

## A Single Center Study to Evaluate the Immunization Status in Children: an Observational Study

Priya Verma<sup>1</sup>, Jiteshwar Prasad Mandal<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Pediatrics, Shri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

<sup>2</sup>Associate professor, Department of Pediatrics, Shri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India

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Corresponding Author: Dr. Priya Verma

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, Shri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India From January 2023 to December 2023. 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 immunization 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

Immunization is one of the most cost-effective measures in public health to date, preventing an approximately 2--3 million fatalities in young children every year. [1-3] The number of deaths caused by traditional vaccine-preventable diseases (diphtheria, measles, neonatal tetanus, pertussis, and poliomyelitis) has fallen from an estimated 0.9 million in 2000 to 0.4 million in 2010. [4] Besides reducing mortality and morbidity, there is reduction in disability burden by 9 million cases and 960 million disability adjusted life years have been saved from 2001 due to this protective measure. Since 2001, the economic advantage would be around US\$ 350 billion (uncertainty range: 260–460 billion), the total cost saved due to avoidance of illness. Among these costs, about US\$ 250 billion (uncertainty range: 190-330 billion) had been averted since 2011. [5] Globally, the immunization coverage rate is

witnessing an increasing trend, this rate of diphtheria pertussis and tetanus-3 (DPT-3) vaccine has been increased to 85% in 2017 from 72% in 2000 and 21% in 1980. [6,7]

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. [8] 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. [9] 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. [10]

According to mission Indradhanush, the goal was to get all children in India fully immunized by 2020, up from a current coverage rate of about 65 percent in 2013. [11] 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. [12] 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 [13]

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, Shri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India during the study period of 1 year. 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:**

- 1.Children who are seriously ill.

- 2 Children with progressive neurological disease.
- 3 Immunocompromised child.
- 4.Children enrolled during previous visit.
- 5. Parents not willing for interview.

**Methodology**

This is a 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.

**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.

**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. [14] 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. [15]

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. [16] Datta and Mog found that 14 of the 30 children who were not fully immunized missed the Measles vaccine, followed by the third dose of DPT, OPV, and Hepatitis B vaccine in 8 (26.7 percent) [17] 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. [17]

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 [18] 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 [16] 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. [17]

### Conclusion

The consistent efforts are 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 of environment are more important in reducing the morbidity and mortality in slums.

### References

1. Immunization [Internet].
2. Feikin DR, Flannery B, Hamel MJ, Stack M, Hansen PM. Vaccines for Children in Low- and

- Middle-Income Countries. In: Black RE, Laxminarayan R, Temmerman M, Walker N, editors. Reproductive, Maternal, Newborn, and Child Health: Disease Control Priorities, Third Edition (Volume 2). Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2016 Apr 5. Chapter 10.
3. Shrivastava SR, Shrivastava PS, Ramasamy J. Assessment of the inequalities in the immunization coverage: World Health Organization.
  4. Vaccination and Immunization Statistics-UNICEF DATA,
  5. WHO | Estimated economic impact of vaccinations in 73 low- and middle-income countries, 2001–2020.
  6. WHO | Global immunization coverage sustained in the past five years.
  7. Global Routine Vaccination Coverage, 2016.
  8. Le Monde Afrique. Un plan vaccinal pour sauver 220 000 enfants de RDC [Internet]. 2018.
  9. Ministère de la Santé. Plan Pluri Annuel Complet du PEV de la République Démocratique du Congo, 2015–2019.
  10. Vandelaer J, Bilous J, Nshimirimana D. Reaching Every District (RED) approach: a way to improve immunization performance. Bull World Health Organ. 2008 Mar;86(3):A-B.
  11. Mission Indradhanush Operational Guidelines. 2015.
  12. Mohapatra I, Kumar A, Mishra K. A study on awareness and utilization of Mission Indradhanush in an urban slum of Bhubaneswar. J Family Med Prim Care. 2018; 7(6):1294-1299.
  13. Joseph J, Devarashetty V, Reddy SN, Sushma M. Parents' knowledge, attitude and practice on childhood immunization. Int J Basic Clin Pharmacol 2015;4:1201-7.
  14. United Nations Children's Fund, 2021.
  15. World Health Organization. Media Centre (Immunization Coverage) cited on 2021 June 12.
  16. Gurnani V, Haldar P, Aggarwal MK, Das MK, Chauhan A, Murray J, Arora NK, Jhalani M, Sudan P. Improving vaccination coverage in India: lessons from Intensified Mission Indradhanush, a cross-sectoral systems strengthening strategy. bmj. 2018 Dec 7;363.
  17. 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. Int. J. 2017 Feb 1;6:394.
  18. Kumar D, Aggarwal A, Gomber S. Immunization status of children admitted to a tertiary-care hospital of north India: reasons for partial immunization or non-immunization. J Health Popul Nutr. 2010 Jun;28(3):300-4.