

Socio-Economic Factors Influencing Health Behavior of Women and Immunization Status of Children in Nigeria

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Abstract—Women’s health behavior is a major barrier to the immunization status of children in Nigeria. Despite the intervention and progress over the years on childhood immunization in Nigeria four out of five children still do not see their fifth birthday due to preventable diseases. Women’s health behavior has been recognized as a major barrier to the immunization status of children in Nigeria. The purpose of this study is to examine the Socio-economic factors influencing the health behavior of women and immunization status of children in Nigeria. Nigeria Demographic and Health Survey (NDHS) that included the women 15-49 years. The result of the analysis shows that 69.5% of the respondents have ever had vaccination. This study revealed that mothers’ level of education, type of occupation, place of residence, wealth quintile, religion and region were significantly associated with health behavior of women (p-value = 0.000). Region, residence, level of education varied significantly by respondents’ check-up after delivery (p-value = 0.000), respondent checked health status before delivery (p-value= 0.000), and number of antenatal visits during pregnancy (p-value = 0.000). Future policy geared to increase immunization coverage will have to consider these factors.

Keywords—Socio economic factors, Health Behavior of women, immunization status, Nigeria, NDHS 2013

I. INTRODUCTION

Vaccines are among the most effective preventive health measures in reducing child mortality, morbidity, and disability [1]. Immunization is described as a form of health technology that is central on child health care practice that is aiming at reducing preventing or protecting an individual against epidemic [2]. In 2011 alone, statistics reveal that, about seven million under-5 mortality occurred globally, out of which about 41% occurred in sub-Saharan Africa and vast majority of the deaths are preventable through universal immunization coverage in the region [3]. In fact, about 30 million out of the 130 million children born every year worldwide are not receiving vaccination of any kind [4].

Child mortality has fallen significantly in many low-income countries; however, sub-Saharan Africa continues to experience the slowest fall in mortality rate among children [5]. Studies in Africa have shown that about 3 million children in developing countries still die and many more are crippled, blinded, or otherwise disabled from six major diseases that are

preventable through immunization (World Health Organization [6]. While coverage was estimated to be less than 80% in 36 countries, six countries (Chad, Equatorial Guinea, Gabon, Nigeria, Palau and Somalia) failed to achieve 50% coverage level [6].

Nigeria is among the countries with vaccine coverage rate below 50% [7]. In Nigeria, an estimated 10.8 million children die worldwide each year, of which 41% of these deaths occur in sub-Saharan Africa and 34% in South Asia [8]. Nigeria is among the countries which has a very low coverage rate of childhood vaccines in the world [9]. Nigeria’s immunization coverage rates are among the worst in the world [10]. Measles was responsible for 5 percent of the child deaths in Africa [11]. It has been documented that children from parents who live below the poverty level have lower immunization coverage than those who live above poverty level [12]. Parents of higher socio-economical background with non-minority children were far more likely to have complete immunization [13].

[14] observed that many factors such as poor knowledge of immunization, lack of suitable venues, long waiting, transportation difficulties, non-medical facilities and poor motivation impede smooth realization of the objectives of immunization programmes. Mothers who have poor health, their children are likely to also suffer poor health either because of inheritance or because of the type of place where they grew up [15]. Even though several other factors are responsible for low immunization coverage in Nigeria which is yet to be explored. Hence the need for this present study which seeks to examine the impact of socio economic factors (Mother’s Educational attainment, employment status, marital status, wealth quantile, Religion and place of residence) influencing women’s health behavior and immunization status.

II. LITERATURE REVIEW

In immunization coverage, widespread inequalities persist to the disadvantage of parents in the lowest socio economic quintile, including parents in rural areas and no education which affects a child’s immunization status [16].

A. Socio Economic Factors

Child health is significantly related to maternal health as health status of the mother impact the health of the child prior

to delivery and after [17]. Mothers below 30 years were 2.26 times more likely to be fully immunized [18]. To reduce under-five (5) mortality rate mother's education is an important independent factor [19]. Mothers who completed primary education were less likely to have their children fully immunized compared to women who have no education at all [20]. A woman is empowered through education to access relevant health care services such as prenatal care, antenatal care and childhood immunization [21]. Mothers who are educated have three times more chances to immunize their children than the uneducated mothers; therefore there is a significant relationship between mother's education status and child immunization status [22]. In another study, uneducated mothers are less concerned about their children's immunization status compared to highly educated mothers [18]. Immunization status of children can be increased through the increase in education of women on health care services [23]. Educational qualification does not influence parents to immunize their children when due and education qualification does not significantly influence the belief of people about the causes of the diseases [24]. Another highly significant factor that influences parents to be willing to immunize their children is marital status [14].

In 2003, some leaders from three states in Nigeria who are religious and also into politics shunned a polio campaign organized by WHO with an assertion that vaccines are causes of AIDS and infertility in the country [2]. The choice of health practice women adopt is a function of their beliefs [25]. Religion, social and religion are not barriers to routine immunization [26]. Vaccination is believed by some respondents to be a form of family planning which is targeted towards the Muslims [27].

There is a positive association between religion, marital status, household size, and age with their knowledge of expanded programme immunization [25]. Education and wealth status of women has a strong hold on their health seeking behavior and also on child survival [21]. Mothers who are wealthier are more likely to attend a first visit than poorer mothers. Mothers' age is an influencing factor on utilization of prenatal care services [28]. The level of child health and infant mortality is a function of traditional mores, condition including health literacy or awareness as well as community development [29]. Children born to mothers educated have a lower mortality risks because educated women tend to marry and have their first child during their reproductive ages than uneducated women who give birth before and after their reproductive age which leads to lower birth weight and poor health status of the child [30].

Children in wealthier families have access to high quality health care and living conditions [31]. It is reported that children in urban area have consistency higher immunization rates than those in rural areas [32].

B. Health Behavior of Women

Other factors also associated with the immunization status of children are place of delivery, access to health facilities [33]. Two studies have indicated that antenatal visit and birth in health facility give children a more likely chance to be fully vaccinated since mothers will be exposed to health information

on immunization [34]. According to [35], children who are born in the health facilities are more likely to be vaccinated with BCG since it is given immediately after birth and up to date with their vaccination unlike children who were not given birth to at home. Prenatal care increases the chances of a child having access to health care services such as immunization and institutional delivery. Almost 40 percent of women with no education gave birth without receiving any antenatal care compared with 60 percent of women who with secondary education.

III. 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.

IV. 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.

V. 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).

VI. 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: Frequency Distribution of Socio Economic Factors, Women Health behavior, and Children Immunization

Variables	Frequency N=(26,046)	Percentage %	Variables	Frequency N=(26,046)	Percentage %
Women age in groups			No antenatal visits during pregnancy		
15-19	4153	15.9	None-don't know	6808	35.1
20-24	4571	17.5	1-3	2407	12.4
25-29	5596	21.5	4-6	4390	22.6
30-34	4442	17.1	7-9	2078	10.7
35-39	3553	13.6	10+	3704	19.1
40+	3731	14.3			
Region			Place of delivery by major types of facility		
North-Central	4035	15.5	Home based facility	11501	59.5
North-East	5167	19.8	Public health facility	5159	26.7
North-West	7696	29.5	Private health facility	2685	13.9
South-East	2403	9.2			
South-South	3347	12.9			
South-West	3398	13.0			
Place of Residence			Respondents Professional checkup - all first six children		
Rural	16754	64.3	None prof	169	2.0
Urban	9292	35.7	Low level prof	2036	23.9
			Medium level prof	3556	41.7
			High level prof	2768	32.5
Highest Education level			Respondents health checked after discharge – delivery –all first six children		
No education	10925	41.9	None-don't know	10432	79.0
Primary	5027	19.3	Yes	2769	21.0
Secondary	8375	32.2			
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-Trad.	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	Received Polio 0 Vaccination- all six children		
Richer	5126	19.7	No	9684	50.9
Richest	4585	17.6	Yes	9358	49.1
Number of Living Children and pregnancy			Received Polio 3 Vaccination- all six children		
None	4116	15.8	No	8473	45.0
1-2	7547	29.0	Yes	10370	55.0
1-2	7133	27.4			
3-4	7250	27.8			
5+					
Employment Status					
No working	9418	36.4			
Working	16487	63.6			
Visited Health Facility					
No	19151	73.9			
Yes	6771	26.1			

Table 2: Logistics Regression: Socio economic factors, Health behavior of women and children immunization

Variables	Child ever received Immunization	Child Received BCG	Child Received Measles	Child Received 0 Polio	Child Received 3 Polio
Women age in groups					
15-19 (Ref)	1.00	1.00	1.00	1.00	1.00
20-24	1.461*	1.617***	1.546***	1.037	1.508***
25-29	1.614**	1.699***	2.117***	1.233	1.913***
30-34	1.657**	1.973***	2.292***	1.160	2.005***
35-39	1.864**	2.127***	2.290***	1.381*	1.746***
40+	1.929**	1.683**	2.373***	0.966	1.732***
Region					
North-Central (Ref)	1.00	1.00	1.00	1.00	1.00
North East	0.817	0.802*	0.878	0.569***	1.310**
North-West	2.091***	0.459***	0.934	0.483***	1.501***
South -East	0.781	1.369	0.933	1.182	1.092
South -South	1.486**	1.573***	1.286**	0.654***	1.314***
South -West	1.083	0.836	0.750***	0.600***	0.811**
Place of residence					
Rural (Ref)	1.00	1.00	1.00	1.00	1.00
Urban	0.827	1.159	1.014	1.231**	1.035
Highest education level					
No Education (Ref)	1.00	1.00	1.00	1.00	1.00
Primary	1.685***	1.812***	1.598***	1.463***	1.349***
Secondary	1.975***	2.717***	2.142***	1.862***	1.580***
Higher	3.170***	3.681***	2.568***	2.361***	1.763***
Marital Status					
Never in union (Ref)	1.00	1.00	1.00	1.00	1.00
Married-living together	0.573	0.720	0.864	0.732	0.868
No longer living together-widowed-divorced-separated	0.967	0.681	0.912	0.706	0.946
Religion					
Islam-trad (Ref)	1.00	1.00	1.00	1.00	1.00
Catholic	1.593**	1.515**	1.775***	1.436**	1.184
Other Christian	1.360**	1.571***	1.506***	1.477***	1.274***
Wealth Index					
Poorest (Ref)	1.00	1.00	1.00	1.00	1.00
Poorer	0.924	1.142	1.466**	1.192	1.032
Middle	1.056	1.495**	1.883***	1.548***	1.043
Richer	1.039	1.798***	2.118***	1.915***	1.085
Richest	1.620**	2.839***	2.807***	2.858***	1.401**
Number of living children					
1-2 (Ref)	1.00	1.00	1.00	1.00	1.00
3-4	1.046	1.029	1.623***	1.035	0.993
5+	0.950	0.986	1.503***	1.035	0.953
Employment Status					
No working (Ref)	1.00	1.00	1.00	1.00	1.00
Working	1.564***	1.210**	1.298***	1.164*	1.102
Visited health facility					
No (Ref)	1.00	1.00	1.00	1.00	1.00
Yes	1.335***	1.613***	0.994	1.374***	1.390***
No of antenatal visits during pregnancy					
None-don't know (Ref)	1.00	1.00	1.00	1.00	1.00
1-3	1.746***	1.996***	1.518***	1.696***	1.633***
4-6	1.723***	2.273***	1.546***	2.489***	1.429***
7-9	2.286***	3.041***	1.856***	2.711***	1.469***
10+	2.415***	3.828***	2.043***	2.831***	1.728***
Place of delivery by major types of facility					
Home based facility (Ref)	1.00	1.00	1.00	1.00	1.00
Public health facility	1.157	1.557***	1.351***	2.055***	0.977
Private health facility	1.024	1.116	1.185	1.684***	0.902
Respondent Professional Checkup- all first six children					
None prof (Ref)	1.00	1.00	1.00	1.00	1.00
Low level prof	0.490**	1.256	1.215	1.079	0.684*
Medium level prof	0.591*	1.600**	1.363	1.513*	0.727
High level prof	0.643	2.106***	1.538*	1.733**	0.694*
Wald: (Model chi square)	1934.355	2719.154	660.343	1434.301	231.013
-2 Log likelihood	4280.921	5692.891	9246.166	7598.838	10747.086
Nagelkerke R Square	0.178	0.394	0.234	0.350	0.074

VII. RESULTS

A. Basic Description 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 majority (55%) had three or more children. Results show 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. With respect to health behavior, close to 60% used home based facility during delivery, 27% used public health facility, and 14% used private health facility. Only 26% of women visited health facility, and of these, about half (52%) reported having had at least four antenatal visits, 21% reported health check after discharge, and 74% of these were checked by medium or high level professional. 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.

B. Multivariate Results

1) Child Ever Received Immunization vs. Background Factors and Health Behavior

Women's health behavior was measured as; (1) visited health facility, (2) number of antenatal visits during pregnancy, (3), place of delivery of child, and (4) respondents professional check-up after delivery. Results in Table 2 show that the odds women immunized their children increased with age, education, and wealthiest women, and the odds varied significantly by region, religion, and work status. The odds that women would have their children immunized varied significantly by whether they visited health facility, and the odds increased by number of antenatal visits during pregnancy, and level of professionals that checked them during visits.

2) Child received BCG immunization vs. background factors and health behavior

Results show that the odds that children received BCG increased by age, education, and wealth status index, and it varied significantly by regions (in some), religion, and employment status. The odds that children received BCG varied significantly by whether their mothers visited health facility, especially public health facility, and the odds increased by number of antenatal visits and level of professional that did checkup for them during visits

3) Child Received Measles Immunization vs. Background Factors and Health Behavior

Findings in Table 2 show that the odds that children received measles immunization increased with age, level of education, wealth index, and number of living children, and it varied significantly by region (some), religion, and employment status. The odds that children received measles immunization increased by number of antenatal visits, and varied significantly by whether they had check-up at public health facilities with high level health professionals.

4) Child Received Polio 0 & 3 Immunization vs. Background Factors and Health Behavior

Results in Table 2 suggest that the odds for children immunization on polio 0 and 3 increased with age (mostly for polio 3), level of education, and wealth index (mostly for polio 0), and the odds varied significantly by region, religion, employment status and residence (only for polio 0). The odds that children received polio 0 and polio 3 immunization varied significantly by whether women visited health facility, place of delivery (public or private), and the odds increased significantly by number of antenatal visits, and level of professional that checked the woman during visits.

VIII. DISCUSSION AND CONCLUSION

The results of this study is a pointer to the fact that background characteristics of women and their health behavior have significant effects on whether they would immunize their children or not. Key characteristics of women that are consistent in the data analysis and should be consider in designing programs to increase children immunization intakes in Nigeria are; age, region, education, religion, and wealth or socioeconomic status of women. These key background factors were consistently significant all through the five key immunization indicators examined in this study. The number of visits women make to the health facility, whether they were attended to by high or medium level professional at a public or a private health facility have positive effects on immunization of children. These health behavioral factors should be factored into policies and programs geared to increase immunization intake in the country.

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