ORIGINAL RESEARCH ARTICLE

An assessment of essential maternal health services in Kwara state, Nigeria.

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Abstract

The objective of this study is to evaluate the levels of emergency obstetrics care (EOC) signal functions in health facilities in a developing setting with high maternal morbidity and mortality indices and to determine if there are differences between public and private health facilities in terms of availability of these signal functions. A survey of health facilities was carried out in six of the 16 Local Government Areas (LGAs) of Kwara State Nigeria. All health facilities in these LGAs including public and private health facilities offering some services to pregnant women were surveyed using an interviewer- administered, facility-assessment questionnaire adapted from the WHO/UNFPA/UNICEF international guidelines for monitoring the availability and use of obstetric services. Frequency tables, percentages and charts were used for presenting the data. Comparing public and private facilities was done using chi-square tests. A total of 258 health facilities that provide maternal health services were surveyed in this study, out of which 76 (29.5%) were private facilities and 182 (70.5%) were public sector facilities. Most of the UN indicators were not met by the health facilities in Kwara state. The availability of EOC facilities was more among the private sector and this was statistically significant. This study shows that all stakeholders involved in reducing maternal mortality have a big challenge in the areas of availability, inequity in geographical distribution of EOC facilities and poor utilisation of these EOC services by women. (*Afr J Reprod Health 2013; 17[1]: 41-48).*

Résumé

Cette étude a comme objectif d'évaluer les niveaux de fonctions des signalisation de soins obstétricaux d'urgence (SOU), dans les établissements de santé dans un cadre de développement ayant des indices de la morbidité maternelle élevés et de déterminer s'il existe des différences entre les établissements de santé publics et privés en ce qui concerne la disponibilité de ces fonctions de signalisation. Une enquête auprès des établissements de santé a été menée dans six des 16 zones d'Administrations locales (AL) de l'état de Kwara au Nigéria. Tous les établissements de santé dans ces régions locales, y compris les établissements de santé publics et privés, qui assurent des services aux femmes enceintes, ont été interrogés à l'aide d'un questionnaire destiné à l'évaluation des établissements. Le questionnaire qui a été adapté été à partir des lignes directrices internationales de l'OMS / FNUAP / UNICEF pour la surveillance la disponibilité et l'utilisation des services obstétricaux a été administré par un intervieweur. Les tables de fréquences, des pourcentages et des graphiques ont été utilisés pour présenter les données. La comparaison des établissements publics et privés a été effectuée à l'aide des tests du chi-carré. Au total, 258 établissements de santé qui assurent des services de santé maternelle ont été enquêtés dans cette étude, dont 76 (29,5%) ont été des établissements privés et 182 (70,5%) étaient des établissements publics. La plupart des indicateurs de l'ONU n'ont pas été atteints par les établissements de santé de l'État de Kwara. La disponibilité de services SOU était plus dans le secteur privé, ce qui est statistiquement significatif. Cette étude montre que tous les acteurs impliqués dans la réduction de la mortalité maternelle ont un grand défi dans les domaines de la disponibilité, de l'inégalité de la répartition géographique des centres de SOU et une mauvaise utilisation de ces services de SOU par des femmes (*Afr J Reprod Health 2013; 17[1]:41-48).*

Keywords : Essential Obstetrics Care, Private sector, Public sector, UN Guidelines, Health Facility Survey

Introduction

Maternal mortality is a global public health problem, particularly in developing countries. In 2011, it is estimated that 273,465 maternal deaths occurred worldwide, and the developing countries accounted for 99% (270,772) of these deaths [1]. The United Nations Millennium Development

Goals call for a reduction by three-fourths of the maternal mortality ratio (MMR) by year 2015 (Goal 5) [2]. Although significant declines have occurred globally since year 2000 [1], minimal progress has been made within sub-Saharan African countries, which has MMRs that are among the highest in the world [1]. In Nigeria, the MMR in 1990 was 393.4 per 100,000 live births in year 2000 and rose to 487.1 in 2011 [1]. In Kwara State of Nigeria, the MMR is estimated to be 532 per 100,000 live births [3].

Since an appreciable improvement in maternal mortality has not been achieved, the Nigerian government has determined that there is need to have data to monitor and determine the progress made towards the reduction of maternal mortality. One of the ways of monitoring this progress is the use of process indicators for maternal mortality, which monitors changes in those activities or circumstances that are known to contribute to maternal death [4].

In 1997, UNICEF, WHO, and UNFPA published Guidelines for Monitoring the Availability and Use of Obstetric Services (also called the UN Guidelines), which define specific process indicators to measure the "minimum acceptable" level of access to essential obstetric care (EOC) in any given region [4]. These process indicators measure three important aspects of maternal health services: accessibility, utilization, and quality (Figure 1) [4,5]. Furthermore, the UN Guidelines distinguish between facilities that provide Basic EOC (BEOC) or Comprehensive EOC (CEOC) and those that do not using a set of eight "signal functions" (Figure 2) [4]. These signal functions were developed from an understanding that certain medical services or procedures are necessary to save the lives of women with obstetric complications [4]. A BEOC facility is one that performs signal functions one through six, while a CEOC facility is one that performs all of the signal functions, one through eight [4]. A health center or hospital must have performed each of the six or eight signal functions at least once within the past three months to be classified as either BEOC or CEOC facility [4].

Previous research indicates that the UN standards of EOC are not met in Nigeria [6,7]. Furthermore, the maternal health needs of Kwara State have not been adequately studied. The present study is a baseline assessment in Kwara State of Nigeria to determine the availability and quality of EOC services. Furthermore, this study sought to review the type of EOC services offered (i.e., BEOC or CEOC), the utilization of EOC services, and the differences between private and public facilities.

Methods

A comprehensive evaluation of maternal health services was conducted utilizing data from the State Ministry of Health and National Population Commission office in Kwara State of Nigeria, as well as data collected through a quantitative survey instrument designed for local health facilities. Kwara State is one of the 36 states of Nigeria with its capital in Ilorin. It is located in the North Central zone of Nigeria and considered the 'gateway' between the North and the South of the country. According to the 2006 national census, Kwara State has a land area of about 32,500 square kilometres and a population of about 2.3 million [8]. Within Kwara State, there are sixteen administrative units called Local Government Areas (LGAs), which are divided into three senatorial zones – Kwara North, Kwara South and Kwara Central. The state has about 455 primary health facilities managed by the LGA councils (ranging from dispensaries to primary health centres), 65 State government owned secondary health facilities (ranging from comprehensive health centres to specialist hospitals) and 1 Federal government owned teaching hospital. There are 222 privately owned health facilities of varying standards scattered within the state.

From each senatorial zone, two LGAs were randomly selected totaling six LGAs and representing more than a third of the administrative units of the state [as recommended by the international guidelines by UNICEF/WHO/UNFPA [4]]. All health facilities, including public, private, and mission rendering any form of maternal health services (antenatal, delivery, or postnatal) in the six LGAs, were included in the study, resulting in 258 health facilities. A comprehensive list of all health facilities in the six target LGAs is presented in

Process Indicator	**Minimum Acceptable Level**
Amount of essential obstetric care (EOC): **Basic** EOC facilities **Comprehensive** EOC facilities	For every **500,000 population**, there should be: **At least 4 Basic** EOC facilities. **At least 1 Comprehensive** EOC facility **OR** **At least 5 EOC** facilities (at least one is CEOC)
Geographical distribution of EOC facilities	Minimum level for amount of EOC services is met in sub-national areas is 100%.
Proportion of all births in Basic and Comprehensive EOC facilities	**At least 15% of all births** in the population take place in either Basic or Comprehensive EOC facilities.
Proportion of women estimated to have complications who are treated in EOC facilities	**100%** of women estimated to have obstetric complications are treated in EOC facilities.
Caesarean sections as a percentage of all births	As a proportion of all births in the population, Caesarean sections account for **not less than 5% and no more than 15%**.
Case fatality rate	The case fatality rate among women with obstetric complications in EOC facilities is **less than 1%**.

Figure 1: Process indicators for essential obstetric care (EOC) facilities and their minimum acceptable levels (UN Guidelines, 1997).

Table 1. Facilities were classified into whether they met standards prescribed for basic essential obstetrics care (BEOC) or comprehensive essential obstetric care (CEOC) on the basis of performance of signal functions as specified in the UN Guidelines (Figure 2) [4]. For the purpose of classification, a BEOC facility is one that performs all six 'signal functions' while a CEOC facility, carries out all the eight signal functions.

The data collection instrument utilized in this study was an interviewer-administered, facility assessment questionnaire that was adapted from the UN Guidelines for monitoring the availability and use of obstetric services [4]. Variables included in the questionnaire include the type of facility, the type of signal functions carried out, and information on the different cadres of staff in these facilities. The maternal complications and deaths at each facility were also collected on a monthly basis. One questionnaire was administered to either the nursing staff in charge, the medical doctor/medical director, or the most senior staff present in the facility at the time of visit. To ensure implementation fidelity, field interviewers underwent a two-day training, and study coordinators reviewed the questionnaire for each facility with the field interviewers to verify the data. Only facility level data were collected and analyzed.

1. Administer parenteral antibiotics
2. Administer parenteral oxytocic drugs
3. Administer parenteral anticonvulsants for pre-eclampsia and eclampsia
4. Perform manual removal of placenta
5. Perform removal of retained products (e.g., manual vacuum aspiration)
6. Perform assisted vaginal delivery
7. Perform surgery (caesarean section)
8. Perform blood transfusions

Figure 2: Signal functions for essential obstetric care (EOC) facilities (UN Guidelines, 1997).

Data were analyzed with SPSS version 15. Most of the results are presented in simple descriptive statistics. The public and private facilities were compared for the availability of EOC using chi-square tests, with the level of significance set at 0.05. Before study initiation, permission to conduct the research was given by the Kwara State Ministry of Health, and ethical clearance was received from the University of Liverpool Committee on Research Ethics.

Results

A total of 258 health facilities that provide maternal health services were surveyed in this study, of which 76 (29.5%) were private facilities and 182 (70.5%) were public sector facilities. The

public sector facilities were made up of 162 (62.8%) primary health care (PHC) facilities, 19 (7.4%) were secondary health care (SHC) facilities and 1 (0.4%) was a tertiary health centers (Table 1). The LGAs of Kaiama and Oyun had the lowest proportion of health facilities (25, 9.7% and 27, 10.5%, respectively), while Ilorin West LGA had the largest number of health facilities (56, 21.7%). Both Edu and Irepodun LGAs had 19.8% (51) of facilities, and Asa LGA had 18.6% (48) of facilities. Ilorin West LGA had the only tertiary health care facility in the state.

According to the UN Guidelines, the minimum acceptable number of EOC facilities is five per 500,000 population (four BEOCs and one CEOC). The total population in the six LGAs studied was 1,059,597 [8]. Within the state, there are a total of 35 EOCs, which is about 16 per 500,000 population, exceeding the overall recommendation of the UN Guidelines.

Of the 258 health facilities studied, a total of 7 facilities (2.5%) met the UN guidelines to be designated as a BEOC facility, and 28 facilities (10.9%) met the standard for a CEOC facility (Table 2). Seven (2.6%) of the 76 private health facilities met the UN guidelines as a BEOC and 24 (31.6%) as a CEOC. None of the 182 public facilities met the criteria for BEOCs; however, 4 (2.2%) met the standard for CEOCs. When comparing the private and the public sector regarding the number of EOC facilities, the private sector provided significantly more facilities (31 facilities) than the public sector (4 facilities) (x^2= 68.1; p=0.000).

However, some LGAs did not have a single EOC facility. When looking at EOCs by type, there were 7 BEOC facilities, which converts to approximately three per 500,000 population, which is below the UN recommendation. Conversely, there were 28 CEOC facilities, or 13 per 500,000 population, far exceeding the UN standard of one per 500,000. It is estimated that four of the six target LGAs, or 66.7% of the state, have the minimum acceptable level of five EOC facilities per 500,000 population.

The UN Guidelines state that at least 15% of all births in the population should take place in either a BEOC or CEOC facility. The ratio of the number of women who gave birth in EOC facilities to the estimated number of all the live births expected in the area can serve as a crude indicator of the use of the EOC services by pregnant women. Using data from the National Population Commission [9], it is estimated that a total of 45,499 deliveries occurred in the state from June 2008 and May 2009 (Table 3). Of these, 6,172 (13.6%) of the deliveries took place in EOC facilities. Overall, the minimal acceptable UN standard of deliveries within EOC facilities was not met within the state, with the exception of the Ilorin West LGA.

The UN Guidelines recommend an acceptable range of caesarean section deliveries as 5 to 15%. In all the EOC facilities in the state, 1,070 of the births were delivered by caesarean section, which equates to 2.3%, below the standard level (Table 4). When considering caesarean section rates by LGA, only Ilorin West falls within the recommended rage. All caesarean sections are not performed in EOC facilities because some lack one of the basic signal functions for obstetric care, as described by the UN Guidelines. Therefore, we also looked at all facilities, irrespective of their EOC status. In all facilities, there were 1,285 caesarean sections, which form 2.82% of all estimated number of births in the state. Similar to the EOC facilities, this overall proportion did not meet the criteria of the UN Guidelines, but the estimate for the Ilorin West LGA did meet the standard.

As a measure of the quality of services provided by the EOC facility, the UN Guidelines recommend an obstetric case fatality rate of less than 1%. The obstetric case fatality rate is defined as the proportion of women who die due to major obstetric complications. Of all births within the state, it is estimated that 15% or 6,825 births may develop complications. Only 1,837 (26.9%) of these complications were treated in health facilities, and 1,181 (17.3%) were treated within EOC facilities. Overall, 161 maternal deaths result from these complications, 110 of which occurred within EOC facilities. The resulting obstetric case fatality rate was 8.7% within the state and 9.3% for EOC facilities, both of which exceed the acceptable standard set by the UN Guidelines.

Table 1: Number and type of health facilities with maternal health services in six Local Government Areas (LGAs) in Kwara State, Nigeria. *

Senatorial Zone	Total N=258	Kwara North		Kwara South		Kwara Central	
LGA		Edu N=51	Kaiama N=25	Oyun N=27	Irepodun N=51	Asa N=48	Ilorin West N=56
Facilities	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Primary Health Facilities	162 (62.8)	38 (74.5)	21 (84.0)	19 (70.4)	31 (60.8)	37 (77.1)	16 (28.6)
Secondary Health Facilities	19 (7.3%)	5 (9.8)	1 (4.0)	2 (7.4)	6 (11.8)	3 (6.3)	2 (3.6)
Tertiary Health Facilities	1 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.8)
Private Health Facilities	76 (29.5)	8 (15.7)	3 (12.0)	6 (22.2)	14 (27.5)	8 (16.7)	37 (66.1)

** Percentages may not total to 100% due to rounding.*

Table 2: Distribution of the BEOC and CEOC Health facilities by LGA and population size

LGA	Population	Number of health facilities	BEOC			CEOC			EOC (BEOC+CEOC)		
			Public	Private	Total	Public	Private	Total	Public	Private	Total
Asa	124,668	48	0	0	0	0	0	0	0	0	0
Edu	201,642	51	0	0	0	1	3	4	1	3	4
Ilorin West	365,221	56	0	5	5	1	14	15	1	19	20
Irepodun	147,594	51	0	2	2	1	6	7	1	8	9
Kaiama	124,015	25	0	0	0	0	0	0	0	0	0
Oyun	94,454	27	0	0	0	1	1	2	1	1	2
TOTAL	**1,059,597**	**258**	**0**	**7**	**7**	**4**	**24**	**28**	**4**	**31**	**35**
									x^2= 68.1; p=0.000		

Table 3: Number of births at EOC facilities by LGA.

(1) LGA	**(2) Estimated no. of births**	**(3) No of Births at EOC facilities**	**(4) Proportion of births taking place at EOC facilities (column 3 ÷ column 4 × 100)**	**(5) Is the minimum acceptable level of 15% facilities met?**
Asa	5431	0	0%	Not Met
Edu	8654	519	5.9%	Not Met
Ilorin West	15664	4980	31.8%	***Met***
Irepodun	6368	633	10%	Not Met
Kaiama	5333	0	0%	Not Met
Oyun	4049	40	10%	Not Met
TOTAL	**45,499**	**6172**	**13.6%**	**Not Met**

Discussion

The study showed that in Kwara State did not meet the minimum acceptable standards for EOC services, as indicated by the international guidelines of UNICEF/WHO/UNFPA [4]. While the state has an acceptable number of combined EOC services (both BEOC and CEOC), when taken separately, there is shortage of BEOC facilities.

Although there was an ample number of CEOC facilities (n=28), the state falls short in the recommended number of BEOC facilities (n=7). It should be noted that the BEOC and the CEOC operate at different levels of care. BEOC facilities usually function at the primary care level and, therefore, serve as the entry point for patients in the community. Patients are supposed to be referred to the CEOC facilities from BEOC

Table 4: Number of caesarean section (CS) deliveries as a proportion of births at EOC facilities by LGA.

LGA	Estimated no. of births	EOC Facilities			Public Facilities			Private Facilities			ALL (Public + Private)		
		No. of CS	Proportion of CS	Acceptable level of 5-15% met?	No. of CS	Proportion of CS	Acceptable level of 5-15% met?	No. of CS	Proportion of CS	Acceptable level of 5-15% met?	No. of CS	Proportion of CS	Acceptable level of 5-15% met?
Asa	5431	0	0	Not met	0	0	Not met	0	0	Not met	0	0	Not met
Edu	8654	63	0.72%	Not met	11	0.13%	Not met	37	0.43%	Not met	48	0.55%	Not met
Ilorin West	15664	930	5.9%	***Met***	812	5.18%	***Met***	280	1.78%	Not met	1092	6.97%	***Met***
Irepodun	6368	72	1.1%	Not met	19	0.29%	Not met	72	1.13%	Not met	91	1.43%	Not met
Kaiama	5333	0	0	Not met	7	0.13%	Not met	13	0.24%	Not met	20	0.38%	Not met
Oyun	4049	5	0.1%	Not met	25	0.62%	Not met	9	0.22%	Not met	34	0.84%	Not met
TOTAL	**45499**	**1070**	**2.3%**	**Not met**	**874**	**1.92%**	**Not met**	**411**	**0.9%**	**Not met**	**1285**	**2.82%**	**Not met**

facilities; hence, the large number of CEOC facilities does not alleviate the gap in services resulting from the limited number of BEOC facilities.

Although Kwara State met the UN guidelines regarding the overall number of EOC facilities per 500,000 populations, this number does not translate to accessibility to services. When looking at the number of health facilities by LGA, Ilorin West, one of the urban LGA in our state, has 17 out of the 35 EOC facilities in the state. Asa and Kaiama LGAs have no EOC facility at all, and Edu and Oyun LGAs have no BEOC facilities. While Irepodun LGA has both BEOC and CEOC facilities, the numbers are minimal.

In this study, 38.7% of all deliveries took place in health facilities (irrespective of their EOC status), which is higher than the national average of 13.9% [7]. There is also variation between the local governments areas, ranging from 14% in one of the most rural and remote LGAs to 72% in the most urban LGA. Most of these deliveries took place at private facilities. Previous research on women's preferred choice of place for delivery indicates that they sought respect from health workers, privacy, and a clean environment, which are largely absent from our public health facilities, making it more likely for women to choose private facilities [7]. However, a large number of women still prefer to deliver in their personal homes, churches, and the homes of traditional birth attendants due to the lack of financial resources to go to the private hospital [16].

The proportion of deliveries that took place at EOC in the state was 13.6%, which did not meet the minimum target of 15%; however, this rate was higher than the national average

of 5.7% [7]. When analyzed by LGA, Ilorin West LGA, which has the highest concentration of private hospitals, was the only LGA that met and surpassed the minimum UN target. This result is similar to results from other countries. These results provide evidence that improvements are needed within the public health facilities to bring them up to standards that they can have the potential to provide the needed services to improve health outcomes for women in poor and rural areas.

The recommended level for the proportion of women with obstetric complication to receive care in EOC facilities is 100%. However, in Kwara State, the estimates fall well below this goal at a mere 17.3% at EOC facilities and 26.9% in all facilities surveyed. This finding shows that majority of women with serious obstetric complications are not receiving the emergency care they need. This result is very similar to those reported in other African countries [13, 15, 17]. By eliminating the potential barriers to seeking health care (e.g., transportation, cost) and educating the community to recognize complications and the importance of seeking care, EOC service utilization could be improved.

The proportion for caesarean section deliveries among all childbirths in Kwara State was 2.82%, which was well below the recommended level of 5-15%. Among only EOC facilities, the proportion of caesarean sections was 2.3%, remaining outside of the acceptable range. As non-EOC health centres may lack at least one of the recommended signal functions for EOC facilities, women may not be receiving the best health care services. When private and public facilities were compared, the proportion of caesarean section delivers in public facilities was roughly twice that of private facilities (1.92% vs. 0.9%, respectively). The implication of these results being below the recommended minimum value of 5% is that many women are not getting the obstetric services they require and, thereby, may be suffering unnecessarily or are at risk of prolonged morbidity or mortality.

The present study has some noteworthy limitations. One of the most important limitations was the inability to include measures of access based on how close populations reside to these facilities though use of geo-coded data in the analysis. No community level qualitative data were collected, which could provide insight regarding issues of EOC coverage, utilization, and quality of care and no data was collected from health care providers that could give an insight into their behaviour. An important limitation was the general lack of accurate data in most of the health facilities. Data on maternal deaths had the greatest inconsistencies. Proper registers with accurate and updated records were not available. This limitation is expected to affect the validity of study findings, but most of the facilities most affected by data deficiencies are those that are not functioning.

This was carried out in 6 out of the 16 LGAs in Kwara state, in 258 health facilities. It covers about a third of the LGAs in the state as recommended in the UN guidelines, and also covers about half of the population in the state. The study also covered both the rural and the urban areas of the state including the state capital, which houses the only tertiary health centre in the state. This gave the study a wide coverage such that it can comfortably be presented to the state government and other stakeholders to highlight the problems of EOC service provision in Kwara State.

Conclusion

Maternal mortality is a serious public health problem, particularly in the developing countries, like Nigeria. EOC is an essential component of maternal mortality reduction. This study is important as it provides a baseline needs assessment for Kwara State to aid in policy and intervention development. Given the unequal distribution of EOC facilities and services in Kwara that is evident in our findings, the establishment of new health facilities, specifically those that provide BEOC services, is needed. Additionally, it may be beneficial to the community to upgrade existing facilities to offer EOC services, ensuring that they are staffed by skilled health workers and equipped with sufficient supplies.

Extensive research studies at the community and organizational levels are needed to reveal more information regarding EOC coverage and utilization, as well as quality of care, in Nigeria. Qualitative studies could yield important information on community perceptions of the services offered, what types of services are required, and their relationship with the staff. Additionally, quantitative studies that assess factors associated with maternal morbidities and mortalities will aid in the determination of appropriate preventative strategies to improve health outcomes. Research findings will aid policymakers in effectively advocating for improved maternal health services that will help reduce maternal morbidities and mortality.

Contribution of Authors

Rakiya Saidu: conception of the idea, designing the study, analysis of data
Euna M. August: designing of the study, analysis of the data
Amina P. Alio: designing the study, preparation of manuscript
Hamisu M. Salihu: designing the study, analysis of data, and preparation of manuscript
Mohammed J Saka: designing the study, collection of data.
Abdulgafar A. G Jimoh: designing the study, collection of data.

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