

# Household cost of antenatal care and delivery services in a rural community of Kaduna state, northwestern Nigeria

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## ABSTRACT

**Background:** Maternal mortality remains a leading cause of death among women of reproductive age. While Nigeria has only two percent of the global population, it contributes 10% to the global maternal mortality burden. Antenatal care (ANC) reduces the incidence of maternal mortality. However, financial capability affects access to antenatal care. Thus, the rural poor are at a higher risk of maternal mortality. **Materials and Methods:** A cross-sectional descriptive study involving 135 women (pregnant women and those who are 6 weeks postpartum). Structured interviewer-administered questionnaires were used for data collection. Data analysis was carried out using statistical package for social sciences software (version 17). **Results:** The average amount spent on booking and initial laboratory investigations were N77 (half a dollar) and N316 (\$2), respectively. Per ANC visit, average amount spent on drugs and transportation were N229 (\$1.5) and N139 (\$0.9) respectively. For delivery, the average amount spent was N1500 (\$9.6). On an average, ANC plus delivery cost about N3,365.00 (\$22). There was a statistically significant association between husband's income and ANC attendance ( $X^2 = 2.451$ ,  $df = 2$ ,  $P = 0.048$ ). **Conclusion:** Cost of Antenatal care and delivery services were not catastrophic but were a barrier to accessing antenatal care and facility-based delivery services in the study area. ANC attendance was associated with the income of household heads. Pro-poor policies and actions are needed to address this problem, as it will go a long way in reducing maternal mortality in this part of the country.

**Key words:** Antenatal care, cost, delivery services, household, Nigeria, rural community

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## INTRODUCTION

Maternal mortality remains a leading cause of death among women of reproductive age. While Nigeria has only two percent of the global population, it contributes 10% to the global maternal mortality burden. The average National maternal mortality rate is 545 per 100,000 while in the North Eastern Zone, it is 1,549 per 100,000. Annually, an estimated 52,900 Nigeria women die (about 1,000 per week) while pregnant, during childbirth or within 42 days of giving birth out of a global 529,000.<sup>1</sup> This is the equivalent of an aeroplane, full of precious Nigerian mothers crashing with no survivor, every day, for

an entire year!. Antenatal care (ANC) reduces the incidence of maternal mortality.

Most maternal deaths occur in poor countries and most of these can be attributed to low level of supply and utilisation of skilled maternal health services.<sup>2,3</sup> Skilled attendants at delivery care has been considered as the single most effective means for reducing maternal mortality and morbidity in low and middle income countries.<sup>4</sup> However, studies have suggested that the cost of health services is a major determinant of demand for healthcare, particularly for maternity healthcare.<sup>5</sup> Estimates of out-of-pocket costs for maternity care shows that they constitute a significant percentage of household income.<sup>6</sup> The cost of obtaining skilled obstetric care at a health facility is prohibitively high for many poor households and constitutes a major barrier to increase utilization and access to safe maternal care.<sup>7,8</sup> It is, therefore, not surprising that in rural communities, majority of births take place at home. For example, in rural Bangladesh, 85% of births take place at home.<sup>9</sup> Home delivery is preferred as it is associated with low cost.<sup>10</sup>

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Almost four times as many women in the rural areas had no ANC compared to urban areas.<sup>11</sup>

The cost of ANC and delivery services (obstetric care) could be catastrophic in some communities. For example, in a study in Matlab, a rural community of Bangladesh, the cost of a normal delivery alone was found to be equivalent to 18% of the annual income of the household heads.<sup>5</sup> On a similar note, in South Delhi, India, the average cost of a normal vaginal delivery in government health facility was \$61.1, which constitutes 10% of the annual household income of the lowest income groups.<sup>12</sup>

On the contrary, in other communities, studies have shown that the cost of ANC and delivery services were not catastrophic. For example, in Rajasthan, India, the average rural household income was Rs 23,527 while average amount spent on ANC and delivery were Rs 397 and RS 836, respectively. These costs constituted 1.7% and 3.6% of household annual income respectively.<sup>13</sup> Also in Dhaka, a rural community of Bangladesh, the mean cost of normal delivery was \$31.9, which was 2.2% of the annual income of the poor households.<sup>14</sup>

Health expenditure has been defined as catastrophic if it exceeds 10% of the annual household income remaining after subsistence needs have been met.<sup>15-17</sup> Catastrophic health expenditure depletes household income and contributes to the vicious cycle of poverty and disease. It forces poor households to reduce other basic expenses such as food, shelter, or their children's education.<sup>18</sup> In other words, it forces household members to cut their consumption of other minimum needs, triggers productive asset sales or high levels of debt, and leads to impoverishment. Worst still, it adversely affects the health seeking behaviour of poor households, forcing them to access less than the required amount of treatment or cheap, inappropriate treatment. In the case of delivery, it forces women to deliver at home instead of a health facility, thereby, missing the care of a professional birth attendant.

In Nigeria, like in most developing countries, there is regional differential in poverty and financial access to healthcare with the North East and North West being worst hit. This has made some governments in these regions to come up with a free maternal and child healthcare package to solve the problems of financial access to healthcare services. However, Giwa Local Government area, where this study was conducted, is yet to introduce or benefit from such a package, probably due to financial constraints.

It was in this regard that this study was carried out with the aim of estimating the total cost to the user of ANC services and how this affects the use of the service in Fatika Village, a rural health facility in Giwa Local Government area in Kaduna, North-Western Nigeria. This

was necessary since only few studies have investigated the total cost of ANC services in rural health facilities of developing countries.

## MATERIALS AND METHODS

A cross-sectional descriptive study conducted during community diagnosis posting of final year medical students of Ahmadu Bello University, Zaria, from 28<sup>th</sup> February, 2011 to 25<sup>th</sup> March, 2011.

The study was conducted in Fatika community, a rural settlement in Giwa Local Government area of Kaduna state, North-western Nigeria. It is located on latitude 11.1667 and longitude 7.3. It is 234 Kilometers North of Abuja and 162 Kilometers South-West of Kano. The population of the village was re-projected from 2,576 in 1996 to 3,586 in 2011 using Kaduna state's annual growth rate of 2.8 percent.<sup>19</sup> The inhabitants are predominantly Hausas and farming is the predominant occupation. There are 896 households in the village and one Health facility.

A total of 135 women participated in the survey. Only currently pregnant women and those who delivered recently (within 6 weeks postpartum) were included. All ANC attendees received care at the village's Health Facility, which is managed by the Local Government Authority. Respondents used their money to pay the official prices of various services at the facility. An ingredients approach, whereby the cost incurred by respondents for each of the inputs for ANC, was used to estimate the total cost of ANC. The inputs include costs of ANC registration, laboratory investigations, drugs and transportation.

Yakawada Comprehensive Health Centre is the nearest referral centre to the village and is more than 30 kilometres away. None of the respondents received ANC at Yakawada Comprehensive Health Centre probably because of the distance, economic implications and the distress of transporting a pregnant woman in labour there, coupled with the near absence of commercial vehicles.

Data was collected by trained final year medical students using an interviewer administered questionnaire in which respondents were asked about their socio-demographic profiles, monthly income and estimates of cost of ANC services (drugs, investigations and delivery, transportation). The questionnaire was pretested on 42 pregnant women in Danmahawayi Village, a community with similar characteristics with the study area.

Ethical clearance for the study was obtained from Ahmadu Bello University Teaching Hospital's ethical committee. Appropriate entry permission to conduct the study was sought from Giwa Local Government Area, Kaduna State and from Fatika community leaders. An informed verbal consent was given by the respondents.

After the data collection, all completed questionnaires were checked properly for any error and edited. The data obtained were cleaned and analyzed using statistical package for social sciences software (SPSS), version 19. Results are presented in tabular form.

## RESULTS

A total of 135 women participated in the study, of whom 43 (39.4%) have delivered within past 6 weeks of study date. Table 1 shows the socio-demographic profile of the respondents. Most of the respondents (62.3%) are in the 20-31 years age group. Seventy one percent (71.9%) of the respondents have between 1 and 5 living children. Their average number of living children was three. Majority (60.9%) have no formal education. Most of the spouses of respondents (52.6%) earn less than N10, 000(\$65) per month and have only one wife (64%). A significant proportion of respondent's spouses (36%) have more than one wife (polygamy).

As shown in Table 2, ANC attendance was high among respondents (80.7). Average ANC attendance was four times. However, majority of the respondents (56%), who attended ANC or are attending it, have no formal education. Also, majority of the respondents (78%), who did not attend or do not attend ANC, had no formal education.

Table 3 shows the estimated amount of money spent on ANC and delivery services by respondents. The average amount spent on booking and initial laboratory investigations were N77 (half a dollar) and N316 (\$2), respectively. Per ANC visit, the average amount spent on drugs and transportation were N229 (\$1.5) and N139 (\$0.9), respectively. For delivery, the average amount spent is N1500 (\$9.6). Most of the respondents that have delivered (60.4%) spent between N1,000-N1,500 (\$6.5-\$9.6) for delivery.

Table 4 shows the estimated monthly income of spouses of respondents, who attended or are attending ANC, with 38.5% earning less than N10,000 per month. Only 12% earn more than N30,000 per month.

## DISCUSSION

The community is predominantly Hausa and early marriage is a common practice among them.<sup>13</sup> Hence, a significant proportion of the respondents (20.7%) were aged between 14-19 years. In Northern Nigeria, female education is considered of secondary importance due to socio-cultural practices, religious beliefs and misconceptions. Parents generally consider sending their daughters to school as a complete waste of time and resources, especially in rural communities where the latter are scarce. This resulted in poor girl-child enrolment into formal schools.<sup>20,21</sup> It, therefore, accounted

**Table 1: Socio-demographic characteristics of respondents**

Variable	Frequency	Percentage
Age group		
14-19	28	20.7
20-25	36	26.7
26-31	48	35.6
32-37	14	10.4
38-43	6	4.4
>44	3	2.2
Educational level		
Non-formal	82	60.7
Primary	36	26.8
Secondary	14	10.9
Tertiary	2	1.4
Total	135	100
Husband's monthly income in Naira		
<N10,000	71	52.6
N10,000-20,000	32	23.7
N20,001-N30,000	20	14.8
>N30,000	12	8.9
Husband's type of marriage		
Monogamy	86	64
Polygamy	49	36
Number of living children		
1-5	97	71.9
6-10	32	23.7
>10	6	4.4
Total	135	100

N155 – US \$1

**Table 2: Distribution of respondents by ANC attendance and educational attainment**

Educational level	ANC attendance		
	Yes	No	Total
Formal education	48	6	53
No-formal education	61	21	82
Total	109	27	135

( $\chi^2 = 4.25$ ,  $df = 1$ ,  $P = 0.039$ ); ANC – Antenatal care

for the low proportion (39.3%) of respondents with formal education. This finding is not surprising, since the educational level of a woman, her age, number of children, and other socio-demographic profiles such as her husband's income and type of marriage have been shown to influence the use of antenatal and delivery services.<sup>11</sup> Majority of the spouse of the respondents (52.6%) earn less than N10,000 (\$64.5) per month, which translates to less than \$2 per day. Their average estimated monthly income is N14, 000 (\$90) which translates to N120, 000 (\$774) per annum. This is a reflection of the poverty under which the community lives.

ANC attendance was directly proportional to level of education. All 15 women with secondary school education attended ANC (100%), also the only two women with

**Table 3: Estimated cost of ANC services and delivery in Naira**

Services	Frequency	Percentages
ANC Booking		
N50	61	67
N50-100	16	17.6
>N100	14	15.4
Total	91	100
Drugs (per visit)		
<N250	53	67.9
N251-500	21	26.9
>N500	4	5.1
Transportation (per visit)		
<N100	41	47.1
N100-200	43	49.4
>N200	3	3.4
Total	87	100
Laboratory investigations		
<N500	39	81.2
N501-1000	7	14.6
>N1000	2	4.2
Total	48	100
Delivery		
<N1000	6	14.0
N1,001-1,500	26	60.4
>N1,500	11	25.6
Total	43	100

ANC – Antenatal care

**Table 4: Estimated monthly income of husbands of ANC attendees in Naira**

Husband's monthly income	Frequency	Percentage
<N10,000	42	38.5
N10,000-N20,000	35	32.1
N2,001-N30,000	19	17.4
>N30,000	13	12
Total	109	100

( $X^2 = 2.451$ ,  $df = 2$ ,  $P = 0.048$ ); ANC – Antenatal care

tertiary education both attended ANC. However, only 83% and 74% of those with primary and those without formal education attended ANC, respectively.

The average number of living children was three and most of the respondents had between 1 and 5 children. This is in keeping with the finding that mothers with less than six children are likely to seek for professional ANC than those with six or more children.<sup>11</sup>

There was a statistically significant association between level of formal education and ANC attendance ( $X^2 = 4.25$ ,  $df = 1$ ,  $P = 0.039$ ) [Table 2]. The possible explanation for this is that level of education improves health seeking behaviour.<sup>22</sup> However, it is contrary to findings among Chinese women where there was a negative relationship between education and seeking for treatment in a hospital.<sup>23</sup> This difference

could be due to the fact that the Chinese women were not pregnant and so there was no perceived risk of danger.

The average cost of a single ANC visit (drugs and transportation only) from the study was N368 (US\$2.4) while the average number of ANC visits was four. Since, focussed ANC is not practiced in the Health facility, four ANC visits will cost N1, 472.00 (N368 × 4). On the other hand, the average cost of normal delivery was N1,500 (US\$9.6). It, therefore, follows that the summation of average costs of ANC (N1, 472.00), delivery (N1,500.00), and ANC booking/ laboratory investigations (N393) is N3, 365.00 (\$22). This amount translates to 2% of the average annual income of household heads in the community. Therefore, the cost of ANC and delivery was not catastrophic. However, there was a statistically significant association between husband's income and ANC attendance ( $X^2 = 2.451$ ,  $df = 2$ ,  $P = 0.048$ ) [Table 4]. This implies that ANC attendance was directly related to the monthly income of household heads. In other words, affordability of the ANC services by household heads directly influences ANC attendance by respondents. Thus, the cost of ANC services is a possible barrier to ANC attendance and a possible contributory factor to high prevalence of home deliveries in the community. This implies that the fees, though not catastrophic, still present a significant barrier to accessing ANC and facility-based delivery services in the study area.

This finding is contrary to that of a study in Matlab, a rural community in Bangladesh where the cost of a normal delivery alone was catastrophic, amounting to 18% of the annual income of the household heads.<sup>12</sup>

One limitation of the study is that it relied on recall of the clients with respect to estimations of costs incurred at point of service. The estimates might be inaccurate due to poor recall. Another limitation was the small number (proportion) of women who delivered in the village's Health Facility. This might affect the statistical significance of findings regarding facility-based deliveries.

## CONCLUSION

Cost of ANC and delivery services were not catastrophic but were a barrier to accessing ANC and facility-based delivery services in the study area. ANC attendance was associated with the income of household heads. Pro-poor policies and actions are needed to address this problem, as it will go a long way in reducing maternal mortality in this part of the country.

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