# TRENDS AND CAUSES OF MATERNAL MORTALITY AT THE GENERAL HOSPITALS IN JIGAWA NORTH-WEST SENATORIAL DISTRICT

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**Abstract**

Maternal mortality reduction is very important of international development goal. Any attempts of health programme and policies aiming to reduce maternal deaths need reliable and valid information. The research was undertaken comprehensive review of maternal mortality at the General Hospitals in Jigawa North-West Senatorial District to find out the trends and maternal mortality causes and recommend ways of getting better the circumstances. The research utilized a retrospective data of maternal deaths records from 2010 to 2015. It incorporated all deaths related to pregnancy recorded at the public hospitals within this period. Midwives and other health records officers served as key research assistant who provided shading lighter on the primary data collected. The results reveal that there was a sum of 1,006 maternal mortality recorded  out of 73,821 l deliveries, yielding a of 1,362 per 100,000 live births maternal mortality ratio. The yearly mortality ratios observed an fluctuating picture. The study discovered a total of 8,265 reported obstetric complications in which direct causes accounted for 518(51%), while indirect causes were 492(49%).The study further identified the major obstetric complications that caused deaths in the study area in which the haemorrhage (APH and PPH) represents (29.3%), Anaemia in pregnancy (17.2%), eclampsia (12.6%), Retained placenta (RP) (10.4%), Sepsis (1.89%), Obstructed Labour (3.08), Malaria (9.74%), Labour Pain (4.17%). VVF (1.09%) and others uncommon causes representing (10,4%).Based on the above findings, the number of death recorded is unacceptably high and also the maternal mortality ratio (MMR) was not encouraging. Therefore, the research recommend: improve obstetric care by providing enough personnel, facilities, Haihuwa Lafiya vehicles that uses to carry women who are in labour prior to delivery and after delivery, and also enlighten the individuals and the entire communities on the effects of early age pregnancy.

**Key Words:** Maternal Mortality, Obstetric Complication, Maternal Mortality Ratio, Trends,

## INTRODUCTION

Improvement of the maternal health becomes source of concern; this is because global community want to reduce the maternal mortality rate. The effort became fruitful as resulted to declining the ratio of maternal mortality from 385 in 1990 to 216 in 2015. Therefore maternal health advancement is central in making health policy globally(Alkema et al., 2016). The maternal mortality burden is high still in many South Asian and less develop (Kassebaum et al., 2016; Vos et al., 2016). About 250,000 women lost their lives in 2015 alone. Unfortunately all the death have been avoidable because are from preventable causes. The preventable causes are eclampsia, anaemia, bleeding and prolong labour. If there is accessibility to the maternal health services by those women the deaths have been avoidable (Christopher, Aminu, & Onwenu, 2015; Lawson & Keirse, 2013; Olusegun, Ibe, & Micheal, 2012).

Maternal health facilities and care accessibility to are among the woman right all over the world and is regardless of the financial or social status of the women(Ginsburg et al., 2017; Matsuoka, Aiga, Rasmey, Rathavy, & Okitsu, 2010). Many research findings revealed that Nigeria and many less develop countries has high maternal death burden with high regional variation in terms of utilization of the health care (Gatrell & Elliott, 2014; Organization, 2016; Singh, Rai, & Singh, 2012).

Nigeria is a country which is characterized by many problems ranging from poverty, insecurity, political instability, geographical barriers and decayed social infrastructures including health facilities. Therefore the country is fighting challenges of health socio-demographic which include life expectancy (low), high maternal and infant mortality, high fertility rate and communicable diseases(Abbass, 2010; Development & Organization, 2010).  Even though the ratio of the maternal death in Nigeria decline from 1350 in 1990 to 814 in 2015, the country remain the second in terms of maternal death after sierra Lone within Sub Saharan African sub region(Organization & UNICEF, 2015b; Tabutin, Masquelier, Grieve, & Reeve, 2017). Many studies have argued that Socio-demographic and economic factors play significant role in maternal health services in terms of  availability and accessibility(Marmot, Allen, Bell, Bloomer, & Goldblatt, 2012; Moreno-Serra & Smith, 2012).

Globally, more than 200 million women get pregnant annually (Alkema et al., 2016), yet safe deliveries that are celebrated worldwide sometimes turns tragic to many women and families most of whom are poor and powerless. This is because women die because of pregnancy or childbirth from causes that are preventable. Maternal mortality involves the women death as result of pregnancy or six weeks (42 days) after the giving birth by the women, not considering of the period, from any pregnancy connected causes and accidental cause were excluded(Ebeniro, 2012; Eneh, 2017; Oppong & Ebeniro, 2016). In the 1980s some scholars argued that there are many deaths that occurred six weeks after the women had giving birth, therefore because of this, some definitions by Koonin and other scholars extended the period up to a period of good one year even after the pregnancy was terminated (Berg, Callaghan, Syverson, & Henderson, 2010; Howell & Zeitlin, 2017)

More than 350,000 pregnant women lost their lives annually as result complications from pregnancy or giving births of the child, 99 percent are found less developed nations. In

developed nations of the world, a woman's maternal mortality risk is 1 in 5,600as against less developed countries like Africa 1 in 30,(Organization, 2014; Oyerinde, 2016). Deaths of pregnant women are disappointingly unimaginable. In 2015 approximately around 303,000 pregnant women lost their lives as a result of giving birth to the child and complication from the pregnancy. Therefore every day close total of 830 mothers lost their lives as result of complication related to pregnancy. Nearly all the recorded death happened at developing nations and such deaths could have been avoidable if needed intervention is in place(Bhavin, 2018; Patel, Sharma, & Vati, 2018)

Sadly, Countries in Africa registered the highest number of a women dyeing as a result complication related to pregnancy, annually 253,000 women with the pregnancy related complication are dyeing (Yusuf Muhammad Adamu, 2014; Collymore, 2003; Supply & Programme, 2014).Many countries in Africa reduced the rate at which women dyeing as result of pregnancy. Other regions like North Africa and Asia recorded more success. The ratio of the maternal mortality of the world has reduced by 2.3% between 1990 and 2015 yearly(Bacci, 2017)

During the year 2010 Nigeria alone registered 10% of the world's total maternal mortality bearing in mind that Nigeria has only 2% of the world total population. The ratio of the death in the country (Nigeria) exceeds 1000 which is above average of African continent of 800 MMR. Less developed nation accounted for over 99 percent (99%) of the total maternal mortality of the world (Zozulya, 2010).The maternal mortality varies within Nigeria; the serious concern is in the Northern Nigeria which experiencing experienced high maternal mortality (figure i) (Yusuf M Adamu, Salihu, Sathiakumar, & Alexander, 2003; Wollum, Burstein, Fullman, Dwyer-Lindgren, & Gakidou, 2015)

The high number of maternal death recorded in Africa make the reduction of the problem as a global priority. A reliable estimate and dimension of the maternal mortality in Africa is needed to enable you come up with the effective intervention that can easily and efficiently reduced the burden. Because of the multi factorial complexity of the region make the measuring maternal mortality complex and very difficult even though remarkable progress has been recorded regarding the quality of data as a result of new ways of maternal mortality measuring in these countries(Organization, 2015, 2017)

Sustainable Development Goal 3 set a year 2030 as a target year to reduce the maternal death globally by 70 per 100,000. A national target was set by The Ending Preventable Maternal Mortality (EPMM) to achieve by SDG that countries should have MMR 420 or less than as baseline by the year 2010, ratio of maternal mortality to be reduce at least by 2/3 from 2010 to 2030. Country with the maternal mortality ratio of 420 in the year 2010 as baseline should not exceed MMR 140 by the year 2030. While a country with the less than 10 in 2010 achieve equity in MMR(Woldegiorgis, 2018)

Back to thenorthern Nigeria Jigawa State isn't a special case, with basically Hausa-Fulani by clans, men hold the essential basic leadership power in the general public, the choice to go to a wellbeing office in a crisis must hold up until the spouse (or parents in law) give assent (Adamu, 2003). It is additionally critical to take note of that, different exercises, for example, water and sanitation, streets correspondence, horticulture, and interior security, likewise impact maternal result (Wall, 1998 and NDHS, 2008).It is against this foundation; this examination was undertaking thorough maternal mortality review at Jigawa North-West General Hospitals so as to find the patterns and recognize the reasons for maternal mortality and recommends methods for improving the circumstance.

**Table 1. Variation of MMR in State/Geo-political Zones**

| Studies | Year | MMR/ 100,000 | State/city | Region |
|---|---|---|---|---|
| Adamu | 2003 | 2420 | Kano | North- |
| Kolo | 2013 | 1110 | Borno | North |
| Ujah et al. | 1999 | 739 | Plateau | North |
| Abdulkadir | 2015 | 825 | Jigawa Central | North |
| Ibrahim Y. | 2013 | 1625 | Kano | North |
| Olatunji et al | 2001 | 1700 | Sagamu | South |
| Okaro et al | 2001 | 1406 | Enugu | South |
| Ameh | 2015 | 1305 | Katsina | North |
| This Study | 2015 | 1362 | Jigawa Northwest | North |

Source: Various

**Aim and Objectives**

The point of this examination is to look at and clarify the patterns and recognize the reasons for Maternal Mortality dependent on General emergency clinics records in Jigawa North-west Senatorial District, so as to make proposals toward decrease of the weight of Maternal Mortality. The examination explicitly guided by the following objectives

i. To examine the Trends of maternal mortality, maternal mortality ratio from 2010 to 2015.
ii. To identify and explain the major causes of maternal mortality from 2010 to 2015.
iii. To describe the demographic characteristics of women who dead from obstetric causes from 2010 to 2015.

**MATERIAL AND METHODS**

**Study area**

Jigawa State came into being on 1991 August 27th . Jigawa State is positioned in North-western part of Nigeria and lies on the Latitudes $11^0 15^I N$ to $12^0 55^I N$ and Longitudes $8^0 15^I E$ to $10^0 15^I E$. Kano and Katsina States share a border with Jigawa State to the west, Bauchi State to the east and Yobe State to the north-east and the north, Jigawa State shares an international border with the Republic of Niger (MoL& PP, 2015). Jigawa State ranked 8th among the most populous states in Nigeria with 4,348,649 peoples (NPC, 2006). Jigawa North-West Senatorial District comprises three out of nine *Gunduma* council areas, namely Gumel, Kazaure and Ringim*Gunduma* council areas in which 12 Local Governments Areas are included, with the total population of males and females about 1,641,823 people (NPC, 2006).
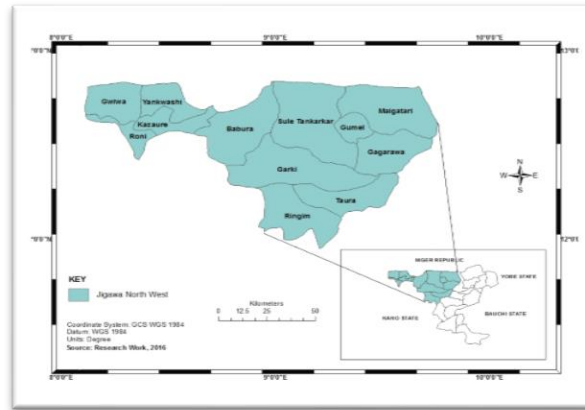
**Figure1. Map of the Study Area**

**Study Design and Data Collection**

The study used and adopted a retrospective record of 1,006 maternal death at the four available General hospitals in the study area from 2010 to 2015; it included all pregnancy related deaths that occurred within the period of study. It was also an assessment of all deaths related to pregnancy record in the reports at the General hospitals within the six year time-period. Furthermore, midwives working in the Maternity units of the hospitals were asked to assist in shading more light in some cases and other related issues from folders of the patient and other records regarding the obstetric complications. They also shared their experiences on issues relating to pregnancy and maternal mortality at the hospitals. The data collection instruments were used to elicit information from the patients' admission registers at the maternity units, patients' folders, *and Health Information* Management System (HIMS) unit. The data collection instrument used to record the number of maternal deaths, causes of the deaths, age of the dead women, women's parity, and place of residence among others.

**Statistical Analysis**

Because of the descriptive nature of the data the analysis was done using tables, frequencies and percentages. MMR was compute by dividing number of deaths counts by total number of deliveries and multiplying by 100,000 live-births. The study also, calculate case-fatality rate (CFR) as the number of deaths divided by the total number of obstetric complications multiplied by 100. The trends of maternal deaths and MMR over the six years studied, a line graph of maternal death against year was formed at first to have an idea about the pattern of temporal distribution of the deaths.

**RESULTS AND DISCUSSION**

**Age Distributions**

The demographic variables of the cases include, age, numbers of previous births (parity) and place of residence. The following presents the results of these demographic characteristics.

**Table 2: Age distribution of women died in pregnancy related complications**

| Age Group | Number of Women Dead | Percentages (%) |
|---|---|---|
| <15 | 24 | 2.4 |
| 15-19 | 260 | 25.8 |
| 20-24 | 227 | 22.6 |
| 25-29 | 118 | 11.7 |
| 30-34 | 114 | 11.3 |
| 35-39 | 75 | 7.6 |
| 40-44 | 60 | 5.9 |
| 45+ | 57 | 5.7 |
| unknown | 70 | 6.9 |
| Total | 1006 | 100 |

The age of women has commonly been distinguished as one of the pre-arranging variable of maternal mortality all inclusive (Ameh, 2015). A few examinations show that ladies at particular age bunches are more obligated to specific entanglements than others.Table 1 exhibits the age dissemination of thewomen died,theresults uncovers that ladies matured gatherings underneath 15 years of age spoke to minimal number of casesamong the aggregate of 1,006 passings with just 2.4%. The age bunch with the most elevated number of passings was15 to 19 with 25.8 %, followed intently by 20-24 age bunches with 22.6%. Indeed,the age gatherings of underneath 15 to 24 represented almost 50% of the passings in the cases. The remaining agegroups had passings cases as follows; 25-29 with 11.7%, 30-34 (11.3%), 35-39 (7.6%), 40-44, 45+ with 5.9% and 5.7% individually, while obscure matured gathering have 6.9% of the complete cases.The age gatherings of 15-19 represented the most elevated number of passings because of the way that Women in lower age bunches will in general bear more hazard in the childbearing procedure than those in the higher age gathering; this can be related with their physical structure.This might be the motivation behind why specialists in conceptive wellbeing

consistently demoralize early youngster bearing.Again age gathering of 35-39 represented the higher number of passings because of the way that they were 'multi-gravid', consequently they had given births on different occasions in the past,this may bring about debilitated uterus and thus mortality. This implies in spite of the fact that ladies more youthful than 20 and more established than 40 are at a danger of biting the dust during labor, the individuals who fall between the ages of 15 and 34 really have the most serious hazard. This is on the grounds that they fall in the age bunches where they are probably going to get pregnant on a few events in this way expanding their weakness.

**Parity of women who dead**
Certain age groups are more liable to certain complications than others; this effect is also related to the parity of a woman because in underdeveloped countries, age usually goes with parity and also women in developing countries have higher fertility (Adamu, 2003). All of the reported women have had at least one or more deliveries; this indicates high level of fertility in the study area. However, the number of deliveries decreased with increases parity. Table 3shows the parity distributions of women who died in the study area from 2010 to 2015.

**Table 3 Parity of the women who died**

| Parity (Delivery) | Number of women | Percentage (%) |
|---|---|---|
| 1-2 | 449 | 44.6 |
| 3-4 | 245 | 24.4 |
| 5-6 | 125 | 12.4 |
| 7-8 | 96 | 9.5 |
| 9-10 | 62 | 6.2 |
| 11-12 | 29 | 2.9 |
| Total | 1006 | 100 |

**Place of Residence of women who dead**
Taking into account the fact that the General hospitals receives referral cases from the primary health facilities in their catchment areas, the study made an effort to ascertain the place of residence of the various cases reported to the hospital and how that could have influenced the death of those women.

**Table 4: Place of Residence of the dead women**

| Place of Residence | Frequency of the cases | Percentage (%) |
|---|---|---|
| Gumel | 417 | 41.5 |
| Ringim | 420 | 41.7 |
| Kazaure | 169 | 16.8 |
| Total | 1006 | 100 |

From the table 4 above, 41.7% of the cases originate from Ringim *Gunduma* area, and also the 41.5% from Gumel Gunduma area. The remaining 16.8% came from Kazaure Gunduma area. About 33% of the cases in Ringim Gunduma came from the towns and villages within the Gunduma area such as Babura, Garki and Taura Local Government areas, in the case of Gumel Gunduma, about 23% came from the towns and the villages around such as Gagarawa, Maigatari and Sule-Tankarkar, while in Kazaure Gunduma only 6.9% cases come from Kazaure and 10% from the other towns within the Gunduma area such as Yan-Kwashi, Roni and Gwiwa. The higher percentage of cases from the Ringim Gunduma area is due to the fact that there are two General hospitals located in the area to handle all the referral cases from the towns and villages around the area.

**Trends of Maternal Mortality**
During the study period showed a total of 1,006 maternal deaths were recorded out of 73,821 live births, giving a maternal mortality ratio of 1,362 per 100,000 live births.

**Table 5 Annual Trends of Maternal Mortality Ratio**

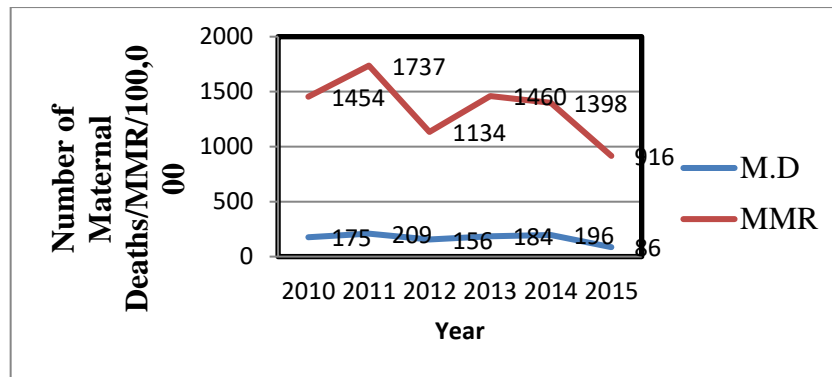| Year | Total Deliveries | Live-births | Maternal Deaths | MMR/100,00 Live-births |
|---|---|---|---|---|
| 2010 | 12061 | 12035 | 175 | 1454 |
| 2011 | 12056 | 12031 | 209 | 1737 |
| 2012 | 13783 | 13754 | 156 | 1134 |
| 2013 | 12621 | 12596 | 184 | 1460 |
| 2014 | 14045 | 14015 | 196 | 1398 |
| 2015 | 9409 | 9390 | 86 | 916 |
| Total | 73975 | 73821 | 1006 | 1362 |

**Fig.2 Temporal Trends of Maternal Deaths and MMR/100,000**

As indicated by the World Health Organization et al (2012), a significant test confronting dominant part of the nations on the planet is absence of complete common enrollment framework with great attribution of reason for death, making it trying to evaluate precisely the degree of progress towards the fifth Millennium Development Goal (MDG 5). To have an unmistakable circumstance of maternal passing, knowing the maternal mortality proportion per 100,000 live births is exceptionally basic, in light of the fact that maternal mortality is generally communicated per 100,000 live-births.A aggregate of 1,006 maternal passings distinguished, among the aggregate of 73,975 conveyances and 73,821 live-births inside the multi year time frames gave a surmised MMR of 1,362/100,000 live-births. The most noteworthy number of maternal passings was recorded in 2011 and the least number recorded was in 2015 with 209 and 86 individually. There was a decline of (5.3%) in 2012, of maternal passings, the most conceivable purpose behind this abatement is the compelling utilization of

HaihuwaLafiya around the year. In 2010, there were an aggregate of 1,450(17.4%) maternal passings recorded from a sum of 73,975 all out conveyances which processed to have MMR of 1454 for each 100,000 live-births. In 2011, in any case, there were a sum of 12,056 emergency clinic conveyances and the recorded maternal passings was 209 which yield the maternal mortality proportion of 1,737 for each 100,000 which is an expansion from 2010 with 1454/100,000. At that point the circumstance keeps fluctuating from 156 out of 2012 to 184 out of 2013 and 196 out of 2014 with MMR of 1134/100,000, 1460/100,000 and 1398/100,000 individually.

**Causes of maternal mortality**
One of the objectives of this study was to find out the major causes of these deaths that occurred over the period. The medical causes of deaths determined in the 1,006 death are presented in Table 6

**Table 6 Identified Causes of Maternal Deaths**

| Causes | Number of Deaths Caused | Percentages (%) |
|---|---|---|
| Heamorrhage(APH, PPH) | 295 | 29.3 |
| Eclampsia | 127 | 12.6 |
| P. Sepsis | 19 | 1.89 |
| Obstructed Labour | 31 | 3.08 |
| Retained Placenta | 105 | 10.4 |
| Aneamia in Pregnancy | 173 | 17.2 |
| Malaria in Pregnancy | 98 | 9.74 |
| Labour Pain | 42 | 4.17 |
| Vesco-Vaginal Fistula(VVF) | 11 | 1.09 |
| Others (uncommon causes) | 105 | 10.4 |
| Total | 1006 | 100 |

The deaths causes were further sub divided into indirect and direct cause figure 3. The 1,006 recorded deaths resulted from direct and indirect causes are; 51.1% from direct causes while 48.9% are indirect causes. The direct causes haemorrhage (APH, PPH) accounted for 29.3% of the deaths closely followed

by eclampsia with 12.6%. Anaemia cases represented 17.2% with Malaria taking up 9.74% and Retained Placenta accounts for 10.4%.Others accounted for the remaining 10.4% of the complications.
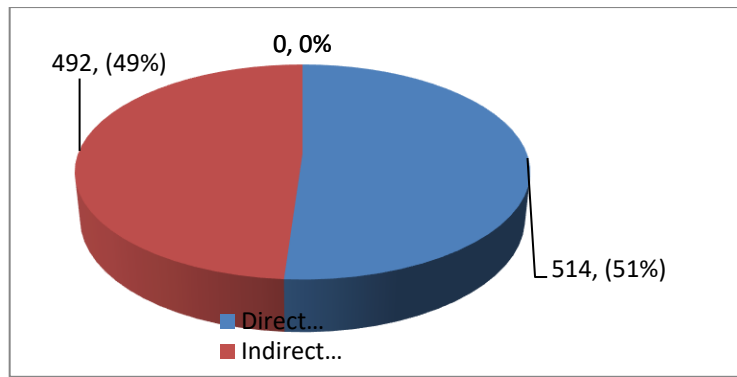
**Fig 3: Distributions of Direct and Indirect Maternal Deaths Causes**

**Non-Medical Causes**

The study sought to identify a number of non-medical factors which play important roles in the 1,006 recorded maternal deaths. Maternal deaths are very useful indicators for health policy makers, as they reflect not only the quality and quantity of health care but also the socio-economic status of a people. There are many non-medical factors that associate and influence the rate of maternal mortality in any given location, some of them are mentioned as follows; delay in seeking care, financial status, believes, age of the mothers, accessibility to health care services, culture and religion among others.

**CONCLUSION AND RECOMMENDATIONS**

Based on the temporal trends of hospital deliveries, maternal deaths, MMR observed, the trends were not encouraging. The observed trend shows annual fluctuations which indicated something wrong with the health system in the study area. Despite the fact that the patterns of maternal mortality and MMR in the General medical clinics over the time of study have seen a decrease, the decay isn't quick or soak enough to have the option to meet the targets of the MDG 5. Notwithstanding a few endeavours to check these patterns the quantity of ladies who pass on from labour is still high.

There are various medicinal and non-therapeutic, immediate and circuitous causes that record for the maternal passing in the examination zone and the issue must be given huge consideration so as to control the circumstance. Further examinations ought to be completed to decide the careful connection between the two (restorative and non-therapeutic elements) and how they happen in the maternal mortality circumstance. Based on the above finding the study recommend the following:

i)    There is the need for the health stake-holders to advice the government to intensify its efforts of "*HaihuwaLafiya*" programme, through providing additional vehicles (Ambulances) in order to encourage women especially those who are living far away from the health facilities for attending the hospitals for deliveries.

ii)   Health policy makers should give more consideration the major obstetric complications that causes maternal deaths in terms of their prevention and cures to lower their contributions towards maternal deaths. This would help in keeping the level of maternal mortality low.

iii)  Looking at the age distributions of women who dead in pregnancy related complications, policies or a low should be made in order to discourage early age pregnancy in order to improve maternal health outcomes

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