MATERNAL MORTALITY IN NIGERIA: AN IMPACT ANALYSIS

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Abstract

Given the perplexing and high rate of preventable maternal mortality in Nigeria, its attendant consequences on future human capital development, and its effect on the family this paper, examines the impact analysis of maternal mortality in the country via its non health causative agents. The ordinary least square technique and simple percentage were adopted in the analysis of the data. The data were sourced from the Nigeria Demographic and Health Survey (NDHS) 2013 document. The findings from the data analysed indicated that a negative and significant relationship exists between mother's educational attainment (MEI) and maternal mortality (MMR) in the country. A negative and significant relationship also exists between the place of delivery (PCD) and maternal mortality. Mother's decisions concerning their healthcare (DMH) has a negative effect on maternal mortality (MMR). The result also shows that there is a negative but insignificant relationship between other measures of women autonomy (DHP and DVR) and maternal mortality. Given the above findings the paper, therefore recommends increase level of girl child education through award of scholarship and free anti-natal care as to encourage delivery at health centres.

Key Words: Maternal mortality, Mothers Status and Nigeria Demographic and Health Survey.

Introduction

The arrival of a new-born baby on earth is an event that brings Joy to the mother, father and relatives and it is accompany with fanfare. But, for women in developing countries and Nigeria in particular, this is not often the case, as the pregnancy journey is a perilous one and a death trap with much maternal mortality (Aboyeji, Ijaiya, & Fawole, 2007).

Pregnancy and childbirth is a constant source of a challenge to women, very risky and complications trotted leading to precocious death among women in Nigeria. This ugly incidence has turned the supposed pleasant experience (childbirth) that is accompanied by fanfare into a nightmare because of the end result (premature death) (Nwosu, 2012).

According to World Bank estimate cited in the vanguard (2018) out of the 303,000 maternal deaths in the World emanating from complications of pregnancy and childbirth in 2015, 58,000 maternal deaths occurred in Nigeria. Nigeria maternal mortality rate stood at 821 per 100,000 live births (World Bank, 2018). Mr Bill Gates, the co-chair of the Bill and Melinda Gates Foundation, stated that Nigeria is one of the most unsafe places in the globe to give birth and the 4th country with the worst maternal death rate ahead of Sierra Leone, Central African Republic and Chad (Vanguard, 2018). What a gloomy picture of the giant of Africa that plays the big brother role to sisters' countries but can not handle preventable maternal death. This shows some level of insensitive by government and callousness among leaders, in the country.

The report of the 18th General membership meeting on Reproductive Health Supplies Coalition in Brussels, Belgium, revealed that Nigerian women have a life time risk of maternal mortality of 4.62 per cent, the fertility rate of 5.71 and annual births of almost 7 per cent (Vanguard, 2018).

Maternal death results in the loss of a productive member of the household, economic and social hardship for children (Felix, 2017, Turmen & Abauzhar, 1994, Herrera-Torres, Cruz & Burgu, 2006). The unissen cited in the Vanguard (2018) stated that "A child whose mother dies in childbirth is three to ten times more likely to die before his or her second birthday". The implication is that maternal death has adverse consequences on future human capital development, by cutting short the life span of the child, through poor nutrition and dropping out of school especially where the mother is the breadwinner (Felix, 2017).

The leading medical causes of maternal mortality are categorized into two direct and indirect causes. The direct causes account for about 80 per cent,

while the indirect causes account for about 20 per cent (Kvale, Oslen, Hinderaker, Ulstein, &Bergsjo2005). The direct causes comprise of severe bleeding, infections, unsafe abortion, enclampsia and obstructed labour. The indirect causes are anaemia, cardiovascular disease, tuberculosis, malaria, hepatitis and aids related conditions.

The fifth goal of the millennium development goals is reducing maternal mortality ratio by three-quarter by 2015, but this has been extended to 2030 as captured in the sustainable development goals.

Previous scholars (Aboyeji, Ijaiya & Fawole, 2007,Trivedi&Pasriya, 2007,Olapade & Lawoyin, 2011) have examined the clinical causes of maternal mortality. Other scholars (Felix, 2017, Hagman 2013, Abansa, Idris & Akanegbu, 2013) examined the maternal mortality issue from the social infrastructure provision perspective. The point of departure of this study from earlier works is that this study centres on non-health related factors and there effect on maternal mortality. This is what motivated this study; thus the objective of this study is to carry out an impact assessment of maternal mortality in Nigeria.

The rest of the paper is organized as follows: section two dwells on maternal mortality in Nigeria and steps taken by government to curb it. Section three is the literature review and section four centres on methodology. Section five is data analysis and discussion of results and section six concludes the study.

Maternal Mortality in Nigeria and Steps Takento Curbthe Menace

Maternal mortality is a topical issue because of its inclusion as the fifth goal in the millennium development goals (MDGs). The fifth goal of the MDGs is reducing maternal death by three-quarter by 2015. The alarming rate of maternal mortality in Nigeria has caused some women to develop phobia for pregnancy and childbirth. This phobia is what drives them to seek solace from faith clinics and herbal homes when they are pregnant because they (pregnant women) believe that these faith clinics and herbal homes have control over the spiritual realm which can manipulate pregnancy outcomes.

The trend in maternal mortality rate from 1990 to 2015 is given below. According to World Bank (2017), Nigeria in1990 had 1350 maternal death per 100,000 lives birth, 1250 for 1995, 1170 for 2000, 946 for 2005, 807 for 2010 and 814 maternal death per 100, 000 lives birth in 2015. What a heart aching trend. The sustainable development goal (SDGs) 3.1 is the reduction of global maternal mortality ratio to less than 70 per 100,000 live births (World Health Organization 2017). This fixed rate reflected in the sustainable development goal document is a myth and not real given the kid gloves with which we handle issues concerning maternal mortality in Nigeria, the level of infrastructural decay, and brazen corruption that has become a household phenomenon in the country.Sanusi (2012) captured the Nigerian ugly infrastructural investment scenario thus:

> The current level of infrastructure deficit in Nigeria is the major constraint towards achieving the nation's vision of becoming of the 20 largest economies in 2020 because about 70 percent of 193,000 kilometers of roads in the country is in poor condition; the power outages the nation experiences amount to over 320 lost days a year; over 60 percent of the population lack access to electricity; over $13 billion is spent annually to fuel generators, and Nigeria which once had one of the most extensive railway systems in Africa could now barely boast of a functional route either for passenger or freight.

The government has adopted several strategies to curb maternal death in Nigeria. This range from user fee charge, antenatal care, training of skilled birth attendants to partnership with world health organisation and the Gill and Melinda foundation reproductive health initiative. The others include primordial prevention, primary prevention, secondary and tertiary prevention.

Primordial prevention this entails nipping the occurrence of risk factors linked with the incident of cases of maternal mortality. Some examples of primordial prevention are health campaign against harmful cultural practices such as female genital mutilation, early childhood marriage, forced marriage etc.

Primary prevention has to do with prevention of maternal mortality through modifications of behaviours and exposures that give rise to the pervasiveness of maternal death (Ogu and Ephraim, 2018).

Secondary prevention involves the early discovery and prompt treatment of pre-clinical pathological changes occurring during pregnancy. This is achieved via training and retraining of skilled birth attendants at designated health facilities at the time of delivery (Ephraim, 2018). Tertiary prevention seeks to moderate the negative effect caused by the disease on the patients function, longevity and quality of life. Examples are cardiac rehabilitation following a cardiomyopathy, modifying risk factors (Goodrum, 2001).

Literature Review

Olopade and Lawoyin (2008) examined maternal mortality in a Nigerian maternity hospital. They identified the primary causes of maternal mortality to be haemorrhage, sepsis, enclampsis etc.

World Bank (2003) in a paper tagged Investingin Maternal Health**:** Learning from Malaysia and Sri Lanka, established that full use of existing social infrastructure interventions, especially comprehensive emergency obstetric care, would reduce maternal mortality by 75 per cent. The above result buttresses the fact that maternal mortality is a product of government insensitivity and recklessness.

Goyaji and Rao (1998) in their study community-based case control study of maternal mortality in rural west Maharashtra, India, discovered that maternal education was not associated with an increased risk of maternal mortality, but a higher level of education in men was protective against maternal mortality.

Nwankwo (2018) examined the effects of public health spending on maternal mortality in Nigeria. He employed a panel data regression technique and the result indicates that public health spending is imperative in explaining reduction in maternal mortality in Nigeria.

Kirigia, Oluwole, Mwabu, Gatwiri and Kainuyu (2008) in their study established that maternal mortality is inversely related to economic growth

(GDP) in the WHO Africa region. The reason deduced for this are: maternal death can reduced the quantity and quality of labour force and by so doing the number of people involve in active production. Next a mother is a caregiver, thus, her death entail the loss of a caregiver compelling the father to reallocate time to provide care to the bereaved children. This entails the loss of economically productive time. Thirdly, the high funeral costs associated with maternal death at time may force family to sell some of the productive assets (land, farm machinery and equipment) to pay for the funeral. Fourthly, maternal death has negative consequences on future human capital development process, on quality of labour force and hence future level of economic growth. Bokhari, and Pablo (2007)examined the relationship between government health expenditures and health outcomes using instrumental variables techniques. Their findings established a negative and significant relationship exist between government health expenditures and maternal mortality.

Kravdal (2002) investigated the relationship between education and fertility in sub-Saharan Africa: individual community effects. The findings establish that education at the community level is inversely related to fertility rates and by extension maternal mortality. Empirical literature abounds both in developed and developing countries about the negative relationship between female education and a decrease in fertility (Bbaale & Mpuga 2011, Sackey, 2005, Vavrus & Larsen, 2003).

A number of factors accounted for the negative relationship between female education and fertility decline, among them are: first the more the number of years a woman stays in school, the longer she postpones giving birth to her first child. The delayed birth affect negatively the number of children she will be willing to deliver (Bbaale&Mpuga, 2011).

Among the causes of maternal death, severe anaemia is seen as the primary cause of maternal death in less developed countries (Lindsay, 1997). Severe anaemia in pregnancy is documented as the primary cause of 8 to 23 per cent maternal death in most hospital (Rush, 2000). The overall effect of HIV/AIDs on pregnancy related maternal death remains ambiguous (Lekeur, Khlat and Halembokaka (2005).

Method of Study

The methodology of this study is anchored on Adeyele and Ofoegbu (2013) simple regression method. The explained variable is maternal mortality and the explanatory variables include mother's educational attainment and mother status. Mother's status measures the ability of women to control resources and make decisions. In the 2013 women were asked questions pertaining to certain aspect of their autonomy, including a number of household decisions in which women participates. Such decisions include place of delivery, decision on mother's health and decision on household purchase.

The data for this study are from the Nigeria Demographic and Health Survey (NDHS) 2013. The 2013 Nigeria Demographic and Health Survey is the fifth comprehensive and latest survey conducted in Nigeria as part of the Demographic and Health Surveys (DHS) programme. The 2013 NDHS is a comprehensive natural representative survey of 40,320, women aged 15 to 49 and 18,229 men aged 15 to 49 randomly selected households within the six geo-political zones in the country. Maternal mortality estimates are based on information from survivorship of sisters. This information dates back to the seven-year period before the 2013 survey (NDHS, 2013).

Model Specification

MMR = f(MET, MST)
MST = f(PLD, DMH, DHP, DNHR)

Where:

MET = Mother's Educational Attainment
MMR = Maternal Mortality rate. This is defined as the death of a woman while she is pregnant or within 42 days of the termination of her pregnancy, irrespective of the cause of death (WHO, 2012)
MST = Women Status
PLD = Decision on the place of delivery
FMH = Decision on Mother's healthcare
DHP = Decision on Household purchases
DVR = Decision on visits to family or relatives

Empirical literature established has linear relationship between maternal mortality and its determinants (MET, PLD, DMH, DHP and FVR). Thus, the researcher deems it necessary to fit a regression model as specified below.

$$MMR = a_0 + a_1\ MET + a_2 PLD + a_3\ DMH + a_4\ DHP + a_5\ DVR$$

Data Analysis

Descriptive Statistics

Table1:Mother's Educational Attainment

Educational Attainment	Frequency	Percent	Cumulative Percent
No Education	15, 462	39.7	39.7
Some primary	2,103	5.4	45.1
Completed primary	5,141	13.2	58.3
Some secondary	5,881	15.1	73.4
Completed secondary	6,738	17.3	90.7
More than secondary	3,623	9.3	100
Total	**38,948**	**100**	

Source: *Nigeria Demographic and Health survey (NDHS)2013.*

Table 1 indicates that out of a total of 38,948 mothers, 15,462 had no formal education and this represented39.7 per cent of the total number of women that duly responded to the questionnaire. 5.4 per cent(2,103) had some primary education, 13.2 (5141) per cent of the women had completed primary education. 15.1 per cent (5881) women had some secondary education, while 17.3 per cent (6,738 women) had complete secondary education and 9.3percent (3,623 women) had more than secondary education. This buttresses the fact that there is high level of illiteracy among mothers, and all things being equal, this will impinge negatively on them in terms of utilizing the existing health care facilities and increase the risks of maternal death. Again lack of basic education makes them ill prepared for parenthood and its attendant consequences.

Table 2: Place of Delivery

Place of Delivery	Frequency	Per cent	Cumulative Percent
Public health sector facility	**8413**	21.6	21.6
Private health sector facility	**428.4**	11.0	32.6
Home	**278**	66.2	98.8
Other	**39**	0.1	98.9
Missing	**412.8**	1.1	100
Total	**38948**	**100**	

Source: *Nigeria Demographic and Health Survey (NDHs) 2013*

Table 2 below indicates the various places of child delivery. 21.6 per cent (8413) women delivered their babies at a public health sector facility. 11 per (4284) women delivered their babies at a private health sector facility. 66.2 per cent (25,784) women delivered their babies at home, while 0.1 per cent (39) women delivered their babies outside the three identified places above. 1.1 per cent is unaccounted for. The above break down shows that higher percentages of children were delivered at home without any trained medical personnel assistance. This may partly explain the mind boggling rate of maternal deaths recorded in the country.

Table 3: Decisions on Mother's Health Care

Response	Frequency	Per cent	Cumulative Per cent
Mainly Wife	2415	6.2	6.2
Wife/husband jointly	12,697	32.6	38.8
Mainly husband	23,680	60.8	99.6
Someone else	78	0.2	99.8
Other	-	0.0	99.8
Missing	78	0.2	100
Total	**38948**	**100**	

Source: *NDHS 2013*

Table 3 above shows the degree of decision control as admitted by women. 6.2 per cent (2415) of the women (respondents) admitted that decision about their health care solely rest on them. 32.6 per cent (12,697) admitted the decision about their health care is jointly taken by them and their husband. 60.8 per

cent (23,680) women also admitted that the decision concerning their health care is the sole responsibility of their husband. 0.2 per cent (78) women attested the decision concerning their health care is taken by someone else, and 0.2 per cent is missing. The implication of the above descriptive analysis portray that women in Nigeria have little control concerning decision relating to their health care. This may partly explain the reason for the high rate of maternal mortality experience in the country within the period under review.

Table 4: Decisions on Major Household Purchases

Response	Frequency	Per cent	Cumulative Per cent
Mainly Wife	2181	5.6	5.6
Wife/husband jointly	12, 463	32.0	37.6
Mainly husband	24,109	61.9	99.5
Someone else	78	0.2	99.7
Other	38	0.1	99.8
Missing	78	0.2	100
Total	**38, 948**	**100**	

Source: *NDHS 2013.*

From table 4 above 5.6 per cent of respondents (women) admitted that they take decision singularly concerning major household purchases. 32 per cent of respondents admitted that major household purchases were a joint decision (wife/husband) while 61.9 per cent of respondents attested such decision were solely the husband's responsibility. The above breakdown shows the level of women autonomy in Nigeria is very weak.

Table 5: Decision about Visits to her Family and Relatives

Response	Frequency	Per cent	Cumulative Per cent
Mainly Wife	3077	7.9	7.9
Wife/husband jointly	15,384	39.5	47.4
Mainly husband	20,331	52.2	99.6
Someone else	78	0.2	99.8
Other	0.0	0.0	99.8
Missing	78	0.2	100
Total	**38, 948**	**100**	

Source: Nigeria *Demographic and Health Survey (NDHS) 2013*

Table 5 indicates that 52.2 per cent of the respondents admitted that decision regarding visits to her family or relatives is made by their husbands. 39.5 per cent of the respondents stated that decision regarding visits to family or relatives were jointly determined by wife and husband. Only 7.9 per cent of the decision was done mainly by the wife.

Table 6: Case Processing Summary

Cases	**N**	**Percent**
Valid	36, 458	94.7
Excluded	2, 490	5.3
Total	38948	100.0

Source: *Author's Computation.*

Table 7: Reliability Statistics

Cronbach's Alpha	Number of items
0.61	6

Source: *Author's Computation*

Table7 presents the reliability result of the determinants of maternal mortality. The Cronbach's Alpha in the table above shows the strength of significance of the determinants. The Cronbach's Alpha value 0.61 indicates that the conclusions that could be inferred from the variables included in the model are reliable given that the reliability is above an average weight of 0.5. Given the above there is need to take a step further to estimate the model.

Table 8: The Ordinary Least Square Multiple Regression

Coefficients (a)							
	Unstandardized coefficients		**Standard coefficients**			**Collinearity statistics**	
Model	**B**	**Std. Error**	**Beta**	**T**	**Sig**	**B**	**Std Error**
(Constant)	11.483	1.083		8.164	.000***		
MET	-0.813	.046	-.074	-5.218	.000***	.681	1.632
PLD	-0.076	.089	-.004	-4.383	.000***	.635	1.589
DMH	-0.691	.237	-.093	-4.564	.000***	.414	1.703
DHP	-0.003	.251	-.021	-.089	.834	.401	2.201
DVR	-0.214	.183	-.032	1.347	.612	.387	2.402
a Dependent Variable: MMR							

Source: *Author's Computation, 2019.*

The result of the estimated multiple regression in table 8 above shows that the mother's educational attainment (MET) has a negative coefficient (-0.813) and it is statistically significant. The implication is that an inverse relationship exists between the mother's educational attainment (MET) and maternal mortality in Nigeria. The result depicts that the more mother's attend school level of maternal mortality in the country will reduce by 0.813. This is evidenced in the Nigeria Demographic Health Survey (NDHs 2013) where about 60.3 per cent of mothers had different levels of educational attainment. The place of delivery (PLD) has a negative coefficient (-0.076) and it is statistically significant as shown in the above table. This implies there is a negative relationship between the place of delivery by mothers and maternal mortality (MMR). This further buttressed the fact the more mothers deliver at available health facilities, maternal mortality will reduce by 0.076 per cent. This is depicted in the Nigeria Demographic and Health Survey (NDHS, 2013), where 66.2 per cent of deliveries were carried out at the homes of the mothers. This without any prejudice partly explains the high incidence of maternal mortality experience in the country.

The degree of women autonomy (the degree of women participation in the decision that affect them and that of the family) and maternal mortality was tested using the three decision criteria identified in NDHS 2013. There is a negative and significant relationship between the degrees of mother's involvement in decision making concerning their health and maternal mortality. This implies that as mothers are more involved in decisions making concerning their health care, there will be reduction in the maternal mortality rate all things being equal. Thus, mothers should be given the opportunity to have a say with regards to their health, this will avail them the opportunity to have access to medical personnel that can give them their professional counselling and the necessary treatment.

A negative and insignificant relationship exists between decision making regarding large household purchase (DHP) and maternal mortality. A negative and insignificant relationship exists between decision making regarding visits to family and relative and maternal mortality.

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.783	.572	.416	.810	2.153

a. **Predictors:** (constant), MET, PLD, DMH, DHP, DVR
b. **Dependent variable:** MMR

Source: *Author's Computation,2019.*

The above result for the test of goodness of fit (the Adjusted R-square=0.416), implies that the explanatory variables in the model explain about 42 per cent of the variations in maternal mortality (dependent variable). The remaining 58 per cent of the variations in maternal mortality is explained by variables not captured in the model. The F-statistic value is 13.876 and its probability value of 0.000 shows that the model has a good fit and it is statistically significant. The Durbin-Watson statistic (DW=2.153) indicates the absence of autocorrelation in the model specification.

Conclusions

Given the result from the data analysed the paper concludes as follows: Women educational attainment is low since 39.7 per cent of them are without any formal education. This party explain the high incidence of maternal mortality in the country, because without any education there is the tendency for the women to marry early and bear more children which increase their risk of maternal mortality. Lack of formal education by women reduced their chances of using medical facilities because of the user fee charges; this forces them to patronize faith clinic and herbal homes. This is in collaboration with Felix (2017) who stated that access to education and health lead to a reduction in maternal mortality.

The place of delivery (mother's home) has a negative effect on maternal mortality, because dangers signs are not easily detected and adequate treatment measure are not taking to avert maternal death because the traditional birth attendant lack the requisite skills. About 66.2 per cent of delivery within the study period is at home, and this may partly explain the high rate of maternal mortality in the country.

Women participation in decision concerning their health has a negative impact on maternal mortality. This is because 60.8 per cent of decisions about women health care are taking by their husbands. This portrays low level of women autonomy in the country and may partly also explain the high rate of maternal mortality in the country.

Recommendations

The following recommendations are put forward:

(1) Women should be allowed to make decision concerning their health care because it is them that bear the brunt of maternal death.
(2) Anti-natal care should be giving free of charge as to encourage women to deliver in health facilities.
(3) The girl child education should be encouraged through award of scholarship.

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