

## Coverage and Quality of Immunization Services in Rural Chandigarh

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The present study assessed the coverage and quality of immunization services for children aged 12-23 months and mothers who delivered a baby in last one year in rural areas of Chandigarh. Two hundred ten children and 210 mothers were enrolled. 69% of children were fully immunized, 15% were partially immunized and 16% were unimmunized. Among mothers, 79% were fully immunized, 11% partially immunized and 10% were unimmunized. Weaknesses in quality were lack of planning any specific strategy, and inadequate verbal reminder for the appointment.

**Key words:** Immunization, Quality, Equity, Coverage.

Immunization averts between 2 and 3 million deaths each year globally [1]. In India, immunization services are offered free in public health facilities but the coverage still remains low. According to the National Family Health Survey (NFHS-3), only 44% of 1 to 2 years old children had received the basic immunization, which is much less than the desired goal of achieving 85% coverage [2]. This emphasizes the continuing need of coverage assessment surveys with a focus on quality of the health services. To enhance the coverage of routine immunization, it is crucial that shortcomings in the quality of routine vaccination services are addressed, and quality of immunization services is monitored [3]. The present study was planned with the objective of assessing the immunization coverage levels and the quality of immunization services among children aged 12-23 months and mothers who delivered a baby in last 1 year in rural Chandigarh.

### METHODS

This population based cross sectional coverage assessment was conducted during October 2010 to February 2011 in all 24 villages under the Union Territory of Chandigarh. Subsequently, a cross sectional survey was conducted in 10 randomly selected sub-centers (out of 19) quality assessment, for immunization service. Standard 30 by 7 cluster sampling technique devised by WHO was adopted to assess the levels of immunization of children and pregnant mothers [4]. Child and mother immunization coverage performa was used [5].

Children's immunization status was classified as immunized or not, based on the immunization card [6]. A

child who has received three doses of DPT and OPV vaccine and one dose each of BCG and Measles vaccine was considered '*Fully Immunized*'. A child who missed any one or more of the above doses was labelled '*Partially Immunized*'. A child who did not receive even a single dose of any of the above vaccine was labeled '*Unimmunized*'. Hepatitis B status was not considered while calculating the coverage rates. The drop out rate was defined as:

$$\frac{(\text{No. received the 1}^{\text{st}} \text{ dose} - \text{No. received the last dose of the vaccine})}{\text{No. received the 1}^{\text{st}} \text{ dose of the vaccine}} \times 100$$

For mothers, immunization cards and recall were used to get requisite information. Full immunization was defined when a primigravida had received both the doses of TT or a multigravida had received single dose of TT, if the second/subsequent pregnancy occurred within 3 years. Partial Immunization was defined when a primigravida had received only one dose of TT or a multigravida had received one dose of TT but had the previous pregnancy more than 3 years back. Mothers who did not receive even single dose of TT were labeled as unimmunized. Along with the TT coverage, other aspects of antenatal care (ANC) evaluated were: iron and folic acid tablets, 3 antenatal check-ups, and place of delivery.

Based on the information given in immunization modules of WHO, a quality assessment performa was devised [7]. Nine domains were included in the proforma. The proforma included: (i) observations, and (ii) responses given by the health workers to the questions posed by the investigator. Of these, 5-6 domains were similar to the domains included in the study by

Streefland, *et al.* [3] (**Web Table I**). Some of other domains like side effects, registration of the eligible children were included as sub-components in our study [3]. The sub-centers were visited on Wednesdays and Saturdays (immunizations days).

## RESULTS

Information on 210 children was collected while 17 children were excluded from the study as their records were not available. The overall coverage for various vaccines for children was BCG-81.2%; DPT-75.2%; OPV-75.2%; Hepatitis B-18.1% and Measles-69%. Dropout rates were 7.4%, 7.2%, and 15.6% for DPT, OPV, and Hepatitis-B, respectively. Overall, 69% of children were fully immunized, 15% were partially immunized and 16% were unimmunized. Majority (79%) of the pregnant mothers were fully immunized. 11.4% were partially immunized and 9.5% were unimmunized.

Most (95%) of the mothers received at least one ANC visit and 44% received three or more ANC visits. Most (85%) of women were without ANC cards. Source of ANC was government hospital in 92.4%, and private hospital in 5.7%. Majority (62%) of the women had their first pregnancy below the age of 20. Place of delivery was government hospital in 63.8%, private hospital in 10.4% and home in 25.7% of the deliveries. Only 29.7% of the home deliveries were attended by the trained dais. Most (80.4%) of the women were provided with iron and folic acid tablets at the time of ANC check-ups.

Quality of immunization services is shown in **Table I**. None of the sub-centers had any specific strategy to cover the migrants. Except for one, list of the pregnant mothers and under five children was maintained in all the sub-centers. Meeting for planning of the immunization activity before the start of the session was held at only two sub-centers. None of the health workers made any calculations regarding the number of vials required during each session. All the sub-centers except one had ice lined refrigerator (ILR) for the storage of vaccines. Temperature of the ILR was monitored twice a day and placements of the vials in the ILR were found to be correct in all the sub-centers. Only four auxiliary nurse midwives (ANMs) knew about the maximum number of vials that can be kept in a vaccine carrier. No sub-center had alternate storage system at the time of defrosting/power failure. Direct exposure to sunlight of the vaccination area was not found in any of the sub-centers. Freeze sensitive vaccines were checked by the shake test and freezing was not reported in any of the sub-centers. Health workers at all the sub-centers checked the vaccine vial marker (VVM) and expiry date of the vaccines before reconstituting or injecting the vaccine. All the ANMs had a clear idea about the right time to discard the reconstituted vaccines. Labels, expiry date and VVMs were found to be correct in all the sub-centers. Eight out of ten ANMs were found to have the correct knowledge about the indications and contraindications of the vaccines. Emergency kit to handle the life threatening conditions was available in only five sub-centers.

**TABLE I** QUALITY OF THE IMMUNIZATION SERVICES AT SUB-CENTERS

Sub-center	Domains of Immunization services								
	Plann- ing(11)	Suppl- ies(3)	Storage of vaccines (12)	Work Organi- zation (21)	Location of Sub- center	Vaccin- ation Techniq- ue(34)	Record keeping (4)	Commun- ication (6)	Conclud- ing the session (5)
Dhanas	3	3	12	13	3	20	2	1	5
Khudda lahora	2	3	9	7	4	20	2	1	5
Sarangpur	3	1	4	14	4	19	3	2	5
Maloya	1	3	10	14	4	25	1	1	5
Khajeri	3	3	11	13	4	30.5	2	3	5
Hallomajra	2	3	10	11	4	29.5	2	1	5
Behlana	2	3	10	17	4	29	2	2	5
Maulijagran	6	3	9	17	4	31.5	2	3	5
Raipur kalan	4	3	10	17	2	19	4	3	5
Daria	4	3	11	12	4	19.5	1	1	5
Average	3	2.8	9.6	13.5	3.9	24.3	2	1.8	5

Figures in brackets imply maximum attainable score for respective activity.

Practice of washing the hands before reconstituting the vaccine and after injecting the patient was noticed in only seven sub-centers. Working sterilization equipments; availability of cleaning materials like soap, towel and water; and adequate ventilation of workup area were present in all the sub-centers except one. Needle cutter to destroy the used needles and syringes were available in all the sub-centers. Seven sub-centers had the waiting area for the patients. Eight sub-centers had a separate gate for the entry and exit of the patients. Seven sub-centers had a separate space for screening and registration of the patient. Five sub-centers had a separate space for the services other than immunization. Working area was found to be well organized in six sub-centers. Out of the 10 sub-centers visited, physical presence of the supervisor was verified in the seven sub-centers.

Eight out of ten ANMs marked the next immunization dates on the cards. Parents were informed verbally about the next immunization date, time and place by only two workers. Purpose of the vaccination was explained by only one ANM. Only two ANMs explained the parents the possible side effects of the vaccines. Rapport/way of talking with the patients was good in all the sub-centers. Completion of the tally sheets and taking care of the remaining vaccines at the end of the session was observed. Waste generated at the end of the immunization session was properly disposed off in all sub-centers.

## DISCUSSION

We found the immunization coverage to be unsatisfactory. Evaluation of the quality of the immunization services at the sub-centers revealed poor planning, work organization, record keeping and communication. These poor scores reflect unsatisfactory work culture and attitude among health workers. This also implies that there is a lack of professional approach among the health workers towards their duties. Planning was found to be deficient among health workers when immunization services were observed by the investigator. Other reasons for low immunization coverage were absence of outreach sessions to cater to migrant populations, and lack of proper follow-ups. Although the coverage rates of present study were higher than the Midline RCH report 2009 (61%) [8] and the NFHS-3 report [2], such results are not acceptable in a city like Chandigarh where there is no problem of access. Some other studies in last decade conducted in different parts of India also reported a coverage rate of 69-83% [9-11].

To improve immunization coverage adequate planning and adequate supervision is required. Improvement can also be achieved by better follow-up to

reduce the dropout rates. Efforts should be made to educate the mothers about the importance of immunization by organizing information, education and communication (IEC) activities. The district health authority should conduct frequent outreach camps in underserved areas and give emphasis on immunization of eligible population. Efforts should be intensified to ensure complete immunization in slums and rural areas.

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