



(RESEARCH ARTICLE)



## Demographic determinants of poor childhood immunization coverage among women in Bayelsa state

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### Abstract

The study examined at the extent demographic factors influence childhood immunization coverage in Bayelsa State. The design was cross-sectional. The total female population of Bayelsa State is estimated to be 1,116, 200.9. National Population Commission and National Bureau of Statistics (2016); National Bureau of Statistics (2018) According to the World Health Organization, women of reproductive age account for 22% of the total population of 501, 502 people. The study population consists solely of women in Bayelsa State who have child(ren) between the ages of 0 and 5 years. A multi-stage procedure was used to select 20 women with at least one child under the age of five from each selected community, yielding a sample size of 1100. The instrument's internal consistency was assessed using Cronbach's Alpha statistics, yielding a reliability of 0.77. At the 0.05 level of significance, simple regression statistics was used to analyze the hypotheses. The findings revealed that mothers' age and education influence childhood immunization coverage, as the educated and older mothers have higher probability of getting their children immunized completely. Maternal education was recommended in the State, also that the National Orientation Agency should ensure mass media exposure and community education awareness and campaigns on immunization.

**Keyword:** Childhood immunization; Immunization coverage; Educational qualification; Age; Women,

### 1. Introduction

Immunization is the process of developing resistance to infectious diseases through the administration of an attenuated vaccine that stimulates the production of antibodies against the disease's antigen. It protects against these diseases and helps to develop one's immune system, which can be passive or active. Immunization is a method of preventing infectious diseases by administering an antigen to stimulate the body's immune system to produce and develop its own immune system to protect the person from future infection or disease (WHO, 2019). The global coverage of immunization is said to be 85 percent, and vaccines are being used less frequently around the world. Though coverage varies by vaccine, 19.9 million infants are reportedly not immunized with full doses of vaccines, with 60 percent of these children coming from ten countries, including Nigeria (World Health Organization [WHO], 2018). They also claimed that the high rate of child mortality in some countries is due to coverage issues.

According to Wetherill et al. (2017), child mortality in Nigeria is on the rise, and the majority of the causes of these childhood deaths are preventable diseases that can be prevented with appropriately administered vaccines. These diseases are preventable and will result in fewer deaths if immunization coverage improves. According to the United Nations International Children's Emergency Fund, [UNICEF] (2018) in its 2017 Annual Report, one out of every eight children in Nigeria dies before the age of five, and 10.5 million are stunted in growth. In 2016, maternal mortality was reported to be 546 per 100,000 live births, while neonatal mortality was reported to be 39 per 1000 live births. With

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the round of immunization and the routinely carried out immunization in health facilities, the polio virus was still reportedly present in Nigeria as of 2017, and only one-quarter of all Nigerian children were immunized as recommended in their first year. The National Primary Health Care Development Agency (NPHCDA) identified challenges and poor performance in the presentation of vaccine preventable diseases in Nigeria, and coverage of all vaccines could not reach the global recommended target (WHO, 2017).

Nigeria has the world's second highest maternal mortality rate, accounting for approximately 15% of total annual global deaths, representing 2% of the global population. With the drop in global maternal mortality, Nigeria's child mortality rate has worsened, but the country remains the highest in Sub-Saharan Africa, and the maternal mortality rate remains very high, at 82 per 100,000 live births. In 2015, 303,000 women worldwide were estimated to have died as a result of pregnancy and childbirth-related issues, with Nigeria accounting for 58,000 of the total deaths in Sub-Saharan Africa, which totaled 201,000. (World Health Organization, 2018).

The study Akwataghibe et.al (2019) showed that young women in Ilara and Ipara were knowledgeable and aware of immunization and its value, the poor knowledge of vaccine schedules and times for the doses displayed by Ilara young women gave a hint as to why their understanding of the value of immunization had not translated to more utilization. More so, a study carried out in Indonesia by Holipah, et al (2018) titled determinants of immunization status among 12-23 months old children showed that the ages of the mothers also contributed to the children's immunization status, where children of older mothers had more of complete immunization compared to the younger mothers who were unable to take decision for themselves. Educated mothers' children were more likely to have full immunization compared to less educated mothers. Adebayo et al (2012) in a study titled immunization coverage in a rural community in southwestern Nigeria averred that majority of mothers with some level of education had their children fully immunized, mother's age and mother's occupation are not significantly associate with immunization coverage. So far, there has been an unresolved issue to find out whether the mother's education determines poor childhood immunization. As a result, the researcher tends to fill in the gaps by this study.

### **1.1. Statement of the Problem**

Nigeria has one of the highest under-five mortality rates in the world, with vaccine-preventable diseases accounting for at least 20% of these deaths (Itimi et. al, 2012). This influenced the World Health Organization's introduction of the Expanded Programme on Immunization in 1974, as well as Nigeria's nationalization of the program in 1996, in order to expand coverage and increase the number of antigens. Although there was a significant increase in immunization coverage, it proved difficult to sustain due to a number of factors such as vaccine shortages, inaccessible immunization centers, long waiting times, and low demand due to lack of knowledge and motivation. As a result, supplemental immunization programs and strategies such as Reaching Every Ward, an accelerated measles campaign, and Immunization Plus Days were implemented (IPDs). These programs, like all other MDG programs, were massively funded by the government and donor agencies, and ensured that immunization services were brought to homes by providing vaccinators with all the logistics needed to move from house to house, immunizing eligible children. Surprisingly, this has not resulted in a significant increase in immunization coverage rates in Nigeria, with the percentage of fully vaccinated children increasing from 13% in 2003 to 23% in 2008. We would like to speculate that the low immunization coverage achieved could be attributed to mothers' educational background and age in Bayelsa State.

### **1.2. Aim and Objectives of the Study**

The aim of the study is to investigate the extent demographic factors influence childhood immunization coverage in Bayelsa State. Specifically, the study seeks:

- To find out the extent age influence childhood immunization in Bayelsa State.
- To determine the extent educational qualification influence poor childhood immunization coverage among women in Bayelsa State.

### **1.3. Research Questions**

The following research questions guided the study:

- To what extent does age influence childhood immunization in Bayelsa State?
- To what extent does educational qualification influence poor childhood immunization coverage among women in Bayelsa State?

### 1.4. Hypotheses

The following hypothesis were tested at 0.05 significance level

- There is no significant difference on childhood immunization coverage in Bayelsa State with regards to age.
- There is no significant difference on childhood immunization coverage in Bayelsa State with regards to educational qualification.

## 2. Methodology

A cross-sectional design was used in the study. All mothers who had lived in Bayelsa State for at least six months and had a child or children between the ages of 0 and 5 were included in the population. The total female population of Bayelsa State is estimated to be 1,116, 200.9. National Population Commission and National Bureau of Statistics (2016); National Bureau of Statistics (2018) According to the WHO, women of reproductive age account for 22% of the total population of 501, 502 people. The study population consists solely of women in Bayelsa State who have child(ren) between the ages of 0 and 5 years. The cluster sampling technique was used to designate Bayelsa State's three (3) senatorial districts, which are made up of eight Local Government Areas and 105 political wards. A simple random selection technique was used to choose half of the wards in each Local Government Area, for a total of 55 wards. From the chosen wards, half of the communities within each ward were chosen at random, yielding a total of 53 communities; from each of the 53 communities, 20 women with at least one child under the age of five were conveniently chosen to participate in the study, yielding a sample size of 1100. The data collection instrument for this study was titled "Determinants of Childhood Immunization Coverage Questionnaire (DCICQ)," and it had polychotomous response options based on the modified 4 point Likert scale using Very High Extent (VHE), High Extent (HE), Low Extent (LE), and Very Low Extent (VLE), and it was completed by women who had at least one child aged 0 to 5 years and had lived in Bayelsa for at least six months. The internal consistency of the instrument was measured using Cronbach's Alpha statistics, yielding a reliability of 0.77. Although 1100 women responded to the items, 1078 were completely filled and retrieved, yielding a 98 percent return rate. At the 0.05 level of significance, simple regression statistics were used to analyze the hypotheses.

## 3. Results

### 3.1. Research Question 1: To what extent does age influence childhood immunization in Bayelsa State?

**Table 1** Mean and Standard deviation on the extent age influence childhood immunization in Bayelsa State

Age	N	Mean	Std. Deviation
<20YRS	310	3.0694	0.11409
21-30YRS	308	3.0542	0.15845
>30YRS	460	3.0947	0.14032
Total	1078	3.0758	0.13993

Table 1 shows that mothers above 30 years had the highest mean score of 3.09, followed by those less than 20 years with mean score of 3.07 and mothers within 21-30 years had 3.05. This indicates that mothers above 30 years participate more on childhood immunization in Bayelsa State.

### 3.2. Research Question 2: To what extent does educational qualification influence poor childhood immunization coverage among women in Bayelsa State?

Table 2 shows that mothers with tertiary education had the highest mean score of 3.10, followed by those with secondary education with mean score of 3.06 and mothers with primary education had the least score of 3.02. This indicates that mothers with tertiary education participate more on childhood immunization in Bayelsa State.

**Table 2** Mean and Standard deviation on the extent educational qualification influence childhood immunization in Bayelsa State

	MOTHERSAGE	N	Subset for alpha = 0.05	
			1	2
Ryan-Einot-Gabriel-Welsch Range	21-30YRS	308	3.0542	
	<20YRS	310	3.0694	
	>30YRS	460		3.0947
	Sig.		.177	1.000
Means for groups in homogeneous subsets are displayed.				
	N	Mean	Std. Deviation	
Primary education	175	3.0215	0.14064	
Secondary education	367	3.0622	0.14053	
Tertiary education	536	3.1029	0.13283	
Total	1078	3.0758	0.13993	

**3.3. Hypothesis 1: There is no significant difference on childhood immunization coverage in Bayelsa State with regards to age.**

The result in table 3 shows that F-cal = 8.289, p-value = 0.000 at degree of freedom of 2 and 1075. This implies that the p-value of 0.000 is less than 0.05 level of significance. Hence, the null hypothesis one is rejected, that is there is significant difference on childhood immunization coverage in Bayelsa State with regards to age. Also, the Post Hoc table indicates no significant difference between mothers within 21-30 and those less than 20 years, while a significant difference was seen between mothers above 30 years above and those with 21-30 years and <20 years.

**Table 3** ANOVA analysis on childhood immunization coverage in Bayelsa State with regards to age

	Sum of Squares	Df	Mean Square	F	p-value
Between Groups	.320	2	0.160	8.289	0.000
Within Groups	20.767	1075	0.019		
Total	21.087	1077			

**3.4. Hypothesis 1: There is no significant difference on childhood immunization coverage in Bayelsa State with regards to educational qualification**

**Table 4** ANOVA analysis on childhood immunization coverage in Bayelsa State with regards to educational qualification

	Sum of Squares	Df	Mean Square	F	p-value
Between Groups	0.979	2	0.489	26.157	0.000
Within Groups	20.109	1075	.019		
Total	21.087	1077			

	MOTHERSEducationalSTATUS	N	Subset for alpha = 0.05		
			1	2	3
Ryan-Einot-Gabriel-Welsch Range	PRIMARY EDUCATION	175	3.0215		
	SECONDARY EDUCATION	367		3.0622	
	TERTIARY EDUCATION	536			3.1029
	Sig.		1.000	1.000	1.000
Means for groups in homogeneous subsets are displayed.					

The result in table 4 shows that  $F_{cal} = 26.157$ ,  $p\text{-value} = 0.000$  at degree of freedom of 2 and 1075. This implies that the  $p\text{-value}$  of 0.000 is less than 0.05 level of significance. Hence, the null hypothesis two is rejected, that is there is significant difference on childhood immunization coverage in Bayelsa State with regards to educational qualification. Also, the Post Hoc table indicates that tertiary education influences childhood immunization coverage.

#### 4. Discussion

The findings in this study revealed that mothers above 30 years participate more on childhood immunization in Bayelsa State. This is in tandem with Adokiya et al (2017) which averred that mothers age, marital status, religion are associated with childhood immunization status where mothers of 40-49 years of age are more likely to have their children fully immunized. Moreso, increase in maternal age improved child immunization, mother with secondary or higher education are more likely to immunize their children fully than mothers with no formal education.

Furthermore, the study shows that mothers with tertiary education participate more on childhood immunization in Bayelsa State. It agrees with Adedokum, et al (2017) which carried out a study on incomplete childhood immunization in Nigeria considering mothers age, education, occupation, birth order and gender of child, size of child birth, exposure to malaria, ANC and place of delivery and find out that children of younger women are more likely to have incomplete immunizations attributing this to child care experience which implies that the mothers with more numbers of children have more experience and are much likely to welcome preventive measures that will help keep their children healthy. The result is in line with Holipah, et al (2018) that the ages of the mothers also contributed to the children's immunization status, where children of older mothers had more of complete immunization compared to the younger mothers who were unable to take decision for themselves. Educated mothers' children were more likely to have full immunization compared to less educated mothers.

#### 5. Conclusion

The study shows that mother's age and education influences childhood immunization coverage, as the educated and older mothers have higher probability of getting their children immunized completely. The study suggested that improving mothers' educational and economic status are basic factors to heighten immunization coverage.

#### *Recommendation*

Based on the findings, the following recommendations were made;

- There should be maternal education in the various health centre in the State.
- The National Orientation Agency should ensure mass media exposure, community education awareness and campaigns on immunization.
- The health workers should ensure confidence in vaccines.

#### **Compliance with ethical standards**

#### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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