

Spatio-Temporal Distributions of Ante-natal Care Utilization and Hospital Deliveries in Jigawa North-West Senatorial District

Muhammad Abdulkadir^{1,2*}, Ruslan Rainis³

¹Geography Section, School of Humanities Universiti Sains Malaysia

²School of Preliminary Studies, Sule Lamido University, Kafin Hausa Jigawa State Nigeria

Corresponding Authors: Email: muhammad.abdulkadir@student.usm.my
rruslan@usm.my

³Geography Section, School Of Distance Education Universiti Sains Malaysia

Article Info

Volume 82

Page Number: 3372 - 3378

Publication Issue:

January-February 2020

Abstract:

Background: Antenatal care utilization and hospital deliveries is still low in Nigeria; this underutilization varies from region to region and from state to state. This study examined the spatio-temporal distributions of ANC utilization and hospital deliveries in Jigawa north-west senatorial district. **Methods:** The study employed a retrospective audit of 207,688 ANC utilisations at the four available general hospitals in the study area from 2010-2015, it included all pregnancy related deaths that occurred within the period of study. The study was carried out in three Gunduma council areas in Jigawa State. Required data was obtained from the hospital base records. **Results:** The results reveal that there were a total of 207,688 ANC services utilisation reported within the study period (2010-2015) and spatially distributed in the Gunduma areas as follows; Ringim Gunduma area had 120,711 (58.12%), Gumel Gunduma Area 48,251, (23.23%) and Kazaure Gunduma area with 38,726 (18.7%). Out, 207,688 ANC utilisations, only 73,975 (36%) of the women delivered in hospitals and a total of 1,006 (1.4%) women were dead in which (86.1%) had their ANC visit of at least one time. Those who have never attended any ANC visit have the considerable percentage (13.9%). There is no significant relationship between ANC visits and the parity (number of deliveries) of a woman ($X^2 = 46.813$, $df = 44$, the p -value = 0.368). This indicated no significant relationship between the ANC visits and the parity of the women. **Conclusion:** Efforts towards ensuring the utilization of ANC should be targeted towards the areas where no facilities, the importance of modern antenatal care should be emphasized even in the community settings and older women (multiparas) should be encouraged to utilize antenatal care services.

Keywords: Antenatal care utilisation, Hospital Delivery, Parity, Gunduma (district), Distribution, Spatial.

Article History

Article Received: 18 May 2019

Revised: 14 July 2019

Accepted: 22 December 2019

Publication: 20 January 2020

I. INTRODUCTION

Antenatal care visit is very essential to every pregnant woman as it gives them the opportunity to be examined by health personnel who then give them advice against any expected complications in order to have maximum protection to herself and yet to born baby. In fact, reproductive health care is the care of women before and during pregnancy, at the time of delivery and after delivery or within 42 days for the survival and well-being of both mother and her baby. Women who have access to attend antenatal care clinics stand a greater chance of having safe deliveries than women who do not (Abouzahr, 2007). This care is a key entry point for pregnant woman to receive a broad range of health promotion and preventive health services, including nutritional support, prevention and treatment of anemia, prevention, detection and treatment of malaria, tuberculosis and sexually transmitted infections and tetanus toxoid immunization (WHO, 2003). It is always an opportunity to promote the benefits of skilled attendance at

birth and to encourage women to seek postpartum care for themselves and their newborns. Antenatal care is a component of safe motherhood, focuses on birth preparedness and readiness to handle complications. The primary aim of ANC is ensuring prevention, early detection and prompt management of pregnancy related complications. Focused Antenatal Care requires four comprehensive ANC visits, delivery in a health facility with skilled health care providers or assistance from a skilled professional when giving birth at home, access to emergency obstetric care and a timely postpartum visit (Singh, et al., 2009). In developed countries an estimate of 97% pregnant women receive ANC and 99% use skilled obstetric services at delivery while in developing countries 63% and 53% of women use ANC and skilled obstetric care respectively (Agbede et al., 2015). This implies that sometimes women who received ANC from skilled personnel still end up patronizing unskilled services for delivery. In Nigeria and many other developing countries, pregnant women view the event of childbirth with apprehension of possible pain and

death unlike the situation in most developed countries (Ekele, Bello and Adamu, 2007). The trust in the healthcare facility to reduce this fear is low, and some will even prefer to use the tradition birth attendants for delivery (Agbede et al., 2015). Proportion of deliveries attended to by skilled health personnel in Nigeria declined from 43% in 1990 to 38.9% in 2008, although it rose to 53.6% in the year 2012, the trend is currently on the decline despite the interventions put in place (MDGs, 2010). Therefore, increasing utilization of maternal health services (MHS) for deliveries require special skills and attitudinal changes from both the providers and the clients. The recent international initiatives recommended the use of mobile phones as additional instrument in healthcare delivery and a means to boost utilization of MHS for delivery. The Millennium Development Goal 8 also highlighted the need to make use of new technologies available, especially those related to information and communication to improve healthcare delivery.

Statement of the Problems

Most of world's maternal deaths occur in developing countries though the majority of these deaths are avoidable. Lack of access to antenatal care or skilled attendants at delivery are associated strongly high maternal mortality indices (WHO, 1999, in Adamu, 2002). Over the years, efforts to reduce maternal mortality have included promoting antenatal care, providing family planning services, and improving essential obstetric care. Despite such interventions, many women do not have access to these life-saving services, not only in areas where they are non-existent, but even in the areas where they exist, because availability does not necessarily guarantee utilisation. A number of socio-economic and cultural factors act as constraints to utilisation of antenatal care services (Khan, 2000 in Adamu, 2002). The majority of women especially in rural areas do not have access to full antenatal care services and prepare to deliver at home without skilled attendants. In fact, the spatio-temporal studies on antenatal care utilisation and hospital deliveries from Jigawa state particularly north-western part of the state are not known. It is believed that if poor quality care services are rendered to antenatal mothers, the tendency is that there may be reduction in antenatal visits which will lead to reduction of deliveries in health facilities. There is also need to find out the level of antenatal care service utilization and the hospital deliveries spatially in order to identify which areas having the low utilisation of health care service for further actions. This study conducted in Jigawa North-West Senatorial District (where no such study has been done in the past) with the aim to examine and explain the spatial and temporal patterns of hospital deliveries and ANC services utilisations in the study area.

Objectives of the study.

- To examine the spatio-temporal distributions of antenatal care (ANC) utilisation from 2010 to 2015 in the study area

- To identify and explain the spatio-temporal distributions of the hospital deliveries from 2010 to 2015
- To describe the demographic characteristics of the women who died during their last delivery from 2010 to 2015

Hypothesis

H₀: There is no significant relationship between ANC visits and parity (deliveries).

H_A: There is significant relationship between Age and ANC visits and parity (deliveries).

Materials and Methods

Background of the study area

The study conducted in four General hospitals, were purposely selected due to their full maternal health care services. Jigawa State is located in the north-west geopolitical zone of Nigeria; it was created out of the old Kano State on Tuesday 27th August 1991. It is located between Latitudes 11°15'N to 12°55'N and Longitudes 8°15'E to 10°15'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 (Min. of Land & Physical Planning, 2015). It has the population of 4,348,649 (NPC, 2006). Jigawa is made up of 27 Local government areas and the state uses "Gunduma health care system", the state was divided into nine health Gunduma council areas. In particular, Jigawa north-west zone comprises three (3) out of the nine (9) health Gunduma council areas namely: Gumel, Kazaure and Ringim Gunduma council area and twelve (12) Local Government areas were distributed within the zone (Figure 1) with population of 805,104 (NPC, 2006).

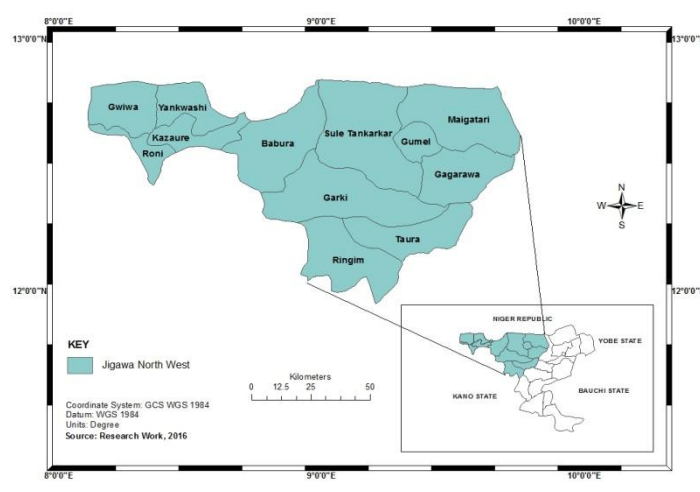


Figure 1. Map of the Study Area

The four purposely selected General hospitals located in these areas are as follows; Gumel General Hospital, Ringim

General Hospital, Babura General Hospital and Kazaure General Hospital. These hospitals have ANC clinics and maternity units that provide emergency obstetric care services. The hospitals are staffed by chief medical officers, nurses, midwives and are equipped with laboratories and receipt all referral maternal cases from the primary health facilities in their catchment areas. Charges for ANC services and some other maternal health care services are very low. The maternal mortality ratio in the study area was 1,359 deaths per 100,000 live births as of 2015, and case fatality rate was 12.2/100. There were 1,006 reported maternal deaths within the study period (2010-2015), the deaths were due to mainly Hemorrhage (29.3%), Eclampsia (12.6%) among others (Musa, 2015).

2.2 Study Design and Data Collection

The study employed a retrospective audit of 207,688 ANC utilizations at the four available General hospitals in the study area from 2010-2015, it included all pregnancy related deaths that occurred within the period of study. It was an examination of all hospital deliveries, general ANC utilizations and the ANC visits by those who died within the period of study (2010-2015). In addition to the examination of records, also, 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 patient folders and other records regarding the ANC utilizations and the attendance for deliveries in health facilities.

The documented data were collected from these hospitals' records with aid of data collection instruments designed according to the research objectives. The instrument was used in order to summarise the data required. The required information from the ANC clinics, record units and the maternity units of the respective hospitals were filled by the researcher with aid of the unit's staff and the research assistants. The data collection instruments were used to elicit information from the patients' admission registers at the ANC clinics, health information management system (HIMS) units, and maternity units. 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.

Data Analysis and the Statistical Tests.

Because of the descriptive nature of the data, it was summarising and presented using tables described the frequencies, percentages and decreases or increases of antenatal care (ANC) utilizations, hospital deliveries and other demographic variables. The study also, examined the temporal distributions of ANC and hospital deliveries over the six years; a line graph was also produced initially to have an idea about the pattern of temporal distribution of both the two. Maps also used to show the spatial distributions of ANC and hospital deliveries in the study area. The data of those who died within the study period were coded, then recorded into Micro Soft Excel (2007) and transferred to Statistical Package for Social Science (SPSS, Version 21). Cross tabulation, which is a joint frequency of cases according to two or more classification of variable, was used. The joint frequency

distributions of ANC and parity (deliveries) have been statistically analyzed using Chi-square (X^2). The (X^2) inferential statistical technique was used to test whether there is or not significant relationship between variables stated in the hypothesis at (0.05) level of significance.

II. RESULTS AND DISCUSSION

Spatio-Temporal Distribution of the General ANC Utilizations

In order to comprehend the situation of maternal mortality in any given location, there is need to understand the general patterns of ante-natal care (ANC), utilizations. Women who have access to attend antenatal care clinics stand a greater chance of having safe deliveries than women who do not (Abouzahr, 2007).

Table 1 shows the temporal distribution of general antenatal care (ANC) utilisation in the study area. There was a total of 207,688 women who had attended the antenatal care (ANC) service at the general hospitals for at least once.

Table 1
Temporal Distribution of ANC

Year	ANC Attendance	% of total	Increase/ decrease
2010	26825	12.9	-
2011	31144	15.0	4319
2012	42369	20.4	11225
2013	43278	20.8	909
2014	42378	20.4	-900
2015	21694	10.4	-20684
Total	207,688	100%	

Source: Field Data, 2015

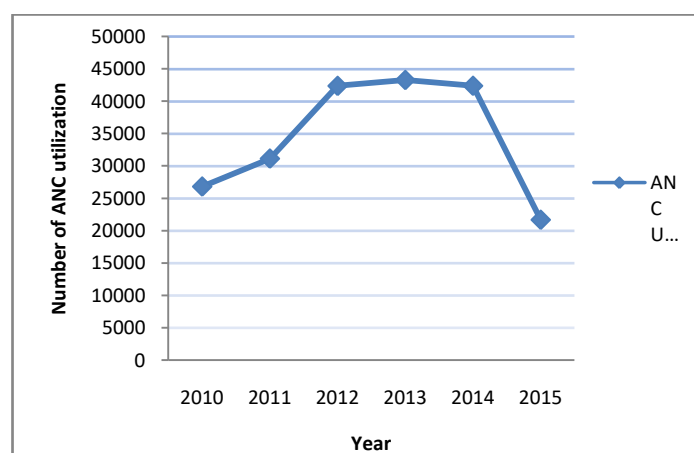


Figure 2. Temporal Patterns of Antenatal Care Utilizations

The data revealed that, there was an increase in ANC utilization from 2010 to 2013 ranging from 4,319 (16%) in 2011, 11,225 (36%) in 2012 and 909 (2.1%) in 2013, followed by decrease in 2014 with -900 (2.1%) and 2015 with -20,684 (46.1%).

-20684 (10%). The average figure of the total ANC attendance is 34,614 and the year having the highest number of ANC utilization is 2013 with 43,278 representing (20.8%), the reason behind the increase from 2010 up to 2013 was the effective use of maternal health care services under *HaihuwaLafiya* programme, which encourage women to attend ANC services. Unfortunately, around the year 2014 up to 2015, the programme was been weak and was not used effectively, instead women were asked to pay some charges along ANC services, so ANC attendance reduced drastically. The implications behind the decrease of ANC utilization is, women may prefer to use local treatment at home in the absence of health personal in which the outcomes of the pregnancy will be in danger. Therefore, the distributions of ANC utilization spatially explained that, RingimGunduma Council area has the highest number of ANC utilizations which account for 129,711 representing (58.12%) of the total ANC utilization within the study period. The geographical reason for this high number is related to the number of the general hospitals in the Gunduma council area and also the area is highly populated compared to other Gunduma areas in the zone. KazaureGunduma has the lowest recorded ANC utilization with 38,726 representing (18.64%). The expected reasons behind the situation is the geographical location of the Gunduma area, it is surrounded by Kano and Katsina states, and there is a number of health facilities around the area belong to either Kano or Katsina state, therefore, many of the women prefer to attended the nearby hospitals like Daura Hospitals in Katsina State, Dan Batta in Kano State etc. This practice has contributed to have lower percentage of ANC attendance in KazaureGunduma Council Area.

Table 2 Spatial Pattern of ANC Utilizations

GumelGunduma		RingimGunduma		KazaureGunduma	
LGA	ANC	LGA	ANC	LGA	ANC
Gumel	1308	Ringim	30237	Kazaure	1086
	1			Y/kwas	0
	1461			hi	9903
Maigatari	6	Babura	34714		
	1051				
Sule T.K.	1	Taura	27111	Gwiwa	8087
	1004				
Gagarawa	3	Garki	28649	Roni	9876
	4825		12071		3872
Total	1		1		6

Source: Field Data 2015

Table 2 reveal that, the spatial distribution of ANC at the Gunduma level, RingimGunduma area has the highest number of ANC utilization with 120,711 representing (58.12%), the GumelGunduma Area came next to Ringim with the total ANC utilization of 48,251, representing (23.23%). ANC utilization at the Local Government level revealed the same pattern as in Gunduma level, where local Government Areas within RingimGunduma council area having the higher numbers, followed by GumelGunduma, then KazaureGunduma council Areas, the geographical reasons earlier explained. Observing the figure 3, below, the

spatial distribution of ANC utilizations shows that, Babura, Garki, Taura and Ringim local government areas were high of ANC attendance. But, SuleTankarkar and Gagarawa local government areas were at the low ANC attendance, this is due to the women find it difficult to attend Gumel General Hospital from Gagarawa and SuleTankarkar for only ANC services, instead they attend nearby primary health care facilities to receive cares.

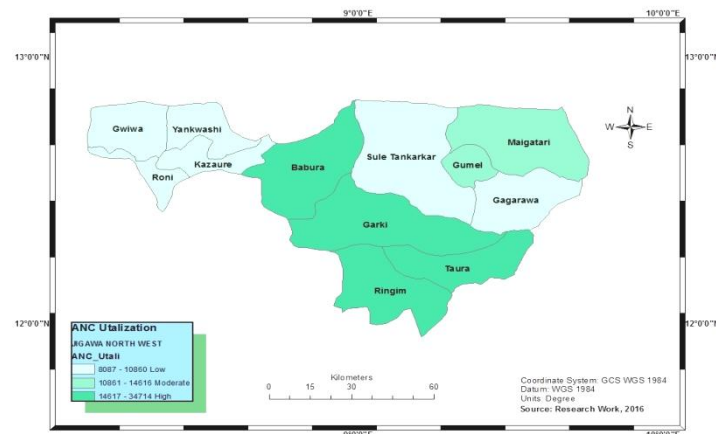


Figure3. Spatial Distributions of ANC utilizations

Spatio-Temporal Distribution of the General Hospital Deliveries

It is very difficult to get the exact total number of deliveries in any given area within a period of six years using only hospital records. However, looking at the number of deliveries reported throughout the six years period, one will expect to see more, the number of women delivering in hospitals is an underestimated one to the actual number of deliveries. For example, out of the total 207,688 women who have at least one ANC visit only 73,975 representing (35.6%) delivered in the hospitals, with a minimum of 9,409 and a maximum of 14,045 deliveries in 2015 and 2014 respectively. Many of the women go to hospital only when it is absolutely necessary due to obstetric complications (Adamu, 2003). The average delivery is 12,329. Table 3 shows the temporal distributions of hospital deliveries from year to year depending on a number of factors, such as utilization of and quality of antenatal and obstetric care services.

Table 3 Temporal Distribution of Hospital Deliveries

Year	Total Delivery	% of total	Increase/decreases
2010	12061	16.3	
2011	12056	16.3	-5
2012	13783	18.6	1727
2013	12621	17.1	-1162
2014	14045	18.1	1424
2015	9409	12.7	-4636
Total	73,975	100%	

Source: Field Data, 2015

The distributions were not uniform and the percentages shows some kind of fluctuations, for example, there were decreases in 2013 with -1162, the decreases coincided with internal strike around the year conducted by health workers across the state which paralyzed activities in all the health facilities.

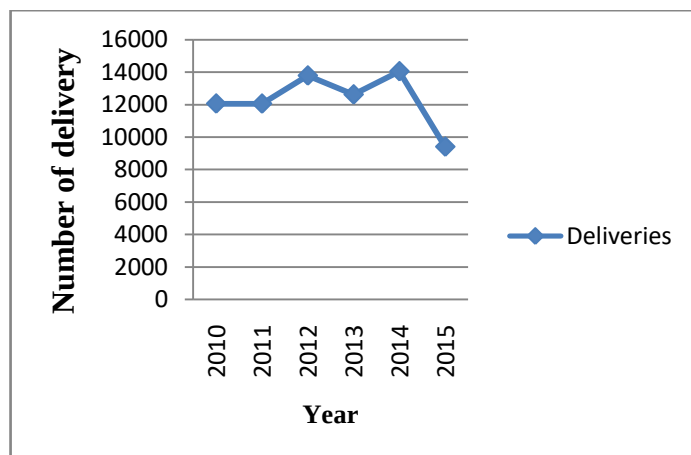


Figure 4. Temporal Patterns of Hospital Deliveries

This contributed to the decreased of about 17% of the total hospital deliveries. There was an increases of 1424 (18.1%) in 2014 even though the ANC were decreased. While at the end of 2014 to 2015, there was a steady decrease of hospital deliveries of about -4636 (12.75), this is as a result of the records gaps found in some of the hospitals during data collection. It might also be related to the different policies formulated and implemented by the Government from time to time while the distribution of midwives and nurses is also of great importance, as their availability tends to improve efficiency.

Table 5

Spatial Distribution of the General Hospital Deliveries

Gumel Gunduma		Ringim Gunduma		Kazaure Gunduma	
LGA	Delivery	LGA	Delivery	LGA	Delivery
Gumel	6371	Ringim	6128	Kazaure	6464
Maigatari	6046	Babura	7374	Y/kwashi	5957
Sule T.K.	6425	Taura	5815	Gwiwa	5433
Gagarawa	5508	Garki	6440	Roni	6014
Total	24,350		25,757		23,868

Source: Field Data, 2015

Therefore, the distributions of hospital deliveries (Table 4) spatially described that, the high number of hospital deliveries of 25,757 (34.8%) obtained in Ringim Gunduma Council Area. Gumel Gunduma Area came next with 24,350 (32.9%). Kazaure Gunduma Council accounted for a low percentage with 23,868 (32.1%). At local government level, Babura Local Government area has the highest number of

hospital deliveries with 7,374 (9.6%), while, Gwiwa Local Government area has the lowest number of hospital deliveries with 5,433 (7.3%). The average of the total deliveries within the study period is 6,164 (8.33%). The figure 5 shows the spatial distributions of hospital deliveries, in which it found only two local government areas classified as low hospital deliveries (Gwiwa and Gagarawa Local Government areas), looking at the distance to reach the nearby general hospital in their respective Gunduma council areas could be the reasons. While Gumel, Babura and Kazaure are urban areas and the General Hospital were located in these towns, so that people living in these areas are more access to and also aware of the importance of delivery in health facilities.

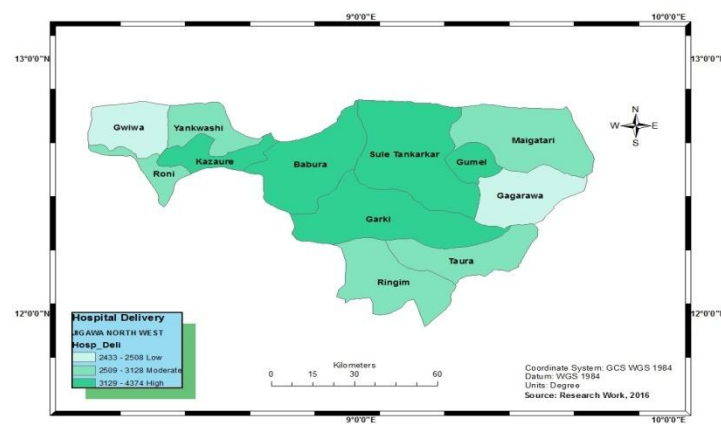


Figure 5. Spatial Distributions of Hospital Deliveries

Demographic Characteristics of the women who dead during delivery (2010-2015)

Table 5
Demographic Characteristics

Variables	Number	(%)
Age Group		
Below 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
Not indicated	70	6.9
Parity(Delivery)		
1-4	694	69
5-8	221	22
9-12	91	9
Place of residence (Gunduma Area)		
Gumel	417	41.5

Ringim	420	41.7
Kazaure	169	16.8
ANC Visits		
1 visit	172	17
2 visits	232	23
3 visits	172	17
4 visits	290	29
No visit	140	14

Source: Field Data, 2015

The age of women has generally been identified as one of the pre-disposing factor of maternal mortality globally (Ameh, 2015). Some studies indicate that women at certain age groups are more liable to certain complications than others, a total of 1,006 women who dead during delivery within the study period (2010-2015) was viewed representing (1.2%) of the reported 73,975 hospital deliveries. Four hundred and seventeen (417) representing (41.5%) of the women were from GumelGunduma area, 420 (41.7%) from RingimGunduma area, and 169 (16.8%) from KazaureGunduma area. In all deliveries, about 866 (86%) have attended ANC of at least one, while only 140 (14%) were not attended any ANC services. Table 4 described that, out of 1,006 died women, 172 (17%) has only one (1) ANC visit reported, 232 (23%) had two (2) visits, 172 (17%) had three (3) visits, only 290 (2.9%) had the recommended four (4) visits. ANC check-up is essential to the health of both the mother and the child, while 140 (14%) may not know the benefit and the importance of ANC services. Therefore, the study revealed that there are differences in the use of antenatal care (ANC) services between three Gunduma areas. These differences might be due to the fact that women living in Gunduma centres such as Gumel, Kazaure and Ringim are more accessible to the hospitals than others living in far away from the Gunduma centre such as Roni, Gagarawa, Gwiwa, Garki etc.

The table 5 revealed that, immediate deliveries, examples, 1-4 delivery can be an independent predictor of antenatal care utilization, where women whose age less than 30 nearly three times more likely to use antenatal care services than whose are multiparas which have 5 deliveries to above. The possible explanation might be young women (aged 15-29) with their immediate pregnancy and childbirth are more careful about their pregnancy and therefore require seeking institutional care than multiparas women, or older women whose in most cases prefer to attend the traditional birth attendants (TBA) due to the previous experiences they had.

Number of ANC visits Versus Parity (deliveries) of died women

The table 6 shows the distribution of women's ANC visits from zero visits to 4th visits by parity of the women. The results reveal that in all the three categories of deliveries there is fluctuation in number of ANC utilization by the dead women as follows; those who have never attend ANC

(No visit) has the considerable percentage (13.9%). Chi square were computed ($X^2 = 46.813$, $df = 44$, the p-value 0.368). This indicated a very weak or no significant relationship between the ANC visits and the parity of the women. Therefore, null hypothesis (H_0) fails to reject. Thus we can conclude that the ANC utilisations do not determine by the parity of a woman.

Table 6
Cross tabulation between ANC visits and Parity

			ANC attendance					
			No Visit	1 st Visit	2 nd Visit	3 rd Visit	4 th Visit	Total
Parity (Delivery)	1 st to 4 th Delivery	Count % of Total	84 8.30%	126 12.50%	146 14.50%	120 12%	188 18.60%	664 66%
	5 th to 8 th Delivery	Count % of Total	28 2.80%	31 3.10%	53 5.30%	29 2.90%	66 6.60%	207 21%
	9 th to 12 th Delivery	Count % of Total	28 2.80%	15 1.50%	33 3.30%	23 2.30%	36 3.60%	135 13.40%
	Total	Count % of Total	140 13.90%	172 17.10%	232 23.10%	172 17.10%	290 28.80%	1006 100%

Source: Field Data, 2015

III. CONCLUSION AND RECOMMENDATIONS

Conclusion

There are 207,688 ANC attendance distributed over the six years reviewed, in which spatially, GumelGunduma had 48,251(32.9%), RingimGunduma with 120,711(34.8%) and KazaureGundumahaving 38,726(32.1%). With all that, only 73,975 women delivered in hospitals. Based on the temporal distributions of hospital deliveries and antenatal care (ANC) utilisations observed shows annual fluctuations which indicated something wrong with the health system in the study area, the study investigated the patterns of ANC utilisation and deliveries using data from the general hospitals in the study area. In addition, the study examined the relationship between ANC visits and parity (deliveries) with (p value = 0.368). The research also mapped the spatial distributions of hospital deliveries and the ANC utilisations across three Gunduma council areas. Therefore, from a policy perspective, programs which are aimed at increasing women's participation in antenatal care utilization may take advantage of certain relevant information provided. In an attempt to encourage better use of medical services in general, and antenatal services in particular. The following recommendations if implemented may improve ANC utilisations and hospital delivery and other health care seeking behaviours.

IV. RECOMMENDATIONS

The following recommendations are as follows:

1. Directors at *Gunduma* council level should increase accessibility of ANC services by proving scheduled outreach programs in remote areas in collaboration with *HaihuwaLafiya* Programme.
2. Ministry of health with the aid of Chief Medical Officers need to provide continuous health education on the importance of antenatal care(ANC) services and delivery in the presences of skilled birth attendant through the media and community sensitization meetings.
3. Campaign against harmful community norms and cultural beliefs that could hinder mothers from accessing ANC services and delivery in health facility.

V. REFERENCES

- [1] AbouZahr C, Adjei S. (2007): From data to policy: good practice sand cautionary tales. The Lancet 2007 Mar 24; 369(9566):1039-46.
- [2] Adamu, Y.M. (2003) Geographical Analysis of Maternal Mortality in Kano State. PhD thesis, submitted to the Department of geography, Bayero University, Kano.
- [3] Adamu, YM and Salihu, HM (2002): Barriers to the use of antenatal and obstetric care services in rural Kano, Nigeria, Journal of obstetrics and Gynaecology (2002), vol. 22, No. 6, 600-603.
- [4] Agbede, C.O, Omeonu, P.E and Kio J.O (2015): Influence of clinic-based health education on pregnant women's knowledge and attitudes in relation to pregnancy management: Evidence from Ogun state, Nigeria Global J. of Medical Research: Gynaecology and Obstetrics, 15 (1):28-34.
- [5] Ameh, (2015) Geographical Analysis of Maternal Mortality in Kano State. MSc. thesis, submitted to the Department of geography, Bayero University, Kano.
- [6] Ekele BA, Bello SO, and Adamu AN (2007): Clusters of eclampsia in a Nigerian teaching, 2007 Engender Health, (2008) Obstetric Fistula Needs Assessment Report: Findings from Nine African Countries, Appendix on Nigeria available at www.engenderhealth.org.
- [7] Min. of Land & Physical Planning (2015); Jigawa State Ministry of Land and physical planning, Dutse: Administrative map of Jigawa State.
- [8] National Population Commission (2006): Report on the population and housing census of Population and Family Planning in Nigeria. Abuja: NPC Press.
- [9] Saengchai, S., Pattanapongthorn, J., & Jernsittiparsert, K. (2019). Influence of Beliefs on Attitudes and Intention of Adopting e-Health System among the Public Hospitals of Thailand. International Journal of Innovation, Creativity and Change, 8(8), 238-255.
- [10] Singh, S., Darroch, J. E., Ashford, L. S. and Vlassoff, M., (2009): Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health, New York: Guttmacher Institute and United Nations Population Fund.
- [11] WHO (2003): Antenatal care in developing countries: promises, achievements and missed opportunities: an analysis of trends, levels and differentials, 1990-2001? WHO Press