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AVAILABILITY OF EMERGENCY OBSTETRIC CARE (EMOC) IN KANO METROPOLIS, NIGERIA

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ABSTRACT
The article summarises the baseline assessments of emergency obstetric care (EmOC) carried out in Kano metropolis, located in urban, Kano Central Senatorial zone. The objectives were to determine the availability and utilization of emergency obstetric care (EmOC) in Kano metropolis. This study also examined the availability interventions used to treat direct obstetric complications. It was a cross sectional study that involved quantitative method of data collection using questionnaires. Total sampling was done for the entire public facilities conducting maternal health services within Kano metropolis. Sampling procedure for the facilities is Simple random sampling using Microsoft Excel random number generation. There are nine key interventions; seven constitute basic EmOC and entire nine constitute comprehensive EmOC. The following patterns emerge from the generated data in 37 health facilities assessments: comprehensive EmOC facilities are available to meet the recommended minimum number for the size of the population, basic EmOC facilities are not available in sufficient numbers and the majority of facilities offering maternity services provide only some interventions indicating an unrealized potential. Upgrading maternities and health centres to at least basic EmOC status and CEmOC in other LGAs would be a major contributing step towards maternal mortality reduction in Kano Metropolis. The State Ministry of Health (SMOH) in collaboration with its MDAs and technical Partners needs to identify and upgrade some of the PHC facilities for BEmOC and CEmOC services provision to ensure availability, meeting of standards and equity in coverage.

INTRODUCTION

For about three decades there are various commitments from the international community in reducing the thresholds of maternal mortality in developingcountries including Nigeria, starting with the 1987 Safe Motherhood Conference in Nairobi, Kenya to the Millennium Development Goals established by the United Nations in 2000. The fifth of the eight Millennium Development Goals (MDG-5), is to "improve maternal health", whose target is to reduce by three-quarters between 1990 and 2015, maternal mortality ratio [1]. Maternal death was, chosen as the outcome with which to judgeprogress towards this goal, thus bringing renewed attention to what is a 21st century problemessentially only for the poor, and one virtually eliminated for people with the means and status toaccess health care. Such a marker of global inequity is shocking and is an indication of wider development issues targeted in some of the other MDGs, especially on poverty, education, and gender [2,3].

Although, many women die in hospitals, some of them die because they were not admitted until their condition was critical. Many others, however, die because they did not receive timely treatment or because the

treatment they received was inadequate [2]. According to WHO estimation, about 15% of pregnant women are likely to develop complications that require access to Emergency Obstetric Care (EmOC) as these complications cannot be predicted despite good antenatal care services. [2,4] A set of process indicators was formally issued by [5], which are useful in determining the availability, utilization and quality of service [2,6]. The Tenth International Classification of Diseases [ICD-10], has defined a maternal death as "the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.[5,7].

The emergencies obstetric care (EmOC); are those Services that must be provided at the facility for the treatment of complications that arise during pregnancy and childbirth. Emergency obstetric care (EmOC) therefore, is a set of life saving services that must be available in health facilities to respond to emergencies that arise during pregnancy, delivery or postpartum [8,9]. The Safe Motherhood Programme in 1987 has emphasized the importance of access to EmOC to manage the common causes of obstetric death: hemorrhage, obstructed labour, complications due to unsafe abortion, Eclampsia, and infection [5,7]. If women are to receive prompt adequate treatment for complications that arise during these period, then facilities for providing emergency obstetric care (EmOC) must be available, accessible and equitably distributed; be used by women; and be used by women who really need them.

All of these issues can be subsumed under the heading of coverage. Adequate coverage does not suggest that all births should take place in health facilities. It does mean that all pregnant women need access to functioning EmOC facilities, in case they need them. The indicators are: availability of EmOC, proportion of births in EmOC facilities, met needs in EmOC facility, Caesarean deliveries as a proportion of all births, and case fatality rate. All pregnant women with complications the minimum recommendation is that 100% should have access to and be treated in health facility providing EmOC. In order to save women's lives, it is crucial that they have access to such lifesaving procedure as Caesarean section. United Nations (UN) process indicator recommended at least 5% of birth be undertaken by Caesarean section and not more than 15%. Case fatality rate – this indication is a measure of the quality of services provided by health facilities; it estimates the number of women who come to the facility with complication from which they die. The recommended maximum is 1% [5]. The WHO recommended that there should be four Basic Emergency Obstetric Care facilities (BEmOC) and one Comprehensive Emergency Obstetric Care (CEmOC) facilities per 500,000 [5]. A Basic Emergency Obstetric care facility (BEmOC) is defined as any facility offering the following services: parenteral antibiotic, parenteral oxytocic, parenteral anticonvulsants, manual removal of placenta, removal of retained products of conception and assisted vaginal delivery. A Comprehensive Emergency Obstetric care facility is defined as any facility offering the above plus Caesarean section and blood transfusion [5].

The Northern zones also experience comparatively worse dearth of health resources; illiteracy and poverty, all which work in synergy to limit access to utilization of maternal health services [10]. The problem of maternal mortality in Nigeria is worst in the North West and North East zones of the country which recorded the highest figure of 1,549/100,000 and 1025/100,000 respectively. A wide geographical variation obtains with maternal mortality in Nigeria, with the north having a far higher maternal mortality compared to the south. The North-west zone which recorded the highest figure of 1,549/100,000 has almost ten times the maternal mortality of the south-western zone (165/100,000). The rural area, where most of Nigerians live, has a higher maternal mortality ratio (828 deaths per 100,000 live births) compared to the urban areas (351 maternal deaths per 100,000 live births) [11].

To address this problem, in 2007[12], the Northern Governors First Health Summit was held with the theme "Alarming Death Rates in Northern Nigerian: The Time for Change is Now". The aim of this Summit was to articulate an enduring response that will address without delay, problems of inadequate finances; health resources inadequacies; deficiencies of health services; health management, coordination and evaluation defects. Consequent upon these, the State Chief Executives resolved to improve financing of the health care; the (human) resources devoted to health care; health services, and the sourcing; management and use of medical equipment and consumables; staff attitudes and performances; review the mechanism of staff supervision; monitoring and evaluation at all levels of health care; and health management and coordination. The Government of Kano in its efforts for reducing Maternal Mortality in the State since 2003 commenced free maternity service that include antenatal care services, delivery services, manual vacuum aspiration services, and free obstetric surgical intervention [13].

METHODOLOGY

Study design

The study was a descriptive cross sectional studyin public health facilities providing Maternal Health care Services within Kano Metropolis only. The general information about all the metropolitan LGAs was obtained from the State's Health Management Information System (HMIS) unit.

The information included: size of population, a list of all the health facilities including those providing Maternal Health Services.

Study population

Kano State has a total of 44 LGAs, 484 political wards, 36 Secondary Health Facilities (SHF), 299 Private Health Facilities, 2 Tertiary Health Facilities, 2 military hospitals, 1, 148 PHCs, 546 HF offering ANC and 167 HF offering Labour & Delivery. The study populations were the State and Local government public health facilities conducting maternity services within the eight metropolitan LGAs. Private health facilities and tertiary health facilities were excluded from the study. Thus, only secondary healthcare facilities and PHC facilities were included in the analysis.

Sampling technique

Procedure for sampling of facilities (Simple random sampling using Microsoft Excel random number generation) is shown below:

1. Obtained list of all healthcare facilities in Kano State from www.dhis2nigeria.org.ng
2. Narrowed down to list of facilities in the Metropolitan LGAs
3. Narrowed down to list of Primary and Secondary facilities within the metropolitan LGAs=148
4. Use Excel formula =RANDBETWEEN(1,148) to generate random number for all facilities
5. Sorted the generated random number from lowest to highest
6. Selected 25% of all the facilities in No.3 above (=37 health facilities)
7. Results generated were 3 secondary healthcare facilities and 34 PHC facilities.

Data collection instruments

The data collection instrument was the facility assessment-Questionnaire/Interview for the officer in charge or his representative of each of the selected facility. The EmOC facility-review tool was adopted from a similar instrument used for the national survey of EmOC facilities, with the main variables based on the EmOC element used in other studies [5,14]. A set of tools proposed by Guidelines for Monitoring the Availability and Use of Obstetric Services with little modification as proposed by FMOH, Nigeria [15], was used for appraisal of health facility performance and adapted for the study.

Data quality control

One day training for the research assistants was conducted before the commencement ofdata collection; two community health extension workers were recruited for the data collections in PHC facilities and researcher himself took the data for the secondary health facilities. The criteria for selection was based onthe research assistants having worked in the local government of interest, had knowledge of theterrain and were all health workers. The questionnaires were pre-tested to assess the researchassistants' appreciation and understanding of the questions, the suitability of the questionnairesaddressing the study objectives, followed by demonstration of instruments to be assessed andhealth facility register on delivery, admission and operation. Data from facilities were collectedin stages, starting with PHCs then Secondary Health Facilities. Data collection period was between January,2014 and April,2014. Field supervision was conducted by the researcher during thedata collection and all questionnaires were reviewed for completeness and correctness ofrecording.Data validation was done at the end of each day by the researcher.

Data analysis

Data from the questionnaire would be analyzed using SPSS version 16.0. Quantitative variables summarized using mean and standard deviation; while qualitative variables would be summarize using percentage and proportion. Statistical associations where possible would be obtained by using univariate or multivariate analysis such as Xi-square (X^2), Student t-test and regression analysis as the case may be.

Ethical issue

Ethical approval was collected from Kano State Ministry of Health/Hospitals Management Board Ethical Committee. Permission was obtained from the Kano State Hospitals Management Board and Primary Health Care Management Board. Only hospitals where consents were given to carry out the study were included in the study. The respondents were reassured that all the information given would be kept confidential and used solely for the study.

Limitations of the study

Very few studies on EmOC services using the process indicators had been done both at national and international level, therefore limiting the number of references made to previous works. Not all the indicators were adequatelyevaluated due to poor records keeping in the health facilities. The study did not assess the use of partograph in health care facilities as ameans of proper monitoring of labour. Case fatality rate was calculated for only referral facilitiesthat are public secondary health care facilities

RESULTS

Distribution of public health facilities offering maternal health services within Kano Metropolis. A sample of 37 health facilities where assessed in terms of level of care. It was observed that, 5.4%(2) were Specialist, 2.7%(1) was general hospital, 16.2% (6) were Primary health centre, 43.2%(16) were PHC Clinic, 2.7%(1) were Maternity health Centre, 8.1 % (3) were Health Dispensary and 21.6%(8) were others. The others comprise BHC, Community health centre, health post and Metropolitan health centres (Table 1).

AVAILABILITY OF EmOC SERVICES

A sample of 34PHC and 3-SHF Health facilities were assessed based on the EmOC status of whereby 78.4 % (29) were NEmOC facilities, 13.5% (5) were BEmOC facilities and 8.11%(3) were CEmOC facilities. It was observed that majority of the facilities were NEmOC facilities.

This determined the availability of Emergency Obstetrics Care services in Public health facilities within Kano Metropolis (Table 2).

A sample of 37 health facilities was assessed for signal functions based on WHO and the Nigerian Guidelines on EmOC services and observed that 37.8%(14) had IV antibiotics,18.9% (7) had anticonvulsants, 35.1% (13) had IV oxytocic, 40.5% (15) provided manual removal of placenta, 35.1% (13) provided removal of retained product of conception (RPOC), 16.2%(6) provided assisted Vaginal delivery, 8.1% (3) provided neonatal resuscitation with ambubag, 16.2% (6) provided 24 hours services, 8.1% (3) had at least 4 midwives, 8.1% (3) provided Blood transfusion services and 8.1%(3) provided Caesarean Section services. There is absent in the PHC facility, neonatal resuscitation with ambubag and at least 4 Midwives per facility. Also observed, low percentages of 24 hours service coverage and assisted vaginal delivery. Basically, the entire 3 Secondary health care facilities assessed provided all the above mentioned services (Table 3).

A sample of 34PHC were assessed were 32.43 % **(**12) has facility for BEmOC, 8.1% (3) offered 24 hours service coverage and non-had 4 Midwives (Table 4).

COVERAGE OF EmOC SERVICES

Kano Metropolis has a total of 3,667,871 populations for the entire eight LGAs and recommended to have 7CEmOC and 29BEmOC facilities. Using the WHO guidelines for EmOC services, for the 34 PHC facilities assessed for BemOC services, Kumbotso has 2 and Ungogo has 1 while none of the facility in the remaining six LGAs namely Dala, Gwale, Fagge, Kano Municipal, Nassarawa and Tarauni has met for the criteria for BEmOC. Using the Nigerian guidelines for EmOC services, the number of BEmOC facilities reduced to zero (0) for the entire LGAs as none has at least 4 Midwives per facility. All the 3 Secondary health facilities assessed had facility for CEmOC services.

AVAILABILITY OF RESOURCES FOR EmOC SERVICES

Resources such as human, infrastructure, equipment and drugs are keys to the availability of EmOC services. The true assessment of signal functions was carried out when available resources were examined.

From 34 PHC facilities assessed 6% (2) had non-specialist physicians on part time basis, 9% (3) of the facilities had nurse-midwives, 12% (4) had midwives, 6% (2) had single qualified nurses, 41% (14) had laboratory staff, 88% (30) had senior community health extension workers and 74% (25) had junior community health extension workers. Assessing proportion of PHC Staff trained in life Saving courses; 29% (10) of the CHEWs had gone for MLSS training, 6% (2) of the nurses have gone for LSS training.

For the 3 Secondary Healthcare Facilities (SHF) assessed, all had non-specialist physicians, nurse midwives, theatre Nurse and laboratory staff. 67%(2) had attending obstetrician, single qualified nurses, and CHEWs in their maternity serviceswhile non-had single qualified midwife.Assessing proportion of staff trained in life saving courses;none of the CHEWs had gone for MLSS, 100% (3) of the nurses were trained for LSS and 100% (3) of the non-specialist physicians were trained in ELSS.

Overall, it was observed that the entire category of health workers (skilled birth attendants) were available in SHF while more than 90% of the PHCs were manned by CHEWs (Table 5).

A sample of 34 PHC facilities was assessed for the availability of functional instrument used for at least the last three months period before the survey. It was observed that 65%(22)had sphygmo mano meter,68%(23)had stethoscope, 35% (12) had urinary catheter,35%(12) had episiotomy scissors and 50%(17) had artery forceps,41%(17) had sponge holding forceps,24%(8) had vaginal speculum, 50%(17) had needle holder,15%(5) had angle poise lamp,41%(14) had cord scissors, 56%(19) had kidney dish and 9%(3) had Manual Vacuum Aspiration (MVA) kit, 32%(11) had surgical scissors and 6%(2)had Oropharyngial air way. The entire 3secondary health care facilities assessed had the entire above check listed instrument available and functional (Table 6).

The availability of infrastructure in Public health facilities in Kano Metropolis was roughly assessed. It was observed that 40.5% (15) had power source from the national grid, 45.9% (17) had connected to functioning generating sets, 37.8% (14) had functioning laboratory services,8.1%(3) had functioning blood Bank services and 8.1% (3) had functioning Ambulance services. Source of water supply were found to be tap; 27.0% (10), well 27.0% (10) and 43.2% (16) had borehole, 91.9 % (34) had functioning toilet facility. It was observed that none of the facility had solar panels for energy generation and the entire PHCs lack ambulance services (Table 7).

In Kano metropolis, all the 34 PHC facilities assessed, none has functional 2 way referral system and returned referral slip available but 47% (16) had suitable referral forms and6%(3) had linkage with EmOC facilities(Table 8).

Table 1. Distribution of health facilities by facility type in Kano metropolitan LGAs

Health facility types	Frequency	Percentage (%)
Specialist	2	5.4
General	1	2.7
Primary Health Centre	6	16.2
PHC Clinic	16	43.2
Maternity Centre	1	2.7
Health Dispensary	3	8.1
Others	8	21.6
Total	**37**	**100.0**

Table 2. Distribution of health facilities by EmOCstatus in Kano metropolis

EmOC status	Frequency	Percentages(%)
BEmOC	5	13.5
CEmOC	3	8.1
NEmOC	29	78.4
Total	**37**	**100.0**

Table 3. Distribution of public health facilities based on provision of WHO signal functions and Nigerian guidelines in Kano metropolis

Signal Functions	PHC + SHF (N=37, FREQ%)
I.V Antibiotics	37.8% (14)
I.V Anticonvulsants	18.9% (7)
IV Oxytocic	35.1% (13)
Manual removal of placenta	40.5% (15)
Removal of retainedproducts of conception	35.1% (13)
Assisted vaginal delivery	16.2% (6)
Neonatal resuscitation with ambubag	8.1% (3)
24 hours service operation	16.2% (6)
4 Midwives	8.1% (3)
Blood transfusion	8.1% (3)
C-Section	8.1% (3)

Table 4. Proportion of PHC facilities that met with the Nigerian guidelines on BEmOC services in Kano Metropolis

No of PHC facilities with BEmOC	No of PHC facilities with at facilities with 24hrs service	No of PHCleast four midwives
Frequency (%)	**Frequency (%)**	**Frequency (%)**
12(32.43%)	3(8.1%)	0.0

Table 5. Distribution of human resources by facility type and level of care in Kano Metropolis

Health care workers	Secondary%(n=3)	PHC%(n=34)
Obstetricians	67%(2)	0%(0)
Drs non-specialist	100%(3)	6%(2)
Nurse-midwives	100%(3)	9%(3)
Single nurse	67%(2)	6%(2)
Single midwives	0%(0)	12%(94)
CHO	33%(1)	15%(95)
SCHEW	67%(2)	88%(30)
JCHEW	33%(1)	0%(0)
Auxillary nurse	67%(2)	74%(25)
Anesthesiologist	100%(3)	9%(3)
Theatre nurse	100%(3)	0%(0)
Anesthetist nurse	100%(3)	0%(0)
Medical Lab Scientist	33% (1)	0%(0)
Lab Technician	100%(3)	41%(14)

Table 6. Patterns of distribution of available equipment in public health care facilities

Functional Equipment	Frequency	Percentages
Stethoscope	22	68%
Sphygmomanometer	8	65%
Vaginal Speculum	5	24%
Angle Poise Lamp	14	15%
Cord Scissors	17	41%
Artery Forceps	17	50%
Needle holder	11	50%
Surgical Scissors	19	32%
Kidney dish	3	56%
MVA Kits	1	29%
Episiotomy Scissors	12	35%
Urinary Catheter	2	35%
Oropharyngial airways	1	46%
Sponge holding Forceps	23	41%

Table 7. Distribution of available Major Infrastructure in public health care facilities for EmOC Services

Presence of Functional Infrastructure	Frequency (n=37)	Percentage (%)
Power (Ngrid)	15	40.5
Power (Generator)	17	45.9
Laboratory services	14	37.8
Operating theatre	3	8.1
Blood Bank	3	8.1
Ambulance services	3	8.1
Borehole	16	43.2
Well	10	27.0
Tap	10	27.0
Toilet facility	34	91.9

Table 8. Distribution of available funtional two way refrral systemsin PHC facilities for EmOC Services

Services	Frequency	Percentage
Availability of referral forms	16	47%
Suitability and Adequacy of the forms	16	47%
Availability of functional 2-way referral	0	0%
Availability of returned referral slip	0	0%
Facility linkage with EmOC	3	6%

DISCUSSION

Maternal Mortality is an indicator of the health status of any nation and for Nigeria is in slow decline as access to appropriate maternal Health Services (MHS) is far below expectation.The use of process indicators as an indirect measure of Maternal Mortality Rate (MMR) highlights thegaps in the available maternal health service(MHS). Base on the assessment of 37 public health care facilities offering maternal health services (MHS) in Kano metropolis the entire 37 health facilities offer ANC services, 43%(16) offer Normal delivery service,78%(29) offer postnatal services, 8.1% (3) offer Blood transfusion services and Caesarean Section services.For assessing Emergency Obstetric Care (EmOC) servicesstatuses, it was observed that 59.46% (22) were NEmOC facilities, 32.43% (12) were BEmOC facilities and 8.11 % (3) were CEmOC facilities. It has shown that significant percentages of the facilities were noted not to have facilities for offering EmOC. Though, maternity services for the entire public healthcare facilities in Kano State is free,majority will not be able tomanage cases of Emergency Obstetric condition as at when due.

The eight Metropolitan LGAs has a total of 3,667,871 populations and recommended to have 7CEmOC and 29BEmOC facilities. Using the WHO guidelines(ref.) for EmOC services, the entire 34 PHC facilities were assessed on the facility for BEmOC services. It was observed that Kumbotso has 2, Ungogo has 1 and the remaining six LGAs namely Dala, Gwale, Fagge, Kano Municipal, Nassarawa and Tarauni have none that met the criteria for BEmOC facility. Thus, using the Nigerian guidelines for EmOC services, the number of BEmOC facilities reduced to zero (0) for the entire LGAs as none of their facility that has at least 4 Midwives per facility. All the 3 Secondary health facilities assessed had facility for CEmOC services.

The findings were similar to that carried out by the Federal Ministry of Health in Nigeria, which revealed that only 1 PHC facility in Lagos state out of the entire PHC facilities in the twelve states studied met with the BEmOC standard [16]. The absence of BEmOC facilities amongst PHC facilities for the entire LGAs in Kano metropolis, indicate that access to skilled birth attendants and adequate 24 hours coverage at the facilities was not possible and thesewill affect the utilization of services,forcing the women to overstretch the few available secondary health facilities thereby increasing morbidity and mortality.Thus, the aim or purpose of Free maternity servicesin the state is defeated as observed that there is a daunting task of reducing MMR through the services offer by them as many did not meet the required guideline for EmOC services.

The above findings has a wider implications as the Northern State Governors in 2007, became a signatory to the policy of Free Maternal and ChildHealth Services for the reduction of MMR in their states. In respect to the human resources at PHClevel, theStaff who are directlyconnected to delivery ofEmOC services were assessed. It was observed that 6% (2) were non-specialist physicians on part time basis, 9% (3) were nurse-midwives, 12% (4) were midwives, 6% (2) were single qualified nurses, 41% (14) were laboratory staff, 88% (30) were senior community health extension workers and 74% (25) were junior community health extension workers. The findings also showed that none of the PHC facility has met the requirement of at least four midwives perfacility.

The assessments was made for the availability of key equipment and drugsof emergency obstetric conditions and noted thatthe 3 Secondary health facilities assessed had the adequate number of instrument available and functional. While in PHC facilities we noticed paucity of manual vacuum aspiration kits and vacuum extractors/forceps, these indicated that relevant aspects of the signal function such as removal of retained products of conception andassisted vaginal delivery were not being carried out at the PHC facilities. There were staff trained to carry out especially MVA procedure but were not being utilized. The implication is that the limited resources in secondary and tertiary facilities are being overstretched to carry out these services which could have otherwise been handled atthe PHC level. Also noted in the PHC facilities were the presenceof parenteral drugs (anticonvulsants and antibiotics drugs) which thoughpresent, were not being utilized by the staff of the facilities. Thus, bringing out the gaps in the role of PHC facilities in delivering EmOC services. The proportional mortality rate was noted and observed that Haemorrhage was the highest with 59% from which 11% were cases of APH and 48% were cases of PPH; 24% were cases of pre eclampsia/eclampsia, 2% were cases of ectopic pregnancy, 4% of the cases were due to prolonged obstructed labour, 5% were due to Postpartum sepsis, 2% were due to complications of abortion and 4% were as a result of ruptured uterus.

The findings were tallied with a study carried out in Pakistan on analysis of maternal mortality in tertiary care hospital to determine causes and preventable factors, it was observed that obstetrical haemorrhage and hypertensive disorders were the major causes of death [17].

Good referral system is very important in the reduction of maternaldeath and thecornerstone of EmOC practice. The health care delivery system recognizes the 3 tiers of health facilities: PHC facilities, secondary and tertiary health care facilities. The PHC facilities are designed to be BEmOC facility while the secondary and tertiary are designedto be referral centers (i.e. CEmOC facilities). The BEmOC facilities are meant to be the first point of call for any pregnant woman with/without obstetric complications. Applying the above 7 signal functions, many obstetric emergencies will be attended to, such asante partum/postpartum haemorrhage,pre-eclampsia/eclampsia retained placenta and its products, postpartum sepsis, and minor degree of obstructed labour. The BemOC facility should be able to diagnose, treat, resuscitate and refer where appropriate the above conditions. It is the process of transfer of care of the patient from the first point ofcall at the primary facility to the next facility for better management that the referral letteris needed. The best referral system is thetwo-way referral system. This is when complications are recognized, patients are resuscitated and promptly referred to the nextreferral facility for further management with a letter stating the diagnosis, what measuresof resuscitation was carried out before transferring the patient and the patient is sent backto the referring facility with the reply of what was the final diagnosis and treatment givento the patient after recovery. The advantages of the two-way referral system are: patient receives prompt treatment at the referral center thereby avoiding the third delay; the patient is sent back to the referring facility this allows for patient's confidence in thereferring facility; access to EmOC facilities is improved thereby reducing the first andsecond delay as a result in the confidence in the referring facility (PHC are supposed to besituated within 5km walking radius).

The referral system is best supported by use of ambulance services where available, useof community vehicle where the community is involved (through community advocacy &mobilization) as part of community birth preparedness or advocacy and involvement oflocal road transport employers. These will remove the second delay which results inmaternal death. Also the use of telecommunication as a means of communication betweenhealth care facilities on available resources (e.g. bed space, functioning theatre, skilledbirth attendant on duty e.t.c) will also help reduce the third delay.

In Kano Metropolis, out of the 34 PHC assessed 84% of the PHC had suitable referral forms available but none had a functional two-way referral system. According to a staff in the PHC facilities'the referral centre do not refer their clients back to them after treatment.None of the 34 PHC assessed hada functional ambulance or mode of

communication to support the referral system. The absence of a two-way referral system between the health care facilities was generallynoted in Kano metropolis. Thus, precluding the PHC staff from being informed about thediagnosis and management of the obstetric conditions which have effect on the entirequality of care received at the lower level of care and the pattern of utilization is alsoaffected because confidence in the lower care is eroded and limited resources at thelevel of referral centers are stretched.

The advantages of supporting referral system was noted in a preliminary studies on facilitating emergency obstetric care through transportation and communication, Bo, Sierra Leone: [18]. Focus group discussions revealedpoor roads, few vehicles, and high transportation costs as major causes of delay indeciding to seek and in reaching emergency obstetric care. Following intervention through the installation of a radio system linking the hospital, primary health units (PHUs) and the referral vehicle, The number of women with major obstetric complications arriving at Bo Government Hospital (BHG) from the project areaincreased from 0.9 to 2.6 per month, while case fatality rate dropped from 20% to 10%. Inthe post-intervention period, approximately half of women with complications from theproject area utilizing Bo Government Hospital came by project vehicle. The mean timefrom the vehicle being called by the primary health units to the patient's arrival at BoGovernment Hospital was 3.1h [18].

According to WHO guidelines on EmOC services, 15% of the estimated births shouldtake place in EmOC facilities. It was observed that the proportion of births occurring in the 3 surveyed secondary (CEmOC) facilities in Kano Metropolis was more than double that of the 34PHCs (BEmOC) facilities. It was also noted that one of the secondary health facility received larger share of proportion of births and this could be due to its location at the city centrewith high number of personnel (which are assumed to be offering goodmaternal health services).It also serves as the Specialized health care facility which was areferral center for entire General health facilities in the state including the private healthcare facilities.This is responsible for drawing women from a widergeographical area than the nominal catchments (service) area of the facility or group offacilities in a geographical area.

CONCLUSION

The EmOC services should be targeted primarily at the goal of ensuring availability and utilization of low cost-high quality essential maternal health services for the pregnant women population in general. The notion that EmOC services are available is to have it 24h a day, 7 days a week (24/7) is also implicit in the definition (AMDD, 2002). The use of process indicators as a means of assessing health care facilities is an indirect means of measuring how far we have gone towards achieving the MDG 5. The findings of the results had shown that most of the LGAs in Kano metropolis did not meet with the WHO standard for the availability and utilization of EmOC facilities per 500,000 populations. A total of 22,147 births were recorded between January, 2013 – December, 2013, observed that 20,870 (94%) were by spontaneous Vaginal delivery (SVD) and 1,277(6%) were caesarean section.

RECOMMENDATIONS

The Kano State Ministry of Health (SMOH) in collaboration with its MDAs and technical Partners needs to identify and upgrade some of the PHC facilities for BEmOC and CEmOC services provision to ensure availability, meeting of standards and equity in coverage. The Primary Health care Management Board in collaboration with the Ministry for local government need to employ more Midwives so as improve the staff strength by at least 4 midwives per PHC facility. Health education and community mobilization on emergency birth preparedness should be intensified to increase utilization of available emergency obstetric care services.

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CONFLICT OF INTEREST:
The authors declare that they have no conflict of interest.

REFERENCES

1. Sach JD, Mc Arthur JW. (2005). The Millennium Project, a plan for meeting the development. *Lancet*. 365, 347-53.
2. JHPIEGO. (2004). Monitoring Birth Preparedness and Complication Readiness. Tools and Indicators For Maternal and Newborn Health. Baltimore, Maryland. Available at , http, //www.jhpiego.jhu.edu/resources/pubs/mnh/BPCR toolkit.pdf.
3. Gabrysch S. (2011).Tracking progress towards safe motherhood, meeting the benchmark yet missing the goal? An appeal for better use of health-system output indicators with evidence from Zambia and Sri Lanka. *Tropical Medicine and International Health.* 16, 627–639.
4. Paxton A, Bailey P, Lobis S & Fry D. (2006). Global patterns in availability of emergency obstetric care. *International Journal of Gynaecology and Obstetrics*, 93, 300–307.
5. UNICEF, WHO, UNFPA (1997). Guidelines for monitoring the availability and use of obstetric services. New York, USA, 2nd edition.
6. UNICEF. (2008). Countdown to 2015. Maternal, Newborn & Child Survival. United Nations Children Fund, New York. Online at, http//www.countdown2015mnch.org/
7. Carla A. (2003). Global burden of maternal death and disability. World Health Organization, Geneva, Switzerland. *British Medical Bulletin*, 67, 1–11.

8. Lobis S, Fry D, and Paxton A. (2005). Program Note, Applying the UN process indicators for emergency obstetric care to the United States. *International Journal of Gynecology and Obstetrics*, 88, 203—207.
9. Carine R, Wendy G. Maternal Survival 1. (2006). Who, when, where and why. *Lancet*, 1189-200.
10. UNFPA. (2004). Maternal mortality situation and determinants in Nigeria.
11. Federal Ministry of Health Nigeria. (2015). Road map for accelerating the attainment of the MDGs related to maternal and newborn health in Nigeria.
12. First Health Summit for the Northern States of Nigeria. (2007). Proceedings of the Northern State Governors at Arewa House, Kaduna State, Nigeria.
13. Kano State Ministry of Health. The Report of the Committee on the proposal for Rehabilitation and / or Upgrading of Primary Health Centers and renovation of referring secondary centers under the 2011 conditional Grants. 2012, July.
14. Bailey PE & Paxton A. (2002). Program note. Using UN process indicators to assess needs in emergency obstetric services. *International Journal of Gynaecology and Obstetrics*, 76, 299–305, discussion 306.
15. FMOH and UNFPA. (2003). National study on essential obstetric care facilities in Nigeria. Available at, http//www.nigeria.unfpa.org/document/EOC.doc
16. Shamshad B, Aziz-un N, Iqbal B. (2003). Analysis of Maternal Mortality in A tertiary care hospital to determine causes and preventable factors. *J Ayub Med CollAbbottabad*, 15(2).
17. Price T. (1984). Preliminary report on maternal deaths in the South Highlands of Tanzania. *Journal of Obstetrics and Gynecology of East and Central Africa*, 3(103), 103-110.
18. Samai O, Sengeh P. (1997). Facilitating emergency obstetric care through transportation and communication, Bo, Sierra Leone. The Bo PMM Team. *Int. J. Gynaecol.Obstet*, 59(2), S157-64.