

## A study of immunization coverage and its determinants among under five children residing in urban field practice area of S. N. Medical College, Bagalkot, Karnataka, India

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### Abstract

**Background:** Aim of the study was to know the immunization coverage and its determinants among under five children residing in the urban field practice area of S. N. Medical College, Bagalkot.

**Materials and Methods:** This study was conducted in the urban field practice area of S. Nijalingappa Medical College in Bagalkot city between August - October 2016. According to NFHS-4, full immunization coverage in Karnataka is 59.8%. Sample size =  $4pq/l^2$ , taking  $p=59.8\%$ ,  $q=100-p=40.2$  and allowable error ( $l$ ) = 10% of  $p$ . Sample size = 269. House to house survey was done for the presence of under 5 children. Vaccination status of the under five children was assessed based on immunization card or mother's verbal reports, and its determinants were collected using a pre-designed semi-structured questionnaire. Data was compiled and tabulated by using MS EXCEL and was analyzed, using percentages and chi square test.

**Result:** A total of 283 under five children's immunization status was studied. Percentage of children fully immunized was found to be 83%, partially immunized were 16% and unimmunized were 1%. 24.3% children were less than 12 months of age, 22.9% were 12-23 months and 52.6% children were 24-60 months. 65.37% of mothers had their child's immunization card. Major reason for failure of immunization was found to be lack of awareness of the schedule i.e. 41% of children and negligence of parents and grand-parents in 32.5%.

**Conclusion:** More vigorous awareness campaign are to be brought about in this area to achieve the coverage of 100%.

**Keywords:** Immunization, Under five children, Urban area.

### Introduction

One of the most significant contributions of the medical fraternity to mankind is the advent of vaccines. They are the most powerful, safe and cost-effective measures for prevention/control of a number of diseases.<sup>(1)</sup>

The historical success of eradicating the dreaded disease, Smallpox, prompted World Health Organization (WHO) to ask its member countries to launch immunization against six vaccine preventable diseases in its national immunization schedule. In May 1974, the WHO launched the Expanded Immunization Programme (EPI) globally, with focus on prevention of 6 vaccine-preventable diseases by the year 2000. In India, EPI was launched in 1978 and it was re-designated as the Universal Immunization Programme (UIP) in 1985, with a goal to cover at least 85% of infants.<sup>(2)</sup>

The National Family Health Survey (NFHS) shows a marginal improvement in the vaccination coverage of India over the years. NFHS-1 conducted in 1992-93 reported a vaccination coverage of 35.4%, which rose to 42% in NFHS-2 conducted in 1998-99.<sup>(3,4)</sup> The NFHS-3 conducted in 2005-06 reported a vaccination coverage of 43.5%.<sup>(5)</sup> The UNICEF coverage evaluation survey for the year 2009 showed that the immunization coverage had improved to 61%.<sup>(6)</sup> Nevertheless, these figures are way short of the target of 85% coverage.

NFHS – 4 survey shows that full immunization coverage in Karnataka is 59.8% in urban area.<sup>(7)</sup>

Though vaccination coverage globally has been stable with immunization preventing 2 - 3 million deaths yearly, it has been estimated that about 19 million infants are not accessing basic vaccines due to peculiar regional challenges such as inadequate funds and manpower for vaccine procurement, distribution, monitoring and supervision activities, and also the poor state and management of health care facilities.<sup>(8)</sup>

The inequitable access to immunization services, further highlights the fact that the vaccination coverage or administration is not only dependent on the country's provision of vaccine supplies, equipment and manpower which the Government appears to be investing resources but also on other factors such as knowledge, opinions and attitude of mothers, mothers education, mother's religion, number of children within the family, perceived health institution support, family income, being born in a health facility and the accessibility to health facility's immunization services, lack of confidence and trust in the health services and political problems.<sup>(9)</sup>

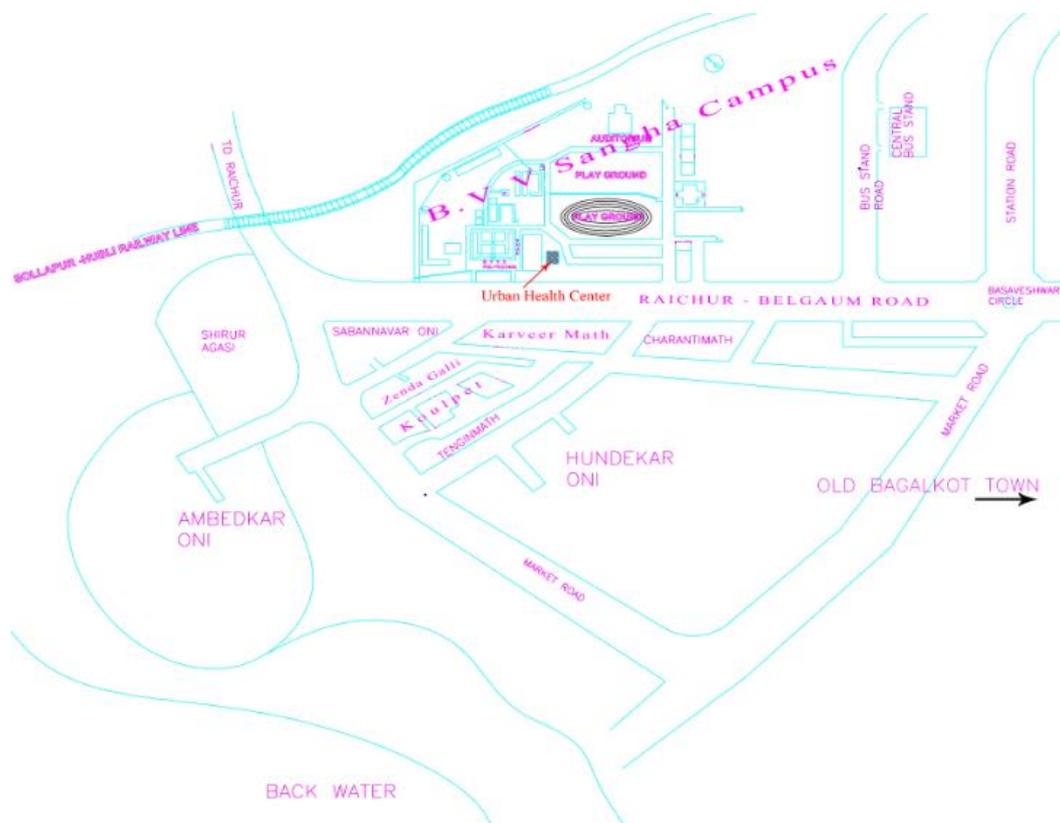
Thus, the objective of this study was to assess the immunization coverage and its determinants among under five children in the urban field practice area of S. Nijalingappa Medical College, Bagalkot, Karnataka.

## Materials and Methods

A community based, cross-sectional study was conducted in the urban field practice area of S. Nijalingappa Medical College, Bagalkot from August to October 2016.

According to NFHS-4, full immunization coverage in Karnataka is 59.8%.<sup>(7)</sup> So, the sample size with the formula  $4pq/L^2$ , taking  $p=59.8\%$ ,  $q=100-p=40.2$  and allowable error ( $L$ ) = 10% of  $p$ , was 269.

After Ethical Clearance and obtaining informed consent, house to house survey was done for the presence of under 5 children until the sample size was achieved. A total of 283 children were included in the study as they belonged to 5 Anganwadi areas (Fig. 1). Vaccination status of the under five children was assessed based on immunization card or mother's verbal reports, and its determinants were collected using a pre-designed semi-structured questionnaire.



**Fig. 1: Area of Urban Health Training Center, Department of Community Medicine, S. Nijalingappa Medical College, Bagalkot**

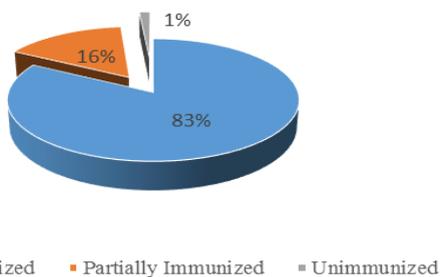
On the basis of the information on vaccination, we categorised the child as 'fully immunised' if one dose of BCG and measles vaccine and three doses of pentavalent and OPV vaccine had all been administered. If a child who had received at least one vaccine (but not all) was categorised as 'partially immunised', while a child who did not receive any vaccine was considered 'unimmunised'.

Data from the survey was statistically analysed using Microsoft Excel, percentages and by applying Chi-Square test.

## Result

A total of 283 under five children's immunization status was studied, 83% children were found to be fully immunized, and 16% were partially immunized while 1% of children were unimmunized in this area as shown

in Fig. 2. Out of all, 24.3% children were less than 12 months, 22.9% children were 12-23 months of age and 52.6% children were 24-60 months of age. 56.5% children were born in a private hospital, 41.7% in government hospital, while 1.8% were born at home. Majority of children were of first birth order (47%), followed by second order 37.4%, third order 13.4%, and fourth order 1.4% and fifth order 0.7%. Table 1 shows distribution of children according to their family's socio-economic status under modified BG Prasad Classification, where majority of children belonged to Class IV i.e. 53.7%.



**Fig. 2: Immunization status of under five children in the area**

Majority of mothers were housewife (82.3%), 2 mothers had expired, and highest educational qualification of mothers and fathers was found to be secondary education 33.5% and 39.5% respectively, 16.2% mothers were illiterate while 13% fathers were illiterate. Table 2 shows a comparison of literacy status of mother and percentage of their children fully immunized. Table 3 presents distribution of father’s according to their occupation, where majority of them were involved in private jobs i.e. 56.1%.

Out of all, 75.6% children were Hindu while 24.4% were Muslim. Only 65.37% of mothers possessed immunization card.

**Table 1: Distribution of children according to their Socio-economic status**

Socio-economic status	Frequency (%)
1	3 (1%)
2	9 (3.2%)
3	75 (26.5%)
4	152 (53.7%)
5	44 (15.5%)

**Table 2: Comparison of literacy of mothers and full immunization status of the children**

Mother’s literacy	Percentage of fully immunized children
Illiterate	67.4%
Literate	69.8%

**Table 3: Distribution of fathers according to their occupation**

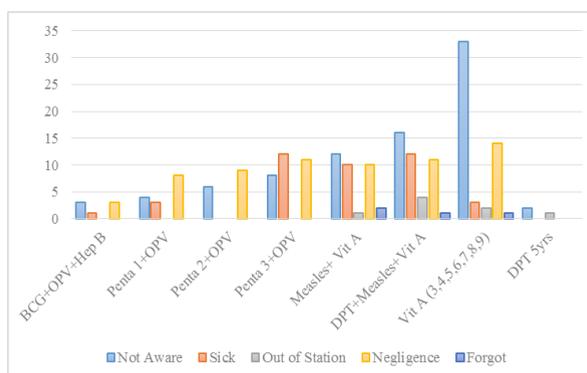
Father’s occupation	Frequency (%)
Unemployed	1 (0.3%)
Government	19 (6.7%)
Private	159 (56.1%)
Self employed	4 (1.4%)
Farmer	1 (0.3%)
Labour	97 (34.2%)

Most of the households approached private hospitals for various health problems i.e. 65%. Fig. 3

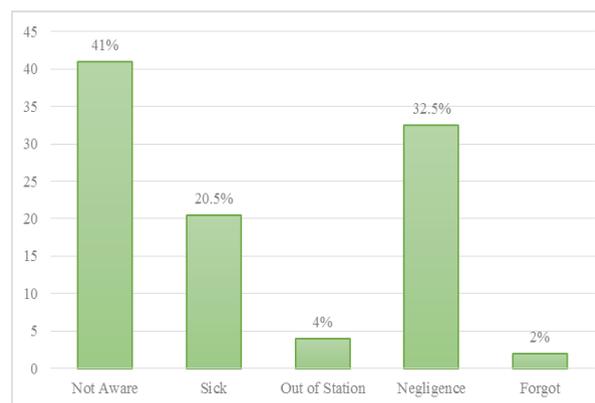
shows percentage of children immunized for a particular vaccine for which they were eligible in their age group, BCG had 97.5% coverage, Vitamin A coverage for first dose was 84.7% but it reduced to 71.6% for later doses, while three children eligible for DPT booster dose at five years had zero coverage. Fig. 4 & 5 shows distribution of various vaccines and their different reasons for failure to immunize. Majority of caregivers gave lack of awareness of the schedule as the main reason for failure to immunize (41%), followed by negligence (32.5%) and baby being sick (20.5%).



**Fig. 3: Percentage of eligible children that were immunized**



**Fig. 4: Reason for failure to immunize for individual vaccine**



**Fig. 5: Distribution of various reasons for failure of Immunization**

**Table 4: Comparison of Immunization status with Birth order, Socio-economic status, Mother's education, Religion and Place of Delivery**

Variable	Fully immunized (% of fully immunized)	Partially immunized (% of partially immunized)	Unimmunized (% of unimmunized)	Total	P value
<b>Birth order</b>					
1	88(44.9%)	42(50.6%)	3(75%)	133(47%)	0.3
2	80(40.8%)	25(30.1%)	1(25%)	106(37.5%)	
3	23(11.7%)	15(18.1%)	0(0%)	38(13.4%)	
4	4(2%)	0(0%)	0(0%)	4(1.4%)	
5	1(0.5%)	1(1.2%)	0(0%)	2(0.7%)	
<b>Socioeconomic Class</b>					
1	2(1%)	1(1.2%)	0(0%)	3(1.1%)	0.6
2	6(3.1%)	3(3.6%)	0(0%)	9(3.2%)	
3	48(24.5%)	27(32.5%)	0(0%)	75(26.5%)	
4	111(56.6%)	38(45.8%)	3(75%)	152(53.7%)	
5	29(14.8%)	14(16.9%)	1(25%)	44(15.5%)	
<b>Mother's education</b>					
Illiterate	31(15.8%)	14(16.9%)	1(25%)	46(16.3%)	0.8
Primary	45(23%)	25(30.1%)	2(50%)	72(25.4%)	
Secondary	71(36.2%)	23(27.7%)	1(25%)	95(36%)	
PUC	37(18.9%)	14(16.9%)	0(0%)	51(18%)	
Graduation	11(5.6%)	6(7.2%)	0(0%)	17(6%)	
<b>Religion</b>					
Hindu	149(76%)	62(74.7%)	3(75%)	214(75.6%)	0.9
Muslim	47(24%)	21(25.3%)	1(25%)	69(24.4%)	
<b>Place of delivery</b>					
Private	116(59.2%)	42(50.6%)	2(50%)	160(56.5%)	0.6
Government	76(38.8%)	40(48.2%)	2(50%)	118(41.7%)	
Home	4(2%)	1(1.2%)	0(0%)	5(1.8%)	

Table 4 presents comparison of immunization status with its various sociodemographic factors, although none were found to be statistically significant.

### Discussion

Fully Immunized coverage in the area was found to be 83%, which is almost similar to District Level Household and Facility Survey-4 (82.1%).<sup>(10)</sup> The percentage of fully immunized children according to a study done in Bijapur was found to be 34.84%.<sup>(1)</sup> This indicates the efficiency of our services and also of the government Urban Primary Health Centre in our area in conducting immunization sessions regularly according to the schedule, in Anganwadi and also house to house. Catch-up immunization campaigns like Mission Indradhanush and the Measles Rubella campaign also help in improving the immunization coverage in the country. Booster dose coverage of vaccines like Vitamin A and DPT saw reduction as compared to their first dose, for which the reason could be that the children start going to school by that age and miss the immunization sessions, so it indicates the need that immunization should also cover places like schools for better coverage.

Percentage of fully immunized children with illiterate mothers was 67.4% and 69.8% in literate mothers. In a study done in Delhi, there was a marked difference in immunization status among children of illiterate (16.59%) and literate mothers (83.41%).<sup>(11)</sup>

There was no significant association between Immunization coverage and Place of Delivery (p=0.5), Birth Order (p=0.3), Socio-economic class (p=0.6), Mother's education (p=0.7), Father's education (p=0.3), Religion (p=0.9). In the study done in Bijapur there was no significant association between mother's education and socio-economic status and immunization status.

The major reason for failure of immunization was found to be lack of awareness regarding vaccination schedule which is similar to the study done in Bijapur, Karnataka.<sup>(1)</sup> Similar findings were seen in the study conducted in Rajasthan, where they concluded that though many were aware of the importance of vaccination in general, specific information on importance of completing the schedule and knowledge on vaccine preventable diseases other than poliomyelitis were very limited.<sup>(12)</sup>

One of the reason for not being fully immunized on schedule cited by the mother's was lack of awareness; the others being negligence and sick child. In the study

done in North Kashmir, lack of awareness and sick child were some of the reasons for not completing vaccination on schedule.<sup>(13)</sup> This indicates that the mothers do not completely understand the importance of vaccinating the child as was seen in our study. So, repeated awareness campaign is needed.

Since the majority of the mothers are the main caregivers and informants regarding immunization, Information Education and Communication activities and media must be harnessed in creating awareness and knowledge about vaccines and vaccine preventable diseases. Hence if steps are taken to ensure good education to the girl child and knowledge about vaccination integrated into the antenatal care of mothers, the vaccination coverage will be near complete and the goals of decreasing morbidity and mortality may be achieved.<sup>(14)</sup>

### Conclusion

The percentage of children fully Immunized was found to be 83%. The main reason for failure of immunization was found to be lack of awareness of the immunization schedule and negligence of parents and grandparents. Though immunization coverage in the study population is relatively high compared to that of other areas of the Country, there are still opportunities for improving its coverage by regular awareness campaigns.

### Recommendation

There is a need of improving the knowledge, attitude and practice regarding immunization and motivating the parents to get the children immunized. Stress on booster doses of vaccines has to be given.

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**Conflict of Interest:** None declared.

### References

1. Angadi MM, Jose AP, Udgiri R, Masali KA, Sorganvi V. A Study of Knowledge, Attitude and Practices on Immunization of Children in Urban Slums of Bijapur City, Karnataka, India. *Journal of Clinical and Diagnostic Research*. 2013;7(12): 2803-6.
2. Park K. Park's textbook of Preventive and Social Medicine, Banarsidas Bhanot Publishers. 22nd Edition, 2009; 114.
3. International Institute for Population Sciences (IIPS), 1995. National Family Health Survey. (MCH and Family Planning), India 1992-93, Bombay: IIPS.
4. International Institute for Population Sciences (IIPS) and ORC Macro. 2000. National Family Health Survey. (NFHS- 2), 1998- 99: India, Mumbai: IIPS.
5. International Institute for Population Sciences (IIPS) and Macro International. 2007. National Family Health

- Survey. (NFHS-3), 2005–06: India: Volume I. Mumbai: IIPS.
6. Immunization. UNICEF 2016. Available from: <http://unicef.in/Whatwedo/3/Immunization> (Accessed 5 December 2016).
7. State Factsheet. National Family Health Survey, India 2016. Available from: [http://rchiips.org/nfhs/pdf/NFHS4/KA\\_FactSheet.pdf](http://rchiips.org/nfhs/pdf/NFHS4/KA_FactSheet.pdf) (accessed 5 December 2016).
8. National Primary Health Care Dev Agency (NPHCDA) (2016) National Routine Immunization Strategic Plan 2013-2015. <http://www.jhsph.edu/research/centers-and-institutes/ivac/resources/Nigeria-NRISP-Technical-Policy.pdf>. (Accessed 5 Dec 2016).
9. Duru C, Iwu A, Uwakwe K, Diwe K, Merenu I, Emerole C et al. Assessment of Immunization Status, Coverage and Determinants among under 5-Year-Old Children in Owerri, Imo State, Nigeria. *OALib*. 2016;03(06):1-17.
10. District Level Household and Facility Survey 2012-13, Fact sheets (Bagalkot). <http://www.nrhm-mis.nic.in> (Accessed 5 Dec 2016).
11. Devasenapathy N, Ghosh Jerath S, Sharma S, et al. Determinants of childhood immunisation coverage in urban poor settlements of Delhi, India: a cross-sectional study. *BMJ Open* 2016;6:e013015.doi:10.1136/bmjopen-2016-013015.
12. Manjunath U, Pareek RP. Maternal knowledge and perceptions about the routine immunization programme – A study in a semi-urban area in Rajasthan. *Indian J Med Sci*. 2003;57:158-63.
13. Hamid S, Andrabi SAH, Fazli A and Jabeen R. Immunization of children in a rural area of North Kashmir India: a KAP study. *Online J Health Allied Scs*.2012;11(1):10.
14. Mahalingam S, Soori A, Ram P, Achappa B, Chowta M, Madi D. Knowledge, attitude and perceptions of mothers with children under five years of age about vaccination in Mangalore, India. *Asian Journal of Medical Sciences*. 2014;5(4).