Exposure to Health Information and Women's Behavioral Response to Immunization of Children in Nigeria

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Abstract- **According to the 2013 Nigeria Demographic and Health Survey (NDHS) data immunization coverage for children aged 0-5 was 69.5% the literature show that exposure to health information and services is associated with Women's behavioral response on children's immunization. The purpose of this study is to examine key sources of women's health information and behavior of children's immunization in Nigeria. This study uses the NDHS data of 2013. Preliminary results show that exposure to TV and radio were significantly associated with respondent check-up after delivery (p-value = 0.000), number of antenatal visit (p-value = 0.000), baby post natal two monthly checks (p-value = 0000). Also, access to radio was significantly associated with children's immunization status with respect to (1) BCG injection (p-value = .0000), Polio injection (p-value = 0.000), and measles (p-value = 0.000). Future programming geared to increase immunization coverage in Nigeria will find these results useful for planning.**

Key Words: Exposure to Health information, Women's Behavior, Childhood immunization, Nigeria, NDHS 2013

I. INTRODUCTION

Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases [1]. The Global immunization and strategy goal of 2006-2015 was for every country to reach at least 90% coverage nationally and for every district 80% by 2015 [1]. Out of the 14 million deaths of children under 5 years of age globally, 95% of the deaths occurred in developing countries and 70% of this deaths are attributed to vaccine preventable diseases [2]. Globally, 23% (30 million) of (130 million) children born every year do not take vaccine of any kind [3]. An estimated 2.1 million people around the world died in 2002 of diseases preventable by widely used vaccines, including 1.4 million children [1]. In African countries, studies show that about 3 million children still die and considerable number are crippled, blinded, or otherwise disabled from six major diseases that are preventable through immunization [4]. Nigeria National immunization coverage has plateaued at about 70% for several years with variations cutting across states. (National Bureau of Statistics, 2013). Nigeria ranks 15th highest in the world among countries with high under-five mortality [5]. The first five years of life are the most crucial to the physical and intellectual development of a child. This time of life can affect potential to learn and thrive thought life [6]. The mothers' poor knowledge of immunization against targeted diseases has been identified as the cause for low coverage rate [7]. Most common reasons for non-immunization were lack of knowledge about childhood immunization schedule, where to source for it and a lack of awareness about the benefits of immunization [8]. In order for mothers and teachers to promote best health practices, they must have good knowledge of health information [9]. According to Kahane et al. [10], there are many explanations as to low or partial immunization among children; they classified the reasons for this into three main groups: causes due to health care system, causes relating to parents and causes due to the health providers.

Previous studies revealed that factors associated with immunization coverage of children in developing countries is over the first year of life of a child include lack of mothers' health literacy [11]. The exposure to mass communication channels such as television, radio, and newspaper have important influence for creating awareness and reproductive health behavior [12]. This study provides empirical evidence on how exposure to health information affects women's health seeking behavior immunization status of their children.

II. LITERATURE REVIEW

Despite impressive achievements each year approximately 9.7 million of the world's children die under the age of five from largely preventable diseases [13]. It is estimated that immunization saves lives of 3 million children per year but 2 million more lives could be saved by existing vaccination [14]. Full and continuing access to health information requires active participation, and responsibility for our health is an important aspect of our daily lives [15]. Effective information is relevant for promoting and encouraging preventive as well as effective treatment practices [16]. Access to reliable health

information is the cornerstone for improved and sustainable health outcomes [17].

III. MASS MEDIA CAMPAIGN

The role of mass media in fostering behavior change with respect to immunization is tackled in this study. Mass media health communication on immunization has contributed greatly to the success of immunization in Nigeria [18]. The main source of health information worldwide and most especially in low-medium income countries is mass media [19]. In Nigeria, a major source of information on women's health, family planning and HIV/AIDS is the mass media [20]. Public health attitudes, beliefs, behaviors and knowledge are largely impacted by the mass media [21]. Mass media has led to positive health behaviors and health changes among individuals [22]. The combination of other forms of communication and mass media campaigns, will increase knowledge and reduce possibility of negative health outcomes through the use of effective strategy [23]. An Individual's behavior can be influenced by the effective and efficient use of mass media [24]. Mass media is a strong tool for most especially creating awareness but also to motivate the desires of people for more information and to help people put the information to their own behavior [24, 25]. Education enlightens people as to the availability of health facilities and treatment options, and so places them in positions of making more informed decision on health [26].

In Low-and-Middle-Income countries (LMIC) like Nigeria, poor access to health information, especially among rural women is a major public health problem [20, 27]]. Health behavior of women has untoward implications on immunization of children. About 35 percent of women in developing countries have no access to or contact with health personnel before delivery and only 54 percent gave birth with a skilled attendant present [28]. The basis of child health revolves around the knowledge and experience of mothers who are the first custodians of the child's health [29]. Health Literacy is the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions [30]. Mothers who are more educated have healthier behavior and provide more sanitary and safer environments for their children [31].

IV. THE DATA SOURCE

This study used the 2013 Nigeria Demographic Health Survey (NDHS) women data. According to the study report, data on immunization status was collected from vaccination cards and in cases where not available or a vaccination was not recorded, the mother's recall of vaccination was accepted. This study includes a sample of 26,046 women aged 15-49 who had children aged five years or younger in household at the time of survey.

A. Sample Design

The sample survey uses as sampling frame the list of enumeration areas (EAs) prepared before 2006 population census of the Federal Republic of Nigeria, provided by the National Population Commission. The NDHS sample was selected using a stratified three stage cluster design consisting of 904 clusters, 372 in urban areas and 532 in rural areas. A representative sample of 40,680 households was selected for the survey. A fixed sample take of 45 households were selected for cluster. All women age 15-49 who were either permanent residents of the household in the 2013 NDHS sample or visitors present in the households were interviewed.

B. Data Collection

Unlike the previous NDHS surveys, data collection was carried out in six zones (rather than the states). NDHS 2013 was carried out by 37 interviewing teams, one for each of the 36 states of the country and the Federal Capital Territory (FCT). Data was collected from February 15th to the end of May 2013 (with the exception of two states Kano and Lagos who completed the data collected in June 2013).

C. Limitations of the Study.

Due to the security situation at the time this data collection was conducted, the survey could not be accomplished in eight clusters (four in Borno, two in Yobe, one in Nasarawa, one in Plateau).

Table 1: Showing Percentage of Women According to Background Characteristics, Exposure to Health Information and Immunization Status of Children.

Variables	Total N=(26,046)	Percentage %	Variables	Total N=(26,046)	Percentage %
Women age in groups			**Heard Family Planning on TV last few Months**		
15-19	4153	15.9	No	21654	83.2
20-24	4571	17.5	Yes	4358	16.8
25-29	5596	21.5			
30-34	4442	17.1			
35-39	3553	13.6			
40+	3731	14.3			
Region			**Read about Family Planning in Newspapers last few months**		
North-Central	4035	15.5	No	24610	94.7
North-East	5167	19.8	Yes	1369	5.3
North-West	7696	29.5			
South-East	2403	9.2			
South-South	3347	12.9			
South-West	3398	13.0			
Place of Residence			**At Health Facility told about Family Planning**		
Rural	16754	64.3	No	3865	57.9
Urban	9292	35.7	Yes	2810	42.1
Highest Education level			**Multiple Exposure to Family Planning Information**		
No education	10925	41.9	None	16724	64.2
Primary	5027	19.3	One	4496	17.3
Secondary	8375	32.2	2 or more	4826	18.5
Higher	1719	6.6	**Child ever been Vaccinated- all first six Children**		
Marital Status			No	3924	26.5
Never in union	4134	15.9	Yes	10857	73.5
Married-living together	20984	80.6			
No longer living together-widowed-divorced-separated	928	3.6	**Received BCG – all first six children**		
Religion of respondent			No	8522	44.8
Islam-Traditional	14693	56.7	Yes	10512	55.2
Catholic	2285	8.8			
Other Christian	8939	34.5	**Received Measles Vaccination –all first six children**		
Wealth Index			No	10569	55.6
Poorest	5304	20.4	Yes	8438	44.4
Poorer	5699	21.9			
Middle	5332	20.5			
Richer	5126	19.7			
Richest	4585	17.6			
Number of Living Children			**Received Polio 0 Vaccination- all six children**		
None	4116	15.8	No	9684	50.9
1-2	7547	29.0	Yes	9358	49.1
3-4	7133	27.4			
5+	7250	27.8			
Employment Status			**Received Polio 3 Vaccination- all six children**	8473	45.0
No working	9418	36.4	No	10370	55.0
Working	16487	63.6	Yes		
Heard Family Planning on Radio last few months					
No	18223	70.0			
Yes	7803	30.0			

V. RESULTS

Basic Descriptive Statistics of Respondents The majority of women (72%) were aged 34 or younger, and were from the North Central (15%), North East (19%), North West (29%), South East (9%), South South (12%), and South West (13%). Most of the respondents were from the rural areas (64%) and most were working (64%) at the time of survey. Most of the women had no education/Primary education (61%), and the over half (55%) had at three or more children., Results shows that the majority of women were married or living together (80%), and considerable proportion (58%) were of the middle/rich socioeconomic status. Over half of the respondents were either Moslems or Traditionalist. On exposure to health information, results show that 30% of respondents had family planning (FP) information on radio, 17% on TV, 42% from a health facility, 5% from newspapers, and 18% heard from two or more of these sources. Findings show that 73% of children aged five or younger had been vaccinated as at the time of the survey. Of those vaccinated, 44% had measles vaccination, 49% received polio 0, 55% polio 3, and 55% BCG.

A. Multivariate Results

The results in this section are interpreted based on dummy reference category represented as 1 in Table 2.

1) Dependent Variable I: Child ever had Vaccination

Ever had vaccination for children in household is one of the key dependent variables in this study. Results in Table 2 show that age of women is positively related to whether a child ever had vaccination. Women aged 40 or older were 1.7 times as likely as those aged 19 or younger to have vaccinated their children, women aged 35-39 were 1.8 times as likely as those in the youngest age group to have vaccinated their children, and for women aged 30-34, and 25-29, the odds were 1.7 and 1.6 respectively. Education of women is also positively related to child vaccination. The odds were three times more for women with higher education than those with no education to have vaccinated their children, and for women with secondary school education, and those with primary education, the odds were 1.9 times, and 1.7 times as likely as those with no education respectively. Other background variables with some significant odds in expected directions are marital status, religion, and employment status. Results of this study showed that women in the urban areas were less likely than their counterparts in rural areas to have vaccinated their children.

The intervening variable exposure to health information was measured with respect to ever heard family planning on; radio, TV, at the health facility, or read in the newspapers. Results shows that women who heard family planning in the radio were 1.2 times as likely as those who did not to report that they ever had vaccination for their children, and those who heard about family planning from health facility were 1.6 as likely as those who did not to have ever vaccinated their children.

2) Dependent Variable II: Child Received BCG

As Table 2 showed the odds that women reported that their children had BCG vaccination increased with age, wealth status, and education, and the odds varied by region, religion and employment status as well. Also, women who heard FP from health facility were 1.6 times as likely as those who did not to report that they received BCG for their children.

3) Dependent Variable III: Child Received Measles Vaccination

Results in Table 2 show significant relationships between background characteristics of women and measles vaccination for their children. The odds that women reported receiving measles vaccination for their children increased with age, wealth status, education, and number of living children. While the odds that the same women reported measles vaccination for their children varied significantly in some regions, by religion, and employment status. Exposure to health information is also significantly related to a child receiving measles vaccination. Women who heard family planning on TV were 1.3 times as likely as their counterpart who did not to have vaccinated their children, and those who heard family planning at the health facility were 1.6 times as likely as those who did not to have vaccinated their children.

4) Dependent Variable IV & V: Child Received Polio 0 and Polio 3 Vaccination

According to standard health requirements, children under five years are expected to receive five polio vaccinations, one right after birth, and other taken at intervals before age five (Ubajaka, Ukegbu, Okafor, Ejiofor 2012). This study included polio vaccination at birth, and the last polio vaccination requirement just to have insights on women's adherence to children's polio vaccination. Results in Table 2 show that the odds that women obtained vaccination for their children increased by wealth status, education, and age (for polio 3), and it varied significantly by religion, and employment (for polio 0). The odds that women obtained polio 0 and polio 3 vaccinations for their children were more for those who heard family planning at the health facility compared to their counterparts who did not.

VI. DISCUSSIONS AND CONCLUSION

Results of this study corroborate vaccination coverage of about 73% in Nigeria which had been stagnant over the years. This figure drops to about 50% or less when specific types of vaccination are considered, and is a major concern for policy makers, health professionals, and other stakeholders working to achieve the new sustainable development goals of 100% vaccination by 2030 [32]. In order to improve vaccination intake in the country, it will be necessary that programs be implemented taking considerations of significant variations of this study results on vaccination intake by women's age, region, wealth

Table 2: Showing Odds of Children Vaccination by Women's Background Characteristics, and Exposure to Health Information.

Variables	Ever had Vaccination	Received BCG	Received Measles	Received Polio 0	Received Polio 3
Women age in groups					
15-19 (Ref)	1.00	1.00	1.00	1.00	1.00
20-24	1.351	1.625**	1.508**	1.084	1.727***
25-29	1.647*	1.7259**	1.941***	1.260	2.170***
30-34	1.777**	2.338***	2.157***	1.332	2.172***
35-39	1.784*	1.771**	1.753**	1.133	1.762***
40+	1.685*	1.698	1.835**	1.007	2.127***
Region					
North-Central (Ref)	1.00	1.00	1.00	1.00	1.00
North East	0.808	0.926	0.870	0.645***	1.301**
North-West	1.304	0.458***	0.698***	0.409***	1.639***
South -East	0.776	2.564***	1.116	1.683**	1.295*
South -South	1.487	1.221	0.994	0.517***	1.150
South –West	0.978	1.184	0.766**	0.696**	0.836
Place of residence					
Rural (Ref)	1.00	1.00	1.00	1.00	1.00
Urban	0.722**	0.947	0.963	1.094	1.031
Highest education level					
No Education (Ref)	1.00	1.00	1.00	1.00	1.00
Primary	1.683***	2.015***	1.777***	1.533***	1.199*
Secondary	1.945***	2.810***	2.460***	2.093***	1.563***
Higher	3.110***	4.390***	2.622***	2.950***	1.624***
Marital Status					
Never in union (Ref)	1.00	1.00	1.00	1.00	1.00
Married-living together	1.369	1.049	1.219	0.785	1.159
No longer living together-widowed-divorced-separated	2.421*	0.979	1.460	0.996	1.278
Religion					
Islam-trad. (Ref)	1.00	1.00	1.00	1.00	1.00
Catholic	1.406	1.874***	1.692***	1.810***	1.202
Other Christian	1.340*	1.645***	1.551***	1.345***	1.249**
Wealth Index					
Poorest (Ref)	1.00	1.00	1.00	1.00	1.00
Poorer	1.054	1.520**	1.599***	1.611***	1.222
Middle	1.036	1.995***	2.030***	2.025***	1.116
Richer	1.006	2.948***	2.420***	3.126***	0.957
Richest	1.540	5.009***	2.930***	4.877***	1.348*
Number of living children					
1-2 (Ref)	1.00	1.00	1.00	1.00	1.00
3-4	1.106	1.028	1.675***	1.063	1.099
5+	0.979	0.787	1.574***	0.969	1.100
Employment Status					
No working (Ref)	1.00	1.00	1.00	1.00	1.00
Working	1.775***	1.400***	1.322***	1.355***	1.124
Read of Family planning in Radio					
No (Ref)	1.00	1.00	1.00	1.00	1.00
Yes	1.252*	1.141	1.089	1.051	1.057
Heard of family planning on TV last few months					
No (Ref)	1.00	1.00	1.00	1.00	1.00
Yes	0.892	1.039	1.270**	1.110	1.058
Heard family planning on Newspaper last few months					
No (Ref)	1.00	1.00	1.00	1.00	1.00
Yes	1.349	1.403	1.206	1.196	1.034
At health facility told about family planning					
No (Ref)	1.00	1.00	1.00	1.00	1.00
Yes	1.608***	1.888***	1.190**	1.593***	1.310***
Wald (Model Chi- Square)	1337.512	1600.370	237.092	836.737	398.843
-2 Log likelihood	3001.507	4299.725	6684.279	5647.716	7313.352
Nagelkerke R Square	0.128	0.405	0.229	0.314	0.054

status, educational levels, religion, employment status, and number of children depending on the type of vaccination.

Results of this study suggest that although radio, and TV are important tools for exposing women to health information, many women were not exposed to vaccination information through this channels of communication. Also, radio and tv may not be effective enough to ginger more women to obtain the range of vaccinations needed for their children. The most effective channel of information reported by women who participated in this study is from professionals at the health facilities. Therefore, future program would need to encourage women to visit health facilities in their localities and not rely only on what they get from the radio or TV which may not be enough to motive them to obtain vaccination for their children or wards. In addition, the strategy may be to use radio, and TV to encourage women to visit health facilities to obtain information on the importance of vaccination for their children.

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