Policy implication of non-utilization of health care services for maternal mortality in Nigeria

Introduction

The World Health Organisation report on maternal mortality (WHO, 2007) indicated that about half a million women (536,000) die each year due to pregnancy or childbirth. Developing countries accounted for 99% (533 000) of these deaths. Slightly more than half of the maternal deaths (270 000) occurred in the sub-Saharan Africa region alone, followed by South Asia (188 000). Thus, sub-Saharan Africa and South Asia accounted for 86% of global maternal deaths. Nigeria alone accounted for about 11% (59,000) of global and 22% of sub-Saharan Africa maternal deaths; Nigeria has the highest maternal deaths in Africa and the second highest in the world.

Nigeria's high maternal mortality rate can be partially attributed to the low levels of births attended by a skilled attendant: just 39% of births were attended by skilled personnel in 2008 (NPC & ICF Macro, 2009). However, the 2008 NDHS report indicates large regional variations within the country, ranging from 87% in both the South West and South East to just 10% and 16% respectively in the North West and North East.

Numerous social and institutional factors constitute barriers to the use of obstetric services and consequently the high level of maternal mortality in the country. These include poverty, gender inequality, poor transportation, lack of skilled attendance at delivery, low levels of caesarean section, inefficient referral system, and place of residence, among others. Risks of mortality for women and their babies are highest at the time of birth (WHO 2008); the availability of skilled attendants – nurses, midwives and doctors – at the time of delivery is therefore crucial to the reduction of maternal deaths. According to Abouzahr and Wardlaw (2001), estimates indicate that globally, skilled attendants assist only around 56% of births. The lowest levels are in

South Asia (29%) and sub-Saharan Africa (37%). The highest levels are in Latin America and the Caribbean (83%) and the Central and Eastern Europe/Commonwealth of Independent States regions (94%).

In Nigeria, skilled attendants attend only 42 percent of births, according to UNICEF (1997). Skilled health professionals are in short supply in Nigeria and other less developed countries. This problem is exacerbated by the "brain drain" of Nigerian doctors and nurses to other African countries, Europe, and the United States. Ufford and Menkiti (2007) citing a 1993 report from the United Nations Development Programme indicates that more than 21,000 Nigerian doctors are working in the United States while Nigeria suffers from a shortage of doctors. As indicated in the 2008 NDHS, only 35 percent of all deliveries take place in a health care facility with just 39 percent of deliveries attended by skilled attendants (NPC and ICF Macro, 2009). Those who do not give birth in hospitals deliver their babies at homes, churches, or other remote places in accordance with tradition or cultural beliefs.

Strong cultural barriers to the use of maternal health services exist in many countries where maternal mortality is high. One such cultural issue is the role of gender, which often includes spousal influence on women's health seeking behaviour. Several studies have documented the immense power which men wield in household decision-making, including decisions that affect women's reproductive health (Ogunjuyigbe, Ojofeitimi and Liasu, 2009). Dia (1989) found in Senegal that health-seeking decision-making belongs to the husband or senior family members. A study in Bangladesh showed that several women in critical obstetric conditions were refused referral to hospitals with adequate facilities because the husband was either absent or did not give permission for referral (Juncker and Vanneste 1994). Also, Adewuyi (1999) reported that in some parts of Nigeria, spousal permission is important before a

woman with obstetric complications seeks health care; in the absence of the male household head, another male member must accompany her to the clinic.

Furthermore, the perception of the severity of emergency obstetric conditions might be a strong determinant in the use of maternal health services. The Prevention of Maternal Mortality Network (PMMN) (1992) reported that in some parts of Nigeria, swollen feet during pregnancy, which could be indicative of eclampsia, is seen as an indication that the baby will be a boy (or twins in the belief of some Ghanaians). Small amounts of bleeding, which are early signs of antepartum haemorrhage are also not considered a cause of concern. It is thus presumable that couples are not likely to act in time to seek emergency care unless they have correct knowledge of emergency obstetric complications and the danger they pose to the lives of pregnant women.

This paper will therefore examine the proportion of women at risk of maternity care related risks of maternal mortality, their use or non-use of health care services and the implications these will have for maternal mortality situation in Nigeria.

Methodology

This study analysed data from the 2008 NDHS. The sample for the 2008 NDHS was designed to provide population and health indicators at the national, zonal, and state levels. The sampling frame was the 2006 Population and Housing Census of the Federal Republic of Nigeria conducted in 2006, provided by the National Population Commission (NPC). The primary sampling unit (PSU), referred to as a cluster for the 2008 NDHS, is defined based on Enumeration Areas (EAs) from the 2006 EA census frame. Sample was selected using a stratified two-stage cluster design consisting of 886 clusters, 286 in the urban and 602 in the rural areas. A representative sample of 36,800 households was selected with a minimum target of 950 completed

interviews per state. In each state, the number of households was distributed proportionately among its urban and rural areas. A complete listing of households and a mapping exercise were carried out for each cluster from April to May 2008, with the resulting lists of households serving as the sampling frame for the selection of households in the second stage. All private households were listed. In the second stage of selection, an average of 41 households was selected in each cluster, by equal probability systematic sampling.

Although 33,385 women aged 15-49 years were successfully interviewed in the survey, this paper is based on a sample size of 17,635 women. The selection criteria for the sample used is the condition that for a woman to be eligible for inclusion in the study, she must have given birth to at least one child in the last five years preceding the survey. Only 17,635 women satisfied the inclusion criteria. Three questionnaires were used for the 2008 NDHS. They are the Household Questionnaire, the Women's Questionnaire, and the Men's Questionnaire. This paper is based on data generated from the women's questionnaire used to collect information on all women age 15-49.

Data were analysed at three levels which were adapted from the methodology of Govindasamy, Stewart, Rutstein *et al* (1993) with some modification. For instance, unlike the Govindasamy *et al* (1993), the effects of confounding variables at the multivariate level were controlled for. The first level of analysis involves the cross tabulations of some important variables determined by the known influence (from literature) of these variables on the risks of maternal mortality such as age, residence, education, states, region, occupation, wealth index, among others. The analysis examines maternity care-related risk factors of maternal mortality. Women were classified into single and multiple risk categories. As defined by the DHS, the three risks associated with non-use of essential maternity care services considered in the

analysis are: risks from non-use of antenatal care during last pregnancy, risks of not delivering in a health facility during last childbirth and the risk of delivering the last baby without the assistance of a skilled provider. The second level involves a bivariate logistic regression of selected predictor variables on the specified risks of maternal mortality. Finally, the multivariate level analysis further analysed the patterns and relationships between non-use of essential maternity care services and selected socio-demographic variables. The multivariate logistic regression model considered the relationship between a bivariate dependent variable (at risk or not at risk) and a set of independent variables $X_1, X_2, \ldots, X_n$

$$Logit\ P(x) = \alpha + \sum \beta_i X_i$$

$\exp(\beta) = odds\ ratio\ for\ a\ person\ having\ characteristic\ "i"\ versus\ not\ having\ characteristic\ "i"$

$\beta = regression\ coefficient$

$\alpha = cons\tan t$

The focus of analyses included women who had at least one birth in the last five years preceding the survey. The dependent variable is the risk of maternal mortality (at risk or not at risk). The risks are proxied by (a) high-risk births and (b) risks from non-use of essential maternity care services. The dependent variables were dichotomised based on whether or not the woman was at risk of maternal mortality. For single risk factors, the dependent variable was 1 if woman falls into any one of the individual risk categories and 0 if otherwise; while for multiple risks, it was 1 if woman falls into at least two of the specified risk categories and 0 if otherwise. Based on literature, independent variables to be included in the analysis include educational status, marital status, work status, religion, residence, access to media, women's empowerment status, cultural factors, and institutional factors (including accessibility of health facilities, quality and cost of care).

Nigeria has six officially recognised geographic regions, often referred to as geo-political zones. The NDHS data divided the 36 states of the country and the Federal Capital Territory (FCT) into these geographic regions. The North Central region, comprising the FCT, Niger, Nasarawa, Plateau, Benue, Kogi and Kwara states, accounts for 14% of the total respondents. About 16% of the respondents are from the North East region which includes Yobe, Borno, Adamawa, Gombe, Bauchi and Taraba States. The North West, which includes the states of Sokoto, Zamfara, Katsina, Jigawa, Kano, Kaduna and Kebbi, has the highest proportion of respondents (30%). Thus, about 60% of the respondents are from the northern part of the country while the Southern part accounts for the remaining 40%. The Southern distribution is as follows: South East, made up of Anambra, Enugu, Ebonyi, Abia and Imo States, has 9% of the respondents; 17% were from the South West region which includes Oyo, Osun, Ekiti, Ondo and Lagos while the third southern region, the South-South region (comprising Edo, Delta, Rivers, Cross River, Akwa Ibom and Bayelsa States), accounts for the remaining 13%.

Characteristics of Respondents

As shown in Table 1, 70% of the women who gave birth in the last five years preceding the survey reside in the rural part of the country. A disaggregation of the proportions by geographic region shows that the Southwest region is an exception to the overall trend as more than half of the women who gave birth in the last five years in the Southwest reside in urban areas (56%). In all of the remaining five regions however, the majority of the women are rural dwellers and in each of the northern regions, at least three-quarters of the women reside in the rural areas. The table shows that 7% of the women who gave birth in the last five years are teenagers within the age range 15-19 years while more than a quarter (27%) are above 34 years of age. It should

be noted that this statistic represents the current age of the women (at the time of interview) and not their ages at the time they had their last births.

As many as 45% of the women have not attended school, while the rest have received at least a primary school education. About 3 in 4 women who gave birth in the last five years in North East and North West regions have no formal education (73% and 78% respectively). The North Central region fared a little better than the other two northern regions with about 57% of the women receiving at least primary schooling and more than a quarter (about 29%) receiving secondary or higher education. In contrast, in each of the three southern regions, more than 4 in 5 of the women have formal schooling while about 60% in each region received secondary or higher education. These statistics depict a wide educational divide between the women in the southern region and their northern counterparts. Table 1 further shows that most of the men to whom the women are married (or living with as married) have attained at least primary-level schooling and 38% had no formal education. Unlike the women however, men in the northern region are more educated with at least a fifth of the men in each of the northern regions having attained a minimum of secondary schooling. In the south, the education gap between the women and their partners is very narrow. However, there is a noticeable exception in the pattern in the South East where a higher proportion of the women (61%) had attained at least secondary level education compared to 48% of their male partners.

More than half of the respondents are Muslim (54%) while 44% are Christian. There is a clear pattern in terms of religious affiliation of the women in the two major geographical divides: the southern region is predominantly Christian while the northern region is mainly Muslim. The North Central region however has more Christians (55%) while the other northern regions have a Muslim majority. In the

southern region, the South West has a fairly large proportion of Muslims (38%) unlike the two other southern regions that have a near-universal Christian population (about 95% each).

Table 1: Percentage distribution of respondents by selected socioeconomic characteristics and region of residence

	North Central	North East	North West	South East	South West	South-South	% (Nigeria)	No. of women*
%	14.32	15.60	30.46	9.09	17.44	13.10	100.0	-
No. of women	2,525	2,751	5,372	1,603	3,075	2,310	-	17,635
Type of place of residence								
Urban	24.88	24.83	17.47	44.08	56.16	28.0	30.22	5,330
Rural	75.12	75.17	82.53	55.92	43.84	72.0	69.78	12,305
Age								
15-19	6.47	9.62	8.89	3.37	2.98	5.07	6.62	1,168
20-24	20.31	21.49	22.08	15.13	14.22	18.58	19.27	3,399
25-29	28.17	25.61	23.47	27.90	29.47	28.74	26.62	4,694
30-34	18.57	17.52	18.82	22.30	25.27	22.53	20.51	3,617
>34 years	26.48	25.76	26.74	31.30	28.05	25.07	26.98	4,757
Highest Educational level								
None	42.83	72.99	78.39	7.63	14.32	6.66	45.46	8,017
Primary	29.44	16.32	12.78	31.06	27.81	33.78	22.75	4,012
Secondary	23.31	9.31	7.22	49.28	45.13	50.73	25.84	4,557
Higher	5.42	1.37	1.61	12.03	12.74	8.83	5.95	1,050
Currently working								
No	29.82	40.86	50.23	25.63	14.91	24.60	34.07	5967
Yes	70.18	59.14	49.77	74.37	85.09	75.40	65.93	11544
Religion								
Christian	55.38	16.74	5.2	95.14	60.57	94.76	43.74	7,714
Islam	41.29	81.57	92.83	0.41	38.29	2.92	54.01	9,525
Others	3.33	1.69	1.97	4.45	1.13	2.32	2.25	396
Current Marital Status								
Never married	2.01	1.33	0.17	3.67	2.52	8.19	2.39	422
Married/living together	94.00	96.17	97.74	90.74	95.37	87.43	94.56	16,676
Others	3.99	2.50	2.09	5.60	2.10	4.38	3.05	538
Partner's education level								
None	33.90	63.47	63.22	7.82	12.53	5.69	38.05	6441
Primary	22.10	15.48	15.78	43.92	22.55	25.18	21.53	3644
Secondary	30.32	14.58	12.75	38.70	46.66	52.19	28.72	4861
Higher	13.68	6.47	8.24	9.56	18.26	16.94	11.69	1979
Total Children ever Born								
1-3	50.21	40.27	42.83	51.38	61.35	55.71	49.24	8684
3+	49.79	59.33	57.17	48.62	38.65	44.29	50.76	8951
No. of Child deaths								
0	65.33	50.21	51.55	65.46	79.49	67.38	61.52	10849
1-2	28.58	35.18	32.55	30.09	18.24	28.17	29.10	5132
3-4	4.86	11.50	11.65	3.72	2.05	3.47	7.19	1267
5+	1.23	3.12	4.26	0.74	0.22	0.99	2.19	387
Births in the last five years								
1-3	99.64	99.51	99.35	98.64	99.55	99.37	99.39	17,528
3+	0.36	0.49	0.65	1.36	0.45	0.63	0.61	108
Age at time of last birth								
Younger than 18 yrs	4.87	6.95	6.10	1.66	2.19	3.38	4.62	814
18 – 34 years	75.06	73.83	74.12	75.57	77.52	77.93	75.43	13303

Older than 18 yrs	20.07	19.22	19.78	22.77	20.28	18.69	19.95	3518

**** The number of observations for some variables may be less than 17635 because missing values (non-response and not applicable) have been excluded.***

Maternity care risks factors

As indicated above, three maternity care-related risks faced by pregnant women are considered in this paper and these include: (i) not receiving antenatal care (a woman is categorised under this risk if she did not make a single antenatal visit to a health facility during her last pregnancy); (ii) not delivering in a health facility; and (iii) delivering without the assistance of a skilled birth attendant. Skilled providers include doctors, nurses, midwives and auxiliary nurses.

i. Risk of not receiving antenatal care in a Health Facility

Receiving antenatal care can help the early detection of possible pregnancy complications and enable medical staff to prepare to manage such high-risk pregnancies. As shown in Table 2, it was found that 36% of the women did not make a single antenatal visit to a hospital during the duration of their last pregnancy. The problem is more pronounced in the northern part of the country where more than 2 in 3 women in the North West (67%), a little above half of the women in the North East (51%) and about a quarter of the women (26%) in the North Central did not receive antenatal care in a health facility. In the Southern part of the country, the picture is quite different. Only about 6% of women in the South West and 7% of their counterparts in the South East did not receive antenatal care in a health facility. However, in the South-South region, almost a fifth of the women (19%) did not receive antenatal care.

ii. Risk of not delivering in a Health Facility

Table 2 shows that as many as 63% of the women who gave birth in the last five years did not deliver in a health facility (government or privately owned). The picture is quite dire in two of the northern regions where 4 in 5 women (North East) and 9 in 10 women (North West) undertook the risk of not delivering in a health facility. Some 57% of the women in the North Central did not deliver in a health facility while 51% in the South-South did not deliver in a health facility. The proportion that did not deliver in a health facility in the remaining two southern regions were relatively smaller: the South East region (26%) and South West region (29%).

iii. Delivery not assisted by skilled provider

This study found that about 60% of the women who gave birth in the last five years in the country did not deliver with the assistance of a skilled provider (Table 2). By region, those who delivered in the northern part of the country in the last five years were most at risk. More than half of those in the North Central region (57%), more than 4 in 5 in the North East (82%) and almost 9 in every 10 (88%) of the women in the North West region delivered without the assistance of a skilled provider. The smallest proportion of women exposed to this risk was in the South East (18%).

Table 2: Percentage distribution of respondents by exposure to maternal mortality risks and region of residence

	North Central	**North East**	**North West**	**South East**	**South West**	**South - South**	**% (Nigeria)**	**No. of women**
%	**14.32**	**15.60**	**30.46**	**9.09**	**17.44**	**13.10**	**100.0**	**-**
No. of women	**2,525**	**2,751**	**5,372**	**1,603**	**3,075**	**2,310**	**-**	**17,635**
MATERNITY CARE RISK FACTORS (single risk)								
No antenatal visit	26.23	51.16	67.15	7.41	5.67	18.76	36.31	**6403**
Delivery not in hospital	57.14	86.06	90.21	26.13	29.40	50.99	63.26	**11157**
Delivery not by skilled provider	57.08	82.35	88.26	18.27	22.94	44.13	59.35	**10466**
MATERNITY CARE RISK FACTORS (multiple risks)								
No antenatal & no hospital delivery	23.40	50.00	65.90	6.48	5.29	17.61	35.04	**6180**

No antenatal & no skilled provider delivery	23.10	48.95	65.50	5.90	4.88	16.56	34.45	**6075**
Delivery neither in hospital nor by skilled provider	54.60	82.21	88.12	17.20	22.02	42.80	58.49	**10316**
All three maternity care risks	23.01	48.92	65.37	5.77	4.88	16.10	34.32	**6053**
Any maternity care risk	62.35	87.33	91.47	28.00	30.69	53.00	65.25	**11507**
Single maternity care risk	6.96	3.63	2.21	7.75	7.91	6.66	5.19	**916**
Multiple maternity care risk	55.09	83.32	88.78	18.05	22.43	44.78	59.34	**10466**

iv. Multiple maternity care-related risks

Exposure to a single maternity care risk is bad in and of itself, but there are women who face multiple avoidable risks during pregnancy and childbirth. For instance, it was found that nationwide, more than a third (35%) of the women who gave birth in the last five years neither made a single antenatal visit to a health facility nor delivered in a health facility. As is the trend, the proportion of women exposed to this multiple risk is highest in the North East (50%) and North West (66%) regions while the least exposure was in the South East (6%) and South West (5%) regions. Also, a third of the women in the country who had a birth in the last five years (34%) made no antenatal visit and had no skilled provider at delivery**.** North West recorded the highest proportion (66%) while the least was in the South West (5%). The northern regions were generally more exposed to this multiple risk than the South.

Almost 60% of women in the country never delivered in a health facility and with no skilled provider at delivery. Even in the southern part of the country, the proportion of women facing this risk was quite high: 17% in the South East, 22% in the South West and 43% in the South-South. The smallest proportion of women facing this multiple risk in the northern regions was recorded in the North Central (55%) while the North East and North West recorded proportions of 82% and 88% respectively. Finally, a third of all Nigerian women (34%) who delivered in the five years preceding the survey were simultaneously exposed to the three risks of not making a single antenatal visit to a health facility, not delivering in a health facility,

and going into labour and childbirth without the assistance of a skilled provider. About two-thirds (65%) of the women in the North West region face this multiple risk compared to 5% and 6% in the South West and South East respectively.

Maternity care risks by selected background variables

The Odds ratios from bivariate logistic regressions of some selected background variables on the risks of maternal mortality are presented in Tables 3 - 5 below.

Table 3 shows that rural residents were 4.66 times more likely to face a maternity care related risk relative to urban residents. The regression results strongly suggest that an increase in maternity care risks is directly related to being resident in the rural area. The odds ratios from logistic regression of age on maternity care risk factors also indicate that the maternity care risks reduce with advancing age. This implies that as a woman grow older, her likelihood of being at risk significantly reduces. With higher levels of education, the proportion of women exposed to risks sharply decline. The odds ratios from the bivariate logistic regression of education on maternity care risks indicates that, at bivariate level, education is inversely associated with exposure to maternity care risk factors of maternal mortality. In particular, post-secondary education significantly reduces the odds ratio of exposure to maternity care risk factors by about 99% in virtually all instances considered. A bivariate assessment of the effect of partner's education on exposure to risk of maternal mortality show that the proportion of women exposed to risk consistently declines with increasing levels of education of the partner. The chance that a woman whose husband attained primary education did not make a single antenatal visit to a health facility during her last pregnancy was 0.18 (compared to those whose spouse had no formal education

(reference group). This reduces to 0.08 if the spouse had secondary level schooling and the likelihood of not receiving antenatal is as low as 0.05 if the husband has attained higher education. The lowest proportion of those exposed to risk is recorded among women whose husbands have had higher levels of education.

As presented in Table 3, the odds ratios from the bivariate logistic regression of the number of child deaths suffered by a woman suggest a positive association with her exposure to maternity care risks. The likelihood of exposure to maternity care risks increases as the number of child deaths suffered by a woman increases. For instance, the odds ratio that a woman who had suffered 1-2 child deaths will not deliver in a health facility is 0.93 times higher than that of a woman with no reported child death. The odds ratio increases to 4.61 if the woman had suffered 3-4 child deaths and the likelihood increases further to 6.44 times if the woman had suffered 5 or more child deaths in her reproductive life.

Table 3: Odds ratios from bivariate logistic regression of residence, age, education and employment status on maternity care risks of maternal mortality

Characteristics	Single risk[1]				Multiple risks				Any maternity care risk	No. of women Interviewed
	No antenatal	Delivery not in health facility	No skilled provider at delivery	No antenatal & no health facility delivery	No antenatal & no skilled provider	No health facility & no skilled provider	All three risks	Multiple maternity risks		
% at risk	40.00	63.43	59.68	35.04	34.45	58.49	34.32	59.34	65.25	N=17635
Type of place of residence										
Urban (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	6095
Rural	6.82*	4.58*	5.06*	6.77*	6.99*	5.10*	7.00*	5.17*	4.66*	11540
Age										
15-19 (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1168
20-24	.63*	.70*	.71*	.67*	.68*	.72*	.68*	.70*	.63*	3399
25-29	.43*	.45*	.46*	.46*	.46*	.46*	.46*	.46*	.40*	4694
30-34	.43*	.41*	.43*	.45*	.46*	.44*	.46*	.42*	.37*	3617
>34 years	.56*	.53*	.56*	.59*	.59	.56*	.60*	.54*	.47*	4758
Highest Educational level										
None (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	8017
Primary	.17*	.18*	.18*	.16*	.16*	.18*	.16*	.17*	.17*	4012
Secondary	.05*	.06	.05*	.04*	.04*	.05*	.04*	.05*	.06*	4557
Higher	.01*	.01*	.01*	.01*	.01*	.01*	.01*	.01*	.01*	1050
Partner's education level										
None (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	6441
Primary	.18*	017*	.17*	.18*	.18*	.17*	.18*	.17*	.17*	3644
Secondary	.08*	.09*	.09*	.08*	.08*	.09*	.08*	.09*	.09*	4861
Higher	.05*	.05*	.05*	.04*	.04*	.05*	.04*	.05*	.05*	1979
Currently working										
No (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5967
Yes	.49*	.49*	.49*	.52*	.51*	.48*	.51*	.48*	.49*	11544

1 Note: (i) all percentages are row percentages (ii) the percentages shown are for only those that are at risk.

* P≤0.05

Table 4 shows that the wealthier a woman is the less likelihood of exposure to maternity care risks. The odds ratios show that women at the richest quintile are at the least risk of maternity care risks. They are also at the least risk of multiple risks. Table 4 also shows that religion is an important predictor of exposure to maternity care risks. The odd ratio of a Muslim being exposed to maternity care risks is five times more than Christians (reference). Compared to Christians, Muslims are 6.5 times more likely to have carried through their last pregnancy without making a single antenatal visit to a health facility; 5.1 times more likely to have delivered their last pregnancy outside a health facility and 5.6 times more likely to have had their last childbirth without the assistance of a skilled provider. As shown in Table 4, married respondents are almost twice more likely than their never married counterparts in not receiving antenatal care for their last pregnancy. They are also more likely to deliver outside a health facility (1.34) relative to the unmarried and half as likely (1.50) to deliver without the assistance of a skilled provider.

Table 4: Odds ratios from bivariate logistic regression of number of dead children, wealth index, religion and marital status selected predictor variables on maternity care risks of maternal mortality

Characteristics	Single risk[1]			Multiple risks						No. of women interviewed
	No antenatal	Delivery not in health facility	No skilled provider at delivery	No antenatal & no health fac. delivery	No antenatal & no skilled provider	No health fac. & no skilled provider	All three risks	Multiple maternity risks	**Any maternity care risk**	
% at risk	40.00	63.43	59.68	35.04	34.45	58.49	34.32	59.34	65.25	N=17635
No of dead children										
0 (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10849
1-2	1.67*	1.93*	1.90*	1.67*	1.66*	1.87*	1.66*	1.89*	1.95*	5132
3-4	3.12*	4.61*	4.46*	3.12*	3.15*	4.27*	3.13*	4.43*	4.64*	1267
5+	5.50*	6.44*	5.97*	5.17*	5.11*	5.79*	5.14*	6.03*	6.79*	387
Wealth index										
Poorest (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	4074
Poorer	.48*	.43*	.43*	.46*	.46*	.44*	.46*	.42*	.40*	3916
Middle	.17*	.16*	.15*	.16*	.15*	.16*	.15*	.15*	.15*	3550
Richer	.07*	.06*	.05*	.06*	.06*	.06*	.06*	.05*	.05*	3204
Richest	.01*	.02*	.02*	.01*	.01*	.02*	.01*	.01*	.02*	3091
Religion										
Christian (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	7714
Islam	6.55*	5.12*	5.61*	7.16*	7.51*	5.64*	7.60*	5.58*	5.03*	9525
Others	5.85*	5.61*	6.43*	6.54*	6.82*	6.22*	6.93*	6.17*	5.74*	396
Current Marital Status										
Never married (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	422
Married	1.98*	1.34	1.50*	2.39*	2.47*	1.57*	2.53*	1.51*	1.17	16676
Others	1.39*	1.04	1.06	1.57*	1.55*	1.13	1.60*	1.12	.94	538

1 Note: (i) all percentages are row percentages (ii) the percentages shown are for only those that are at risk.

* P≤0.05

Examining the odds ratios from logistic regressions of "access to any media" on each of the three maternity care risks, it was found that exposure to risks reduces with improved access to media (Table 5). Using those who have no access to any media as the reference group, it is found that the odds ratio of not receiving antenatal care in a health facility declines to 0.39 if the woman has access to media less than once a week; reduces further to 0.36 if she has access to any media at least once a week; and if she has access to media almost every day, then, the risk is only 0.13. A similar trend occurs for each of the other risks. Table 5 further shows that the proportion of women exposed to multiple maternity care risks declines as access to media increases.

The odds ratios from bivariate logistic regression of contraceptive need on maternity care risks show that women whose contraceptive need have been met are significantly less at risk than those with unmet need (Table 5). For instance, the risk of not utilizing antenatal care in a health facility among women with unmet need for contraception is 5.85 times higher than those with met need. Similarly, among those with unmet need the respective risk of not delivering in a health facility and going into childbirth without the assistance of a skilled provider was 3.5 times and 4.22 times higher respectively, compared to those with met need.

Table 5 further shows that exposure to risks declines as the level of household decision-making authority increases. Though the decline in risk exposure was not consistent, the odds ratio of exposure to maternity care risks was reduced by at least half among women with some measures of decision-making authority within their households, relative to those with no authority. Similarly, women who justify domestic violence are twice more likely (odds ratio = 2.19) to go through pregnancy without

antenatal care, compared to those with no justification of domestic violence (reference category). In addition, women who make “very strong justification” for domestic violence are 3.14 times more likely to deliver in very risky circumstances (delivery not in a health facility and delivery without the presence of a skilled provider). They are also 3.09 times more likely to be exposed to multiple maternity care risks relative to those with no justification of domestic violence.

Table 5: Odds ratios from bivariate logistic regression of media exposure, contraceptive need and decision-making authority on maternity care risks of maternal mortality

Characteristics	Single risk[1]			Multiple risks					Any maternity care risk	No. of women interviewed
	No antenatal	Delivery not in health facility	No skilled provider at delivery	No antenatal & no health facility delivery	No antenatal & no skilled provider	No health facility & no skilled provider	All three risks	Multiple maternity risks		
% at risk	40.00	63.43	59.68	35.04	34.45	58.49	34.32	59.34	65.25	N=17635
Access to any media (Print/electronic)										
Not at all (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5259
Less than once/week	.39*	.30*	.30*	.40*	.40*	.31*	.39*	.31*	.29*	2603
At least once a week	.36*	.29*	.31*	.36*	.37*	.32*	.37*	.30*	.27*	2787
Almost everyday	.13*	.14*	.14*	.13*	.13*	.14*	.13*	.14*	.13*	6718
Contraceptive need										
No contraceptive need	7.53*	4.83*	5.95*	7.63*	8.22*	6.01*	8.22*	5.96*	4.85*	10626
Unmet need	5.85*	3.50*	4.22*	5.65*	5.99*	4.30*	5.97*	4.33*	3.58*	4244
Met need (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2742
Household decision-making authority										
No authority (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	6338
Low authority	.52*	.48*	.46*	.55*	.54*	.45*	.54*	.46	.49*	2987
Medium authority	.32*	.34*	.33*	.33*	.33*	.33*	.33*	.33*	.34*	2652
Strong authority	.16*	.19*	.18*	.16*	.15*	.18*	.15*	.18*	.19*	1973
Very strong authority	.20*	.24*	.25*	.20*	.20*	.25*	.20*	.24*	.25*	2650
Wife-beating justification										
No justification (r)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	8661
Low justification	1.80*	1.67*	1.70*	1.88*	1.88*	1.66*	1.88*	1.67*	1.72*	3025
Strong justification	2.05*	2.18*	2.19*	2.10*	2.11*	2.10*	2.11*	2.11*	2.34*	2885
Very strong justification	2.19*	3.14*	3.08*	2.28*	2.26*	3.02*	2.27*	3.09*	3.30*	2882

1 Note: (i) all percentages are row percentages (ii) the percentages shown are for only those that are at risk.

* P≤0.05

Policy Implications of non-utilization of health care services

High-risk births, among other factors, pertain to women who passed through pregnancy and childbirth without availing themselves of the use of maternity care in a health facility. These risks, classified as maternity care risks, constitute the principal factors that a country must overcome if it is to make progress towards MDG-5 (improvement of maternal health). It was found that more than a third (36%) of the women who delivered in the last five years in the country did not receive antenatal care. They failed to make even one antenatal visit to a health facility during their last pregnancy. The national figure however masks the regional variations in the proportion of women at risk. In the northern regions, the proportion that did not receive antenatal care range from 26% in the North Central to 67% in the North West while in the southern regions, the range is 7% in the South East to 19% in the South-South. It was also found that 63% of the women did not deliver in a health facility and 59% delivered without the assistance of a skilled service provider. Regionally, as much as 90% and 88% of the women in the North East took the risk of not delivering in a health facility and delivering without the assistance of a skilled provider respectively. A relatively high proportion of women were exposed to multiple maternity care risks.

For policy and planning purposes, attention needs to be drawn to some of the factors that have been found to have statistically significant effect on the risks of maternal mortality. Education is one of such factors that research has continually identified as having a long run implication for the reduction of high maternal mortality. The odds ratios from bivariate logistic regression show that the probability of not receiving antenatal care in a health facility, of not having childbirth in a health facility and of going

into labour and childbirth without a skilled provider in attendance consistently reduce with increasing levels of schooling. Policies should therefore promote female education up to secondary and higher levels as an implicit, long run population policy to reduce hazards associated with pregnancy and childbirth in the country.

The findings also show that the northern regions of the country remain the battleground where the fight against maternal mortality must be won if Nigeria is to join the committee of nations where pregnancy and childbirth is safe. The findings show that the probability that a woman will not use life-saving maternity services (for antenatal, delivery and skilled assistance during delivery) is very high in the northern part of the country. Interestingly, the response of majority of the women who did not deliver in a health facility to the question of why they did not deliver in any health facility was "not necessary" (54%). By north/south disaggregation, only 9% of women who opined it was "not necessary" to deliver in a health facility were from the south, 91% reside in the northern regions. The implication of this is that opinions of people about the use of maternal health services must be reshaped in the north through formal education and mass communication. With as much as 98% of the women in the northern regions being either Muslims (78%) or Christians (20%), religion could be used in the north to change the perspectives of women by mobilising support of religious clerics to advocate for use of health services.

Another significant factor that policies need to address due to its significant influence on maternal mortality risks is the level of poverty in the country. The distribution of the respondents by wealth index show that 45% of the women who gave birth in the last five years preceding the survey were in the two poorest quintiles. By

regions however, between 15% - 23% of women in the south are in the two poorest quintiles compared to between 48% - 71% of women in the north. Most of the women at risk were in the two poorest quintiles. Findings show that maternity care risks significantly and consistently reduces as the wealth status improves. This suggests that exposure to risks could be poverty-driven, and this is logical. The poorer women are less likely to be educated, more likely to reside in the rural areas, and more likely to have suffered more child deaths than their richer counterparts. Reduce inequity in wealth opportunities is therefore an important option in reducing maternal mortality.

Another significant factor that has an influence on maternal mortality risks is access to media. The findings show that as frequency of access to the media increases, the likelihood of maternity care risks significantly reduces. This suggests that the media is having a positive influence on the attitude of the women towards use of maternity care services. Thus, this knowledge can be harnessed to pursue a vigorous media campaign on maternity care, especially through the most popular medium – the radio.

Finally, the empowerment of women is significantly related to the reduction of maternal mortality risks. Based on the two indicators of women's empowerment considered, the study found that women who have strong household decision-making authority were significantly at reduced risk of maternity care risks relative to those with no authority. This suggests that the "strong authority" of women in household decision-making gives them a voice that is heard in the house: a voice that is heard in matters relating to their healthcare, heard on matters relating to household expenditure and ability to initiate moves to obtain healthcare without necessarily waiting for "administrative clearance" from adult males within the husband's family. Similarly, the study found that

women who have justifications for domestic violence were more at maternity care risks compared to those who considered domestic violence unjustifiable. It is arguable that a culture of acceptance of male authoritarianism, including the acceptance of the "right" of men to enforce their authority by violence, is the reason behind the acceptance (by women) of wife-beating as justifiable, even on issue like "if she goes out without telling him". It is, therefore imperative for policy makers to end the culture of impunity attached to violence against women as a way of encouraging inter-spousal communication and decision-making rather than the dictatorial and often violent assertions of authority which less empowered women have been brought up to accept as just.

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