

ORIGINAL RESEARCH ARTICLE

**IMMUNISATION STATUS OF CHILDREN UNDER FIVE YEARS OF AGE AND FACTORS ASSOCIATED WITH IT IN A TERTIARY CARE HOSPITAL, TUMKUR - A CROSS-SECTIONAL STUDY**

**<sup>1</sup>DR. ABHISHEK G (JUNIOR RESIDENT), <sup>2</sup>DR. SHILPASRI Y M (ASSOCIATE PROFESSOR), <sup>3</sup>DR. PALLAVI H (PROFESSOR) & <sup>4</sup>DR CHETHAN L (PROFESSOR)**

DEPARTMENT OF PAEDIATRICS, SHRIDEVI INSTITUTE OF MEDICAL SCIENCES AND RESEARCH HOSPITAL, TUMKUR-06<sup>1,2&3</sup>

DEPARTMENT OF SURGERY, SHRIDEVI INSTITUTE OF MEDICAL SCIENCES AND RESEARCH HOSPITAL, TUMKUR-06<sup>4</sup>

**CORRESPONDING AUTHOR: DR. PALLAVI H**

**Abstract:**

**Background:** Immunization is one of the most cost effective public health interventions which has a significant role in saving millions of lives every year[1]. Immunization of each and every child is the need of the hour to reduce under 5 mortality/morbidity in India[2]. Still the coverage of immunization varies widely among and within the states which is not evaluated and rectified on a full scale.[3] The current study was carried out in a tertiary level teaching hospital in Tumkur District of Karnataka to determine the immunization status of children under 5 years of age and the factors affecting the failure of immunization

**Materials and methods:** A cross-sectional study was conducted among 160 under five children visiting a tertiary care centre, Tumkur from the month of May 2023 to June 2023. Convenient sampling method was incorporated. Pre-tested semi-structured questionnaire was used to collect the data. The data was analysed using Epi-Info TM version 7.2.1.

**Results:** Out of 160 children,78.75% were Immunised till date 21.25% were partially immunised. No child was unimmunised. The coverage of vaccines was highest for BCG (BacilleCalmette Guerin) (98.75%) and lowest for OPV (oral Polio vaccine)-booster and DPT (Diphtheria Pertussis Tetanus)-booster (57.51%). The most common reasons for partial immunisation were low birth weight (67.65%), unaware about the need for immunisation (17.65%), no belief on immunisation (11.76%) and home deliver (2.94%). Various factors were used to assess the immunisation status of the children and it was found that children belonging to nuclear family had better immunisation status when compared with children belonging to a joint family and this was statistically significant.

**Conclusion:** Nearly 78.75% were Immunised till date 21.25% were partially immunised. The most common reason for partial immunisation was low birth weight. Type of family was found to be significantly associated with immunisation status of the child. The coverage among under-five must be increased to reduce the rate of drop-out.

**Keywords:** Immunisation, under-five children

### 1. Background:

Immunization is one of the most cost effective public health interventions which has a significant role in saving millions of lives every year[1]. Immunization of each and every child is the need of the hour to reduce under 5 mortality/morbidity in India[2]. Still the coverage of immunization varies widely among and within the states which is not evaluated and rectified on a full scale[3]. Vaccination does not only benefit immunized child, but also helps unimmunized children through herd immunity. When the proportion of the population immune to the pathogen is high enough to lower the probability of transmission, community immunity develops. It also protects children who are too young to vaccinate and person with contraindication[4]. The current study was carried out in a tertiary level teaching hospital in Tumkur District of Karnataka to determine the immunization status of children under 5 years of age and the factors affecting the failure of immunization

### Aims and objectives:

To assess the immunisation status of children under-five years of age

To identify the reasons for partial/no immunisation

To assess the factors associated with the immunisation status of children

### 2. Methods:

A cross-sectional study was conducted among 160 under five children visiting a tertiary care centre, Tumkur from month May 2023 to July 2023. Convenient sampling method was incorporated.

This study was approved by the ethics committee of the institute. Informed parental consent was obtained.

### Inclusion criteria:

Children less than 5 years of age presenting to tertiary care teaching hospital, Tumkur Children whose parents gave informed consent.

Vaccine		Number	%
BCG/ BCG scar	Yes	158	98.75

	No	2	1.25
DPT-B	Yes	92	57.51
	No	5	3.13
	NA	63	39.38
fIPV-1	Yes	151	94.38
	No	9	5.63
fIPV-2	Yes	151	94.38
	No	9	5.63
fIPV-3	Yes	129	80.63
	No	9	5.66
	NA	22	13.84
Hepatitis B- Birth dose	Yes	126	79.00
	No	33	21.00
JE-1	Yes	129	80.63
	No	9	5.63
	NA	22	13.75
JE-2	Yes	128	80.00
	No	8	5.00

	NA	24	15.00
MR-1	Yes	129	80.63
	No	9	5.63
	NA	9	22
MR-2	Yes	128	80.00
	No	8	5.00
	NA	24	15.00
OPV-Zero	Yes	155	96.88
	No	5	3.13
OPV-1	Yes	151	94.38
	No	9	5.63
OPV-2	Yes	151	94.38
	No	9	5.63
OPV-3	Yes	151	94.38
	No	9	5.63
OPV-B	Yes	92	57.51
	No	5	3.13
	NA	63	39.38

PCV-1	Yes	151	94.38
	No	9	5.63
PCV-2	Yes	150	93.75
	No	10	6.25
Penta-1	Yes	151	94.38
	NO	9	5.63
Penta-2	Yes	151	94.38
	NO	9	5.63
Penta-3	Yes	151	94.38
	NO	9	5.63
RVV-1	Yes	151	94.38
	NO	9	5.63
RVV-2	Yes	151	94.38
	NO	9	5.63
RVV-3	Yes	151	94.38
	NO	9	5.63

**Exclusion criteria:**

Children with immunocompromised diseases.

Children whose parents don't give consent.

**Methodology:**

Pre-tested semi-structured questionnaire was used to collect the data.

All children were examined for BCG scar.

Immunisation status of the children were assessed using immunisation card or Tayi card.

Statistical analysis:

The data were entered in excel sheet, coded and analysed using Epi-Info TM version 7.2.1. p-value of <0.05 was taken as significant

**Definitions used in the present study:**

Birth Order: It was taken as told by the mother/ father/ guardian.

Educational status of parents: A person who could not read and write was labeled as illiterate.

Type of family: Nuclear family consists of husband, wife and unmarried children. Joint family consisted all other families Socio economic status: Classified based on education, occupation and educational status of the father / head of the family according to modified Kuppuswamy classification 2018[5]

**3. Results:**

Primary outcome – Immunisation status of the children presenting to tertiary care center in Tumkur.

Secondary outcomes –

- Reasons for partial / no immunisation
- Association between various factors and immunization status of children.

Mean age of children in the study group was 60 ±16.13 months

Among the study population 52.50% were males and 47.50% were females

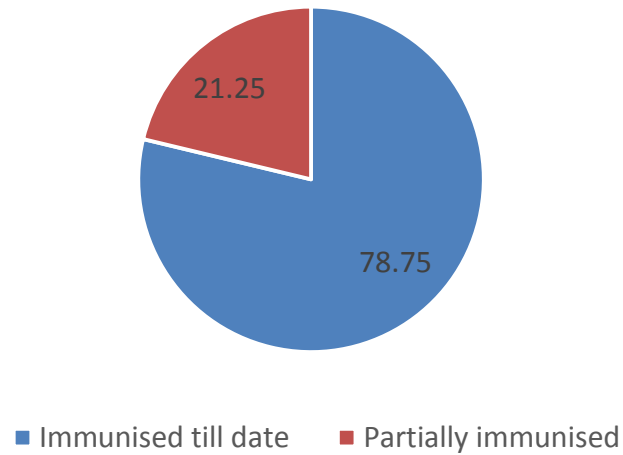
Table: Coverage of vaccines (N=160)

In our study Children Immunized till date was found to be 126 (78.75%)

Partially immunised children were 21.25%

There was no unimmunized child among the children studied

Figure: Immunisation status of children  
(under 5 years of age) (N=160)



**Reasons for partial immunisation (n=34)**

Sl.No	Reason	Number	Percentage
1.	Low birth weight	23	67.65
2.	Unaware about the need for immunisation	06	17.65
3.	No belief on immunisation	04	11.76
4.	Home delivery	01	2.94

**Table: Association between various factors and immunisation status of the child (N=160)**

Sl.No.	Variable	Immunisation Status				$\chi^2$	p-value	
		Immunised with both doses		Partial and no-immunisation				
		Number	%	Number	%			
1.	Age (years)						9.29	0.06
	< 1	19	15.08	11	32.35			
	1-2	44	34.92	15	44.12			
	2-3	20	15.87	03	8.82			
	3-4	22	17.46	02	5.88			
	4-5	21	16.67	03	8.82			
2.	Gender						0.6923	0.41
	Male	64	50.79	20	58.82			
	Female	62	49.12	14	41.18			
3.	Birth Order						2.62	0.25
	1	56	44.44	10	29.41			
	2	50	39.68	18	52.94			
	$\geq 3$	20	15.87	06	17.65			



4.	Number of children 12-36 months of age in the family						
	1	60	44.78	64	43.84	2.061	0.36
	2	61	45.52	74	50.68		
	3	13	9.70	8	5.48		
4.	Fathers age (years)						
	<30	38	30.16	9	26.47	0.79	
	30-31	72	57.14	19	55.88		
	≥ 40	16	12.70	6	17.65		
5.	Fathers Education						
	Illiterate	1	0.79	1	2.94	0.38	
	Literate	125	99.21	33	97.06		
6.	Mothers age (years)						
	<25	52	41.27	16	47.06	0.1128	
	25-34	71	56.35	15	44.12		
	≥ 35	03	2.38	03	8.82		
7.	Mothers Education						
	Illiterate	03	2.38	03	8.82	0.113	
	Literate	123	97.62	31	91.18		

8.	Type of family						
	Nuclear	111	88.10	25	73.53	4.45	0.03**
	Joint	15	11.90	09	26.47		
9.	Religion						
	Hindu	99	78.57	25	73.35	0.39	0.53
	Non-Hindu	27	21.43	09	26.47		
10.	Socioeconomic Status						
	Lower	77	61.11	21	61.76	2.58	0.28
	Lower middle	18	14.29	08	23.53		
	Upper lower	31	24.60	05	14.71		
11.	Immunisation card						
	Present	126	100.00	33	97.06		0.213
	Absent	0	0.00	1	2.94		
Total		126	100	34	100		

Note: \*\* p-value <0.05

#### 4. Discussion:

Even though there is huge progress in immunization services in the country there are lacunae in full coverage, hence this study attempted to assess the immunization coverage and factors associated with poor vaccination.

This study revealed complete immunization coverage is 78.75% among study population which is lower than the NFHS -5 data results for Tumkur district which is 97.7%[6]

The most common reasons for partial immunisation were low birth weight, unaware about the need for immunisation, no belief on immunisation and home delivery.

It was found that children belonging to nuclear family had better immunisation status when compared with children belonging to a joint family Our study result of Complete vaccine coverage (78.75%) and partial vaccination coverage (21.25%) is similar to the results of a studies conducted by Pandey LN et al in Jaipur, Rajasthan (76.19%,22.86%) respectively.

Similar patterns of results were observed in study conducted by Malkar VR et al where results of complete immunization and partial immunization were 78.5% and 20.48% respectively[9,10]

#### Limitations:

The study was restricted to one tertiary care unit in Tumkuru district .So the results cannot be generalised to the whole population due to the probable variations in the socio demographic characteristics

#### 5. Conclusions:

Nearly 78.75% were Immunised till date and 21.25% were partially immunised.

The most common reason for partial immunisation was low birth weight.

Type of family was found to be significantly associated with immunisation status of the child.

The vaccination coverage among under-five can be overcome by collecting population based information regarding poor coverage, educating people and improving communication among target population.

#### 6. References:

1. Lindstrand A, Cherian T, Chang-Blanc D, Feikin D, O'Brien KL. The World of Immunization: Achievements, Challenges, and Strategic Vision for the Next Decade. *J Infect Dis.* 2021 Sep 30;224(12 Suppl 2):S452-S467. doi: 10.1093/infdis/jiab284. PMID: 34590130; PMCID: PMC8482029.
2. Immunization and Vaccine Development (IVD) WHO-SEARO, IP Estate, MG Marg, New Delhi 110002, India

3. National Health Mission Department of Health & Family Welfare, Ministry of Health & Family Welfare, Government of India
4. Rashid H, Khandaker G, Booy R. Vaccination and herd immunity: what more do we know? *Curr Opin Infect Dis.* 2012 Jun;25(3):243-9. doi: 10.1097/QCO.0b013e328352f727. PMID: 22561998.
5. Directorate of Census operations. Census of India Maharashtra District census handbook 2011. [http://www.censusindia.gov.in/2011census/dchb\\_A/27/2785\\_PART\\_A\\_DCHB\\_PUNE.pdf](http://www.censusindia.gov.in/2011census/dchb_A/27/2785_PART_A_DCHB_PUNE.pdf)
6. Government of India. National Health and Family Welfare (NFHS) 5. Child immunization and Vitamin A supplementation [Internet]. 2019[updated 2019-2020; cited 2023 Aug 18 ]
7. World Health Organization. Immunization coverage [Internet]. Geneva: 2018 July 16 [cited 2023 Aug 8 ]. Available from: [http://who.int/home/news/fact\\_sheets/detail/Immunization\\_coverage](http://who.int/home/news/fact_sheets/detail/Immunization_coverage).
8. Government of India. Ministry of health and Family Welfare. Immunization: Mission Indradhanush Guidelines [Internet]. 2014 [cited 2023 Aug 2].
9. Pandey LN, Paliwal A, Sharma BN, Choudhary RC, Bhardwaj SL. Evaluation of immunisation coverage in the rural area of Jaipur, Rajasthan, using the WHO thirty cluster sampling technique. *Int J Med Sci Educ.* 2016;3(1):16-24
10. Malkar VR, Khadilakar H, Lakde RN, Joge US, Choudhari SG. Assessment of Sociodemographic factors affecting immunisation status of children in age group of 12-23 months in a rural area. *Indian Medical Gazette.* 2013:164-69