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Determinants of Maternal Healthcare Utilization in Nigeria

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Abstract

Reproductive healthcare has remained a point of concern in sub-Saharan Africa due to the prevailing high maternal mortality rate. Despite the fact that the utilization of maternal healthcare services is a curbing solution, the records of utilization still remains low. This paper examined the determinants of the decision to use healthcare services by women within the reproductive ages of 15 to 49 with at least a child. Logit models of the use of prenatal care only and the non-use of both prenatal and postnatal care were estimated. A probit regression was also estimated for the probability of child delivery in a hospital or maternity home. Urban and rural differentials were also estimated. Education significantly increased the utilization of prenatal care, postnatal care and a hospital or maternity home for delivery among both urban and rural women. Mothers' age and urban residence also significantly increased the utilization of prenatal and postnatal care but not the use of a hospital or maternity home for delivery. Shorter distance to clinics discouraged non-utilization of both prenatal and postnatal care. Acquiring at least a primary education, discouraging child marriages and early childbearing, and improving rural health infrastructures should be priority goals for policy.

Key Words: maternal and reproductive health, probit regression, Logit models

Introduction

The use of healthcare services by women plays an important role in determining the health of women during pregnancy, childbirth and even after delivery. Reproductive health care, the care a woman receives before and during pregnancy, at the time of delivery, and soon after delivery, is important for the survival and well-being of the mother and her child (NDHS 2013). The percentage of women in Nigeria who make use of the hospital or maternity home for delivery is quite low. This is as shown in UNICEF's State of the World's Children (2016) that only 38 percent of women had the presence of skilled birth attendants during delivery and 36 per cent received delivery care in an institutional facility. It was also reported that 61 percent of women made at least one antenatal care visit during the period 2010 to 2015 while 51 per cent of women were able to make at least four antenatal care visits. Also, only 40 per cent of mothers made use of postnatal care during the period. From the Nigeria Demographic and Health Survey (NDHS) (2013), 86 per cent of urban women and 46.5 per cent or rural women received antenatal care from a skilled provider. The South East had the highest percentage of women receiving antenatal care from a skilled provider that is, 90.6 per cent followed by the South West of 90.4 per cent while the North East and North West recorded the lowest, 49.3 and 41.0 respectively. According to the NDHS (2013), Increasing the percentage of births delivered in health facilities is an important factor in reducing deaths arising from complications of pregnancy. Their reported statistics showed that thirty-six percent of births in Nigeria are delivered in a health facility and sixty-three percent of births are delivered at home. Home delivery was highest in rural than urban areas, and in the North West followed by the North East compared to other zones. For proper management of complications and the observance of hygienic practices, it is important that skilled healthcare providers are present during delivery. However, only 38 percent of all deliveries were assisted by a skilled provider, namely a doctor, nurse, or midwife. From the NDHS (2013) report, place of delivery also influenced the likelihood of receiving a postnatal checkup in the first two days. While 79 percent of those who delivered in a health facility had a checkup within the first two days, only 16 percent of those who delivered elsewhere had a checkup within that period. The use of antenatal care, postnatal care and a health facility for delivery by mothers increased with an increase in education and wealth.

Several studies have shown that income, education, distance, amongst others play significant roles in enabling women seek for healthcare services (Babalola and Fatusi, 2009; Abor et al, 2011). Titus et al. (2015) showed that most rural households in Nigeria had the challenge of inaccessibility of modern healthcare facilities, in the form of long distance to such healthcare facilities. Nonyelu and Nwankwo (2014) found that in addition to location of health facilities, education, patriarchal social arrangement, rural residence, poverty and religious and cultural beliefs about certain diseases strongly affected access to health services. Non past complications and negative

provider attitude were reasons mothers gave for non utilization of maternal health services in northwestern Nigeria (Idris et al, 2013). Poor health seeking behaviours in terms of low antenatal care use, postnatal care use, and skilled birth attendant at delivery exist in rural Nigeria (Osubor, 2006). Celik and Hotchkiss (2000) also found educational attainment significant along with other factors as parity level, health insurance coverage, ethnicity, household wealth and geographic region. Differences in the use of maternal health services in developing countries was attributed to age, education, medical insurance and distance to health facility (Say and Raine, 2007). Using the Nigeria Demographic and Health Survey, (2008) women's education, husband's education, wealth quintile, and region of residence were found to be the most important factors associated with maternal healthcare service utilization (Rai et al, 2012). Emphasizing the fact that inequalities exist in the allocation of maternal health care in urban locations of sub-Saharan Africa, a study of 23 countries by Magadi (2003) reveals that even though on average, urban poor receive better antenatal and delivery care than rural residents, the urban poor receive worse care than the urban non-poor. Also in countries where maternal healthcare was relatively good, the urban poor were even so disadvantaged that they were worse off than rural residents. Mekonnen and Mekonnen (2003) also found mothers' education to have a strong impact on increasing the utilization of maternal healthcare services (antenatal care and delivery care), as well as urban residence and being a married woman. Examining factors associated with non-utilization of postnatal care, Titaley et al, (2009) found low household wealth index, low education levels, lack of knowledge of pregnancy-related complications or where distance from health services was a problem to be significant. Infants of high birth rank and those reported to be smaller than average were less likely to receive postnatal care. Also, having few antenatal care checks, using untrained birth attendants and having births outside healthcare facilities were associated with non-utilisation of postnatal care services in Indonesia. For the case of Botswana, Letamo (2003) observed that low parity women, women with low educational level, those residing in rural areas, and those with low socioeconomic status were less likely to use maternal services. Buor (2009) found distance to be a common factor affecting healthcare utilization by women in both rural and urban areas in Ghana, however, factors specific to rural areas were income and family size while education and marital status were specific to urban areas.

Methodology

Data used was from the Harmonised Nigeria Living Standard Survey 2010, a nationally representative data capturing health, poverty and – three measures of maternal healthcare utilization used in this study include the use of prenatal care only, the non-use of both prenatal and postnatal care and the decision to have delivery care in a hospital or maternity home or to deliver at home/other places). The dichotomous nature of the variables explains the use of a logit and probit regression model after a Hausman test was employed to ascertain their appropriateness. The models were estimated at the

national level and by location in order to obtain urban and rural differentials. The three dependent variables were binary with a 1 representing a woman's use of each maternal healthcare service and a 0 if otherwise. The independent variables used include education, which is expected to increase the level of awareness of women on the advantages of professional modern healthcare services in preventing complications before, during and after pregnancy. Distance to a hospital or clinic was used to capture the impact that proximity, accessibility, less travel time and hence cost would have on the utilization of healthcare by women. Mothers' age is expected to have a positive effect since older mothers would have acquired higher educational levels and also have more decision making powers due to their maturity than very young mothers. The log of per capita household expenditure was used to capture household income. Others include religion, urban residence and geopolitical zone. A simple description of the variables used and their statistics is presented in Table 1. As shown in the table, the mean age of mothers is 33 years and more than half of the women (53%) are uneducated and only 6% having a post secondary education. Only 1% of the women use prenatal care, 7% used both prenatal and postnatal care and as high as 82 % used none of both. Only 3% of the women used a hospital or maternity home for delivery rather than delivering at home or in other places. 76% of the hospitals are at a distance of 30-59 minutes while 41% of clinics were at a shorter distance of 0-29 minutes.

Results

Using a Hausman test to determine the appropriateness of the estimation method, a logit regression model of the use of prenatal care was estimated, a logit regression model of the non-use of both prenatal and postnatal care was also estimated and finally a probit model of place of delivery was estimated. The results are discussed below and presented in Tables 2 to 4.

Use of Prenatal Care Only

The overall significance of the logit model of the use of prenatal care only was high. This estimates of the model are presented in Table 2.

Table 2 Logit Regression Estimates for Use of Prenatal Care

Variables	National	Urban	Rural
Education			
No education	RC	RC	RC
Primary education	0.891(19.78)*	0.545(5.68)*	0.980(19.15)*
Secondary education	0.830(15.81)*	0.528(5.59)*	0.921(14.36)*
Post-secondary education	0.728(9.45)*	0.395(3.38)*	0.920(8.50)*
Urban residence	0.253(5.91)*		
Rural residence	RC	RC	RC
Age	0.044(2.65)*	0.106(3.15)*	0.016(0.82)
Age squared	-0.001(-5.75)*	-0.003(-5.11)*	-0.001(-3.23)*

Per capita expenditure	0.008(2.62)*	0.001(0.12)	0.011(2.97)*
Christian	0.465(2.08)**	-0.161(-0.33)	0.571(2.25)*
Muslim	0.639(2.85)*	-0.073(-0.15)	0.798(3.13)*
Traditional	RC	RC	RC
Other	0.504(1.31)	0.220(0.29)	0.515(1.13)
0-29 mins to hospital	0.002(0.04)	-0.029(-0.24)	-0.018(-0.27)
30-59 mins to hospital	-0.064(-1.36)	-0.220(-1.96)**	-0.028(-0.53)
60 mins and above to hospital	RC	RC	RC
0-29 mins to clinic	0.032(0.56)	0.156(1.03)	0.018(0.28)
30-59 mins to clinic	-0.079(-1.46)	0.159(1.08)	-0.126(-2.12)**
60 mins and above to clinic	RC	RC	RC
North-Central	0.339(5.51)*	0.286(3.00)*	0.252(2.79)*
North-East	0.065(0.92)	0.116(0.86)	-0.059(-0.62)
North-West	0.204(3.19)*	0.315(3.15)*	0.058(0.63)
South-East	0.409(5.70)*	0.241(2.01)**	0.340(3.37)*
South-South	0.265(3.89)*	0.384(3.52)*	0.102(1.05)
South-West	RC	RC	RC
Constant	-3.248(-9.44)*	-2.864(-3.91)*	-2.975(-7.50)*
LR chi2(p-value)	1341.39(0.0000)	390.41(0.0000)	926.00(0.0000)
Pseudo R –squared	0.0495	0.0523	0.0473
Observations	40382	9550	30832

*Note***:** Values within parenthesis represent t-statistics where (*) and (**) represent significance at (1%) and (5%), respectively. RC denotes reference category.

The use of prenatal care was significantly increased by education such that educated women from the primary to the post secondary level were more likely to use prenatal care than women with no education. This was significant at the national level and in both urban and rural locations. Prenatal care use was found to significantly increase at the early reproductive age and decline as women approached the end of their reproductive age. This nonlinear relationship applies to both urban and rural women. Christian and Muslim women significantly used more prenatal care than women who practiced traditional religion. This is significant at the national level and in rural locations but not in urban locations. Urban women had a greater likelihood of using prenatal care only than rural women. The use of prenatal care was significantly higher for women in all other zones than for those in the south west except for the case of women in the north east. This was observed at the national level and among urban women. For the case of rural women, only women in the north east and south east used more prenatal care only than those in the south west.

The distance to the nearest hospital and clinic was insignificant at the national level. Surprisingly, a shorter distance of 30 to 59 minutes to the nearest hospital significantly reduced the use of prenatal care only than a distance of 60 minutes and above in urban locations. However, in rural locations a shorter distance of 30 to 59 minutes to the

nearest clinic significantly reduced the use of prenatal care than a distance of 60 minutes and above. An increase in the log of household per capita expenditure significantly increased the use of prenatal care only at the national level but it is not significant among urban women.

Non-use of Both Prenatal and Postnatal Care

Table 3 presents the estimates from the logit regression model of the non-use of both prenatal and postnatal care. Education was found to reduce the likelihood of non-utilization of both prenatal and postnatal care at the national level and in both urban and rural locations. Thus educated women were less likely to abstain themselves from using healthcare services. Mothers' age had a nonlinear positive significant relationship at the national level and among both urban and rural women so that the case of non-utilization of both prenatal and postnatal care is minimal at the early reproductive age but increases at the latter reproductive age.

Table 3 Logit Regression Estimates for Non-use of Both Prenatal and Postnatal Care

Variables	National	Urban	Rural
Education			
No education	RC	RC	RC
Primary education	-0.872(-23.38)*	-0.644(-8.14)*	-0.914(-21.44)*
Secondary education	-0.998(-23.62)*	-0.783(-10.14)*	-1.049(-20.37)*
Post-secondary education	-1.022(-17.42)*	-0.847(-9.32)*	-1.096(-13.24)*
Urban residence	-0.260(-7.50)*		
Rural residence	RC	RC	RC
Age	-0.013(-1.01)	-0.033(-1.26)	0.006(0.37)
Age squared	0.001(4.79)*	0.002(3.94)*	0.001(2.38)**
Per capita expenditure	-0.005(-1.79)	0.005(1.02)	-0.008(-2.68)*
Christian	-0.354(-2.14)**	-0.248(-0.58)	-0.374(-2.08)**
Muslim	-0.485(-2.92)*	-0.281(-0.65)	-0.547(-3.02)**
Traditional	RC	RC	RC
Other	-0.601(-2.09)**	-1.652(-2.59)*	-0.213(-0.61)
0-29 mins to hospital	-0.052(-1.13)	0.001(0.01)	-0.093(-1.71)
30-59 mins to hospital	0.010(0.26)	0.021(0.23)	0.017(0.39)
60 mins and above to hospital	RC	RC	RC
0-29 mins to clinic	-0.097(-2.06)**	-0.217(-1.76)	-0.075(-1.44)
30-59 mins to clinic	0.046(1.02)	-0.118(-0.97)	0.068(1.40)
60 mins and above to clinic	RC	RC	RC

North-Central	-0.116(-2.39)**	-0.131(-1.71)*	-0.039(-0.55)
North-East	0.217(3.85)*	0.075(0.69)	0.322(4.27)*
North-West	0.131(2.56)**	-0.102(-1.26)	0.282(3.90)*
South-East	-0.552(-10.09)	-0.222(-2.40)**	-0.564(-7.33)*
South-South	-0.144(-2.72)*	-0.040(-0.45)	-0.092(-1.22)
South-West	RC	RC	RC
Constant	1.984(7.41)*	1.456(2.39)**	1.798(5.87)*
LR chi2(p-value)	2667.23(0.0000)	690.44(0.0000)	1784.55(0.0000)
Pseudo R –squared	0.0699(0.0000)	0.0648	0.0657
Observations	40382	9550	30832

Note: Values within parenthesis represent t-statistics where (*) and (**) represent significance at (1%) and (5%), respectively. RC denotes reference category.

The non-utilization of both prenatal and postnatal care was less likely among urban women than among rural women. the non-use of both prenatal and postnatal care is less likely among Christian women, Muslim women and those of other religions than among women who are traditionalists. This was significant at the national level and only among Christian and muslim rural women. However it was not significant among urban Christian and Muslim women except for those of other religion. While women in the north east, south east and south south are less likely to abstain from using both prenatal and postnatal care than women in the south south. It was significant among both urban and rural women in the south east but only among urban women in the north central. However the non-utilization of both prenatal and postnatal care was more likely among women in the north east and north west than mong women in the south west though it was significant only among urban women. Distance to the nearest hospital was insignificant in both urban and rural locations. However, the shortest distance of 0 to 29 minutes to the nearest clinic significantly reduced the non-use of both prenatal and postnatal care than a distance of 60 minutes and above. The log of per capita household expenditure was not significant at the 5 percent significance level at the national level and in urban locations but it was significant in rural locations. The non-use of both prenatal and postnatal care declined with an increase in the log of per capita household expenditure. Thus, as household income increases, women are more likely to use both prenatal and postnatal care.

Place of Delivery

The overall model was highly statistically significant. Age, residence, religion, income and distance to a hospital or clinic were not significant in explaining a woman's decision to have her baby in a healthcare facility (hospital, clinic or maternity home)

or at home/other places. Only residing in the north central zone was significant with a negative effect only at the national level. Only a post secondary education was positively significant but only in rural locations. Therefore having an education increased the likelihood that a woman would decide to deliver her baby in a hospital or maternity home than at home or in other places.

Discussion

Education played a key role in increasing the utilization of prenatal care, postnatal care and a hospital or maternity home for delivery. This could be as a result of the fact that education increases the awareness about the health and complication prevention benefits from modern healthcare utilization as well as exposes women to sanitary and hygienic practices. Mothers' age and urban residence also significantly explained the utilization of prenatal and postnatal care but not delivery place. Age was positively significant implying that as women grow older into the reproductive age, their need and hence use of maternal healthcare services increase. The greater availability of health and social infrastructure in urban than rural locations could explain the greater utilization observed in urban locations. Shorter distances, implying proximity to healthcare facilities discouraged non-utilization of both prenatal and postnatal care especially for the case of clinics. For the case of prenatal care, proximity did not necessarily increase utilization. This shows that more emphasis should be placed on whether such healthcare facilities are affordable to encourage patronage than just ensuring proximity.

Conclusion

Education, mothers' age and urban residence are significant determinants of the utilization of health care services by mothers. Thus, acquiring at least a primary education and discouraging early participation in reproductive activities through child marriages and early childbearing should be a major point of focus towards improving maternal healthcare utilization and thus the health status of women. Improving rural health infrastructures should also be taken seriously.

Appendix

Presentation of Tables

Table 1 Variable Description and Statistics

Variable	Description	Mean	Standard Deviation
Fertility equation			
Age	Woman's age	32.64	8.12
Age squared	Woman's age squared	1131.58	540.84
Per capita expenditure	Expenditure per head in a household	4.86	5.27
No education	Woman is not educated; dummy = 1 if woman has no education and 0 if otherwise	0.53	0.5
Primary	Woman has a primary education; dummy = 1 if woman has a primary education and 0 if otherwise	0.24	0.42
Secondary	Woman has a secondary education; dummy = 1 if woman has a secondary education and 0 if otherwise	0.17	0.38
Post-secondary	Woman has a post-secondary education; dummy = 1 if woman has a post-secondary education and 0 if otherwise	0.06	0.24
Christian	Woman is a Christian; dummy = 1 if woman is a Christian and 0 if otherwise	0.45	0.5
Muslim	Woman is a Muslim; dummy = 1 if woman is a Muslim and 0 if otherwise	0.53	0.5
Traditional	Woman is a traditionalist; dummy = 1 if woman is a Traditionalist and 0 if otherwise	0.01	0.1
Other	Woman is of any other religion; dummy = 1 if woman is of any other religion and 0 if otherwise	0	0.05
North-Central	Woman resides in the north central; dummy = 1 and 0 if otherwise	0.18	0.39
North-East	Woman resides in the north east; dummy = 1 and 0 if otherwise	0.18	0.38
North-West	Woman resides in the north west; dummy = 1 and 0 if otherwise	0.3	0.46
South-East	Woman resides in the south east; dummy = 1 and 0 if otherwise	0.09	0.28
South-South	Woman resides in the south south; dummy = 1 and 0 if otherwise	0.12	0.32
South-West	Woman resides in the southwest; dummy = 1 and 0 if otherwise	0.14	0.34
Urban residence	Woman resides in an urban area; dummy = 1 and 0 if otherwise	0.24	0.42
Rural residence	Woman resides in a rural area; dummy = 1 and 0 if otherwise	0.76	0.42
Prenatal care use	Woman uses prenatal care only; dummy = 1 and 0 if otherwise	0.1	0.21

Postnatal care use	Woman uses postnatal care only; dummy = 1 and 0 if otherwise	0.01	0.1
Use of both	Woman uses both prenatal and postnatal care; dummy = 1 and 0 if otherwise	0.07	0.25
Use of none	Woman uses neither prenatal nor postnatal care; dummy = 1 and 0 if otherwise	0.82	0.38
Hospital and maternity home delivery	Woman has her child in a hospital or maternity home; dummy = 1 and 0 if otherwise	0.003	0.053
Home delivery and others	Woman has her child at home or in other places; dummy = 1 and 0 if otherwise	0.997	0.053
0-29 mins	Distance to hospital is between 0 - 29 minutes; dummy = 1 and 0 if otherwise	0.24	0.42
30-59 mins	Distance to hospital is between 30 - 59 minutes; dummy = 1 and 0 if otherwise	0.38	0.49
60 mins and above	Distance to hospital is 60 mins and above; dummy = 1 and 0 if otherwise	0.38	0.49
0-29 mins	Distance to clinic is between 0 - 29 minutes; dummy = 1 and 0 if otherwise	0.41	0.49
30-59 mins	Distance to clinic is between 30 - 59 minutes; dummy = 1 and 0 if if otherwise	0.38	0.48
60 mins and above	Distance to clinic is 60 mins and above; dummy = 1 and 0 if otherwise	0.21	0.41

Source: HNLSS 2010

Table 4 Probit Regression Estimates for Place of Delivery

Variables	National	Urban	Rural
Education			
No education	RC	RC	RC
Primary education	0.062(0.68)	-0.147(-0.64)	0.110(1.08)
Secondary education	0.106(1.05)	0.026(0.13)	0.101(0.82)
Post-secondary education	0.250(1.82)	0.067(0.27)	0.357(2.09)**
Urban residence	-0.036(-0.41)		
Rural residence	RC	RC	RC
Age	0.004(0.11)	0.022(0.25)	0.004(0.11)
Age squared	-0.001(-1.05)	-0.001(-0.86)	-0.000(-0.81)
Per capita expenditure	0.001(0.17)	-0.021(-1.63)	0.007(1.03)
Christian	3.060(0.02)	2.926(0.02)	2.833(0.03)
Muslim	3.020(0.02)	2.694(0.01)	2.866(0.03)
Traditional	RC	RC	RC
Other	omitted	omitted	omitted
0-29 mins to hospital	0.133(1.25)	-0.048(-0.18)	0.193(1.62)
30-59 mins to hospital	-0.011(-0.13)	0.066(0.27)	-0.044(-0.45)
60 mins and above to hospital	RC	RC	RC
0-29 mins to clinic	0.078(0.68)	0.105(0.31)	0.051(0.41)

30-59 mins to clinic	0.100(0.95)	-0.004(-0.01)	0.118(1.05)
60 mins and above to clinic	RC	RC	RC
North-Central	-0.342(-2.29)**	-0.576(-1.76)	-0.141(-0.64)
North-East	0.066(0.52)	0.170(0.74)	0.195(0.96)
North-West	-0.032(-0.25)	-0.239(-1.01)	0.135(0.67)
South-East	0.086(0.61)	-0.477(-1.33)	0.339(1.55)
South-South	0.177(1.43)	0.054(0.27)	0.355(1.71)
South-West	RC	RC	RC
Constant	-5.531(-0.04)	-4.889(-0.03)	-5.635(-0.06)
LR chi2(p-value)	80.20(00000)	46.27(0.0002)	55.97(0.0000)
Pseudo R –squared	0.0512	0.1174	0.0478
Observations	40273	9529	30744

Note: Values within parenthesis represent t-statistics where (*) and (**) represent significance at (1%) and (5%), respectively. RC denotes reference category.

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