

## Assessment Of Immunization Status Of 1000 Children Attending Pediatric OPD Of A Teaching Hospital In Ahmedabad

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**Abstract:** Objective: Assessment of immunization status of children attending Pediatric OPD of a tertiary care hospital and the common causes for not giving the vaccines on time. Methods: A cross sectional study was performed with the help of a semi- structured questionnaire. Vaccination status was confirmed referring to the records of immunization available with the mothers. Site and age-specific details of the vaccines administered were also probed to ascertain the vaccine given whenever required. Results: Immunization coverage was 52.7% which was less than the national average of 61%. Coverage was highest for BCG and OPV zero vaccines (94.4%). Significant reductions in the coverage of the first and third doses of DPT, OPV and Hepatitis B vaccine were observed. There was absolutely no coverage of dT/ TT vaccine. Most common reasons for denial of vaccination were found to be negligence (35.8%) and ignorance (14.8%). The immunization coverage was higher in residents of rural areas (72.32%) and in children of literate mothers (76%). There was no significant reduction in eventual booster doses of DPT. Conclusions: Day by day, universal immunization is increasing but gaps are still visible even at tertiary care settings. Efforts are needed to strengthen the already existing policies. Aggressive sensitization and behaviour change drives targeting mothers can go a long way in achieving the same. [Vasavada H et al NJIRM 2013; 4(2) : 48-53]

**Key Words:** Immunization in tertiary care, UIP in India, vaccine drop-out.

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**Introduction:** Immunization is one of the most effective, safest & efficient Public Health Interventions. While the impact of Immunization on childhood morbidity & mortality has been great, its full potential has yet to be reached<sup>1</sup>. Thousands of children still die from Vaccine-Preventable diseases each year. VPDs contribute significantly to under- five mortality. Routine immunization was 1st introduced in India in 1978<sup>2</sup>. Yet, despite the concrete efforts of government & other health agencies, large proportion of vulnerable infants & children in India remain un-immunized. Many studies done in the past have documented the coverage of primary vaccines in various parts of the country<sup>3,4,5</sup>. But few studies are available showing the coverage in all age groups.

Our study aims at documenting the vaccination coverage of individual vaccines across all age groups including the booster doses and to search for the common causes of not giving the vaccines on time. With this, proper measures can be taken in future to improve the general awareness regarding immunization thereby improving the vaccination coverage.

### Materials And Methods:

**Type of study:** Cross sectional study

**Study period:** June 2012 to July 2012

**Place of study:** Pediatric OPD, LG Hospital, Ahmedabad

**Study material:** Pre designed and pre tested semi-structured questionnaires with scope for open ended response

**Inclusion criteria:** All patients attending pediatric OPD irrespective of whether they need outdoor or indoor treatment

**Exclusion criteria:** Patients who are already admitted in the pediatric ward at the beginning of study

**Study subjects:** Parents and children (up to 16 years) attending the pediatric OPD

**Study limitation:** This being a cross sectional study, the patients were not followed in subsequent visits.

**Study method:** Parents/care-takers of the children attending pediatric OPD were interviewed using a semi structured questionnaire by trained doctors. The questionnaire was pre tested by a pilot study amongst 20 children to start with and thereafter corrections were made for final proforma.

The vaccination status of children was confirmed referring to the records of immunization available with the mother. If not available, site and age specific history of vaccination was probed for getting information about the vaccine which was administered. The information included socio demographic variables, maternal educational status and knowledge about vaccination, vaccines administered to their children, adverse effects of vaccination and reasons for not giving vaccines in children who are unimmunized /partially immunized.

Confidentiality of the study subjects was maintained throughout the study procedure and afterwards. The de-identified, collected data were compiled, entered in Microsoft Excel Sheet, analyzed and results were tabulated.

**Results:** The data were entered in Microsoft Excel 2007 and analysed using medcalc v12 software. Records were available only in case of 215 children out of 1000 children studied.

Out of the 1000 patients included in the study, 719 were males (71.9%) and 281 were females (28.1%). Majority of the children were Hindus (78.4%) followed by Muslims (20.5%). **(Table 1)**

**Table 1: Distribution of study population by sex and religion**

Characteristics	Male	Female	Total
Hindu	583(81.8)	201(71.53)	784
Muslim	133(18.49)	72(25.62)	205
Christians	3(0.42)	3(1.07)	6
Sikh	0	5(1.78)	5
<b>Total</b>	<b>719</b>	<b>281</b>	<b>1000</b>

82.3% of the children lived in urban areas while 17.7% lived in rural areas. Of the mothers of these children, 15% were illiterate, 72% were educated till primary-middle, 11% were educated up to secondary-higher secondary and only 2% were graduates. **(Table 2)**

Majority of the children (52.7%) were fully immunized closely followed by partially immunized

(43.8%). Only 3.5% children were non-immunized. Full immunization coverage was more in females (57.29%) compared to that of males (50.90%). Coverage of full vaccination in rural areas was 72.32% compared to 48.48% in urban areas. The fully immunized children among Hindus were 52.17% and those among Muslims were 52.68%. **(Table 3)**

**Table 2: Socio Demographic pattern of the study subjects**

Characteristics	No.	%
<b>Residential area</b>		
Urban	823	82.3
Rural	177	17.7
<b>Maternal literacy</b>		
Illiterate	150	15
Primary- middle	720	72
Secondary-higher secondary	110	11
Graduate	20	2

**Table 3: Coverage level by Background characteristics**

Character-istics	Fully immunized		Partially immunized		Non immunized	
	No.	%	No.	%	No	%
Overall	527	52.7	438	43.8	35	3.5
<b>Sex</b>						
Male(n=719)	366	50.90	326	45.34	27	3.76
Female(n=281)	161	57.29	112	39.86	8	2.85
<b>Residential area</b>						
Urban(n=823)	399	48.48	403	48.97	21	2.55
Rural(n=177)	128	72.32	35	19.77	14	7.91
<b>Religion</b>						
Hindu(n=784)	409	52.17	354	45.15	21	2.68
Muslim(n=205)	108	52.68	83	40.49	14	6.83
Christian(n=6)	5	83.33	1	16.67	0	0
Sikh(n=5)	5	100	0	0	0	0

Majority of the children born to illiterate mothers were either partially immunized (57.33%) or non immunized (18.67%). 58.89% children born to mothers who were educated till primary–middle school were fully immunized & 40.28% were partially immunized. 50.91% children born to mothers who were educated till secondary- higher secondary school were fully immunized & 48.18%

**Table 4: Coverage level by maternal literacy**

Characteristic	Fully immunized		Partially immunized		Non Immunized	
	No	%	No	%	No	%
Maternal literacy						
Illiterate (n=150)	36	24	86	57.33	28	18.67
Primary-middle (n=720)	424	58.89	290	40.28	6	0.83
Secondary-higher secondary (n=110)	56	50.91	53	48.18	1	0.91
Graduate (n=20)	11	55	9	45	0	0
<b>Total</b>	<b>527</b>		<b>438</b>		<b>35</b>	

were partially immunized. 55% children born to graduate mothers were fully immunized & 45% children were partially immunized. (Table4)

The overall coverage level was highest for BCG and OPV0 in our study (94.4%). The coverage progressively reduced for subsequent vaccines with DPT1 and OPV1 at 80.56%, DPT2 and OPV2 at 73.62% and DPT3 and OPV3 at 52.86%. It reduced further for booster doses. The coverage for Hepatitis B1 vaccine was 53.07%, for Hepatitis B2 vaccine 47.15% and for Hepatitis B3 vaccine was 40.84%. The overall coverage for measles vaccine was 67.94%. TT/dtT at 10 years and 16 years had not been taken by any of the eligible 104 children. (Table 5)

**Table 5: Vaccines administered**

Vaccines	Male		Female		Total	
	Eligible	Received (%)	Eligible	Received (%)	Eligible	Received (%)
<b>Primary</b>						
BCG	719	684 (95.13)	281	260(92.53)	1000	944(94.4)
OPV0	719	684(95.13)	281	260(92.53)	1000	944(94.4)
OPV1	623	497(79.78)	308	253(90.04)	931	750(80.56)
OPV2	567	400(70.55)	301	239(79.40)	868	639(73.62)
OPV3	560	330(58.2)	280	114(40.71)	840	444(52.86)
DPT1	623	497(79.78)	308	253(90.04)	931	750(80.56)
DPT2	567	400(70.55)	301	239(79.40)	868	639(73.62)
DPT3	560	330(58.2)	280	114(40.71)	840	444(52.86)
Hepatitis B1	542	309(57.01)	257	115(44.75)	799	424(53.07)
Hepatitis B2	486	215(44.24)	250	132(52.80)	736	347(47.15)
Hepatitis B3	479	174(36.33)	236	118(50.00)	715	292(40.84)
Measles	639	382(59.78)	250	222(88.80)	889	604(67.94)
<b>Boosters</b>						
DPT Booster 1	389	174(36.33)	187	132(70.59)	576	306(53.13)
DPT Booster 2	236	104(44.07)	104	70(67.31)	340	174(51.18)
OPV Booster1	389	174(44.74)	187	132(70.59)	576	306(53.13)
OPV Booster2	236	104(44.07)	104	70(67.31)	340	174(51.18)
TT/dT	76	0(0)	28	0(0)	104	0(0)

The most common reason for not giving the vaccines among the partially and non immunized children was found to be negligence (35.8%). The next common reason was ignorance (14.8%). Among other common reasons found for not giving vaccine were fear of side effects (1.4%), social problems (1.3%) and taboos (0.6%). Other rare

causes were history of adverse drug reaction to sibling (0.2%), economic constraints (0.2%), difficulty in reaching the hospital (0.1%) & unavailability of vaccines (0.1%).

Most common adverse effects associated with vaccination were fever (68.4%), swelling (59.8%),

**Table 6: Reasons for not giving vaccination**

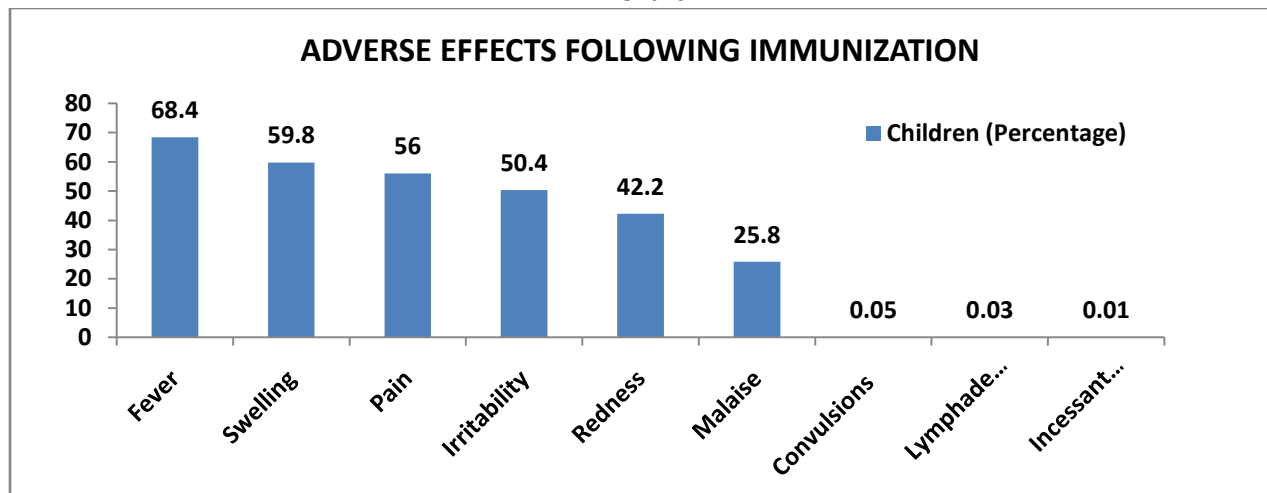
Reasons	Male (n=719)	Female (n=281)	Total
Negligence	272 (37.83%)	86 (30.60%)	358 (35.8%)
Ignorance	106 (14.74%)	42 (14.95%)	148 (14.8%)
Fear of side effects to pt	10 (1.39%)	4 (1.42%)	14 (1.4%)
Social problems	4(0.56%)	9(3.20%)	13 (1.3%)
Taboo	5(0.69%)	1(0.36%)	6(0.6%)
H/o ADR to sib/family	2(0.28%)	0(0)	2(0.2%)
Economic	0(0)	2(0.71%)	2(0.2%)
Difficulty in reaching	1(0.14%)	0(0)	1(0.1)
Unavailability	1(0.14%)	0(0)	1(0.1%)
Others	0(0)	0(0)	0

pain (56%), irritability (50.4%) and redness at the site of vaccination. Other side effects were malaise (25.8%), convulsions (0.05%), lymphadenitis (0.03%) & incessant cry (0.01%). Adverse effects e.g. hyperpyrexia, shock like states, acute encephalopathy, paralysis of limbs and arthropathy were not observed in any of the patients. **(Chart 1)**

**Discussion:** In our study, majority of the patients attending the pediatric OPD were males (71.9%) and only 28.1% were females which is similar to most of the Indian studies<sup>4,5,6</sup>.

In the study by Padam Singh et al<sup>4</sup> 80% were Hindus and 10.7% were Muslims. In our study, 78.4% children were Hindus and 20.5% were Muslims.

**Chart 1:**



15% of the mothers were illiterate, 72% studied till primary-middle school, 11% had secondary-higher secondary education and 2% were graduates. Padam Singh et al<sup>4</sup> observed different proportions of literacy in study population which was 38.6% illiterate respondents, 31.5% women

having studied up to primary-middle, 18.1% secondary-higher secondary educated and 10.7% graduate women. In the study by Arshad et al<sup>(3)</sup>, 80% were illiterate/primary educated, 18% were middle-high educated and 2% were intermediate/graduate. The difference in various

studies mainly pertains to the socio-geographical area the respondents belong to. Ahmedabad is a metro city and the study location has been a tertiary care hospital. Majority of the respondents having moderate education corroborates with the same.

National data shows 61% immunization coverage while that of Gujarat is 57%. (UNICEF Report June 18, 2011)<sup>7</sup>.

In our study, only about half of children were fully immunized (received all the vaccine doses up to

their age as per UIP recommendation), while as many as 44% were partially immunized (missed any one vaccine) and rest were non-immunized (received no vaccine in their life). Padam Singh et al<sup>4</sup> reported 63% full immunization, 27% partial immunization and 10% non-immunization which was almost in line with national data. However, in our study full immunization was almost 13% less.

The percentage of fully immunized females (57.29%) was slightly higher in males (50.90%). This suggests that females are no longer the neglected sex, especially in this predominantly urban study population attending a tertiary care unit in Gujarat where sex ratio is gradually improving.

The immunization coverage was higher in subjects belonging to rural areas (72.32%) as compared to those in urban areas (48.48%). This is in contrast to studies by Padhi et al<sup>8</sup> and Pebley et al<sup>9</sup>. This may be because multiple points of health care delivery create confusion/duplicity/under-reporting of data. It underlines the need for some interventions in the urban areas, including adoption of successful rural models like observation of 'Mamta days', etc.

The full immunization coverage was nearly the same in both Hindus (52.17%) and Muslims (52.68%). No discrepancy in the immunization coverage was observed on the basis of religion.

The full immunization coverage was only 24% in illiterate mothers while it was more than 50% in educated mothers. This suggests that education level of mother has an important influence on routine and complete immunization. This is supported by studies of Akmatov et al<sup>(10)</sup>, Desai et al<sup>11</sup>, and Gage et al<sup>12</sup>. Efforts should be made for regularly training the mothers through various awareness programmes and through mass media communication for better immunization coverage.

The coverage of BCG vaccination in our study was 94.4% which was 85.9% in study by Padam Singh et al<sup>(4)</sup> and 87% as per the UNICEF report 2011. This indirectly indicates the strong post-partum service delivery clubbed with immunization services in

tertiary care hospital of the city, still the lacunae of 5.6% need to be plugged and concerted efforts should be made for the same. There was no significant statistical difference between males and females in BCG service utilization (Chi square 2.12 at  $df=1$ ,  $P=0.145$ ). This is in contrast to study by Nilanjan Patra et al<sup>6</sup> where BCG coverage was higher in males.

Beneficiaries of DPT and OPV vaccines reduced from first dose to the eventual third dose. The reduction from first to the third dose both in case of DPT and OPV was statistically highly significant. (Chi sq 152.99,  $df=1$ ,  $P<0.0001$ ) The statistically significant difference continued even in the gender-wise break-up. (For males, Chi sq 63.85,  $df=1$ ,  $P<0.0001$ , for females Chi square 158.12,  $df=1$ ,  $P<0.0001$ ). This was observed in eligible children at given point of times hence drop-out rates are not taken into consideration. Proportional fall in number of beneficiaries even at tertiary care hospital is a worrisome scenario especially when majority of the visiting population is urban. Specific concerted efforts targeting urban population are the need of hour. High degree of coverage reduction (27.7%) in primary doses of DPT and OPV was reported contrary to the study by Padam Singh et al (6.8% reduction from first dose to the third dose)<sup>4</sup>.

There was also a significant reduction in the overall coverage of 1<sup>st</sup> and 3<sup>rd</sup> dose of Hepatitis B vaccination (Chi sq 22.15,  $df=1$ ,  $P<0.0001$ ).

Overall coverage of measles vaccine in our study was 67.94% which was comparable to the study by Padam Singh et al (66.5%) while the coverage of measles vaccine in Gujarat as per DLHS3 was 75.5%<sup>13</sup>. The coverage of measles vaccination was higher in females compared to males (Chi square 22.154,  $df=1$ ,  $P<0.0001$ ).

These are the basic vaccines provided under UIP in India for the children below one year of age. High coverage rate reduction mainly can owe to either lack of knowledge or sustained sensitization which is evident from our findings of 'ignorance' or

'negligence' as the cause of non-vaccination in about half of the respondents.

There was no statistically significant difference between coverage of DPT 1st booster and DPT 2<sup>nd</sup> booster (Male Chi sq 3.37, df=1, P=0.06; females Chi sq 0.2, df=1, P=0.653). This shows that most of the patients who come for 1st booster (at 18 months age) also turn up for the 2<sup>nd</sup> booster (5 years of age). This indirectly suggests that the degree of sustenance is relatively strong in those who complete the routine immunization till the age of 1 year.

None of the children included in the study were immunized for dT/TT at ten years of age. This shows complete lack of awareness about this vaccine which needs to be addressed.

**Conclusion:** In this study, immunization coverage was less than the national average. It was higher for the primary doses of vaccine as compared to the booster doses. Low coverage of Hepatitis B vaccine is probably because of its introduction in a phased manner and has started only since the year 2002. There was absolutely no coverage of dT/ TT vaccine. Sustenance towards booster doses is stronger in individuals successfully completing routine immunization till the age of 1 year.

These results suggest that a synergistic effort incorporating multiple sectors is needed to achieve universal immunization. To increase immunization coverage and to plug various gaps in various immunization schedules, policy-makers should also try to improve mothers' education and their awareness about the concepts of immunization, its schedule and availability.

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