Original Article

Immunization Coverage of the Under-5 Children in Akure North Local Government Area of Ondo State

Rosena Olubanke Oluwafemi[1]* and Femi Peter Adesina[2]

[1]Department of Paediatrics, Mother and Child Hospital, Akure, Ondo State, Nigeria; [2]Department of Biology, Federal University of Technology, Akure, Ondo State, Nigeria

Corresponding author:
Rosena Olubanke Oluwafemi,
Department of Paediatrics,
Mother and Child Hospital,
Akure, Ondo State, Nigeria,
Tel: +2348034101163
E-mail: bankyfem@yahoo.com

Abstract

Background: Immunization coverage is one of the indicators used to monitor progress towards achieving child survival and the strategy to reduce child morbidity and mortality. Vaccine-preventable diseases (VPDs) are the major causes of these morbidity and mortality in the resource-poor countries, yet many factors were associated with the achievement of national antigen cumulative coverage desired in Nigeria. The aim of the study is to assess the immunization coverage of under-5 children in Akure North Local Government Area of Ondo State. **Method:** Community based descriptive cross sectional study was done among 560 mother-child pair selected using multistage sampling method. Research instrument was interviewer-administered questionnaire, and data were analyzed using the STATA software. **Results:** The under-5 immunization coverage in the current study is 94.6%. The figure is higher than the National figure of 25%, though lower than figures from similar other developing nations. Dropout rate of BCG/DPT1 was 7.3%, DPT1/DPT3 (31.3%) and DPT3/Measles (35.8%). Majority of the subject studied rated immunization staff to be friendly. Nevertheless, there was significant difference in staff attitude between the communities studied ($p<0.05$). **Conclusion:** Immunization coverage for children under-5 in Akure North Local Government Area of Ondo State is high and compares favourably with findings from other parts of the country.

Keywords: Immunization coverage; Under-5 children; Vaccine Preventable disease; Akure North LGA

Introduction

Immunization coverage is one of the indicators used to monitor progress towards achieving child survival and the strategy to reduce childhood morbidity and mortality. [1] It is the process of inducing immunologic defence against infectious micro-organisms without significant risk to the recipient. It can also prevent infectious diseases in an individual, restrict the spread of diseases in the community (by herd immunity) and may ultimately eradicate the disease. [2]

The standard measure of vaccination coverage is the percentage of children who have received the requisite number of vaccine doses irrespective of the age at receipt of the vaccine. However, to have maximal protection against a VPD, a child should receive all immunizations within recommended intervals, thus a coverage rate of 95% is necessary for the sustained control of these VPDs. [3] The World Health Organization (WHO), United Nations Children's Fund (UNICEF), and National Programme on Immunization (NPI) guidelines stipulate that a child should receive four doses of Oral Polio Vaccine (OPV), three doses of Hepatitis B Vaccine, three doses of Diphtheria, Pertussis and Tetanus (DPT) / Pentavalent vaccines and one dose each of Bacille Calmette Guerin (BCG), measles and yellow fever vaccines. This is usually cost-effective in reducing morbidity and mortality rates from VPDs. [4]

While immunization coverage in Nigeria increased from 12.9% in 2003 to 16.4% in 2007 and 22.7% in 2008, the coverage in the more recent times is quite encouraging. The coverage has more than tripled ever since 2008. [5] However, there is need for caution, because pockets of susceptibility may act as potential reservoirs of infection as well as the general attitude of the people in terms of late presentation to the health facilities for treatment. Some local studies cited that some children are still never immunized despite high coverage in several places. The States of Bayelsa, Delta, Akwa-Ibom, Abia and Rivers in Nigeria have 13.2%, 39%, 3.5%, 4.8% and 2.2% of their infants respectively who were never immunized. [5]

In areas where immunization is still a big problem, VPDs are a major contributor to childhood morbidity and mortality and this does not exclude Sub-Saharan Africa and Nigeria in particular. [6] VPDs accounts for 17% of global total under-five mortality per year. In Nigeria, VPDs were responsible for 22% of child mortality amounting to over 200,000 deaths per year. [7,8]

Several studies on immunization coverage were health facility based. Community evaluation of immunization coverage provides true evidence whether substantial progress towards achieving vaccination targets is being made, as well as true

How to Cite this Article: Oluwafemi RO, Adesina FP Immunization Coverage of the Under-5 Children in Akure North Local Government Area of Ondo State. Ann Med Health Sci Res. 2019;9: 519- 523

Table 1: Socio-demographics.

Variables	Iju (%)	Ogbese (%)	Total (%)
Sex			
Male	133 (46.7)	152 (53.3)	285 (50.89)
Female	147 (53.5)	128 (46.5)	275 (49.11)
Age (years)			
Less than 2 years	128 (58.7)	90 (41.3)	218 (38.93)
2 years and above	152 (44.4)	190 (55.6)	342 (61.07)
Tribe			
Yoruba	239 (57.5)	177 (42.5)	416 (74.29)
Hausa	5 (41.7)	7 (58.3)	12 (2.14)
Igbo	24 (29.6)	57 (70.4)	81 (14.46)
Others	12 (23.5)	39 (76.5)	51 (9.11)
Religion			
Christianity	250 (50.1)	249 (49.9)	499 (89.11)
Islamic	29 (48.3)	31 (51.7)	60 (10.71)
Traditional	1 (100.0)	0 (0.0)	1 (0.18)
Mother's level of education			
Primary	53 (31.4)	116 (68.6)	169 (30.18)
Secondary	139 (54.3)	117 (45.7)	256 (45.71)
Tertiary	87 (68.5)	40 (31.5)	127 (22.68)
None	1 (12.5)	7 (87.5)	8 (1.43)

Table 2: Determinant of immunization in the community.

Variables		Iju	Ogbese	χ^2	P - value
Mother's parity	primigravida	38 (13.6%)	30 (10.7%)	15.78	0.001
	Multigravida	146 (52.1%)	191 (68.2%)		
	Grand multigravida	96 (34.3%)	59 (21.1%)		
Child socio economic class	Low	56 (20.0%)	54 (19.3%)	1.25	0.54
	Middle	78 (27.9%)	90 (32.1%)		
	Upper	146 (52.1%)	136 (48.6%)		
Source of information	Others	85 (30.4%)	133 (47.5%)	17.31	0.001
	Antenatal	195 (69.6%)	147 (52.5%)		

$\chi^{\wedge 2}$ - Chi-square Value, P – Significant value

Table 3: Patients' perception of the immunization staff.

	Iju town		Ogbese town		
Variables	**Frequency (n=280)**	**Percentage (%)**	**Frequency (n=280)**	**Percentage (%)**	**p value**
How will you rate the hospital staff?					
Friendly	244	87.15	219	78.22	0.015*
Unfriendly	2	0.71	3	1.07	
Bad	2	0.71	2	0.71	
Good	30	10.72	56	20	
Don't know	2	0.71	0	0.0	
The attitude of the staff is?					
Encouraging	257	91.79	237	84.64	0.038*
Discouraging	2	0.71	6	2.14	
Committed	21	7.5	34	12.15	
Not committed	0	0.0	2	0.71	
Others	0	0.0	1	0.36	
Environment of the clinic					
Good	182	65.0	181	64.64	0.611
Relaxing/Conductive	19	6.79	14	5.0	
Clean enough	76	27.14	79	28.22	
Manageable	3	1.07	6	2.14	
The clinic is…..					
Far from town	57	20.36	70	25.0	0.15
Within reach	223	79.64	210	75.0	
Staff commitment					
Too much delay	28	10.0	35	12.5	0.381
Can do better	78	27.86	88	31.43	
Prompt services	174	62.14	157	56.07	

**Likelihood ratio; *Fisher's exact test

correlation of morbidity and mortality from vaccine preventable diseases. Such study will inform planners and policy makers on strategic changes required to achieve the desired National antigen cumulative coverage. The study therefore set out to assess the immunization coverage of the children under-5 in Akure North Local Government Area of Ondo State, Nigeria.

Materials and Methods

Study area

The study was conducted in the Akure North Local Government Area (ANLGA) of Ondo State in January 2016. It has a population of 171,450 based on a 2016 projection of the 2006 Nigerian national population. ANLGA is one of the 18 Local Government Areas that constitute the State. It is divided into 12 administrative wards namely: Ayetoro, Igbatoro, Ilu-Abo, Isimaja, Moferere, Oba-Ile, Odo-Oja, Ogbese, Oke-Afa, Oke-Iju, Oke-Ore and Osi-Igoba. Vaccination roles are being played by multiple stakeholders including Governments, development partners and the NGO; with Primary Health Care centres assuming implementation roles. Study design was community-based, descriptive and cross-sectional.

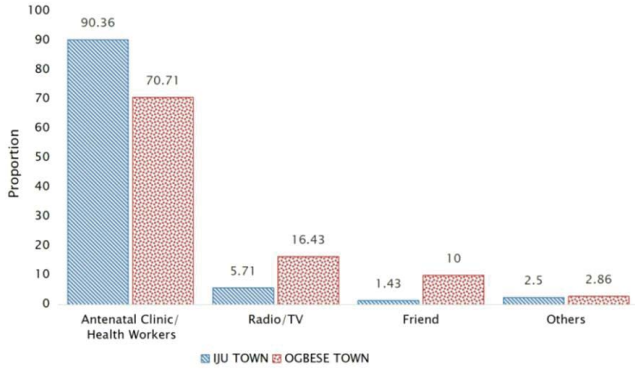


Figure 1: Sources of immunization information for Iju and Ogbese town.

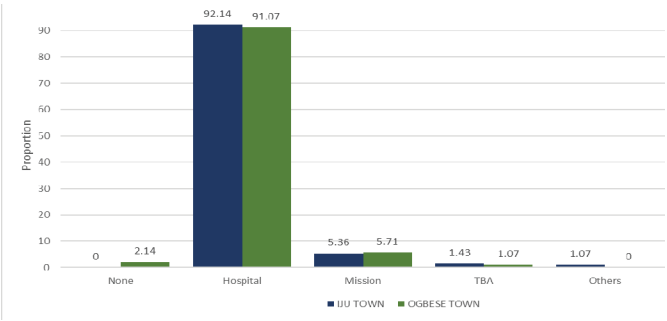
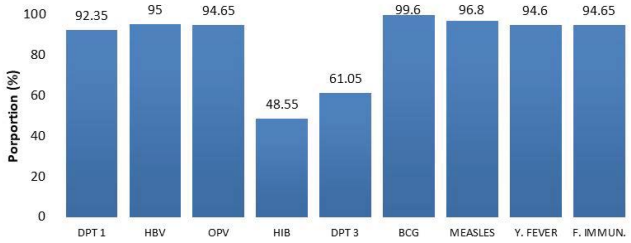


Figure 2: Place of Antenatal care for Iju and Ogbese towns. TBA (Traditional Birth Attendant).



Note: Y. Fever = Yellow Fever; F. Immun. = Fully Immunized

Figure 3: Immunization coverage for children in Iju and Ogbese by show of immunization cards.

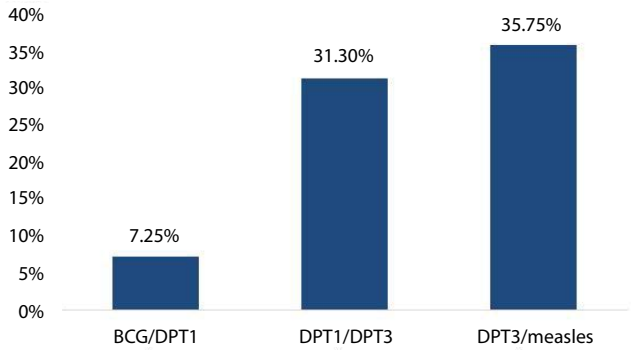


Figure 4: Dropout rate.

Study population

Consisted of eligible mothers and children resident in Akure North LGA. The study subjects included care-giver/mother-children pairs in which the children are aged one to five years living in the houses selected for the study.

Inclusion criteria

These included (1) consenting care-giver/mother-children pair and (2) respondents resident in the study location.

Exclusion criteria

These included (1) respondents who have lived in the catchment area for less than six months and (2) mothers whose children are less than one year or greater than five years of age.

Sampling size estimation

Using the modified Leslie Fisher's formular for the calculation of sample size for population less than 10,000, and National Demographic Health Survey, 2013 (NDHS) immunization coverage, a sample size of 255 was obtained. This was raised to 280 to allow for cases of non-response. The estimated sample size of 280 was made to apply to each of the two communities, giving a total figure of 560.

Sampling method

A multi stage sampling method was employed in sample selection. In Stage I, two community wards (Ogbese and Oke-Iju) were selected from the 12 using simple random sampling employing simple balloting. These two communities have human populations of 25,797 and 10,806 respectively. There were about 2,150 houses in Ogbese while 600 houses were in Oke-Iju. The population for children aged 1-5 years in Ogbese and Oke-Iju were 4,863 and 2,037 respectively.

In Stage 2 and using the National Population Census (NPC) enumeration areas (EAs) as the stratifying factor, six EAs were selected using stratified random sampling technique. In Stage III and in an EA, a systematic random sampling technique (following the listing of the sampling frame) in which one- in-seven (for Ogbese) and one- in- -two houses (for Oke-Iju) was employed to accommodate the population difference.

Research instruments and data collection

A semi-structured interviewer-administered questionnaire meant to elicit socio-demographic information of mother, knowledge of vaccination schedule, knowledge about vaccine preventable

diseases and historical recall of vaccines received by the child was used.

Ethical clearance

To conduct this study was obtained from the Obafemi Awolowo University Research and Ethics committee. Written informed consent was obtained from the mothers.

Data analysis

Data collected with the questionnaires were checked for errors, entered into the computer and analyzed using SPSS version 21 (Chicago Il, USA). Dropout rate which is the percentage of the children dropping out from those who started immunization were calculated. Confidence limit for the study was set at 95%: thus significance level was set at $p < 0.05$.

Results

The total number of mother-child pairs recruited for the study was 560, with equal numbers (280) from each of the two Wards [Table 1]. Altogether, there were 285 (50.89%) males and 275 (49.11%) females. Majority of the study subjects 416 (74.3%) were of Yoruba tribe while more than two-third were Christians 499 (89.1%).

Figure 1 shows that 90.3% of the respondents from Iju and 70.7% from Ogbese got their information about immunization from the hospital source (through antenatal clinics and health workers) and Figure 2 shows that more than 90% of all the mothers in both communities had antenatal care in the hospitals.

Figure 3 shows the immunization coverage for Iju and Ogbese. There was high immunization coverage for the various vaccines in both communities except HIB and pentavalent vaccines. Meanwhile, 94.6% of the children had full immunization in both communities altogether. Figure 4 shows the dropout rate. BCG/DPT1 was 7.3%, DPT1/DPT3 was 31.3% and DPT3/Measles was 35.8%.

Immunization uptake among mother's parity was significantly different (15.78; $p < 0.05$) between the two communities likewise in the source of information [Table 2]. Meanwhile, child socio economic class was not significant determinant (17.31; $p < 0.05$) of immunization coverage between the two communities.

The patient perception on the immunization staff was shown in Table 3. Majority of the subject studied rated immunization staff to be friendly. Nevertheless, there was significant difference ($p < 0.05$) in staff relationship with the patient between the towns studied. Likewise, there was significant difference ($p < 0.05$) in attitude of staff between the towns, 6 (2.14%) subject studied from Ogbese and 2 (0.71%) from Iju rated the attitude of the staff to be discouraging. Only 2 (0.71%) of subject studied from Ogbese reported that the staff were not committed. The perception of the subject studied on the environment and distance of the clinic from Ogbese was not significantly different ($p > 0.05$) from Iju. More than half; 174 (62.14%) and 157(56.07%) of subject studied from Iju and Ogbese respectively) identified prompt service delivery by the immunization staff.

Discussion

The immunization coverage in this current study was 94.6% and it was higher than the figures recorded from other parts of Nigeria, like 72.2% in imala, Ogun Sate, [9] 76.9% in Igbo-Ora, Oyo state, [10] 47.2% in Ondo State, 62.4% in Imo State, 1.4% in Sokoto State and the national figure of 25%. [11] Other countries like Ghana (70%), Sudan (75.1%) Ibnouf et al., [12] USA (86-90%) USAID, [13] Pakistan (71.9%) Shaikh et al. [14] and India (39%) Banerjee et al., [15] UK (99.5%) and South Africa (90.4%) had been also reported.

The coverage for the individual antigen in this current study is high except for HIB and DPT3. These high levels of coverage of the rest of the vaccines may be attributable to the quality of information provided to mothers at the health facilities, the more frequent use of local Polio Immunization Days (LIDs), Immunization Plus Days, mop ups and other vaccination campaigns to pre-empt or respond to disease outbreak. The mothers are given moral support in form of gifts (mosquito nets, vests, kegs, water guards and celebrations) when they endeavour to complete their children's immunization schedules; which is called "Moyege" in the local language meaning "I am free." NDHS [11] reported 62.3% for BCG in Nasarawa, 60.1% for DPT1 and 34.1% for DPT3. There is however a dropout rate of 7.25% for BCG/DPT1, 31.3% for DPT1/DPT3 and 35.75% for DPT3/Measles. The dropout rates in this study was higher than dropout rate of DPT3/Measles (1.8%) recorded by Datta et al., [16] DPT1/DPT3 of 13.4% [17] and 0.0%. [18]

Lower socio-economic class mother were likely to be less informed about immunization has revealed in the present study. This was in supported by Mosiur and Sarker [19] that rich family will be more likely vaccinate their children than poor family. It was also revealed in this study that multigravidas are more like to have good knowledge about vaccination than primigravidas. Source of information mentioned by most of the mothers was antenatal and this due to the fact that almost the entire mother attends antenatal care in the hospital, not elsewhere.

More than three-quarter of mother in these communities acknowledged that the clinic is very close to their residence and also that the staff are prompt in service delivery. Nevertheless, far distances to clinic and staff attitude are still challenging immunization coverage as mentioned by a few of the mothers. According to Ibnouf et al., [12] distance of walking from the residence to the clinic for the accessibility of vaccination is one of the principal factors affecting immunization status.

In the communities studied, mothers from Iju have more knowledge about vaccination than mothers from Ogbese. This is more likely to literate level, some mothers have no education and many of them were of primary education in Ogbese community. Educational levels also determine mother's perception and knowledge in taking vaccination for their children [20-22] while the findings of Omole and Owodunni, [23] and Tagbo et al. [24] were not in agreement with this.

Conclusion

Despite the fact that immunization coverage of the children under 5 was high in AKNLGA, Ondo State must work harder

to keep up the high figures they have and also improve on the few lapses on the parts of some of the inhabitants who need more information and community mobilization to comply with the immunization schedule at all levels.

Conflict of Interest

The authors disclose that they have no conflicts of interest.

References

1. Pavlopoulou ID, Michail KA, Samoli E, Tsiftis G, Tsoumakas K. Immunization coverage and predictive factors for complete and age-appropriate vaccination among preschoolers in Athens, Greece: a cross- sectional study. BMC Public Health, 2013;13:908.
2. Edna I. Vaccines and Immunization, in Azubuike JC, Nkaginieme KEO (editors), Paediatrics and Child Health in a tropical region 2nd ed. (African Educational Services, Nigeria) 2007;28-30.
3. Glenda LL, Brynley CM, Peter BM. Reasons for Incomplete Immunization among Australian Children. Australian Family Physician, 2004;33:13-19.
4. World Health Organisation. Expanded programme on Immunization: Imaginative ways of raising immunization coverage, 1997.
5. Nigeria Demographic and Health Survey. National Population Commission (Nigeria) and ORC Macro. Calverton, Maryland: USAID; 2008;20-22.
6. Health Reform Foundation of Nigeria. Nigerian Health Review, 2006;48-49.
7. Federal Office of Statistics and UNICEF. The progress of Nigerian children. African Book Builders Ltd, Ibadan, 1997.
8. World Health Organisation. Immunization surveillance, assessment and monitoring: vaccine preventable diseases, 2008.
9. Adediran AS, Nnamdi BO, Virginia OG, Ezeanosike O, Onyinye UA. Immunization Status of Under-5 Children in a Rural Community in Nigeria. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), 2017;16:126-130.
10. Adeyinka D, Oladimeji O, Adeyinka F, Aiinakhu C. Uptake of childhood immunization among mothers of under-five in south western Nigeria. International Journal of Epidemiology 2008;28:32-39.
11. National Demographic Health survey. National population Commission, Nigeria, 2013.
12. Ibnouf AH, Van den Borne HW, Maarse JAM. Factors influencing immunisation coverage among children under five years of age in Khartoum State, Sudan. South African Family Practice 2007;49:14-14f.
13. United States Agency for International Development (USAID) for Africa. Immunization Basics. Strengthening routine immunization services and sustainable financing for immunization 2009.
14. Shaikh S, Taj T, Kazi A, Ahmed J, Fatmi Z. Coverage and predictors of vaccination among children of 1–4 years of age in a rural sub-district of Sindh. J Coll Physicians Surg Pak. 2010;20:806-810.
15. Banerjee A, Duflo E, Glennerster R, Kothari D. Improving immunisation coverage in rural India: clustered randomised controlled evaluation of immunisation campaigns with and without incentives. BMJ 2007;340.
16. Datta A, Mog C, Das S, Datta S. A cross-sectional study to assess the immunization coverage and vaccine dropout rates among 12 to 23 months old children in a rural area of Tripura. International Journal of Medical Science and Public Health 2016;6:1-6.
17. Fatiregun AA, Alonge TO, Rukewe A, Etukiren E, Chidinma U, Adejugbagbe AM. An assessment report on an immunization clinic located in a tertiary institution in Ibadan. Niger J Paed. 2014;41:163-169.
18. Fajola AO, Ekanem EE, Ande BA, Usman RS, Umejiego CN. Immunization Completion Rates in a Cottage Hospital in the Niger Delta Area of Nigeria. Annals of Medical and Health Sciences Research 2018;8:51-53.
19. Mosiur R, Sarker, O. Factors affecting acceptance of complete immunization coverage of children under five years in rural Bangladesh. Salud Publ Mex. 2010;52:134-140.
20. Odunsanya OO, Alufohai JF Maurice FT. Short-time evaluation of rural immunization program in Nigeria, Journal of Nigerian Medical Association, 2003;95:175-179.
21. World Health Organization. Pocket Book of Hospital Care for Children, 2005.
22. Obiajunwa PO Olaogun AA. Childhood Immunization Coverage in South West Nigeria. Sudanese Journal of Public Health 2013;8:92-96.
23. Omole MK, Owodunni KO. Mothers" Knowledge of immunization programme and factors influencing their compliance at a children hospital in south West Nigeria. Journal of Pharmaceutical and Biomedical Sciences 2012;21:1-4.
24. Tagbo B, Uleanya N, Nwokoye I, Eze J, Omotowo I. Mothers' knowledge, perception and practice of childhood immunization in Enugu. Nigerian J Paediatrics 2012;39:90-96.