

Availability and Utilization of Emergency Obstetric Care Services in Three Communities in Kaduna State, Northern Nigeria

Kingsley Odogwu^{1*}, Onyemochu Audu², Sa'adatu Baba-Lafia¹, Umma Bawa¹, Babayo Tukur³, Clara Ejemb², Sunday Adaji¹, Oladapo Shittu¹

¹Department of Obstetrics and Gynaecology, Ahmadu Bello University Teaching Hospital, Zaria; ²Department of Community Medicine, Ahmadu Bello University Teaching Hospital, Zaria; ³Department of Nursing Sciences, Ahmadu Bello University, Zaria.

*For Correspondence: Kingsley Odogwu. Email: kingsleyodogwu@yahoo.com.

Abstract

Maternal mortality ratios often reflect on the quality and availability of emergency obstetric care (EmOC) services. Ten health facilities in Kaduna State were assessed to determine their capacity to provide EmOC. Each community had the recommended number of both primary and secondary health facilities per population. All secondary health facilities had 24-hour services staffed by at least one doctor and one nurse/midwife per shift, and were able to perform most signal functions of EmOC in the three months preceding the survey. However, no primary health centres (PHC) were open 24 hours, and their performance of EmOC in the three months preceding the survey was near zero. Thus the presence of functional secondary hospitals is not enough to reduce maternal mortality in communities where women have to overcome numerous barriers to reach a hospital. If shortages of personnel, equipment and supplies in PHCs were resolved, 24-hour services could lead to a sharp reduction in maternal and infant mortality among rural women in northern Nigeria (*Afr. J. Reprod. Health* 2010; 14[3]: 83-88).

Résumé

Disponibilité et utilisation des services de soins obstétriques d'urgence dans trois communautés dans l'état de Kaduna, au nord du Nigéria. Les rapports de la mortalité maternelle reflètent souvent la qualité et la disponibilité des services de soins obstétriques d'urgence (SSOU). Nous avons évalué dix établissements de santé dans l'état de Kaduna afin de déterminer leur capacité pour assurer les SSOU. Chaque communauté disposait d'un nombre d'établissements primaires et secondaires par population. Tous les établissements de santé secondaires avaient de services de 24 heures qui avaient comme personnel un médecin, et une infirmière/sage-femme par poste et qui étaient capables d'exercer la plupart des signal-fonctions des SSOU dans les trois mois avant l'enquête. Néanmoins, aucun centre de soins primaires (CSP) n'était ouvert pour 24 heures et leur performance des SSOU dans les trois mois avant l'enquête était presque zéro. Ainsi, la présence des hôpitaux secondaires ne suffit pas pour réduire la mortalité maternelle dans les communautés où les femmes doivent surmonter beaucoup d'obstacles pour arriver à l'hôpital. Si les problèmes de manque de personnel, d'équipements et d'approvisionnement dans les CSPs sont résolus, les services de 24 heures pourraient amener une réduction remarquable dans la mortalité maternelle et infantile chez les femmes rurales au nord du Nigéria (*Afr. J. Reprod. Health* 2010; 14[3]: 83-88).

Key words: Emergency obstetric care, primary health care, maternal mortality, rural communities, northern Nigeria.

Introduction

Worldwide more than 585,000 women die from pregnancy and childbirth annually¹. Ninety-nine percent of these deaths occur in developing countries, with especially high rates in the regions where most women deliver at home without a skilled birth attendant (SBA)². In Sub-Saharan Africa alone, women have a 250 times higher risk of dying during preg-

nancy or childbirth than their counter-parts in developed countries¹. In Nigeria, maternal mortality is estimated to be 545 per 100,000 live births, with rates nearing 1500 in some northern regions of the country³.

As far back as 1987, the World Health Organization's Safe Motherhood Program emphasized the importance of access to emergency obstetric care for the management of common causes of obstetric

death, such as PPH, obstructed labour, complications of abortion, eclampsia, and puerperal sepsis^{4,5}. Emergency obstetric care (EmOC) refers to a set of interventions to treat complications in pregnancy, labour and the postpartum period. Approximately 15% of all pregnant women experience serious complications in childbirth which require some form of intervention. Because many complications are impossible to predict, such as postpartum hemorrhage (PPH), it is essential to have SBAs ready to provide treatment as soon as a woman is brought into an EmOC facility^{1,4}.

The specific interventions included within EmOC are called 'signal functions,' some of which can be performed with a more basic set of equipment and providers, and other which can only be provided at the best equipped hospitals. Basic emergency obstetric care (BEOC) functions can be performed in a well equipped primary health centre. These interventions include the administration of antibiotics, oxytocics, anticonvulsants, manual removal of placenta or other retained product of conception, and assisted vaginal delivery. They can be done in a PHC because they do not require an operation theatre.

Comprehensive emergency obstetric care (CEOC) is restricted to secondary or tertiary facilities with an operation theatre. Comprehensive EmOC functions include all interventions that can be conducted in BEOC facilities, as well as caesarean section and safe blood transfusion⁶.

Regardless of where a woman is when complications arise, the availability of SBAs, appropriate drugs, equipment and supplies are required to carry out the needed interventions. Availability of the above four components needed to provide care can be the critical factor that determines whether a woman lives or dies. Because of this, an SBA represents a combined package of knowledge, skills, medicines and supplies that is required to reduce risks in childbirth. The indicator 'proportion of births attended by a skilled birth attendant' is a key measure used to track country's progress towards MDG 5¹. Unfortunately, Nigeria is not on track to meet either MDG 4 or 5, and the northern region is the area of greatest concern. Factors such as low educational attainment, low contraceptive prevalence, and lack of access to quality EmOC are three major contributors to poor maternal and neonatal health⁷.

Over the last five years, Nigerian state governors have faced intense pressure to come up with an improved strategy to achieve address MDG 4 and 5. In 2007, at the Northern Governors Forum, the governors emerged from their maiden Health Summit with a decision to eliminate hospital charges from all maternal and child health services. However, implementation of this decision has been uneven across the northern states⁸. Much greater political will is required to translate policies into reality. In places

where EmOC is actually free and people are aware of it, it is expected that demand might increase even among the poorest families, who currently do not even consider leaving their homes to go to a hospital for fear of financial ruin.

The purpose of the present study was to assess the availability and capacity of both primary and secondary health facilities to provide EmOC services in 3 communities in northern Nigeria. In the context of 3 communities with an estimated MMR of 1400, this study is an initial attempt to identify the problems and inform the solutions to improve coverage of EmOC.

Methods

A cross-sectional study was conducted in 2008 investigating 6 primary health care facilities and 4 secondary health facilities that served inhabitants of Tsibiri, Shika Dam and Dakace. The PHCs of each community as well as PHC Layin Sarki, PHC Babandodo, and the Institute of Child Health in Banzazzau constituted the primary health care facilities. Four secondary health facilities, General Hospital Giwa, General Hospital Kofan Gayan, Limi Hospital, and St. Luke's Wusasa were also included, all of which are located approximately 20-40 minutes by car from community to hospital. Private facilities were excluded because they are generally unaffordable to the population under study. Informed consent was sought from the management of each health facility after securing certification from the ethical review board of Ahmadu Bello University Teaching Hospital (ABUTH) in Zaria and the University of California at Berkeley.

The facilities surveyed were assessed using a structured questionnaire which asked heads of facilities about services, staff, equipment and supplies (recorded only if observed) that are needed to carry out EmOC signal functions. The study team intended to assess the facilities based on three indicators: frequency of performing signal functions within the preceding three months, caesarean section rate, and case fatality rates per facility, but the latter two indicators were impossible to collect due to the quality of records in the facilities. The discovery of the current state of record keeping has serious implications and calls for major remedies in quality of care.

Results

The UN recommends one CEOC and four BEOC facilities per 500,000 population. This translates to 1 BEOC per 125,000 populations. The research teams found the number of CEOC facilities were numerically adequate, with one CEOC per 4,405 populations. The major gap in the ratio of facilities to

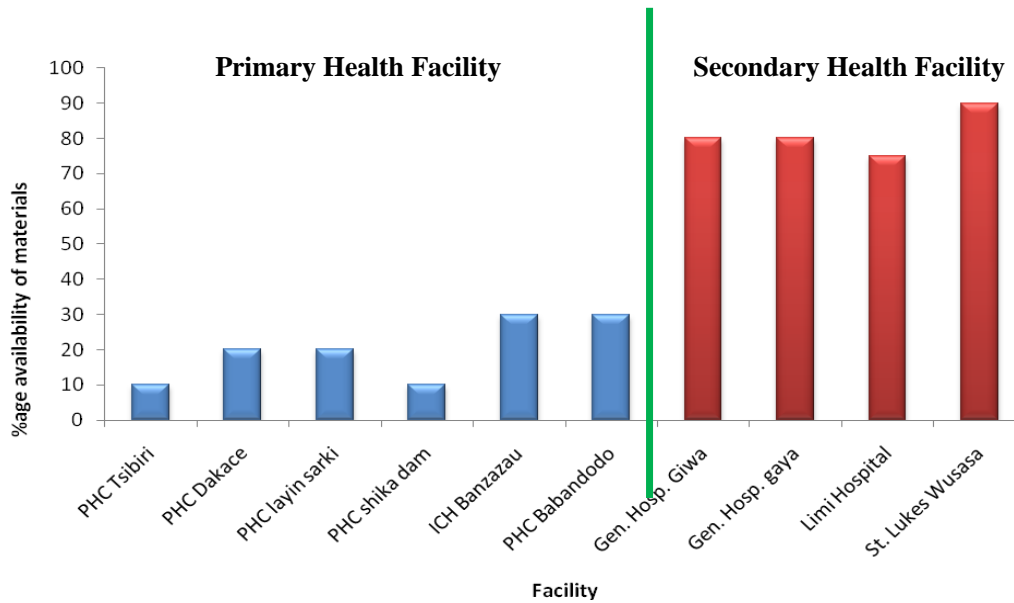


Figure 1. Availability of supplies and drugs to perform EmOC signal functions in primary and secondary health facilities.

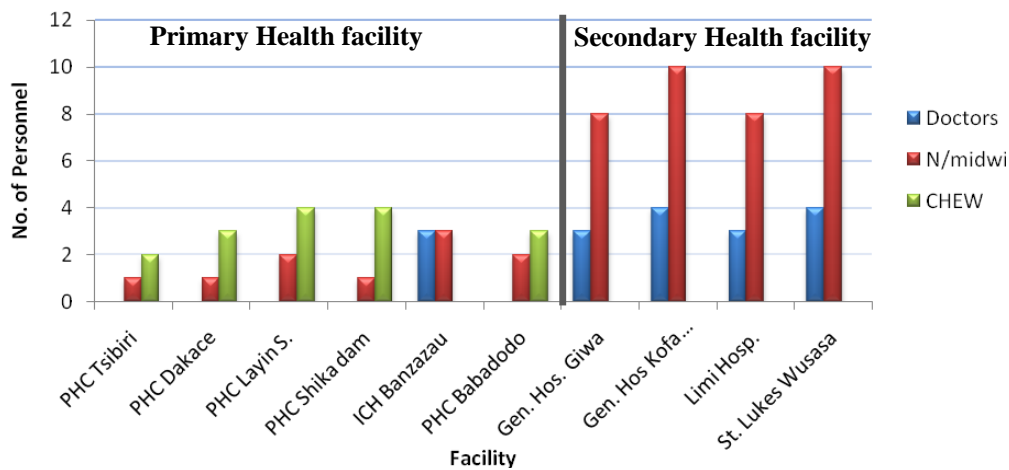


Figure 2. Categories of health care providers available in primary and secondary facilities.

population was found at the lowest level. If the PHCs had been functioning as BEOCs, the ratio of PHCs to population would be excellent, with one per 1270 population. However, only 3 of the 6 PHCs (Babadodo, Layin Sarki, and Banzazao ICH) were able to provide limited and occasional BEOC functions (less than twice a month). The three PHCs of Tsibiri, Dakace and Shika Dam had not provided any type of BEOC in the previous three months and thus cannot be considered to be BEOC facilities at all.

Of the six PHCs and ten secondary health facilities, utilization pattern was as follows: Of the two rural villages, inhabitants of Tsibiri utilized one primary and one secondary facility and Shika Dam utilized three primary and three secondary facilities. The third peri-urban community, Dakace, was ser-

ved by three PHCs and three secondary health facilities. All secondary hospitals are located within a reasonable distance from Ahmadu Bello University Teaching Hospital, if a referral to a tertiary institution were required.

Figure 1 described the various facilities' readiness to perform EmOC in terms of drugs and supplies. All secondary facilities assessed had over 75% of required drugs and supplies for EmOC. Among the PHCs, two of the six had up to 30% of required drugs and supplies for EmOC and another two had 20% of drugs and supplies. The communities that were the worst off were Tsibiri and Shika Dam, both of which had less than 10% of the required drugs and supplies for EmOC.

Figure 2 shows EmOC readiness in terms of personnel availability. At the secondary health care

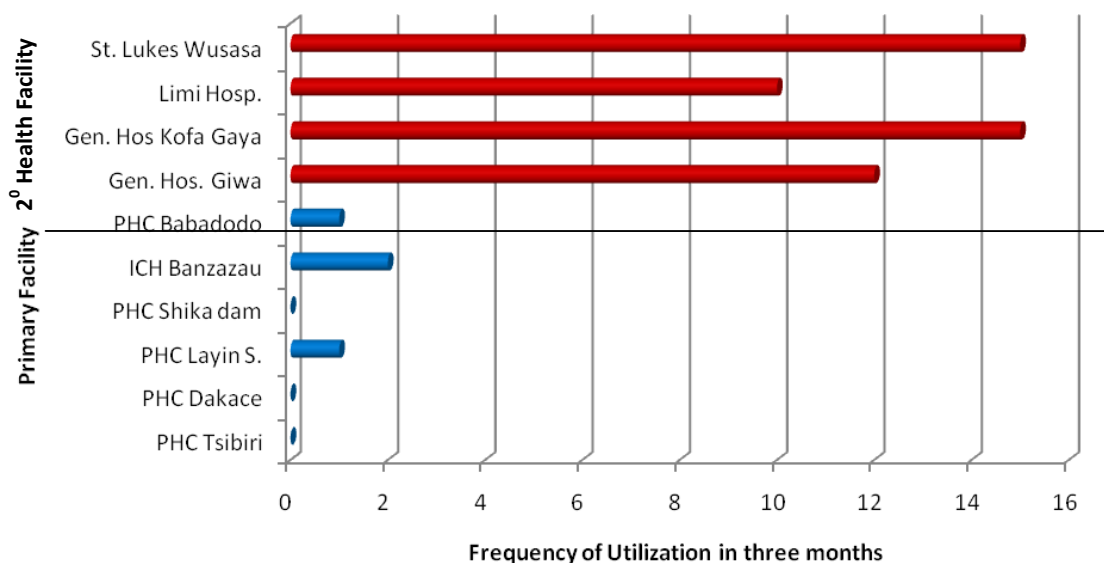


Figure 3. Frequency of performance of signal functions of EmOC in the last three months.

level, all facilities had at least a medical doctor and a nurse/midwife per shift, operating 24 hours a day. All PHCs were reported to have at least one midwife, but none were able to offer BEOC services, even during daytime working hours.

Figure 3 shows the frequency of performance of EmOC signal function, by facility, within the last three months. While all secondary health facility performed at least one of the six signal function at least 10 times in the three months prior to the survey, none of the PHC performed any of the signal function more than twice over the same period.

Haemorrhage (30%), eclampsia (24%) and prolonged labor (22%) were the most frequently reported complications reported by the staff of the secondary facilities in the three months prior to the survey. All secondary health facilities conducted deliveries. The case fatality rate could not be determined due to poor record-keeping.

The rate of caesarean delivery is a frequently used indicator to determine whether access to care is sufficient for the predicted number of women who will suffer from obstructed labor. The secondary hospitals performed cesarean deliveries in less than 30% of all deliveries. However disaggregated data for the study villages could not be obtained because the hospitals serve a large catchment area. Patient records do not mention village of origin.

Limitations

Previous population-based studies in the area revealed very low caesarean section rates. (<5%)². As a facility-based study, the study team was unable to obtain any data on current rates. However, additional research is required on current rates, because a proportion that falls much below 5% indicates that

the number of women who suffered from obstructed labour surpassed the number of women who were able to reach a hospital to obtain a caesarean section¹.

The present study is limited in its ability to comment on the actual quality of care in secondary facilities in the area. The findings only demonstrate that the four secondary hospitals do conduct caesarean deliveries, and their levels of staff, basic equipment, and supplies needed to conduct caesareans appear adequate.

A final limitation is due to an error that occurred in survey design that impacted the reliability of the data presented in Figure 4. The survey omitted questions about how many cases of sepsis and abortion-related complications were seen. Since it is unlikely that the number of cases treated for these two common conditions could have fit within the "other" category, this figure must be interpreted with caution. It can only hint of what the true distribution of complications might have been. It has been included only to indicate that postpartum hemorrhage, pre-eclampsia/eclampsia and prolonged labour most likely account for a large proportion of the EmOC treatment provided in the three months prior to the survey.

Discussion

Countries with the highest rates of home births tend to also have high rates of preventable maternal and neonatal mortality¹. Because of the high risks of delivering without an SBA, there has been a concerted effort to encourage women to come to health facilities for delivery, rather than staying at home.

Pattern of Obstetric Complications

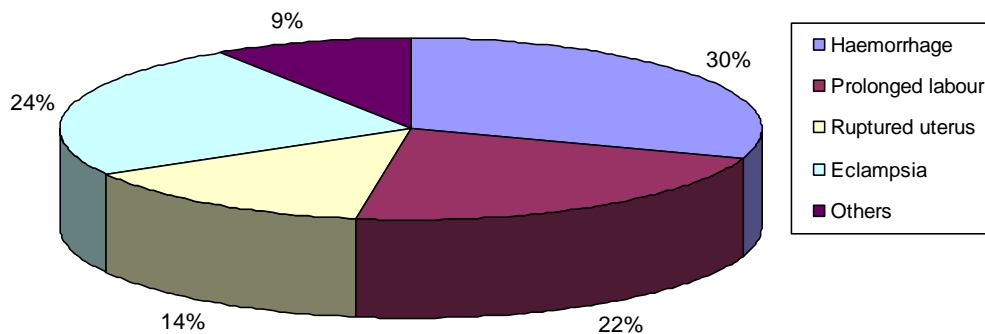


Figure 4. Distribution of Obstetric Complications recorded in secondary health facilities in the three months prior to the survey.

However a gulf between two worlds remains that is often marked by poverty vs. privilege, and a wide range in access to education: there are the women who actively attend ANC and seek out hospital delivery with SBAs, who are often more educated, and the women who live in communities with the highest MMR and IMR who continue to deliver at home without the option of having an SBAs come to their home.

As shown in this study, the potential accessibility and coverage of EmOC services depends partly on the number of both BEOC and CEOC facilities, and whether an appropriate ratio of facilities to population exists. The actual accessibility of EmOC, however, is determined only by women's ability to reach the facility and by a facility's demonstrated ability to perform the services in a timely manner. A discussion of how Thaddeus and Maine's 'three delays' operate in the context of Tsibiri, Dakace and Shika Dam, is treated in detail by Tukur et al. in this issue.

An interesting paradox occurs in this context. In addition to the 4 secondary hospitals that serve these 3 communities, there is also a tertiary hospital (ABUTH) within a reasonable distance. So in terms of potential accessibility to EmOC, these communities have an advantage that many others lack. The number of secondary and tertiary facilities in the vicinity per population is more than adequate, contrasting sharply with other developing countries such as Pakistan, where massive shortages exist in the number of facilities available per population⁹.

At the primary health care level, in terms of raw infrastructure, the three communities in this study could be well-served by the existing PHCs if their PHCs were provided with more staff and supplies and improved the overall quality of care. Making this happen sooner, rather than later, is a basic issue of equity, because compared to other sub-populations in Nigeria, the average Hausa-Fulani woman has less education and is likely to find it difficult to

access care at hospitals^{10,11}. Living in *purdah* may even affect rates of ANC attendance in places where ANC is only available in secondary hospitals¹¹. However, the major risk for women is complications occurring in labour and delivery. If an emergency occurs when a woman's husband is not reachable, there is a problem. Even if he grants permission, but fails to leave enough money behind to cover the costs of emergency transport there could be further delays. In short, even if secondary and tertiary hospitals are close to a woman's home, one cannot assume that she can use it¹¹.

Because of the proximity to women's homes, it is the PHCs - not the secondary hospitals - that may have more potential to provide timely advice and assistance. If staffed and stocked with essential medicines, PHCs could avert outcomes such as maternal death from haemorrhage or eclampsia. Examples from countries such as Bangladesh or Ethiopia provide models of how community-based outreach can be organized to benefit rural women^{13,14}. Cost-effective innovations need to be tested and evaluated to figure out what combination of interventions would work best in northern Nigeria.

In terms of skilled personnel and material resources for the performance of EmOC signal functions, all PHCs fell significantly short of national standards that require a minimum of four midwives per BEOC to enable mandatory 24 hour service⁶. Until there are enough midwives to take round the clock shifts, a PHC cannot become a BEOC facility. However, even with current staffing constraints (in many cases, PHCs are staffed by a few trained CHEWs) some basic improvements in training, equipment, materials, drug supply and day-to-day operations could be implemented at low cost.

In this way, primary health care facilities could become the first point of call for women with obstetric emergencies. A midwife or highly skilled CHEW would need to be available to assist families in dis-

tress with advice, birth assistance and support in reaching a referral facility, if needed. Improved communication and transport systems could also be put in place that could be coordinated at the PHC.

Approximately 15% of women will experience complications – regardless of where they deliver. In another study in the same area, Oguntunde et al. found that 87% of women from Tsibiri, Dakace and Shika Dam had delivered at home during their last birth. The women least likely to have delivered their last child in a hospital were the women with no formal education (0%) or only Quranic education (2.5%). Rates of hospital delivery significantly increased to 18% with primary schooling and 42% with secondary schooling.

Maternal mortality in developing countries is a tragedy of inequity and social injustice. Since Nigeria's first national health policy was instituted, the country has witnessed several positive policy changes related to maternal and child health, yet these developments are yet to be implemented in a way that has sparked an appreciable decline maternal and infant mortality rates^{16,17}. This study has attempted to present a different perspective on the problem, one that is not often revealed by statistics. It has also clearly identified areas where improvement in EmOC services should be accorded priority attention.

The challenges ahead will be to ensure equity in access to BEOC and CEOC. Relying on CEOCs, because BEOCs are not functioning, is inefficient because it misses an opportunity for effective triage, where less complex cases are handled at a lower level of care. Much can be done through community outreach and education, paired with recruitment and training of more health workers, improved management of logistic and supplies and better supervision and support of personnel.

Acknowledgements

The authors will like to acknowledge the communities of Dakace, Shika Dam and Tsibiri for their participation. This study was a collaboration of the Population Reproductive Health Program, Ahmadu Bello University Teaching Hospital Zaria and University of California, Berkeley, Bixby Center for Population, Health and Sustainability. This project was funded by the National Institutes of Health, Forgarty International Center and National Institute for Child Health and Development, Grant no. 5D43TW007696-04.

References

1. World Health Organization. *The World Health Report 2005. Make every woman and child count.* Geneva: WHO; 2005. 61-62.
2. Federal Government of Nigeria. National Economic policy Abuja 2001
3. National Population Commission (NPC) [Nigeria] and ICF Macro. 2009. Nigeria Demographic and Health Survey 2008. Abuja, Nigeria: National Population Commission and ICF Macro.
4. Maine D, Rosenfield A, The safe motherhood Initiative: Why has it stalled? *Am. J. Public Health.* 1999; 89:480-82
5. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Soc. Sci. Med.*1994; 38(8):1091-1110.
6. Maine D, Wardlaw TM, Ward VM, McCarthy J, Birnbaum A, Akalin MZ et al. *Guidelines for monitoring the availability and use of obstetric services.* New York: UNICEF/WHO/UNFPA, 1997.
7. Saving Newborn Lives in Nigeria: Newborn health in the context of the Integrated Maternal, Newborn and Child Strategy, Abuja: Federal Ministry of Health, Save the Children, ACCESS; 2009.
8. First Northern Government Health Summit. Report of Proceedings. 2007
9. Moazzam Ali, Mohammad Ayaz, et al. Emergency Obstetrics care availability, accessibility and utilization in eight districts in Pakistan's North West Frontier province. *J Ayub Med coll Abbottabad* 2006; 18(4). 10-15
10. United Nations Educational, Scientific and Cultural Organisation (UNESCO) Institute for statistics Montreal. Children Out of School: Measuring Exclusion from Primary Education 2005. Available at <http://www.uis.unesco.org>
11. Yusuf, Bilkisu. Sexuality and the Marriage Institution in Islam: An Appraisal. African Regional Sexuality Resource Center. 2005
12. Shehu D. "Socio-cultural factors in the causation of maternal mortality and morbidity in Sokoto" in M.N. Kisekka (ed.) *Women Health Issues in Nigeria*, Tamaza, Zaria. 1992.
13. Chaudhury RH and Chowdhury Z. Maternal Mortality in Rural Bangladesh: Lessons Learned from Gonoshasthaya Kendra Programme Villages Asia. *Pacific Population Journal*, April 2008.
14. Center for National Health Development in Ethiopia. Assessment of Working Conditions of the First Batch of Health Extension Workers. May 2006.
15. Desai J. The cost of emergency obstetric care: concepts and issues. *Intl. J. Gynecol. Obstet.* 2003; 81:74-82.
16. National study on essential obstetric care in Nigeria, Technical Report Federal ministry of Health 2003.
17. Kongnyuy E.J, Hofman J.J, Van den Broek N. Ensuring Effective Essential Obstetrics Care in Resource poor settings. *BJOG* 2009; 116 (Suppl. 1): 41-47.