A Cross-Sectional Study of Immunization Coverage in Children in Urban Slums of Western Maharashtra

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ABSTRACT

Background: Children in urban slums suffer accentuated vulnerability to illnesses, as outbreaks of vaccine-preventable diseases are more common in urban slums. Though the immunization coverage has been steadily increasing, the average level remains far less, which is 62% (NFHS-4) than the desired coverage (90%).

Objectives: 1) To estimate Immunization coverage in children aged between 12–23 months living in Urban Slum area 2) To study socio-demographic factors influencing immunization coverage & reasons behind missed vaccination.

Material and Methods: A community-based cross-sectional study was conducted from September to December 2018. A sample of 210 children aged 12–23 months was selected using WHO 30 cluster sampling technique from urban slum areas. Data were collected by parent interviews using the pretested questionnaire and checking immunization card.

Results: Out of a total of 210 children studied, 106 were boys, and 104 were girls. BCG, OPV1/Penta1, OPV3/Penta3 and Measles1 immunization was received by 207 (98.6%), 203 (96.7%), 181 (86.2%) and 154 (73.3%) children respectively. Socio-demographic factors like Religion, Birthplace, socio-economic status, mother’s education, Mother’s Occupation were found significantly associated with full immunization coverage. Common reasons for missed immunization were sick child (35%) and unawareness of missed doses (23%).

Conclusion: In urban slum area coverage of full immunization was found only 66.2%, which is though above the national coverage (62%) but still far lower than the expected coverage under Mission Indradhanush (90%). This demands vigorous efforts to improve immunization through IEC, Community Participation and inter-sectoral coordination.

Keywords: Fully immunization, Urban slums, Cluster sampling

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Introduction

In May 1974, the World Health Organization (WHO) launched a global immunization program ‘Expanded Programme of Immunization (EPI)’ to protect children from six vaccine-preventable diseases. EPI was launched in India in January 1978 and further Universal Immunization Programme in November 1985.[1,2] The Government of India launched “Mission Indradhanush” in December 2014 and Intensified Mission Indradhanush (IMI) on October 8, 2017, to achieve full immunization coverage to at least 90% by 2020.[3,4] Though the immunization coverage has been steadily increasing, the average level remains far less than the desired.[4] Still, only 62% of the children in India are fully immunized (NFHS-4), which is much less than the desired goal of achieving 90% coverage.[5] Children in urban slums suffer accentuated vulnerability to illnesses, as outbreaks of vaccine-preventable diseases are more common in urban slums.[6] This study was formulated with the objective of assessing the immunization coverage in the urban slums.

Material and Methods

This is a community based descriptive cross-sectional study conducted from September to December 2018 among the children age 12-23 months residing in urban slums of the Solapur Municipal Corporation area in Western Maharashtra. A sample of 210 children was selected using the WHO 30/7 cluster sampling method.[6] 30 clusters from the study area were identified, and from each cluster, 7 study subjects were taken into the study by a simple random sampling method. Children in the age group of 12–23 months and residing in the study area for at least 6 months and above were included in this study while the children whose parents were not willing to participate were excluded.

Conflict of interest: None

Source of support: Nil

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Entry and Statistical Analysis was done using Microsoft Office Excel 2007, statistical methods like Chi-square test and other appropriate statistical tests of significance.

Slum area- Residential areas where dwellings are unfit for human habitation by reasons of dilapidation, overcrowding, faulty arrangements and design of such buildings, narrowness or faulty arrangement of the street, lack of ventilation, light or sanitation facilities or any combination of these factors which are detrimental to the safety and health.[8]

Fully Immunization- A child is considered fully immunized if the child received one dose each of BCG and measles and three doses of oral polio and pentavalent vaccine before the age of 1 year.[9]

Dropout Rate[9] - Proportion of children who receive one or more vaccinations but do not return for subsequent doses.

eg. Dropout rate Pentavalent1 to Pentavalent3 = Pentavalent1 cumulative total minus Pentavalent3 cumulative total x 100/Pentavalent1 cumulative total.

RESULTS

Out of 210 children, as shown in Table 1, 106 (50.5%) were boys, while 104 (49.5%) were girls. A total of 54.3 and 45.7% of the total children under study were belonging to the Muslim and Hindu communities, respectively. 63.3, 33.3, and 3.3% of children were born in a government hospital, private hospital, and at home. 53.8% of the children belonged to class IV socio-economic status, while 40% in class V and 6.2% in class III according to modified B.G. Prasad classification. Mothers of 9.5% of children were illiterate, and mothers of 23.3% of children were employed somewhere.

Assessing the immunization coverage, as shown in Table 2, out of 210 children, 139 children (66.2%) were found fully immunized. Immunization coverage of BCG vaccine was highest (98.6%) among all the vaccines and measles first dose coverage was the lowest (73.3%). The dropout rate BCG to Measles was 25.6%, and Penta I to Penta III was 10.8%.

Table 3 shows that full immunization was highly significantly associated (p < 0.001) with the religion of child. Fully immunization coverage was significantly higher among children belonging to the Hindu community as compared with children belonging to the Muslim community.

Fully immunization coverage was significantly associated (p = 0.0116) with birth-place of the child. Fully immunization coverage was significantly higher among children born in private hospitals and government hospitals as compared with children born at home.

Mother’s education (p = 0.0019) and mother’s occupation (p = 0.0031) were found significantly associated with fully immunization of her child. Fully immunization coverage was significantly higher in children whose mother was literate as compared with children whose mother was unemployed.

Sex of the child and socio-economic status were not significantly associated with full immunization coverage.

Reasons for Missed Vaccination or No vaccination were asked to the parents of children who are not fully immunized, as shown in Figure 1. The most common reason (35%) was the child was sick when he was due for the immunization. Other common reasons were unawareness of parents about missed doses (23%), concern

Table 1: Socio-demographic characteristics of study children of age 12–23 month

| Groups                | Number | %  |
|-----------------------|--------|----|
| Sex wise distribution |        |    |
| Female                | 104    | 49.5|
| Male                  | 106    | 50.5|
| Total                 | 210    | 100.0|
| Place of birth of child |      |  |
| Govt Hospital         | 133    | 63.3|
| Home                  | 7      | 3.3 |
| Private hospital      | 70     | 33.3|
| Total                 | 210    | 100.0|
| Socio-economic status |        |    |
| III                   | 13     | 6.2 |
| IV                    | 113    | 53.8|
| V                     | 84     | 40.0|
| Total                 | 210    | 100.0|

Table 2: Vaccine wise immunization coverage

| Immunization | Number of children who received the vaccine | Percentage of children who received the vaccine (%) |
|--------------|--------------------------------------------|----------------------------------------------------|
| BCG          | 207                                        | 98.6                                               |
| OPV 1        | 203                                        | 96.7                                               |
| OPV 2        | 190                                        | 90.5                                               |
| OPV 3        | 181                                        | 86.2                                               |
| Pentavalent 1| 203                                        | 96.7                                               |
| Pentavalent 2| 190                                        | 90.5                                               |
| Pentavalent 3| 182                                        | 86.7                                               |
| Measles 1    | 154                                        | 73.3                                               |
| Fully immunization | 139                        | 66.2                                               |
of loss of wages (11%), and unawareness of parents about the need for vaccination (10%).

**Discussion**

A community based descriptive cross-sectional study conducted among the children of age 12-23 months residing in urban slums. Two hundred ten children were assessed for their immunization status.

In the present study, coverage of full immunization was found 66.2%. It is better than the figures as per NFHS4[10] conducted in 2015-16, which was 62%. Also, it is above the coverage found in the study conducted at urban slums of Miraj in 2011 by G M Jatti et al.[10] which was 60.5%. But it is far less than the coverage found in a study conducted in urban slums of Bangalore (94.3%) in 2013 by C Karthik et al.[11] and the study conducted in urban slums of Mumbai (90%) in 2014 by Naresh Gill et al.[12] This variation might be due to the variation of population composition, awareness of parents, availability of health services, and combined effect of socio-demographic factors, which would be adverse for the full immunization achievement in the study area.

In our study, fully immunization coverage was higher in children born in a private hospital (70%) followed by children born in a government hospital (66.9%) and poor coverage in children born due to delivery at home (14.3%). This reflects that the awareness of population and health-seeking nature is for the place of delivery and giving immunization to their children. Similar findings were seen by G M Jatti et al.[10] and Naresh Gill et al.[12].

Mother’s education was found significantly associated with the full immunization achievement by their child in the present study. In children of literate mothers, it was found significantly higher (69.5%) than the children of illiterate mothers (35%). Similar findings were observed by G M Jatti et al.[10] C Karthik et al.,[11] and Naresh Gill et al.[12] This might be due to as with literacy or knowledge, the awareness, health-seeking behavior, and decision-making capacity of parents improves which further improves if the mother is educated.

In the present study, comparably similar fully immunization coverage was seen among boys and girls. Similar findings were also observed in the study of C Karthik et al.[13] and Naresh Gill et al.[12] This might be due to decreased gender discrimination among parents. In the present study, coverage of immunization is seen higher as the socio-economic status increases, though not statistically significant. Similar findings are observed by Naresh Gill et al.[12] but the contrast to findings of the present study was observed by C Karthik et al.,[11] where coverage of immunization was decreased with increase in socio-economic status. This may be due to the influence of other factors like literacy that might be more on the achievement of full immunization. In our study, the most common reasons of missed immunization or no immunization was decreased with increase in socio-economic status. This may be due to the influence of other factors like literacy that might be more on the achievement of full immunization. In our study, the most common reasons of missed immunization or no immunization was decreased with increase in socio-economic status. This may be due to the influence of other factors like literacy that might be more on the achievement of full immunization. In our study, the most common reasons of missed immunization or no immunization was decreased with increase in socio-economic status.

**Conclusion**

In urban slum area, coverage of Fully immunization was found only 66.2%, which is above the national coverage (62%) and also better as compared to coverage in total urban area (63.9%).
but still far lower than the expected (90%). Dropout rate was very much high, showing weak follow up of children for immunization by health workers. Religion, place of birth, mother’s education, and occupation are the prime factors associated with immunization coverage. Sick child (35%), unaware of missed dose (23%), concern of loss of wages(11%) are common causes of missed immunization.

Each and every child must be traced for the immunization by health workers and with the help of RCH portal like software. All sick children should be covered in successive sessions. Health workers should increase door to door visits to form a repo with beneficiaries. Vigorous efforts must be taken to improve immunization through IEC, community participation and inter-sectoral coordination. Activities of Mission Indradhanush should be implemented and well supervised in all slums to find out and vaccinate the unimmunized children.

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