STUDY THE STATUS OF IMMUNIZATION OF CHILDREN IN URBAN AREA OF ROHTAK CITY IN HARYANA

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ABSTRACT
Immunisation is one of the most powerful and cost effective of all health interventions. The contribution of immunization is especially critical in achieving the goal to reduce deaths among children fewer than five years of age. Today, more children are being immunized than ever before and an increasing number of new vaccines are being made available to protect children, adolescents and adults against life-threatening diseases. Aims and objectives were to study the immunisation status of 12 – 23 month old children in urban area of Rohtak city in Haryana. The study was conducted in urban area of Rohtak having population of 2, 86,807. Coverage evaluation survey in the area was conducted according to the 30 cluster sampling technique. 7 children aged 12-23 months were selected from each of the selected cluster. A pre-designed, semi-structured, pretested questionnaire regarding history of vaccination and different factors affecting the vaccination was used. The study spanned over a period of 1 year beginning from July 2011. Data was collected and appropriate statistical tests were applied for analysis. Out of the total of 213 study subjects, 120(56.3%) were males and the rest 93 (43.7%) were females. Majority of children 177 (83.1%) were fully immunised, whereas, only1 (0.5%) child was not immunised at all. However the percentage of partially immunized children was 35(16.4%). Immunization card was not available with more than half (54.9%) of the study subjects, whereas, it was present with 45.1% of them. The need of the hour is an equitable, participatory and intersectoral approach to health and health care. Provision of vaccination should not be treated as the sole responsibility of the health sector.

Key Words: Immunisation, Coverage Evaluation, Cluster Sampling

INTRODUCTION
Immunization is the process of giving vaccines (vaccination) for the development of body’s protective response. It is one of the most powerful and cost effective of all health interventions. It prevents debilitating illnesses and disability and saves millions of lives every year. The contribution of immunization is especially critical in achieving the goal to reduce deaths among children fewer than five years of age. It is one of the most effective health investments, with proven strategies that make it accessible to even the most hard-to-reach and vulnerable populations. Vaccines have the power not only to save, but also to transform lives – giving children a chance to grow up healthy, go to school and improve their life prospects (Ministry of Family and Health Welfare, 2012).

Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases and is estimated to avert between 2 and 3 million deaths each year in all age groups from diphtheria, tetanus, pertussis (whooping cough) and measles (World Health Organization, 2012). Since 2000, efforts have been scaled up to meet the MDGs and the goals set out in Global immunization vision and strategy (GIVS) (World Health Organization, 2010).

Today, more children are being immunized than ever before and an increasing number of new vaccines are being made available to protect children, adolescents and adults against life-threatening diseases. An estimated 83% of infants worldwide received at least 3 doses of DTP in 2011, similar to coverage in 2009 (82%) and 2010 (85%). Among 194 WHO member states, 130 (67%) achieved ≥90% national DTP3 coverage. More than half of all incompletely vaccinated children (i.e., those who did not receive DTP3)
lived in one of three countries: India (32%), Nigeria (14%), and Indonesia (7%). Strengthening routine immunization services, especially in countries with the greatest number of under-vaccinated children, should be a global priority to help achieve the fourth Millennium Development Goal of reducing mortality among children aged <5 years by two thirds from 1990 to 2015 (World Health Organization, 2010). Every year communicable diseases kill more than 14 million people throughout the world, predominantly in developing countries. At present, measles, pertussis and tetanus, diseases that affect children, are responsible for the majority of disability-adjusted life years lost. Measles accounts for 30 million cases and 888 000 deaths worldwide annually, 85% of them in South-East Asia and Africa. Outbreaks of diphtheria also occur, especially in countries with low vaccination coverage (Prinja et al., 2010). About 29% of deaths in children 1-59 months of age are vaccine preventable (World Health Organization, 2012).

In May 1974, WHO officially launched a global Immunization Programme, known as Expanded Programme of Immunization (EPI) for the prevention and control of six major killer diseases of children namely tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis and measles, all over the world (World Health Organization, 1978). The Government of India on 19th November 1985 renamed EPI programme as “Universal Immunization Programme (UIP)” after modifying the schedule (Suryakantha, 2010). According to District Level Household Survey-3 (DLHS-3) (2007-08), fully immunised children in India were 54% (urban 63.1% and rural 50.4%), and unvaccinated children were 11.4% (urban 7.9% and rural 12.7%). Children who received BCG vaccination were 86.7% (urban 90.4% and rural 85.2%), three doses of DPT were 63.5% (urban 72.2% and rural 60.1%), and children who received three doses of OPV & measles were 66% (urban 73.7% and rural 63.1%) & 69.5% (urban 77.5% and rural 66.5%) respectively (Ministry of Family and Health Welfare, 1989; Park, 2011).

The Coverage Evaluation Survey 2009 (CES-2009), of India, reported that fully immunized children of 12-23 months were 61%. The coverage for BCG was 86.9%, three doses of OPV 70.4%, three doses of DPT 71.5% and for measles 74.1%. The dropout rate was 15% for BCG-Measles, 18% for BCG- DPT 3, 10% for DPT-Measles, 5% for DPT1- DPT2, 9% for DPT2-DPT3, and 13% for DPT1-DPT3 (Joshi et al., 2011).

As per DLHS-3 in Haryana, fully vaccinated children were 63.6% (urban 71.4% & rural 60.8) and unimmunised children were 1.8% (urban 1.6% & rural 1.9%). BCG coverage was 87.1% (urban 90.0% & rural 86%), three doses of DPT coverage was 70.4% (urban 77.3% & rural 67.9%), three doses of OPV coverage was 68.2% (urban74.9% & rural 65.8%) and for measles coverage was73.6% (urban 80.2% & rural 71.2%) (Ministry of Health and Family Welfare, 2008; Ministry of Health and Family Welfare, 2009).

Measles immunization is an indicator of progress towards Millennium Development Goal 4 of reducing child mortality (World Health Organization, 2012) Global measles deaths have decreased by 74% from 535 300 in 2000 to 139 300 in 2010 (World Health Organization, 2012). Moreover, it is estimated that polio eradication will save governments $1.5 billion per year in vaccine, treatment and rehabilitation costs (Ministry of Health and Family Welfare, 2012).

**Aims and Objectives**
To study the immunisation status of 12–23 month old children in urban area of Rohtak city in Haryana.

**MATERIALS AND METHODS**

**Study Area**
The study was conducted in 30 colonies (total 163 colonies) of urban area of Rohtak city having population of 2, 86,807 (as on 31st March 2011) (World Health Organization, 2005). The population of the study area is served by PGIMS Rohtak, one District hospital and 8 urban health posts (Sainipura, Chamanpura, Police lines, Gandhi camp, Housing Board, Kamla Nagar, Shivaji colony and Ekta colony).
running under Department of Community Medicine. In addition, a number of urban health dispensaries and various private practitioners are also serving the population.

**Methodology**

Coverage evaluation survey in the area was conducted according to the 30 cluster sampling technique—the standard methodology for such surveys as devised by W.H.O (World Health Organization, 2001; Ministry of Family and Health Welfare, 1989; Park et al., 2011). Seven children aged 12-23 months were selected from each of the selected cluster. If there were two eligible subjects in any household, both the subjects were enrolled in the study. It was an interview based study and a pre-designed, semi-structured, pretested questionnaire regarding history of vaccination and different factors affecting the vaccination was used. Vaccination cards were used to know the exact time of vaccination and in case cards were not available history from mother/ reliable respondent was taken.

Cluster survey is a two stage cluster sampling. In the first stage, all the colonies in the area were listed serially. Population of each colony was listed and cumulative population was calculated. Sampling interval was calculated by using the formula:

\[
\text{Total cumulative population} / 30 \text{ (cluster)} = \text{Sampling interval}
\]

A four digit random number was selected from the digits of any currency note, which would be equal to or less than the sampling interval. Cluster no 1 was identified by locating the first colony whose population would be equal to or more than the random number selected.

Cluster number 2 was identified by using the formula:

\[
\text{Random number} + \text{sampling interval} = \frac{1}{\text{Cluster number } 2}
\]

In the second stage of cluster survey the first house was selected by going into the selected cluster and according to the following random selection procedure. From the centre of the colony, number of paths was marked, currency note was used and last digit of serial number was taken to decide as to which path is to be taken.

The investigator himself conducted the study by house to house visits and filled the household summary form (Annexure-1). All the study subjects were fully informed about the purpose of the study. Informed consent was taken from the individuals before conducting the interview. Assurance regarding confidentiality was given. Interview was started with general discussion to build up a rapport with the respondents and to gain their confidence.

**Study Period**

The study spanned over a period of one year beginning from July 2011.

**RESULTS AND DISCUSSION**

**Data Analysis**

The data collected was compiled, coded, tabulated and analysed by using SPSS 20 software. Appropriate statistical tests were applied for analysis wherever applicable

**Definitions (Kadri et al., 2010)**

- Fully Immunized child is that who has received one dose of BCG, three doses of DPT and OPV each and one dose of measles before one year of age.
- Partially immunized child is that who has been administered vaccine but immunization is not complete.
- Non immunized child is that who has not been given a single dose of vaccine

**Observations**

- The present study was undertaken in urban area of Rohtak city. 213 children in the age group of 12-23 months were studied from 30 colonies of Rohtak city.
- The study was undertaken to find out the coverage and status of immunization among study subjects. The observations are as follows:
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Table 1: Sex-wise distribution study subject (n=213)

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>120</td>
<td>56.3</td>
</tr>
<tr>
<td>Female</td>
<td>93</td>
<td>43.7</td>
</tr>
</tbody>
</table>

Table 1 shows that 120 (56.3%) out of the total number of study subjects were males and the rest 93 (43.7%) were females.

Table 2: Immunization status of Children between 12-23 months (n=213)

<table>
<thead>
<tr>
<th>Immunization status</th>
<th>Number</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully Immunized</td>
<td>177</td>
<td>83.1</td>
</tr>
<tr>
<td>Partially Immunized</td>
<td>35</td>
<td>16.4</td>
</tr>
<tr>
<td>Non immunized</td>
<td>1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Table 2 and Figure 1 shows the immunisation status of children between 12 – 23 months of age. Majority of children 177 (83.1%) were fully immunised, whereas, only 1 (0.5%) child was not immunised at all. However the percentage of partially immunized children was 35(16.4%).

Table 3: Availability of immunization cards among the study subjects (n=213)

<table>
<thead>
<tr>
<th>Availability of immunization card</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>96</td>
<td>45.1</td>
</tr>
<tr>
<td>No</td>
<td>117</td>
<td>54.9</td>
</tr>
</tbody>
</table>

Figure 1: Bar diagram showing Immunisation status of children between 12 – 24 months (213)
In Table 3 and Figure 2, it was observed that immunization card was not available with more than half (54.9%) of the study subjects, whereas, it was present with 45.1% of them.

Discussion
This study was carried out in 30 colonies in urban area of Rohtak city. The aim of the study was to know the coverage of immunization and antenatal care in these areas. A total of 213 children of age group 12-23 months were studied. Information was collected from study subjects by the investigator himself by house to house visit on a pretested, semi-structured schedule using 30 cluster sampling technique as devised by W.H.O (World health Organization, 2001).

The summary of observations is:
- Out of the total number of study subjects, 56.3% were males and 43.7% were females.
- Immunisation status of children between 12 – 23 months showed that 83.1% of total were fully immunized, 16.4% partially immunized and 0.5 % not immunized at all.
- From among males, 82.5 & 17.5 % were fully and partially immunized respectively. There was no such male who was not immunized. Data among females showed that 83 & 16.4% were fully and partially immunized respectively. Out of total females, 0.5% was such who had never been immunized.
- 45% of study subjects had an immunization card with them, whereas, 54.9% did not.

The coverage for various vaccines in the study area is quite good as compared to national figures (NFHS-3) (World Health Organization, 2001), data from state of world children for 2012 and also some of the studies undertaken in the area, however, it is still less than the national targets. Similar observations were reported by Chhabra et al., (2007) and Punith et al., (2008) and Kumar et al., (2008) in their studies. Chhabra et al., (2007) also found that the importance of keeping immunization cards was even not well understood in urban areas, as cards of around one third (30.1%) of total children could not be traced by them.

In present study, it has been observed that full immunization was less in male children (82.5%) as compared to female children (83.9%) , showing the improving trends of society towards gender discrimination. Kadri et al., (2010) and Punith et al., (2008) also indicated such type of trends in their study in urban slums of Ahmedabad. Though the only non immunized child was a female(1.1%) wherein mother was not having knowledge regarding need and place of immunization.
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Conclusion
The need of the hour is an equitable, participatory and intersectoral approach to health and health care. Provision of vaccination should not be treated as the sole responsibility of the health sector. To reach the goal of 100% coverage of immunisation in India, the policy managers should implement the following:

- Enhance coverage by organizing more sub-national immunization days (SNIDs).
- Spread news to break religious misbeliefs against vaccination.
- Compulsory possession of immunization cards for school admission can be taken as a positive approach towards increasing the level of awareness.
- VPD & AEFI surveillance should be made mandatory and should be carried out under the direct supervision of District Immunization Officer (DIO)
- Some supply side facility enhancement can also improve demand for vaccination. For example, physician and clinic hours might be increased to reduce waiting time of the parents for getting their children immunized or introduction of mobile units in thinly populated areas to minimize travel time of parents to curtail their economic disincentives.
- Higher budgetary allocation for preventive care might improve immunization coverage but only in the short run.

REFERENCES


