

**INFANT IMMUNIZATION COVERAGE IN DIFFICULT-TO-REACH
AREA OF LAGOS METROPOLIS****¹Adeiga, A., ²Omilabu, S. A., ¹Audu, R. A., ³Sanni, F., ³Lakehinde, G. P.,
¹Balogun, O., ¹Olagbaju, O.****¹Nigerian Institute of Medical Research, PMB 2013, Yaba, Lagos, Nigeria
²College of Medicine, University of Lagos, Idi-Araba, Lagos, Nigeria
³Lagos Mainland Local Government, Ebute-Metta, Lagos, Nigeria**

Correspondence to: Dr. Adesina Adeiga

A retrospective survey of infant immunization coverage was conducted among 210 children aged 12 to 23 months in difficult-to-reach coastal suburb of Lagos, Nigeria. This was to assess immunization coverage for BCG, DPT, OPV and measles vaccination and to investigate reasons for failure to be immunized and evaluate the drop out rate as well as missed opportunities. An EPI cluster method was used. Questionnaires were administered with WHO cluster form for infant immunization. Recall history and card records of immunization were the tools used. The result showed that 82 (39%) of the 210 children assessed were not immunized, 84 (40%) were partially immunized and only 44 (21%) were fully immunized. At one year of age, only 21 (10%) of the children completed their immunization. Observation of the follow up of vaccination showed that 65.5% of 127 children who started BCG vaccination dropped out as at the time of receiving measles vaccination. Reasons advanced for failure to immunize or complete immunization of the children included obstacles in 47.7%, lack of information 40.7% and lack of motivation in 11.6%. These factors contributed to missed opportunities. Only 9 (11%) of 82 children not vaccinated against measles attributed non vaccination to illnesses. Lack of health facilities and the terrain that is difficult to reach contributed to low coverage. Also, low literacy level, poor maternal health education, poor socioeconomic status and poor advocacy to community leaders and lack of commitment of health workers contributed to low coverage. For immunization coverage to improve in this area, these factors must be addressed

Keywords: infant, immunization, coverage, antigens, advocacy

INTRODUCTION

Immunization has been reported to be cost effective in reducing vaccine preventable childhood diseases (1). To achieve this, there must be high immunization coverage. Reports have shown that improved immunization coverage has promoted child health, reduced childhood diseases and death (2, 3).

Unfortunately, most reports of immunization coverage were low. Many factors have been identified to be impeding immunization. These include poor knowledge of immunization, lack of suitable venues, long waiting, transportation difficulties, non-medical facilities and poor motivation (1, 4, 5).

Apart from the social problems, the terrain of the environment has been reported to affect immunization coverage, especially where the terrain is difficult to reach (6). The poor knowledge of child immunization has caused missed opportunities in some communities. This has been found to cause a low coverage (7-

9). The consequences of this low immunization coverage is the resurgence of diseases such as measles, tuberculosis and poliomyelitis (1, 6, 10).

Pedro village is a suburb coastal area of Lagos metropolis with a population of about 44, 000 people. The area is water terrain and difficult to reach. High morbidity (though low mortality) of measles in the village informed the need to assess the immunization coverage for all antigens of the children between the ages 12 and 23 months in the area.

The objectives of this study include; estimating coverage for Bacillus Calmette Guerin (BCG), Diphteria-Pertussis-Tetanus (DPT) and Measles antigens; determining the number of children fully immunized by one year of age; investigating reasons for failure to complete immunization; evaluating drop-out rate for antigens DPT 1-3 and OPV 1-3 and assessing missed opportunities.

MATERIALS AND METHOD

Study location

The study location, Pedro village, is a coastal suburb of Lagos metropolis. A major part of the village is water terrain that is accessible only by canoe and the remaining part is swampy land area that is accessible only by foot in summer. The people of the village are mostly fishermen. There is neither health facility nor any other infrastructural facilities such as piped borne water or electricity in the village. Due to the absence of health facility, a church yard is used as immunization centre.

Study design

The study was randomized using the standard Expanded Programme on Immunization (EPI) cluster method (11). With a random number and a sampling interval, housing units in a cluster were identified from which 7 children were evaluated for immunization coverage. The inclusion criteria are children 12 to 23 months of age and mothers who are able to confirm the date of child's birth and recall child's immunization history or produce child's immunization card. Thirty clusters of the community were evaluated and a total of 210 children were selected for the study.

Ethical issue

The concept of the study was explained to mothers of the children studied and only consenting mothers gave required information regarding children immunization. Ethical committee of Nigerian Institute of Medical Research gave consent for the study.

Information on immunization status

The mothers were interviewed by members of the investigating team comprised of nurses, social health workers and physicians using the WHO cluster form for infant immunization. The questionnaire was designed

to contain information on immunization status and dates of receiving BCG, DPT, OPV and measles vaccines. Recall history of immunization by mothers and review of immunization cards were used as tools of assessment. The parents were asked the reasons for failing to immunize or complete immunization of their children.

Defined status of immunization

Children were defined as "not immunized" if at the time of interview, they have not received any vaccine dose. They were "fully immunized" if they receive BCG at birth, with DPT/OPV after receiving at least three doses of the vaccines and "fully immunized against measles" if they receive one dose of measles at 9 months. Children who did not complete three doses of DPT/OPV were taken as "partially immunized". Missed opportunity for immunization is defined as any visit by an eligible child to a health facility, which did not result in his or her vaccination.

RESULT

The age distribution of the children surveyed was 12-23 months. At age 12 to 23 months, children are presumed to have received the 5 antigens that were surveyed. The socio-demographic characteristics of the sampled population were the same as the population in the village (Tables 1 and 2). The mean age of the mothers was 29.4 years and 80% were illiterates.

Table 1: Demographic characteristics of children sampled in Pedro village

Sample size	210
Mean age	17.5 months
Median age	17.5 months
Children > 12 months	45.75%
Males	53%
Females	47%

Table 2: Sociodemographic data of mothers of children studied at Pedro village

Mean age	29.4 years
Median age	30 years
Level of education	
Never been to school	84%
Primary education	16%
Secondary education	0
Tertiary education	0

Using recall history and immunization card as tools of assessment, the result showed that 82 (39%) of the children were not immunized, 84 (40%) were partially immunized and 44 (21%) were fully immunized (Fig 1).

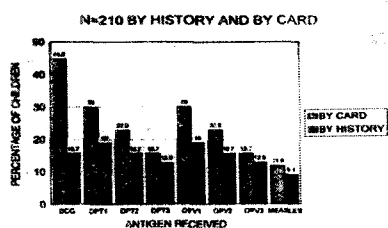
FIG. 1 SUMMARY OF RESULTS FOR IMMUNIZATION COVERAGE OF 210 CHILDREN BETWEEN 12 TO 23 MONTHS OF AGE THAT WERE STUDIED



As at one year of age, only 21 (10%) were fully immunized with measles and were deemed to have completed their immunization.

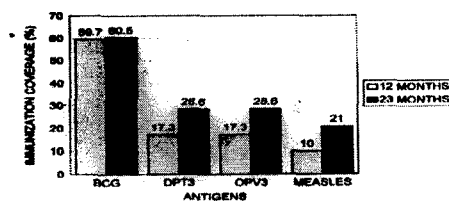
BCG recorded the highest coverage of the antigens by card with 44.8%, while measles was the lowest with 11.9%. DPT and OPV had 15.7% coverage. By recall history, DPT-1/OPV-1 coverage had the highest with 30% while measles had the lowest with 9.1% (Fig 2).

FIG. 2 IMMUNIZATION PROFILE OF CHILDREN STUDIED



A comparison made between children who received all antigens by 12 months and those who received all the antigens from 12-23 months revealed a significance difference with DPT/OPV antigens ($t = 3.297, p < 0.05$) and measles ($t = 3.241, p < 0.05$).

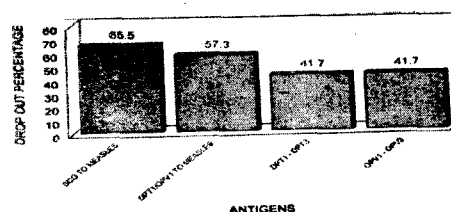
FIG. 3 COMPARISON OF IMMUNIZATION COVERAGE WITHIN 12 MONTHS AND 23 MONTHS



Drop out rate

Sixty five point five percent of 127 children who started BCG vaccination dropped out as at the time of receiving measles vaccination, 59 (57.3%) of 103 children who received DPT/OPV did not complete vaccination to the time of receiving measles vaccination. Also, 41.7% of the 103 children who started the DPT/OPV immunization did not complete the 3-dose regimen of the paired vaccines (Fig 4).

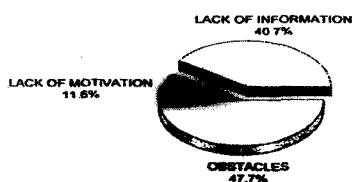
FIG. 4 DROP OUT RATES



Failure to receive immunization

The reasons advanced by mothers for failure to vaccinate or complete immunization of their children include; obstacles such as busy nature of mother schedule of work, most of whom are traders, long distance of outreach clinic to the village and unavailability of transport means such as canoes and boats to the vaccination centres. These accounted for 47.7% of the reasons for non vaccination. Lack of information about immunization accounted for 40.7% while lack of motivation and neglect of village accounted for 11.6% of failure to receive or complete immunization of children (Fig 5).

Fig 5 REASONS FOR IMMUNIZATION FAILURE IN CHILDREN



For missed opportunities, analysis of result showed that 14 (13.5%) of 103 children vaccinated against DPT/OPV missed the completion of the 3-dose regimen due to lack of information on the vaccination regimen. Of the 82 children not vaccinated against measles, 9 (11%) attributed illnesses as the reason for non vaccination, while 42 (51.2%) attributed lack of information and 31 (37.8%) attributed lack of transportation to vaccination centres.

DISCUSSION

Appraising immunization coverage is important in determining the strength and weaknesses of any system adopted for the programme. This could become necessary where resurgence of disease is emerging in people who are supposed to be protected (12-14). This informed the conduct of this survey. The EPI cluster sampling technique employed has been widely used and accepted especially in developing countries where birth and vaccination records are inadequate.

Our study shows that immunization coverage is low among the children in the village with only 21% of the study population fully immunized and only 10% were fully immunized with measles by one year of age. This is similar to the findings of Bosu and his group in a rural setting in Ghana (2). Poor knowledge of immunization is observed to affect compliance as shown in the trend of results obtained in this study. This is compounded by the very low literacy level of the mothers.

BCG ranked as the vaccination with the highest coverage rate by immunization card. This could be possibly due to many mothers delivering in the hospital where first immunization dose, BCG, is given before discharge. However, a set back in the follow-up vaccination was observed for the remaining antigens similar to the findings of Sokhey *et al* (5) in India.

Immunization coverage of DPT/OPV was very low with 15.7% coverage by card. Although, there is little surveillance report of pertussis, the coverage for its prevention is low. The low OPV coverage could be general in the State as wild polio virus infection is still being detected in Lagos State at the time of this survey (personal communication with core facilitator of National Immunization Day on Polio surveillance). Measles immunization is also very low with 11.9% coverage. This low coverage level can not possibly interrupts the spread of measles in any outbreak. If this low level is maintained, the mortality and morbidity associated with measles can not be reduced.

Reasons advanced for failure to immunize or complete child's immunization include obstacles in the way of the mothers, accounting for 47.7% of cases. This indicates that immunization has not been given any priority by the women and this can be attributed to their poor knowledge of immunization and belief about immunization.

Also, lack of information about details of the vaccination programme contributed about 40.7% to failure to complete vaccination. This was observed with the DPT/OPV vaccination where many mothers were unaware of the third dose and stopped receiving vaccination after the second dose.

All these factors could have accounted for the high dropout rate as well as missed opportunities observed in the study. This is a

reflection of poor maternal education about immunization in the area and is similar to reports from other poor or rural communities (1, 2, 15).

The reasons for missed opportunities in the community may be attributed to fear of water terrain by the health care providers and the poverty level of the people. The health care workers are often times afraid to walk on planks used as bridges to get to the village, while mothers equally lacked transport means to get to the vaccination centres.

CONCLUSION

It is recognized that low literacy level coupled with poor maternal health education, lack of structural and health facilities affected immunization coverage in this area. Also, poor socio-economic status, coupled with poor advocacy about immunization and poor commitment of health workers assigned to the village contributed immensely to the low immunization coverage.

There is therefore need for government of Lagos State to establish health facilities in the village and motivates health workers to work in this difficult-to-reach area of the State. Equally important is the need to strengthen maternal beliefs of the efficacy of immunization through health education. Advocacy about the importance of immunization to community leaders who hold cultural belief and opinion on any issue of interest such as immunization will need to be carried out, to ensure acceptability and mobilization of the people of this area for immunization of their children.

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