

# An Assessment of Booking Status on Pregnancy Outcome Among Women in Geidam Local Government Area, Yobe State, Nigeria

Usman Abba <sup>\*1</sup>, Abubakar Musa <sup>2</sup>

<sup>1</sup>Department of Obstetrics and Gynaecology, Yobe State University, Damaturu-Nigeria.

<sup>2</sup>Department of Community Medicine, Abubakar Tafawa Balewa University/Abubakar Tafawa Balewa University Teaching Hospital, Bauchi-Nigeria.

\*Corresponding Author: Usman Abba; [usmanabbagdm@gmail.com](mailto:usmanabbagdm@gmail.com)

## Abstract

**Introduction:** Antenatal care (ANC) refers to the care a pregnant woman receives during her pregnancy through consultations with trained healthcare workers such as midwives, nurses, and sometimes doctors specializing in maternal health. Globally, approximately 800 women die daily from pregnancy- or childbirth-related complications, with Yobe State being among the regions with the worst health indices in Nigeria, particularly concerning maternal health. The maternal mortality rate in this region is unacceptably high, exceeding 1000 deaths per 100,000 live births. Factors contributing to this include poor ANC services, socio-cultural norms, and lack of access to healthcare facilities. This study aims to assess the influence of antenatal care on pregnancy status and outcomes among women in Geidam LGA, Yobe State, Nigeria. **Methodology:** A facility-based cross-sectional descriptive study was conducted among 400 women. Participants were selected using a systematic sampling technique. Data were collected using a pre-tested, interviewer-administered questionnaire and analysed using Epi-info at a 5%  $\alpha$  level of significance. **Results:** The age range of 25–29 years constituted 28% of the participants, 46.5% were grand multipara and 32.2% had three ANC visits. The study revealed that 63.8% of respondents attended ANC, with 85% attending due to the desire for better outcomes. Among those who did not attend ANC (36.2%), the reasons were not due to lack of knowledge but factors such as cost, distance, ineffectiveness, unavailability, and refusal of husband consent. Factors influencing ANC attendance included age, educational status, parity, residence, cost of services, ineffectiveness, unavailability, and husband refusal. The sisterhood method estimated maternal mortality at 6030/100,000 live births, which is significantly higher than similar studies in other developing countries. **Conclusion:** The study found that perinatal mortality was higher among unbooked pregnancies, and pregnancy complications such as eclampsia, postpartum haemorrhage, and anemia were more prevalent among unbooked women. There are needs to promote female education, subsidizing ANC services, improving infrastructure, encouraging male involvement in ANC, and establishing more antenatal clinics in the rural areas.

**Keywords:** Booking status, pregnancy outcome, women of reproductive age, Yobe.

## Introduction

Antenatal care (ANC) is the care a pregnant woman receives during her pregnancy through a series of consultations with trained healthcare workers, such as midwives, nurses, and sometimes doctors who specialize in pregnancy and birth [1]. ANC entails the clinical assessment (advice, supervision, and attention) of both mother and fetus during pregnancy, with the purpose of obtaining the best possible outcome for both [2,3]. Antenatal care should commence from the time the pregnancy is diagnosed and should continue until the safe delivery of the mother [4,5]. Visits should occur once a month for the first 28 weeks, once a fortnight for the next 8 weeks, and weekly until delivery [6].

An analytical review of recent World Health Statistics showed that ANC coverage between 2006 and 2013 was indirectly correlated with maternal mortality ratio (MMR) worldwide [7]. This

indicates that countries with low ANC coverage are the countries with very high MMR [10]. Unfortunately, this is not usually the case in developing countries, where most patients still have little or no antenatal care [8,9,10].

About 800 women die daily from pregnancy- or childbirth-related complications worldwide. In 2013, there were an estimated 289,000 maternal deaths, a decline of 45% from the 1990 estimate. Approximately 99% of these deaths occurred in low- and middle-income countries (LMICs), with sub-Saharan Africa (SSA) alone accounting for 62% (179,000) of the deaths [11]. Although the global maternal mortality ratio declined by 2.6% per year, this is far from the annual decline of 5.5% required to achieve the fifth Millennium Development Goal (MDG) of improving maternal health. Only seven LMICs achieved the MDG 5 target of a 75% reduction in the maternal mortality ratio by 2015. Two countries accounted for one-third of all global maternal deaths in 2013: India, with 17% (50,000),

and Nigeria, with 14% (40,000), suggesting that pregnant women in these LMICs have high-risk pregnancies <sup>[12,13]</sup>.

## Methodology

### Study area

The study was conducted General Hospital Geidam. It was established in 1973 as a Comprehensive health Centre following an increased population in the community, the hospital was expanded and upgraded to the status of general hospital in 1985 then to that of a specialist hospital in 1998. It has 360 bed space and 33 services points. It covers a total area of 2,366km<sup>2</sup>. It has an estimated population of 137,000 and a population density of 37/km<sup>2</sup>, the residents are predominantly farmers <sup>[14]</sup>.

**Study Design:** This study is a Cross-Sectional Descriptive Study

**Study Population:** The study population constitutes women of child bearing age (15-49 years) who resides within the communities of Geidam LGA of Yobe state, Nigeria and accessed their ANC services in the health facilities were included and those that were too sick or not around during the study were excluded.

### Sample Size Estimation

The minimum sample size was determined using the formula:

$$n = Z^2pq/d^2$$

Where: n=the desired sample size, Z=the standard normal deviate, usually set at 1.96 which corresponds to 95% confidence interval, p= the proportion of the target population from previous similar studies set at 62.5% <sup>[11]</sup>, q=1-p and d=Degree of accuracy desired =0.05

$$n = (1.96)^2 \times 0.625 \times 0.375 \\ = (3.8416 \times 0.234375)/0.0025(0.05)^2$$

n=360.15 **Correction for non-response:** To compensate for non-response, adjustment was made using the formula:

$$N_s = n/0.9$$

$$N_s = 360.15/0.9$$

$$N_s = 400.16$$

The final sample size used for the study was: 400

### Data Collection

Primary data was collected using a semi-structured pre-tested interviewer administered questionnaire at the health facilities. During the study, a total of 400 women of reproductive age group who have at least given birth to one child were interviewed regarding their previous pregnancies, antenatal care (ANC) attendance delivery outcome and puerperium. Prior to the data collection exercise, eight (8) data collectors were trained for this purpose. The designed questionnaire was pre-tested at the facility and corrections were made before the final data collection exercise. Each of them collected interviewed 50 women at the clinic. Each data collected was serially coded to avoid duplication. Interviews were conducted

in a safe confidential non-noisy consulting room within the health facility. The sample of the questionnaire is attached in the annex as an appendix. Collected and excel based collated data by each data collector was checked and examined for Accuracy, Consistency, Reliability, Relevance, Completeness and Appropriateness by the principal researcher.

**Data Analysis:** Completed collated data was entered into excel spreadsheet, transposed into Epi-info version 7.0 statistical software which was used for data analysis. Socio-demographic data elements were summarized into tables and analysed according to demographic characteristics. Frequency and proportions were applied for categorical variables while for numerical variables, mean and standards deviation was computed. Chi-square test was used to test level of significance between categorical variables in 2x2 contingency tables.

**Estimation of Maternal Mortality:** The model used in estimation of maternal mortality rate was sisterhood method among respondents. The age group, the number of respondents corresponding to each age group, the number of ever-married sisters from each age group, death from other causes and the total death were key parameters computed. The conventional maternal mortality rate (MMR) was calculated using the mathematical equation:

$$=1-(1-W)/TFR$$

=1-(1-0.353)/TFR Where TFR=total fertility rate and W=Life Time Risk.

### Ethical Approval & Considerations

To ensure ethical protocols are strictly uphold, the questionnaires did not carry name columns of the patients whose data were collected to avoid potentiality of subsequent linkages of the results with the patients. The questionnaires were sequentially coded to ensure its non-duplication. Errors made while entering data were only stroked in a single line and colour shading was avoided to allow for fairness. All the information entered into the questionnaire was treated with utmost confidentiality and unauthorized third person within or outside the hospital or health facility community was denied access to the extracted data to ensure respect for subjects' information.

Prior to commencement of the study, the research protocol was sent to Research Committee of the LGA for initial ethical review and clearance. Thereafter, preliminary approval to conduct the study was granted from the said ethical committee before commencement. All data collected was kept confidential in an electronic platform and pass worded to avoid unauthorized access. This was not to be used for any other purpose apart from sole intention of research. Retrieved written consents from patients were filed appropriately and scanned copies kept confidential in an electronic platform also. Patients were given the option to decline participation at any time of the interviews without litigation.

## Results

The response rate for this study was 95% among the women that were interviewed.

### Demographic characteristic of the respondents

**Table 1: Shows the distribution of respondents by their socio-demographic characteristics.**

Variables	Frequency	Percentage (%)
AGE		
15-19	26	6.5
20-24	72	18
25-29	112	28
30-34	79	19.8
35-39	36	9
40-44	38	9.5
45-49	37	9.3
Total	400	100.1
TRIBE		
KANURI	205	51.3
MANGA	35	8.8
HAUSA	39	9.8
FULANI	36	9
SHUWA	9	2.3
BODOWOI	21	5.3
OTHERS	55	13.8
Total	400	100.3
EDUCATION		
PRIMARY	83	20.8
SECONDARY	55	13.8
TERTIARY	15	3.8
QUR'ANIC	82	20.5
NIL	163	40.8
OTHERS	2	0.5
Total	400	100.2
OCCUPATION		
PETTY TRADER	57	14
FARMER	207	51.8
HOUSE WIFE	117	29.3
CIVIL SERVANT	12	3
OTHERS	7	1.8
Total	400	99.9
PARITY		
NULLIPARA	47	11.8
MULTI PARA	167	41.8
GRAND MULTIPARA	186	46.5
Total	400	100.1

**Table 2: Number of clinic visitation among women who attended ANC**

Number of Clinic Visit	Frequency	Percentages (%)
1	8	2.9
2	25	9.2
3	88	32.2
4	74	27.1
5	35	12.8
6	27	9.9
7	11	4.0
8	3	1.1
9	2	0.7
Total 45	273	100

$$\chi^2 = 8.98, df = 1, P = 0.003$$

#### Comparison between Booking Status and Pregnancy Outcome among Respondents

Table 3 shows the relation between outcome of pregnancy and antenatal status. 211 out of the 232 uneventful pregnancies were booked. Both maternal and fetal complications among booked pregnancy were less than un-booked ones. The result is statistically significant ( $p < 0.05$ ).

**Table 3: Comparison between booking status and pregnancy outcome**

Pregnancy Outcome	Booked	Un-booked	Total
Uneventful	211	21	232
Maternal complications	30	51	81
Fetal complications	32	55	87
TOTAL	273	127	400

#### Comparisons between Types of Pregnancy Complications and ANC Attendance

Types of Pregnancy Complication	Attended ANC	Not Attended ANC	Total
Eclampsia	4(4.94)	10(12.35)	14
Antepartum Hemorrhage (APH)	6(7.41)	7(8.64)	13
Anemia in pregnancy	1(1.23)	7(8.64)	8
Postpartum Hemorrhage (PPH)	4(4.94)	15(18.52)	19
Prolonged obstructed labor	7(8.64)	5(6.17)	12
Other complications	8(9.88)	7(8.64)	15
Total	30(37.04)	51(62.96)	81

$$\chi^2 = 9.083, df = 5, P = 0.106$$

#### Relationship between Perinatal Mortality and ANC Attendance

Perinatal Mortality	Attended ANC	Attended Did Not Attend	Total
Stillbirth	38(13.9%)	45(35.4%)	83
Mortality	221(81%)	62(48.9%)	283
Total	273(100%)	127(100%)	400

#### Estimate of Maternal Mortality Rate by the Sisterhood Method

$$\chi^2 = 26.13, df = 2, P = 0.000$$

Table 8 below shows the age group, the number of respondents corresponding to each age group, the number of ever-married sisters from each age group, death from other causes and the total death. It also gives proportion of maternal death to the total, and also shows the adjustment factor A, which is reproduced from the original article (Graham W. Brass, W and Snow RW 1989). Sister unit B in column 9 is obtained by multiplying the adjustment in each age group with the corresponding number of ever-married sisters in that age group (column 3).

Finally, the lifetime risk  $R_9$  (W) is the ratio between the number of death due to maternal causes and the corresponding sister's unit. As there is a good variation between the values of lifetime risk  $R_9$  (W), to obtain it is necessary to sum up  $R_1$  and  $B_1$  over ages up to 49 to get a unique figure for life time risk, which is

$$Er/EB = \dots 53/150 = 0.353$$

The conventional maternal mortality rate (MMR)

$$= 1 - (1 - 0.353)^{1/TFR}, \text{ Where TFR} = \text{total fertility rate}$$

$$TFR = 7, MMR = 1 - (0.647)^{1/7}$$

$$= 1 - 0.9397 = 0.0603. MMR = 60.3/100,000 \text{ or } 6030/100,000.$$

From the sisterhood method of estimation, the maternal mortality rate was found to be **630/100,000 live births**.

Age Groups	No. of Respondents	No. of ever married sisters	No. of Maternal death	Death from other causes	Total death	Proportion of maternal death	Adjustment factor A	Sisters Unit B	Life time risks
15-19	26	23	6	3	9	0.667	0.107	2.5	2.4
20-24	72	53	9	4	13	0.692	0.206	11	0.82
25-29	112	82	11	8	19	0.572	0.343	28.1	0.391
30-34	71	65	6	4	10	0.6	0.503	32.7	0.183
35-39	36	31	7	3	10	0.7	0.664	20.6	0.34
40-44	38	35	9	5	14	0.643	0.802	28.1	0.32
45-49	37	30	5	5	10	0.5	0.9	27	0.185
Total	400	319		32	85	0.624		150	0.353

## Discussion

The distribution of antenatal care attendance among the respondents in this study showed that the majority of women attended ANC (68.3%), while 31.8% did not attend ANC. This level of attendance can be compared with other findings in Nigeria [15]. This could also be attributed to the level of awareness about health matters among the respondents. Other contributory factors to this high level of attendance include women's support groups and international organizations in the area [16].

The finding that 32.2% of those who attended ANC visited the clinic three times during the course of their pregnancies is in line with the WHO standard for minimum ANC attendance [6]. From this study, it was discovered that these women start attending ANC when their pregnancies are six months old, and subsequent visits are monthly. The inability to attend ANC was attributed to various reasons such as high cost, distance, lack of awareness, unavailability, etc. It is apparent from the findings in this study that high cost and distance were the main reasons that hindered the women from attending ANC. On the other hand, ineffectiveness and other reasons such as husband's refusal represent the minor reasons for not attending ANC.

### ANC Attendance and Age of Respondents

The finding in this study that the age group 25-29 represents the highest percentage of women attending ANC can be compared with research conducted at Aminu Kano Teaching Hospital, which shows that those within the age group 26-30 years have the highest number of ANC attendance [3]. In another study conducted in eastern Nigeria, it was found that women below the age of 30 years have the highest attendance rate. This implies that women at the active phase of reproductive age have a higher turnout of ANC in the tropics. It also implies that reproductive age group has an influence on antenatal attendance [16].

### Booking Status and Pregnancy

A statistically significant ( $p < 0.05$ ) result in this study shows a relationship between the outcome of pregnancy and antenatal status. A total of 211 out of the 232 uneventful pregnancies were booked. This explains that the more antenatal care, the better the outcome of pregnancy. Similarly, studies conducted at Aminu Kano Teaching Hospital, Kano, reported that the pregnancy outcome among booked women is twice better than that of the unbooked, irrespective of the mode of delivery [17].

### Types of Pregnancy Complications and ANC Attendance

In this study, the frequency of occurrence of complications was higher in those not attending ANC, and four times higher in the unbooked than the booked ones. Similarly, anemia in pregnancy had

the lowest frequency, which in this study is seven times more in those not attending. Even though there is no association between individual complications and ANC attendance ( $P > 0.05$ ) in this study, most of these women deliver at home, even though they attend ANC.

### Perinatal/Neonatal Mortality and ANC Attendance

The influence of ANC attendance on perinatal mortality was statistically significant ( $p < 0.05$ ) in this study. Neonatal death was equally high among unbooked pregnancies [18]. Even though cases of perinatal mortality were considerably high among the booked, this could be related to poor nutrition and lack of skilled deliveries at birth, as most of the women, even though they attended ANC, delivered at home with no skilled supervision [18].

### Maternal Mortality Rate

Studies from various parts of the developing world have estimated the mortality rate as 1,500-4,000/100,000 live births [19]. Similarly, a study conducted by Yarned et al. in Ethiopia shows that maternal mortality rate was more than 816/100,000 live births. It therefore implies that maternal mortality rate is 15-30 times higher in the developing world compared to the developed world. These differences could be attributed to the shortage of medical personnel and facilities, coupled with the low socio-economic status in the developing world [20].

## Conclusion

The study found that majority of the women had attended ANC, perinatal mortality was higher among un booked pregnancies, and pregnancy complications such as eclampsia, postpartum hemorrhage, and anemia were more prevalent among un booked women. There are needs to promote female education, subsidizing ANC services, improving infrastructure, encouraging male involvement in ANC, and establishing more antenatal clinics in the rural areas.

## Declarations

## Acknowledgement

The authors are grateful to the patients who participated in the study.

## Declaration

## Conflict of Interest

None declared

## Funding

Nil

## References

- [1] Campbell S, Less C. Textbook of obstetrics by ten teachers. 17th ed.
- [2] Knowledge, attitude, and practice toward antenatal care among women in Konduga Local Government Area of Borno State. University of Maiduguri; 2007.
- [3] Ismail A. Comparative study of the characteristics and outcomes of pregnancies among booked and unbooked patients in Aminu Kano Teaching Hospital, Kano State Medical Students Association (KAMSA) Journal. 2008;1(1):22–28.
- [4] World Health Organization. Making pregnancy safer: A strategy for action. Safe motherhood. 2010;29.
- [5] Christopher M, Alan L. Health dimension of sex and reproduction. Vol. 3. Global burden of disease and injury series. Boston: Harvard University Press; 2013.
- [6] Lister UG. Maternal and child health in primary health. University Printing Press, Ibadan, Nigeria; 2013. p. 69–73.
- [7] Lori A. Hidden suffering: Disabilities from pregnancy and childbirth in less developed countries. Policy Brief. 2005;1–5.
- [8] Amy T. Reproductive health in developing countries. Washington DC: National Academy Press; 2004. p. 120.
- [9] Pearson J, Rees G. Effective care in pregnancy and childbirth. Oxford University Press; 2000. p. 1234–45.
- [10] Fawcus S, Mbizvo M, Limmark G, Nystrom L. A community-based investigation of avoidable factors for maternal mortality in Zimbabwe. Studies in Family Planning. 1996;27(6):319–27.
- [11] American College of Obstetricians and Gynecologists. Technical Bulletin 150. Washington DC; 1990.
- [12] Grimes SD. The morbidity and mortality of pregnancy: Still a risky business. Am J Obstet Gynecol. 1994; 170:1489–94.
- [13] Sarrs A. The Safe Motherhood agenda: Priorities for the next decade. New York: Family Care International; 1998.
- [14] Royston E, Armstrong S. Preventing maternal death. WHO; 1989.
- [15] Agbohoroma OC, Emoveyan EE. Maternal mortality in Lagos, Nigeria: A ten-year review (1986–1995). Nig Obstet Hosp Med. 1997;7(3):230–2.
- [16] Jocus S, Mitchel EF, Entmans P, Piper JM. Monitoring records linkage. Am J Prev Med. 1995; 11:75–8.
- [17] Yared N, Asnakeeh M. Factors influencing the use of maternal care services in Ethiopia. ICDDR B Research.
- [18] Chukudebelu WO. Some characteristics of antenatal care in Eastern Nigeria. African Health. 1989;12(1):22–3.
- [19] Tielze C. Maternal mortality. World Health Stat Q. 1977; 30:312–39.
- [20] O'Reilly-Green G, Cohen WR. Pregnancy in women aged 40 and older. Obstet Gynecol Clin N Am. 1993; 20:313–31.



Published by AMMS Journal, this is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

© The Author(s) 2025