Effects of Health Service Delivery and Maternal Health in Rural Nigeria

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Abstract
An important element of any healthcare system is effective service delivery and it is no gainsaying that good health service delivery is crucial to maternal health especially in the rural areas of Nigeria. In this study the effect of health service delivery on maternal health in rural Nigeria was examined. Nigeria Demographic and Health Survey (NDHS, 2013) secondary data was used for analysis in this study. The study population comprises of women aged 15-49 years and 13,282 women individual data were used. Descriptive statistics and Tobit regression model were the analytical techniques used in the study. The study revealed that 58% of the respondents had no formal education, 63.7% were within the age group of 15-30years. Also, 68.5% had trading as their primary occupation and 46.8% had household size of between 6 to 10 persons. The different health service delivery types identified in the study include government hospital, private hospital and home delivery. Seventy five percent of the women delivered at home, 18.2% delivered at government hospitals and 6.7% delivered at private hospitals. Age, wealth index, husband's educational level, husband's occupation, household size, types of earning from work, and sex of household head are factors that influenced private and public health service delivery. The place of delivery had positive relationship with maternal health. The study recommended that for maternal health to improve and to prevent death during delivery government and non-government organization should provide maternity health care centers and hospitals in rural areas of Nigeria.

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Background of the Study

Women's health is very important, based on the roles they play in the family, the community and the nation at large. Women are regarded as the home builders thus issues about their health cannot be overemphasized. Efficient health service delivery is therefore a vital part of every healthcare system and it is crucial to maternal health in rural Nigeria (WHO, 2010). Service delivery involves for example workers in the health sector, demand and supply of equipment and financing. Access to required inputs should improve service delivery and enhance access to services. Health service delivery is built on core pillars of availability, acceptability, affordability, accessibility and utilisation (WHO, 2011). Oftentimes, these are lacking either as a result of policy failure or due to the pervasive poverty among women particularly in rural areas of Nigeria. Lack of proper health service may lead to weakness, debility and eventual death of pregnant women. A mother's death brings losses to her family, community and the nation.

Nigeria communities put up with very poor public healthcare services delivery (Onyeneho, Amazigo, Njepuome, Nwaorgu & Okeibunor, 2016). The poor performance of the healthcare sector is majorly due to extreme underdevelopment in infrastructure, high levels of corruption, widespread poverty and weak governance (An, Razzaq, Nawaz, Noman, & Khan, 2021). In addition to this, a reasonable number of women in Africa still suffer from diseases and other related problems (Adde et al., 2020). Poor health service delivery wrecks a lot of havoc on women during pregnancy and after child delivery in Nigeria due to avoidable complications (Idris et al., 2006) Provision of sound health service delivery system will go a long way in reducing problems of maternal health among rural women (Shrestha et al., 2012).

Obansa and Orimisan (2013) identified the following among others as the factors affecting the overall performance of the Nigerian healthcare system: Inadequate health facilities/structure, shortage of essential drugs and supplies, inadequate supervision of the healthcare system, poor human resources, management, remuneration and, lack of fair and sustainable health care financing with very low per capita health spending, unequal economic and political relations, the neo-liberal economic policies of the Nigerian state and corruption, high out-of-pocket expenditure in health by citizens, absence of community-based integrated system for disease prevention, surveillance and treatment.

Apart from the problems itemised above, poverty is one of the central problems that affect the health of women. This poverty stems from the fact that women are assigned to petty jobs around the house and care of the home in general due to the prevailing traditional beliefs among rural households. These jobs are less likely to fetch women any meaningful income making them completely dependent on their spouses for nearly everything. This lifestyle generally predisposes women to poverty. The poverty makes women unable to afford, access, or utilize health services at their disposal. In addition, safe motherhood which eludes many women due to inadequate knowledge about reproductive health, complicated by unmitigated socio-cultural and economic backgrounds of women (Agbede, Aja and Owolabi, 2015). such as poverty, high risk social environment, inconsiderate working policies as well as role conflicts that lead to both emotional and physical stress which ultimately induce complications during pregnancy. This scenario seems to explain why several women lose their lives daily because of pregnancy-related complications (WHO, 2007).

Furthermore, poor education and lack of awareness may also constitute significant obstacles to health service delivery thereby making worse the problems of maternal health among women. Oftentimes women in rural areas have little or no formal education. This makes them unaware of any health services being offered by government around them. Moreover, low level

of awareness of health service makes the women more inclined to continue to patronize local health service providers which tend to creates more problem than they solve for the women that is having health challenges.

Maternal health is a serious problem in the world particularly in the developing countries and Nigeria boasts of one of the poorest record of maternal mortality by all statistics and indicators. The Nigerian government is aware of these and is making relentless effort to ensure that death due to maternal mortality is reduced to the barest minimum. In spite of the above health service delivery problem in Nigeria appears to be systemic, this is why the problems have defied every attempt to solve it. Most government policies are often superficial and not far reaching enough, thus health problem continue to persist despite government interventions and huge capital outlay. Similarly, broad or blanket policies without regard for the peculiar attribute of the intended target groups are less likely to be efficient because health needs among women differ from place to place. In the healthcare sector, constant equipment failure means putting the lives of patients at a very high risk (ODI,2012).

Most rural areas in Nigeria are remote and difficult to access by road; as a result, women in such areas are completely cut off from health services provided by the government. All these lead to untold hardship and suffering by women in rural area during and after pregnancy. Attaining efficient service is one of the cardinal goals of the Federal Government of Nigeria. This is informed by the barrage of policies formulated by the government year after year. However, in spite of these policies this goal has proven elusive because of the thousands of women that dies yearly as a result of maternal health. These deaths have been attributed to poor health service delivery by many authors in literature.

While there have been professed improvements in health by government both at the national and state level but it has not reflected on high figures of maternal mortality among women both in Nigeria. This study will help policymakers to formulate policies that will improve the plight of pregnant women in the rural area.

Statement of Research Questions

i. What are the health service delivery types in rural Nigeria?

ii. What is the effect of health service delivery on maternal health in rural Nigeria?

Objectives of the Study

The specific objectives of the study are to:

i. profile the health service delivery types in rural Nigeria.

ii. determine the effect of health service delivery on maternal health in rural Nigeria.

Methodology

Scope of the Study

The study area is rural areas in Nigeria. The study used data from Nigeria Demographic and Health Survey (NDHS, 2013) collected by the National Population Commission 2014. Data were collected at all enumeration areas in Nigeria, but this study focused more on that of rural areas. The data provides information on health service delivery and maternal health which includes socio-

economic characteristics that are: the age, sex, religion, gender, marital status, household size, health centre, occupation, income.

Analysis of Objectives

Objective I was analysed using Descriptive statistics such as frequency tables and percentages was used to profile the health service delivery types in rural Nigeria while objective 2 was analysed Tobit regression model.

Tobit regression is a hybrid of the discrete and continuous dependent variable was used to determine the effect of health service delivery on maternal health in the study which include explanatory variables (socio-economic and demographic). The model is specified as:

$$y_i^* = \beta_i x_i + \varepsilon_i \quad (1)$$

$$y_i = 0 \; if y_i \leq 0$$

$$y_i = y_i, if \; 0 < y_i < 1 y_i = y_i, if \; 0 < y_i < 1 \quad (2)$$

$$y_i^* = 1 \; if y_i \geq 1$$

Where $y_i^* y_i^*$ is the limited dependent variable. It represents the maternal health

$y_i y_i$ is the observed dependent (censored) variable

Y includes number of antenatal care visit, postnatal and professional checkup after delivery.

$x_i x_i$ is the vector of independent variables

$\beta_i \beta_i$ is a vector of unknown parameters

$\varepsilon_i \varepsilon_i$ is a disturbance term assumed to be independently and normally distributed with zero mean and constant variance and

$i \; i$ = I, 2 … n (n is the number of observations)

The following socio-economic (independent) variables will be considered Y= Maternal health

$X_1 X_1$= Age (years)

$X_2 X_2$ = Time spent at delivery (hours)

$X_3 X_3$ = Household size (number)

$X_4 X_4$ = Occupation of the respondent

$X_5 X_5$ = Years of formal education (years)

$X_6 X_6$ = Wealth index

$X_7 X_7$ = Religion (I = Christianity, 2= Islam, 3= Traditional)

$X_8 X_8$ = Husband occupation

$X_9 X_9$ = Place of health delivery (km)

$X_{10} X_{10}$ = Sex of household head

Results and Discussions

Socio-economic Characteristics of the Respondents

Table 1: Distribution of Respondents by Age

Respondent's current age (years)	**Frequency**	**Percent**
< 30	8,455	63.66
31-40	3,838	28.9
41-49	988	7.44
Highest Educational level		
No formal education	7,671	57.76
Primary	2,674	20.13
Secondary	2,624	19.76
Tertiary	312	2.35
Respondent's occupation		
Agriculture	2,008	15.12
Trading	9,097	68.5
Services	2,176	16.38
Household size		
1-5	5,042	37.96
6-10	6,205	46.72
11-29	2,034	15.32
Total	**13,281**	**100**

Source: NDHS, 2013.

Table 1 shows the socio-economic characteristics of respondents in the study area. In this study, more than half of the women (63.66%) were less than 30 years, 28.9% falls within 31-40 years while 7.44% were within the age of 41 to 49 years. This is slightly higher than that found in Ethiopia at 61.3% less than 30 years.

Distribution of the respondents by highest education level shows that 57.76% of the respondents had no formal education, 20.13% had only primary education, 19.76%

had secondary education and 2.35% had tertiary education. This have implication for their health service seeking options as they may see other traditional health options as fine or even better. This will limit their knowledge of taking necessary health care service during pregnancy. This is in contrary to the findings of Abebo and Tesfaye (2018), who finds out that most of them, 37.4% have at least a secondary education. This may be due to difference in study settings.

Respondent's occupation revealed that 15.12% were into agriculture, 68.5% were into trading and 16.38% were into services. Evidences have shown that women having paid jobs are likely to utilize maternal health services and access health services in the hospital (Tarekegn et al., 2014).

Distribution of the respondents by household size shows that respondents within 1-5 had 37.96%. 6-10 had 46.72% while those within 11-29 were 15.32%. This has great implications for health care utilisation of the woman. It is in live with the findings of Tekelab, Chojenta C., Smith R. and Loxton (2019), who opined that living in household more than 5 members reduces the likelihood of utilising modern health care services. This may be because of the fact that household expenditure increases with increase in household size.

Place of Delivery

Table 2: Distribution of Respondents by place of delivery

Place of delivery	**Freq.**	**Percent**
Home	9,976	75.11
Government hospital	2,422	18.24
Private hospital	883	6.65
Total	13,281	100

Source: NDHS,2013

Table 2 shows the place of delivery of the last child for women in the rural areas of Nigeria. The study reveals that 75.11% delivered at home, 18.24% were delivered at government hospital while 6.65% were delivered at private hospital. This implies that 3

out of 4 women surveyed gave birth to their last child at home and this shows a low prevalence of health facility delivery. This sis in line with the Idris, Gwarzo, and Shehu (2007) and Adde et al., 2020 who found that less than 50% of women visit a health facility for their child delivery. One of the major reasons cited is distance from the homestead to the health facility.

Use of Maternal Health Services (antenatal care services)

Table 3: Place of antenatal care

Place of antenatal care	Yes	No	Total
Government hospital	3,006 (22.63)	10,275 (77.37)	13,281 (100)
Government health center	2,746 (20.68)	10,535 (79.32)	13,281 (100)
Other public sector	1 (0.01)	13,280 (99.99)	13,281 (100)
Private hospital	1,000 (7.53)	12,281 (92.47)	13,281 (100)
Other private center	23 (0.17)	13,258 (99.83)	13,281 (100)
Home	56 (0.42)	13,225 (99.58)	13,281 (100)
Other home	178 (1.34)	13,103 (98.66)	13,281 (100)
Other	6 (0.05)	13,275 (99.85)	13,281 (100)

Source: NDHS, 2013

Table 3 shows distribution by place of antenatal care, it was revealed that 22.63% used government hospital, 20.68% used government health centre, 0.01% used other public sector, and 7.53% used private hospital while 0.17% used other private sector, 0.42% used their home and 1.34% used other home while 0.05% used other places. All these places accounts for 52.84% of the respondents. This implies that 43.48% of the women surveyed used modern health care for their antenatal services. Looking at this statistics as against the proportion of women that gave birth in modern health facilities shows that just 24.89% of these women gave birth in the health facility. The study again shows that 47.16% of the respondents do not go through any form of antenatal care. This is in line with the findings of Nwosu and Ataguba, 2019 who found that utilisation of antenatal care services in Nigeria is still very low.

Table 4 presents the Tobit regression results of the effect of health service delivery on maternal health. The results shows that place of delivery, occupation, age, sex of household head, highest year of education, household size and highest educational level had positive relationship on maternal health, while husband occupation had negative relationship. However, the evidence has contained in the table below shows that the set of significant explanatory variables varies across maternal health in term of the levels of significance and signs which are reported as follows:

The place of delivery a had positive relationship on maternal health and it is statistically significant at 1%. This implies the place of delivery will affect maternal health because when the place of delivery is not well equipped with necessary facilities, the

service given to the pregnant will be poor and this have effect on the mother's health. This is in line with the findings of Adde et al, 2019.

The Effect of Health Service Delivery on Maternal Health

Table 4: Result of Tobit Regression

Maternal health	Coefficient	Std. Err.	t-value	P>t	dy/dx
Place of delivery	0.3545127	0.0094023	37.7	0.0000***	0.1929734
Respondents occupation	0.0288324	0.0081711	3.53	0.0000***	0.0156945
Respondents current age	0.0649346	0.0096389	6.74	0.0000***	0.0353462
Sex of household head	1.536754	0.2349507	6.54	0.0000***	0.8365079
Highest year of education	0.0482661	0.0285094	1.69	0.09*	0.0262729
Time spent at delivery	0.0007905	0.0010091	0.78	0.433	0.0004303
Source of drinking water	0.0023014	0.005291	0.43	0.664	0.0012527

Household size	0.1606613	0.0206808	-7.77	0.0000***	-0.0874535
Religion	-0.0108648	0.0096469	-1.13	0.26	-0.0059141
Husband educational level	1.368329	0.054693	25.02	0.0000***	0.7448285
Husband occupation	0.0011396	0.0003288	-3.47	0.001***	-0.0006203
_cons	-7.8955	0.5165625	-15.28	0	
/sigma	6.974372	0.0645739			

Source: NDHS, 2013

Level of significance, *** significant at 1%, ** significant at 5%, * significant at 10%

Prob> $Chi^2 = 0.0000$

Pseudo $R^2 = 0.0521$

Log likelihood = -27149.318

With respect to occupation, the relationship is positive and it is significant at 1%. This means that the type of occupation engaged in by the pregnant woman can affect her health. A pregnant woman should not go through more stress in order not to have health implications during delivery and this can reduce the level of good health.

Age had positive a relationship and it significant at 1%. This implies that as the older the woman, the more the maternal health improves.

The sex of the household had positive relationship and it is significant at 1%. It means the households headed by female are more like to have improved maternal health because the health of a pregnant woman is well known by female as a result of experience.

The highest year of education had a positive relationship on maternal health and it is statistically significant at 10%. This implies that the years of formal education of a pregnant woman can improve her maternal health as a result of literacy and knowledge of health through educational programmes.

The household size had a positive relationship and it is significant at 1%. This means the less the household size the more likely improved maternal health, this is because the income of the household will be enough for their needs and to cater for their health especially the pregnant woman.

Religion had a negative relationship on maternal health and it is significant at 5%. This implies the religion practiced by the pregnant woman will have negative effect on her health as a result of norms and belief of the religion.

Husband occupation had positive relationship on maternal health and it is statistically significantly at 1%. This implies that the well paid job done by the husband will have positive impact on the health of the pregnant woman because it will be so easy to have surplus after consumption to cater for the pregnant woman.

Conclusion and Recommendations

Conclusion

This study has shown that good health care service can lead to improved maternal health. The study successfully identified some key factors that can contribute to good maternal health, these factors include, sex of the household head, place of delivery, age, low household size, well paid husband occupation, highest educational level. This means that a woman who is highly educated have an improved maternal health. Maternal health also depends greatly on antenatal care by professional personnel for proper health care service which can reduce health implications during delivery to the barest minimum.

Recommendations

Based on the findings of the study, the following recommendations are made:

- Result revealed that majority of them delivered at home as a result of distance to health facility; there should be provision of infrastructural development which involves building of health facilities at a relatively near distance to the villages in Nigeria.
- The study also revealed that most of the respondents have poor knowledge on the necessity of child delivery at the health facility; as a result of lack of information and health education, proper information should be made available through creation of awareness.
- The women should be encouraged to have formal education in order to increase their knowledge of maternal health during pregnancy because the result revealed that a female who is highly educated will have improved maternal health as a result of knowledge gained from formal education to know the necessary care needed by pregnant women during and after delivery.

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