

# A cross-sectional study on immunization status among Anganwadi children in a rural community, Karnataka

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## Abstract

**Background:** Communicable diseases are the major cause of morbidity and mortality in children. One of the most cost-effective methods for well-being of a child is immunization. In India, immunization services are offered through anganwadis which is mainly well utilized in rural areas. The Universal Immunization Programme which was launched in 1985 currently covers Ten Vaccine Preventable diseases in Karnataka. In spite of good resources the immunization rate remains low in some areas because of various reasons. **Objectives:** To assess the immunization coverage of 3-6 years children coming to Anganwadis. **Materials and Methodology:** The present study was carried out in rural field practice area of a medical college in Kolar district. In this descriptive cross sectional study, children in the age group of 3-6 years who were enrolled with anganwadi were listed and their mothers were interviewed by using a pre-tested semi-structured questionnaire which captured various sociodemographic details, factors favoring and obstacles for immunization was Captured for a period of 6 months from October 2018 to March 2019. **Results:** Completely immunized children were 86 %, partially immunized were 14 % and none was un-immunized. The most common reasons for not immunizing the child were Current Illness for the Child, Time and Place not known for vaccination and Fear of Side Effects, Mother's education, Social class and Religion were significantly associated with Immunization. **Conclusion:** The overall coverage of immunization among the rural area was good but emphasis on addressing the reasons for partial immunization should be met by effective IEC and Inter-personal communication. The reasons for partial/non immunization are preventable and may be increased by creating awareness about vaccine preventable disease and strengthening the immunization services.

**Key words:** Immunization, Anganwadi, Rural areas

## Introduction

Immunization is often cited as being one of the most cost-effective public health interventions. A vaccine is an immuno-biological substance designed to generate specific protection against a given disease [1]. In 1974, the World Health Organization (WHO) established the Expanded Program on Immunization to ensure that all children have access to routinely recommended vaccines [2]. Immunization prevents illness, disability and death from vaccine preventable diseases including cervical cancer, diphtheria, hepatitis B, measles, mumps, pertussis (whooping cough), pneumonia, polio, rotavirus diarrhea, rubella and tetanus.

Global vaccination coverage estimated that 18.7 million infants are missing out on basic vaccines [3]. Launched in 1978 as expanded programme on immunization, it got its present name of Universal Immunization Programme in 1985 when its reach was expanded beyond urban areas. In 1992, it became part of Child Survival and Safe Motherhood Programme and in 1997 it came under the ambit of National Reproductive and Child Health Programme.

Since the launch of National Rural Health Mission in 2005, Universal Immunization Programme is an integral part of it. Post-National Immunization Programme era has witnessed a dramatic decrease in the incidence of the VPD's. Of the several VPD's, as of now, only small pox has been eradicated; which was confirmed in May 1980[4].

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The Indian Government's Universal Immunization Program (UIP) provides vaccines against Ten diseases to all infants free of charge: one dose of bacillus Calmette–Guérin (BCG; tuberculosis); three doses of Pentavalent (Diphtheria, Pertusis, Tetanus, Hepatitis B and Haemophilus Influenza B); three doses of oral polio vaccine (OPV) and two doses of IPV; and two doses of MR (Measles and Rubella) and Japanese Encephalitis. All of these vaccine doses should be administered by the age of 16-24 months.

Immunization not only reduces morbidity and mortality from potentially infectious diseases but also interrupts disease transmission in the community. Because of the national immunization programme even though the morbidity and mortality of children due to vaccine preventable diseases has gone down drastically, non-immunization, partial immunization, delay in initiation and completion of immunization of children are still quite common.

However, in a developing country like India, a large proportion of children are either not immunized at all or partially immunized, which results in higher infant and child morbidity and mortality [5]. In India, Even though there is increased accessibility of health care services in both urban and rural areas, the utilization of these services by different segments of the society are different.

Anganwadi Centre is a part of ICDS (Integrated Child Development Services) Scheme initiated in 1975 is India's most ambitious multi-dimensional welfare Programme to reach millions of children and mothers who are caught in the grip of malnutrition, diseases, illiteracy, ignorance and poverty [6,7].

Anganwadi worker (AWW) is the incharge of an AWC who is chosen from the community. The main services of ICDS are supplementary nutrition, immunization, health checkup, referral service, growth monitoring and non-formal education. The health system in rural areas uses the anganwadi centers to immunize children, pregnant women and to perform other primary health care activities.

The anganwadi workers carry out the following immunization duties: - list the infants and pregnant women to be immunized; -motivate the family members to accept immunization;- assist the health teams to perform the immunizations; and - follow up and carry out first aidmanagement of any minor side-effects resulting from the immunizations[8].

Looking at the magnitude of the problem an attempt has been made in the present study to assess the immunization coverage of 3-6 years old children coming to Anganwadis of rural field practice area of Sri Devaraj Urs Medical College, Kolar.

**Objective-**To assess the immunization coverage of 3-6 years children coming to Anganwadis

## Materials and Methods

**Design-** The present cross-sectional study was conducted among children of 3-6 years old enrolled in anganwadis under the field practice area of the Rural Health Training Centre at Devarayasamudra, which is affiliated with the Department of Community Medicine, Sri Devaraj Urs Medical College, Kolar.

**Study duration-** The data was collected from the mothers of the children enrolled in anganwadi for 6 months from October 2018 to March 2019.

**Sample size-** The sample size calculated for this present study was population proportion with specified relative precision. For this purpose "Sample size Determination in health studies- a practical manual by WHO" was used. A rough estimate of anticipated population proportion (P) is usually sufficient to calculate the sample size. In any study if it is not possible to estimate P than it can be taken as 0.5 (i.e.50%) as the "safest" choice for the population proportion [8]. Taking this as the prevalence with precision 10% at 95% CI the sample size was calculated to be 384.Assuming 5% non-response rate final sample size was found nearly to be 400.

**Sampling-** All the children 3-6 years of age who are enrolled in the anganwadis of rural field practice area of Sri Devaraj Urs Medical College will be taken for the study. There are 19 villages and 20 anganwadis in the field practice area. All the anganwadis were visited and children who were present on the day of visit will be enrolled for the study.

**Inclusion criteria-** Children in the age group of 3 to 6 years (both male and female) enrolled in anganwadi centres.

## Exclusion criteria

- Children less than 3 year
- Children more than 6 years
- Whose mothers not willing to participate in the Study

**Methodology of collection of the data-** Permission to carry out the study was sought from the concerned ICDS officer. The mother of study subjects and AWWs will be explained about the details of the study and informed consents will be taken after assuring about confidentiality and anonymity of the information obtained. The mothers of selected subjects under the AWCs will be interviewed by house to house visit to get relevant data. Data will be collected by pre designed and pre tested questionnaire regarding demographic information of study subjects and status of immunization coverage of study subjects. Immunization shall be assessed by looking at the Immunization card of the Child or by the history from the mother about vaccination. Immunization coverage will be assessed by mother and child protection card or by recall method where the card dies and percentages was not available.

In this study a child will be considered to be completely immunized if all the doses of the vaccine till measles 2nd dose and DPT booster was taken. And child will be considered partially immunized if any of the vaccine is missed as per the National Immunization schedule.

If none of these vaccines had been administered, then the child is termed as unimmunized (zero dose of OPV / Pulse polio immunization / optional vaccines are excluded for evaluating the immunization status) [9,10]. At the end, the reasons for non-compliance for Immunization were collected from the mothers.

**Statistical methods:** Data will be entered in Microsoft Excel sheet and analysed using software SPSS version 22. All the descriptive data will be represented as frequent.

## Results

This study included 416 children between the age group 3- 6 years. 38.2% of the children belonged to 3-4 years age group followed by 31.6% and 30.2% belonged to 5-6 years and 4-5 years respectively. The study included 51.6% of boys (Table 1).

**Table-1: Distribution according to age and gender**

| Age group(months) | Male       |             | Female     |             | Total      |            |
|-------------------|------------|-------------|------------|-------------|------------|------------|
|                   | Number     | %           | Number     | %           | Number     | %          |
| 36-48             | 82         | 38.1        | 77         | 38.3        | 159        | 38.2       |
| 48-60             | 66         | 30.6        | 60         | 29.8        | 126        | 30.2       |
| 60-72             | 67         | 31.3        | 64         | 31.9        | 131        | 31.6       |
| <b>Total</b>      | <b>215</b> | <b>51.6</b> | <b>201</b> | <b>48.4</b> | <b>416</b> | <b>100</b> |

86% of all the Children were completely immunized and 14 % were Partially Immunized and none were Un-Immunized. There was not much of difference among the genders and age groups with respect to immunization status (Table 2).

**Table-2: Distributions according to immunization status**

| Age group(months) | Completely immunized |            |            | Partially immunized |           |           | Un-immunized |          |          | Total      |
|-------------------|----------------------|------------|------------|---------------------|-----------|-----------|--------------|----------|----------|------------|
|                   | Male                 | Female     | Total      | Male                | Female    | Total     | Male         | Female   | Total    |            |
| 36-48             | 69                   | 67         | 136        | 13                  | 10        | 23        | 0            | 0        | 0        | 159        |
| 48-60             | 55                   | 51         | 106        | 11                  | 9         | 20        | 0            | 0        | 0        | 126        |
| 60-72             | 59                   | 57         | 116        | 8                   | 7         | 15        | 0            | 0        | 0        | 131        |
| <b>Total</b>      | <b>183</b>           | <b>175</b> | <b>358</b> | <b>32</b>           | <b>26</b> | <b>58</b> | <b>0</b>     | <b>0</b> | <b>0</b> | <b>416</b> |

45.7% of the Children who belonged to Islam, 34.7% and 9.8% of Christianity and Hinduism respectively were Partially Immunized. (Table 3)

**Table-3: Distributions based on religion and immunization status.**

| Religion     | Completely immunized | Partial immunized | Unimmunized | Total      |
|--------------|----------------------|-------------------|-------------|------------|
| Hindu        | 324                  | 34                | 0           | 358        |
| Christian    | 15                   | 08                | 0           | 23         |
| Muslim       | 19                   | 16                | 0           | 35         |
| <b>Total</b> | <b>358</b>           | <b>58</b>         | <b>0</b>    | <b>416</b> |

**Table-4: Distribution of Children according to Literacy Status of the Mother and Immunization status.**

| Socio-economic status | Immunization status           |                              | Total      |
|-----------------------|-------------------------------|------------------------------|------------|
|                       | Completely immunized<br>n (%) | Partially immunized<br>n (%) |            |
| Illiterate            | 29 (60.4)                     | 19(39.6)                     | 48         |
| Class 1-5             | 24(66.6)                      | 12(33.4)                     | 36         |
| Class 6-7             | 33(70.2)                      | 14(29.8)                     | 47         |
| Class 8-10            | 103(91.6)                     | 09(8.4)                      | 112        |
| PUC                   | 114(97.4)                     | 03(2.6)                      | 117        |
| Graduate and Above    | 55(98.2)                      | 01(1.8)                      | 56         |
| <b>Total</b>          | <b>358</b>                    | <b>58</b>                    | <b>416</b> |

Table 4 shows that as the education status of the mother who was interviewed increases, there was higher proportion of their children being completely immunized. More than 90% of the children of the mothers who had educational qualification of 8<sup>th</sup> Class or more were completely immunized. So children who were partially immunized belonged to the mothers who had studied only up to primary and secondary schools.

**Table-5: Distribution of Children according to Socio-economic status and Immunization status.**

| Socio-economic status | Immunization status           |                         | Total      |
|-----------------------|-------------------------------|-------------------------|------------|
|                       | Completely Immunized<br>n (%) | Partially Immunizedn(%) |            |
| Lower                 | 9 (64.2)                      | 5(35.8)                 | 14         |
| Upper Lower           | 81(81.8)                      | 18(18.2)                | 99         |
| Lower Middle          | 176(90.7)                     | 18(9.3)                 | 194        |
| Upper Middle          | 92(84.4)                      | 17(16.6)                | 109        |
| <b>Total</b>          | <b>358</b>                    | <b>58</b>               | <b>416</b> |

Social class plays an important role in getting their children Immunized. As you see in the Table 5 Families who belonged to Upper lower and Middle class got their Children Completely Immunized.

**Table-6: Reasons for Partial Immunization.**

| Reasons for partial immunization          | Number    | Percentage |
|---|-----------|------------|
| Current illness                           | 20        | 34.2       |
| Fear of side effects                      | 12        | 20.6       |
| Unaware of need                           | 4         | 6.8        |
| Lack of faith                             | 9         | 15.5       |
| Time and place not known/<br>inconvenient | 13        | 22.4       |
| <b>Total</b>                              | <b>58</b> | <b>100</b> |

The mothers who were interviewed quoted the above reasons for partial immunization. The main reasons quoted were Current Illness for the Child, Time and Place not known followed by Fear of Side Effects (Table 6).

## Discussion

This study was done to assess the immunization status of anganwadi children in a rural area of Karnataka. In this study, 51.6 % of children were boys and 48.4 % of were girls. In the study by Mandal GC et al 49.20 % of children were boys and 50.79 % were girls [11]. In the study conducted by Deshmukh PR et al in under six children 52% of were male and 48% of were female[12].

There was not much difference in the immunization status between the gender of the child in this study. Similar results were found in another study at Delhi by Kar M, et al which reported that the sex of the child did not affect significantly the immunization of the child[13]. Similar finding of no significant association between gender and immunization cover-age was found

in other studies as well [14,15]. This might be due to better knowledge and higher literacy rate of population residing in our area.

Children whose mothers had higher education level (who had studied class 8 or more) showed higher percentage for Complete immunization which was significant. Similar finding showing a positive correlation between maternal education status and complete immunization status of child was reported by Mathews in a review study [16]. In the present study, partial immunization rate was higher among lower socioeconomic class. Similarly, a study conducted in Turkey, found differences in full immunization vaccination coverage among different socio-economic groups in the districts [17].

The percentage of partially immunized among Muslims was found to be around 45% and among the Christians it was 35% as against 10% among Hindus. Similar results were reflected in a study done by Chaudary et al, only 44% of Muslims were fully immunized [18]. In a study by Malini kar et al, children who were Hindus by religion 69.9% were completely immunized than and among non-hindus 66.7% were completely immunized [19]. The main reasons for partial immunization were Current Illness for the Child, Time and Place not known followed by Fear of Side Effects which were quoted by the mothers during interview.

Similar findings were recorded as the reasons for poor immunization in various studies done in different parts of India [20, 21].

Punith et al. in Bangalore also showed that major reasons for non- acceptance/ discontinuation of immunization were unawareness of the need of immunization or need to return for 2nd or 3rd dose, lack of information about the place of immunization, fear of side reaction etc [22]. Similar findings were observed in the present study. Overall, demand side issues (fear of AEFI, caregiver didn't go for vaccination due to sickness of child etc.) were found more than the supply side issues (i.e. health worker didn't vaccinate due to sickness of child, long waiting time/ inconvenient session time, absence of vaccinator etc.) in the present study which was observed in another study done at Gujarat[23].

**Limitations-** The limitation of the present study was that when the immunization card was not available the required information was based on the history of the mother which would have led to recall bias.

## Conclusion

Out of 416 children, 358 (86%) were completely immunized, 58 (14%) were partially immunized and none was un-immunized. Mothers Education, Socio economic class and Religion significantly influences the immunization coverage. Though the immunization coverage has increased over the last few years in general, the role of Anganwadi and anganwadi worker is immense in achieving higher percentages. Awareness generation campaigns should target the causes for partial immunizations to take the immunization coverage to cent percent. Specific IEC activities (mass media or group based) should be undertaken focusing on need of completing immunization, information about timing and location of future sessions and need to preserve the Thai card (Mother and Child Protection Card). The health workers involved in vaccination should focus on delivering 4 key messages about vaccination to all the mothers at each immunization session which would address the most of the reasons for poor turn out.

## What the present study adds to the existing knowledge?

Immunization coverage of the Urban areas is usually more than the Rural areas because of their access to better and private health care facilities. But the immunization coverage of the surveyed rural areas was more than the national average of 75% as per the new NFHS – 4 survey findings. The main source of vaccination was through Anganwadi Centre and most of the children were enrolled to the anganwadis where they were immunized. Hence the authors conclude by emphasizing the need for strengthening the existing Immunization system through ICDS and incentivizing the efforts of the grass root level workers like ANM, ASHA and Anganwadi Workers.

## Authors Contribution

**Dr. Dhananjaya CD:** The principal investigator was involved in protocol writing and manuscript preparation. **Dr. Sunil BN:** Corresponding author was involved in protocol writing, data collection, data analysis and manuscript editing.

## Recommendations

Organizing such surveys in rural areas once in a year, can help in finding out the problem areas for the poor immunization coverage. Findings of such surveys must be shared with health staff and the follow up action

taken by them must be reviewed. Further based on such surveys, health staff reporting 100% achievement must be incentivised or publicly honored. The reasons for partial/ non immunization are preventable by increased awareness about vaccine preventable disease and strengthening the immunization services.

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## References

1. Park K. Park's Text book of Preventive and Social Medicine. 25 th ed. Jabalpur: m/s Banarasidas Bhanot Publishers; 2019. Chapter 3, Principles of Epidemiology and Epidemiologic Methods; p.61-147.
2. Bland J, Clements CJ. Protecting the world's children: the story of WHO's immunization programme. In World health forum 1998;19 (2):162-173.
3. WHO: Immunization coverage; Media centre factsheet available at: <http://www.who.int/mediacentre/factsheets/fs378/en>. [Last assessed Sep 2018]
4. Kishore J. National health programs of India. 11th ed. New Delhi: Century Publications; 2014. chap 8, Universal Immunization Programme; p. 156-199.
5. Datta S, Jobby A. Nutritional status and immunization coverage of the Anganwadi children in the Urban Training Health Centre of Travancore Medical College, Kollam: Int J Public Health Res. 2016;3(1):27-31.DOI:10.17511/ijphr.2016.i1.05
6. Kapil U. Integrated Child Development Services (ICDS) scheme: a program for holistic development of children in India. Indian J Pediatr. 2002;69 (7):597-601.DOI: <https://doi.org/10.1007/BF02722688>
7. Kumari PBJ, Kamini S, Menon AGG. Factors affecting the knowledge, attitude and adoption of improved practices in health and nutrition of ICDS beneficiaries. Indian J Nutr Diet. 2007;44 (2):140-7.
8. Tandon BN, Gandhi N. Immunization coverage in India for areas served by the Integrated Child Development Services programme. The Integrated Child Development Services Consultants. Bull World Health Organ. 1992;70 (4):461.
9. Government of India. Ministry of health and family welfare. Immunization Handbook for Medical Officers. 2008; P-7.
10. Chaudhary V, Tiwari M, Ghoghare M. Immunization status of 1-5 year old children and factors affecting it: a hospital based study - Pediatr Oncall J. 2015; 12(3): 67-68.DOI: 10.7199/ ped.oncall.2015.54
11. Mandal GC, Bose K, Bisai S. Thinness among rural children in Bengal. Indian J Pediatr. 2009;76 (8):817-9. DOI: 10.1007/s12098-009-0178-y. Epub 2009.
12. Deshmukh PR, Dongre AR, Gupta SS, Garg BS. Newly developed WHO growth standards: implications for demographic surveys and child health programs. Indian J Pediatr. 2007;74 (11):987-90. DOI:10.1007/s12098-007-0181-0
13. Kar M, Reddaiah VP, Kant S. Primary immunization status of children in slum areas of South Delhi-the Challenge of Reaching the urban poor. Indian J Comm Med.2001;26 (3):151-154.
14. Kadri AM, Singh A, Jain S, Mahajan RG, Trivedi A. Study on immunization coverage in urban slums of Ahmedabad city. Health Population: Perspect Issues. 2010;33 (1):50-54.
15. M.M. Angadi, Arun Pulikkottil Jose, Rekha Udgiri, K.A. Masali, and Vijaya Sorganvi. A Study of Knowledge, Attitude and Practices on Immunization of Children in Urban Slums of Bijapur City, Karnataka, India. J Clin Diagn Res. Dec 2013; 7(12): 2803-2806. DOI: 10.7860/JCDR/2013/6565.3763
16. Mathew JL. Inequity in Childhood Immunization in India: A Systematic Review. Indian Pediatr 2012; 49(3): 203-22.
17. Buor D. Mothers' education and childhood mortality in Ghana. Health policy. 2003 1;64 (3):297-309.DOI:doi.org/10.1016/S0168-8510(02)00178-1
18. Chaudhary V, Kumar R, Agarwal VK, Joshi HS, Sharma M. Evaluation of Primary immunization coverage in an urban area of Bareilly city using Cluster Sampling Technique. Nat JInteg ResMed. 2010 1;1(4):10-15.

## Original Research Article

19. Kar M, Reddaiah VP, Kant S. Primary immunization status of children in slum areas of South Delhi-the Challenge of Reaching the urban poor. *Indian J Commun Med.* 2001; 26(3):151-154.
20. Nath B, Singh JV, Awasthi S, Bhushan V, Kumar V, Singh SK. A study on determinants of immunization coverage among 12-23 months old children in urban slums of Lucknow district, India. *Indian Journal of Medical Sci.* 2007; 61(11):598-606.
21. Rafiq MM, Sufoora BM, Masoodi MA. Coverage 77. evaluation survey of immunization programme in hilly and plain area of field practice area of government medical college, Srinagar. *JK Pract.* 2004;11:149-59.
22. Punith K, Lalitha K, Suman G, Pradeep BS, Jayanth Kumar K. Evaluation of primary immunization coverage of infants under universal immunization programme in an urban area of Bangalore city using cluster sampling and lot quality assurance sampling techniques. *Indian J Commun Med.* 2008;33 (3):151-155.DOI: 10.4103/0970-0218.42049
23. Bhatt GS, Mehariya VM, Dave RK, Mahavadiya M, Rana M, Sharma R, Kumar P. Immunization coverage in rural and urban field practice areas of a medical college of Gujarat. *Nat J Comm Med.* 2015; 6 (3):398-404.

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