Differentials in Risk of Neonatal Mortality among children of young mothers in Nigeria: Empirical Evidence from NDHS 2013

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Abstract—This study assessed the correlates of neonatal mortality among young mothers in Nigeria. Data were extracted only for singleton births. A total of 10,455 women aged 15-29 years old reported to have given birth during the previous period of five years. Statistical analyses included univariate and bivariate techniques. Results showed that neonatal mortality rate for teenage mothers was 46.5 per 1000 and for mothers 20-29 years old it was 24.21 per 1000. However, the difference was not statistically significant (Chi-square = 1.96, on 1 d.f; P > 0.05). Mortality decreases with woman's education, higher in the Northeast and Northwest than in the Southern States, higher in rural than urban areas and higher among the poor than the rich women. Hence all hands must be on deck to ensure that teenage pregnancies are reduced to minimum among Nigerian women. Government policies that ensure that young girls receive education up to completed secondary level will go a long way to reduce teenage pregnancies.

Keywords—Neonatal Mortality, Young Mothers, Bivariate Analysis, Education

I.   INTRODUCTION

Neonatal mortality is a strong significant public health problem across the world. It accounts for more than 60% of child mortality [1, 2]. Out of the 7.7 million under-five mortality worldwide, 3.1 million occurred in the first 28 days of life (neonatal deaths) with about 99% occurrence in low and middle-income countries, mostly in sub-Saharan Africa, including Nigeria [3]. Uwaezuoke (2004) [4] discovered that about 36% of these deaths are caused by preventable diseases such as tetanus infection and asphyxia.

Globally, Nigeria has persistently recorded highest number of neonatal deaths in Sub Saharan Africa 48/1000 live births annually [5]. Studies revealed that countries, such as Ghana and Uganda experienced significant decline in neonatal mortality [2, 6]. Also, WHO, 2011a [7] report shows that, approximately one in every 25 neonates born in Nigeria died in the first month of life. Nigeria contributes about 8% of the world's annual neonatal mortality of about 242,000 [8]. Aigbe (2012) [1] reported that Nigeria has neonatal deaths rate of 247 per 1000 births whereas other researchers argued that the stated figures were still underestimated [1, 5]. There are complex issues of political sentiments and mismanagement of information leading to void in vital statistics in neonatal mortality rate in Nigeria.

II.   LITERATURE REVIEW

In investigating the socio-demographic factors influencing neonatal mortality, there are proximate (direct) causes of mortality. For instance, Zupan (2005) [9] and Reynolds (2006) [10] identified that use of health care services as a key proximate determinant of maternal and infant outcomes. Vishnu *et al*. (2014) [11] clearly stated that education, place of residence and household wealth index were strong determinants of antenatal visits and place of delivery. Whereas, Titaley (2012) [12] found no difference in neonatal mortality occurrence of deliveries at home assisted by trained attendants or untrained attendants.

Ezeh *et al*. (2014) [13] discovered that there were collective factors responsible for neonatal mortality among newborns. This was supported by the works of Vishnu *et al*. (2014) [11]; Titaley (2012) [12]; Ganchimeg *et al*. (2013) [14] that although neonates born to teenage mothers have higher risk of neonatal death than mothers in their twenties, others factors such as low birth weight, preterm delivery, physical deformity, severe neonatal conditions and an increased risk of intra-hospital late neonatal death were contributing to neonatal deaths. Mothers' educational level was also identified by Fotso (2006) [6]; Aigbe *et al*. (2008) [1] and Ezeh *et al*. (2014) [13] to have significant direct relationship with child survival, especially in the developing countries of the world. This was supported by UNICEF (2013) [15].

Several hospital-based case-control and experimental studies that identified direct causes of neonatal mortality [14, 16-19] do not take into cognizance neonate delivered at homes, whereas, 58%, 66% and 62% of neonates were delivered at home as recorded by NDHS 1999, 2003 and 2008 respectively [20-22].

III.   METHODS AND MATERIALS

This study used Nigerian Demographic Health Survey NDHS (2013) [23]. This is a nationally representative sample collected by face to face interview among 38,948 women aged 15-49 through a stratified two stage cluster sampling. The data provides basic information on the characteristics of

respondents, including age, sex, marital status, education, and relationship to the head of the household.

Out of the total of 38,948 eligible women aged between15 and 49 years that were interviewed, The analysis extracted information on all single births of women aged 15-19 and women aged 20-29 totaled 10,455 who had given birth in the last 5-year period preceding the 2013 NDHS.

This study adopted Mosley Chen [24] conceptual framework because it provides specific and clear concept for studying of child mortality. The Conceptual framework hypothesized relationship between socio-demographic characteristics, proximate determinants and neonatal mortality. The outcome variable for this study was neonatal deaths as reported by the mothers who participated in the survey, and it was defined as the death of a neonate between day 0 till first month. It was extracted and recoded from ratio scale to nominal scale, such that neonate that died within this period will be regarded as (1 = if death occurs in the specified age period) or failure (0 = if the newborn survived this period). The outcome variable was examined against all background variables, and these variables were classified into socio-demographic and proximate variables. Only two proximate variables were used for this analysis (antenatal visits and place of delivery). Specifically, only two analytical procedures were adopted namely: univariate and bivariate analysis. The univariate featured the descriptive analysis of selected background variables. The bivariate estimated the significant associations between the independent and outcome variables.

IV. RESULT AND DISCUSSION

The total respondents were 10,445 (12.1%) of the respondents were women aged 15-19 years while 87.9% were age 20-29 years. The mean age at 1st Childbirth was 16.2 years for the teenagers and 18.7 for women aged 20-29 years. Table 1 shows that NMR was 46.5 and 24.2 for teenage mothers and mothers aged 20-29 years respectively. Higher percentage (55%) of the teenage mothers were not educated, (38.2%) mothers in their twenties had secondary or higher education. Higher percentage (92.5%) of women in their twenties were already married. The table also shows that higher percentage (83%) of the teenage mothers lived in the rural areas compared to the non-teenage mothers (67.7%). It can also be seen from the Table 1 that higher percentage (60.4%) of teenagers who had becomes mothers were from poor households compared to mothers in their twenties (40.4%). Furthermore, greater percentage (63.9%) of teenage mothers did not attend antenatal compared to non-teenage mothers (46.3%). Finally, it can also be deduced that (73.7%) of the teenage mothers delivered at home compared to non-teenage mothers (62.7%).

In Table 2, we present the bivariate analysis of this work: It clearly shows that education, regions, place of residence, wealth index and place of delivery were the only variables that were statistically significant with neonatal mortality. There were regional differences in neonatal mortality ratio with South East having the highest rate (NMR=29.9) and a (P>0.01) which also shows that region is significantly associated with neonatal mortality. Education, place of residence, wealth index and place of delivery were also significantly associated with neonatal mortality at (P<0.05).

TABLE 1: FREQUENCY DISTRIBUTION OF SOCIO-ECONOMIC AND PROXIMATE VARIABLES AMONG TEENAGE AND NON-TEENAGE MOTHERS

Selected variables	Age group\15-19	Age group\20-29	Selected variables	Age group\15-19	Age group\20-29
Total births	1268	9187	**Place of residence**		
Mean age @ 1st child birth	16.2	18.7			
Education level			Urban	215 (17.0)	2964 (32.3)
No education	698 (55.0)	4070 (44.3)	Rural	1053 (83.0)	6223 (67.7)
Primary education	225 (17.7)	1610 (17.5)	**Wealth index**		
Sec./higher edu.	345 (27.2)	3507 (38.2)	Poor	766 (60.4)	4083 (44.4)
Marital status			Intermediate	278 (21.9)	1915 (20.8)
Not married	165 (13.0)	692 (7.5)	Rich	224 (17.7)	3189 (34.7)
Married	1103 (8.0)	8495 (92.5)	**Antenatal**		
Religion			No Antenatal	773 (60.9)	4255 (46.3)
Christians	369 (29.1)	3629 (39.5)	Yes Antenatal	473 (37.3)	4711 (51.3)
Moslems & others	899 (70.9)	5558 (60.5)	**Place of delivery**		
Employment status			Home	935 (73.7)	5761 (62.7)
Not working	702 (55.4)	3295 (35.8)	Health facility	329 (26.0)	3412 (37.1)
Working	566 (44.6)	5892 (64.1)			

CONCLUSION AND RECOMMENDATION

The result provided empirical evidences on neo-natal mortality in Nigeria which is relevant for current monitoring and effective programme of action in this regard. It demonstrated that lower level of education and poverty are key determinants of neonatal death. This finding has a top-line

implication for implementation of girl-child education and poverty alleviation in Nigeria. Although, the study has its own limitations in terms of a single-year dataset used, perhaps, better understanding would have been highlighted if several years data have been analysed. Notwithstanding, the understanding of the correlates of neo-natal mortality in

Nigeria can be explored for other countries in sub-Saharan Africa.

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TABLE 2: BI-VARIATE ANALYSIS OF SELECTED SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS AND NEONATAL MORTALITY RATIO (NMR)

Selected Variables	Total Live Births	Neonatal Death	NMR	Chi-Square	Selected Variables	Total Live Births	Neonatal. Deaths	NMR	Chi-Square
Age group					**Region**				
15-19 years	1268	59	46.5		North Central	1658	39	23.5	
20-29 years	9187	223	24.2	1.955	North East	2235	67	29.9	
Education level					North West	3395	93	27.4	
No education	4768	130	27.3		South East	764	20	26.2	
Primary education	1835	60	32.7		South South	1252	33	26.4	
Sec./higher edu.	3852	92	23.9	14.232***	South West	1151	30	26.1	11.755**
Marital status					**Place of residence**				
Not married	901	30	33.3		Urban	3179	74	23.2	
Married	9554	252	26.4	2.631	Rural	7276	208	28.6	8.356**
Religion					**Wealth index**				
Christians	3998	110	27.5		Poor	4849	145	30.0	
Moslems & others	6393	171	26.8	3.661	Intermediate	2193	59	27.0	
Employment status					Rich	3413	78	22.9	9.453**
Not working	3948	116	29.4		**Antenatal visit**				
Working	6458	163	25.2	0.424	No	5028	149	30.0	
					Yes	5184	121	23.3	1.781
					Place of delivery				
					Home	6696	175	26.1	
					Health facility	3741	102	27.2	11.420***

Significant Level ***p < 0.001, **p > 0.01, *p < 0.05

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