



## Evaluation of Immunization Status: A Hospital Based Study of 1000 Children at Department of Paediatrics BMC, Vadodara

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### ABSTRACT

**Background:** Despite the Universal Immunization Program, the immunization coverage in country remains unsatisfactory, A wide disparity is seen in the immunization coverage of children at different ages.

**Objectives:** The present study was conducted to know the immunization status of children, up to the age of 5 years, and particularly to evaluate the same with regard to the age of the child.

**Methods:** The present study was carried out as a cross sectional study, between March, 2015 and Nov, 2015 at Department of Paediatrics, Baroda Medical College, Vadodara. A total of 1000 children, aged up to 5 years were included. Immunization status with regard of BCG, OPV, DPT, and measles vaccine given at different time was assessed by interviewing parents & checking immunization cards. An endeavor was also made to know the various factors responsible for incomplete or no immunization through interviewing parents.

**Results:** Over all, number of children with complete, partial and no immunization were 69.6%, 22.6% and 7.8% respectively. A selective pattern is seen, the OPV 1 being the most preferred and measles as the least preferred vaccine.

**Conclusions:** There is need for improving the immunization coverage, particularly for the older children for reducing the burdn of vaccine preventable diseases.

### KEYWORDS

Children, Immunization failure, Drop-out

### INTRODUCTION

Immunization is a proven tool for controlling and even eradicating disease. An immunization campaign, carried out by the World Health Organization (WHO) from 1967 to 1977, eradicated smallpox. Eradication of poliomyelitis is within reach. A successful immunization program is of particular relevance to India, as the country contributes to one-fifth of global under-five mortality with a significant number of deaths attributable to vaccine preventable diseases. There is no doubt that substantial progress has been achieved in India with wider use of vaccines, resulting in prevention of several diseases. However, lot remains to be done and in some situations, progress has not been sustained <sup>(1)</sup>.

A national socio-demographic goal was set up in the National Population Policy 2000 to achieve universal immunization of children against all vaccine-preventable diseases of the childhood by 2010. India records a half million vaccine preventable diseases among kids below age of 5 years. One third of world's unimmunized children live in India <sup>(2)</sup>.

An overwhelming majority of health professionals, medical researchers, and professional medical organizations recommend Immunization. As because, Vaccinations prevent child from getting diseases which can result in serious complications and even death. A small number of people may be susceptible to diseases, such as those with impaired immune systems. These people may not be able to get vaccinations or may not develop immunity even after having been vaccinated. Their only protection against certain diseases is for others to get vaccinated so the illnesses are less common. Getting immunized is costing less than getting treated for the diseases. If exposure to a disease occurs in a community, there is little to no risk of an epidemic if more of the people have been immunized.

The commonest childhood diseases namely: measles, tuberculosis, diphtheria, poliomyelitis, tetanus, whooping cough which are still the major responsible disease for the childhood

mortality and morbidity. Therefore efforts towards achieving healthier childhood days are very critical for every health providers. An assessment of the activities of the immunization programme is therefore vital in realizing the extent to which the immunization service, which is regarded as a child survival intervention, is being utilized by the target population <sup>(3)</sup>.

The coverage of vaccination in India is not complete despite the commitment for universal coverage. According to the National Family Health Survey (NFHS) 3, only 43.5% of children, aged 12–23 months, were completely vaccinated—57.5% in urban areas and 38.6% in rural areas. Reasons for lack of coverage vary from logistic ones to those dependent on human behavior<sup>(4)</sup>. A number of previous studies have explored the reasons for non-immunization but none has been carried out on children admitted to a tertiary-care hospital in Gujarat. Hence, the present study was undertaken to assess the status of immunization and to analyze the various factors responsible for the suboptimal coverage of immunization among patients.

In our society (specifically in lower socioeconomic class) awareness and knowledge about immunization is very much less. So evaluation of practical barrier to immunization is essential. By which we can enhance the awareness and improve catch-up in lot of possible ways

In our study we have included various demographical variables and questionnaire in the form of KAP (Knowledge, Attitude and Practice) to explore the factors responsible for failure of immunization.

### MATERIAL AND METHOD

The study was conducted from March 2015 to Nov 2015 in the Department of pediatrics of Sir Sayajirao Gaekwad Hospital (SSGH), a tertiary level hospital and Government Medical College, Vadodara. It was cross-sectional study in which a total of 1000 patients in the age group of 1 years to 5 years presenting to outdoor patient department as well as indoor

patient department were enrolled on purposive sampling method.

A detailed bio-data of patient including name, age, gender, address, religion, parent's occupation, income and education was taken by oral questionnaire method. The immunization status of the enrolled patients was assessed as per the national immunization programme. Mother was asked about the immunizations received by their children by one year of age, and where possible, this information was verified by cross-checking against the vaccination cards of the children. If the mother was not available or unaware about child immunization status, father was interviewed after the acute phase of illness in the child was over.

A questionnaire containing total of 13 direct questions, classified in the form of KAP (Knowledge, Attitude and Practice) was precisely formed to attain information regarding concept of immunization in community.

**a) Inclusion criteria:**

(1) Patient from 1 year of age to 5 year of age admitted in paediatric ward during study time

(2) Parents who are willing to participate in study.

**b) Exclusion criteria:**

(1) Patient less than 1 year of age and more than 5 year of age admitted in paediatric ward during study time.

(2) Parents who are not willing to participate in study.

**c) Defining the condition:**

(1) Completely Immunized: Children who had received BCG+OPV at birth and three doses of DPT + oral polio vaccine (OPV) and measles vaccine as scheduled in the first year of life were classified as completely immunized.

(2) Partially Immunized: Those who had missed any dose of six primary vaccines were labelled as partially immunized.

(3) Non-Immunized: Those who had not received any vaccine, except OPV in pulse polio immunization, up to 12 months of age, were defined as non-immunized.

(4)Primary education: up to 8th standard.

(5)Migratory person (non-Gujarati) is the person who was recently came to Gujarat from other state for occupation or social purpose in last one year.

**RESULTS & DISSCUTION**

Immunization against common childhood diseases has been an integral component of mother and child health services in India since adoption of primary health care approach in 1978. UIP was introduced by the Government of India in 1985-'86 to cover at least 85% of infants against the six vaccine-preventable diseases by 1990. It was hoped that by the turn of 20th century, coverage of children for vaccination against six VPDs would reach 100%. In the present study, vaccination coverage among children aged 12-60 months reflects that 70% of the children are completely immunized which is less than the desired goal of achieving 85% coverage Out of the total children, 58.4% (584) were males and 41.6% (416) were females. Vaccination card was available for 32 % of children and for the remaining children, it was relied upon recall memory of parents. With regards to type of vaccinations, coverage was highest for BCG and DPT-1 + OPV-1 (86% and 83%) and lowest for measles vaccine (70%). The coverage rate for all the vaccines was slightly higher among males as compared to females though it was found to be statistically insignificant. Even the rate of complete immunization was also slightly higher among males as compared to females, though it was also found to be statistically insignificant. Numbers of non-immunized children were higher in females with statistically significant value (p<0.05).Higher number of non-immunized

females is possibly due to negligence towards female health requirement in rural areas.

According to National fact sheet 2013-14, rate of complete immunization amongst males is 65% and females is 65.7%; while rate of non immunization is 6.5% and 6.6% in males and females respectively. <sup>(19)</sup>

In the study conducted by Kadri AM, Singh A, Jain S, Mahajan R and Trivedi A titled "A study on immunization coverage in urban slums of Ahmedabad city in 2010."The coverage rate for all the vaccines was also slightly higher among males as compared to females but it was found to be statistically insignificant <sup>(15)</sup>which is similar to our study result.

In the study conducted by Agrwal S, Kumari A tilted "Immunization status of children and the influence of social factors: A hospital based study in western Uttar Pradesh in 2013-14" The rates of complete immunization were 45.10% in males against a figure of 31.87% in females, while the male and female coverage was just reversed for partially immunized (41.37 and 51.87% respectively) and non-immunized children (13.10 and 16.25% respectively). <sup>(16)</sup>

In the study by Kumar D, Aggarwal A Gomer S at University College of Medical Sciences and Guru Tegh Bahadur Hospital, New Delhi, in 2007, 17.8% children were completely immunized till one year of age, 48% were partially immunized, and 34.15% were non-immunized. <sup>(17)</sup>

Coverage Evaluation Survey 2009 reveals that left-out children for Immunization and Drop- out is still a major concern for Gujarat. The BCG-MV dropout of 15 % and DPT1-MV Dropout of 10% is a major cause of low coverage of completely immunized children in the state. <sup>(12)</sup> In our study BCG-MV dropout rate is 20 % and DPT1-MV Dropout rate is 16%.

**Table 1 Comparison of Immunization status amongst males and females**

	Male	%	Female	%	Total	P value
Total	584	58.4	416	41.6	1000	
Immuniztion card	210	35.9	106	25.4	316	>0.05
Completlely immunized	416	71.2	280	67.3	696	>0.05
Partially imm.	132	22.6	94	22.9	226	>0.05
Non immunized	28	4.7	50	12	78	<0.05
BCG	504	86.3	360	86.5	864	>0.05
DPT 1 + OPV 1	488	83.5	344	82.6	832	>0.05
DPT 2 + OPV 2	475	81.3	332	79.8	805	>0.05
DPT 3 + OPV 3	464	79.4	324	77.8	788	>0.05
Measels + Vit A	416	71.2	280	67.3	696	>0.05
Drop out rate						
BCG to MV	17.41%		22.09%		19.75%	
BCG to DPT 1	3.42%		4.65%		4.03%	
DPT 1 to MV	14.42%		18.29%		16.35%	
DPT 1 to DPT 2	2.42%		3.41%		2.91%	
DPT 2 to DPT 3	1.23%		3%		2.11%	
DPT 3 to MV	10.12%		12.98%		11.55%	



### Main reasons for the non-immunization are as follows:

1. Did not feel the need of immunization (84%)
2. Financial problem to visit immunization centre (74%)
3. A wrong advice given by someone (69%)
4. Place of the immunization was too far from home (61%)

### Analysis of Performa

In our study Performa we have taken different criterion to assess coverage of immunization according to demographical profile, these variables were adopted from National fact sheet RSOC 2013-14<sup>(19)</sup> and CES-2009<sup>(12)</sup>.

### SUMMARY and CONCLUSION

1. Study was done in SSG Hospital, Baroda during the period of July-2015 to Dec-2015. Total 1000 children were enrolled in our study, out of which 584 were male and 416 were female, 696 children were completely immunized, 78 children were non-immunized, 316 children have immunization card.

2. Overall rate of complete immunization was 69.6 % ( 696), partial immunization was 22.6 % ( 226) and non-immunization was 7.8 % ( 78). Percentage of complete immunized children was almost similar among male and female (71.2 vs. 67.3).

3. 864 children were immunized for birth dose of BCG and OPV-0, while 696 were immunized up to measles.

4. Dropout rate from BCG to MV is 19.75% which is much higher than last CES data (8%), so we need to improve subsequent immunization.

5. Total 636 children were from urban area while 364 were from rural. Percentage of Completely immunized children is significantly higher in urban population, 85% in urban while 46% children in rural area were completely immunized. Non-immunized children are 4% and 14% in urban and rural area respectively. It is essential therefore to put in more efforts in rural area to improve knowledge and develop facilities to improve immunization coverage in these areas.

6. Total 798 children were Gujarati while 202 were non-Gujarati, out of which 75 % ( 602) of Gujarati and 48 % (94) of non-Gujarati were completely immunized, difference was statistically significant. Analysis of KAP shows that knowledge regarding place of immunization is inadequate among non-Gujarati.

7. Total 678 children were Hindu while 332 were non-Hindu, out of which 75 % ( 484) of Hindu 64 % (214) of non Hindu were completely immunized and the difference is statistically significant. Non-immunized children are 3% and 16% in Hindu and non-Hindu respectively. Further study is required to explore the reasons for such a specific difference.

8. Type of family (joint or nuclear) has no significant influence on immunization status of children.

9. Total 634 children were hospital delivered while 366 were home delivered, out of which 80 % (510) of hospital delivered and 50% (186) of home delivered were completely immunized. Non immunized children were 0% and 21% in hospital and home delivered children respectively. Higher rate of complete immunization among hospital deliver children is due to early sensitization of parents at hospital.

10. All of unimmunized children were home delivered and delivered by untrained dai, effort should be made to enhance institutional delivery or knowledge regarding importance of immunization should be imparted during SBA training

11. Birth order and type of delivery have no influence on immunization status.

12. Parents with education qualification more than primary education are better in immunization practice.

### Drop out



### Analysis of KAP (Knowledge, Attitude, Practice)

In our study, on the basis of CES-2009(coverage evaluation survey), we had formulated KAP questionnaire to find out barriers regarding non-immunization as well as partial immunization.

Analysis of KAP (knowledge, attitude and practice) of this study, gave us some important reasons for the failure of immunization.

### These are as follows;

1. Wrong advice given by someone (61%).
2. Sickness of child at the scheduled time (59%)
3. Fear of side effect (57%)
4. Financial problem to visit immunization centre (49%)
5. Lack of knowledge of subsequent immunization (47%)
6. Scheduled time was not convenient (42%)
7. Place of the immunization was too far from home (33%)
8. Services were not available (29%)
9. Did not feel the need of immunization (23%)

In the study conducted by Agrwal S, Kumari A "Immunization status of children and the influence of social factors: A hospital based study in western Uttar Pradesh", the major reasons of immunization failure were; lack of knowledge (37%), forgetfulness(33%), illness of child at scheduled time(25%), place was too far(21%), fear of side effect(14%).<sup>(16)</sup> In the study at Guru Tegh Bahadur hospital, major reasons for failure were; lack of knowledge(30%), fear of side effects (28%), lack of knowledge of subsequent immunization (22%) and lack of faith in effectiveness (21%).<sup>(17)</sup>

13. Those with monthly income more than 10000 are better in immunization practice. 110 parents have monthly income more than 10000. Out of them 102 children was completely immunized and no patient was non-immunized.

14. Reasons for poor immunization were multiple, 61% of partial and non immunized children were not aware of subsequent immunization. Knowledge of subsequent immunization was significantly less in rural population.

15. Wrong advice given by someone is the reason for failure of immunization in 61% of poorly immunized children.

16. Amongst 284 poorly immunized children, 168 children had minor illness at the scheduled time. 59% of poorly immunized children missed their immunization due to some minor illness. The message that minor illness is not a contraindication for the immunization needs to be vigorously propagated amongst health care providers as well as parents to overcome this lacuna.

17. 57% parents had fear of side effects. So among 284 poorly immunized children, 161 parents had fear of side effect.

18. Among poorly immunized children almost 50% of parents have financial problem to visit immunization centre.

19. 42% parents feel that schedule time was not convenient.

20. 33% parents did not go for immunization as because place of the immunization was too far from home, so providing immunization at convenient time and place is very important to overcome this barrier.

21. In 29% poorly immunized children, parents mentioned that immunization services were not available at the scheduled timing at health centre.

22. 23% parents did not feel the need of immunization, which means that they are aware of immunization but they did not consider it as an essential aspect of their child's health.

## RECOMMENDATIONS

On the basis of findings of our study the following recommendations can be proposed.

1. Counseling for immunization should be started from antenatal visit. Effort should be made to enhance institutional delivery and knowledge regarding importance of immunization should be imparted during SBA training

2. Proper counseling should be done about - Knowledge of subsequent immunization on each visit -explain minor side effects in proper manner to alleviate fear of side effects -explain the parents that minor illness is not a contraindication for immunization.

3. Involvement of dharmguru, maulvi and other prominent religious persons to motivate the people for immunization in particular community.

4. Strengthening of I.E.C (Information, Education, Communication) on immunization by mass media, poster and roll play.

5. Improve the accessibility of routine immunization services for migratory population.

6. Place of immunization should be easily approachable.

7. Number of immunization centre should be increased in urban area.

8. There should be a system to provide reminder of immunization to parents.

9. There should at least one visit after 3<sup>rd</sup> dose of DPT at health facility between six to seven month of age to motivate about dose of measles vaccine as well as complementary feeding.

10. There should be active tracking and back tracing for drop outs.

11. There should be availability of low cost transportation to visit immunization centre.

12. More time convenient vaccination sessions should be held for lower socioeconomic class.

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