

Review Article

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Covariates of Maternal Health Care Utilization: Evidence from Agricultural Households in Rural Nigeria

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ABSTRACT

Maternal health care utilization remains a persistent public health concern in Nigeria, particularly in rural areas where maternal mortality rates are among the highest globally. This study investigates the socio-economic and demographic covariates influencing maternal health care utilization among agricultural households in rural Nigeria. Using data from the 2018 Nigeria Demographic and Health Survey (NDHS), the analysis focused on 2,751 women in agricultural households, employing a Tobit regression model.

The findings reveal that maternal health care utilization is significantly influenced by factors such as mother's education, age at first birth, employment type, media exposure, household head's sex, regional location, and birth order. Contrary to prior studies, the study found that formal education, media exposure, and full-time engagement in agriculture were negatively associated with maternal health care utilization, suggesting underlying sociocultural barriers. For instance, religious and patriarchal norms in some northern regions were noted to limit women's autonomy in health-seeking decisions. The study also affirms regional disparities, with women in the South-East and South-West zones less likely to utilize maternal care compared to those in the North-Central zone. The study concludes that maternal health care utilization in rural agricultural households is shaped by intersecting social, economic, and cultural factors. Addressing these determinants is vital for improving health outcomes and enhancing household productivity in Nigeria's rural economy. The results underscore the need for multi-sectoral policy approaches that promote female education, delay early marriage, improve healthcare infrastructure in rural areas, and economically empower women. Additionally, targeted media campaigns and male involvement in maternal health decisions are crucial for fostering behavioral change and boosting service uptake. Addressing these barriers is crucial not only for improving maternal health but also for enhancing agricultural productivity and reducing rural poverty in Nigeria

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Introduction

A population burdened by poor health is significantly limited in its capacity to contribute to labor productivity and economic development. Improving maternal health is not only a moral imperative but also a strategic economic investment. As Wright (2024) observes, good health functions as a durable asset that enhances productivity over time. In Nigeria, agriculture serves as the backbone of the rural economy, employing approximately 34% of the total labor force as of 2023 and contributing around 25% to national GDP. Beyond its economic role, agriculture remains a key driver of poverty alleviation [1,2].

IFAD (2022) further reports that approximately 70% of the world's extremely poor reside in rural areas, with the majority relying on smallholder agriculture for their livelihoods. This rural-based poverty is particularly concentrated in regions like Sub-Saharan Africa and South Asia. Supporting this, a cross-country analysis by the International Food Policy Research Institute (IFPRI, 2022) demonstrates that agricultural productivity growth yields the most substantial poverty reduction effects in low- and middle-income countries, particularly those dominated by smallholder farming systems. Similarly, findings from FAO and IFAD show that sustained agricultural growth is closely associated with marked

reductions in hunger and poverty. Countries that experienced rapid agricultural development recorded improvements in food availability, better nutritional outcomes, and reduced hunger prevalence [3,4].

Maternal health remains a central focus in global development, particularly because of its strong connection to Sustainable Development Goal 3: ensuring healthy lives and promoting well-being for all. In agricultural households, the health of mothers plays a pivotal role not only in family well-being but also in household productivity and food security. Women in these households are often caregivers, food producers, and key contributors to farm labor. When mothers are healthy, they are better able to care for their children, engage in agricultural activities, and manage household resources effectively. This in turn enhances the household's capacity to produce food, generate income, and secure better nutrition contributing directly to the reduction of hunger and poverty. Conversely, poor maternal health can lead to reduced labor productivity, increased medical costs, and nutritional deficiencies within the family, all of which reinforce the cycle of poverty. Therefore, investing in maternal health within farming communities is not only a health priority but also a critical pathway to achieving broader goals of food security and poverty reduction in rural areas.

Maternal health care utilization remains a critical public health concern in Nigeria, particularly in rural areas where maternal mortality rates are alarmingly high. According to the World Health Organization (WHO, 2022), Nigeria accounts for a significant proportion of global maternal deaths. Ensuring access to quality maternal health services including antenatal care, skilled birth attendance, and post-natal care is essential for reducing both maternal and child mortality. However, the uptake of these services is often constrained by a range of factors, including socioeconomic status, education level, cultural norms, and geographic location. Understanding the intersection of maternal health and agricultural livelihoods is vital for addressing both health and economic inequalities in Nigeria’s rural areas. By exploring the covariates of maternal health care utilization in agricultural households, this study contributes to the broader discourse on health equity and sustainable rural development. This study aims to examine the key determinants influencing maternal health care utilization among agricultural households in rural Nigeria and to provide evidence-based insights to inform policy and targeted interventions [5].

Summary of Reviewed Literature

Table 1: A-Priori Expectations on the Factors Influencing Maternal Health Care Utilisation.

Variables	Expected Sign	Literature
Age of the Mother	+ve/-ve	Burgard (2004), Magadi, Agwanda & Obare, (2007) Elo (1992)
Birth Order	+ve/-ve	Elo (1992), Chakraborty et al (2003)
Mother’s Education	+ve	Elo (1992), Bello et al (2017), Chakraborty et al (2003)
Women’s Employment	+ve/-ve	Furata & Salway (2006), MilesDoan& Brewster (1998)
Family Wealth Index	+ve	Mallick et al (2016), Elo (1992),
Place of Residence	+ve	Chakraborty et al (2003), Ayele(2014), Mallick et al (2016), Adamu(2011)
Parity	-ve/ +ve	Baral et al (2012), Simkhada et al (2008)
Woman’s Autonomy	-ve/ +ve	Furuta and Salway (2006), Kamar (2010), Mahapatro(2012)
Husband’s Employment	+ve	Ayele (2014), Chakraborty et al (2003)
Household Size	+ve	Ayele (2014)

Methodology

This study made use of secondary data. The National Population Commission’s National Demographic and Health Survey (NDHS), which was conducted in 2018, served as the primary source of data. The NDHS contains data on the demography, diet, and health of the Nigerian population. Three primary questionnaires were

utilized in the survey, which were one for households, one for female respondents, and a third one for male respondents. Data on the socioeconomic and demographic traits of respondents in rural agricultural households in Nigeria, indicators of maternal health care utilisation were used, among other things.

For the survey, a sample of roughly 42,000 households were chosen as being representative. A total of 40,427 households, 41,821 women and 13,311 men were interviewed. Also, 23,403 rural homes were surveyed for this study, however, the number of rural households included was decreased to 6,514 homes after data cleaning and sorting. Since this study focused on mothers in agricultural households in rural Nigeria, the 6,514 rural households were further disaggregated into agricultural (2,751) and non-agricultural households (3,763) using the employment of the husband. Therefore, the study utilised data on 2,751 women in agricultural household in rural Nigeria.

Method of Data Analysis

Tobit Regression Model was used to examine factors influencing maternal health care utilisation. It’s specified as follows.

$$L_i^* = r_i'\beta + \varepsilon_i \tag{3.1}$$

$$L_0 = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} \tag{3.2}$$

Where:
 L_i^* is the dependent variable
 β_0 is the intercept
 $\beta_1, \beta_2, \dots, \beta_{11}$ are the coefficients of the independent variable
 $R_1, R_2, \dots, R_{11}$ are the independent variables
 ε_i is the error term
 L_0 is maternal health care utilization index

Other variables used in the analysis and how they are operationalized:

Child’s Characteristics

X_1 = Child’s sex. (1 if male and 0 if otherwise)
 X_2 = Birth order (number)

Mother’s Characteristics

X_3 = Mother’s educational status (1 if formal, 0 if otherwise).
 X_4 = Mother’s age at first birth (years)
 X_5 = Mother’s occupation (0 = Agriculture part-time, 1 = agriculture full time.)
 X_6 = Media exposure (1 = exposed, 0 = otherwise)

Household’s Characteristics

X_7 = Household size (persons)
 X_8 = Family wealth index
 X_9 = Sex of household head. (1 if male, 0 if otherwise)
 X_{10} = Husband’s educational status (1= formal, 0 = no formal)

Results and Discussion

The outcome from the Tobit model indicates that the sigma (σ) is statistically significant ($P<0.01$) and has a value of 0.1975 with a t-value of 73.69. This shows that the model and the data are well-matched. Eleven (11) out of the fifteen (15) variables estimated in the model were statistically significant in the analysis at various levels between one percent ($p<0.01$) and ten percent ($p<0.1$). More

than 50% of the coefficients were significant, demonstrating that multicollinearity is not significant in the model.

The result in Table 2 indicates that, compared to mothers without formal education, the coefficient of mother’s education showed a significant ($p<0.01$) negative connection with maternal health care use. This suggests that, compared to mothers without formal education, women with formal education were less likely to use maternal health care facilities. In contrast, found that educated mothers were less likely to forgo using maternal health care services. Regardless of the mother’s education level, she still has no say in whether or not she uses a maternal health care facility, and since the majority of the men were primarily Muslims who valued their privacy, most of their wives were denied access to medical facilities especially in the Northern part of Nigerian as earlier documented by Suleman et al and Yerzever et al. According to men, particularly in rural areas, hold the primary decision-making power. The decision to go to a medical facility in an emergency must wait until the husband or in-laws give consent. Mother’s formal education will less likely improve the use of maternal health care services ($s = -0.0661$, $p<0.01$) [6-12].

The outcome also demonstrates a strong negative correlation between maternal health care utilization and the mother’s age at her first birth. This suggests that the likelihood of a rise in the usage of maternal health care will be reduced depending on the age of the mothers at their first birth. There was a negative and substantial correlation between the mother’s job and the use of maternal healthcare. This suggests that women who worked only in agriculture would be less likely to make use of health care facilities prior, during and after pregnancy than mothers who had other occupations besides agriculture. It is more likely that mothers who work full-time in agriculture will utilize maternity care facilities less ($s = -0.0378$, $p<0.01$). This is consistent with the assertion of who found that a mother’s work had a significant impact on her decision to use maternal health care facilities [13].

Mothers’ media exposure and the use of maternal healthcare had a negative and substantial correlation ($s=-0.0342$, $p<0.01$). This implies that mothers who had been exposed to mass media were less likely to use facilities for maternal health care. In contrast, and reported that young mothers in Nigeria choose to give birth at home due to a lack of media exposure. It is likely that this is the case because the media content that the mothers were exposed to

at each point in time may not have directly addressed or stressed the use of maternal health care, and as a result, exposure to such contents had no effect on the use of maternal health care services. Contrary to findings from which a significant positive relationship between exposure to the mass media and the use of maternal health care was established in India [14-16].

The utilization of maternal health care facilities was found to have a substantial unfavorable connection with the sex of the household head being female in comparison to male ($s=-0.0388$, $p<0.05$). This suggests that having a female head of home in an agricultural household in rural Nigeria will probably result in less mothers using the facilities for maternal health care. In a rural setting, males usually have access to resources like land, loan and credit facilities than a female possibly because of cultural and religious belief, this in turn improves their production and level of income which makes it possible for them to afford health care facilities better than the females.

The utilization of maternal health care facilities in the households was shown to be positively and negatively correlated to the geopolitical region in which the households were located ($p<0.01$). Mothers in the Northwestern zone were more likely to use maternal healthcare facilities than mothers in the North Central zone. In addition, women in rural Nigeria’s southeast zone were less likely to use maternal health care facilities than mothers in the north central area. Mothers in rural Nigeria’s South zone were found to be more likely to use maternal health care facilities than mothers in the North Central zone, and mothers in rural Nigeria’s Southwestern zone were found to be less likely to use maternal health care facilities than mothers in the North Central zone.

Furthermore, the childbirth order significantly influenced maternal healthcare utilization ($s=0.0195$, $p<0.1$). This implies that the position a child holds either as 1st, 2nd, 3rd born in the household is more likely to increase the use of maternal health care facilities by mothers within the households. An experience with pregnancy or delivery in time past might necessitate the need to utilize health care facility in subsequent pregnancies due to complications or advice from health care personnel who once managed the mother. The findings of earlier reported that women who had more than three living children were less likely to make use of maternal health services (only for family planning) because of the experience they believed they have gathered over time [17-20].

Table 2: Distribution of Mothers by Factors Affecting Maternal Health Care Utilization.

Variables	Coefficient	dy/dx	Std. Error	p>t
Mother’s Characteristics				
Mother’s Education				
Formal	-0.0669***	-0.0661***	0.0104	0.000
Mother’s age at First Birth	-0.0082***	-0.0081***	0.0011	0.000
Mother’s Occupation				
Agriculture Full-Time	-0.0383***	-0.0378***	0.0090	0.000
Media Exposure				
Exposed	-0.0347***	-0.0342***	0.0088	0.000
Household Characteristics				
Household Size	0.0008	0.0008	0.0012	0.487
Sex of Household Head				
Female	-0.0394**	-0.0388**	0.0170	0.020
Wealth Index	-0.0388	-0.0382	0.0046	0.000

Husband's Education				
Formal	-0.0082	-0.0081	0.0098	0.400
Region				
North East	0.0379***	0.0377***	0.0130	0.004
North West	0.0431***	0.0423***	0.0136	0.002
South East	-0.1246***	-0.1222***	0.0195	0.000
South- South	0.0545***	0.0541***	0.0160	0.001
South West	-0.0879***	-0.0866***	0.0162	0.000
Child Characteristics				
Child Sex				
Female	0.0118	0.0116	0.0076	0.121
Birth Order	0.0198*	0.0195*	0.0101	0.051
_cons	0.7428		0.0409	0.000
Number of Observations	2751			
LR chi2(15)	937.92			
Prob> chi2	0.0000			
Log likelihood	519.875			
Sigma (σ)	0.1975		0.0027	

Source: Compilation from NDHS, 2018

Conclusion and Recommendation

Maternal health care utilization in rural Nigeria continues to be suboptimal, especially among agricultural households where structural and socio-economic barriers persist. This study has shown that women’s access to maternal health services is significantly influenced by factors such as education, household income, age at childbirth, and exposure to information. These determinants reflect deeper issues of inequality and limited access, which must be addressed through comprehensive, multi-sectoral approaches.

Improving maternal health outcomes will require a strong policy focus on expanding female education, particularly in rural and underserved communities. Educated women are more likely to seek and utilize health services for themselves and their children. Equally important is the need to improve access to health facilities by expanding rural healthcare infrastructure and introducing mobile clinics to reach remote areas. Economic empowerment initiatives such as microfinance programs directed at women can also enhance their ability to afford and prioritize healthcare.

Media should be leveraged to deliver targeted health messages that raise awareness about the benefits of maternal care, while culturally appropriate campaigns can further encourage positive health behaviors. In addition, involving men in maternal health discussions and decisions can increase household-level support and improve maternal healthcare utilization. By addressing these interconnected factors, policymakers and development partners can make meaningful progress toward reducing maternal mortality, alleviating rural poverty, and improving health outcomes for Nigeria’s most vulnerable populations.

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