

## ORIGINAL ARTICLE

**Gender inequalities in immunization of children in a rural population of Barabanki, Uttar Pradesh**Ravindra Ahuja<sup>1</sup>, Ambresh Chand Rajpurohit<sup>2</sup>, Rajat Ahuja<sup>3</sup>Associate Professor<sup>1</sup>, Department of Pediatrics, Hind Institute of Medical Sciences, Barabanki, Uttar Pradesh,Associate Professor<sup>2</sup>, Department of Community Medicine, Hind Institute of Medical Sciences, Barabanki, Uttar Pradesh,Junior Resident<sup>3</sup>, Department of Pediatrics, Era Medical College, Lucknow, Uttar Pradesh.

<a href="#">Abstract</a>	<a href="#">Introduction</a>	<a href="#">Methodology</a>	<a href="#">Results</a>	<a href="#">Conclusion</a>	<a href="#">References</a>	<a href="#">Citation</a>	<a href="#">Tables / Figures</a>
--------------------------	------------------------------	-----------------------------	-------------------------	----------------------------	----------------------------	--------------------------	----------------------------------

**Corresponding Author**

Address for Correspondence: Dr Ravindra Ahuja, Associate Professor, Department of Pediatrics, Hind Institute of Medical Sciences, Barabanki, Uttar Pradesh, India.

E Mail ID: anhbarabanki@gmail.com

**Citation**Ahuja R, Rajpurohit AC, Ahuja R. Gender inequalities in immunization of children in a rural population of Barabanki, Uttar Pradesh. *Ind J Comm Health*. 2014;26(4):370 – 373.**Source of Funding :** Nil **Conflict of Interest:** None declared**Article Cycle****Submission:** 21/07/2014; **Revision:** 22/07/2014; **Acceptance:** 15/10/2014; **Publication:** 15/12/2014**Abstract**

**Background:** There is evidence of inequalities in immunization in India, despite the fact that childhood immunization has been an important part of maternal and child health services since the 1940s [1]. **Objective:** To evaluate the gender inequality in the missed opportunity for immunization in pre-school children in the rural population of Barabanki, Uttar Pradesh, India. **Methods:** This was a cross-sectional study conducted in the rural areas of Barabanki district among the children of 1- 2 years of age. The information was collected on pre-designed questionnaire. A total of 15 villages were covered. A door to door survey was conducted in all the villages. There was 6% non-response due unavailability of mother/father of children. A total of 447 children were included in the study. **Results:** Out of the total children, 50.6% (226/447) were males and 49.4% (221/447) were females. Overall, 49.7% were fully immunized and 20.4% partially immunized. However, 5.8% were having contraindication for immunization. The percentage of fully immunized children was higher among males (54.4%) compared with females (44.8%). However, the percentage of partially immunized was found to be higher among females (21.3%) than males (19.5%). The percentage of contraindication was similar among both male and female children. **Conclusion:** Missed opportunity for immunization can be brought down by creating awareness periodically once in 2 or 3 months for immunization among health personnel.

**Key Words**

Immunization; Missed Opportunities; Pre-School Children

**Introduction**

There is evidence of inequalities in immunization in India, despite the fact that childhood immunization has been an important part of maternal and child health services since the 1940s [1]. Only 44% of infants in India are fully immunized [2] which is much less than the desired goal of achieving 85% coverage. Globally about 20% of children remain unimmunized. Missed opportunities for immunization (MOI) is defined as missing the benefit of getting immunized by the partially or

unimmunized child, during a visit to the health facility for check-up or illness, when there is no particular contraindication for that particular immunization as per the National Policy [3]. The global magnitude of MOI is 0 to 99% [4] and 9-81% in India [5, 6].

The analysis of change over one and half decades (1992–2006) shows considerable variations in child immunization coverage across six geographical regions in India. Urban-rural inequality increased in the west region during 1992–2006 [7].

## Aims & Objectives

The objective of the present study was to evaluate the missed opportunity for immunization in pre-school children in the rural population of Barabanki, Uttar Pradesh, India.

## Material and Methods

**Study design:** This was a cross-sectional study conducted in the villages under Rural Health Training Centre, Satrikh of Hind Institute of Medical Sciences, Barabanki. The study was conducted during the year 2013-14. **Sample size:** In a prior study, the percentage of missed opportunity was 36%7. Based on this finding with 80% power and 5% significance level, the sample size calculated was 369 children of either sex.

**Definitions used for study parameters:** A child who had completed the recommended EPI Immunization schedule of BCG, DPT and OPV (3 doses) and Measles vaccine before one year of age was considered as fully immunized. Partially immunized: A child who was not yet fully immunized (those who had missed any dose of six primary vaccines were labeled as partially immunized). Unimmunized: A child who had not yet received any vaccine for the age, though eligible. Contraindications in general, for all vaccinations were: (a) severe febrile illness requiring hospital admission; and (b) previous untoward reaction to particular vaccine. **Data collection:** The information was collected on pre-designed questionnaire. A total of 22 villages were covered covering all the eligible households. A door to door survey was conducted in all the villages. There was 6% non-response due unavailability of mother/father of children. Mothers were asked about the type of the vaccination received by their children on the basis of age. They were asked to show the immunization card, if available. All the signs and symptoms, if any were noted. The informed consent was taken from mothers of children before enrolling in the study. The data collected was entered in Microsoft Excel computer program. The results are presented in proportions.

## Results

A total of 447 children of age 1-2 years were included in the study. Out of these, 50.6% (226/447) were males and 49.4% (221/447) were females. Overall, 49.7% were fully immunized and 20.4% partially immunized. However, 5.8% children were not

immunized due to contraindication. The percentage of fully immunized children was higher among males (54.4%) compared with females (44.8%). However, the percentage of partially immunized was found to be higher among females (21.3%) than males (19.5%). The percentage of non-immunized due to contraindication was similar among both male and female children [Table 1].

Table 2 presents the immunization status according to demographic profile of parents of child. The majority of the children belonging to Hindu (53.5%) community were fully immunized. The percentage of fully immunized children was lower in scheduled caste (40.8%) than general (52.6%) and backward (50%) castes. There was increasing trend with the education of parents and percentage of fully immunized children.

The reason for non-immunization were unaware of need of immunization (52.8%), unavailability of immunization services at door step (41.7%), place or time of immunization not known (62%), afraid for side effect (13%) and working parents (38.0%). The main reason of partial immunization was child being sick (40.7%) [Table-3].

## Discussion

In the present study, the percentage of fully immunized children was 49.7% which was lower than the findings noted by Kar *et al* [8] (69.3%) and Yadhav *et al* [9] (60.8%) and Prabhakaran *et al* [10] (77.5%). While, Nath *et al* [11], Manjunath and Pareek [12], Bhandari *et al* [13] noted similar percentage of fully immunized children to this study i.e. 44.1%, 50%, and 44.65% respectively. Our findings are higher than those reported by Mathew *et al* (25%) [14], Kumar *et al* [15] (17.84%) and Nirupam *et al* [16] (34.5%).

The percentage of partially immunized children in the present study was 20.4%, similar findings were also observed by Kar *et al* [8] (15.7%) and Prabhakaran *et al* [10] (18.3%). However, Kumar *et al* [12] found 48% of the children assessed in tertiary care hospital of North India were partially immunized which was very high as compared to the present study. The difference in the findings underlines the need of effective and uniform implementation strategy of universal immunization program (UIP) to cover every individual child.

In the present study, 54.4% male children were fully immunized as compared to female children i.e. 44.8% which was similar to the findings of Tiwari and

Kulkarni [17], Kar *et al* [8] and Nirupam *et al* [15]. In a study [18], the lack of knowledge of immunization, ignorance about immunization of child and revisits for the immunization sessions were two main reasons (36.67% each) responsible for partial immunization. In this study, The reason for non-immunization were unaware of need of immunization (52.8%), unavailability of immunization services at door step (41.7%), place or time of immunization not known (62%), afraid for side effect (13%) and working parents (38.0%). However, the main reason of partial immunization was child being sick (40.7%).

A study in Lucknow district of Uttar Pradesh [19] found that the major reasons for failure of immunization were postponing it until another time, child being ill and hence not brought to the centre for immunization, unaware of the need of immunization, place of immunization being too far, no faith in immunization, unaware of the need to return for 2nd and 3rd dose, mother being too busy, fear of side reactions, wrong ideas about immunization, and polio was considered only vaccine, and others.

Among general category as much as 52.6% children were fully immunized, the corresponding figure among OBC and SC was found to be 50% and 40.8% respectively. These findings of the present study i.e. relationship of caste with full immunization are supported by the data of NFHS III [20].

It is clear from table 2 that percentage of fully immunized among children of illiterate mothers was about 21.8% were found to be fully immunized and these findings of association of mother's educational status with immunization coverage are similar to the findings of NFHS III data [20].

## Conclusion

Missed opportunity for immunization can be brought down by improving awareness amongst public as well as health personnel. Intensive IEC activity about immunization i.e. its importance and need, should be conducted focusing on individual level, family level and community level.

## Authors Contribution

All authors have equally contributed in the study.

## References

- Pandey RP, Yazbeck AS. Beyond National Averages for Immunization in India: Income, Gender, and Regional Inequalities. 1999, Pg 5-7.
- National Family Health Survey (NFHS III) 2005-06 Key Findings. Ministry of Health and Family Welfare, Government of India, International Institute for Population Sciences Deonar, Mumbai.
- Muranjan M, Mehta C, Pakhare A. An observational, health service based survey for missed opportunities for immunization. *Indian Pediatr.* 2011 Aug;48(8):633-6. PubMed PMID: 21719943. [[PubMed](#)]
- Hutchins SS, Jansen HA, Robertson SE, Evans P, Kim-Farley RJ. Studies of missed opportunities for immunization in developing and industrialized countries. *Bull World Health Organ.* 1993;71(5):549-60. PubMed PMID: 8261558; PubMed Central PMCID: PMC2393481. [[PubMed](#)]
- Nirupama S, Chandra R, Srivastava VK. A survey of missed opportunities for immunization in Lucknow. *Indian Pediatr.* 1992;29:29-32.
- Mitra J, Manna A. An assessment of missed opportunities for immunization in children and pregnant women attending different health facilities of a state hospital. *Indian J Public Health.* 1997 Jan-Mar;41(1):31-2. PubMed PMID: 9567524. [[PubMed](#)]
- Singh PK. Trends in child immunization across geographical regions in India: focus on urban-rural and gender differentials. *PLoS One.* 2013 Sep 4;8(9):e73102. doi: 10.1371/journal.pone.0073102. eCollection 2013. PubMed PMID: 24023816; PubMed Central PMCID: PMC3762848. [[PubMed](#)]
- Kar M, Reddaiah VP, Kant S. Primary Immunization Status of Children in Slum Areas of South Delhi - The Challenge of Reaching Urban Poor. *Indian J Community Med* 2001;26(3):151-4.
- Yadhav RJ, Singh P. Immunization status of children and mothers in the state of Madhya Pradesh. *Indian J Community Med* 2004;29(3):147-8.
- Nair TN, Varughese E. Immunization coverage of infants--rural-urban difference in Kerala. *Indian Pediatr.* 1994 Feb;31(2):139-43. PubMed PMID: 7875836. [[PubMed](#)]
- 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 J Med Sci.* 2007 Nov;61(11):598-606. PubMed PMID: 18025746. [[PubMed](#)]
- Manjunath U, Pareek RP. Maternal knowledge and perceptions about the routine immunization programme--a study in a semiurban area in Rajasthan. *Indian J Med Sci.* 2003 Apr;57(4):158-63. PubMed PMID: 14510348. [[PubMed](#)]
- Bhandari B, Mandowara SL, Gupta GK. Evaluation of vaccination coverage. *Indian J Pediatr.* 1990 Mar-Apr;57(2):197-201. PubMed PMID: 2246016. [[PubMed](#)]
- Mathew JL, Babbar H, Yadav S. Reasons for non-immunization of children in an urban, low income group in North India. *Trop Doct.* 2002 Jul;32(3):135-8. PubMed PMID: 12139150. [[PubMed](#)]
- 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. PubMed PMID: 20635642; PubMed Central PMCID: PMC2980896. [[PubMed](#)]
- Nirupam S, Chandra R, Srivastava VK. Sex bias in immunization coverage in an urban area of U.P. *Indian*

- Pediatr. 1990 Apr;27(4):338-41. PubMed PMID: 2210819. [\[PubMed\]](#)
17. Tiwari RR, Kulkarni PN. Delayed immunization against vaccine preventable diseases--factors responsible among children under 5 years of age. Indian J Med Sci. 1999 May;53(5):212-5. PubMed PMID: 10695231. [\[PubMed\]](#)
18. Wadgave HV, Pore PD. Missed opportunities of immunization in under-fives in adopted area of Urban Health Centre. Ann Trop Med Public Health 2012;5(5):436-40
19. Vohra R, Vohra A, Bhardwaj P, Srivastava JP, Gupta P. Reasons for failure of immunization: A cross-sectional study among 12-23-month-old children of Lucknow, India. Adv Biomed Res. 2013 Jul 30;2:71. doi: 10.4103/2277-9175.115809. eCollection 2013. PubMed PMID: 24223386; PubMed Central PMCID: PMC3814854. [\[PubMed\]](#)
20. International Institute for Population Sciences (UPS) and Macro International. 2007. National Family Health Survey (NFHS-3), 2005-06: India: Volume I. Mumbai: UPS.P. 229.

## Tables

**TABLE 1 MISSED OPPORTUNITY FOR IMMUNIZATION AMONG CHILDREN BETWEEN 1-2 YEARS OF AGE**

	Male (n=226)		Female (n=221)		Total (n=447)	
	No.	%	No.	%	No.	%
Fully immunized	123	54.4	99	44.8	222	49.7
Partially immunized	44	19.5	47	21.3	91	20.4
Unimmunized	46	20.3	62	28.0	108	24.1
Contraindication	13	5.8	13	5.9	26	5.8

**TABLE 2 IMMUNIZATION STATUS ACCORDING TO DEMOGRAPHIC PROFILE OF PARENTS OF CHILD**

	Interviewed (n=447)		Fully immunized		Partially immunized		Unimmunized		Contraindication	
	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Religion</b>										
Hindu	372	83.2	199	53.5	81	21.8	81	21.8	11	3.0
Muslim	75	16.8	23	30.7	10	13.3	27	36.0	15	20.0
<b>Caste</b>										
General	213	47.7	112	52.6	45	21.1	46	21.6	10	4.7
Backward	158	35.3	79	50.0	33	20.9	34	21.5	12	7.6
Scheduled	76	17.0	31	40.8	13	17.1	28	36.8	4	5.3
<b>Maternal education</b>										
Illiterate	101	22.6	22	21.8	34	33.7	36	35.6	9	8.9
Primary	97	21.7	31	32.0	28	28.9	31	32.0	7	7.2
Upto middle	83	18.6	37	44.6	23	27.7	18	21.7	5	6.0
High school to intermediate	75	16.8	55	73.3	3	4.0	14	18.7	3	4.0
Graduate & above	91	20.4	77	84.6	3	3.3	9	9.9	2	2.2
<b>Education of father</b>										
Illiterate	86	19.2	19	22.1	29	33.7	33	38.4	5	5.8
Primary	90	20.1	33	36.7	24	26.7	29	32.2	4	4.4
Upto middle	87	19.5	37	42.5	21	24.1	22	25.3	7	8.0
High school to intermediate	76	17.0	45	59.2	10	13.2	17	22.4	4	5.3
Graduate & above	108	24.2	88	81.5	7	6.5	7	6.5	6	5.6
<b>Birth order of child</b>										
1	185	41.4	110	59.5	43	23.2	22	11.9	10	5.4
2	153	34.2	67	43.8	34	22.2	43	28.1	9	5.9
3+	109	24.4	45	41.3	14	12.8	43	39.4	7	6.4

**TABLE 3 REASONS FOR NON-IMMUNIZATION AND PARTIAL IMMUNIZATION**

Reasons	No.	%
<b>Reasons for non-immunization*</b>		<b>n=108</b>
Unaware of need of immunization	57	52.8
Unavailability of immunization services at door step	45	41.7
Place or time of vaccination not known	67	62.0
Afraid for side effect	14	13.0
Working parents	42	38.9
<b>Reasons for partial immunization*</b>		<b>n=91</b>
Went outside during session	28	30.8
Sick child	37	40.7
Vaccine was not available	11	12.1
Working parents	14	15.4
Not aware of need	12	13.2
Session too far	16	17.6