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Immunization Status of Under-5 Children in A Rural Community in Nigeria

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Abstract
Aim*: A survey was carried out to assess the immunization status of under-5 children in a rural community and its association with mother's educational status and age.*
Methods*: Trained personnel administered pre-tested questionnaires to the mothers of the selected children who met the inclusion criteria.*
Results*: Complete immunization rate is 72.2%, 83.3% for males; 69.5% for females. There is positive correlation between educational status of mothers and immunization of their children. Children of mothers aged less than 20 years of age and of those over 50 years of age have 100% vaccination rate for most of the vaccines but as low as 47.7% among children of mothers aged 20-50 years.*
The commonest reason for failure of mothers to immunize their children is mother's illness.
Conclusion*: complete immunization occurred more in boys than in Girls. Maternal age, education and illness affected immunization status of children.*
Keywords*:* ***Immunization, Children, Rural, Nigeria***
What is already known on this topic Under-5 mortality rate remains high especially in developing countries of the world 6 Immunization rate is low in Nigeria8 Improved immunization will reduce childhood morbidity and mortality 4,5
What this paper adds
Complete immunization rate in this rural community is 72.2% Age, education, and illness of mothers affect the rate of immunization in their children Mother's illness is the commonest reason for missed opportunity to immunize their children

I. Introduction

Immunization, a key component of child survival strategies, is among the most cost-effective public health tools for disease control worldwide. 1, 2,3 Successful immunization programme anywhere in the world is rewarded with reduction in childhood morbidity and mortality.4,5The impact is potentially more significant in developing countries because of higher population of under-5 children, high infectious disease burden and poor health infrastructure. Currently, in the developing world, immunization is estimated to prevent about 3 million childhood mortality yearly but if immunization programmes are strengthened, this number could increase to 5 million. 8 Sadly, it's in these same countries that the level of immunization coverage and therefore its impact on the health indices is abysmal.

Today, about 6.5 million under- 5 children die yearly; 2.5 million from vaccine preventable diseases. About half of these (3.2 million) are from sub-Saharan Africa. In Nigeria, the under-5 mortality rate is 124/1000 live births while over 827,000 children under 5 perish annually. 6 Twenty-two percent of these are due to vaccine preventable diseases.7

In Nigeria, 25% of children age 12-23 months are fully immunized with the highest of 62.4% in Imo state and the lowest of 1.4% in Sokoto state. 8 Thus, despite the massive potential benefits of immunization in Nigeria, many children are still un-immunized. It is in view of this that this community-based cross-sectional study was undertaken to determine the immunization status of under-5 children at Imala, a rural community in Ogun state.

II. Subjects And Methods

This was a cross-sectional study carried out at Imala in Abeokuta North Local Government area of Ogun state in April 2014. Approval of the Hospital Research Ethics committee was obtained for the study. Imala is a rural community with a total population of 19, 723. The number of children aged 0-59 months, constituting 25% of the total population was about 4,930.

The investigating team visited the traditional ruler of Imala who then invited all his Chiefs to the palace for briefing by the team leader. The traditional Chiefs were mandated to invite all women with at least one child under-5 years of age to the palace ground at an agreed date. Other traditional means of communication were also employed by the traditional ruler. Systematic random sampling method was employed whereby only odd numbered respondents were chosen. All the children of these women aged under-5 years were then recruited for the study until the minimum sample size was attained. The 28-item pre-tested questionnaires were then administered by research assistants who had been properly trained before commencing the study.

III. Results

A total of 312 children were recruited into the study. The socio-demographic characteristics of the respondents are represented in table I.

Table 1: Demographic characteristics of the respondents

Variable	Frequency(N=312)	Percentage (%)
Sex		
Male	174	55.8
Female	138	44.2
Fathers occupation		
Technicians, skilled artisans etc	126	40.4
Unskilled workers	186	59.6
Mother's Education		
University	18	5.8
Secondary or tertiary	132	42.3
Primary or None	162	51.9
Mother's age		
<20	18	5.8
20-29	156	50.0
30-39	96	30.8
40-49	30	9.6
50-59	12	3.8
Socio-economic Status		
Middle	84	26.9
Lower	228	73.1

Uptake Of Vaccines

There was a relatively high uptake of all the vaccines administered at birth: BCG and OPV0 94.2%; Hepatitis B vaccine 92.3%. The uptake progressively decreased with age: OPV1 -88.5%; OPV2 – 84.6% and OPV3 -76.9%. Measles and yellow fever vaccines had uptakes of 55.1% and 51.95% respectively. This trend is illustrated in figure1

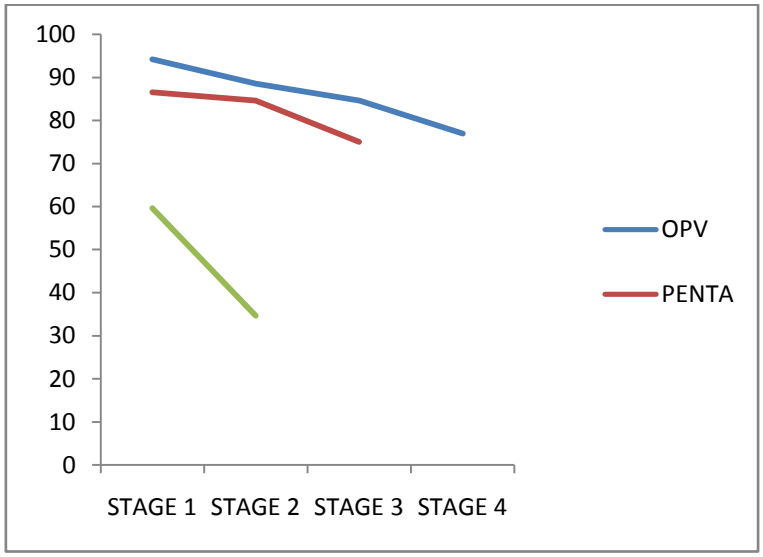

Fig1

Mother's Educational Status

As illustrated in the table II the uptake of all the vaccines increased with the mother's educational status. In the case of oral polio vaccine 150 (92.6%) of children who got the vaccine had mothers with only primary or no education, 126 (95.5%) of children who got the vaccine had mothers with up to secondary

education only while 18 (100%) of children who got the vaccine had mothers with tertiary education. The difference was however not statistically significant.The difference in uptake of immunization with other antigens by the children were also not significant across the various educational levels of the mothers, However, a significant difference was noticed for Vitamin A. The uptake of the first dose of vitamin A was 65% by children of mothers with primary education, 80% by children of mothers with secondary education and 92.3% by children of mothers with tertiary education. For the second dose of vitamin A the figures were 49.5%, 50.8% and 75% respectively.

Table2 Uptake of vaccines and mother's education

Vaccine	Mother's Education		
	Primary N(%)	Secondary N(%)	Tertiary N(%)
Topv0			
Given	150(92.6)	126(95.5)	18(100.0)
Not Given	12(7.4)	6(4.5)	0(0.0)
Total	162(100.0)	132(100.0)	18(100.0)
Bcg Vaccine			
Given	150(92.6)	126(95.5)	18(100.0)
Not Given	12(7.4)	6(4.5)	0(0.0)
Total	162(100.0)	132(100.0)	18(100.0)
Measles			
Given	66(73.3)	90(83.3)	6(100.0)
Not Given	24(26.7)	18(16.7)	0(0.0)
Total	90(100.0)	108(100.0)	6(100.0)
Penta3			
Given	120(76.9)	102(81.0)	12(100.0)
Not Given	36(23.1)	24(19.0)	0(0.0)
Total	156(100.0)	126(100.0)	12(100.0)
Vitamina2			
Given	48(49.5)	54(50.5)	6(75.0)*
Not Given	49(50.5)	53(49.5)	2(25.0)
Total	97(100.0)	107(100.0)	8(100.0)

Values with superscript * are significantly different in a row

Mother's Age

The uptake was generally higher (100%) for children whose mothers are less than 20 years old and children whose mothers are over 40 years old but much lower for mothers aged 20-49 years (72%-83%). The figures were much higher for first and second doses of vitamin A.

Table3 Uptake of vaccines and mother's age

Vaccine	Mother's Age (Years)				
	<20 N(%)	20-29 N(%)	30-39 N(%)	40-49 N(%)	50-59 N(%)
Opv0					
Given	18(100.0)	144(92.3)	90(93.8)	30(100.0)	12(100.0)
Not Given	0(0.0)	12(7.7)	6(6.2)	0(0.0)	0(0.0)
Total	18(100.0)	156(100.0)	96(100.0)	30(100.0)	12(100.0)
Bcg Vaccine					
Given	18(100.0)	144(92.3)	90(93.8)	30(100.0)	12(100.0)
Not Given	0(0.0)	12(7.7)	6(6.2)	0(0.0)	0(0.0)
Total	18(100.0)	156(100.0)	96(100.0)	30(100.0)	12(100.0)
Measles					
Given	12(100.0)	72(80.0)	48(72.7)	12(100.0)	12(100.0)
Not Given	0(0.0)	18(20.0)	18(27.3)	0(0.0)	0(0.0)
Total	12(100.0)	90(100.0)	66(100.0)	12(100.0)	12(100.0)
Penta3					
Given	18(100.0)	114(79.2)	72(80.0)	18(60.0)	12(100.0)*
Not Given	0(0.0)	30(20.8)	18(20.0)	12(40.0)	0(0.0)
Total	18(100.0)	144(100.0)	90(100.0)	30(100.0)	12(100.0)
Vitamina2					
Given	6(70.5)	48(47.5)	24(36.4)	18(72.0)	12(100.0)
Not Given	2(25.0)	53(52.5)	42(63.6)	7(28.0)	0(0.0)
Total	8(100.0)	101(100.0)	66(100.0)	25(100.0)	12(100.0)

Values with superscript * are significantly different in a row

Reasons For Failure To Immunize

One hundred and two doses of vaccines were missed due to mothers' illness while 60 doses were missed as a result of fear of reactions. The third commonest reason was that mothers claimed they were unaware of the need to return for immunizations. Thirty doses were missed because vaccines were postponed till another time by health workers. Thirty doses were missed because the vaccines were not available while 18 doses were missed because the mothers were too busy. No mother claimed to be unaware of the need for immunization.

Table4 Reasons for failure to immunize

Responses given by respondents	Different Immunization Types									
	OPV_0	HBV	BCG VACCINE	OPV_1	$PENTA_1$	OPV_2	$PENTA_2$	OPV_3	MEASLES	YELLOW FEVER
Fear of Reactions	6(33.3)	6(25.0)	6(25.0)	6(16.7)	6(16.7)	6(12.5)	6(12.5)	6(8.3)	6(4.0)	6(4.0)
Illness of mother	12(66.7)	6(25.0)	6(25.0)	6(16.7)	12(33.3)	12(25.0)	12(25.0)	12(16.7)	12(8.0)	12(8.0)
Unaware of the need to return		6(25.0)	6(25.0)	6(16.7)	6(16.7)	6(12.5)	6(12.5)	6(8.3)	6(4.0)	6(4.0)
Mother too busy		6(25.0)	6(25.0)	6(16.7)						
Not due				12(33.3)	12(33.3)	18(37.5)	18(37.5)	18(25.0)	108(72.0)	108(72.0)
Postponed till another time						6(12.5)	6(12.5)	18(25.0)		
Not available								6(8.3)	12(8.0)	12(8.0)
Illness of Child								6(8.3)	6(4.0)	6(4.0)
Unaware of the need for immunization										
Total	18	24	24	36	36	48	48	72	150	150

IV. Discussion

Immunization rate in Nigeria has remained unacceptably low. According to the National Demographic and Health survey (NDHS) 2013, 25% of Nigerian children are fully vaccinated with BCG, measles and the three doses of DPT/pentavalent and polio vaccines with a range of 1.4% in Sokoto and 62.4% in Imo state. Complete vaccination rate was 24.4% in Ogun state. Urban dwellers have a basic vaccination rate of 42.6% while rural dwellers have a vaccination rate of 15.8%. The current study shows a complete vaccination rate of 72.2% This was in agreement with Adeyinka et al who found a vaccination rate of 76.9% in Igbo-Ora, Oyo state.9 In Chandigarh, India, complete vaccination rate is 86.4% as documented by Goel et al. 10 In the current study, the vaccination rate for polio vaccine is over 90% while that of pentavalent vaccine/DPT is 75-92.3%; vaccination rate for measles vaccines is 55% while yellow fever vaccination rate 51.9%. The vaccination rate in the current study is quite high compared to the rate in the NDHS but is comparable to the rate obtained by Adeyinka in Nigeria and Goel et al in India.

Mother's Educational Status

This current study shows a positive relationship between educational status of mothers and immunization of their children. Though not significant for the antigens, it was quite significant for the two doses of vitamin A. This might be because vitamin A is not considered important by less educated mothers. Itimi et al working in a rural community in Bayelsa state found out that for no clear reason, vaccination rate in better educated urban community was much lower than in the rural community ($p<0.001$)11

Mother's Age

This study shows a significant relationship between mother's age and immunization of their children. The very young mothers less than 20 years of age tend to have 100% vaccination rate for most of the vaccines; this equally applies to older mothers who are 50 years of age. The vaccination rate however could be as low as 47.7% in children of mothers aged between 20-50 years of age. The difference is not statistically significant except for vitamin A1, OPV2, penta2, and penta3. The reason for this is not obvious. This is similar to what Ibnouf et al found in Sudan where children of older mothers were correctly vaccinated more than the children of younger mothers (82.6% versus 68.6%).12

Reasons For Failure To Immunize

This study shows that the commonest reason given by mothers for failure to vaccinate their children was mother's illness. In the earlier cited study carried out in Igbo-Ora, Adeyinka et al documented that the commonest reason for failure to immunize is long waiting queues (46.1%) followed by payment in private clinics (20.2%) and distance (17.7%).

V. Conclusionc

omplete immunization rate observed in this study is commendable, however maternal age, educational status and illness were shown to affect immunization uptake in this rural community.

References

[1]. Armstrong EP. Economic benefits and costs associated with target vaccination. *J Manag Care Pharm* 2007; 13:12-15.
[2]. Gains S. Vaccination is the best protection. AAP healthy children's magazine 2009;05-11
[3]. World Health Organization. Challenges in global immunization and its global immunization vision and strategy 2006-2015.Weekly Epidemiol Rec 2006; 19: 190-04
[4]. Otten M, Kezaala R, Fall A, Masresha B, Matin R, Cairris L, et al. Public health impact of accelerated measles control in the WHO African Region. Lancet 2005; 369:833-39
[5]. Breiman RF, Streatfield PK, Phelan M, Shifa N, Rasid M, Yunus M. Effect of infant immunization on childhood mortality in rural Bangladesh: Analysis of health and demographic surveillance data. Lancet 2004; 364: 2204-11
[6]. UNICEF. The state of the world's children.UNICEF publication. Oxford University press 2013:
[7]. National population Commission, Nigeria. National Demographic Health survey 2013.
[8]. 8.United States Agency for International development. Immunization programmes for healthy children. Immunization basics.
[9]. Goel N, Abrol A, Pathak R, Sharwa M, Gulati S, Swami H. Status of routine immunization in Chindigarh, India. Int J health 2007; 7:34-38.
[10]. Adeyinka D, Oladimeji O, Adeyinka F, Aiinakhu C. Uptake of childhood immunization among mothers of under-five in south western Nigeria. Int J Epidemiol 2008; 28:32-39
[11]. Itimi K, Dienye PO Ordinioha B. Community participation and childhood immunization coverage. A comparative study of rural and urban communities of Bayelsa state, South-South Nigeria.Niger med J 2012; 53: 21-25
[12]. Ibnouf AH, Van den Borne HW, Maarse JAM. Factors influencing immunization coverage among children under five years of age In Khartoum, Sudan.SA FamPract ; 2007; 49:14-20