PROFILE OF MATERNAL MORTALITY AND MATERNAL HEALTH SERVICES IN NIGERIA

[1]Adinma, J.I.B. & [2]Adinma, E.D.

[1]Department of Obstetrics and Gynaecology, College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus, Nnewi, Nigeria
[2]Department of Community Medicine, Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria

Correspondence Author: *Email: brianadinma@yahoo.com, Phone number:- 08037080814*

ABSTRACT

Nigeria has a high maternal mortality that is disproportionate to its population relative to that of the world. This review examines maternal mortality in Nigeria with respect to the magnitude of the problem, its causes, together with the pattern of maternal health services and their influence on maternal mortality. Among direct medical causes of maternal mortality in Nigeria include haemorrhage (23 %), sepsis (17 %), malaria, anaemia, abortion, hypertensive disorders/eclampsia, obstructed labour (11 % each), and others (5 %). Non-medical factors which include sociocultural, economic, and legal factors, reproductive health factors, health services and health system factors, and delay in access to emergency obstetrics care; all impede availability and access to maternal health services, thereby promoting maternal mortality. The knowledge of these factors will redirect the thought and actions of stakeholders in maternal health towards a better focused planning and implementation of maternal mortality reduction efforts in Nigeria.

Keywords: *Profile, Maternal mortality and maternal health services, Nigeria*

INTRODUCTION

The death of a woman in relation to pregnancy and childbirth engenders grief, anguish and despair amongst the household and indeed the community at large, largely because pregnancy is not a disease but a physiologic and therefore natural process expected to perpetuate the continuity of the human race. Pregnancy and delivery should therefore be safe to the extent that no mother should be allowed to suffer disability or death from the events.

The World Health Organization defines maternal mortality as a death of a woman while pregnant or within 42 days of a termination of a pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental and incidental causes.[1]

Over the past 10 years, until recently, maternal deaths all over the world had been placed at approximately 523,000 annually; however following interventions in various countries pursuant unto the attainment of the major target of the fifth component of the United Nations' Millennium Development Goals (MDGs) i.e. reduction of maternal mortality by 75% by the year 2015, a 45% reduction of maternal mortality to 289,000 in 2013 has been reported by the United Nations[2]. Approximately 99 % of these maternal deaths occur in developing countries.[3] Presently, 60% of the current burden of global maternal deaths occur in 10 countries of the developing world, viz India (50000, Nigeria 40000, Democratic Republic of the Congo 21000, Ethiopia 13000, Indonesia 8800, Pakistan 7900, United Republic of Tanzania 7900, Kenya 6300, China 5900 and Uganda 5900[2].

Maternal mortality is believed to exhibit the

widest discrepancy amongst all public health statistics, between developed and developing nations, and further constitutes a manifestation of the disparity and inequity between men and women, and of women's place in the society.[4]

Issues related to maternal mortality and its reduction have occupied a prominent place as a contemporary global health challenge, and this has been aptly captured in one of the foremost world's developmental strategies – the United Nations Millennium Development Goals (MDGs) where it occupies a pivotal position, directly or indirectly affecting all the other goals.[5,6]

Nigeria is believed to have one of the highest maternal mortality ratios in the world, comparable only to that of war-torn countries. Given the position of Nigeria as the most populous nation in Africa, its abundant human, natural and economic resources, her high maternal mortality ratio, and indeed an overall poor reproductive health statistics only but constitute an embarrassment to the nation and the world at large.

This review examines maternal mortality in Nigeria with respect to the magnitude of the problem, its causes, together with the pattern of maternal health services and their influence on maternal mortality. The knowledge of this is expected to guide health policy-makers and health practitioners alike towards an evidence-directed maternal health care package that will facilitate a speedier maternal mortality reduction in Nigeria.

Magnitude of maternal mortality in Nigeria

Nigeria accounts for 10 % of the world's overall maternal mortality. This figure is quite high seen in the light of the fact that Nigeria constitutes only 1.2 % of the world's population. Nigeria's maternal mortality ratio as represented in the National Demographic and Health Survey (NDHS) of 1999 was given to be 704 per 100,000 live births.[7] The United Nations Population Fund's UNFPA 2002 version of the State of the World's Population Report showed a maternal mortality ratio figure of 1,100 deaths per 100,000 live births.[8] A 2003 report from the Federal Ministry of Health showed maternal mortality ratio of 948 per 100,000 live births with a range of 339 to 1,716 per 100,000 live births.[9] The 2008 Nigerian Demographic and Health Survey showed a reduction in Nigeria's maternal mortality ratio to 545 per 100,000 live births.[10] Variations in maternal mortality statistics are not unrelated to logistics and technical difficulties associated with the national maternal mortality surveys which cast doubt as to the reliability of those surveys. In spite of this, there is no doubt whatsoever as to the high maternal mortality ratio in Nigeria which in fact seems to have continued to be on the increase over the recent years. The 2013 National Demographic and Health Survey in fact reported maternal mortality ratio of 576 per 100,000 live births which is clearly higher than the 2008 report of 545 per 100,000 live births[11].

Nigeria's poor maternal mortality ratio is similar in pattern and trend over the past more than a decade to its other unsalutary related demographic and health indices as shown below in Table 1.

Table 1: Trend in some Nigeria's demographic and reproductive health statistics (1999-2013)

Characteristics	1990	2003	2008	2013
Total fertility rate	6.0	5.7	5.7	5.5
Maternal mortality	1000	704	545	576
(CPR) any method	6(%)	13(%)	15(%)	15(%)
(CPR)modern method	4(%)	8(%)	10(%)	10(%)
Child mortality	-	112	88	64
Neonatal mortality	-	48	40	37

Causes of maternal mortality in Nigeria

The pattern of the causes of maternal mortality in Nigeria is essentially similar to that of the world-over with subtle variations in incidence for the various components of causes. Broadly the causes of maternal mortality can be grouped into medical – direct and indirect, and non-medical, which are in fact associated factors and include socio-cultural factors, reproductive health factors, and health systems/health service factors.

Medical causes of maternal mortality

Direct medical causes of maternal mortality in Nigeria and the corresponding global profile[12,13,14] are shown in Table 2.

Table 2: Direct medical causes of maternal mortality in Nigeria/Global

Direct medical causes	Nigeria	Global
Hemorrhage	23 %	25 %
Sepsis	17 %	15 %
Malaria	11 %	-
Anaemia	11 %	-
Abortion	11 %	13 %
Hypertensive disorders/Eclampsia	11 %	12 %
Obstructed Labour	11 %	8 %
Others including Ectopic pregnancy, Embolism and Anesthesia related risks	5 %	8 %.

Indirect medical causes of maternal mortality refer to problems that may have been either pre-existing but have become aggravated by the pregnancy, or co-existing with the pregnancy. Examples are malnutrition, cardiac failure, tuberculosis, sexually transmitted infections, gender-based violence, etc. They constitute 20% of the medical causes of maternal mortality.

Non-medical causes of maternal mortality

Socio-cultural, economic, and legal factors impact tremendously on access, acceptability and utilization of maternal health services, and the ultimate outcome of maternal health in Nigeria. Socio-cultural constraints prohibit women's ability to make decisions even on issues concerning their health. Amongst socio-cultural factors recognized to play major roles in the causation of maternal deaths in Nigeria include: low status of women in the community in respect of education, income, occupation, social, and legal autonomy. Others include: young age at marriage, bearing children too early or too late, poor spacing of children, heavy work burden during pregnancy, harmful traditional practices, and obstacles to access to family planning services and apathy and stigmatization of women experiencing disabilities from childbirth such as vesico-vaginal fistulae.[15]

Poverty has profound influence on the health of the mother and child in Nigeria which impact tremendously on the overall quality of life. Poor mothers tend to have poor nutrition, increasing their susceptibility to anaemia and infection with overall poor pregnancy outcome. Furthermore they are seldom able to afford patronage to hospitals or orthodox maternal health services and oftentimes resort to substandard health care. Studies conducted in selected areas of Benue State of Nigeria show that in spite of the preference of most people to receiving treatment from orthodox health facilities, most of the poor, in fact resort to receiving treatment from patent medicine stores, native medicine men, and spiritual homes on account of their inability to afford the cost of health services from orthodox facilities.[16]

The Structural Adjustment Programme (SAP) introduced by the World Bank and International Monetary Fund (IMF) to Nigeria in 1988 seemed to have played a significant role towards the worsening of the socio-economic situation in Nigeria which it was intended to address. SAP's prescription of the devaluation of the national currency, embargo on employment, retrenchment of workers and removal of subsidies and subvention to hospitals and educational institutions in fact actually dealt a disastrous blow particularly on the nation's health and educational social sub-sectors.[17,18,19] School enrollment dropped, accompanied with a high level of dropout from schools of Nigerian children. Hospitals and health facilities became increasingly characterized by stock-out of drugs, break down of equipments which were not being replaced, dilapidation of physical infrastructure and poor patronage. These in conjunction with the introduction of user-fees into public health facilities, poor motivation and remuneration of the health workforce resulted in the exodus of quality staff in search of greener pastures – the brain drain, all led to increasingly worsening status of the health of Nigerians especially the mother and child. Worsening poverty increased the number of obstetric emergencies and the overall maternal mortality.

The poverty situation in Nigeria has undergone an upward trend over the past two decades, being largely fueled by corruption, bad governance, and adverse trade relation. Before 1980, only 27% of Nigeria's 66 million people were poor. This figure more than doubled by 1996 to as high as 65 %, with the core poor (i.e. those living on about 70 US per day) rising from 4 million to 30 million between 1980 and 1996.[20].This trend had not improved over the years, in a 2012 press briefing by the statistician general of the Federation on Nigerian poverty profile report, 2010 , it was

reported that 51.6% of Nigerians were living below US$1 per day which by 2010 had increased to 61.2%. If cognisance is taken of the current World Bank Standard of US$1.25, this figure would have been much higher[21]. Studies have shown that rising hospital cost and increasing poverty have resulted in drastic reduction in the utilization of hospital services[17 22], although the introduction of the National Health Insurance Scheme is going a long way towards alleviating the burden of the payment of out of pocket expenses for maternal health services especially for formal sector employees[23].

Religion has a significant impact on maternal health, whether in the northern or southern part of Nigeria. The Muslim Pudar system which is believed to have become integrated into the culture of the people discourages the patronage to orthodox health facilities, so as to prevent them from being attended to by male staff. They are encouraged therefore to be attended to by traditional birth attendant who apart from paying strict attention to cultural imperative also seize the available opportunity to perform religious rites.[24,25]

Literacy level and education in general, play important role in utilization of maternal health services by Nigeria women. The National Demographic and Health Survey (NDHS) of 2003 vividly captures this. Whereas 60 % of mothers with no education relied on unskilled attendants during delivery, only 9% of mothers with higher education did so.[7]

Unsafe abortion and its complications constitute major cause of maternal deaths in Nigeria. Unsafe abortion occurs mainly from clandestine operations, due to the restrictive abortion laws of the country which prevent women's access to legal abortion services.[26,27]

Reproductive health factors causing maternal mortality

Maternal outcome following pregnancy is to a large extent influenced by reproductive health seeking behaviours and practices both at personal and community levels. Although several factors interplay towards the ultimate behavior of an individual in respect of reproductive health – induced abortion for instance accounts for 11% of the overall maternal deaths in Nigeria. Altogether approximately 760,000 abortions are performed annually in Nigeria. More than 60 % of which are performed by non-medical personnel.[28,29] The implications of this to maternal mortality are obvious.

Antenatal care represents a well known approach to safe motherhood. Surprisingly however antenatal care of women by health professionals has shown a decline. For example the 1999 NDHS survey showed that 63.6 % of mothers received antenatal care from health professionals over the three years preceding the survey, compared to 58.8 % who did so over the three years preceding the 2003 NDHS survey, there was even a further decline to 58.0% from the report of 2008 NDHS survey, which increased to 61% in the 2013 report[11] . Among factors reported to be responsible for the declining antenatal care visits include: lack of awareness of the importance of antenatal care, lack of awareness of antenatal care services in the health facilities, and economic consideration.[30]. The extent to which these factors have continued to input into the declining patronage to skilled birth attendant for antenatal care services remains embarrassingly confounding, considering the plethora of activities and programmes put on over these years by several stakeholders which are governmental and non-governmental organizations towards maternal health services and maternal mortality reduction effort, especially under United Nations' Millennium Development Goals (MDGs)[33].

Delivery also adopts a near-similar pattern as antenatal care. While 37.3 % of deliveries recorded at the 1999 NDHS survey occurred in health facilities, a lower percentage – 30.4 % was reported for the health facility at the

2003 NDHS survey, which increased only slightly to 35% by the implications of the declining antenatal care and delivery at health facilities on maternal mortality are indeed grave.

Family planning plays an important role in preventing maternal mortality through either preventing the absolute number of women getting pregnant, or when targeted at the highly vulnerable groups – the too young, too old, or high parity. It is believed to prevent maternal mortality when combined with abortion services in 50% of cases.[34] The contraceptive prevalence rate for Nigeria currently stands at only 15% overall, much lower, than 25% reported for sub-Saharan Africa. Modern contraceptive method currently has a prevalence rate of just 10% from the 2013 NDHS[11] .The need to embrace modern methods of family planning has become absolutely necessary, considering the total fertility rate of Nigeria which has increased from 5.2% in 1999 to 5.7% in 2008, declining only slightly to 5.5 in 2013[12]. The Nigeria's revised Population Policy of 2002 stipulates specific provisions on family planning, which includes achieving reduction of the county's population growth rate to 2% lower by the year 2015; achieving reduction in total fertility rate (TFR) of at least 0.6 children every five years; increasing modern contraception prevalence rate by at least 2% point per year.[31] In Nigeria today, universal access to family planning is elusive while family planning commodities, logistics management is still quite poor.

Teenage adolescence contributes to increase maternal mortality rate (MMR) in several ways. The NDHS report of 1999 indicates that 22% of teenagers in Nigeria have begun childbearing. The NDHS report of 2003 further revealed that only 48% of teenage pregnant women received antenatal care from health professional in contradistinction to 60.7% amongst women above 35 years of age. Adolescents also have high rate of induced abortion with attendant complications. Studies have shown that up to 33% of women seeking abortion were adolescents, and up to 80% of hospital-based admissions for abortion complications occurred in the adolescent girls[34].

Health services and health system factors causing maternal mortality

Report has it that the total number of health facilities in Nigeria by the year 2000 was 23,676; of which 74% were primary health care facilities, 25.2% secondary health facilities while 0.2% constituted tertiary health facilities. 37% of the overall health facilities are privately owned. Only 14,474 of the 101,041 communities in Nigeria were reported to have access to any form of modern health facility by 1993. The proportion of Nigerians with access to health care services has been put at 56.5%[29, 32, 36]. This statistics of health delivery centres has shown only but a marginal increase over the years. Although zonal variations occur, it has been reported that there are a total of 13,211 primary health care facilities in the country. Only approximately half (49.8 %) of primary health care facilities in the country provide antenatal care while 42.9 % provide delivery services.[29]

Emergency obstetrics care is a recognized protocol for preventing morbidity and mortality during pregnancy, delivery, and postpartum period. Studies conducted by the Federal Ministry of Health and UNFPA in 2003 indicated only one state out of 12 studied met the minimum criteria of the four basic emergency obstetrics care facility per 500,000 population. Only 18.5% of facilities offering maternal health services, in general, met the minimum emergency obstetrics care criteria: 4.2% of public health care facilities, and 32.8% of private health care facilities respectively met the minimum criteria for EOC[35]. This finding is significant considering the fact that 15% of the complications of pregnancy and childbirth are life threatening, requiring emergency obstetrics care.

Human resources constitute an essential element of maternal health services. In particular the number of skilled birth attendant in a health facility is paramount to effective and safe obstetrics services delivery in the health facility. Skilled birth attendants – the doctor and the nurse/midwife are health personnel that have been trained over a set period of time and dully certificated to conduct midwifery services. The NDHS of 2003 reported that over 40% of the 6,219 births in five years preceding the survey had no trained assistance during delivery. As high as 58.2% of primary health care facilities offering both midwifery and delivery services have been shown in a recent study to have no midwife while 17% have neither midwife nor senior community health extension health worker (SCHEW).[29] This situation is more marked in the northern states of Nigeria compared to the southern states. It is generally believed that the general lack of skilled personnel is more related to the poor commitment of government towards their recruitment rather than an absolute shortage of the personnel – probably because of the perceived higher wages attached on the recruitment of skilled personnel. The presence of skilled personnel has been shown to impact on maternal mortality as shown in Table 3 below which compares antenatal care in relation to maternal mortality

Table 3: Skilled attendants at delivery and maternal mortality ratio in selected countries for 2003-2013

Country	% Skilled Attendants at Delivery		Maternal Death/100,000 Live Births	
Trinidad and Tobago	2003	2013	2003	2013
	98	97	90	84
Sir Lanka	94	99	140	29
Botswana	77	99	250	170
Bolivia	46	71	650	200
Nigeria	31	34	1000	560
Bangladesh	5	31	850	170

Training and re-training of skilled birth attendants on emergency obstetrics care – expanded life saving skills (ELSS) for doctors; lifesaving skills (LSS) for nurse/midwife; and modified life saving skills (MLSS) for community health extension workers, are also a fundamental requirement for effective prevention of maternal mortality. To date, the

number of doctors trained on ELSS is about 10-15%, while only approximately 20-25% of nurse/midwives are trained on life saving skills.

Good infrastructure, functional medical equipments, availability of adequate drugs and other supplies are prerequisite to offering quality services that will determine the ultimate outcome of any pregnancy at delivery. Many health facilities in the country exhibit infrastructural decay with lack of equipments, even as basic as sphygmomanometer where available, many of the equipments are in non-functional state, a situation more prevalent in state government owned facilities.[12,41]

Drug shortage and stock-out which characterized many of the public health facilities constitute an added factor that renders such facilities unattractive to patronage by community members. There is ample evidence to show that basic emergency obstetrics care drugs such as parenteral oxytocic, anti-convulsant, and antibiotics are lacking in many health facilities offering maternal health services.[41]

Quality of health care from health providers has been reported to be on a decline, and constitutes a major hindrance to access to health services in both private and public health facilities. Two key components of quality of services have been identified for the key role they play in maternal mortality viz: interpersonal relationship and technical competence of health workers. Interpersonal communication skills are lacking amongst many health workers. The unfriendly behaviour of hospital staff has been identified as a major reason for poor utilization of health facilities in some studies conducted.[29,41]

Studies and observations have shown incontrovertibly that the technical performance of virtually all cadres of health professionals in Nigeria had been below standard and requisite expertise.[42] Lack of exposure to modern medical equipment and training and re-training programmes have acted in concert to retard the technical proficiency of the Nigerian health professionals. Even following the acquisition of the skills through trainings, the unavailability of the necessary equipments may prohibit the health worker from practicing the acquired skills. For example a recently acquired expertise on the use of anti-shock garment for managing obstetrics haemorrhage by a doctor following an ELSS training, may be lost on account of the absence of the garment in the health facility.

The Nigerian health system essentially adopts a three tier structure vide the National Health Policy of 1988 with primary health care to operate at the local government level, secondary health care to operate at the state government level, and tertiary health care to be controlled at Federal Government level. Health was also placed at concurrent legislative list[43, 44]. Over the years however with the development of government parastatals of ministries of health with implementation status, the establishment of tertiary health facilities by state government, and construction of primary health centers by Federal Government, considerable over lap on the original three tier structural arrangement has become evident thereby seemingly disorganizing the entire health system arrangements, making it even more complex[44]. This situation has apparently affected the activities of government in the health sector – policy formulation programme and implementation filtering down from the Federal to the state and local government levels.

Inadequate funding of the health sector perhaps remains a foremost contributor to poor maternal health services. Even when funds are budgeted for health, release for implementation of programme is usually poor, being influenced tremendously by corruption, self-interest, and poor management. From 1996 - 2000 Federal Government budget on

health ranged from N4,835 million - N17,581.9 million; this amount represented only 2.7% - 5.0% of the total Federal Government budget. Nigerian's total health expenditure (THE) as a percentage of gross domestic products (GDP) is low ranging between 4.3% - 5.5% from 1996 - 2005. From 1996 - 2005 private sector expenditure on health as a percentage of This was high ranging from 66.5% - 78.2% with private household out of pocket accounting for 90.4% - 95.0% over the period[46,48]. This represents an enormous financial burden for health care on the poor Nigerian mass. Nigeria health expenditure as a percentage of the gross domestic product has been given to be 0.2% over the period between 1990 - 1998. This figure is considered low when compared with the World Bank's reported average of 2.6 % for sub-Saharan Africa from 1990-1996.[49] The inadequate funding of the health sector that characterized the Federal Government also replicated at both the state and local governments. Non release of approved budget for health care is even more pronounced in the state government which many a time depends on donor funds. In the local government, it has been reported that considerable percentage of the funds meant for health is spent on the personnel cost, leaving only very little to provide for health care delivery.

The overall performance of the Nigeria's health system has been adjudged to be deplorable. The 2014 WHO Global Rating of health system performance ranked Nigeria 187th out of 190 countries accessed.[48]

The Nigerian public health system has been reported to be characterized by low sector funding, poor staff motivation, and inadequate access to health care. Poor governance, institutionalized corruption, and low commitment to meeting the health care needs of the people have contributed immensely towards the poor performance of the Nigerian health system, and this has been profoundly expressed in Nigeria's poor maternal health profile.

Delay in access to emergency obstetrics care

Maine and Wray identified factors that affect the interval between onset of obstetrics complication and its outcome, which constitutes delays to access to emergency obstetrics care.[48]These have been effectively used as safe motherhood advocacy tools in communities. There are basically three delays involving **4R's**. These are:

Phase I –delays in recognizing the signs of life threatening complications which are attributed to a poor knowledge-base of obstetrics and its complications arising from the patient, household, and community on one hand, preventing them from seeking early appropriate care, and the health provider such as the traditional birth attendant lacking the necessary information to facilitate prompt referral on the other hand. It also includes delays in reacting to the presence of life threatening obstetrics complications which may be attributable to social, domestic, economic, and cultural constraints affecting the parturient woman which compels her to postpone seeking appropriate care.

Phase II – delay in reaching appropriate obstetrics emergency care centre. This is usually attributable to geographical, economic, and social inadequacies as may occur with bad roads, poor transportation system and social practices within a community.

Phase III –delay in receiving treatment for obstetrics emergency at health facility level. This may be related to personnel incompetency, poor interpersonal relationship and irresponsibility, lack of necessary drugs, equipment and other life saving necessities e.g. blood transfusion, and lack of enabling environment to render emergency obstetrics care services.

Phase I or first level delay
Phase II or second level delay
Phase III or third level delay

CONCLUSION

The foregoing exposé of the causes of maternal mortality in Nigeria as well as the various factors influencing them indicates unequivocally that most of these identified factors are largely preventable and remediable. This review has undoubtedly highlighted basic medical, social and logistic factors, most of which are human inflicted, and constitute profound food for thought by all stakeholders in Nigeria health system. It is expected that the facts presented in this review will go a long way towards providing the necessary information that will redirect the thoughts and actions of all the stakeholders of maternal health in Nigeria – especially including policy-makers at executive and legislative levels of government, non-governmental organizations, health care providers, community leaders, and of course the health care beneficiaries. This will constitute the veritable prerequisite to an effective maternal mortality reduction effort in Nigeria.

REFERENCE

1. WHO The tenth revision of the International Classification of Diseases (ICD-10). Geneva, WHO, 1992.
2. Trend in Maternal Mortality 1990-2013 estimates by WHO, UNICEF, UNFPA. The World Bank and the United Nations population division, p4,36.
3. World Health Organization, United Nations Children's Fund, and United Nations Population Fund. Maternal Mortality in 1995. Estimates Development by WHO, UNICEF and UNFPA. Geneva. 2001. World Health Organization (WHO/RHR/01.9).
4. Starrs, A. The Safe Motherhood Action Agenda: Priorities for the next Decade. New York Family Cares International: 1998:1
5. UNDP. Human Development Report 2003, MDGs: A compact among Nations to end human poverty.
6. United Nations Millennium Declaration 2000. A/RES/SS/2. 18 September, New York. http:/www.un.org/millennium/declaration/are5552e.pdf.march2003.
7. National Population Commission (NPC) {Nigeria} and ORC Macro. 2004. Nigeria Demographic and Health Survey 2003. Calverton, Maryland: National Population Commission and ORC Macro.
8. United Nations Population Fund. State of World Population 2002. People, Poverty, and possibilities, New York, UNFPA.
9. Federal Ministry of Health. Consolidated Health Sector Reform/NEEDS priorities for Action. FMOH Abuja. 2003.
10. National Population Commission (NPC) {Nigeria} and ORC Macro. 2008. Nigeria Demographic and Health Survey 2009. Calverton, Maryland: National Population Commission and ORC Macro.
11. Nigeria demography and health survey 2013 preliminary report; population commission Abuja Nigeria, measure DHS, ICF International Calverton Maryland USA October 2013(USAID, UKAID, UNFPA, NPC) p20
12. Fatusi, A.O., Ijadunola, K.T. National Study on Emergency Obstetrics Care Facilities in Nigeria, UNFPA/FMOH, Abuja. 2003.p1
13. World Health Organization. Mother-Baby Package: implementing Safe Motherhood in countries. Practical Guide. Maternal Health and Safe Motherhood Programmes, Division of Family Health, WHO, Geneva. 1994.
14. World Health Organization. Mother-Baby Package: Implementing Safe Motherhood in countries. WHO/FHE/MSM/94.11. World Health Organization, 1994.
15. Okafor, C., Olukoya, P. Safe Motherhood Nigeria. Women's Perspective on Maternal Mortality and

Morbidity. Views and Issues from four Zonal Seminar. 1990.p16
16. Akachi, J., Emishe, K., Igado, O., Ikon, J., Ahemen, T., Akuto, G., Anyebe, W., Ebe, M., Maxwell, K. Benue Health Fund operation research on health related beliefs and practices associated with environmental hygiene and malaria in rural Benue State. (Undated).
17. Harrison, K.A. Maternal morbidity in Nigeria: The real issues. African J. Rep. Health, 1997; 1 (1): 7-13.
18. Harrison, K.A. Macro-economic and the African mother. (Editorial) J. R. Soc. Med. 1996; 89: 361-362.
19. Ekwempu, C.C., Maine, D., Oluraba, M.B., Essien, E.S., Kisseka, M.N. Structural Adjustment and Health in Africa. Lancet, 1990; 336: 56-57.
20. Federal Office of Statistic (FOS). Poverty profile for Nigeria 1980-1996, Lagos, FOS. [the moderately poor have annual income or expenditure less than N11, 292.96 or the equivalent .of $141.2 at 1996 exchange rate of N80/1$, while the core poor have annual income or expenditure less than N5, 646.48 or the equivalent of $70.6. 1999.
21. Onwudiegwu, U. The influence of poverty on the utilization of maternal health services in Nigeria. In: Afonja S, Adelekan D, Soetan F, Alimi T, Ayanwale B. (Eds.) Research and policy directions on poverty in Nigeria. Centre for Gender and Social Policy Studies, Ile-Ife, 2001; 77-85.
22. Kale, Y. Nigeria Poverty Profile Report 2010. Press briefing by statisticians General of the Federation, National Bureau of Statistics Abuja 13th February 2012
23. Adinma, E.D., Adinma J.I.B. Community based Healthcare financing: untapped option for Health Care for Health care funding in Nigeria. Nigeria Medical Journal, 2010;51 (3): 95-10
24. Prevention of Maternal Mortality network (PMMN). Barriers to treatment of obstetrics emergencies in rural communities of West Africa. Studies in Family Planning, 1992; 23 (5): 279-291.
25. Acsadi, G.I., Johnson, A.G. Social and cultural factors influencing maternal and child mortality in sub-Saharan Africa with special reference to Eastern African countries. In the Effects of Maternal Mortality on children in Africa: an explanatory report on Kenya, Namibia, Tanzania, Zambia and Zimbabwe, (compiled by) Defense for Children International – New York USA, 1991: 73-76.
26. Okonofua, F.E., Odimegwu, C., Ajabor, H., et al. Assessing the prevalence and determinants of unwanted pregnancies and induced abortion in Nigeria. Stud FamPlann, 1999; 30: 67-77.
27. Adetoro, O.O. A fifteen year study of illegally induced abortion at Ilorin, Nigeria. Int J Gynaeco/Obstet 1998; 29: 65-68.
28. Bankole, A., Oye-Adeniran, B.A., Sing S., Adewole, I.F., Wulf, D., Sedgh, G., Hussain, R. Unwanted pregnancy and induced abortion in Nigeria: Causes and consequences. CAUP/Guttmacher Institute; 2006; (26) : 1.
29. Henshaw, K., Singh, S., Oye-Adeniran, B., Adewole, I.F., Ngozi, I., Yvette, P. The incidence of induced abortion in Nigeria.
30. Fatusi, A. Maternal Mortality Situation in Nigeria, FMOH, 2004.
31. Adinma, E.D. Influence of family planning on maternal mortality: Women's Sexual and Reproductive Right News. 2008; 7 (1&2): 2-3.
32. Adinma, J.I.B., **Adinma ED**. A critic of MMR reduction efforts in Nigeria. Tropical Journal of Obstetrics and Gynaecology, 2011; 28 (1): 5-13.

33. Adinma, J.I.B., Adinma, E.D. A critic of MMR effort in Nigeria. Tropical Journal of Obstetrics and Gynecology, 2011;28 (1): 5-13
34. Adinma, E.D. Family planning in contemporary reproductive health and rights. Tropical Journal of Obstetrics and Gynaecology, 2011; 28(2) 112-120
35. Otoid, V.O., Oronsaye, F., Okonofua, F.E. Why Nigerian adolescent seeks abortion rather than contraception: Evidence from Focus-Group Discussions. International Family Planning Perspectives, 2001; 27 (2).pages
36. Orubuloye, I.O., Ajakaiye, D.O. Health seeking behaviour in Nigeria. Nigerian Institute of Social and Economic Research, Ibadan. 2002.
37. WHO. WHO contributes to 'Making pregnancy safer'. A press release quoting from the keynote address delivered by Professor UmaruShehu at WHO Nigeria titled 'Improving maternal health services in Nigeria'. www.who-ni.geria.org/press/pregnancy.january24 2004.
38. Federal Ministry of Health, United Nations Population Fund (Nigeria). National study on essential obstetrics care. Abuja, FMOH, UNFPA, 2003. P1
39. WHO Global Health Facts, Birth attended by skilled personnel, World Health statistics 2013. P1
40. Family Care International. "Skilled Care during child birth" Safe Motherhood Fact Sheet, 1998, Family care International, New-York, USA. P1
41. Adinma, J.I.B. Report of Baseline/Needs Assessment of health facilities in Anambra State under the UNFPA/CIDA Emergency Obstetrics Care Project, 2008. P6-14
42. Engender Health. 2004. Maternal health services in six Nigerian States. Summary of a Needs Assessment presented at Chida Hotel, Abuja on 15th April 2004.
43. Kols, A.J., Sherman, J.E. Family Planning Programs: Improving quality. Population Reports, Series J, No 47, p1-39 Baltimore, Johns Hopkins University School of Public Health. Population Information Program. 1998
44. Adinma, J.I.B., Adinma, E.D. Medical Education and Medical Practice in Nigeria-Challenge and strategies for improvement. Archives of Nigerian Medicine and Medical Sciences, 2006, 3 (2): 6-16
45. Adinma, D., Adinma, J.I.B., Community Based Health Financing; An untapped option to a more effective Healthcare funding in Nigeria. Niger Med J vol51, No3, July-Sept 2010
46. World Health Organization. World Health Report 2000, Health system, improving Health performance. Geneva WHO.
47. DFID Health Systems Resource Centre.. Institutional Analysis for the Reforms of the Federal Ministry of Health. September 2000.
48. Canadian Health care Information, World Health Organization's ranking of the world's Health system. 2014
49. Maine, D., Wray, J. Effects of family planning on maternal and child health. Contemporary Ob/Gyn. 1984; 23(3): 122-136.