

## **Analysis of Socioeconomic Factors Influencing Utilization of Immunization Services in Kontagora Local Government Area, Niger State, Nigeria.**

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### **ABSTRACT**

*Immunization services are services to protect humanity and particularly under-five year old children from vaccine-preventable diseases through provision of funds, vaccines, and technical support by governments globally. However, some factors sometimes influence efforts to actualize these services. The study therefore aims to assess factors influencing the utilization of immunization services in Kontagora Local Government Area, Niger State. The study entailed a cross-sectional study of under-five years old children aged 12-59 months in six selected wards in the study area under a five-year period. A multi-stage sampling technique was used to determine the sample size of 400 respondents. Descriptive and inferential statistics were used to summarize and analyze the results obtained. The results show that 202 (50.5%) children were not-fully immunized. The results also show that parent/caregivers' income and parents/caregivers level of education have significant relationship with children immunization status (at  $P=0.000$  and  $0.002$  respectively) while parents'/caregivers' occupation was found to have no influence on children immunization status. The study concludes that income and level of education significantly influenced the completion of required immunization schedules of under-five year old children in the study area. It is recommended that government promotes intensive community awareness programs, enhance capacity training for PHC staff and institutionalize routine vaccination.*

**Keywords:** Caregivers, Immunization Status, Utilization, Sampling, Vaccines.

### **1.0 INTRODUCTION**

Immunization remains the most effective, safe, and efficient public health intervention. It is estimated that five million lives have been saved from vaccine-preventable diseases, particularly diphtheria, pertussis, tetanus, and measles (WHO, 2016). The morbidity and mortality caused by these diseases are still very high in many developing countries. Approximately 20% of children do not receive the three life-saving doses of diphtheria, pertussis, and tetanus (DPT) vaccines (WHO, 2017). A Study by Dore (2016) pointed out that nearly 29% of deaths in children under-five years of age are

vaccine-preventable and that 1.5 million children die from diseases preventable by currently recommended vaccines. Over 70% of children not reached by immunization live in ten countries, including Nigeria, with cases of polio in existence/resurfacing in Afghanistan, Nigeria, and Pakistan (UNICEF, 2015).

Immunization services are services to protect humanity and particularly under-five years old children from vaccine-preventable diseases through the provision of funds, vaccines, public education, and technical support for immunization programmes by governments globally (Aigbe, 2015).

However, the under-five year old mortality rate in Nigeria is one of the highest in the world, and vaccine-preventable diseases are said to be responsible for at least 20% of these deaths (Itimi, *et al.* 2017).

According to United Nations Children's Fund (UNICEF) and World Health Organization (WHO) guidelines, a child should receive a Bacillus Calmette-Guérin (BCG) vaccination to protect against tuberculosis, three doses of DPT to protect against diphtheria, pertussis, and tetanus, three doses of oral polio vaccine (OPV) and a measles vaccination, all by twelve months of age. The challenges facing immunization coverage, coupled with a dramatic resurgence of preventable diseases, suggests that current strategies are failing (Cooke and Tahir, 2015). For instance, recent data indicate the incidences of polio in some states of the country including Niger state and Kontagora Local Government Area in Particular, and has prompted some skepticisms in the effectiveness of the immunization campaign (Cooke and Tahir, 2015). The Multiple Indicator Cluster Survey for Nigeria showed disparities in the coverage of all types or levels of vaccination along with rural-urban and North-South parts of Nigeria (Oleribe, *et al.* 2017). Similarly, income levels, occupation status and education were indicated in the reports as factors influencing coverage of all types or levels of vaccination (Oleribe, *et al.*, 2017). The coverage was found to be low in the rural areas, the northern part of the country, among children of mothers with no education and children in the poorest wealth quintiles (Ilah, *et al.*, 2015).

Parents' means of livelihood and income level are significant factors influencing the utilization of immunization services (United Nations Children's Emergency Fund, 2015; Khan, 2017). The low coverage level of immunization amongst the poor populace is mostly owing to the inability to pay

transportation costs to immunization centres (United Nations Children's Emergency Fund, 2015). For instance, it was recorded that children of parents who held lucrative jobs were more privileged compared to those whose parents are farmers, do menial jobs and other services (Regassa, *et al.*, 2019). Research findings show that parents of little financial/economic status (low yearly income) were less likely to be current about first-hand vaccines and consequently their children were bound not to be immunized with these vaccines (Ilosanya and Oladosun, 2016). Also, a research work carried out in the United States found that children from low socio-economic backgrounds were less likely to be immunized as the parents were not current with the vaccines (Legesse and Dechasa, 2015). Similarly, children of mothers having substantial assets above the least fortunate had full DPT immunization status by nine months of age in Nigeria (Aigbe, 2015).

A related study carried out in Nigeria observed that children of lower socioeconomic status were bound to have greater unimmunized rates (Brown, *et al.*, 2015; Tinashe, 2015). In a related study, it was recorded that children of mothers of higher socioeconomic status have better chances to be completely immunized (Ilosanya and Oladosun, 2016). Rasheed (2017) and Khan (2017) in similar studies found that mothers with higher socioeconomic status with good jobs and steady incomes improved immunization coverage. Studies also found that children living in urban areas in the country are more likely to be vaccinated than those living in rural areas while vaccination coverage is highest among children whose mothers have a secondary or higher education (Aigbe, 2015; Ilosanya and Oladosun 2016; Rasheed, 2017).

Although various studies have been carried out on immunization compliance in Nigeria

and Niger State, there is no documented evidence of studies conducted in the study area on the factors influencing the utilization of immunization services. Therefore, the study aimed at an analysis of socioeconomic factors influencing utilization of immunization services in Kontagora Local Government Area, Niger State, Nigeria. Specifically, the objectives include assessing immunization utilization coverage in children aged 12-59 months and determining the influence of the socioeconomic factors such as parents/caregivers level of education, occupation and income levels on the utilization of immunization services.

## **2.0 MATERIALS AND METHODS**

### **2.1 Study Area**

Kontagora Local Government Area is located between longitude 10°24'01"N to 10°40'00"N and latitude 5°28'11"E to 5°47'00"E (Figure 1). Kontagora Local Government Area lies at about 335m above sea level and covers an area of 2,081 km<sup>2</sup>. The Local Government Area is surrounded to the north and east by Mariga Local Government Area, to the south by Mashegu Local Government Area and to the west by Magama Local Government Area. It has a landmass of 2,081 km<sup>2</sup>, making it one of the largest towns in Niger State (NSG, 2018). The major ethnic groups are Hausa and Kambari, made up of Muslims and Christians. Agriculture is the main occupation of the area. Other occupations in the area are trade, arts and craft.

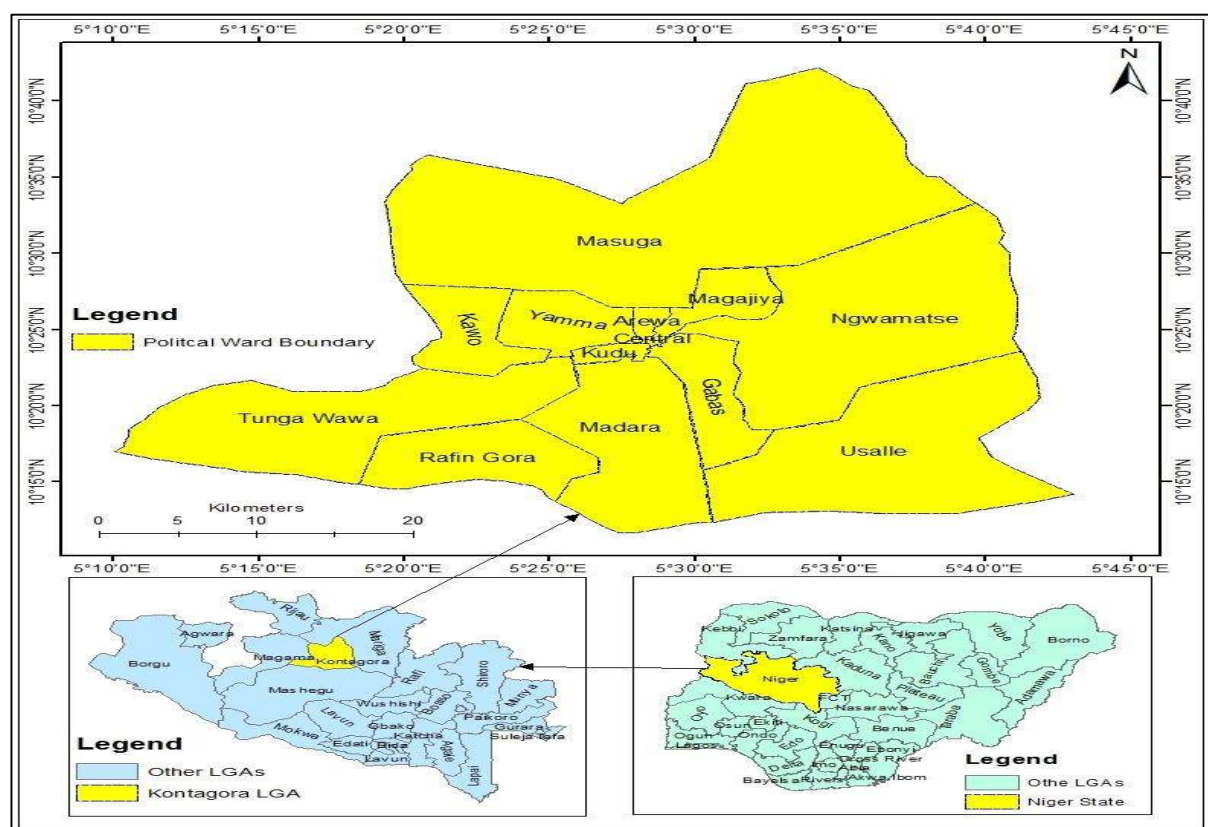
### **2.2 Sampling Procedure and Sample Size**

Following a reconnaissance survey of the study area, an ethical clearance was obtained from the Local Disease Control Division to use the data from Kontagora Demographic Immunization Survey of 2018. A multi-stage sampling technique was adopted in selecting the respondents for the study. The first stage

involved purposive sampling in the selection of six (6) out of the thirteen wards in the study area (based on high, moderate and low immunization coverage as identified and categorized by the Preventable-Disease Control Division of the Local Government Area). The survey covered caregivers/parents of under-five year old children who have lived for at least five years in the targeted communities. In the second stage, three (3) communities from each of the six wards were selected. In all, a total of eighteen (18) communities were randomly selected for the study. In the third stage, a systematic sampling of every 3<sup>rd</sup> household was used to select caregivers from the survey sample frame.

A sample size of 400 caregivers was drawn from the study population of 45,390 caregivers and guardians of children under five years from 15,130 households obtained from the State Emergency Routine Immunization Control (STERIC, 2018) database. Using Yemane (1967) sample size determination formula, 10% of the sample frame was used as the sample size of 400 respondents. A total of 400 questionnaires were administered to wards/caregivers of the under-five year old children.

Descriptive statistics such as frequencies, percentages, and charts were used to summarize data obtained, while regression analysis was used to test for association (at  $P$ -value  $\leq 0.05$ ) between respondents' socioeconomic characteristics and the level of utilization of immunization services.



**Figure 1:** Geographical Location of the Study Area

*Source:* Adopted from the Administrative Map of Kontagora Local Government Area.

The dependent variables constructed are: (a) fully immunized: equals 1 if a child received the six doses against vaccine-preventable diseases and zero otherwise, (b) BCG: 1 if a child received BCG and zero otherwise, (c) OPV: 1 if a child received the three doses of OPV and zero otherwise; (d) HBV: 1 if a child received the three doses of HBV vaccine and zero otherwise.

(e) DPT: 1 if a child received the three doses of DPT vaccine and zero otherwise, (f) Measles: 1 if a child was immunized against measles and zero otherwise. (g) Measles: 1 if a child was immunized against yellow fever and zero otherwise.

Caregivers' education was categorized into four outcomes as follows: 0= no education, 1= primary education, 2= secondary education and 3= tertiary education.

Occupation of the Caregivers/ mothers was categorized as follows: 1= Farming, 2= Formal Employment, 3= House wife, and 4= others. In the 'others' category, three income dummies were defined as 1=High Income, 2=Moderate Income, and 3=Low Income.

### 3.0 RESULTS AND DISCUSSION

#### 3.1 Demographic Characteristics of Respondents

The results of the socio-demographic characteristics of the respondents are presented in Table 1.

The results show that 49.4% of the respondents are aged between 15-30 years. This has implication for child immunization as age has been found to influence the level

**Table 1: Socio-Demographic Characteristics of Respondents**

<b>Variables</b>	<b>Frequency (n)</b>	<b>Percentages (%)</b>
<b>Caregiver's Age (Years)</b>		
15-30	198	49.4
31-55	107	26.8
56 & above	95	23.8
<b>Marital Status</b>		
Single	3	0.8
Married	304	76.0
Divorced	36	9.0
Others	57	14.2
<b>Child Sex</b>		
Male	227	56.8
Female	173	43.2
<b>Residence</b>		
Rural Area	156	39.0
Urban Area	244	61.0
<b>Religion</b>		
Muslim	313	78.2
Christianity	87	21.8
<b>Ethnic Groups</b>		
Hausa	214	53.5
Yoruba	53	13.3
Igbo	29	7.2
Others	104	26.0
<b>Total</b>	<b>400</b>	<b>100</b>

*Source: Field Survey (2020)*

of awareness and utilization of immunization services (Rahman and Obaidah-Nasrin, 2010). The table also indicates that 76.0% are married. The results from the table also show that majority (56.8%) of children immunized are male against 43.2% reported for female children. This agrees with studies which have found that sex discrimination played an important role in immunization coverage with male children more likely to be more fully immunized (Rahman and Obaidah-Nasrin, 2010). The statistics indicate that the study area is a predominantly Muslim and Hausa settlement with a 21.8% Christian population. This may have implications for immunization coverage due to the religious and cultural practice of female sequestration (purdah).

The results also show that 61% of the parents/caregivers live in urban areas. Similar studies have found disparities in the coverage of all types or levels of vaccination

along with rural-urban parts of Nigeria (Oleribe, *et al.*, 2017).

### **3.2 Immunization Coverage among Children Aged 12-59 Months**

The results of immunization coverage among children aged 12-59 months are presented in Table 2.

The results show that 202 (50.5%) were not fully immunized. A drop in the number of children according to immunization schedule was observed, as 16.0% of children had BCG but only 5.0% and 3.8% had measles and yellow fever vaccines respectively. This indicates that fewer than half of the children took their inoculations after six months as found by a similar study which show a prevalence of incomplete vaccinations among children (Rahman and Obaidah-Nasrin, 2010).

**Table 2:** Distribution of Children by Vaccinations Received

Vaccine	Frequency	Percentage (%)	Fully Immunized		Not-Fully Immunized	
			Frequency	(%)	Frequency	(%)
BCG	64	16.0	38	19.2	26	12.9
OPV1	33	8.3	15	7.6	13	6.4
HBV1	32	8.0	16	8.1	18	8.9
DPT1	39	9.6	13	6.6	26	12.9
OPV2	42	10.5	20	10.1	22	10.9
HBV2	35	8.8	15	7.6	20	9.9
DPT2	28	7.0	13	6.6	15	7.4
OPV3	36	9.0	14	7.1	18	8.9
HBV3	26	6.5	12	6.1	14	6.9
DPT3	30	7.5	14	7.1	16	7.9
Measles	20	5.0	14	7.1	6	3.0
Yellow Fev.	15	3.8	7	3.5	8	4.0
<b>Total</b>	<b>400</b>	<b>100</b>	<b>198</b>	<b>100</b>	<b>202</b>	<b>100</b>

\*BCG = *Bacillus Calmette-Guérin*; OPV = *Oral polio vaccine*; HBV = *Hepatitis B virus*; DPT = *Diphtheria, pertussis, and tetanus*.

**Source:** Field Survey (2020)

Generally, children immunization status in the study area is low. Regmi (2015) observed a drop in children immunized according to the schedule. The observed drops maybe explained by high infant mortality and a lack of knowledge of immunization schedule. However, according to Aigbe, (2015) a drop in children inoculation may be as a result of unavailability of some vaccines at the time of administration.

and children immunization status (CV=11.134, P=0.000). This result agrees with findings by Brown, *et al.*, (2015) and Tinashe (2015) which have shown that the children of the high-income class are more likely to be fully immunized than those from the lower income class. Similarly, low income parents have more children not-fully immunized as was observed by Ilusanya and Oladosun (2016).

**Table 3:** Parents' Income and Children Immunization Status

Variables	Fully Immunized		Not-Fully Immunized	
	Frequency	(%)	Frequency	(%)
High Income	35	8.8	25	6.3
Middle Income	65	16.3	48	12.0
Low Income	98	24.5	144	36.0
<b>Total</b>	<b>198</b>	<b>(49.5)</b>	<b>202</b>	<b>(50.5)</b>

**Source:** Field Survey (2020)

### 3.3 Parents' Income and Children Immunization Status

The statistics of parents' income and children immunization status are presented in Table 3.

The results show that 8.8% of the high-income class are fully immunized, 16% of the middle income class were fully vaccinated while 24.5% of the lower-income class are fully immunized. The results indicate a strong relationship between parents' income

### 3.3 Parents' Level of Education and Children Immunization Status

The statistics of parents' level of education and children immunization status are presented in Table 4.

**Table 4: Parents' Level of Education and Children Immunization Status**

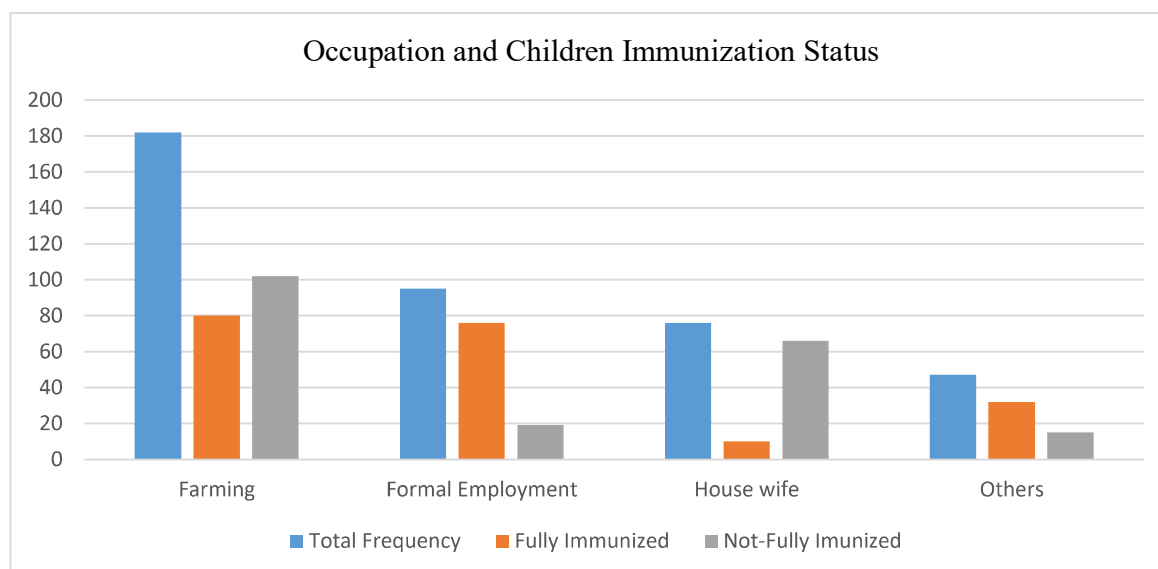
Level of Education	Father (n) (%)	Fully Immunized (n) (%)	Mother (n) (%)	Fully Immunized (n) (%)
None	148 (37.0)	76 (38.4)	158 (39.5)	94 (46.5)
Primary	63 (15.8)	22 (11.1)	90 (22.5)	10 ( 5.0)
Secondary	93 (23.2)	60 (30.3)	48 (12.0)	38 (18.8)
Tertiary	96 (24.0)	40 (20.2)	104 (26.0)	60 (29.7)
<b>Total</b>	<b>400 (100)</b>	<b>198 (100)</b>	<b>400 (100)</b>	<b>202 (100)</b>

*Source: Field Survey (2020)*

The results show that fathers and mothers with no formal education accounted for 37.0% and 39.5% respectively with 38.4 % and 46.5% of the children fully vaccinated. The result shows that fathers with tertiary level of education have 20% of the children fully immunized compared to mothers with

The results of parent's/caregivers' occupation and children immunization status are shown in Fig.2.

The result shows that 76 (38.4%) of the fully immunized children belonged to parents/caregivers' engaged in formal


**Figure 2: Parents Occupation and Children Immunization Status**

tertiary level of education with 30% fully immunized children. This is statistically related at  $CV = 15.240$  and  $P = 0.002$ ). The result agrees with findings which have found low immunization among children of mothers with no education (Rahman and Obaidah-Nasrin, 2010; Ilah, *et al.*, 2015; Oleribe, *et al.*, 2017).

### 3.4 Parents/Caregivers' Occupation and Children Immunization Status

employment. Housewives and those engaged in farming have 66 (32.7%) and 102 (51%) children who are not fully immunized. However, parents/caregivers' occupation was found to have no influence on children immunization status ( $CV=0.402$ ,  $P=0.236$ ).

## 5. CONCLUSION AND RECOMMENDATIONS

The study assessed factors influencing the utilization of immunization services in

Kontagora Local Government Area, Niger State. The results show that over 50% of the children were not-fully immunized. The results also show that children immunization status is influenced by parents/caregivers' income ( $CV=11.134$ ,  $P=0.000$ ) and level of education (at  $P=0.002$ ). However, parents/caregivers' occupation was found to have no influence on children immunization status. The study concludes that income and level of education significantly influenced the completion of required immunization schedules in the study area. Deriving from the findings of this study therefore, it is recommended that government promotes intensive community awareness programmes, enhance capacity training for PHC staff, institutionalize routine vaccination, restructure the existing policies and processes, provide health insurance policies aimed at reducing expenditure, improve vaccination uptake and monitoring to reduce childhood morbidity and mortality in Nigeria.

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