

Socio Economic Factors Effecting Immunisation Coverage: Focus Areas.

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ABSTRACT

Background: Universal Immunization Programme aims at completing the primary immunization (Bacillus Calmette–Guérin (BCG), Diphtheria, Pertussis (whooping cough) and Tetanus (DPT)3, Oral polio vaccine (OPV)3, and Measles) for all the children in the country by the time Children become one year old. Despite all the efforts put by governmental as well as non-governmental institutes for 100% immunization coverage, there are still pockets of low coverage areas existing. Socioeconomic Status (SES) is an important determinant of the standard of living and health status as it influences the incidence and prevalence of various health conditions. **Objectives:** Aim of the study was to undertake a comparative study of factors associated with Childhood immunisation at a Village and an urban slum in Pune amongst children of preschool age group. The study intended to compare the factors associated with Childhood immunisation at rural and urban areas in children of preschool age group and to find out reasons for non compliance and drop outs of immunisation, if any. **Material and Methods:** The study was a cross-sectional analytical study. All children in preschool age group (0-60 months) in these areas were included in the study. The mothers/ reliable informants in the family were individually interviewed, using a pre-tested structured questionnaire. A child was categorized as fully immunised, non-immunised, partially immunised and Immunised for Age. **Results & Conclusion:** Coverage of vaccines under UIP at urban & rural communities showed a marked variation. While BCG coverage was 87.7% & 79.8% in the two areas, OPV Zero coverage was 88.7% & 80.8%. Similarly, variation was noted in the coverage of the three doses of OPV/DPT. OPV-1 coverage was 85.8% & 72.4%, DPT-1 coverage was 92.2 % & 71.3 %, OPV-2 coverage was 79.9% & 78.5%, DPT-2 coverage was 80% & 69.4%, OPV-3 coverage was 66.4 % & 61.5 %, DPT-3 coverage was 64.3% & 60 % in urban and rural communities respectively. Measles coverage at urban & rural community was 72.5 % & 64.4 % . In both urban & rural communities there was a significant association between Immunisation coverage & mothers education. In both the communities, the main reason observed was ignorance 35.4% & 45.3% respectively at rural & urban community. Other common reasons include casual attitude of the parents (18.5% in urban area) and sick child (13% in rural area). Socioeconomic status had a great impact on the immunization coverage in the study. The need of the hour is an equitable, participatory and intersectional approach to health and health care. Provision of vaccination should not be treated as the sole responsibility of the health sector. Convergence, De-centralisation, Community participation and Social inclusion is the need of the hour. Intensive Health education should be undertaken to enhance respondents' knowledge about the complete UIP program and to minimize the gaps regarding the knowledge about correct age of administration, doses, place of vaccination. Evidence-based approach to social mobilisation; develop and provide locally sensitive and appropriate and field-tested IEC resources. Focused efforts to strengthen routine immunization programme especially in the underprivileged groups and areas such as slum in cities so that target of universal coverage can be achieved as envisaged at national level.

Key words: Immunisation, Urban, Rural, Comparative, Dropout.

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INTRODUCTION

Children are nature's gift and the fountain of life. They are our future and are a supremely important asset for a nation. The strength of nation lies in the health of citizens. According to the United Nations declaration "the child shall enjoy special protection and shall be given opportunities and facilities by law and order and by means enable him to develop physically and mentally in a healthy and normal manner and in condition of freedom and dignity". Since 1978, the

WHO/UNICEF Expanded Programme on Immunisation has led to steady reductions in childhood mortality from the vaccine preventable diseases both in developed and less-developed nations. Despite all the efforts put by governmental as well as non-governmental institutes for 100% immunization coverage, there are still pockets of low coverage areas existing in India Wealth-based inequalities in health care provision and utilization are endemic to the developing

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world and India is no exception.¹⁻³ A good indicator of accessibility and outreach in the health care sector is the state of childhood immunization. Concerns about equity in health have led to initiatives to collect and analyze data on how health outcomes and services are distributed across social and economic groups. Roughly 3 million children die each year of vaccine preventable diseases (VPDs) with a disproportionate number of these children residing in developing countries. Vaccines remain one of the most cost-effective public health initiatives, yet the cover against VPDs remains far from complete; recent estimates suggest that approximately 34 million children are not completely immunised with almost 98 per cent of them residing in developing countries. India, along with the whole world, stands committed to the welfare of children, as reflected in the theme of 'World Health Day, 2005', viz., 'Make every mother and child count.' About one-quarter, or 25%, of under-5 mortality is due to vaccine-preventable diseases. The Expanded Program on Immunisation (EPI) was launched by the WHO and UNICEF in 1974 globally following the eradication of smallpox with focus on prevention of the six childhood vaccine-preventable diseases by the year 2000. In India, immunisation has always been a central goal of the health care system. Despite only fully protecting about half of all infants, infant mortality rate (IMR) has declined during the phasing in of the UIP. IMR continued to decline after 1990. The Child Survival Safe Motherhood (CSSM) and Reproductive Child Health (RCH) programmes started in 1992 and 1997 respectively. Both of these programmes included the UIP as a key component and built upon the infrastructure developed for the UIP.⁴⁻⁹

Socioeconomic Status (SES) is an important determinant of the standard of living and health status as it influences the incidence and prevalence of various health conditions. Socioeconomic status also influences social security in terms of the accessibility, affordability, acceptability and actual utilization of various health facilities. Wealth-based inequalities in health care provision and utilization are endemic to the developing world and India is no exception. Although immunisation is but one element of public health services, differential achievements between states, rural/urban areas, and socioeconomic groups give important information about where overall health sector policies. The state of child health in urban slums is comparable to those in rural areas and in some cases even worse. This is especially so in immunisation.¹⁰⁻¹⁵

In India, discrimination of girls in both preventive (immunisation) and curative (treatment of illness) care are also reported with varying degrees amongst the states. Index of immunisation and school attendance indicate consistent and sharper sex differences suggesting systematic neglect of girls.

Aims and Objectives

Aim of the study was to undertake a comparative study of factors associated with Childhood immunisation at Village Kasurdi in Pune district and Wanowrie an urban slum in Pune children of preschool age group. The study intended to compare the factors associated with Childhood immunisation at rural and urban areas in children of preschool age group and to find out reasons for non compliance and drop outs of immunisation, if any.

MATERIAL AND METHODS

The study was an cross-sectional analytical study, conducted at Village Kasurdi & Wanowrie an Urban slum in Pune, India. The village has an anganwadi which is manned by an anganwadi worker. Wanowrie is an urban slum under the administrative jurisdiction of Pune Cantonment Board (PCB) with population belonging to poor socio-economic strata. All children in preschool age group (0-60 months) in these areas were included in the study. The total population (100%) of pre-school children (0-60 months) in both these areas were included in the study.

Houses were visited from one direction on each lane/street, taking the house numbers in consideration. The houses visited were marked on the doors and a spot map was also prepared for the area and houses to avoid duplication of data collected from an individual house. In case of a locked house, it was ensured that the house was marked with red in the spot map and was visited later to cover the missed children. A total of 136 children who fulfilled all the criteria required for the study were present in the rural community and all of them were included in the study. At Urban slum a total of 116 children fulfilled the criteria.

The mothers/ reliable informants in the family were individually interviewed, using a pre-tested structured questionnaire. The Questionnaire (schedule) included questions about household identification data, educational status and occupation of the parents, income of the family, utilization of child health services and reasons for non-utilization if any. Immunization coverage was ascertained from information on immunization cards, where these were available, and mother's report where these cards were not available. Age was recorded to the nearest completed months after verifying birth certificates, Aanganwadi registers and informants memory as correlated with any special event or a festival. The Socio economic scales employed in the study was Kuppuswamy's socioeconomic status scale. The scale incorporates three characteristics to be assessed and scored: Education level of the head of family (HOF), occupation of the HOF, and income per month. Each variable is given scoring and based on the rating the socioeconomic scales are categorized into various classes. The living siblings were taken into consideration for the birth order of living children.

A child was categorized as fully immunised if that child has received one dose of BCG, three doses each of DPT and OPV and one dose of measles vaccine by the time of the survey. Child was categorized as non-immunised if that child has received none of these vaccines by the time of the survey. Child was categorized as partially immunised if he has received at least one immunization but has not completed the immunization as per fully immunised status. The study has taken a fourth category as Immunised for Age for those children who have received immunization as per their present age but has not yet completed the entire immunization schedule. The reason for taking this category into consideration was that even if they were immunised for age they might still default in immunization due to various reasons in coming years. During analysis the four Immunisation coverage groups were clubbed into two groups. The fully immunised for age were included as immunisation appropriate whereas Partial & Non immunised children were grouped as Immunisation default.

All children of migrant population visiting their friends and relatives residing in these areas and Children not born in the village Kasurdi and Wanowrie Bazaar were excluded from the study.

RESULTS

Demographic Profile of Urban and Rural Community

The age-wise distribution of children showed that in rural community 28% children were in age group 31 - 40 months and at urban community the predominance was in age groups 10 - 30 months. Both the population showed predominance of male child. 65.45% children in rural and 60.3% in urban communities were male. The distribution as per birth order showed that in rural community 45.6% were in birth order 2 and in urban community 49% were of birth order 1. (Table 1). The educational status of mothers showed that 12.5% women in rural & 4.3% in urban community were uneducated. Only 21.3% women in rural community had education of 10yrs & above. In rural area the major occupation was found to be farming (30.9%) followed by unskilled workers, whereas in urban area skilled workers were predominant (37.1%) . 52% children in

rural community belonged to SES class IV i.e. upper lower class. At urban community 56% belonged to this class. Children in Lower SES class (class IV) were higher at rural community (10.3%) as compared to 4.3% in urban community. (Table 2)

Comparative analysis of Immunisation coverage

The Immunisation coverage at Urban community showed that 65.5% children were fully immunised whereas same at rural community it was 44.9%. The children who were partially immunised were 29.3% & 41.9 % in urban & rural community. 2.6 % children in urban community have not been immunised at all & the same rural community it was 11%. There was clear correlation between Immunisation coverage & domicile, which was statistically significant. (Table 3)

Coverage of vaccines under UIP at urban & rural communities

Coverage of vaccines under UIP at urban & rural communities showed a marked variation. While BCG coverage was 87.7% & 79.8% in the two areas, OPV Zero coverage was 88.7% & 80.8%. Similarly, variation was noted in the coverage of the three doses of OPV/DPT. OPV-1 coverage was 85.8% & 72.4%, DPT-1 coverage was 92.2 % & 71.3 %, OPV-2 coverage was 79.9% & 78.5%, DPT-2 coverage was 80% & 69.4%, OPV-3 coverage was 66.4 % & 61.5 %, DPT-3 coverage was 64.3% & 60 % in urban and rural communities respectively. Measles coverage at urban & rural community was 72.5 % & 64.4 %. Booster dose coverage showed mild variation. While DPT-4 coverage was 60.1% & 54 % in urban and rural areas, DT coverage was 62.1% & 56.2 % respectively.

Gender differential in Immunisation coverage

In Urban community, male children appropriately immunised were 70 % whereas the same for females was 65.2%. In rural community, however, the difference is more marked, with 60.7% male children appropriately immunised, as against only 25.5% female children. The difference among genders in rural area was statistically significant. (Table 4)

Birth order and Immunisation coverage

While in urban community 84.6% of children of birth order >2 were appropriately immunised, only 15.8% of these children in rural area received appropriate immunisation. This was a statistically significant finding (Table 5).

Mother's Literacy and Immunisation Coverage

In both urban & rural communities there was a significant association between Immunisation coverage & mothers education. As the mother's education increased the immunization coverage also improved. (Table 6)

Source of information and Immunisation Coverage

At both the communities the main source of information was the doctors. At rural community, Anganwadi worker (AWW) played a significant role in providing information to the mothers about the immunization. (Table 7)

Reasons for partial Immunisation / Reasons for Non Immunisation of the child

In both the communities, the main reason observed was ignorance 35.4% & 45.3% respectively at rural & urban community. Other common reasons include casual attitude of the parents (18.5% in urban area) and sick child (13% in rural area). (Table 8)

Additional findings

Though a considerable number of respondents had satisfactory knowledge about the Universal immunization programme, respondents' inability to name or identify diseases other than tuberculosis and poliomyelitis was evident at both the communities. There exists a wide gap in the knowledge regarding correct age of administration, doses, place of vaccination. A well established primary health care setup was seen at rural community but no such provision at urban community. The most of medical care was clinic oriented and no urban health post was established in the community or in vicinity for the residents. As most of them were from a low SES & involved in unorganized work sectors, not many were availing the facilities of health insurances.

DISCUSSION

Rural urban difference in immunization coverage has been significant in most of the studies, with favourable outcome in urban areas as compared to rural. The dropout rate for DPT and OPV was also less in urban and semi-urban than in the rural areas. Gender differential was significant in the rural community. A number of studies have drawn attention to the problem of discrimination against the female child. They have shown that immunization coverage of female children is lower than males. Children with birth order <2 had a positive association in having better immunisation coverage as compared to a child with birth order >2.

Various studies have shown the relation of birth order with immunization coverage. The levels of immunization coverage were better in lower birth order as compared to the higher birth orders. There was a significant association between immunisation coverage & mothers education. As the mother's education increased the immunization coverage also improved. As Per NFHS – 3, percentage of children fully immunised born to mothers with no education was only 26.1% as compared to 71% in mothers with education 10yrs & above. Same for BCG was 64.7% & 96.55%, for Measles it was 41% & 86%. Education of women was directly related to the fertility pattern and also to other child-health indicators. Mother's education has shown important influence over child health care choices related to immunisation. This positive effect is purely driven by the knowledge and awareness associated with maternal education.

Table 1: Children as per Birth order

	1	2	3	4	5	TOTAL
Rural	55	62	14	5	0	136
(%)	(40.4)	(45.6)	(10.3)	(3.7)	(0.0)	(100.0)
Urban	57	46	9	3	1	116
(%)	(49.1)	(39.7)	(7.8)	(2.6)	(0.9)	(100.0)
TOTAL	112	108	23	8	1	252
(%)	(44.4)	(42.9)	(9.1)	(3.2)	(0.4)	(100.0)

Table 2: Urban- Rural distribution as per SES

U/R	Lower (V)	Upper Lower (IV)	Lower Middle(III)	Upper Middle (II)	TOTAL
Rural	14	72	46	4	136
(%)	(10.3)	(52.9)	(33.8)	(2.9)	(100.0)
Urban	5	65	41	5	116
(%)	(4.3)	(56.0)	(35.3)	(4.3)	(100.0)
TOTAL	19	137	87	9	252
(%)	(7.5)	(54.4)	(34.5)	(3.6)	(100.0)

Comparative analysis of Immunisation coverage

Table 3: Urban Rural Differences in Immunisation Coverage

	Fully Immunised	Immunised for Age	Not immunised	Partially immunised	TOTAL
Urban (%)	76 (65.5)	3 (2.6)	3 (2.6)	34 (29.3)	116 (100.0)
Rural (%)	61 (44.9)	3 (2.2)	15 (11.0)	57 (41.9)	136 (100.0)
TOTAL (%)	137 (54.4)	6 (2.4)	18 (7.1)	91 (36.1)	252 (100.0)

Chi square: 1021.9; df: 3; p<0.05

Table 4: Gender differential in Immunisation coverage

Sex	Immunisation Appropriate	Immunisation Default	TOTAL
Male (%)	54 (60.7)	35 (39.3)	89 (100.0)
Female (%)	12 (25.5)	35 (74.5)	47 (100.0)
Total (%)	66 (48.5)	70 (51.5)	136 (100.0)

Chi square: 13.83; df: 1; p<0.05

Table 5: Birth order and Immunisation coverage

Immunisation Coverage	Urban			Rural		
	<2	>2	Total	<2	>2	Total
Immunisation Appropriate (%)	68 (66.0)	11 (84.6)	79 (68.1)	63 (53.8)	03 (15.8)	66 (48.5)
Immunisation Default (%)	35 (34.0)	02 (15.4)	37 (31.9)	54 (46.2)	16 (84.2)	70 (51.5)
Total (%)	103 (100.0)	13 (100.0)	116 (100.0)	117 (100.0)	19 (100.0)	136 (100.0)

Table 6: Correlation of Mother's Literacy & Immunisation coverage in urban community.

Mothers Edn	Immunisation Coverage Group		Total
	Immunisation Appropriate	Immunisation Default	
10 yrs & above (%)	39 (72.2)	15 (27.8)	54 (100.0)
8-9 yrs (%)	16 (80.0)	4 (20.0)	20 (100.0)
<8 yrs (%)	22 (59.5)	15 (40.5)	37 (100.0)
No Education (%)	2 (40.0)	3 (60.0)	5 (100.0)
Total (%)	79 (68.1)	37 (31.9)	116 (100.0)

Chi square: 468.8; df: 3; p<0.05

Table 7: Source of information and Immunisation Coverage

	AWW	Comm leaders	Doctors	Media	MSW	Paramed	Family	NIL	Total
Urban (%)	0 (0.0)	04 (3.4)	59 (50.9)	14 (12.1)	18 (15.5)	09 (7.8)	08 (6.9)	04 (3.4)	116 (100.0)
Rural (%)	31 (22.8)	02 (1.5)	49 (36.0)	04 (2.9)	11 (8.1)	13 (9.6)	21 (15)	05 (3.7)	136 (100.0)
TOTAL (%)	31 (12.3)	06 (2.4)	108 (42.9)	18 (7.1)	29 (11.5)	22 (8.7)	29 (11)	09 (3.6)	252 (100.0)

At both the communities the immunization coverage significantly increased as per SES. The main reason observed was ignorance, which was 35.4% & 45.3% respectively at rural & urban community. Other common reasons include casual attitude of the parents (18.5% in urban area) and sick child (13% in rural area). Various studies over the years have suggested a number of causes of low immunisation coverage.

Universal immunization programme to begin with was introduced in every district of the country, and the target was to achieve 100% immunization coverage although technically 85% coverage levels would ensure herd immunity. Vaccination coverage determines the herd immunity being developed in the community to prevent any outbreaks. The immunization coverage found in the rural and urban slum was way below the expected goals and the development of herd immunity in these locations is a question mark. This reiterates the fact that the coverage has to be improved and herd immunity needs to be developed to ensure effective vaccination and prevent vaccine preventable diseases.

A well established primary health care setup is seen at rural community but no such provisions exist on ground at urban communities. The most of medical care is clinic oriented. The recommendations for urban communities to have urban health post still are far from implementation in the area. Is no uniform set of norms for urban health posts? In rural areas, an ANM/AWW visits the village and provides community-based services. This is not true for urban slums. Women have to go to a hospital or dispensary to avail of basic services such as immunisation of their children or antenatal care during pregnancy. As a result the urban poor have to spend time and money in travel to the hospital/dispensary to avail of services. There exists no uniform set of norms for urban health posts. In rural areas, an ANM/AWW visits the village and provides community-based services. This is not true for urban slums. Women have to go to a hospital or dispensary to avail of basic services such as immunisation of their children or antenatal care during pregnancy.

Table 8: Reasons for partial Immunisation / Reasons for Non Immunisation of the child

	Rural (%)	Urban (%)
Ignorance	22.4	29.2
Unaware of need for immunisation	13	16.1
Unaware of need to return for 2nd and 3rd dose	8.3	7.1
Fear of side effects	4.7	2.4
Fear that vaccine would cause the disease	3.5	7.1
Place and time unknown	2.8	3.6
Casual attitude	9.4	18.5
No faith in immunisation	2	1.8
Rumours	0.8	0
Distance from health center	0.8	0
Sick Child	17.7	8.9
Non availability of vaccines	1.6	1.2
Non availability of health care worker	1.6	0
Influence of family and others	4.3	0
Gender discrimination	1.6	1.8
Migration	3.1	0.6
Negative attitude	1.2	0.6
Scarcity of time	1.2	1.2

CONCLUSION

It is a well known fact that immunization is higher for children from urban areas as compared to the rural communities but a striking feature which appeared in the study was that the urban slums who belong to the under-privileged lot in the cities are equally affected and the immunization coverage in this area, though marginally higher than the rural community, still lags to a greater extent. Health education and behavior change communication is an important tool for effective coverage and utilization of health resources.^{16,17} The socioeconomic status which also encompasses the financial condition of the family has a major role in coverage. The lack of knowledge about the immunization drives being organized for free by government at times leads to draining of meager finances by the family on immunization of the child. This in turn at times leads to incomplete, partial or nil immunization in these communities.

The need of the hour is an equitable, participatory and intersectional approach to health and health care. Provision of vaccination should not be treated as the sole responsibility of the health sector. Convergence, De-centralisation, Community participation and Social inclusion is the

need of the hour. Intensive Health education should be undertaken to enhance respondents' knowledge about the complete UIP program and to minimize the gaps regarding the knowledge about correct age of administration, doses, place of vaccination.

Evidence-based approach to social mobilisation; develop and provide locally sensitive and appropriate and field-tested IEC resources. Focused efforts to strengthen routine immunization programme especially in the underprivileged groups and areas such as slum in cities so that target of universal coverage can be achieved as envisaged at national level.

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NIL.

CONFLICT OF INTEREST

There are no conflicts of interest .

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