DISTAL FACTORS INFLUENCING CHILD MORTALITY IN OGUN STATE, NIGERIA: IMPLICATIONS FOR POLICY ACTIONS

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Abstract

Over one million children die annually in Nigeria from preventable diseases making child survival difficult in the past four decades. Even though there has been some level of decline in under-five mortality rate in Nigeria during the last decade, from 187 per 1000 in 2003 to 128 per 1000 in 2013, the rate is still unacceptable. Understanding the multi-dimensional determinants of child mortality is of imperative importance towards formulating policy interventions for its reduction. Therefore, the main objective of the study was to examine the distal factors influencing child mortality among antenatal care clinic attendants. The study was based on secondary data from the 2017 Covenant University Public Health and Wellbeing Research Cluster survey project on Determinants of child morbidity and survival in Ogun State, Southwest Nigeria. Descriptive statistics and regression analysis were further applied on 1350 respondents that constituted the sample size. All analysis was done on STATA Version 12. Results showed that Spouse's Education (X2 = 11.1912; P = 0.024); Mother's Occupation (X2 = 14.8405; P = 0.022); Spouse's Occupation (X2 = 22.6606; P = 0.001); Birth Spacing (X2 = 55.0538; P = 0.000); Duration of Breast Feeding (X2 = 77.5224; P = 0.000); Immunization Status (X2 = 86.1474; P = 0.000) and Household Waste Disposal (X2 = 47.4179; P = 0.000) have significant effect on child mortality through spouse's education and mother's occupation had reduced level of significant. Therefore, the study suggests health education and socio-economic empowerment for both mothers and their spouses in the campaign towards the reduction of child mortality.

Keywords: Child mortality, antenatal care, clinic attendants, health education, socio-economic

1. INTRODUCTION

Children constitute a major asset to any society or nation and mortality of young children under the age of five constitutes the single largest age specific death. The death of under-five children represents human tragic loss affecting not only families and communities but also the economic and social development of any nation. Report shows that 1 child in 12 in sub Saharan Africa (SSA) dies before his/her fifth birthday far higher than the average ratio of 1 in 147 in high-income countries (UN, 2015). No doubt, substantial global progress has been made in reducing child deaths since 1990, as the no of under five deaths worldwide has declined from 12.7 million in 1990 to 5.9 million in 2015 (UNIGME 2017). It will be useful to have a close look at the conditions in which children are born and brought up especially those that affect them seriously during 1-5 years of age. The high risk of deaths for under-five children in developing countries compared to that of their counterparts in developed countries may be perhaps due to better access to health facilities in developed region. The health of women and children has been enshrined in National Health Policy 2016, National Child Health Policy 2006 and SDGs 2015 among others. The study has bearing on the UN-SDG 3 which ensures healthy lives and promote wellbeing for all at all ages and target 3.1 which intends to reduce the global maternal mortality ratio to less than 70 per 100 000 live births; and 3.2 intends to end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce under-5 mortality to at least as low as 25 per 1000 live births by 2030.

About one million Nigerian children die each year before their fifth birthday (FMOH, 2007; UNDPHDR, 2014) and childhood mortality rates are higher in rural areas than in urban areas where health facilities are either poor or not available. The proportion of children's death in Nigeria is far from satisfactory and Nigeria was ranked by UNICEF (2013) as one of the high risk countries of under-five mortality in the world. According to NDHS (2013) the under-five mortality rate was 128 deaths per 1000 live births (NPC, 2013). Notwithstanding several interventions towards mitigating child mortality especially in developing countries including Nigeria, such as Safe Motherhood Initiative 1987, World Summit for Children, Sustainable Goal 2015 and its local equivalent in Nigeria such as National Safe Motherhood Conference Abuja 1990, Integrated Maternal Newborn and Child Health Strategy 2007, etcetera, child mortality is still at an unacceptable rate and millions under- five children die mostly from vaccine preventable diseases every year. In spite of Nigeria's natural resources and national commitment in this direction, the present status of the child's death in Nigeria is very high, unsatisfactory and linked to several factors. Understanding of the distal factors affecting child mortality become imperative in order to put in place appropriate policies and programs to meet the yearning for reducing the mortality of children under five years. The main objective of the study therefore was to examine the distal factors influencing child mortality among mothers attending antenatal care clinic.

2. REVIEW OF LITERATURE

The level of childhood mortality represents both demographic measures as well as vital indicator of the health status as well as the standard of living of a society. Nigerian children are in pathetic situation which reflect their dismal statistics. In sub Saharan Africa, 1 child in 8 dies before age five, nearly 20 times the average 1in 167 in developed parts of the world (Ojikutu, 2008). Similarly UNICEF (2010) reported that 8.1 million children across the world who died in 2009 before their fifth birth day lived in developing countries and died from a disease or a combination of diseases that could be easily have been prevented or treated. In Africa, decline in U5 mortality has been slow despite comprehensive approaches towards improving child's health. Out of 20 countries identified as having high under- five mortality, 19 are in SSA (WHO 2005).

Education facilitates mothers learning about causation, prevention, recognition and treatment of diseases (Frost et al, 2005). Education may increase the productivity of health inputs through optimal awareness, increase in income, preference for child health and family size among others. Giving women the means to become more economically self –reliant will likely have positive spin-offs for children. Several studies on infant and child mortality have been done in Nigeria, using secondary data and employing indirect methods in the analysis (Adeyemi et al, 2008, Mojekwu and Ajijola, 2011; Ogunjuyigbe, 2004; Ozumba and Nwogu-Ikojo, 2008; Antai, 2010). Some of these were macro-level studies stressed the issues of education, female autonomy, women's work status and economic condition of the household associated with child mortality (Basu and Stephenson, 2005; Bloom, Wypij, and Gupta, 2001; Bhattacharya, 2006).

Children in poorer families tend to be at higher risk of dying than children in the better off families. According to Verma, Kasuma and Babu (2011) improved utilization and access of health care facilities are often interrelated with distance, socio-economic condition and literacy levels of women. While poor households increased the risk of post neonatal, infant, child and under five mortality among Nigerian children (Ezeh et al 2015), Kanmiki et al (2014) found that proportion of respondents in the rich tertiary level that experienced

under-five death was slightly less than that of middle class and the relative poor tertiary level in Ghana Study.

Harttgen et al (2015) found that household's economic wellbeing, mother's education, age and geographical regions strongly influence child mortality risks. Debebe and Dejene (2016) also found that child survival increases with increase in mother's educational level particularly secondary level education. In a recent study, Bello's study (2014) reveals that poverty, malaria, postnatal care, health scheme and breast feeding as the major determinants of child mortality. Gebretsadik and Gabreyohannes (2016) found that children who were breastfed for any period, were 25.5% less likely to have dead before their fifth birthday than those who were not breastfed. Also increased birth interval time corresponds to a low probability of child mortality. In a study by Adeolu et al (2016) indicated that child mortality was highest among mothers with no education and lowest among mothers with tertiary education. Also Mondal et al (2009) found that the risk of child Mortality is lower among the immunized child than never immunized child. They also observed that father's occupation, mother's education, family income and access to safe treatment places lowers child mortality. Nigeria introduced several child survival interventions and expanded existing ones with a particular focus on polio eradication and strengthening routine utilization such as tetanus, measles, yellow fever and use of pentavalent vaccine for mother and new born (NPC, 2014).

3. METHODOLOGY

The study used secondary data from the 2017 Covenant University Public Health and Wellbeing Research Cluster survey on determinants of child morbidity and survival in Ogun State, Nigeria. Descriptive statistics and regression analysis were further applied on 1350 respondents that constituted the sample size. All analysis was done on STATA Version 12.

4. RESULTS

Table 1 shows the percentage distribution of the socio-economic characteristics of the respondents in this study. About 39.7 percent and 35.3 percent of the women interviewed for the purpose of this study were within ages 25-30 years and 31-40 years. More than half (70.1 percent) of the respondents reported that they were Christians as the time of the study, while only 27.6 percent mentioned that they practiced Islam. Similarly, 93.0 percent of the women were married with 88.4 percent reporting that their husband did not have another wife.

Almost 40 percent of the women reported that they heard secondary education 26.7 percent and 24.8 percent had primary and post-secondary education respectively. Further, 46.4 percent of the women were self-employed as at the time of the survey, while 13.6 percent, 13.1 percent, 12.2 percent were civil servants, in the private sector and traders. Only 11.3 percent reported that they were unemployed. On the other hand, only 5.6 percent of their spouses were not working while 38.8 percent, 18.6 percent, 17.3 percent and 15.5 percent of their spouses were self-employed, private sector employees, and civil servants and were into trading. More than 30 percent of the husbands of these women had secondary education and 25.0 percent reported that they had post-secondary education.

Table 1: Percentage Distribution of Respondents' Socio-economic Characteristics

Variables	**n= 1,350**	**%**	**Variables**	**n= 1,350**	**%**
Dependent Variable			**Respondent Occupation**		
Child Mortality			Not working	152	11.26
No	1, 085	80.37	Self-employed	626	46.37
Yes	265	19.63	Civil/Public Servant	183	13.56
Age			Private Sector Employee	177	13.11
20 -24	292	21.63	Farming	18	1.33

25 -30	536	39.70	Trading	165	12.22
31 – 40	477	35.33	Artisan	29	2.15
40 - 44	34	2.52	**Spouse Occupation**		
45 years and above	11	0.81	Not working	76	5.63
Religion			Self-employed	518	38.37
Christianity	946	70.07	Civil/Public Servant	234	17.33
Islam	373	27.63	Private Sector Employee	251	18.59
Traditional	28	2.07	Farming	27	2.00
Other	3	0.22	Trading	209	15.48
Marital Status			Artisan	35	2.59
Single	53	3.93	**Type of Dwelling**		
Married	1,256	93.04	Mud/Grass/Hut	42	3.11
Divorce/Separated	24	1.78	One room	298	22.07
Widow	17	1.26	Room and Parlour	406	30.07
Husband had another wife			2/3 Bedroom	559	41.41
Yes	157	11.63	Detached House/Mansion	45	3.33
No	1, 193	88.37	**Spouse Education**		
Respondent Education			None	86	6.37
None	13	0.96	Primary	126	9.33
Primary	361	26.74	Secondary	459	34.00
Secondary	534	39.56	Post-secondary	337	24.96
Post-secondary	335	24.81	Professional	342	25.33
Professional	107	7.93			

Table 2 shows the bivariate association between the background and health factors of the mothers and their experience of child mortality. The results revealed that the proportion of deaths was higher among children who were delivered at home, by traditional birth attendants and in delivery homes/ centers other than government or private hospitals. Hence, there is a significant relationship between the place of delivery and experience of child mortality (Chi-square value = 35.37; P = 0.000).

Similarly, children who had not being immunized at all (44.3 percent) died more than children who had received the complete recommended vaccines. Therefore, the immunization status of a child is significantly related with the chances of living or not (Chi-square = 86.2; P = 0.000)

The method of disposing waste in the households also had a significant relationship with child mortality in the

study (Chi-square = 47.4; P = 0.000). Children living in homes where wastes are disposed on unauthorized dump sites died more than children living in homes where wastes are collected by private agencies.

Table 2: Bivariate Association between Background and Health Factors and Child Mortality

	Child Mortality		
Variables	**No**	**Yes**	**Chi-square/P-value**
Place of Delivery of the last child			
PHC/Hospital	461 (84.59%)	84 (15.41%)	35.37
Home	70 (77.78%)	20 (22.22%)	P = 0.000
Private Clinic	411 (82.20%)	89 (17.80%)	
Traditional Birth Attendant	108 (64.67%)	59 (35.33%)	
Other	35 (72.92%)	13 (27.08%)	
The distance from House to Health Facility			
Not far/trekable	307 (75.99%)	97 (24.01%)	9.61
Far but trekable	282 (83.43%)	56 (16.57%)	P = 0.022
Very far	470 (82.17%)	102 (17.83%)	
I don't know	26 (72.22%)	10 (27.78%)	
Immunization status of the last child			
Complete	663 (84.46%)	122 (15.54%)	86.15
Not complete	315 (84.45%)	58 (15.55%)	P = 0.000
No immunization	107 (55.73%)	85 (44.27%)	
Duration of breastfeeding the last child			
Below 6 months	270 (80.8%)	64 (19.2%)	77.52
6 -9 months	495 (85.3%)	85 (14.7%)	P = 0.000
10 -12 months	130 (59.4%)	89 (40.6%)	
Above 12 months	190 (87.6%)	27 (12.4%)	
Cost of treatment at the health facility			
Very expensive	147 (80.77%)	35 (19.23%)	2.60

Expensive	345 (79.49%)	89 (20.51%)	P = 0.627
Moderate	418 (81.80%)	93 (18.20%)	
Cheap	106 (80.92%)	25 (19.08%)	
Very cheap	69 (75.00%)	23 (25.00%)	
Household waste disposal practice			
Government collection	397 (82.37%)	85 (17.63%)	47.42
Private agency collection	246 (85.12%)	43 (14.88%)	P = 0.000
Disposal within the compound	329 (83.08%)	67 (16.92%)	
Use unauthorized dump	113 (61.75%)	70 (38.25%)	
Ever used ORS			
Yes	592 (75.80%)	189 (24.20%)	24.53
No	493 (86.64%)	76 (13.36%)	P = 0.000

Table 3 shows the binary logistic regression results. From the table, it was observed that children born by mothers who are in a professional job were 0.51 times less likely to die compared to their counterparts whose mothers had no education. The effect of the educational attainments of the mother on the chances of child mortality was highly significant (P<0.05).

Similarly, children raised by mothers who had lost their husbands as at the time of the survey were 5.30 times less likely to die before reaching age 5 years unlike their counterparts who were raised by single mothers. Hence, there is a significant effect of the marital status of the mother and the possibility of her child dying before reaching the age of five years. Lastly, children raised by mothers working as private sector employees were 0.51 times less likely to die unlike children raised by mothers who were not working. There is a significant relationship between the occupation of mothers and their experience of child mortality (P-value =0.05).

Table 3: Determinants of child mortality among mothers in Ado-odo/Ota

Variables	**Odds ratio**	**P-value**
Religion		
Christianity	**RC**	
Islam	1.22	0.199
Traditional	1.34	0.522
Other	1.53	0.738
Spouse Education		
None	**RC**	
Primary	0.78	0.459

Secondary	0.89	0.696
Post-secondary	0.96	0.881
Professional	0.51	0.029
Marital Status		
Single	**RC**	
Married	2.36	0.057
Divorce/Separated	2.72	0.132
Widow	5.30	0.013
Respondent Education		
None	**RC**	
Primary	1.15	0.847
Secondary	1.03	0.971
Post-secondary	1.01	0.985
Professional	1.35	0.684
Respondent Occupation		
Not working	**RC**	
Self-employed	0.67	0.076
Civil/Public Servant	0.88	0.631
Private Sector Employee	0.51	0.023
Farming	0.93	0.900
Trading	1.17	0.551
Artisan	0.45	0.167
Constant	0.15	0.021

In order to buttress the quantitative results earlier discussed and perhaps aid in designing interventions towards reducing mortality among under-five children, the study conducted focus group discussion (FGD). The FGD was an interaction among selected stakeholders namely, health personnel (Doctor, nurses), mothers and women attending antenatal clinic, traditional birth attendants, mother-in-law and community leaders. Discussion guidelines was developed and pretested before applying it to FGD exercise. Rules governing FGD including informed consent and use of audio recording device were applied. At the end, information obtained was matched with that obtained by Note-taker. Information gotten in vernacular (local language) was translated and back-translated by English-vernacular expert. The age of participants ranges between 24 and 55 years.

The qualitative dimension of this study runs on 4 central themes identified after reading and re-reading the

information obtained that affect child mortality.

Knowledge of causes of Under-five deaths.

Awareness of causes of deaths among under five years of age is high though this has not translated into low child mortality due to several factors. The theme derived is that awareness of causes of sicknesses suffered most among children engenders high preventive measures against child mortality.

One of the participants mentioned during the FGD:

“Children die because of poor food, malaria, diarrhea, cold, fever, and convulsion, no money for treatment, poor sanitation and when we no give them immunization” [Participant, 40 years].

Despite the fact that there exist good knowledge of sicknesses under-five children suffer most in the study community as many participants concurred to the above causes, nevertheless, few ascribed deaths of under-five children as fate or bad luck.

Another participants who lost her child after 3 years said during FGD:

“As far as I know my child has not come to stay. We will get the children that want to be with us and they will stay with me and my husband” [Participant, 40 years].

Challenges to care-seeking and traditional practices of women that accelerate child mortality.

Impediments to accessing healthcare are inadequate information, poverty, lack of access to transport, need to obtain permission from head of household/husband before taking the child to the health facility, use of traditional birth attendants when a child is sick and giving concoctions to children and denying nutritive foods to children and attitudes of health workers, which undermine the confidence in health personnel and discourage mothers from patronizing health care facility. With the above factors in mind, related questions were asked, such as: What are the social barriers in the community that cause delay to seek better treatment when children are sick? Are there obstacles within the family that restrict mothers from managing the complications or illness of their children? Do you receive good care whenever you visit health facility?

One of the participants mentioned in the FGD:

“Health cost is high and no money for Keke (Tricycle) to health facility and cost of treatment is very high. I born my 3 children in traditional doctor’s home and one at home. And all take ‘agbo’ (concoction from local herbs) when they are sick” [Participant, 35 years].

Another participant mentioned in the FGD:

“Our ‘agbo’ is good and cheap. Our Baba (Village doctor or traditional healer) always do us fine and we pay small by small and no shout and but for health facility they treat us poorly and talk in a bad way so they no treat us well” [Participant, 41 years].

Another participant mentioned in the FGD:

“Most time they say no medicine for the health center and the people there (health facility personnel)) do treat us with high temper and no mind that we came with pikin (Child) that is sick” [Participant, 38 years].

Wastes disposal and sanitation practice and consequence of poor disposal practice

When asked question on sanitation, waste disposal around the house or on the road and whether they know that such practice can cause diseases among children.

Another participant mentioned in the FGD:

“We have no money to pay push-push people (private refuse collectors who charge money per weight of the refuse) so we put wastes beside our homes so that when government people come we go throw them away for their motor and for roads so that government people (public waste collectors) will carry the refuse for them tipper. I no know if the wastes fit cause disease for my child” [Participant, 43 years].

Essence of birth Spacing, immunization and benefits of breast feeding.

When questions were asked on practice of child spacing for the health of the mother and child, importance of immunization with respect to protection of children from diseases that kill them and benefits of breast feeding in healthy life of children.

Another participant mentioned in the FGD:

"I don't do any spacing because my husband want plenty children and if I say no when he comes he will beat me too much and nobody will come to save me. There was a woman in this neighborhood that went and tie her stomach and her husband come to know that and beat her and send her back to her parents and he marriage end" [Participant, 24 years].

For immunization, all the FGD participants chorus the awareness and importance of immunization even though not all immunized their children.

"I go there and give my child once only because the health center is far and no money and also the nurse the give us wahala too much (trouble us)" [Participant, 33 years].

On breast feeding, another participant mentioned in the FGD:

"I know the giving breast (breast milk) to children is good and will give my child good health. I give breast to all my children and if breast is not coming after birth Baba (village doctor) will give medicine and breast will come plenty" [Participant, 55 years].

5. DISCUSSION

Results from this study established the findings of Adetoro and Amoo, 2014; Samuel, 2017; and Fayehun and Omololu, 2009, that children who were delivered in hospitals either government or private had higher chances of celebrating their fifth birthdays than children born at home or other delivery centers that are not recognized by the government. Similarly, the proportion of under-five survival increased among children who had received one form of immunization or another unlike their counterparts who had not received at all. This supported the findings of Samuel and Oni, 2018; Olumide and Odubanjo, 2009; Ojewunmi and Ojewunmi, 2012 that there is a high significant relationship between immunization status of the child and his or her chance of living up to age five years.

Among other factors significantly influencing under-five mortality is the method of disposing waste in the household. Children living in homes where wastes are left unkept or thrown in an open place are vulnerable to diseases and if such illnesses are not well managed, it might be life threatening. Hence, a clean home makes a healthy child. Lastly, education as revealed by several other studies is pivot factor that influences under-five mortality (Caldwell, 1979; Ogunjuyigbe, 2004, Fayehun and Omolulu, 2009, Adetoro and Amoo, 2014). Findings have shown that educated mothers experience little or deaths of their under-five children than mothers with little or no education (Frost, *et.al*, 2004; Mondal, Hossain and Ali, 2009; Samuel, Ajayi, Idowu and Ogundipe, 2016). Hence, there is very strong relationship between the education of the mother and the chances of her child surviving till age-5 years.

6. CONCLUSION AND RECOMMENDATIONS

Understanding of the distal factors affecting child mortality become imperative in order to put in place appropriate policies and programs to meet the yearning for reducing the mortality of children under five years. The main objective of the study therefore was to examine the distal factors influencing child mortality among mothers attending antenatal care clinic. The results revealed that the proportion of deaths was higher among children who were delivered at home, by traditional birth attendants and in delivery homes/ centers other than government or private hospitals, Chi-square value = 35.37; P = 0.000. Also found out that children who had not being immunized at all (44.3 percent) died more than children who had received the complete recommended vaccines, Chi-square = 86.2; P = 0.000. The method of disposing waste in the households also had a significant relationship with child mortality in the study (Chi-square = 47.4; P = 0.000). Children living in homes where wastes are disposed on unauthorized dump sites died more than children living in homes where wastes are collected by private agencies.

Table 3 shows the binary logistic regression results. From the table, it was observed that children born by mothers who are in a professional job were 0.51 times less likely to die compared to their counterparts whose mothers had no education. The effect of the educational attainments of the mother on the chances of child mortality was highly significant (P<0.05). Similarly, children raised by mothers who had lost their husbands as at the time of the survey were 5.30 times less likely to die before reaching age 5 years unlike their counterparts who were raised by single mothers. Hence, there is a significant effect of the marital status of the mother and the possibility of her child dying before reaching the age of five years. Lastly, children raised by mothers working as private sector employees were 0.51 times less likely to die unlike children raised by mothers who were not working. There is a significant relationship the occupation of mothers and their experience of child mortality

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CONFLICT OF INTEREST

There is no competing interest among the authors

ETHICAL CONSIDERATION AND INFORMED CONSENT

Prior to the administration of the instruments, the essence of the study was explained to the respondents and the consent of the respondents were sought for their participation. To ensure confidentiality, the questionnaires were given numerical codes instead of names and no respondent was forced into the exercise. The results of the study were presented without manipulation of data in favor of the researcher's expectations. Ado-Odo/Ota Local Government (which is the Local Government of the study jurisdiction) gave approval for the study. Above all the study did not involve any human, animal or related tissue.

CONTRIBUTIONS OF AUTHORS

All the authors contributed immensely in the production of the paper and all the authors read and approved the final manuscript.

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