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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% (NFHS4) 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] 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.[4] 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.

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After reaching each selected cluster, we went center of the cluster and then selected the first house according to the following random selection procedure. We numbered the paths leading from the center. Then, using the lottery method, the path was selected accordingly. Next, we counted or closely estimated the number of houses from the center of the ward to the boundary along that path. Then, we selected a random number between 1 and the total number of houses. This represented the first house from which the survey started. The first house and the direction in which an investigator has gone were chosen randomly.

Approval from the ethical committee was taken for the study. An interview-based pretested questionnaire (checklist was previously used by State Family Welfare Bureau, Maharashtra State for assessment of routine immunization[7] was used for data collection. Immunization status of the child was assessed through checking of immunization cards and interviews of parents. Data

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 notreturn 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 23.33% 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 illiterate. Fully immunization coverage was significantly higher in children whose mother was employed 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*	*%*	*Groups*	*Number*	*%*
Sex wise distribution			*Religion of child*		
Female	104	49.5	Hindu	96	45.7
Male	106	50.5	Muslim	114	54.3
Total	210	100.0	Total	210	100.0
Place of birth of child			*Education of mother*		
Govt Hospital	133	63.3	Graduate and above	2	1.0
Home	7	3.3	HSC or diploma	13	6.2
Private hospital	70	33.3	Secondary school	138	65.7
Total	210	100.0	Primary school	37	17.6
Socio-economic status			Illiterate	20	9.5
III	13	6.2	*Occupation of mother*		
IV	113	53.8	Employed	49	23.3
V	84	40.0	Unemployed	161	76.7
Total	210	100.0	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

Table 3: Association of socio-demographic factors and fully immunization coverage

Socio-demographic factors	*Groups*	*Fully immunized*		*Not fully immunized*		*Total*	*χ2 value*	*p-value*
		Number	*%*	*Number*	*%*			
Sex of child	Male	67	63.21	39	36.79%	106	0.851	0.3563
	Female	72	69.23	32	30.77%	104		
Religion	Muslim	60	52.63	54	47.37%	114	20.486	<0.001
	Hindu	79	82.29	17	17.71%	96		
Socio economic status	V	53	63.10	31	36.90%	84	0.599	0.4388
	IV and above	86	68.25	40	31.75%	126		
Place of Birth	Home	1	14.29	6	85.71%	7	8.912	0.0116
	Govt hospital	89	66.92	44	33.08%	133		
	Private hospital	49	70.00	21	30.00%	70		
Mother's education	Illiterate	7	35.00	13	65.00%	20	9.61	0.0019
	Literate	132	69.47	58	30.53%	190		
Mother's occupation	Unemployed	98	60.87	63	39.13%	161	8.729	0.0031
	Employed	41	83.67	8	16.33%	49		

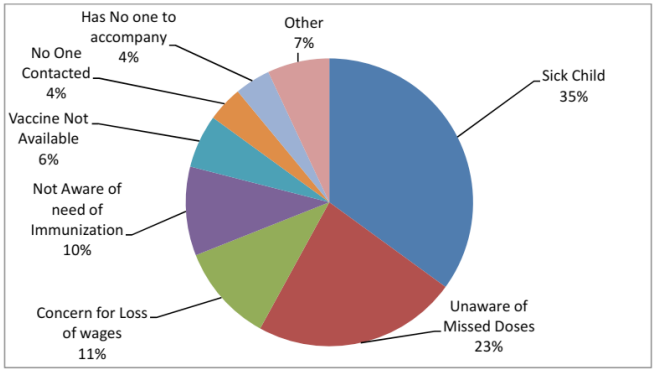

Figure 1: Reasons for Missed Vaccination or No vaccination

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[5] 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*.[11] 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 were sick child at the time of due immunization (35%), unawareness of parents, and concern of loss of wages. In the study of Naresh Gill *et al*.[12] similarly, as present study most common cause observed was a sick child (47.6%). In the study of G M Jatti *et al*.,[10] parent's ignorance was most common cause (40.9%) followed by sick child (27.7%). In the study of C Karthik *et al*.,[11] fear of adverse effects following immunization was the most common cause (50%) of low immunization. In the study of Naresh Gill *et al*.[12] similarly, as present study most common cause observed was sick child (47.6%).

Limitations of study- Composition and facility structure of slums vary from city to city. In the present study slum population of one city is assessed for the immunization coverage, the associated socio-demographic factors and causes of missed immunization. To generalize findings of the present study, wider sample size with the inclusion of a wider study area is needed.

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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References

1. Park K. Text Book of Preventive and Social Medicine. 25th ed. M/s. Banarsidas Bhanot Publishers, Jabalpur; 2019, page. 111,134,475
2. Suryakanta AH. Community Medicine with recent advances.. 4th edition. India: Jaypee Brothers Medical Publishers (P) LTD; 2017. page.833
3. Govt. of India, National Health Portal, Intensified Mission Indradhanush, https://www.nhp.gov.in/mission-indradhanush1_pg
4. Kadri AM, Singh A, Jain S, Mahajan RG, Trivedi A. Study on immunization coverage in urban slums of Ahmedabad city. Health and population: Perspectives and Issues. 2010 Jan;33(1):50-4.
5. Government of India, Ministry of Health & Family Welfare, National Family Health Survey -4, India Factsheet, 2015-16
6. Bennett S, Woods AJ, Liyanage WM, Smith DL. A simplified general method for cluster sample surveys of health in developing countries.
7. State Family Welfare Bureau Pune, Maharashtra State, Guidelines for assessment of full immunization under Routine Immunization, Dated January 20. 2018
8. Census Of India 2011 - Circular No. 8, Registrar General and Census Commissioner, India, Formation and identification of Slum Enumeration Blocks for Slum Demography, No. 9/93/2009-CD(CEN) Dated 20-01-2010, website: www.censusindia.gov.in
9. Ministry of Health and Family Welfare, Government of India, Immunization Handbook for Medical Officers, Nirman Bhawan, New Delhi, India, 2008, page. 7
10. Jatti GM, Bandichhode ST, Nandimath VA, Jadhav SB. An evaluation of primary immunization coverage among 12-23 months old children in an urban area of Western Maharashtra: A community-based study. Indian Journal of Child Health. 2017 Nov 14:85-87.
11. Karthik C, Ranganath TS, Sushmitha P. Assessment of immunization coverage in an urban slum of bangalore city. Asian Pacific Journal of Health Sciencesssssssss. 2015 Dec 30;2(4):15-19.
12. Gill N, Singh R, Mondal A, Jadhav B. Immunization coverage and its associated factors among children residing in project affected population's resettlement colonies in urban slum of Mumbai, Maharashtra, India. International Journal of Community Medicine and Public Health. 2016 Jul;3(7):1783.