

## Expenditure on Emergency Obstetric Care in a Federal Tertiary Institution in Nigeria

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### Abstract

**Background:** Emergency obstetric care services form an integral part of the strategies for the prevention of maternal morbidity and mortality. Access is sometimes hindered by cost. This study was designed to investigate expenditure on inpatient care for obstetric emergencies.

**Materials:** A total of 138 postpartum women attended to over a 3-month period were interviewed using a structured questionnaire. SPSS 16.0 computer package was used to analyse the data.

**Method:** It was a cross-sectional study conducted at Federal Medical Centre, Birnin-Kebbi, Nigeria. Data on socio-demographic characteristics and expenditure on various aspects of care for the obstetric emergency was obtained from respondents and their husbands.

**Results:** Mean age of respondents was 25.6yrs (range 14-45 yrs). Most were multiparous (65.9%, N=92) and had received no antenatal care (89.9%, N=124). Majority of them were not engaged in any income generating activity (52.9%, N=73). Average monthly family income was about N13'000 (USD 81.3).

Major complications managed were prolonged/obstructed labour (31.2%, N=43), obstetric haemorrhages (26%, N=36), and eclampsia (21.7%, N=30). Average length of hospital stay was about nine days. A total of 70 women (50.7%) had an operative delivery. Mean total expenditure on care was about N39'000 (243.8 USD) (maximum N 98'000, 616.4 USD); many of the patients (46.7% N=67) had spent more than this average on care, and it was more than the monthly income of 94.4% (N=131) of families studied. Only 32.8% of the respondents could comfortably afford any expenditure that was greater than N20'000 (123.5 USD).

**Conclusion:** Expenditure on maternity care in this study was high, and it was more than the average monthly income for most families studied. 'Free maternity care' programmes should be guided by available data on expenditure on care in order to make appropriate budgetary provisions if a reduction in maternal mortality is to be achieved.

**Keywords:** Expenditure; Emergency obstetric care; Obstetric complication

### Introduction

Complications of labour and childbirth contribute a significant portion to the causes of maternal mortality. While most of these complications can neither be forecasted nor prevented, many of them can be managed successfully without loss of life if recognized early and treated effectively. Emergency obstetric care services form a very important and integral part of the strategies for the prevention of maternal morbidity and mortality. It is, however known that while these services may be available at referral centres, their utilization by women who need them may be prevented by the issue of cost of care. The leading barrier to health care for Nigerian women and children is getting money for treatment [1]. Cost is shown to be an important factor in determining utilization of emergency obstetric care services especially in resource poor countries [2]. In their effort to improve access to maternity and neonatal care services and hopefully address MDGs 4 and 5, some state governments in Nigeria introduced packages for free maternal health services [3].

Women who are experiencing an obstetric complication and require emergency services must get to the referral centres where these free services are provided in order to access them. Expenditure on transport so incurred may not be covered by the free package; this could add significantly to out of pocket spending by the patient and her relation. In a survey conducted by Partnership for Reviving Routine Immunization in Northern Nigeria; Maternal Newborn and Child Health Initiative (PRRINN-MNCH) in Katsina, Yobe and

Zamfara States, some families paid significant sums of money on transportation, feeding of in-patients and their relations, child care for children left at home by the affected mother, and other less formal expenses (PRRINN-MNCH, 2010).

Kebbi State government is one of the states in Northern Nigeria where free maternity and child health services are provided through the "Free Drug Service Scheme". Under this programme, pregnant women and children below the ages of five years are provided with essential items such as drugs and services needed for safe delivery [4]. There is a paucity of data on the actual cost of accessing emergency obstetric care services. It is believed that data on financial cost of managing an obstetric emergency could be useful in budgeting for free maternity care services in the State.

This study was designed to investigate the amount of money expended by patients and their relations in seeking care for an obstetric complication. The Objectives were to determine the complications for

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which emergency obstetric care was sought in the period of the study, to document expenditure on the various aspects of care, to examine the relationship between elements of care and total expenditure on care, and to document affordability of emergency obstetric care. It is hoped that the information sought will be disseminated to the policy makers in the State and other interested parties.

## Materials and Method

Background to the study area: Federal Medical Centre Birnin-Kebbi (FMCBK) is a tertiary referral centre. It is one of the two referral centres in the state capital. However while in the other referral centre maternity care had been declared free, these free services did not extend to FMCBK. In this latter, maternity services are paid for completely by the recipient or her representative. The bulk of patients who patronize the emergency services of FMCBK are mainly from communities within the state. Routine charges relating to emergency maternity care at FMC Birnin-kebbi included registration fee, delivery fee of 5000 naira (31.25 USD), theatre and anaesthesia fee of 5000 naira (31.25 USD) and 25'000 naira (156.25 USD) respectively for patients requiring the use of these services, and other variable charges depending on the nature of the condition and length of hospital stay. These include drug charges, medical consumables, bed fee, and fee for the use of Special care baby unit. Meals are not provided for patients or their relatives though there is a canteen for those who choose to use this.

The study was a cross-sectional study conducted in the maternity unit of Federal Medical Centre Birnin-Kebbi between 1st July and September 2011. Total live births during the study period was 530 and total maternal deaths were 22 giving a maternal mortality ratio of 4151/100,000 live births; total perinatal deaths were 103; PNMR of 159/1000. The study population were surviving women admitted and managed for an obstetric complication during the study period. A questionnaire was administered at the time of discharge to such consenting women, their spouse, and any relation directly involved in payment for care. Information was collected on patient's bio-data, income status, presenting symptom; husband's economic status was also recorded. Information was sought on the total money spent by the patient and her family on transportation to the health facility, admission and bed fees, laboratory investigations, drugs and other consumables, surgery where such was done, and any other expenditure directly related to accessing care for the presenting symptom. Expenditure is presented in local currency with US dollar equivalent in parenthesis (prevailing exchange rate at the time of this study was 160 naira to a dollar and this rate was used all through the paper). Information on diagnosis was obtained by the research assistant from the patients' case notes. Collected data was analysed using SPSS computer package, test of significance was done by chi-square for categorical data and t-test for continuous data.

## Results

A total of 138 women were studied. Their mean age was 25.8 yrs (range of 14-45 yrs); 34.1% (N=47) were primigravidae, 38.4% multipara (N=53), and 27.5% grand multipara (N=38); most had not received any ante-natal care (89.9%, N=124). Delivery was in the form of caesarean section or laparotomy for uterine rupture in 50.7% of the respondents (N=70); 58.7% (N=81) of the respondents had live birth. Mean duration of hospital stay was 9 days; 26.8% (N=37) stayed for 10 days or more (Table 1). Only 65 of the patients (47.1%) were engaged in any income generating activity while the rest were full time house

wives. More than a third of the respondents (39.9%, N=55) had visited another health facility prior to presentation.

## Obstetric complications

Prolonged/ Obstructed labour (31.2% N=31) was the commonest complication managed during the period (Tables 2 and 3); this was followed by obstetric haemorrhages (26%, N=36) in the form of antepartum haemorrhage and postpartum haemorrhage. Others were eclampsia (21.7% N=30), and uterine rupture (8.7%, N=12).

## Expenditure on maternity care<sup>1</sup>

Mean expenditure on managing the obstetric complication was 39'400 naira (246.3USD) with a range of 7'300 - 98'600 naira i.e. 45.6USD - 616.3 USD. About 46% (N=63) of families had spent more than this average on care, and 94.4% (135) of families had a monthly income that was less than this average (Table 4). Mean costs of various aspects of care are displayed in the Table 5. Drugs and other consumables (such as intravenous cannulae and syringes) accounted for the highest expenditure (mean N12'900 or USD 80.6), followed by cost of surgery for patients who were operated on (mean N11'900 or USD 74.4).

When care variables (mode of delivery, duration of hospital stay, and distance to health facility) were further analysed to find out if they affected total cost of care (Table 6), cost of care was found to be significantly higher for mothers who had surgery ( $X^2=65.05$ ,  $p<0.001$ ) and also for those who stayed longer than nine days on admission ( $X^2=12.2$ ,  $p<0.001$ ). There was no significant association between cost

<b>Age in years:</b>	mean (range) 25.6 (1445) years
<b>Parity</b>	<b>Frequency (%)</b>
Primigravidae	47 (34.1)
Para 1- 4	53 (38.4)
> 4	38 (27.5)
<b>Total</b>	<b>138 (100%)</b>
<b>Booking status</b>	
Prenatal Care	14 (10.1)
No prenatal care	124 (89.9)
<b>Total</b>	<b>138 (100%)</b>
<b>Mode of delivery</b>	
Vaginal delivery	68 (49.3%)
Operative delivery	70 (51.7%)
<b>Total</b>	<b>138 (100%)</b>
<b>Pregnancy outcome</b>	
Baby alive	81 (58.2)
Baby not alive	57 (41.3)
<b>Total</b>	<b>138 (100)</b>
<b>Average Family income</b>	
< 39,000 naira	131 (94.9)
≥ 39,000 naira	7 (5.1)
<b>Total</b>	<b>138 (100)</b>

Table 1: General characteristics of the study population.

Complication	Number of respondents (%)
Prolonged/Obstructed labour	43 (31.2)
Obstetric haemorrhage	36 (26)
Eclampsia	30 (21.7)
Ruptured uterus	12 (8.7)
Sepsis	6 (4.3)
Others	11 (8.0)
<b>Total</b>	<b>138 (100)</b>

Table 2: Obstetric complications.

<sup>1</sup>Conversions of naira to dollar were at the prevailing rate of N160 to one US dollar

	< 39,000 Naira	>39,000 Naira	Total number of respondents
<b>Monthly family income</b>	131 (94.9%)	7 (5.1%)	138 (100)
<b>Total Expenditure on care</b>	75 (54.3%)	63 (45.7%)	138 (100)

**Table 3:** Average expenditure on care relative to family income and total family expenditure on care.

Component of care	Mean expenditure	Max. Expenditure
	1Naira (USD[1])	Naira (USD)
Registration/bed fee	900 (5.63)	3200 (20)
Investigation	1400 (8.75)	6400 (40)
Drugs and consumables	1300 (8.13)	36,100 (225.63)
Blood	3250 (20.31)	21,000 (131.3)
Surgery	10,700 (66.88)	32,000 (200)
Feeding of patients	2400 (15)	8000 (50)
Transport	1450 (9.1)	9450 (59.1)
Relations	2650 (16.56)	12,000 (75)
Child care	2570 (16.1)	14,000 (87.5)
<b>Total expenditure</b>	<b>39,400 (246.3)</b>	<b>98,600 (616.3)</b>

**Table 4:** Mean expenditure on various components of care.

Component of care	Average expenditure on care Naira (USD)		T-value (df=136)	P - value
	Abdominal	Vaginal		
<b>Reg./bed fee</b>	960 (6)	870(5.4)	0.941	0.348
<b>Investigations</b>	1400 (8.75)	1570(9.8)	-0.867	0.388
<b>Drugs and consumables</b>	13,400(83.8)	12,063 (75.4)	0.96	0.399
<b>Blood</b>	3350 (20.9)	3200 (100)	0.251	0.802
<b>Feeding patient</b>	2200 (13.8)	2600 (16.3)	-1.298	0.196
<b>Transport</b>	1650 (10.3)	1250 (7.8)	1.476	0.142
<b>Child care</b>	3300 (20.63)	1800 (11.3)	2.78	0.008*
<b>Relations</b>	2600 (16.3)	2630(16.43)	<b>-0.01</b>	0.992
<b>Total expenditure</b>	<b>49,300 (308.1)</b>	<b>28,800 (180)</b>	<b>7.99</b>	<b>0.001</b>

**Table 5:** Mean expenditure on care compared for mode of delivery.

Expenditure on Care (Naira)				
	0-39'000	>39'000	Total respondents	
Mother operated on				
Yes	15	56	71	<b>X<sup>2</sup>=65.05</b>
No	60	7	67	<b>p&lt;0.001</b>
Total	75	63	138	
Duration of stay				
0-9 days	64	37	101	<b>X<sup>2</sup>=12.35</b>
>9 days	11	26	37	<b>p&lt;0.001</b>
Total	75	63	138	
Approximate distance to facility				
0 – 100km	54	40	94	<b>X<sup>2</sup>=1.14</b>
>100 km	21	23	44	<b>p=0.188</b>
Total	75	63	138	

**Table 6:** Relationship between cost of care and mode of delivery, duration of stay and distance to facility.

of care and distance from the health facility ( $X^2=1.14$ ,  $p=0.188$ ). When cost of surgery was removed, further comparison between elements of care revealed that except for expenditure on child care, there was no significant difference in other expenditures between women who had surgery and women who did not. There was also no significant difference in expenditure between surgery for caesarean section and surgery for uterine rupture ( $p=0.5$ ).

## Affordability of care

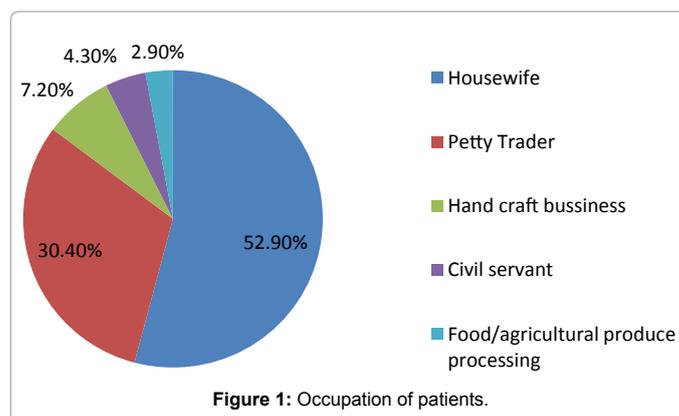
Average monthly income of families was N3000 (18.8 USD) maximum of 81,000 naira (506.3 USD) while average cost of care was N39'400 (246.3 USD). Just about 5.4% (N=7) of families earned a monthly income that was more or equal to average expenditure on care. Mean expenditure was thus more than monthly family income for 94.6% (N=135) of respondents. More than two third of the respondents (70%, N=99) reported that any expenditure beyond 20,000 naira (125 USD) was more than what they could afford without external help. As many as 89 (64.5%) of the respondents, therefore, reported having sought support from their friends and/or relations in order to finance the expenditure on care (Figure 1).

## Discussion

Prolonged and/or obstructed labour was the most common complication presented in this study, with obstetric haemorrhage and eclampsia following closely. Effective management of obstructed labour requires that the obstruction be relieved by surgical intervention, and surgery adds significantly to the cost of managing a patient. The high proportion of prolonged/obstructed labour reported would thus explain the significantly high expenditure on care (especially when compared to the financial status of patients managed) witnessed in this study.

The most significant factor influencing cost of treating an obstetric emergency in this study was whether or not a patient had surgery. Women who had an abdominal delivery spent significantly more than women with vaginal delivery. Previous studies also reported similar findings, where clients were observed to have spent significantly higher for deliveries via caesarean section as against vaginal deliveries [5-7]. Women who had surgery necessarily had to pay anaesthesia and theatre fees while those who had vaginal delivery paid only a flat delivery fee. These two charges (anaesthesia and theatre fee) would account for the bulk of the difference observed between the two categories of women in this study. In addition, women who had surgery were more likely to stay in the hospital for a longer period, and this could add significantly to cost.

Furthermore, surgery may necessitate an increased need for blood, and even though blood itself was not for sale in the hospital, charges for blood bag and relevant pre-donation blood tests were borne by patients and their relations. In their survey PRRINN-MNCH (2010) reported respondents as having to pay so much for a unit of blood, this finding was similar to that of other studies [8]. In addition, blood banking systems in most centres are not very efficient [9], and in most instances patients' relations have to look for donors themselves; this could be



**Figure 1:** Occupation of patients.

from among family members or from friends and well-wishers. In other studies patients' relations have had to travel several kilometres away from a health facility in search for a compatible donor because of the inefficiency of the blood banking system in their own health facility [10]. Where compatible relatives are not available or where they have been exhausted, there is often a resort to the use of commercial donors which not only adds to total cost, but also carries higher risks of transmission of infections. Cruz and Perez-Rosales reported in their study, that, besides yielding a lower donation rate, remunerated blood donation increases the risk of transmitting infections [11].

Other potential sources of additional expenditure to the cost of care are payment of informal charges in the form of 'gift' to hospital personnel (PRRINN-MNCH, 2010). However none of the respondents in this study reported payment of any such charges.

Free packages offered by most states included free caesarean section and emergency laparotomy services [1]. The high cost of surgery reported in this study may thus appear irrelevant in view of the fact that it is covered by the package. Despite the free exemption policy for maternity care, patients may still spend substantially for other components of care that were not free. A previous study reported some households to have paid an average of 152 USD in order to obtain emergency obstetric care despite the "user free" package offered [12]. Payment for other indirect expenses on travel, feeding, and living in the hospital, as well as remuneration of caretakers, could also add to the overall cost of obtaining treatment, even with the free care package. These expenses form a substantial part of health care costs elsewhere [13,14]. It may thus limit the effectiveness of the free maternity services programmes.

Furthermore, even though in this study transportation did not significantly affect the total expenditure on care, transporting the patient to a health facility is an enabling factor. The patient must get to the centre in order to access the free services; inability to afford transportation fare may thus affect the accessibility and utilization of free maternity care services except efforts are made to address this [15]. Lack of efficient transportation services when needed has been recognized as a strong barrier in accessing maternal health services [16,17]. The distance between patient's place of residence and health facility may also affect the ability to get to the health facility on time, and this could affect negatively, the outcome of treatment for women experiencing a complication. A study conducted in Kenya reported that, women had to walk to health facilities due to transportation and financial hindrances; some of these women ended up having unsupervised delivery en route, with attendant poor perinatal outcome [15].

Looking at the relationship between the different care components and expenditure on care, conduct of surgery was the most important factor that appeared to be significantly associated with total expenditure on care. A similar observation was reported in previous studies [7,18]. Also, the duration of hospital stay added significantly to expenditure. When surgery as a component of care was excluded from further analysis, and expenditure on the various aspect of care were compared between women who delivered by the abdominal route and those who delivered by the vaginal route, it was found that the only aspect in which they differed significantly was on the expenditure on child care (Table 6). This was probably because babies who delivered by caesarean section were routinely admitted into the Special Care Baby Unit (SCBU) for a minimum of 24 hours of observation regardless of the baby's stability post operation. This could be longer if the baby had some complications itself. Admission into SCBU required payment of

special SCBU charges separate from bed fee for the mother, thereby adding to total expenditure.

Affordability of care is an important determinant of access to, and utilization of emergency obstetric care services. Just a few of the families in this study could afford the cost of care for the obstetric emergency the patient presented with. A similar study by Nahar and Costello estimated that 79% of households in Bangladesh did not have enough money to pay for delivery; they had to borrow from friends and relatives [6]. Reference has been made to catastrophic spending on health care when families spend more than 10% of their income on an emergency service (PRRINN-MNCH, 2010). World Health Organization suggests that if a household spends 40% on non-food expenditure, then they are making catastrophic payments and this can push them below the poverty line [19-21]. Where care cannot be afforded by the patient or her family, the risk of long standing morbidity or even death becomes very high. This could have implications for the survival and wellbeing of women and newborns [21].

## Conclusion and Recommendations

The expenditure on maternity care was high, and it was more than the average monthly income for most families studied. Cost of care was significantly affected by mode of delivery and duration of hospital stay. Cost of transportation, although not a significant contributor to total cost of obtaining care, could be an important determinant for access. 'Free maternity care' programs are a welcome development but it is recommended that appropriate budgeting should be done to cater for 'unrecognized expenditure' on care; provision of free transport should be a major consideration in these programs too if they are to achieve their desired effect.

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