

THE INTERNATIONAL JOURNAL OF SCIENCE & TECHNOLEDGE

Maternal Mortality Dimensions in North-Western Nigeria: A Case Study of Kaduna Metropolis

Iwalaiye Elizabeth Mayokun

Post Graduate School, Nigerian Turkish Nile University, Abuja, Nigeria

Ali Andesikuteb Yakubu

Department of Geography, Kwarafa University, Wukari, Nigeria

Lagan Andat Nathaniel

Department of Science and Technology Education, University of Jos, Nigeria

Danjuma Andembutop Kwesaba

Department of Geography, Benue State University, Makurdi, Nigeria

Abstract:

Maternal mortality in Nigeria is ranked second in the world after India and Nigeria is part of a group of six countries in 2008 that collectively accounted for over 50% of all maternal deaths globally. Midway to 2015, the date set for attaining the MDG 5, many women still die in Nigeria when compared to most other countries. About 53,000 women die every year, which means one woman dying every 10 minutes. This frightening situation is indeed a call for research. A purposive sampling method was adopted using Hospital record of 5 years to review maternal deaths. Following the projection of women within the reproductive age in Kaduna metropolis, the researcher adopted a sample size of 384 to capture maternal mortality cases in the Household survey. A number of 277 maternal death occurred among 38,058 deliveries in the hospitals during the 5-year period under review, with maternal mortality ratio (MMR) of 729/100,000 live births and incidence of 1 in 137 deliveries. Considering geographical distribution, Kaduna North hospitals recorded 233 maternal deaths with MMR of 979/100,000 live births while Kaduna South hospitals recorded 44 maternal deaths with MMR of 309/100,000 live births. By yearly variation MMR records 649/100,000 live births in 2003, in 2004 (811/100,000 live births), in 2005 (945/100,000 live births), in 2006 (459/100,000 live births) and in 2007 (814/100,000 live births). The greatest risk of MMR was among young adult women of age (15-24 years) and older women from 35 years and above. Parity-specific maternal mortality ratio was highest in the grand multiparous women. Unbooked as well as illiterate women were associated with very high maternal mortality ratio. Hausa-Fulani tribe contributed a disproportionate 47.6% to maternal deaths, which is the group with the highest maternal deaths. The major direct causes of deaths in the medical record are Eclampsia which accounted for (37.0%); obstructed labour is the highest in household survey. The most common indirect causes of maternal deaths identified in the medical records are HIV/AIDS (31.3%). Among others are some socioeconomic and cultural factors which are also underlying causes, such as poverty, lack of education, cultural taboos and gender inequality. However, improvement in family planning services, enlightenment through education, more skilled attendants, government policy in favour of maternal health and prompt efficient and emergency obstetric care will go a long way to help reduce maternal mortality in Nigeria.

Keywords: maternal mortality, maternal mortality ratio, medical records, household survey

1. Introduction

Globally, more than 200 million women get pregnant annually (Safe Motherhood Newsletter, 2000). Over 500,000 women die annually due to pregnancy related complications from hemorrhage, sepsis, obstructed labour, hypertension (eclampsia) and unsafe abortion. While as many as 20 million women currently suffer from short or long-term disabilities related to pregnancy and childbirth such as Vesico-Vaginal Fistula (VVF), Recto-Vaginal Fistula (RVF), severe anemia, Pelvic Inflammation Diseases (PID) and other reproductive tract infections and infertility (World Bank, 2006).

About 800 women out of every 100,000 die in the process of giving birth in Nigeria. This figure masks wide regional disparities which range from 339 per 100,000 live births in the South West to 1,716 per 100,000 live births in the North East as indicated by the presentation from a recent study on Maternal Mortality Situation and Determinants in Nigeria (Society of Obstetrics and Gynecology of Nigeria- SOGON). In 2008 (NDHS) maternal mortality ratio for Kaduna state was 800/100,000 live births (about 1 death for every 12 pregnant women). Attendance of antenatal clinic (ANC) was 30%; delivery by skilled attendants was 10% (Nigerian Urban Reproductive Health Initiative, 2014).

There are a number of problems inherent in measuring maternal mortality in Nigeria: vital registration systems might be inadequate in developing countries, hospital records might be poor, maternal deaths occurring outside health facilities might not

be registered, pregnancy status might not be disclosed, and maternal deaths might be misclassified (Population Reference Bureau, 2007). In the absence of complete vital registration systems with accurate attribution of causes of death, the methods used most commonly to estimate maternal mortality are household surveys with direct death inquiry, indirect and direct sisterhood methods and reproductive age mortality surveys (WHO, 2010).

This study has determined the magnitude of and trends of maternal mortality ratio in north-western region of Nigeria after the launch of the Millennium Development Goals (MDGs) and has also identified the various dimensions of maternal mortality in Kaduna metropolis

2. Materials and Methods

Kaduna metropolis is situated in north-western region of Nigeria; it is in one of the 36 states of Nigeria. In the 2006 census, the figure for Kaduna metropolis is about 1,570,331 in 2006 and 49 percent of the population was female (Chinwe, 2011). By 2015 the city is expected to have increased to 2,057,078 people (inhabitants).

Women of reproductive age (15-49) represent 48 percent of the total female population in the city, which will have a significant impact on the total fertility rate over the next few years. Kaduna's youth (15-24) is primarily female, with girls making up 52 percent of the total youth and boys comprising 48 percent.

Kaduna is a multi-ethnic society. Available evidence shows that the town is inhabited by over 200 different ethnic groups. Kaduna metropolis forms a portion of the country's cultural melting point with about six major ethnic groups and not less than 20 other smaller groups. Among the major groups are Hausa, Fulani, Kadara, Kagoro, Bajju, Jaba, Gbagyi, Kataf, and Kurama with a host of other ethnic groups, all settled as a result of central administrative, industrial and extensive trading activities. Christianity and Islam are the two main religious groups in the metropolis.

The purposive sampling method was used to select four hospitals for the survey. Three state government hospitals in Kaduna town were selected and one popularly known private hospital. These hospitals were selected because of their affordable cost of services and most women from all districts of the metropolis attend at least one of them.

Purposive sampling was also adopted in the household survey for women within the reproductive age. A number of questionnaires allocated to each of the six districts selected by quota sampling, three each from Kaduna North and South Local Government Areas. The census figure for women within reproductive age in 1991 was projected because census 2006 was not based on disaggregated data, using 3.18% growth rate as allowed by the National Population Commission to project population. The population projected for each locality was used to determine the proportion of questionnaire allocated.

Using Krejcie and Morgan (1970) formula for sample determination, a sample size of 384 respondents was adopted. On this basis 347 questionnaires were recovered after questionnaire administration and out of these only 165 women had information about maternal mortality cases.

3. Discussion of Results

3.1. Causes and Characteristics of Maternal death Using Hospital records

From Table 1 below, a number of 277 maternal deaths occurred among 38,058 deliveries in the hospitals over 5-year period yielding the maternal mortality ratio (MMR) of 729/100,000 live births in Kaduna metropolis with an incidence of 1 in 137 deliveries. In terms of spatial differentials, Kaduna North hospitals recorded 233 maternal deaths with MMR of 979/100,000 live births while Kaduna South hospitals recorded 44 maternal deaths with MMR of 309/100,000 live births.

Yearly Record	Number of Deliveries		Number Of Maternal Deaths		Maternal Mortality Ratio (MMR)		Number Of Complications in Pregnancy and Childbirth	
	Total	%	Total	%	Total	%	Total	%
2003	7548	19.83	49	17.69	649	17.65	462	16.11
2004	7401	19.45	60	21.66	811	22.05	587	20.47
2005	6770	17.79	64	23.10	945	25.69	600	20.92
2006	8053	21.16	37	13.36	459	12.48	627	21.86
2007	8286	21.77	67	24.19	814	22.13	592	20.64
Total	38,058	100.0	277	100.0	3,678	100.0	2,868	100.0

Table 1: Percentage Distribution of Total Number of Deliveries, Number of Maternal Deaths, Number of Complications of Pregnancy and Childbirth and MMR from 2003-2007 Using Medical Records
Source: Field Survey, 2012

The yearly variation of MMR records 649/100,000 live births in 2003, in 2004 (811/100,000 live births), in 2005 (945/100,000 live births), in 2006 (459/100,000 live births) and in 2007 (814/100,000 live births). There was no consistent MMR over the study period. It rather showed annual fluctuations in MMR. The MMR peaked in 2005 with a ratio of 945/100,000 live births. The lowest MMR of 459/100,000 live births is in 2006. Annual deliveries also fluctuated remarkably during the study period with the lowest deliveries in 2005.

The observed increase in maternal deaths in 2004 and 2005 may be attributed to the relocation of Ahmadu Bello University Teaching Hospital from Kaduna metropolis to Shika at Zaria, this factor increased the number of patronage of pregnant women to the state government hospitals, and it increased the ratio of patients to doctor and many pregnant women were at a disadvantage but in 2006, the Federal Ministry of Health woke up to the challenge and began to train more midwives and mobilization were made to combat maternal mortality (Ibrahim, 2006).

3.2. Direct Causes of Maternal Deaths

The most common direct obstetric cause of death in Nigeria includes hemorrhage, sepsis, pre-eclampsia/eclampsia, and anemia (kisekka et al, 1992). Rankings for these causes vary with location. In recent years, illegally induced abortion has increasingly been recognized as a major cause of mortality in women of childbearing age, particularly among the young aged women (Anate et al, 1995).

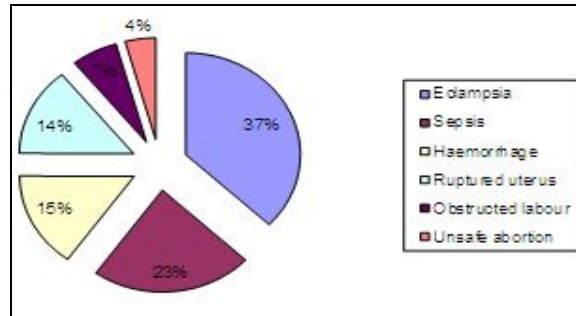


Figure 1: Percentage Distributions of the Six Direct Causes of Maternal mortality using Hospital records
Source: Field Survey, 2012

Figure 1 shows the six direct causes of maternal death that were identified using medical record. The six most common direct causes of maternal deaths are Eclampsia (37.0%), Sepsis (22.8%), Haemorrhage (15.2%), Ruptured uterus (14.1%), obstructed labour (6.5%) and unsafe abortion (4.3%). In the household survey (see Table 2): Obstructed labour accounted for (37.7%), Caesarean section (16.4%), Haemorrhage (16.4%), Eclampsia (12.1%), Abortion (7.3%), Miscarriage (6.7%), Sepsis (2.4%) and Unknown causes (1.8%).

Causes of Maternal mortality	Number of Respondents	Percentage (%)
Obstructed Labour	62	37.7
Haemorrhage	27	16.4
Caesarean Section	27	16.4
Eclampsia	19	12.1
Abortion	12	07.3
Miscarriage	11	06.7
Sepsis	04	02.4
Unknown causes	03	01.8
Total	165	100.0

Table 2: Percentage Distribution of Causes of Maternal Deaths using Household survey
Source: Field Survey, 2012

Though more than one factor may have contributed to maternal mortality in some cases, eclampsia seems to take a leading cause of maternal mortality in the medical record; this is because eclampsia occurs more frequently in primiparae and grandmultiparae women (UNICEF, 2001), these groups of women are common in this study. A study conducted in Kano, northern Nigeria is in agreement with this result, the finding state eclampsia as a leading cause of death among pregnant mothers (Yusuf et al, 2002). Eclampsia is hypertension in pregnancy, manifesting as convulsion and sometimes ending in coma and death. Unexpectedly, the second direct cause of maternal mortality in the hospital record is sepsis, an infection of the genital tract following delivery and unsafe abortion; it is usually accompanied with fever. It commonly affects the endometrium, extending into the blood vessels. Rapid detection of the infection and its early management are vital for preventing mortality. The infection starts in uterus, and then spreads to other sites, in severe cases it spreads into the blood stream (septicaemia). Haemorrhage is third direct cause of maternal mortality but ranked second in the household survey. It is common among multiparous and grandmultiparous women (Oxaal and Baden, 1996). Haemorrhage especially in the post-partum period, is unpredictable and rapidly leads to loss of life, particularly when the mother is anaemic and in the absence of prompt and

appropriate life saving care. Studies carried out in the southern part of Nigeria found haemorrhage and illegal abortion to be the leading causes of maternal mortality (Onwuhafua et al, 1992) and a study in the central part of the northern region (Ujah et al, 2005). It is also similar to the Household review as it accounts for 16.4% of maternal mortality and it accounts for the second direct causes of maternal deaths.

In addition to the reports in the Hospital records, ruptured uterus is fourth cause of mortality; it is mostly found among grandmultiparous women above 30 years of age, this is because numerous pregnancies weaken the birth canal. A study conducted in a Nigerian University Teaching Hospital revealed that 1 per 137 deliveries with the mean age of patients 30.5 years died of ruptured uterus which is similar to the result of this study. Ruptured uterus occurred in younger women with a scarred uterus compared with the unscarred group. The incidence of ruptured uterus was also highest in women who are grandmultiparous.

Surprisingly, obstructed labour, a common cause of maternal mortality in many developing countries is rare in the Hospital record but very pronounced in the household survey accounting for 37.7% of maternal deaths. This problem is more commonly encountered in communities where a large proportion of women marry at an early age when they (women) have not yet achieved optimal growth. It is also common in women who were malnourished in childhood and whose pelvic growth was impaired, this is a typical characteristic of a northern Nigeria situation (Wall, 1998). Ectopic pregnancy as a cause of maternal mortality was not indicated in the data.

3.3. Indirect Causes of Maternal mortality

The ten most common indirect causes of maternal mortality identified in the Hospital records are; HIV/AIDS (31.3%), Anemia (28.1%), Gastro-enteritis (9.4%), Malaria (6.3%), Cardiac-failure (6.3%), Sickle-cell anemia (6.3%), Hepatitis (3.1%), Diabetes (3.1%), Meningitis (3.1%) and Pelvic-inflammatory diseases (3.1%). See Table 6.

HIV/AIDS accounts for the largest proportion of indirect cause of maternal mortality in the Hospital records. It is noteworthy that HIV/AIDS is now alarming and Nigeria is in the epidemic phase of the AIDS pandemic. A seroprevalence survey shows a rate of (5.4%) among women attending antenatal services but in some areas in Nigeria this figure is over 20% (Johnson, 2000). The greatest toll of HIV/AIDS is among adolescents and adults. In 1988, it was estimated that approximately two million HIV positive women worldwide would give birth and in several major towns in eastern and southern Africa, more than a quarter of pregnant women are now HIV positive. Women with HIV are more likely to have complications during pregnancy and delivery, or abortion (UNFPA, 2002).

Indirect Causes of Maternal mortality	Percentage (%)
HIV/AIDS	31.3
Anaemia	28.1
Gastro-enteritis	09.4
Malaria	06.3
Cardiac Failure	06.3
Sickle-cell anaemia	06.3
Hepatitis	03.1
Diabetes	03.1
Meningitis	03.1
Pelvic inflammatory disease	03.1
Total	100.0

Table 3: Percentage Distributions of Indirect Causes of Maternal mortality using Hospital records
Source: Field Survey, 2012

Anaemia is the second highest indirect causes of death. Anaemia is common with pregnant women globally because of the increased physiological demands of pregnancy. Its effect are, however, more severe in the developing countries, due to poor dietary intake and repeated cycles of pregnancy and lactation, coupled with women's daily routine of heavy physical activities. Women with chronic anaemia are more likely to die from puerperal sepsis than those with normal iron levels. Anaemic women are also more likely to suffer frequent and dangerous infections of the respiratory tract, especially staphylococcal pneumonia. Latent tuberculosis lesions often become active and already active ones are exacerbated. Anaemia is therefore both a direct and indirect cause of maternal mortality (UNICEF, 2001).

Gastro-enteritis are diseases of the digestive system; this could appear in form of dysentery, diarrhoea and cholera. It is the third leading indirect causes of maternal mortality. Most especially at the time of its epidemics there used to be high mortality rate of both infants and adults and pregnant women could be affected. It is also an indication of frequent epidemic of gastro-enteritis diseases in Kaduna town. Surprisingly, malaria as a cause of maternal mortality was not among the first three indirect leading cause in this study. Maternal mortality due to anaemia in pregnancy may have been associated with malaria (UNICEF, 2001).

High incidence of cardiac failure has been detected in women who practice traditional rites during and after delivery, some of these practices are hot baths and food rich in salt and potash. Sickle cell anaemia is one of the sickle cell trait found in humans right from the time of birth. The disease is characterized by episodes of haemolytic anaemia that result in bone infraction and bone pain crises with pathologic involvement of many organs. Chronic ill-health is common in the sickle cell patients and if proper care is not given to the patient during pregnancy it could lead to maternal death (UNICEF, 2001).

The strong association between hepatitis and maternal mortality that is noted in this study has been documented in previous studies (Ujah et al, 2005); in his study he attributed hepatitis as a cause of maternal death to the high rate of consumption of locally brewed alcohol by women as well as men in some northern parts of Nigeria. The alcohol is believed to contain impurities that are toxic to the liver. Diabetes is commonly known to be a defect in carbohydrate metabolism and the absence of the hormone islet of langedhams from the pancreas in the body. It is usually accompanied by unuasugable thirst, copious urination, fatigue and rapid weight loss which use to

progress to coma and death (Foster, 1992). It is usually an existing disease but not caused by pregnancy.

Cerebro-spinal-meningitis (CSM) is also one of the diseases causing morbidity and mortality in women of child bearing age, particularly in the North East part of Nigeria (UNFPA, 2001), though CSM not very common in this study but it occurs in sporadic epidemics, affecting principally northern Nigeria during the dry season (UNICEF, 2001). Pelvic inflammatory disease is one of the long term complications resulting from unsafe abortion, in chronic cases the disease leads to maternal deaths (Adebiyi et al, 2006).

3.4. Age Group and Maternal mortality

The greatest age at risk of maternal mortality as revealed by the Hospital records (See Figure 2) younger women and aged mothers from 40 years and above. The percentage of younger mothers' age 15-24 years is the highest with (36.4%), which dropped at 25-29 (23.6%), and 30-34 years (23.6%) then rises again at older age of women from age 35-49 years (26.3%).

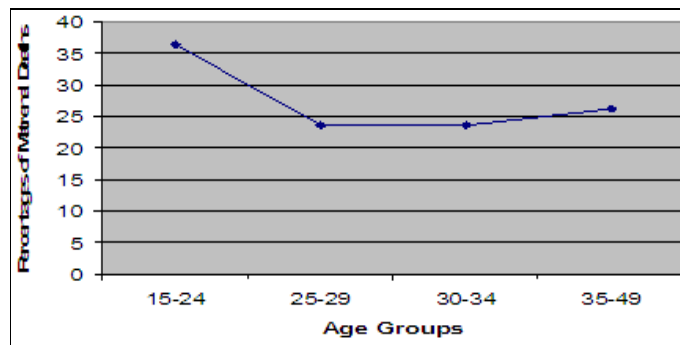


Figure 2 : Percentage Distributions of Maternal mortality by Age Groups Using Medical Records
Source: Field Survey, 2012

3.5. Parity/Still birth and Maternal mortality

Parity distribution in Figure 3 below shows increase in maternal mortality with increase in parity. A more or less similar bimodal pattern of maternal mortality is observed in both extremes of parity with elevated risks occurring among primiparae and grandmultiparae. Primiparae accounted for (33.6%), parity 2 (15.9%), parity 3 (14.5%), multiparae (9.8%) and grandmultiparae (26.2%). Other studies in northern Nigeria confirmed the result from medical record (Yusuf et al, 2002).

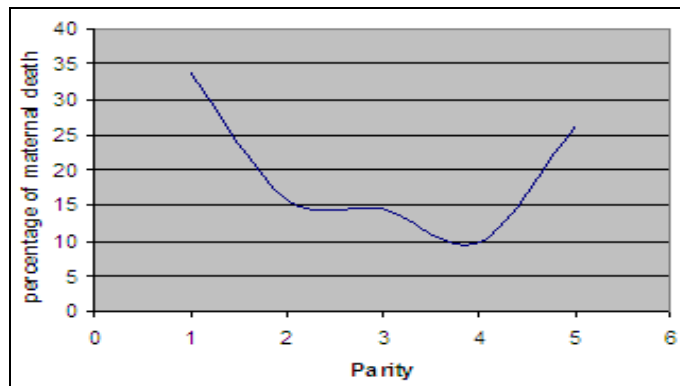


Figure 3 : Percentage Distribution of Maternal mortality by Parity
Source: Field Survey, 2012

It is also confirmed worldwide, that the likelihood of a mother dying is higher in her first pregnancy than in the second or third. Thereafter, however, the risk rises gradually again with each successive pregnancy.

On the other hand, similar result is found in the household survey report (Table 4), primiparae accounted for the highest with (32.1%), parity 2 (15.2%), parity 3 (17.0%), multiparous (11.5%) and grandmultiparous (24.2%). Grandmultiparae in the report are usually women that have had more than four pregnancies, frequent child bearing makes their uterus fibrotic and can easily rupture during delivery because of weak uterine muscle due to much child bearing. Primiparae are women with first pregnancy; they are usually inexperienced and often have undiluted birth canal. Primiparae who have poor antenatal care and socio-economic problems may be endangered during pregnancy and childbirth, multiparae are women with fourth pregnancy, they are likely to be prone to mortality if proper care is not taken during their pregnancy and childbirth.

Parity	Household Survey	
	(N= 165)	(%)
Primiparae	53	32.1
Parity 2	25	15.2
Parity 3	28	17.0
Multiparae	19	11.5
Grandmultiparae	40	24.2

Table 4: Percentage distribution of maternal mortality and Parity from Household survey
Source: Field Survey, 2012

A cross-tabulation statistical method was used to analyse the causes of maternal mortality by still births using data from household survey. This is an attempt to research on a finding discovered in Congo, in the Kosongo health centre where a study was carried out on both the “high risk” and “low risk” women to know if the high risk women are more vulnerable to obstructed labour.

Still Birth	The Causes Of Maternal Mortality							Total
	I	II	III	IV	V	VI	VII	
	(N=27)	(N=12)	(N=61)	(N=27)	(N=4)	(N=11)	(N=23)	
Yes	37.0	33.3	24.6	22.2	50.0	27.3	26.1	27.9
No	51.9	33.3	55.7	48.1	25.0	72.7	60.9	53.3
I Don't know	11.1	33.3	19.7	29.6	25.0	00.0	13.0	18.8
Total (%)	16.4	7.3	37.0	16.4	2.4	6.7	13.9	100.0

Table 5: Percentage Distribution of Causes of Maternal Mortality by Still Births Using Household Survey
Source: Source: Field Survey, 2012

- I - Caesarean Section
- II - Abortion
- III - Obstructed Labour
- IV - Haemorrhage
- V - Sepsis
- VI - Miscarriage
- VII - Others

Table 5 shows stillbirth cases among women that died of maternal mortality with (27.9%), No stillbirth cases (53.3%), and Unknown cases of stillbirth (18.8%). It is observed in the table that most women that died never had stillbirth, that is to say still birth is not a determinant of maternal mortality, and all pregnant women are at risk of maternal mortality. It is also observed from the study that women that died of obstructed labour without history of still birth (low-risk women) were twice the women with such history (high-risk women). It is possible to identify some of the high risk groups for example women who have experienced complications during an earlier pregnancy or past history of still birth, or women whose youth or age puts them at risk but all are at risk (UNFPA, 2002).

3.6. Booking Status and Maternal mortality

Women who received antenatal care (booked) had maternal mortality ratio of 270/100,000 live births, which is 37% of maternal deaths while women with no antenatal care (unbooked) had maternal mortality ratio of 459/100,000 live births, which accounted for 63% of maternal death. See Table 6 below.

Booking Status	Maternal Mortality Ratio (MMR)	Maternal mortality Using Medical Records	
	(Per 100,000)	(N=277)	(%)
Booked	270	102	37
Unbooked	459	175	63

Table 6: Percentage Distribution of Maternal mortality by Booking Status using Hospital records
Source: Field Survey, 2012

3.7. Education and Maternal mortality

Another correlate of maternal mortality was the educational level of the women shown in Table 7. In the Hospital records about 59% of all maternal mortality occurred among illiterates and primary school leavers only while secondary school leavers accounted for (32%) and tertiary (9%).

Educational Level	Maternal mortality	
	(N=277)	(%)
Illiterates/Primary	163	59
Secondary	89	32
Tertiary	25	09

Table 7: Percentage Distribution of Maternal mortality by Educational Level using Hospital records
Source: Source: Field Survey, 2012

It is observed that maternal mortality is lower with women of at least a secondary education. Furthermore, the higher a woman’s educational level, the less likely that she would die during childbirth (Ujah et al, 2005). Illiterate women are usually women of lower socio economic class who may likely delay seeking medical care and may not have knowledge of complications of pregnancy and childbirth and how to protect themselves against unwanted pregnancy. Those with at least secondary school and higher education qualification may have knowledge on how to protect themselves against unwanted pregnancy because of their educational level.

3.8. Ethnicity and Maternal mortality

Ethnicity of the women is also an important risk factor for maternal mortality. In the medical record (Figure 4) below, the women were grouped into 7 tribes. Although the Hausa-Fulani tribe contributed a disproportionate 47.6% to maternal mortality, other ethnic groups include Igbo (15.9%), Southern Kaduna tribe (12.7%), Middle belt tribe (9.5%), Yoruba (9.5%), Gwari (3.2) and South-south tribe (1.6%). Hausa-Fulani, Southern Kaduna and Gwari ethnic groups are the major indigenous ethnic groups in Kaduna state; they contribute to 63.5% of maternal mortality in Kaduna town, while the remaining 4 ethnic groups contributed 36.5% of maternal mortality. Similar findings have been recorded in the North-central part of Nigeria (Ujah et al, 2005).

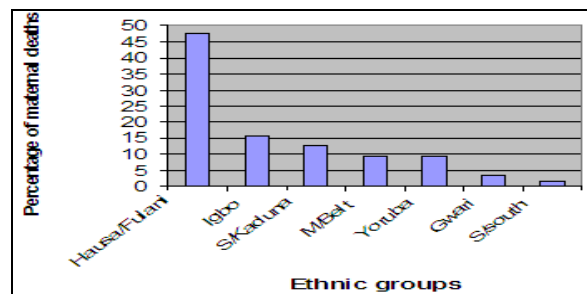


Figure 4: Percentage distributions of maternal mortality by Ethnic Groups Using Hospital records
Source: Field Survey, 2012

3.9. Religion and Maternal mortality

Religion as a cultural underlying factor to maternal mortality is shown in Table 13. Women who died during pregnancy and childbirth in the hospital records practice Islam (66.9%) and Christianity religion (33.1%).

Religion	Number of Maternal mortality	
	(N= 277)	(%)
Christianity	92	33.1
Islam	185	66.9
Traditional	0	00.0
Others	0	00.0

Table 8: Percentage Distribution of Maternal mortality by Religion using Hospital records
Source: Field Survey, 2012

The reason why Islam religion have higher proportion of maternal mortality cases is because they practice purdah and female seclusion, or hiding women in the inner parts of their husband's compounds and the early childhood marriage of females which have adverse on their women educational attainment and reproductive health. This finding is similar to kollehlon (2003) study. Polygamous family practice is also common with them; it increases their family size thereby increasing family demands on wealth and expenditure. Women that practice traditional religion are also at risk of maternal mortality because their traditional beliefs, rituals and taboos may have adverse effect on their health during pregnancy and childbirth.

4. References

1. Adebisi, G.A. and Charles A. (2006) An Analysis of Surgically managed cases of pelvic abscess complicating unsafe abortion. Department of Obstetric Gynaecology, Ahmadu Bello University Teaching Hospital, Kaduna State, Nigeria www. Ayubmed.edu.pk/JAMC/PAST/18.2/adesiyun. Assessed Online Material, Nov., 2006.
2. Anate, M., Awoyemi, O., Oyawoye, O. and Petu, O. (1995). Procured Abortion in Ilorin, Nigeria. East Afri Medical journal, Vol. 72, No.6.
3. Chinwe F. O and Ahmed S. (2011) Gender Needs Assessment for Kaduna Metropolis. <https://academiccommons.columbia.edu>
4. Foster, D. (1992). Health, Diseases and the Environment. Biling and Sons Ltd, Great Britain.
5. Ibrahim H. (2006). Nigerian Tribune: Kaduna moves to check maternal mortality.
6. Johnson, D. (2000). Country Health Briefing Paper: A Paper produced by Department for International Development (DFID) for the United Kingdom Department for international Development.
7. Kisekka, M.N., Ekwenpu, C.C., Essien, E.S. and Olorunfoba, B.M., (1992). Determinants of Maternal Mortality in Zaria Area, In Kisekka (ed.), Women's Health Issues in Nigeria, Tamaza Publishing Co. Ltd, Zaria.
8. Kollehlon K.T. (2003). Ethnicity and fertility in Nigeria, Social Biology: Fall; 50, 3/4: Research library page 201.
9. Krejcie, R.V and Morgan, D.W. (1970). Determining sample size for research activities in educational and psychological measurement. Journal of Education and psychology. No 30 pp 607 – 610.
10. Nigerian Urban Reproductive Health Initiative (2014). Kaduna. <http://www.nurhitoolkit.org>. Assessed Online Material, May, 2014.
11. Onwuhafua, P.A., Onwuhafua, D and Omekara, R.I. (1998). Ruptured uterus in Kaduna, Nigeria: A six year review. Journal of Obstetrics and Gynaecology, Taylor and Francis, Volume 18, Number 5/September 1, 1998. Pg 419 – 428.
12. Oxaal, Z. and Baden, S. (1996). Challenges to Women Reproductive Health: Maternal Mortality. Supported by Department for International Development (DFID). <http://www.Ids.ac.UK/bridge>. Assessed Online Material, February, 2007.
13. Population Reference Bureau (2007). Measuring Maternal mortality. www.prb.org. Assessed Online Material, May 2014.
14. Safe Motherhood Newsletter (2000). Agencies Unite against maternal mortality. Issue 28. World Health Organisation Geneva.
15. United Nations Children Education Fund (2001). Children's and Women's Rights in Nigeria: A Wake-up Call. (UNICEF) Published by National Planning Commission, Abuja, Nigeria.
16. United Nations Fund For Population Activities, (2002). Reducing Maternal Deaths: Selecting priorities tracking progress. Understanding the causes of maternal death, module 7, course 6.
17. Ujah, I.O. A., Aisen, O.A., Mutahir, J.T., Vanderjagt. D.J., Glew, R.H. and Uguru, V.E. (2005). Factors contributing to maternal mortality in North-Central Nigeria: A Seventeen – year review. African Journal of Reproductive Health. 9 (3) 27 – 40. <https://tspace.library.utoronto>. Assessed Online Material, Nov, 2006.
18. Wall L.L. (1998). Dead Mothers and injured wives: the social context of maternal morbidity and mortality among the Hausa of Northern Nigeria studies from planning; 29 (4): 341-359.

20. World Bank, (2006). Public Health At A Glance: Maternal Mortality. <http://www.worldbank.org/population>. Assessed Online Material, May 2007.
21. World Health Organisation (2010). Maternal mortality estimation at the subnational level: a model- based method with an application to Bangladesh. <http://www.who.int/bulletin/volumes>. Assessed Online Material, July 2014.
22. Yusuf, M.A. and Murtala, M.B. (2006). Causes and Determinant of Maternal Mortality in rural Kano. Paper presented at the 48th Annual Conference of the Association of Nigerian Geographers, University of Technology, Yola