Original Article

# Immunization coverage in Etawah: A border District of Uttar Pradesh

Singh CM[1], Kaushik A[2], Jain PK[3], Kumar S[4], Srivastava DK[5], Singh NP[6], Chandra S[7], Singh AP[8]

[1]Associate Professor, [2,5]Lecturer, [3]Additional Professor, [4,6]Assistant Professor, Deptt of Community Medicine, [7]Assistant Professor, Deptt of Pathology, UP RIMS&R, Saifai, Etawah, India, [8]Associate Professor, Deptt. of Community Medicine, UCMS, Bhairahawa, Nepal.

**Abstract**

**Research question:** What is the coverage of immunization among children of 12-23 months age group in rural Etawah (a border District of Uttar Pradesh)?

**Objectives:** 1. To assess the immunization coverage among 12-23 months age group children in rural Etawah. 2. To study the association of different socio-demographic factors with utilization of immunization services.

**Study Design:** A community based cross sectional study.

**Setting:** The present study was conducted in Saifai Block of District Etawah.

**Participants:** Two hundred and ten children of 12-23 months were included in the study.

**Results:** The percentage of completely immunized children was found to be 40%. The present study revealed that approximately 79.0% children were immunized against BCG, while the corresponding figure for measles vaccination was just 42.4%. Drop-out rate for complete immunization was 48.1%.

**Conclusion:** Overall coverage of immunization services among children aged 12-23 months was lower than the national figures for rural Etawah. Literacy status of parents was significantly associated with the percentage of fully immunized children and the drop-out rate was also found to be higher among children of illiterate mothers. So there is need and scope of more focused *Information, education* and *communication* efforts towards parents regarding immunization services.

**Keywords:** Immunization, Coverage evaluation.

## Introduction:

The Government of India has been taking steps to strengthen maternal and child health services in India since the inception of planning process in the country i.e. right from the First Five Year Plan (1951-56). Immunization programme is an important key intervention to protect children from life threatening diseases, which are vaccine preventable and include Tuberculosis, Diphtheria, Pertusis, Tetanus, Polio, and Measles[1]. In 1978 Immunization Programme in India was started as Expanded Programme of Immunization. The programme gained momentum in 1985 as Universal Immunization Programme (UIP) and expanded to cover all the districts in the country by 1989- 90 in phased manner. Since, 1992, UIP has been the part of Child Survival and Safe Motherhood Programme. Immunization activities have been an important component of National Reproductive and Child Health Programme since 1997. At present immunization is among the important areas under National Rural Health Mission (NRHM) which was launched in 2005. Under the Immunization Programme Government of India is providing vaccination to prevent six vaccine preventable diseases. The immunization coverage has seen an improvement over the years. However, there is further need for improvement especially in DPT3 & OPV3 coverage and reducing drop outs[1]. Still we have not reached the goal of universal immunization against all vaccine preventable diseases which was to be achieved by 2010, as envisioned in National Population Policy 2000[2]. Further the results of Coverage Evaluation Survey 2009[3] have shown a decline in the percentage of fully immunized children from 62.4% in 2006 to 61.0% in 2009 as compared to CES 2006[4]. Performance of immunization programme in Uttar Pradesh was revealed to be worse than the national level, it is clear from the results of CES 2009, in which it was found that only 40.0% children received complete immunization in the state[3]. District Level Household Survey (DLHS) III[5] results, conducted in 2007-08 have reported still lower percentage of fully immunized children in the state of Uttar Pradesh i.e. 30.3% only. To

**Address for Correspondence:**
Dr. Amit Kaushik, Lecturer
Department of Community Medicine, U.P. RIMS & R, Saifai, Etawah (UP), India.
Email ID: drcmsingh@yahoo.co.in

supplement the national level survey, there is always need of local level data that is why the present study was conducted to find out the immunization coverage in Etawah district in general and Saifai block in particular.

## Objectives:

1. To assess the immunization coverage among 12-23 months children in rural Etawah. (a border District of Uttar Pradesh).
2. To study the association of different socio-demographic factors with utilization of immunization services.

## Material and Methods:

The present cross sectional community based study was carried out to assess the coverage of immunization services among 12-23 months age-group children in Saifai Block of District Etawah which is a border District of Uttar Pradesh. Out of eight Community Development Blocks in Etawah, Saifai Block was selected by Purposive Sampling. Duration of study was from 1 April 2011 to 31 August 2011. The WHO 30 Cluster Sampling methodology[6] was used in the present study to select the villages. The total population of the selected Block was 93,709[7]. Sampling interval was calculated to be 3123 and the selected random number was 2136. A sample of 30 villages was selected by Systematic Random Sampling. In each selected village with random start, a sample of 7 children aged 12-23 months was selected by visiting the continuous households (thus 210 children were selected for study). Information regarding socio-demographic profile of the study subjects like religion, caste, educational status of parents, BPL status of the family and other information related to vaccination status of the child was elicited. The immunization status of the child was noted from the immunization card available with the family, in case if the card was missing the mother of the child or the person who took the child to immunization clinic was interviewed to elicit the required information. The child who had received one dose of BCG, three doses of DPT, three doses of OPV (excluding zero dose of polio vaccine) and one dose of measles vaccine was considered to be completely immunized, partially immunized children were those who were administered some doses of vaccine but immunization was not complete and the not immunized children were those who had not received even a single dose of any vaccine[8].

Formulae used to calculate the drop-out rate for

1. DPT I to DPT III

(No. of children received DPT I - No. of children received DPT III) × 100/ No. of children received DPT I

2. OPV I to OPV III

(No. of children received OPV I - No. of children received OPV III) × 100/ No. of children received OPV I

3. BCG to Measles

(No. of children received BCG - No. of children received Measles) × 100/ No. of children received BCG.

Before the start of main study, pilot testing of the study tool was done by the medical Interns posted in the Department of Community Medicine of the Institute and these Interns were trained beforehand for study purpose. After the pilot study and making necessary changes in the proforma, the main study was started in April, 2011 and data collection was done by the medical Interns already trained. Before the start of study, participants were told about the purpose of study and informed verbal consent was taken. Ethical approval was obtained from the Institutional Ethical Committee of UP RIMS&R, Saifai, Etawah. The children who were found to have mild sickness during the study were linked to Community Health Centre, Saifai to avail health services, while the seriously ill children were referred to UP RIMS&R, Saifai, Etawah. For quality assurance of data on each survey day, in the evening the proforma were checked for completeness, if any information was missed or there was any confusion regarding any particular, the respective household was re-visited on next working day and in addition to this, 10% of the total proforma were cross-checked by the faculty members of the Department of Community Medicine.

The data thus, collected were coded and entered into computer in SPSS version 16 software package worksheet and analyzed accordingly. Percentage distribution and cross-tables were generated. Chi-square Test was applied for drawing inferences.

## Results & Discussion:

**Table: I**
**Socio-demographic profile of study subjects**

| Specifications | Study Subjects | |
|---|---|---|
| **1. Religion** | **No.** | **%** |
| Hindu | 204 | 97.1 |
| Muslim | 6 | 2.9 |
| **2. Caste** | | |
| General | 19 | 9.1 |
| OBC | 107 | 50.9 |
| SC | 84 | 40.0 |
| **3. Mother's Literacy Status** | | |
| Illiterate | 97 | 46.2 |
| Primary | 27 | 12.9 |
| Middle | 50 | 23.8 |
| High School | 16 | 7.6 |
| Intermediate | 12 | 5.7 |
| Graduate & Above | 8 | 3.8 |
| **3. Father's Literacy Status** | | |
| Illiterate | 33 | 15.7 |
| Primary | 23 | 10.9 |
| Middle | 46 | 21.9 |
| High School | 64 | 30.5 |
| Intermediate | 17 | 8.1 |
| Graduate & Above | 27 | 12.9 |
| **4. BPL Status** | | |
| Yes | 55 | 26.2 |
| No | 155 | 73.8 |

Maximum children in the present study belonged to Hindu religion, only six children were Muslim. Majority of the children belonged to other backward class (50.9%), followed by scheduled caste (40.0), only 9.1% belonged to general category. As far as parent's educational status is concerned mothers of maximum children (46.2%) were illiterate, while fathers of 30.5% children were educated up to high school and 15.7% were illiterate. As much as 26.2% of the study subjects belonged to below poverty line family.

**Table-II**
**Vaccines received by 12-23 months children**

| Vaccine | Yes<br>No. (%) | No<br>No. (%) |
|---|---|---|
| BCG | 166 (79.1) | 44 (20.9) |
| Scar (166) | 151/166 (91.0) | 15/166 (9.0) |
| DPT I | 139 (66.2) | 71 (33.8) |
| DPT II | 131 (62.4) | 79 (37.6) |
| DPT III | 112 (53.3) | 98 (46.7) |
| OPV 0 | 110 (52.4) | 100 (47.6) |
| OPV I | 134 (63.8) | 76 (36.2) |
| OPV II | 129 (61.4) | 81 (38.6) |
| OPV III | 113 (53.8) | 97 (46.2) |
| Measles | 89 (42.4) | 121 (57.6) |
| Vitamin A | 78 (37.1) | 132 (62.9) |

Looking at the immunization status of children it was found that only 84 (40.0%) children were completely immunized, 85 (40.5%) were partially immunized, while the corresponding figure for the children who did not receive even a single dose of any vaccine was 41 (19.5%)(Table: III). BCG coverage in the present study was found to be 79.1%, while only 42.4% children were immunized against measles (Table: II). These findings of our study are almost similar to the findings of Coverage evaluation Survey 2009[3] and DLHS III report of Uttar Pradesh[5]. Out of 166 children who were covered with BCG, only 151 (91.0%) had scar mark for the same. The study revealed the drop-out rate for DPT I to DPT III approximately 19.4%, OPV I to OPV III 15.6%, maximum drop-out was found for complete immunization i.e. 48.1% (Table: III). Drop-out rate in our study was found to be higher than reported in Coverage Evaluation Survey 2009[3] and this may be attributed to lower literacy level of population of Etawah[7] as compared to national figures.

**Table III**
**Immunization Status & Drop-out rate**

| Specification | No. (%) |
|---|---|
| **Immunization Status** | |
| Complete Immunization | 84 (40.0) |
| Partial Immunization | 85 (40.5) |
| No Immunization | 41 (19.5) |
| **Drop-out Rate** | |
| DPTI to DPT III | 27 (19.4) |
| OPV I to OPV III | 21 (15.6) |
| BCG to Measles | 77 (48.1) |

**Table: IV**
**Association of immunization status with different socio-demographic characteristics:**

| Specifications | Complete Immunization No. (%) | Partial/ No Immunization No. (%) | Total No. (%) | Statistical Significance |
|---|---|---|---|---|
| **I. Caste** | | | | |
| General | 10 (52.6) | 9 (47.4) | 19 (100) | $\chi^2$ =2.50 |
| OBC | 45 (42.1) | 62 (57.9) | 107 (100) | *d.f.=2* |
| SC | 29 (34.5) | 55 (65.5) | 84 (100) | *p*=0.28 |
| **II. Mother's Literacy Status** | | | | $\chi^2$ =9.31 |
| Illiterate | 28 (28.9) | 69 (71.1) | 97 (100) | *d.f.=1* |
| Literate | 56 (49.6) | 57 (50.4) | 113 (100) | *p*=0.002 |
| **III. Father's Literacy Status** | | | | |
| Illiterate | 8 (24.2) | 25 (75.8) | 33 (100) | |
| Primary | 8 (34.8) | 25 (65.2) | 23 (100) | $\chi^2$ =13.86 |
| Middle | 13 (28.3) | 33 (71.7) | 46 (100) | *d.f.=5* |
| High School | 30 (46.9) | 34 (53.1) | 64 (100) | *p*=0.01 |
| Intermediate | 8 (47.1) | 9 (52.9) | 17 (100) | |
| Graduate & above | 17 (63.0) | 10 (37.0) | 27 (100) | |
| **IV. BPL Status** | | | | |
| Yes | 26 (47.3) | 29 (52.7) | 55 (100) | $\chi^2$ =1.64 |
| No | 58 (37.4) | 97 (62.6) | 155 (100) | *d.f.=1* |
| | | | | *p*=0.2 |

Among general category as much as 52.6% children were fully immunized, the corresponding figure among OBC and SC was found to be 42.1% and 34.5% respectively and the association between caste and fully immunized status was not statistically significant (p=0.28). These findings of the present study i.e. relationship of caste with full immunization are supported by the data of NFHS III[9]. It is clear from table IV that percentage of fully immunized among children of illiterate mothers was about 29%, while approximately 50% children of literate mothers were found to be fully immunized and this association between mother's literacy status and immunization status of children was statistically significant (p=0.002) and these findings of association of mother's educational status with immunization coverage are similar to the findings of NFHS III data[9]. Looking at the association of fully immunized children and literacy status of father, it was found that percentage of children with complete immunization increased as the educational status of father increased except in middle class category where this percentage was lower in comparison to those educated up to primary and this association was found to be statistically significant (p=0.01).

**Table: V**
**Association of drop-outs with different socio-demographic characteristics: (n=89)**

| Specifications | Drop-out | | Total No. (%) | Statistical Significance |
|---|---|---|---|---|
| | Yes No. (%) | No No. (%) | | |
| **I. Caste** | | | | |
| General | 8 (47.1) | 9 (52.9) | 17 (100) | $\chi^2$ =1.69 |
| OBC | 40 (48.8) | 42 (51.2) | 82 (100) | *d.f.=2* |
| SC | 41 (58.6) | 29 (41.4) | 70 (100) | *p*=0.42 |
| **II. Mother's Literacy Status** | | | | $\chi^2$ =4.76 |
| Illiterate | 46 (62.2) | 28 (37.8) | 74 (100) | *d.f.=1* |
| Literate | 43 (45.3) | 52 (54.7) | 95 (100) | *p*=0.02 |
| **III. Father's Literacy Status** | | | | |
| Illiterate | 17 (68.0) | 8 (32.0) | 25 (100) | |
| Primary | 8 (50.0) | 8 (50.0) | 16 (100) | |
| Middle | 21 (61.8) | 13 (38.2) | 34 (100) | $\chi^2$ =5.43 |
| High School | 24 (44.4) | 30 (55.6) | 54 (100) | *d.f.=5* |
| Intermediate | 6 (46.2) | 7 (53.8) | 13 (100) | *p*=0.36 |
| Graduate & above | 13 (48.1) | 14 (51.9) | 27 (100) | |
| **I. BPL Status** | | | | $\chi^2$ =4.75 |
| Yes | 16 (38.1) | 26 (61.9) | 42 (100) | *d.f.=1* |
| No | 73 (57.5) | 54 (42.5) | 127 (100) | *p*=0.03 |

Out of total 210 children 189 were either fully or partially immunized. Association between drop-out and different socio-demographic factors has been seen on these 189 children only. Drop-out rate as evident from table: V was maximum (58.6%) among SC Caste category, followed by OBC (48.8%), while it was least among the children of general category (47.1%) and this association between caste and drop-out rate was not found to be statistically significant. As far as association between mother's literacy status and drop-out rate is concerned among children of illiterate mother it was found to be 62.2%, while the corresponding figure among children of literate mothers was 45.3% and the difference was statistically significant (p=0.02). The study revealed maximum drop-out rate among children of illiterate fathers. The association between BPL status of family and drop-out was found to be statistically significant (p=0.03).

**Table: VI**
**Reasons for partial or no immunization**

| Reason | No. | % |
|---|---|---|
| 1. Not Aware of need for | 72 | 57.1 |
| 2. Lack of information (Place/Time) | 25 | 19.8 |
| 3. Fear/Rumors of Side Effects | 11 | 8.7 |
| 4. Time/place inconvenient | 09 | 7.1 |
| 5. No one to take the child | 04 | 3.3 |
| 6. Child Ill | 02 | 1.6 |
| 7. Session not held | 01 | 0.8 |
| 8. Others | 02 | 1.6 |

Among the reasons for partial immunization or no immunization the most common reason was found to be not aware of need for (57.1%), followed by lack of information about place and time of immunization, while the least common reason was that the immunization session was not held, which was reported by only 0.8% mothers. These findings regarding reasons for partial immunization or no immunization reported in our study are more or less similar to the findings of CES 2009[3].

**Conclusion:** Overall coverage of immunization services among children aged 12-23 months was lower than the national figures for rural Etawah. Literacy status of parents was significantly associated with the percentage of fully immunized children and the drop-out rate was also found to be higher among children of illiterate mothers. So there is need and scope of more focused *Information, education* and *communication* efforts towards parents regarding immunization services.

## References:


1. Annual Report 2010-11. Department of Health and Family Welfare. Ministry of Health & Family Welfare, GOI, p. 71-72.
2. National Population Policy 2000. Available from http://www.mohfw.nic.in/NRHM/Documents/national Population Policy 2000.pdf. Accessed on 10//06/2012.
3. Coverage Evaluation Survey 2009, Available from http://www.unfpa.org/sowmy/resources/docs/library/R309_UNICEF_2010_INDIA_2009CoverageSurvey.pdf. Accessed on 10/06/2012.
4. Coverage Evaluation Survey 2006, Available from http://www.unicef.org/india/Coverage_Evaluation_Survey_2006.pdf. Accessed on 10/06/2012.
5. District Level Household and Facility Survey 2007-08, Fact Sheets Uttar Pradesh. International Institute for Population Sciences, Mumbai. Available from http://www.rchiips.org/pdf/rch3/state/India.pdf. Accessed on 10/06/2012.
6. Stacy HW. Description and comparison of the methods of cluster sampling and lot quality assurance sampling to assess immunization coverage. Available from http://www.who.int/vaccines-documents/DocsPDF01/www592.pdf. Accessed on 10/06/2012.
7. Census of India – Uttar Pradesh (09). Basic Fact Sheet, District Etawah (31). Available from www.censusindia.gov.in/Dist_File/datasheet-0931. pdf, last accessed on September 14, 2011.
8. National Child Survival and Safe Motherhood Programme, Evaluate Service Coverage, MoHFW, GoI, New Delhi, 1992, p.22.
9. International Institute for Population Sciences (IIPS) and Macro International. 2007. *National Family Health Survey (NFHS-3), 2005–06: India: Volume I.* Mumbai: IIPS.P. 229