of the respondents have utilized maternal health services during their most recent pregnancies. Specifically, most (90.6%) of them attended at least one antenatal clinic visit but < 5% had the minimum recommended 8 ANC visits. About 56% of the respondents had a skilled birth attendant at their deliveries and only 31.2% of the respondents had PNC within 48 hours of delivery. Living within 5km of maternal health services was found to be a predictor of utilization (aOR=1.9; 95% CI:1.3 – 2.05;  $P=0.003$ ). In conclusion, ANC coverage was found to be high although the number of visits was far below recommended. The institutional delivery rate and post-natal care coverage were found to be low. Distance was a predictor of maternal health services utilization. It is therefore recommended that; the Jigawa State Primary Health Care Agency should provide maternal health services in health facilities close to the communities; community leaders, religious leaders, and opinion leaders should be involved in health education efforts to encourage utilization of maternal health services; health care workers should educate the women on the need to sustain ANC visits, deliver in the hospitals and seek post-natal.

**Keywords:** Antenatal care, maternal, postnatal care, skilled attendant, utilization

**\*Correspondence:** deenex1@yahoo.com, +2348034212763

**INTRODUCTION**

Maternal health has assumed a worldwide public health concern because of the lives of millions of mothers and infants that can potentially be saved through the provision of quality maternal health care services [1]. Maternal health revolves around the health and wellness of women, particularly when they are pregnant, at the time they give birth, and during child-raising. Studies have shown that proper utilization of maternal health services plays an important role in reducing the maternal mortality ratio and infant mortality rate [1, 2]. The services include Antenatal care service (ANC), Skilled delivery, and Post Natal Care. Despite the significant efforts to strengthen maternal health care service provision and utilization, maternal mortality is still unacceptably high in the world. For instance, an estimated 289,000 women die each year globally from complications related to pregnancy or childbirth [2]. About 99% of these deaths occurred in developing countries; greater than half of these happened in sub-Saharan Africa.

Greater than 90% of these deaths are preventable with interventions currently existing, specifically, concerning skilled care during prenatal, at delivery, and a few days during the postnatal period [2]. According to the WHO, one in every four (23 %) global maternal deaths occurred in Nigeria. This indicated that a pregnant woman in Nigeria had a one in 21 chance of dying from pregnancy and childbirth-related causes, compared to a one in 38 in Sub-Saharan Africa, 1:190 globally, 1:3,100 in North America, and 1:11,700 in Western Europe. A maternal health situation analysis indicated that for 17 years in Nigeria, only about 24 % was shed off from the maternal mortality ratio (1200 in 2000 and 917 in 2017) [3]. This high burden of maternal mortality is attributed to low access to and utilization of maternal healthcare, women, especially those in rural communities in developing countries remain vulnerable and underserved [4, 5]. Among the six top countries with poor utilization of maternal health services, (India, Nigeria, Pakistan, Afghanistan, and the DRC), almost half of worldwide maternal

mortality happens [2]. An ongoing social catastrophe of very poor performance in maternal health coupled with an unacceptably high number of maternal deaths is evident in Nigeria, especially among women in Northern Nigeria [4]. Regional variations exist in Nigeria, with Maternal Mortality Ratio being highest in rural areas, Northern Nigeria states, and regions. While the South West exhibits lower maternal mortality ratios, the Northern regions show consistently higher ratios [4].

Information about maternal health care services utilization in Jigawa State is important because it will provide evidence of the effectiveness or otherwise of efforts put in place on maternal health services, especially with the scaling up of maternal health services as part of the implementation of “one functional PHC per ward” in the State. Moreover, assessing the current level of utilization and identifying the predictors of maternal health care services are important to guide public health planners, policymakers, and implementers to plan and design appropriate intervention strategies to enhance maternal health care service utilization thereby improving poor maternal health indices in the State [2]. Hence, this study seeks to assess the pattern and predictors of utilization of maternal health services in Jigawa State.

## MATERIALS AND METHODS

### Study area

Jigawa state, Northwestern Nigeria has a 2023 projected population of 5,590,272. About 49% of the population are females [7]. Islam is the predominant religion in the State, with Hausa and Fulani as the major tribes. The 27 Local Government Councils of the State are charged with the provision of primary-level healthcare services, which are essentially promotive, preventive, and curative through the 700 Primary Healthcare Centers, Dispensaries, Clinics, and Health Posts. Jigawa state has 120 functional primary health care centers that provide delivery and other maternal health services [7].

### Study design

Descriptive cross-sectional design

### Study population

Mothers of children under the age of 5 years.

### Sample size determination

The “WHO 30 by 7” cluster survey technique [8] was used to calculate the minimum sample size. The minimum sample size per local government area (LGA) is;  $30 \text{ clusters} \times 7 \text{ respondents} = 210$  respondents per local government area. The total sample size is across three LGAs is thus;  $210 \times 3 = 630$ . A total of 630 mothers of children under the age of five were interviewed

### Sampling technique

The “WHO 30 by 7” cluster survey method <sup>74</sup> was used as follows;

Stage 1: Selection of local government areas.

Three local government areas were purposively selected, one from each of the three senatorial districts in the state.

Stage 2: Selection of clusters (settlements)

Thirty clusters (settlements) were selected out of all the clusters in each local government area. The selection of the clusters was done using probability proportionate to the size (PPS) of the population in the cluster. The list of all settlements in the local government area and the projected population of each settlement was obtained from the National Population Commission. The cumulative population of the clusters was calculated. The sampling interval for each local government was calculated as follows;

$$\frac{\text{Total population of the local government area}}{30 \text{ clusters}} = \text{Sampling interval}$$

The sampling interval was rounded up to the nearest whole number. Randomly, a number less than the sampling interval was selected using a table of random numbers to arrive at the first cluster (Within whose cumulative population the random number lies). The random number must have the same number of digits as the sampling interval. Then subsequently, sampling interval + cluster one cumulative population gives cluster two; sampling interval + cluster 2 gives cluster 3. This continued until 30 clusters were selected from each local government area.

Stage 3: Selection of houses

To select the first house, a central location, which approximates the geographical center of the settlement, was identified. A direction was selected at random and a walk conducted in that direction counting all the houses until the edge of the village was reached. A random number (n) was chosen from one to the total number of houses along the directional line selected. The n<sup>th</sup> house in the direction was chosen as the first house and all eligible subjects in that house were sampled. After the first house was visited, the surveyor moved to the next house, which was defined as the one whose front door was closest to the one just visited.

Stage 4: Selection of households and respondents

Seven subjects were selected within each cluster. The subjects were chosen by selecting all households in a house visited and every eligible subject in the household was included in the sample. This process continued until all seven eligible subjects were found.

### Data collection instrument

An adapted questionnaire from the international budget partnership questionnaire on maternal health services was used for the study [6]. The questionnaire had the following sections;

Section A: Sociodemographic characteristics and reproductive profile of the respondents

Section B; Utilization of maternal Health Services

Section C: Accessibility of maternal Health Services

### Data analysis

At the univariate level, frequencies, and proportions of socio-demographic profile and utilization of Antenatal Care, Post-postnatal care, and skilled delivery services were obtained. Data was presented in tables and charts. Chi-square and Fisher's exact tests were performed at the bivariate level to check for association between socio-demographic, and reproductive profiles with the utilization of maternal health services. The level of significance ( $\alpha$ ) was set at 0.05 and *P*- values were generated. Factors found to be significantly associated with the utilization of maternal health services at the bivariate level were subjected to a binary logistic regression model to determine the predictors of utilization of maternal health services.

### Ethical considerations

Ethical clearance was obtained from the Research Ethics Committee of Ahmadu Bello University Teaching Hospital Zaria (ABUTHZ/HREC/W23/2021). Permission was obtained from community leaders of the selected communities. Verbal informed consent was obtained from the participants. Confidentiality and privacy of the respondents were ensured.

## RESULTS

A total of 630 questionnaires were administered using ODK to the respondents. All were filled (giving a response rate of 100%) and valid for use after data cleaning. All administered questionnaires were analyzed. The mean age (SD) of the respondents was  $29.9 \pm 6.36$  years and the majority (51.7%) of the respondents were aged 25-34 years. Over 98% of the respondents were married and up to 30% of them had no formal education. About 36.8% of the respondent's partners had tertiary education while up to 34.2% were civil servants. The majority (64.8%) of the respondents belong to the poorest wealth quintile with 41% earning less than 20,000 naira per month. The median household monthly income was 30,000 naira. Respondent's mean age at first marriage was  $18.14 \pm 0.03$  years with the majority (89%) of them first married between the ages of 15-24 years. The mean number of children who are alive was  $4.35 \pm 2.5$  with 56.3% of the respondents having between 0-4 living children. The median duration of marriage of the

respondents was found to be 11.0 years and 28.4% of them have been married for 10-14 years. The median time of the last childbirth was 18.25 months. About 34% of the respondents had their last childbirth between 0-11 months ago (Table 1). Fifty-six percent of the respondents take less than 30 minutes to the nearest facility for maternal health services, while 33.8% of the respondents are within 30-minute to one-hour travel time to the closest facility. Forty-two percent of the respondents reported walking to the health facility to access care with only 23.3% using cars as means of transportation (Table 2). Most (93.3%) of the respondents reported having utilized maternal health services during most pregnancies. Most (90.6%) of them attended ANC but only 56.3% of them had a skilled birth attendant at their deliveries. Only 31.2% of the respondents had PNC within 48 hours of delivery (Table 3). The majority (60.2%) of the respondents visited Primary Health Care facilities for utilization of maternal health services (Figure 1). The majority (57.8%) of the respondents had between 3 to 4 ANC visits during their most recent pregnancies with less than 1 % having more than 8 ANC visits. A majority (53.9%) of the respondents had their first ANC visit within the first trimester of pregnancy. A majority (63.9%) of the respondents with skilled delivery were delivered by a nurse/midwife, and only 5.9% were delivered by a doctor. Majority (65%) of the respondents who had PNC visits had only one visit. Only 5% of the respondents had the recommended four visits for PNC (Table 4). Respondent's highest level of education ( $P = 0.043$ ), partner's highest level of education ( $P = 0.044$ ), partner's occupation ( $P = 0.001$ ), and household monthly income ( $P = 0.014$ ) and age at first marriage ( $P = 0.038$ ) were found to be significantly associated with utilization of maternal health services (Table 5). Distance to the nearest facility ( $P = 0.037$ ), time taken to the nearest health facility ( $P = 0.011$ ), and average waiting time to see a medical staff ( $P = 0.014$ ) were found to be significantly associated with utilization of maternal health services. (Table 6). Respondents who live within 5 Km to the nearest maternal health services are almost two times more likely to utilize maternal health services than those who live more than 10Km away from facilities (aOR=1.9; 95% CI:1.3 – 2.05;  $P=0.003$ ) (Table 7).

## DISCUSSION

Findings from this study revealed that up to 90.6% of the respondents had at least one ANC service during their last pregnancy. Similarly, a study from Zaria [9] and Kwara State [10] all in Northern Nigeria, reported that about 96% of the respondents utilized ANC services. Other similar findings were reported from Enugu [11] and Ondo States [12] in Southern Nigeria which both reported ANC attendance rates of more than 90%. The similarities found in these studies could be because of similar socioeconomic and demographic characteristics of the study respondents.

Also, many Governments and Non-Governmental Organizations provide free ANC services in Nigeria. The implication of this good coverage is the potential for pregnant women to have access to promotive, preventive, and curative services during ANC which may help reduce the risk of morbidity and mortality associated with pregnancy and childbirth. Findings from this study are however higher than those reported in some developing countries, with Studies from Ethiopia [13], Ghana [14], and Nepal [15] reporting ANC utilization coverage of 67%, 68%, and 70% respectively. Despite the good ANC coverage reported, the study found that only less than 5% of the respondents had the recommended minimum of 8 ANC visits during their last pregnancy while only 57% of the women had a minimum of four ANC visits.

This conforms with findings from the Nigerian Demographic and Health Survey (NDHS) which reported that only 58% of the women had a minimum of four ANC visits [16]. However, in Lagos, Osun, and Imo States, in Southern Nigeria, coverage of at least eight ANC visits was 76.8%, 80.2%, and 72% respectively [3]. The difference observed could be due to the general poor reproductive health-seeking behavior among women in Northern Nigeria as compared to their counterparts in the South [9]. The low coverage of a minimum number of visits despite good coverage for at least one visit indicates that the potential for ensuring sustaining visits is lost during the first visit. Hence women will not get the required care needed and the potential for reduced morbidity and mortality from pregnancy and childbirth may be lost.

This study also found that only 56.3% of the respondents delivered in a health facility. This is similar to findings from Southwest Nigeria which reported an institutional delivery rate of about 60% [12]. Similarly, a study from Ethiopia reported that 52.1% of the respondents had institutional delivery [13]. Findings from this study are however lower than those reported from Kwara [10] and Enugu [11] States in Nigeria which both reported an institutional delivery rate of more than 70%. A study from Ghana also reported a higher institutional delivery coverage of 83% [14]. Also, Global data reported from the WHO global health advisory data reported an institutional delivery rate of 78% [17]. An interesting finding from this study is the low institutional delivery rate despite good ANC coverage. It therefore means that many women attend antenatal care but choose to deliver at home, this could be because of cultural beliefs in Northern Nigeria especially in the rural communities which encourage home delivery, women who deliver in the hospital are seen as weak [18]. Low coverage of skilled deliveries from this study portends danger as unskilled deliveries account for a significant proportion of maternal and perinatal mortality [19].

The study reported that only 43.9% of the respondents had Post Natal checks within 42 days of delivery. Similarly, a study from Zaria, in Nigeria

reported a PNC coverage of 38% [9]. A similar study from Nepal found a PNC coverage of 40% [15]. Lower coverages were reported from studies in Kwara [10] and Ondo [12] States in Nigeria which reported PNC coverage of 17% and 29% respectively. A study from Enugu, South-Eastern Nigeria reported a PNC coverage of 93% [11]. As evident in this study, post-natal care coverage is the weakest link in the provision of maternal health services. Incidentally, 19% of maternal deaths occur between one and six days postpartum while up to 21% of maternal deaths occur between one- and six-weeks post-partum.

Respondents who live within 5 Km of the nearest health facility are almost two times more likely to utilize maternal health services than those who live more than 10 km away from facilities. Similarly, studies from Delta State [20] and Enugu State, [11] in Nigeria reported that distance to health facilities determined the utilization of maternal health services. Similarly, the distance was also found to be a predictor of maternal health utilization in a study among Chinese women [21]. Distance as a predictor of utilization of maternal health services is expected as women who live more than 10 kilometers away from health facilities will require extra effort to get care, especially in rural areas where bad roads and poor terrain make it more difficult to move long distances. This, however, provides evidence that siting of health facilities close to communities will improve the utilization of maternal health services with consequent decline in mortality and morbidity associated with pregnancy and childbirth.

## CONCLUSION

Antenatal Care coverage was found to be high although the number of visits was found to be far below recommended as the majority of the women had less than 8 ANC visits. The institutional delivery rate and Post post-natal care coverage were found to be low among the respondents. Distance was the only predictor of maternal health services utilization.

## RECOMMENDATIONS

Based on the findings of this study, it is recommended as follows:

1. Community leaders, religious leaders, and other opinion leaders in the State should be involved in health education efforts to encourage utilization of maternal health services. This should be done through community-based structures during social gatherings, religious gatherings, and health outreaches/campaigns organized by health workers and/or development partners.
2. Healthcare workers should educate the women on the need to sustain ANC visits, deliver in the hospitals, and seek post-natal care within 42 days of delivery. This should be done during the first ANC visit since

the majority of the respondents attend at least 1 ANC visit.

3. The Jigawa State Primary Health Care agency along with development partners should ensure that maternal health services are available in health facilities close to the communities. Each community should have at least one functional health facility within a 5km distance as recommended by WHO.

## REFERENCES

- BOLDOSSE-BOESCH, A., BRUN, M., CARVAJAL, L., CHOU, D., BERNIS, L. & KAREN, F. (2017). Setting maternal mortality targets for the SDGs. *Lancet*, **389**(1070): 696–7.
- BAUSERMAN, M., LOKANGAKA, A., THORSTEN, V., TSHEFU, A., GOUDAR, S.S., ESAMAI, F. et al. (2015). Risk factors for maternal death and trends in maternal mortality in low- and middle-income countries: A prospective longitudinal cohort analysis. *Reproductive Health*, **12**(2): 5–15.
- FAGBAMIGBE, A.F., OLASEINDE, O. & SETLHARE, V. (2021). Sub-national analysis and determinants of numbers of antenatal care contacts in Nigeria: assessing the compliance with the WHO recommended standard guidelines. *BMC Pregnancy Childbirth [Internet]* **25**; **21**(1): 402. Available from: <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-021-03837-y>.
- RAI, R.K., SINGH, P.K. & SINGH, L. (2008). Utilization of Maternal Health Care Services among Married Adolescent Women: Insights from the Nigeria Demographic and Health Survey, 2008. *Women's Health Issues [Internet]*. **22**(4): e407–14. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S1049386712000369>.
- Averting maternal death and disability Mailman School of Public Health Columbia University (2017). Report on Needs Assessment for Emergency Obstetric and Newborn Care.
- International Budget Partnership. (2016). Using surveys to monitor budget implementation.
- KHALIFA, U.M., AHMED, A., JIBBIN, M. & HUSSAINI, A. (2019). Spatial analysis of health care facilities in Babura local government area of Jigawa state, Nigeria. *International Journal of Geography and Environmental Management*, **4**(5): 18–29.
- WORLD HEALTH ORGANIZATION (2001). Description and comparison of the methods of cluster sampling and lot quality assurance sampling to assess immunization coverage.
- IDRIS, S., SAMBO, M. & IBRAHIM, M. (2016). Barriers to utilisation of maternal health services in a semi-urban community in northern Nigeria: The clients' perspective. *Nigerian Medical Journal*, **54**(1): 27. Available from: <http://www.nigeriamedj.com/text.asp?2013/54/1/27/108890>.
- FASIKU, M.M., DUROWADE, K.A., OSINUBI, M.O., AKANDE T.M., OSAGBEMI, G.K., SALAUDEEN, A.G. & OLOYEDE, T.A. (2018). Utilization of Maternal Health Services and its Determinants Among Mothers Attending Primary Health Care Clinics In Kwara State. *Nigeria. Res Journal Health Science*, **6**(3): 12-18.
- OKPALA, P.U., OKOYE, C.L., ADEYEMO, F.O., IHEANACHO, P.N., EMESONWU, A.C., OSUALA, E.O., et al. (2019). Utilization of maternal and child health services in Enugu, South East, Nigeria. *International Journal of Community Medicine and Public Health*, **26**; **6**(8): 3228. Available from: <https://www.ijcmph.com/index.php/ijcmph/article/view/5140>.
- ADEBOWALE, A.S. (2016). Determinants of Maternal Utilization of Health Services and Nutritional Status in a Rural Community in South-West Nigeria. *African Journal of Reproductive Health*, **20**(2): 72–85.
- SHUDURA, E., YOSEPH, A. & TAMISO, A. (2020). Utilization and Predictors of Maternal Health Care Services among Women of Reproductive Age in Hawassa University Health and Demographic Surveillance System Site, South Ethiopia: A Cross-Sectional Study. *Advance Public Health [Internet]*. **10**(1): Available from: <https://www.hindawi.com/journals/aph/2020/5865928/>
- NUAMAH, G.B., AGYEI-BAFFOUR, P., MENSAH, K.A., BOATENG, D., QUANSAH, D.Y., DOBIN, D. et al. (2019). Access and utilization of maternal healthcare in a rural district in the forest belt of Ghana. *BMC Pregnancy Childbirth [Internet]*. **19**(1): 6. Available from: <https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/s12884-018-2159-5>.
- RIMU, M. & NITENDR, C. (2015). Utilization of Safe Motherhood Services in Jhorahat PHC Area of Morang District, Nepal. *American Journal of Public Health Research*, **3**(5): 23-28.
- National Population Commission Abuja (NPC) [Nigeria] and ICF (2019). Nigeria Demographic and Health Survey 2018. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF;

17. WORLD HEALTH ORGANIZATION (WHO). (2021). World health observatory data.
18. Demographic and Socioeconomic Factors Influencing Utilization of Maternal Health Services (2021). Vol. 3, Nursing Project Topics and Materials.
19. YAYA, S. & GHOSE, B. (2019). Global Inequality in Maternal Health Care Service Utilization: Implications for Sustainable Development Goals. *Health Equity*, **3**(1): 145–54. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/31289773>.
20. ITIMITANG, W.E. (2018). Determinants of use of Maternal Health Care Services in a Rural Nigerian Community. *Research Humanities Social Science*, **4**(18): 23-27.
21. CHEN, L., DAI, Y., WU, Q., RUDAN, D. & SAFTIC, V. (2013). A comparison between antenatal care quality in public and private sector in rural Hebei, China. *Croatian Medical Journal*, **54**(2): 146–5

**Table 1:** Socio-demographic characteristics and reproductive profile of respondents

Variable	Frequency (n=630)	Percentage
<b>Age group (in years)</b>		
15-24	119	18.9
25-34	326	51.7
35-44	172	27.3
45 and Above	13	2.1
<b>Marital status</b>		
Single	0	0
Married	591	98.2
Divorced	20	3.2
Widowed	11	1.7
Separated	8	1.3
<b>Highest level of education</b>		
No formal	208	30.0
Primary	158	25.1
Secondary	200	31.7
Tertiary	64	10.2
<b>Tribe</b>		
Hausa	562	88.9
Fulani	58	9.2
Igbo	2	0.3
Yoruba	8	1.3
Others (Eg Kanuri, Bade)	2	0.3
<b>Religion</b>		
Islam	622	98.7
Christianity	7	1.1

Traditional religion	1	0.2
<b>Occupation</b>		
Business	42	6.7
Civil servant	44	7.0
Farmer	21	3.3
Petty trader	364	57.8
Not gainfully employed	140	22.2
Others (Eg Tailor, artisan)	19	3.0
<b>Partner's highest level of education</b>		
No formal	148	23.5
Primary	70	11.1
Secondary	180	28.6
Tertiary	232	36.8
<b>Partner's occupation</b>		
Businessman	77	12.2
Civil servant	217	34.2
Farmer	166	26.3
Petty trader	112	17.8
Not gainfully employed	15	2.4
Others (Eg Driver, artisan)	43	6.8
<b>Household average monthly income</b>		
<20,000	258	41
20,000-50,000	260	41.3
>50,000	112	17.8
<b>Wealth index</b>		
Poorest	408	64.8
Poor	117	18.6
Middle	76	12.1
Rich	27	4.3
Richest	2	0.3
<b>Age at first marriage (Years)</b>		
Less than 15	51	8.1
15-24	561	89.0
25-34	15	2.4

35 and above	3	0.5
<b>Number of living children</b>		
1-4	355	56.3
5-9	259	41.1
10+	16	2.6
<b>Duration of marriage (Years)</b>		
< 5 years	79	12.5
5-9	162	25.7
10-14	179	28.4
15-19	112	17.8
20 and above	98	15.6
<b>Last childbirth (months)</b>		
0-11	219	34.8
12-23	176	27.9
24-35	136	21.6
36-47	74	11.7
48-59	25	4.0

**Table 2:** Physical accessibility to maternal health services facilities

Variable	Frequency	Percent
<b>Time taken to closest facility</b>		
Less than 30 mins	358	56.8
30 mins to 1 hour	213	33.8
1hour to 1.5 hours	47	7.5
1.5 to 2 hours	11	1.7
Greater than 2 hours	1	0.2
<b>Distance from closest facility (Km)</b>		
<5	453	71.9
5-10	53	8.4
>10	124	19.7
<b>Mode of transportation</b>		
Bicycle	58	9.2
Car	147	23.3
Donkey/cart	10	1.6
Tricycle	86	13.7



Walking	269	42.7
Others (E.g. Horses, Cattle)	60	9.5
<b>Waiting time to see health care provider</b>		
Less than 30 mins	201	31.9
30 mins to 1 hour	278	44.1
1 hour to 1.5 hours	88	14.0
1.5 hours to 2 hours	43	6.8
Greater than 2 hours	19	3.0

**Table 3:** Utilization of maternal health services during the most recent pregnancy

Variable	Frequency (n=630)	Percent
<b>Utilized maternal health services</b>		
Yes	588	93.3
No	42	6.7
<b>Antenatal care</b>		
Yes	571	90.6
No	59	9.4
<b>Postnatal care</b>		
Yes	277	43.9
No	353	56.1
<b>PNC within 48 hours</b>		
Yes	197	31.2
No	433	68.8
<b>Skilled Delivery</b>		
Yes	355	56.3
No	275	43.7

**Table 4:** Pattern of utilization of maternal health services during the most recent pregnancy

Variable	Frequency	Percent
<b>Timing of first ANC (n=571)</b>		
First trimester	217	38.1
Second trimester	308	53.9

Third trimester	46	8.0
<b>Number of ANC visits (n=571)</b>		
1-2	73	12.8
3-4	330	57.8
5-6	140	24.5
7-8	24	4.2
>8	4	0.7
<b>Attendant at delivery (n=335)</b>		
Doctor	21	5.9
Nurse/midwife	227	63.9
CHEW/CHO	71	20.0
Other (Eg Environmental officer, technicians)	36	10.2
<b>Number of PNC visits (n=277)</b>		
1	180	65.0
2	55	20.0
3	22	8.0
4	14	5.0
>4	6	2.0

**Table 5:** Relationship between sociodemographic and reproductive profile with utilization of maternal Health services

Variable	Utilize maternal health services		P-Value/test statistic
	Yes	No	
	f(%)	f(%)	
Age group(Years)			
15-24	112(19.1)	7(16.7)	$\chi^2 = 1.234$
25-34	301(51.1)	25(59.5)	$P = 0.777$
35-44	163(27.7)	9(21.4)	
45 and above	12(2.1)	1(2.4)	
Tribe			
Hausa	526(89.5)	36(85.7)	Fischer Exact = 2.030
Fulani	52(8.8)	6(14.3)	$P = 0.511$
Igbo	2(0.3)	0(0.0)	
Yoruba	8(1.4)	0(0.0)	
Religion			

Islam	580(98.6)	42(100.0)	Fischer Exact = 1.055
Christianity	7(1.2)	0(0.0)	$P = 1.000$
Others	1(0.2)	0(0.0)	
<b>Marital Status</b>			
Married	552(93.9)	39(92.6)	Fischer Exact = 1.902
Divorced	18(3.1)	2(5.0)	$P = 0.491$
Widowed	11(1.8)	0(0.0)	
Separated	7(1.2)	1(2.4)	
<b>Highest Level of education</b>			
No formal education	190(32.3)	18(42.9)	$\chi^2 = 8.074$
Primary	143(24.3)	15(35.7)	$P = 0.043$
Secondary	194(33.0)	6(14.3)	
Tertiary	61(10.4)	3(7.1)	
<b>Occupation</b>			
None	125(21.3)	15(35.7)	Fischer Exact = 7.657
Business	41(7.0)	1(2.4)	$P = 0.131$
Civil servant	42(7.1)	2(4.8)	
Farmer	18(3.2)	3(7.1)	
Petty trader	342(58.2)	21(50.0)	
Others	19(3.2)	0(0.0)	
<b>Partner's highest level of Education</b>			
No formal	135(23.1)	13(31.0)	$\chi^2 = 8.086$
Primary	63(10.7)	7(16.7)	$P = 0.044$
Secondary	165(28.1)	15(35.6)	
Tertiary	225(43.1)	7(16.7)	
<b>Partner's occupation</b>			
None	14(2.1)	1(2.4)	Fischer Exact = 20.393
Civil servant	212(36.2)	5(12.0)	$P = 0.001$
Farmer	145(24.8)	21(50.0)	
Business	70(11.9)	7(16.6)	
Petty trader	104(17.7)	8(19.0)	
Others	43(7.3)	0(0.0)	
<b>Wealth index</b>			
Poorest	374(63.6)	34(81.0)	Fischer Exact = 5.797
Poor	111(18.9)	6(14.2)	$P = 0.209$

Middle	74(12.6)	2(4.8)	
Rich	27(4.6)	0(0.0)	
Richest	2(0.3)	0(0.0)	
<b>Household monthly income (Naira)</b>			
<20,000	233(39.6)	25(59.6)	$\chi^2 = 8.413$
20,000-50,000	245(41.7)	15(53.7)	$P = 0.014$
>50,000	110(18.7)	2(4.8)	
<b>Age at first marriage (Years)</b>			
<15	44(7.5)	7(16.7)	Fischer Exact = 7.816
15-24	528(89.8)	33(78.6)	$P = 0.038$
25-34	14(2.4)	1(2.4)	
35 and above	2(0.3)	1(2.4)	
<b>Number of living children</b>			
0-4	335(57.0)	20(47.6)	$\chi^2 = 0.1478$
5-9	238(40.1)	21(50.0)	$P = 0.471$
10 and Above	15(2.6)	1(2.4)	
<b>Duration of marriage (In years)</b>			
<5	75(12.8)	4(9.5)	$\chi^2 = 3.391$
5-9	150(25.5)	12(28.6)	$P = 0.491$
10-14	168(28.7)	11(26.2)	
15-19	101(17.2)	11(26.2)	
20 and Above	94(16.0)	4(9.5)	
<b>Last child birth (months)</b>			
0-11	207(35.2)	12(28.5)	Fischer Exact = 3.786
12-23	103(17.5)	13(31.0)	$P = 0.416$
24-35	123(21.0)	13(31.0)	
36-47	70(12.0)	4(9.5)	
48-59	25(4.3)	0(0.0)	

$\chi^2$ = Pearson's Chi-square test

**Table 6:** Relationship between physical accessibility and utilization of maternal health services

Variables	Utilize maternal health services		Test Statistic/ <i>P</i> value
	Yes (%)	No (%)	
Distance to nearest facility(Km)			
<5	330(56.1)	22(52.4)	Fischer’s Exact =6.225
5-10	53(9.0)	0(0.0)	<i>P</i> =0.037

>10	205(34.9)	20(47.6)	
<b>Time taken to nearest facility</b>			
<30 minutes	341(58.0)	17(40.5)	Fischer's Exact=12.122
30 mins to 1 hour	195(33.2)	18(42.9)	$P=0.011$
1 hour -1.5 hours	43(7.3)	4(9.5)	
1.5 hours-2 hours	9(1.5)	2(4.8)	
> 2 hours	0(0.0)	1(2.4)	
<b>Mode of transportation to health facility</b>			
Bicycle	54(9.2)	4(9.5)	Fischer's Exact= 4.051
Car	141(24.0)	6(14.4)	$P=0.504$
Donkey/Cart	10(1.7)	0(0.0)	
Tricycle	77(13.1)	9(21.4)	
Walking	249(42.3)	20(47.6)	
Others	57(9.7)	3(7.1)	
<b>Average waiting time to see medical staff</b>			
<30 minutes	196(33.3)	5(12.0)	$\chi^2=10.850$
30 mins to 1 hour	253(43.0)	25(59.6)	$P=0.014$
1 hour -1.5 hours	80(13.7)	8(19.0)	
1.5 hours-2 hours	42(7.1)	1(2.4)	
> 2 hours	17(2.9)	2(4.8)	

$\chi^2$ = Pearson's Chi-square test

**Table 7:** Predictors of utilization of maternal health services

Variable	aOR	95 % CI for OR	P - value
		Upper-Lower	
Distance to nearest maternal health services (Km)			
< 5	1.9	1.3 – 2.05	0.003
5 – 10	0.95	0.8 – 2.9	0.721
>10	1.00		
Educational Status			
No formal	1.00		
Primary	0.39	0.07 - 2.09	0.275
Secondary	0.54	0.15 – 2.10	0.365
Tertiary	0.39	0.16 – 1.30	0.126

**Partner's Education**

No formal	1.00		
Primary	0.92	0.92 -1.73	4.896
Secondary	0.63	0.66-1.24	3.564
Tertiary	0.92	0.93-2.27	3.810

**Partner's occupation**

Petty trader	1.21	0.78 – 2.90	9.673
Business	1.53	0.45 – 1.98	0.342
Civil servant	1.01	0.62 – 2.80	0.732
Farmer	0.95	0.52 – 1.75	0.231
None	2.01	0.57 – 6.02	0.981
Others	1.00		

**Average amount of time spent to see a medical staff**

Less than 30 minutes	1.00		
30 mins to 1 hour	2.67	0.41– 7.4	0.303
1 hour to 1.5 hours	0.89	0.16– 5.14	0.903
1.5 hours to 2 hours	0.85	0.13 –5.34	0.868
>2 hours	1.43	0.98– 2.65	0.997

**Household income**

<20,000	1.0		
20,000-50,000	0.23	0.04-1.37	0.108
>50,000	0.43	0.08-2.38	0.339

**Age at marriage (Years)**

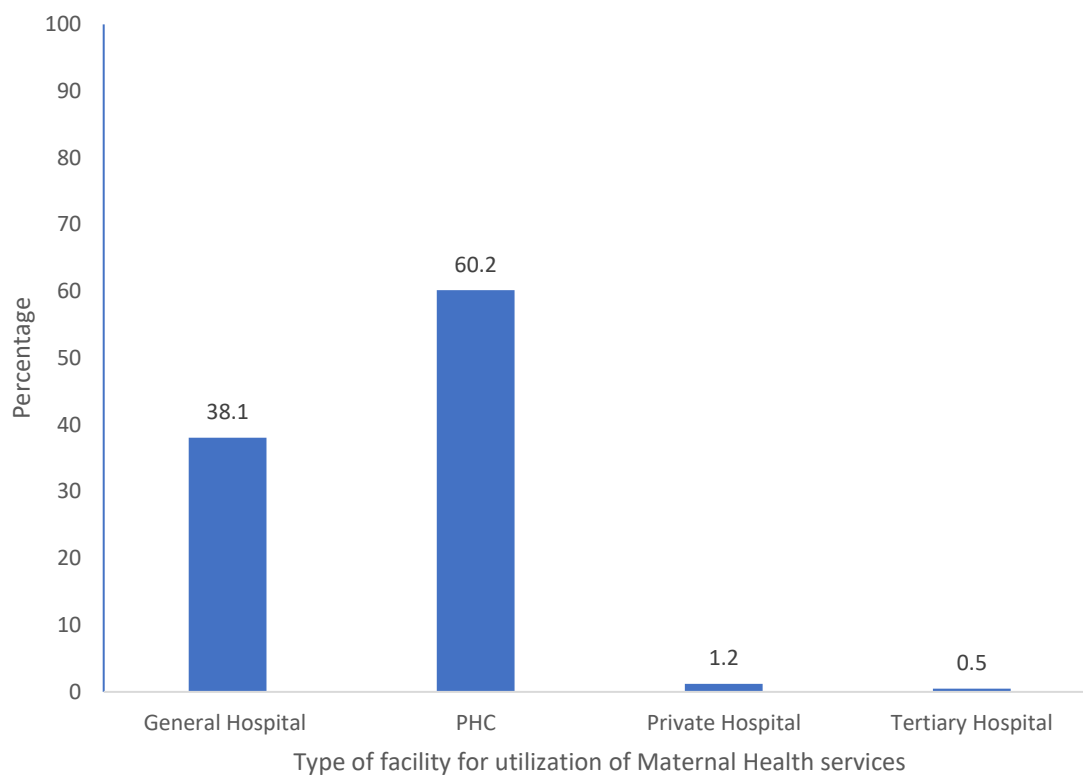
<15	1.0		
15-24	4.35	0.16-11.4	0.377
25-34	11.60	0.50-26.9	0.126
35 and above	7.34	0.16-32.3	6.308

**Time taken to nearest facility**

<30 minutes	1.0		
30 mins to 1 hour	0.34	0.05-1.92	0.207
1 hour -1.5 hours	0.81	0.23-2.88	0.751
1.5 hours-2 hours	0.84	0.38-1.83	0.666
> 2 hours	2.32	0.92-5.82	0.909

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**aOR**=Adjusted odds ratio    **CI**= Confidence interval



**Figure 1:** Facility choice for utilization of maternal health services