

IS ANTENATAL CLINIC ATTENDANCE A PROXIMATE DETERMINANT OF USE OF MODERN HEALTHCARE FACILITY FOR DELIVERY BY NIGERIAN WOMEN?

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Abstract

A proximate determinant of an outcome (or event) is a variable (or factor) that produces a direct effect on that outcome. It can act as an intermediary variable through which other variables (or factors) which have indirect effects on the same outcome variable operate to exhibit their effects. Socioeconomic, demographic and cultural factors (also called background or underlying factors) are known to have indirect effects on whether or not a pregnant woman would choose to deliver her baby in a healthcare facility. The background or underlying factors of the women can also determine if they will attend or not attend antenatal clinic during pregnancy. However, antenatal clinic attendance also has direct effect on a woman's use of healthcare facility to deliver her baby.

In this study we examined whether or not antenatal clinic attendance is a major proximate determinant of use of healthcare facility for delivery by Nigerian women. The study used quantitative data from the 2008 Nigeria Demographic and Health Surveys (NDHS). Mothers were asked to indicate where they delivered their last babies (i.e., in Healthcare Facility or outside the healthcare facility) and also the number of antenatal visits they attended during the pregnancy. A mother that had four or more visits during the pregnancy was considered to have had adequate number of visits and those who did not attend at all or attended for less than four times were considered not to have had adequate attendance. Information was also collected on the socio-economic and demographic characteristics of the women. Information was also collected on the socio-economic and demographic characteristics of the women.

The data analyzed consisted of 17,635 women aged 15-49 years who had a live birth within the five years preceding the survey STATA 12 computer software was used to carry out data analyses. Data analyses were at univariate, bivariate and multivariate levels. Due to the dichotomous nature of the outcome variable (i.e., whether a child was delivered in a healthcare facility or not; coded as (1, 0)), the multivariate analyses technique used is Binary Logistic Regression, and Likelihood Ratio (LR) statistical test of significance was applied.

Results from bivariate analysis indicated that the background (underlying) factors of the women (i.e., age, children ever born, region of residence, educational level, wealth index status, and religion) all have significant association with the number of antenatal visits made by mothers during their last pregnancy ($P <$

0.001). Similarly, antenatal clinic attendance has significant relationship with delivery in healthcare facility ($P < 0.001$).

The binary logistic regression which includes all the six background variables and antenatal clinic attendance (i.e., the proximate determinant) indicated a highly significant contribution to the model chi-square statistic. Women who had adequate number of antenatal clinic visits were about four times more likely to deliver their babies in healthcare facility than were those mothers who did not ($OR = 4.4, P < 0.001$). The likelihood Ratio (LR) test to determine the extent to which antenatal clinic attendance helped to explain the effect of the background variables on delivery in healthcare facilities also gave a highly significant result (chi-square = 891 on 1 degree of freedom, $P < 0.001$). This means that antenatal clinic attendance is an important proximate determinant through which socioeconomic, demographic and cultural factors influence Nigerian women delivery in healthcare facilities.

We conclude therefore that policies and programs targeted at encouraging Nigerian pregnant women to attend adequately antenatal clinics will also increase the prevalence of their delivery in healthcare facilities, thereby reducing the risk of maternal and infant mortality.

Keywords: Underlying Factors, Antenatal Clinic Attendance, Proximate Determinants, Healthcare Facility Delivery, Nigeria

1. INTRODUCTION

Maternal morbidity and mortality remains a challenge despite several global initiatives in reversing the trend. It is estimated that more than half million maternal deaths occur worldwide. The highest ratio is reported in Sub-Saharan Africa. It has been observed over time that most delivery is taking place outside established modern healthcare facility (whether public or private). A nation's development depends on the health status of its people and health is a basic human right of everybody everywhere. Accessibility to health care has a large socio-economic benefit whereas ill health has a grave effect on productivity. It is, therefore, not too surprising that Nigeria has one of the world's poorest maternal and child mortality rates and ratios. In order to reduce Nigeria's maternal and infant mortality rates, Nigerian mothers must intensify their utilization of modern healthcare facility for delivery. It is then that government can develop and implement appropriate and relevant policies that will produce the desired results.

Worldwide, there has been a significant drop in the number of women dying from pregnancy and childbirth. However, Africa still lags behind other parts of the world in making childbirth safe and the conditions in sub-Saharan Africa remain at emergency levels. In the 1990s, while the maternal death rate was as high as 1,100 per 100,000 live births in Nigeria, 600 in India, about 400 in Kenya, it was only 10, 12 and 17 for Italy, Poland and US respectively (World Bank Group, 2014). By the year 2010, while appreciable reduction has been achieved in other countries, Nigeria still ranks high among the countries with high maternal mortality due to low utilization of modern healthcare facilities (WHO, 2008). Recent findings by the World Bank Group (2014) indicate that maternal mortality in India is as low as 200 per 100,000 live births, 21 in United States, 4 in Italy and only 5 in Poland. In a recent report by the United Nations Funds for Population Activities (UNFPA), Nigeria is said to account for over 14 per cent of the World's maternal deaths. At about 145 of such deaths per day, this figure is outrageously high and unacceptable, if we consider that the figure translates to 576 deaths per 100,000 births and that Nigeria's population is just two per cent of the world's population.

An estimated 287,000 maternal deaths occurred globally in 2010 out of which 99.4 percent representing 285,300 occurred in developing countries and more than half of this proportion occurred in sub-Saharan Africa (World Bank, 2013). Nigeria accounts for about 10 percent of the Global Mortality Ratio putting the country in the class of second highest after India (Adamu, 2011). However, while virtually all developed countries have made appreciable progress in curbing the menace of maternal mortality, the appalling rates in Nigeria and other sub-Saharan African countries remain worrisome. South Asia, for example, succeeded in reducing maternal mortality from 620 per 100,000 live births in the 90s to 220 per 100,000 live births in 2010 (World Bank, 2013), Middle East Africa, North Africa, East Asia and Pacific have also reduced their maternal mortality ratios by more than 60 percent (World Bank, 2013).

Global efforts at reducing maternal deaths by engaging in the use of modern healthcare facilities and

disengaged from attending traditional birth homes have increased to save the life of mothers and children. Specifically, attempt to harmonize strategies were discussed in the World Conference on International Women's Year in Mexico in 1975, International Conference for Population and Development (ICPD) in Cairo (1994) and International Conference on Women in Beijing 1995, Hague Forum of 1999 and Millennium Development Goals (United Nations, 1994 and 2008; UN Women, 2011; UNFPA, 2013).

The use of modern healthcare services in developing countries have tended to demonstrate that people's acceptance or rejection of modern healthcare facilities is based on their perception of its effectiveness (Erasmus, 1961) and on how well it mesh with their traditional beliefs and practices concerning health and illness (Paul, Foste, 1976). People participate in Primary Healthcare Programmes to the extent that they experience the services as offering reliable solutions to what they perceive as health problems, including nutritional ones. The decision whether to use the services at the beginning of an illness, later, or even at all is calculated by weighing the anticipated benefits, in terms of opportunity cost, against the expected expenditure of time and money, and the personal abuse that these efforts may entail. The level of understanding on how people estimate factors on both sides of the equation relating costs to benefits is crucial to understanding the demand for primary healthcare services and, as a result, the strengths and weaknesses of the programmes.

In Nigeria, the choice to deliver outside modern healthcare infrastructure settings could be motivated by varying factors such as economic, social, physical, cultural or institutional. Outside the modern healthcare infrastructures setting, women can be assisted by an attendant who may be unskilled. This attendant could be a traditional birth attendant (TBA), village midwife, member of the family or neighbour. According to the Nigeria Demographic and Health Survey 2008, between 2003 and 2008, only 45percent of Nigerian expectant mothers received adequate antenatal care from a skilled provider: doctors, nurses/midwives, auxiliary nurses/midwives, 28 percent of births were assisted by skilled provider and 25 percent of deliveries took place in modern healthcare facilities. Expectant mothers who cannot access these services, due to perceived challenges like cost, distance and trust, are left to use "alternatives" such as Traditional Birth attendance (TBA) services.

The antenatal period is an important time for collecting vital information that fosters women's health, wellbeing and survival of their infants. The international organizations, like United Nations Children Endowment Fund (UNICEF), the United Nations Fund for Population Activities (UNFPA) and the World Health Organization (WHO) recommended a minimum of four antenatal care visits during pregnancy. The prescribed minimum number of visits is expected to provide needed services for safe delivery, and it could be possible through proper intervention which include treatment of hypertension to prevent eclampsia, tetanus immunization, intermittent preventive treatment for malaria and distribution of insecticide-treated nets, prevention of mother-to-child transmission of HIV, and micronutrient supplementation, including information about danger signs during pregnancy and childbirth (UNICEF, 2011). An essential aspect of preserving health is to identify the factors that enable or prevent people from making healthy choices in either their life-style or their use of medical care and treatment, the underlying assumption being that behaviour is best understood in terms of an individual's perception of their social environment (Tipping and Segall, 1995). When individuals make decisions in relation to their health, they weigh up the potential risks or benefits of a particular behaviour. They do so in such a way that influenced by their immediate physical environment, life-style, religious belief and their whole outlook on life generally (Norman and Bennet, 1996; WHO, 2002; Orubuloye, 2003). Studies by Fabrega (1973); Tanahashi (1978); Egunjobi (1983); Aregbeyen (1992); Orubuloye (1992) and Ademuwagun (1998) indicate that in a pluralistic medical setting in which the rural dwellers find themselves, the decision to seek care, where to do this and the form of care perceived as appropriate are all influenced by a range of factors relating to the person, the facility and the socio-cultural environment.

2. OBJECTIVE

The main objective of the study is to determine if antenatal clinic attendance constitutes a medium (i.e., a proximate determinant) through which socioeconomic, demographic and cultural characteristics of women influence their decision to deliver their babies in modern healthcare facilities or outside of it. It is predicated on the assumption that these characteristics of women determine whether or not they attend antenatal clinics during pregnancy and that those who attend adequate number of times are more likely to deliver their babies in modern healthcare facilities than those who did not attend or attended for inadequate number of times.

3. METHOD

The study used quantitative data from the 2008 Nigeria Demographic and Health Surveys (NDHS). Data on

17,635 women aged 15-49 years who had a live birth within the five years preceding the survey were extracted from the 33,385 women sampled in the survey. Mothers were asked to indicate where they delivered their last babies (i.e., in Healthcare Facility or outside the healthcare facility) and also the number of antenatal visits they attended during the pregnancy. A mother that had four or more visits during the pregnancy was considered to have had adequate number of visits and those who did not attend at all or attended for less than four times were considered not to have had adequate attendance. Information was also collected on the socio-economic and demographic characteristics of the women. The data were analyzed using STATA 12 computer software. The level of analyses involved Univariate, Bivariate and Multivariate analyses. Due to the dichotomous nature of the outcome variable (i.e., whether a child was delivered in a healthcare facility or not; coded as (1, 0)), the multivariate analyses technique used is Binary Logistic Regression, and Likelihood Ratio (LR) statistical test of significance was applied.

4. RESULTS

Table 1 presents the background characteristics of women who delivered at least a child during the 5 years period prior to the survey. The distribution shows highest proportions of women who were in the age group 35 years and above (27%) followed by women in the age group 25-29 (26.6%). Information on the women wealth index reveals that a large proportion of the women (about 45 percent) in the country are poor. In addition, Table 1, also presents the percent distribution of live births according to the proximate determinants, that is, number of antenatal visits. However, the Table shows that 55 percent of mothers reported to have had adequate antenatal clinic attendance having made four or more antenatal visits.

Table 1: Percentage Distribution of Women by Selected Socioeconomic and Antenatal Visits

Variables	Frequency (N)	Percentage (%)
Current Age		
Less than 20	1,225	6.94
20-24	3,454	19.56
25-29	4,700	26.61
30-34	3,516	19.91
35+	4,765	26.98
Children Ever Born		
1 Child	2,985	17.28
2-3 Children	5,526	31.99
4-6 Children	5,556	32.17
7+ Children	3,206	18.56
Region		
North Central	2,491	14.42
North east	2,704	15.65
North west	5,244	30.36
South east	1,560	9.03
South west	3,022	17.50
South south	2,252	13.04
Educational Level		
No education	7,829	45.33
Primary	3,932	22.76
Secondary	4,481	25.94
Higher	1,031	5.97
Wealth Index		
Poorest	3,963	22.94
Poorer	3,834	22.19
Middle	3,283	19.01
Richer	3,153	18.25
Richest	3,040	17.60

Religion		
Christianity	7,561	44.02
Islam	9,322	54.28
Traditional Religion	293	1.71
Antenatal Visits		
Less than 4 visits	7,787	45.48
4 or more visits	9,335	54.53

Source: Computed by the Researcher from 2008 NDHS (2017)

Table 2 shows the results of the bivariate association of the background variables and a proximate determinant (i.e, antenatal visits) and the place of delivery made by mothers during the pregnancy of their last children. The results indicated that all the background variables and the proximate determinant had significant bivariate relationship with place of delivery ($P = 0.000$ in all cases). For example, the higher the level of education of the woman, the more likely that she made adequate number of antenatal visits at the place of delivery. It is a similar relationship for age of the mother. The older the woman, the more likely she adequately attended antenatal clinics and deliver at health facility, except that both attendance and delivery at health facility declined among women who were older than 35 years. For wealth status, the richer a woman the more likely she would adequately attend antenatal clinic and deliver at health facility. However, the greater the number of children a woman ever born, the less likely she would make adequate antenatal clinic attendance and also make delivery at health facility. Also, mothers in Southern regions of the country made greater number of antenatal visits than the mothers in the Northern regions and invariably affect their deliver at health facility. Christians' mothers made both more adequate visits and delivery at health facility than mothers of other religions.

Table 2: Bivariate Association of Socio-Economic and Demographic Characteristics and Antenatal Visits with Place of Delivery

Variables	Delivery in a health Facility	Did not deliver in a Health Facility	Chi-Square Value	P-Value
Current Age				
Less than 20	265 (23.28)	8,746 (76.72)		
20-24	1,008 (30.33)	2,315 (69.67)		
25-29	1,852 (40.27)	2,747 (59.73)		
30-34	1,501 (42.45)	2,034 (57.55)		
35+	1,693 (36.55)	2,939 (63.45)	227.2052	0.0000
Children Ever Born				
1 Child	1,388 (46.58)	1,592 (53.42)		
2-3 Children	2,306 (41.81)	3,210 (58.19)		
4-6 Children	1,947 (35.16)	3,591 (64.84)		
7+ Children	677 (21.21)	2,515 (78.79)	534.4931	0.0000
Region				
North Central	1,058 (42.63)	1,424 (57.37)		
North East	3,767 (13.94)	2,325 (86.06)		
North West	4,922 (09.43)	4,727 (90.57)		
South East	1,158 (74.34)	3,998 (25.66)		
South West	1,101 (49.00)	1,146 (51.00)		
South south	2,131 (70.63)	8,861 (29.37)	5015.2651	0.0000
Educational Level				
No Education	8,331 (10.68)	6,969 (89.32)		
Primary	1,587 (40.46)	2,336 (59.54)		
Secondary	2,970 (66.41)	1,502 (33.59)		
Higher	928 (90.15)	1,014 (09.85)	5383.7832	0.0000
Wealth Index				

Poorest	307 (07.76)	3,645 (92.24)		
Poorer	631 (16.51)	3,192 (83.49)		
Middle	1,131 (34.50)	2,147 (65.50)		
Richer	1,811 (57.69)	1,328 (42.31)		
Richest	2,438 (80.37)	5,954 (19.63)	5306.6539	0.0000
Religion				
Christian	4,320 (57.26)	3,225 (42.74)		
Islam	1,924 (20.70)	7,369 (79.30)		
Traditionalist	52 (17.89)	241 (82.11)	2493.7312	0.0000
Antenatal Visits				
Less than 4	1,584 (47.74)	7,739 (52.26)		
4 or More	4,700 (60.37)	3,085 (39.63)	5040.8178	0.0000

Source: Computed by the Researcher from 2008 NDHS (2017)

Table 3 shows the results of the bivariate association of the background variables with the number of antenatal visits made by mothers during the pregnancy of their last children. The results indicated that all the background variables had significant bivariate relationship with antenatal visits ($P = 0.000$ in all cases). For example, the higher the level of education of the woman, the more likely that she made adequate number of antenatal visits. It is a similar relationship for age of the mother. The older the woman, the more likely she adequately attended antenatal clinics, except that attendance declined among women who were older than 35 years. For wealth status, the richer a woman the more likely she would adequately attend antenatal clinic. However, the greater the number of children a woman ever born, the less likely she would make adequate antenatal clinic attendance. Also, mothers in Southern regions of the country made greater number of antenatal visits than the mothers in the Northern regions. Christians mothers made more adequate visits than mothers of other religions.

Table 3: Bivariate Association of Socio-Economic and Demographic Characteristics with Number of Antenatal Visits

Variables	4 or More	Less than 4	Chi-Square Value	P-Value
Current Age				
Less than 20	337 (29.80)	798 (70.20)		
20-24	1,335 (40.50)	1,961 (59.50)		
25-29	2,260 (49.48)	2,307 (50.52)		
30-34	1,797 (51.10)	1,720 (48.91)		
35+	2,057 (44.65)	2,550 (55.35)	273.4866	0.0000
Children Ever Born				
1 Child	1,512 (50.92)	1,458 (49.09)		
2-3 Children	2,712 (49.57)	279 (50.42)		
4-6 Children	2,540 (46.08)	2,972 (53.91)		
7+ Children	1,024 (32.27)	2,148 (67.73)	418.8354	0.0000
Region				
North Central	1,205 (48.75)	1,267 (51.25)		
North East	882 (32.81)	1,806 (67.20)		
North West	1,094 (21.13)	4,083 (78.86)		
South East	957 (61.66)	595 (38.34)		
South West	2,447 (81.66)	550 (18.34)		
South south	1,202 (53.73)	1,035 (46.26)	5362.1804	0.0000
Educational Level				
No Education	1,734 (22.40)	6,007 (77.60)		
Primary	2,119 (54.19)	1,791 (45.81)		
Secondary	3,096 (69.56)	1,355 (30.44)		

Higher	838	(82.15)	182	(17.86)	5296.1017	0.0000
Wealth Index						
Poorest	627	(15.94)	3,306	(84.07)		
Poorer	1,106	(29.12)	2,6.91	(70.87)		
Middle	1,568	(48.22)	1,6.83	(51.78)		
Richer	2,025	(64.86)	1,097	(35.14)		
Richest	2,461	(81.56)	557	(18.44)	5448.9630	0.0000
Religion						
Christian	4,598	(61.27)	2,907	(38.73)		
Islam	3,056	(33.10)	6,176	(66.89)		
Traditional Religion	96	(32.81)	196	(67.19)	2793.6142	0.0000

Source: Computed by the Researcher from 2008 NDHS (2017)

Table 4 shows the results from the logistic regression for place of delivery controlling for selected background variables to show which of the background variables demonstrate a significant independent association with the outcome variable. Only two variables were found not to have a significant effect on the place of delivery.

Only the mothers who were 30-34 and 35 years and older had significantly higher use of healthcare facility for delivery than mothers who were less than 20 years (OR = 1.503 and 1.686, P=0.001 respectively). The findings also showed that the higher the number of children ever born, the less likely she would deliver in health facility. Women with level of education were more likely to utilize health facility for delivery when compared to women with no education. The odds ratios or chance that a woman would deliver her baby in a healthcare facility increases with increase in odd ratios. The odds ratios were 2.0, 3.5 and 8.5 for primary, secondary and post-secondary education respectively. All the odd ratios were significantly different at (P<0.001). Hence, the log likelihood results obtained for all the analysis when the proximate was not included was -7179 and (LR 1) =7879.

Table 4: Binary Logistic Regression Model for Place of Delivery Controlling for Selected Socio-Economic Characteristics

Variables	Odd Ratio	P-Value	STD Error	Confidence Interval (95%)
Current Age				
Less than 20	R.C			
20-24	1.008	0.938	0.101	(0.828 , 1.228)
25-29	1.265	0.024	0.132	(1.031 , 1.552)
30-34	1.503	0.000	0.171	(1.203 , 1.877)
35+	1.686	0.000	0.200	(1.336 , 2.128)
Children Ever Born				
1 Child	R.C			
2-3 Children	0.744	0.000	0.051	(0.651 , 0.851)
4-6 Children	0.622	0.000	0.049	(0.532 , 0.727)
7+ Children	0.543	0.000	0.054	(0.446 , 0.660)
Region				
North Central	R.C			
North East	0.425	0.000	0.029	(0.371 , 0.486)
North West	0.204	0.000	0.015	(0.175 , 0.236)
South East	1.628	0.000	0.133	(1.387 , 1.910)
South West	1.358	0.000	0.094	(1.184 , 1.556)
South south	0.490	0.000	0.034	(0.427 , 0.562)
Educational Level				
No Education	R.C			
Primary	2.048	0.000	0.119	(1.827 , 2.296)

Secondary	3.518	0.000	0.229	(3.097 , 3.997)
Higher	8.509	0.000	1.083	(6. 630,10.920)
Wealth Index				
Poorest	R.C			
Poorer	1.780	0.000	0.132	(1.538 , 2.059)
Middle	3.045	0.000	0.221	(2.641 , 3.511)
Richer	5.792	0.000	0.439	(4.993 , 6.720)
Richest	10.833	0.000	0.967	(9.094 ,12.906)
Religion				
Christian	R.C			
Islam	0.915	0.133	0.535	(0.817 , 1.027)
Traditional Religion	0.447	0.000	0.076	(0.320 , 0.624)

Source: Computed by the Researcher from 2008 NDHS (2017)

Number of observation = 17514 LR chi 2 (21) = 7879 Prob> chi 2 = 0.0000

Pseudo R2 = 0.3546 Log likelihood = - 7169

Table 5 shows the results from the binary logistic regression analysis for Place of delivery controlling for selected background characteristics and antenatal clinic visits. Women who had adequate number of antenatal clinic visits delivered their babies in the health facilities more than women who had inadequate number of visits (OR = 9.7; P = 0.000).

Table 5: Binary Logistic Regression Model for Place of Delivery Controlling for Selected Socio-Economic Characteristics and Number of Antenatal Visits

Variables	Odd Ratio	P-Value	STD Error	Confidence Interval (95%)
Current Age				
Less than 20	R.C			
20-24	0.898	0.310	0.095	(0.729 , 1.105)
25-29	1.075	0.510	0.118	(0.867 , 1.333)
30-34	1.260	0.053	0.151	(0.997 , 1.592)
35+	1.421	0.005	0.177	(1.112 , 1.815)
Children Ever Born				
1 Child	R.C			
2-3 Children	0.750	0.000	0.053	(0.653 , 0.861)
4-6 Children	0.618	0.000	0.051	(0.526 , 0.727)
7+ Children	0.574	0.000	0.060	(0.468 , 0.704)
Region				
North Central	R.C			
North East	0.436	0.000	0.031	(0.379 , 0.502)
North West	0.294	0.000	0.024	(0.251 , 0.344)
South East	1.657	0.000	0.139	(1.406 , 1.953)
South West	1.227	0.004	0.087	(1.067 , 1.411)
South south	0.576	0.000	0.042	(0.499 , 0.664)
Educational Level				
No Education	R.C			
Primary	1.545	0.000	0.094	(1.371 , 1.740)
Secondary	2.528	0.000	0.170	(2.216 , 2.884)
Higher	5.743	0.000	0.743	(4.457 , 7.401)

Wealth Index				
Poorest	R.C			
Poorer	1.385	0.000	0.109	(1.186 , 1.616)
Middle	2.047	0.000	0.157	(1.762 , 2.380)
Richer	3.546	0.000	0.284	(3.031 , 4.148)
Richest	6.107	0.000	0.569	(5.087 , 7.331)
Religion				
Christian	R.C			
Islam	0.956	0.448	0.057	(0.850 , 1.075)
Traditional Religion	0.462	0.000	0.082	(0.326 , 0.653)
Antenatal Visits				
Less than 4	R.C			
4 or More	9.702	0.000	0.755	(8.329 , 11.302)

Source: Computed by the Researcher from 2008 NDHS (2017)

Number of observation = 17403 LR chi 2 (23) = 8987 Prob > chi 2 = 0.0000

Pseudo R2 = 0.4069 Log likelihood = -6549

The following background variables still maintained significant independent (indirect) effects on the background variable, despite the presence of the proximate variable. They are age of mother, children ever born, region, women's education, wealth index, religion. The fact that most of these variables had previously shown significant direct relationship with the proximate variables is an indication that they influence women's delivery in health facilities not only through attendance of antenatal clinics as a proximate variables, but also through some other proximate variables that were considered or captured in the model. Increase in mother's level of education and wealth status corresponds to increased use of modern healthcare facilities for delivery. Hence, from the results obtained for all the analysis which are not shown yet implied that the log likelihood of the first analysis when the proximate was not included (LR 1) was 7879 and from the log likelihood when the proximate was included (LR 2) was 8987. The difference (LR2 – LR1) = 1108 (on 2 degrees of freedom; P = 0.0000). This is highly significant. Therefore we conclude that the proximate variable (Antenatal Visits) had significantly helped to explain the association (indirect effects) of the socioeconomic and demographic (background) variables on health facility for delivery by mothers in Nigeria.

5. DISCUSSION / CONCLUSION

The proximate determinant used significantly helped to explain the indirect effects of the background variables on modern healthcare facility delivery. Mothers who had adequate antenatal clinic attendance delivered their babies in healthcare facilities more than those mothers who did not attend or whose attendance were inadequate. We therefore conclude that antenatal clinic attendance is an important proximate factor through which the socioeconomic, demographic and cultural factors influence mothers to deliver their babies in modern healthcare facilities. Hence, policies that are targeted to ensure adequate antenatal clinic attendance by pregnant women on their healthcare services utilization would go a long way in increasing the level of utilization of healthcare facilities for delivery in Nigeria.

6. RECOMMENDATION

Policies and programs that ensure that all pregnant women have adequate number of antenatal clinic attendance should be put in place. This includes communication programs that enlighten women on the need for adequate antenatal clinic attendance during pregnancy, and delivery in healthcare facilities where they can receive health professional assistance for safe delivery.

Stake holders must also ensure the availability of such services and should be well targeted, by placing special focus on those categories of women who had been identified in this study as very deficient in their antenatal clinic attendance. They include rural mothers, very young mothers (i.e., under 20 years old), mothers with little or no education, poor women, women of high parity, unmarried mothers, and women who reside in the northern regions of the country, particularly the north east and the north west.

ACKNOWLEDGEMENT

I would like to sincerely and deeply appreciate Covenant University for the financial sponsorship of the conference during the paper presentation before the final publication of my paper.

REFERENCE LIST

- AbouZahr, C. (2000). "Measuring Maternal Mortality: What do you need to know?" *Reproductive Health Matters Critical Issues*: pp 13-23.
- Abrahams, N., Jewkes, R. & Mvo, Z. (2001). Health Care-Seeking Practices of Pregnant Women and the Role of the Midwife in Cape Town, South Africa. *Journal of Midwifery and Women's Health*. Vol. 46, No 4, July/August 2001.
- Addai, I. (2000). Determinants of use of maternal-child health services in rural Ghana. *Journal of Biosocial Science* 32(1):1-15.
- Addai I. (1998). Demographic and socio-cultural factors influencing use of maternal health services in Ghana. *African Journal of Reproductive Health* 2(1):73-80.
- AdamuHauwa Suleiman (2011). Utilization of Maternal Health Care Services in Nigeria: An Analysis of Regional Differences in the Patterns and Determinants of Maternal Health Care Use.
- Amoo, Emmanuel & Azuh, Dominic (2010). Mothers' Utilization of Programme Interventions to reduce Maternal Mortality in South-Western Nigeria. *Nigerian Sociological Review*. Vol. 5, No 1, 2010. Nigerian Sociological Society. (ISSN 1596-6151). P69-79
- Aregbeyen, J.B.O. (1992). Healthcare Utilization in Nigerian Rural Communities: A Focus on Otuo Community and Environs in Edo State. Nigerian Institute of Social and Economic Research (NISER) Monograph Services No. 3.
- Babalola, S & Fatusi, A. (2009). Determinants of Use of Maternal Health Services in Nigeria: Looking Beyond Individual and Household Factors. *Journal of BMC Pregnancy & Childbirth* '2009, 9:43.
- Caldwell, John C. (1976). *The Persistence of High Fertility*. Canberra: Australian National University.
- Caldwell, John C. (1982). *Theory of Fertility Decline*. New York: Academic Press.
- Davis, K. Blake J. Social structure and fertility: An analytic framework. *Economic Development and Cultural Change* 1956; 4:211-35
- Egunjobi, T.O. (1983). Characteristics of the healthcare resource production in Nigeria. *Canadian Journal of Africa Studies*, 17(2), 142-149.
- Elo, T. I. (1992). Utilization of maternal health-care services in Peru: the role of women's education. *Health Transition Review*, 2, 49-69.
- Erasmus C. (1961). *Man takes control: cultural development and American aid*. Minneapolis, Minn, USA: University of Minnesota Press.
- Family Care International, 2000. *Sexual and Reproductive Health Briefing Cards*. Family Care International, New York.
- Fosu, G. B. (1994). Childhood morbidity and health services utilization: cross-national comparisons of user-related factors from DHS data. *Social Science and Medicine*, 38, 1209-1220.
- Gbolahan O. (1985). Women's and Postpartum Non-susceptibility in Nigeria.
- Hakim, C. (2003). A new approach to explaining fertility patterns: Preference theory. *Population and Development Review* 29(3): 349-374.
- Interagency Group for Safe Motherhood (2000). *Skilled Attendance at Delivery: A Review of the Evidence*. *Family Care International*, New York.
- Isiugo-Abanihe, Uche C. (1985). "Child Fosterage in West Africa". *Population and Development Review*, 11, 1: 53-72.

- Isiugo-Abanihe, Uche C. (1991). "Parenthood in Sub-Saharan Africa: Child fostering and its Relationship with Fertility". In Locoh, T., Hertrich, V., editors. *The onset of fertility transition in Sub-Saharan Africa*. Belgium: Derouaux Ordina Editions: 163, 174.
- Koblinsky, M. A. & A. Tinker, (1994) Programming for Safe Motherhood: A guide to action, Health Policy and Planning
- Khalid SK. & Daniel W. Lale (2006). WHO analysis of causes of maternal death: a systemic review. The Lancet Maternal Survival Series, 367:1066-74
- Kwast, B.E., & J.M. Liff. (1988). Factors associated with maternal mortality in Addis Ababa, Ethiopia. *International Journal of Epidemiology* 17(1):115-121.
- Lindroos Anna & Luukkainen Annu-Riikka (2004). Antenatal care and maternal mortality in Nigeria. Public Health Program exchange to Nigeria. July, 2004.
- Lule, E., Ramana, G.N.V., Oomman, N., Epp, J., Huntington, D. and Rosen, J.E. 2005. Achieving the Millennium Development Goal of Improving Maternal Health: Determinants, Interventions and Challenges. Health, Nutrition and Population (HNP) Discussion Paper. The World Bank, Washington.
- Manzoor I, Hashmi NR, Mukhtar F 2009. Determinants and pattern of health care services utilisation in post graduate students. *J Ayub Med Coll Abbottabad*, 21(3): 100-105.
- Mason, K.O. (1994). "Conceptualizing and Measuring Women's Status", Paper to the Population Association of America.
- Mason, K.O. (1995). The status of women: A review Literature of its relationship to Fertility and Mortality Rockefeller Foundation, New York.
- Mbugua, W. (1997). The African Family and the Status of Women's health in A. Adepoju (ed) *The Family, Population and Development in Africa*, London: Zed Books, PP.139 -157.
- McCarthy, J. & D. Maine (1992). "A Framework for Analyzing Determinants of Maternal Mortality." *Studies in Family Planning* 23(1): 23-33.
- Mekonnen, Y. and Mekonnen, A. (2002) Utilization of Maternal Healthcare Services in Ethiopia. Calverton, Maryland, USA: ORC Macro. [Online] Available from: <http://www.measuredhs.com/pubs/pdf/FA38/01-mekonnen.pdf>.
- Miller, Jane E. (1991). "Birth intervals and perinatal health: An investigation of three hypotheses," *Family Planning Perspectives*, 23:62-70.
- Moronkola O.A., Ojediran, M.M. & Amosu, A.: Reproductive health knowledge, beliefs and determinants of contraceptives use among women attending family planning clinics in Ibadan, Nigeria.
- Mosley WH, Chen LC. (1984) An analytic framework for the study of child survival in developing countries. *Population and Development Review*; 1984, 10:25-45.
- Mpembeni, R.N.M., Killewo, J.Z., Leshabari, M.T., Massawe, S.N., Jahn, A., Mushi, D. & Mwakipa, H. (2007). 'Use pattern of maternal health services and determinants of skilled care during delivery in Southern Tanzania: implications for achievement of MDG-5 targets'. *BMC Pregnancy and Childbirth* 2007, 7:29.
- Nasir Farooq, Huma Jadoon, Tayyeb Imran Masood, et al., An assessment study of maternal mortality ratio databank in Pakistan.
- National Population Commission Federal Republic of Nigeria and ICF Macro (2009). Nigeria Demographic and Health Survey 2008. National Population Commission Federal Republic of Nigeria, Abuja, Nigeria and ICF Macro Calverton, Maryland, USA. November 2009.
- National Population Commission (2009). The Maternal Health Care Improvement Initiative: Nigeria.
- Navaneetham K, Dharmalingam A. Utilisation of maternal healthcare services in southern India. *Social Science and Medicine*. 2002; 55:1849-1869.
- Nigerian Demographic and Health Survey (2004). Calverton, Maryland: National Population Commission (NPC Nigeria and ORC Macro, 2004, 1-5.
- Obermeyer, C.M. (1993). 'Culture, maternal health care and women's status: a comparison of Morocco and Tunisia', *Studies in Family Planning*, Vol.24, No.6, pp.354-365.

- Okafor, C.B. (1991) 'Availability and use of services for maternal and child healthcare in rural Nigeria' *Int. J. Gynecol. Obstet.*, 1991, 34: 331-346.
- Okonofua, F.E., Abejide, A., Makanjuola, R.A., (1992) Maternal Mortality in Ile-Ife, Nigeria: A study of Risk Factors Studies in Family Planning, Vol. 23, No.5, pp.319-324
- Olujimi, J.A. (2003). Patronage Pattern of Rural Dwellers to Health facilities in Owo Region Nigeria, pp. 265-270.
- Omotosho, O. (2010). Health-seeking behavior among the rural dwellers in Ekiti State.
- Oppong, C. & K. Abu (1986). A Handbook for Data Collection and Analysis on Seven Roles and Statuses of Women. Geneva: International Labour Office Review 6(2): 225-255.
- Orubuloye, I. O. (2003). Disease, Illness and Society. Centre for Population and Health Resources, Ado-Ekiki, Nigeria, pp. 1-26.
- Osirim, M.J., (1992). The state of women in the Third World: The informal sector and development in Africa and the Caribbean. *Social Development Issues* 14, 74-87.
- Patton G.C, Viner RM, Linh L.C, Ameratunga S, Fatusi A.O, et al. (2010) Mapping a global agenda for adolescent health. *Journal of Adolescent Health* 47(5): 427-432
- Penn-Kekana, L. & Blaauw, D. (2002). A Rapid Appraisal of Maternal Health Services in South Africa: A Health Systems Approach.
- Paul, B.K., & D.J. Rumsey. 2002. Utilization of health facilities and trained birth attendants for childbirth in rural Bangladesh: An empirical study. *Social Science and Medicine* 54:1755-1765.
- Pradhan, A. (2005). "Situation of Antenatal Care and Delivery Practices." *Kathmandu University Medical Journal (KUMJ)* 3(3): 266-70.
- Population Reference Bureau. Making motherhood safer (2002): overcoming obstacles on the pathway to care. Washington, DC: Population Reference Bureau.
- Read J. S, Troendle J. F. & Klebanoff M. A. (1997). Infectious disease mortality among infants in the United States (1983-1987). *American Journal of Public Health*, Vol. 87, 1997. Pp192-198.
- Renolds, H.W., Wong, E.L. & Tucker, H. (2006). Adolescents' use of maternal and child health services in developing countries. *International Family Planning perspectives*. 32(1):6-16).
- Rosenstock, I. M. (1974). Historical origins of the health belief model. *Health Education Monographs* 2, 1-8.
- Royston, E. & S. Armstrong, (1989). Preventing Maternal Deaths, WHO, Geneva.
- Rutstein, S. (2003). *Effect of Birth Intervals on Mortality and Health: Multivariate Cross Country Analyses*. Optimal Birth Spacing for Central America, held in Antigua, Guatemala.
- Salter C, Johnston HB, Hengen N. Care for post abortion complications: Saving women's lives. *Population Reports*. Series L, No.10. Vol. xxv. Baltimore (1997): Johns Hopkins School of Public Health.
- Shen, C., and Williamson, J.B., (1997). Child mortality, women's status, economic dependency, and state strength: A cross-national study of less developed countries. *Social Forces*, 76(2), 667-700.
- Shulman, C. E. (1999). Malaria in pregnancy: its relevance to safe-motherhood programmes.
- Stanton, C., Blanc, A.K., Croft, T., Choi, Y. (2007). Skilled care at birth in the developing world: progress to date and strategies for expanding coverage. *Journal of Biosocial Science* 39:1:109-120.
- Studies in Family Planning (2002). Volume 98 number D, August, NY, USA
- Sundari, T. K. (1992). The Untold Story: How the Health Care Systems in Developing Countries Contribute to Maternal Mortality. *International Journal of Health Services* 22(3): 513-528.
- Tanahashi, T. (1978). Health Services Coverage and its Evaluation: Bull., WHO. Geneva, 56, 296-312.
- Tan, C. J., Kizza, M., Morison, I., Mabey, D., Muwanga, M., Grosskurth, H. and Elliot, A. M., 2007. Use of antenatal services and delivery care in Entebbe, Uganda: a community survey. *B M C Pregnancy Childbirth*. URL: <http://www.ncbi.nlm.nih.gov/entrez/query.fc>
- Thaddeus, S., & Maine, D. (1994). Too far to walk: Maternal mortality in context. *Social Science & Medicine*,

38(8), 1091-1110.

- Tipping, G., Segall, M. (1995). Healthcare Seeking Behavior in Developing Countries: An Annotated Bibliography and Literature Review.
- United Nations (1994). Report of the International Conference on Population and Development, Cairo, 5-13, September 1994.
- United Nations (1995). Report of the International Conference on Population and Development: Cairo: 5–13 September 1994. New York: United Nations.
- UNICEF (2001). Progress for Children: Achieving the MDGs with equity, Report No. 9, UNICEF, New York.
- UNFPA (2007). Men at work. World Population Day document. Retrieved September 10, from <http://www.unfpa.org>.
- Van de Walle, E., Knodel, J., 1980. Europe's fertility transition: New evidence and lessons for today's developing world. Population Bulletin 34, 1- 43.
- World Health Organization (2008), Factsheet, Maternal Mortality, Department of Making Pregnancy Safer.
- World Bank Group (2014). Maternal Mortality Ratio, Modelled Estimate per 100,000 live births. World Bank Group 2014 <http://data.worldbank.org/indicator/SH.STA.MMRT>
- World Health Organization (2012). Trends in maternal mortality: 1990 to 2010 (WHO, UNICEF, UNFPA and The World Bank estimates). World Health Organization, Geneva, Switzerland. 2012. ISBN: 978 92 4 150363 1.
- World Health Organization (2013). World health statistics 2013. World Health Organization, Geneva, Switzerland. ISBN 978 92 4 156458 8.
- World Health Organization (2000). Health and Mortality: Selected Aspects. New York, United Nations: 58-74.
- WHO, (1989). Indirect Technique for Demographic estimation Population studies No. 81, New York.
- WHO, (1994). Maternal Health and Safe Motherhood Programme, Verbal Autopsies for Maternal Death – Workshop, London January 10–13.
- WHO, (1994). Annotated Bibliography of Documents relating to Safe Motherhood. WHO, Geneva.
- WHO, UNICEF, UNFPA. (2004). *Maternal mortality in 2000*. Geneva
- WHO, (1996). Population Action. New York.
- WHO, (1996). Addressing violence against women, prevention and Management of the health consequences of violence against women, WHO, Geneva.
- WHO, (1995). *Maternal Mortality Estimates as developed by WHO, UNICEF, UNFPA*. Geneva, Switzerland: World Health Organization; 2001:56.
- WHO, (1996). Safe Motherhood. A newsletter of Worldwide Activity, Geneva.
- WHO & UNICEF, (1997). Revised 1990 Estimates of Maternal Mortality, WHO, UNICEF, Geneva.
- WHO, (1999). Skilled attendant at birth 2006. Updates, Geneva WHO; (Department of Reproductive Health and Research).
- WHO, (1999). World Health Report, Making a Difference, Geneva; WHO.
- WHO, (2004). Reviewing maternal Deaths and Complication to make pregnancy safer, Geneva, 2004.
- WHO, (2005). Mortality database table, Geneva: WHO; 2007
- WHO. Annual Report 2007, Department of Making Pregnancy Safer. WHO, 2008, Geneva/Switzerland
- WHO, UNICEF, UNFPA and the World Bank, *Trends in Maternal Mortality: 1990 to 2010*, WHO, Geneva, 2012.
- Wollast E, (1993). Detecting Maternal Mortality by Traditional Birth Attendants in Burkina Faso. Health Policy and Planning 8 (2): 161. England
- World Bank, (1994). A new agenda for women's Health and Nutrition, World Bank, Washington, D.C.

- World Health Organization, (2007). Skilled Attendant 2007 Updates.
- Wusu, O. & Isiugo-Abanihe, U.C. (2003). "Family Structure and Reproductive Health Decision-Making among the Ogu of southwestern Nigeria: A Qualitative Study". *African Population Studies*, 8, 2: 27-45.
- Yar'zever I. S. & Said I. Y (2013). Knowledge And Barriers In Utilization of Maternal Health Care Services in Kano State, Northern Nigeria. *European Journal of Biology and Medical Science Research*, Vol.1, No. 1, March 2013. European Centre for Research Training and Development, United Kingdom. March 2013. Pp.1-14.