

## Examining the Vaccination Rates among Children Aged 12 to 23 Months and Exploring the Factors Contributing to Dropouts

Baibhav Prakash Sahay<sup>1</sup>, Abu Irfan<sup>2</sup>, S. Bhushan<sup>3</sup>

<sup>1</sup>Senior Resident, Department of Pediatrics, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India

<sup>2</sup>Senior Resident, Department of Pediatrics, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India

<sup>3</sup>Professor and HOD, Department of Pediatrics, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India

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Corresponding Author: Dr. Abu Irfan

Conflict of interest: Nil

### Abstract

**Aim:** The aim of the present study was to evaluate the completeness of vaccination in children of age 12 months to 23 months age and reasons of dropouts in tertiary care.

**Methods:** The present study was conducted in the Department of Paediatrics, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India during the study period of 2 years. The study was conducted on children of age group 12- 23 months. 500 subjects were included in the study.

**Results:** Majority of the patients who were fully immunized had age between 18-20 months. Partially immunized majority had age between 18-20 months. Nonimmunization was equally distributed among the age group of 12-14, 15-17 and 18-20 months. Full immunization was more common among males compared to females. Partial immunization was prevalent in males compared to females. Majority of the fully immunized children belong to urban class III class followed by urban class II class. Of the children who were partially immunized, majority were from the urban class III class followed by urban class II. Of the non-immunized children majority were from the rural class IV and rural class III. The distribution of socioeconomic with Immunization status of the child was highly significant as revealed by the p value of 0.001 for rural area and <0.001 for the urban area.

**Conclusion:** The consistent efforts needed in slum population so that immunized coverage could be achieved to desired level. Regular follow up of children in the vulnerable age group and education of mothers regarding the immunization schedule will go a long way in reducing the dropout rate and ensuring full immunization. Improvement in the income of the poor, proper health services and quality environment are more important in reducing the morbidity and mortality in slums.

**Keywords:** Immunization, vaccination, children, Slums

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### Introduction

Childhood vaccination is one of the most cost-effective public health interventions to reduce child morbidity and mortality. Besides attainment of high coverage with potent vaccines, receiving child full course of recommended immunization doses administered at the appropriate age is essential to reduce the incidence of vaccine-preventable diseases in children. So assuring that children receive all doses of all vaccines before their first birthday is necessary for childhood vaccination status. [1,2] According to guidelines developed by the World Health Organization (WHO), children are considered as fully vaccinated when they have received a vaccination against tuberculosis Bacillus Calmette Guerin (BCG), three doses of Pentavalent

vaccine Diphtheria, pertussis and Tetanus-Hepatitis B-Hemophilus influenza type b (DPT-Hep B-Hib), pneumococcal conjugated vaccine (PCV) and polio vaccines, two dose of Rota virus, and a measles vaccination by the age of 12 months.

Considering this incomplete vaccination can be defined children who missed at least one dose of the ten vaccines before 12 months. [3,4] Center for disease control (CDC) and the World Health Organization (WHO) evaluated the WHO and United Nations Children's Fund (UNICEF) global vaccination coverage estimates to describe changes in global and regional coverage. As of 2016 global routine vaccination coverage, DTP3 coverage

ranged from 74% in the African Region to 97% in the Western Pacific region. [5]

In the DRC, 1.8 million children fail to receive the three-dose DTP series each year despite improvements in national DTP3 coverage from 25% to 1999 to 81% in 2018 through the partnership with the Vaccine Alliance. [6] These improvements have not made it possible to achieve the Congolese EPI goal of vaccinating >90% of children with three doses of DTP before their first birthday [7] In addition, since 2004, the DRC has adopted the "Reaching Every District" approach, developed and introduced in 2002 by the World Health Organization (WHO), the United Nations Children's Fund, and other partners to improve immunization systems in low coverage areas. [8]

According to mission Indradhanush, the goal is to get all children in India fully immunized by 2020, up from a current coverage rate of about 65 percent in 2013. [9] A mere 12.5 percent of India's children were aware of the existence of Mission Indradhanush, despite the fact that the programme has been in operation for more than 30 years. [10] Parents' knowledge and attitudes about immunizations, services provided, opportunity costs (such as lost earnings or time) incurred by parents, socio-demographic characteristics of parents, level of education, lack of health workers and vaccination teams and inadequate infrastructure and supplies are some of the factors that contribute to low immunization coverage in a given country or region. The effectiveness of a programme can also be affected by religious convictions, traditional remedies, and a general distrust of Western medicine. [11]

The aim of the present study was to evaluate the completeness of vaccination in children of age 12 months to 23 months age and reasons of dropouts in tertiary care.

### Materials and Methods

The present study was conducted in the Department of Paediatrics, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India during the study period of 2 years. The study was conducted on children of age group 12- 23 months. 500 subjects were included in the study.

Inclusion criteria: Children aged between 12 months to 23 months attending pediatric opd.

Exclusion criteria: Children who are seriously ill. Children with progressive neurological disease. Immunocompromised child. Children enrolled during previous visit. Parents not willing for interview.

### Methodology

This was descriptive cross-sectional study done using a prevalidated predesigned questionnaire among children of age group of 12-23 months attending pediatric OPD.

### Materials and Methods

Definitions (As per Mohfw India and WHO)

Fully Immunized: The child who has received all primary doses of BCG, DPT/OPV123, Measles and 1st booster doses of OPV/ DPT as recommended in NIS (National Immunization schedule).

Partially Immunized: If child has missed even a single dose as mentioned in immunization schedule.

Unimmunized: If the child not received even a single vaccine dose.

The pre-validated predesigned questionnaire contains six categories of data:

Identification of the household and the child; Family information extracted from the DSS data base; Socio economic status information; Birth place of the child and exposure to vaccination information; Knowledge of parents about immunization.

### Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee before starting the study. A written informed consent was obtained from the care giver or parent of all the participants in their language.

### Statistical Analysis

All the data analysis was performed using IBM SPSS ver. 20 software. Frequency distribution and cross tabulation was performed to prepare the tables. Data is expressed as numbers and percentages. Chi Square test was used to compare the proportions. P value of <0.05 is considered as statistically significant.

### Results

**Table 1: Baseline characteristics**

Immunization status of the child					
		Fully-immunized	Non- immunized	Partial-immunized	Total
Age groups in month	12-14	54	1	5	60
	15-17	115	1	9	125
	18-20	270	1	15	285
	20-23	25	0	5	30
Gender	Male	160	1	139	300
	Female	110	1	89	200

Majority of the patients who were fully immunized had age between 18-20 months. Partially immunized majority had age between 18-20 months. Non-immunization was equally distributed among the age

group of 12-14, 15-17 and 18-20 months. Full immunization was more common among males compared to females. Partial immunization was prevalent in males compared to females.

**Table 2: Immunization status of children based on socioeconomic scale**

		Fully-immunized	Non- immunized	Partial-immunized	Total
Urban	Class I	30	2	28	60
	Class II	75	1	34	120
	Class III	190	1	89	280
	Class IV	30	1	9	40
Rural	Class II	67	2	31	100
	Class III	72	1	27	100
	Class IV	174	1	125	300

Majority of the fully immunized children belong to urban class III class followed by urban class II class. Of the children who were partially immunized, majority were from the urban class III class followed by urban class II. Of the non-immunized children majority were from the rural class IV and rural class III. The distribution of socioeconomic with Immunization status of the child was highly significant as revealed by the p value of 0.001 for rural area and <0.001 for the urban area.

### Discussion

Children are the future of any country, and their development is just as important as the development of any other asset. For children's healthy development, immunization is a highly effective public health strategy. Immunization is a simple, safe, and effective way to protect people from some of the world's most contagious diseases. Immunization reduces the spread of disease and thus protects the population from harmful diseases. As a preventive health measure, immunization is critical for children because it shields them from the majority of life-threatening diseases that arise in childhood. [12] In order for the child's immunization to be successful, they must complete the full course of immunization doses. More than 3 million lives are saved each year thanks to immunization, which has the potential to save an additional 1.5 million children each year. [13]

Majority of the patients who were fully immunized had age between 18-20 months. Partially immunized majority had age between 18-20 months. Non-immunization was equally distributed among the age group of 12-14, 15-17 and 18-20 months. Non-immunization was equally distributed among the age group of 12-14, 15-17 and 18-20 months as there was only single child in each age group. 38 percent of children in India are not vaccinated in their first year of life. [14] Datta and Mog found that 14 of the 30 children who were not fully immunised missed the Measles vaccine, followed by the third dose of DPT, OPV, and Hepatitis B vaccine in 8 (26.7 percent) [15] Full immunization, Partial

immunization and non-immunization was more common among males compared to females. Datta and Mog found in Mohanpur area, there is no gender difference in the children who are not fully immunised. [15]

Full immunization was more common among males compared to females. Partial immunization was prevalent in males compared to females. Majority of the fully immunized children belong to urban class III class followed by urban class II class. Of the children who were partially immunized, majority were from the urban class III class followed by urban class II. Of the non-immunized children majority were from the rural class IV and rural class III. The distribution of socioeconomic with Immunization status of the child was highly significant as revealed by the p value of 0.001 for rural area and <0.001 for the urban area. A study by Kumar D et al [16] in tertiary care hospital of North India showed that the common reasons for partial immunization and nonimmunization were lack of knowledge about immunization (30.3%), apprehension about side effects of vaccination (28.8%), and lack of knowledge about subsequent doses (22.09%). Other reasons were: vaccine causes sterility, vaccine was not available and vaccinator was not available. Datta et al [14] in rural area Tripura highlighted in their research that the main reasons for low immunization is the lack of knowledge (26.7%), any illness of the child (26.7%), followed by fear of possible adverse effects (20%). The consolidated Intensified Mission Indradhanush report states the reason for non-vaccination are lack of awareness (45%), apprehension about adverse events (24%), vaccine resistance (reluctance to receive the vaccine for reasons other than fear of adverse events) (11%), child travelling (8%), and programme related gaps in 4% of the respondents.<sup>15</sup>

### Conclusion

The consistent efforts needed in slum population so that immunized coverage could be achieved to desired level. Regular follow up of children in the vulnerable age group and education of mothers

regarding the immunization schedule will go a long way in reducing the dropout rate and ensuring full immunization. Improvement in the income of the poor, proper health services and quality environment are more important in reducing the morbidity and mortality in slums.

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