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**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1252395>Available online at: <http://www.iajps.com>**Research Article****CROSS-SECTIONAL STUDY ON CHILDREN IN PAEDS  
OUTPATIENT DEPARTMENT: EVALUATION OF EXPANDED  
PROGRAM ON IMMUNIZATION COVERAGE****Dr. Muhammad Bilal, Dr. Rabia Abdul Rashid, Dr. Ayesha Shahid  
Services Hospital Lahore****Abstract :**

**Background:** expanded program on immunization is carried out to protect all children against nine vaccine preventable diseases; still many children don't receive vaccination at proper age. The purpose of EPI is to initiate a collective effort to reduce the mortality results from EPI target disease by immunizing children of age less than two years. Hence, monitoring immunization coverage performance is essential for improving the quality of services and current immunization status.

**Aims and objectives:** Assess immunization coverage and dropout rate. Elicit reasons for immunization failure in children less than two year coming to Paeds outpatient department Services Hospital Lahore.

**Study design:** cross-sectional study

**Study setting:** PAEDS Outpatient department of Services Hospital Lahore.

**Study duration:** January to February 2016: 1 month

**Materials and methods:** Non probability convenient sampling technique was used. Every Mother of the child less than two years was personally interviewed and a preformed questionnaire was filled in. Data was analyzed using SPSS.

**Results:** 88.7% children received complete immunization till required for their age at proper time according to expanded program on immunization schedule while 7.2% children were partially immunized and 4.1 % children were non-immunized. Reasons behind incomplete immunization were 27.3% parents of children were not willing for immunization while reasons given by parents for child being not immunized were lack of information in 9.1%, false beliefs in 18.2%, vaccination center not approachable in 45.5%, child sickness in 18.2% and unavailability of vaccinator in 9.1%.

**Conclusion:** The immunization coverage among children was found to be comparatively high and the major reasons for failure of immunization among children were inaccessibility of vaccination center, misconceptions among parents, child sickness and lack of information.

**Keywords:** Expanded program on immunization, Coverage, Failure reasons.

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**INTRODUCTION:**

In 2002, the program of Hepatitis-B vaccination was introduced with the help of GAVI. In 2006, a tetravalent combination vaccine was introduced which replaced the vaccines of diphtheria, tetanus and pertussis (DTP) and hepatitis-B separately. In 2008, pentavalent (DTP-Hep B-Hib) vaccine with the addition of the new Hib vaccine was commenced. Now a child needs only five visits during the first year and one visit during the second year of his/her life to complete the vaccination with four antigens against eight dreadful diseases. From mid-2012 pneumococcal conjugate vaccine was added in immunization program.

This new vaccine will protect children from pneumonia and meningitis due to pneumococcal infection. It was planned to introduce Rota virus vaccine in 2013, which will prevent children from diarrhea due to rotavirus. The new vaccines may jointly avert 17% of childhood mortality in Pakistan and thus help in achieving Millennium Development Goal after reducing child mortality. For making immunization safer and accommodating more clients new technology was adopted. To prevent the risk of blood borne diseases, the program has been using auto-disable syringes for all immunization injections and safety boxes for proper disposal of sharps waste since 2002 [9].

Vaccination services are provided through fixed EPI centers, established within the health facilities and through outreach sessions, in the catchment area of the health facilities. EPI at provincial level is implemented through deputy director EPI (provincial manager) assisted by two assistant directors. At the district/agency level executive district officer (health) looks after the program. Supervisors at various levels supervise implementation of activities. The grass root work force for EPI is EPI technicians who vaccinate the target population in the field. In 1995 EPI included in the recurrent budget with the understanding that the federal government shall be responsible for the supply of vaccine, syringes and other cold chain equipment's while the provincial government shall bear the operational cost.

The currently followed EPI schedule in Pakistan is polio-0 and BCG is given at birth, polio-1, pentavalent-1 (DPT, Hep-B, Hib) and pneumococcal-1 (PCV-10) is given at 6 weeks,

polio-2, pentavalent-2 (DPT, Hep-B, Hib) and pneumococcal-2 (PCV-10) is given at 10 weeks, polio-3, pentavalent-3 (DPT, Hep-B, Hib) and pneumococcal-3 (PCV-10) is given at 14 weeks, measles-1 is given at 9 months, measles-2 is given at 15 months and lastly booster dose of DPT and polio is given at 20 to 23 months.

On the other hand the estimated total coverage for a fully immunized child in Pakistan varies between 56% to 88% with considerable variation between provinces however the estimated immunization coverage for Punjab is found to be 65.5%, an average of 74.4% is confined to urban population while 61.5% to rural population. EPI in Pakistan targets about 5.8 million children below 1-year of age to protect them against 9 vaccine-preventable diseases, in addition about 5.9 million pregnant women to prevent them and their children from tetanus <sup>10</sup>

A Modified Cluster Sampling Survey Method developed by the World Health Organization is being used for evaluation of community based surveys. Vaccine coverage is evaluated using a two-stage sampling approach in which 30 clusters and seven children are selected in each cluster. Healthcare workers with no or limited background in statistics and sampling can collect data after getting minimal training <sup>11</sup> Surveys or questionnaires can provide more detailed information than administrative reports [12]. Despite significant efforts Infant Mortality Rates (IMR) in Pakistan are quite high major cause being infectious diseases [13]. A study conducted in Pakistan showed that 2 out of top 3 causes of infant mortality were due to vaccine-preventable diseases. Pakistan's EPI indicators have failed to meet the expected targets, especially in comparison with other regional countries [10,14].

The key goals of polio eradication, and measles and neo-natal tetanus elimination, have not been achieved due to lack of awareness and vaccination facilities in remote areas of the country [15,16]. For instance, Pakistan is among one of the three countries around the globe which are yet to interrupt the wild type transmission of the Poliomyelitis virus. Several studies are available in which prevalence rates of vaccination have been investigated in various cities of Pakistan [17,18]. Many authors have reported various barriers standing in the way of successful vaccination, which are different in different regions and at different time periods <sup>19,20</sup>. The aims of this study

are to investigate the immunization status of children coming to Paeds OPD services hospital Lahore and to identify the various causes of under vaccination in children less than two years of age. Hence on this basis we can give some suggestions to improve the implementation of vaccination schedule in community

### Material and Method

A study on determinants of immunization coverage among 12-23 months old children conducted by N Bhola et al in urban slums of Lucknow district, India was About 44% of the children studied were fully immunized. An illiterate mother, scheduled caste or tribes and higher birth order were independent predictors of the partial immunized status of the child; while those associated with the unimmunized status of the child were low socioeconomic status, higher birth order, home delivery and belonging to a joint family[37].

A research was conducted on resistance of polio to its eradication in Pakistan by Shah et al and results showed that Immunization against polio is higher in urban areas as compared to rural areas. Marked variation in vaccination has been observed in different provinces of Pakistan in the last decade. Secondly 10-20% of the children who have received their first dose of trivalent polio vaccine were deprived of their 2nd and 3rd dose because of poor performance of EPI and Lack of information about immunization[38].

A research on causes of immunization failure in DPT vaccination in urban and rural areas of Peshawar was conducted by Muhammad Adil et al. This cross-sectional study was conducted on 509 children in selected areas of Peshawar university, Peshawar Saddar, Naway Kalay and Pawaka village. DPT complete immunization coverage was found to be 69.4%. The low vaccination coverage was mainly due to low awareness among people and lack of knowledge regarding its importance [39].

A study to evaluate progress Toward Measles Elimination in the Eastern Mediterranean Region by Naouri B et al showed that For the 22 EMR member countries, routine coverage with the first dose of a measles-containing vaccine (MCV) increased from 70% in 1997 to 82% in 2009. All 22 countries conducted measles catch-up vaccination campaigns during 1994–2009, and most conducted follow-up campaigns as needed[40].

A recent study enquiring on Barriers to Immunization Among Children of HIV-Infected Mothers conducted by Sensarma P et al in Kolkata, India showed that more than one fourth of children are not completely immunized by 12 months of age. Deteriorating socioeconomic status, tightening of time schedule of caregivers due to illness in the family, stigma, discrimination, and lack of awareness about immunization prove to be major barriers for immunization of the HIV-exposed children. Harassment and negative attitudes of service providers toward HIV-affected/HIV-infected people also impede immunization[41].

A research conducted by Sesaya FF et al showed High coverage of vitamin A supplementation and measles vaccination during an integrated Maternal and Child Health Week in Sierra Leone i.e. 91.9% and 91.6%, respectively, with no significant differences by age group, sex, religion or occupation. Major reasons given for not receiving VAS and measles vaccination were not knowing about the MCHW or being out of the area[42].

A research by Cuesta JG et al on Measles Vaccination Coverage Survey in Moba, Katanga, Democratic Republic of Congo, 2013 showed The EPI coverage was 76% and MVC coverage by vaccination card and oral history was 87% and 66%. The main reason for non-vaccination was family absence 68%[43].

### Method

Study Design: cross-sectional study.

Study Setting: Paeds Outpatient department of services Hospital Lahore.

Study Duration: 1st May to 30th may 2015: 1 month

Sample Size: The sample was estimated using WHO S-size software by using formula of estimated population proportion with specified relative precision at confidence interval of 95 % with anticipated population proportion of 80% and relative precision (relative error) of 10% the minimum sample size was 97.

Sampling Technique: Non probability convenient sampling technique .

Inclusion Criteria:

Children less than two years of age.

Exclusion Criteria:

a. Parents of children who were not willing to participate in study.

b. Children suffering from any acute illness.

Operational definition:

The following operational definitions are used:

**Fully immunized :** It is defined as both male and female children who took all the recommended nine vaccines included in expanded program on immunization verified by immunization card or verbal information by mothers or caretaker at the time of survey.

**Partially immunized :** It is defined as both male and female children who missed at least one of the nine vaccines included in expanded program on immunization verified by immunization card or by verbal information from mothers or caretaker at the time of survey.

**Not immunized :** It is defined as both male and female children who didn't receive any of the nine vaccines included in expanded program on immunization verified by immunization card or

by verbal information from mothers or caretaker at the time of survey.

**Data collection procedure:** Parents of the children were approached and the researcher himself interviewed parents of children using semi structured questionnaire. These children were under two years of age. All data was conducted through informed consent.

**Data analysis plan:** Data was analyzed or descriptive variable was analyzed in terms of tables, frequency and percentage.

**Data collection tool:** With the use of researcher administered standard Questionnaire. The questionnaire was semi-structured (pre-designed closed ended with open ended questions). The questionnaire collected information regarding immunization status of the child and reasons for failure of immunization.

## RESULTS:

Table – 1:Immunization status of children (n=97)

Immunization status	Frequency	Percent
Fully immunized	86	88.7%
Partially immunized	7	7.2%
Not immunized	4	4.1%
Total	97	100%

Out of a total of 97 children under study, 86 children (88.7%) were fully immunized, 7 (7.2%) were partially immunized; while 4 (4.1%) were non immunized. This has been shown in Table 1.

Figure – 1

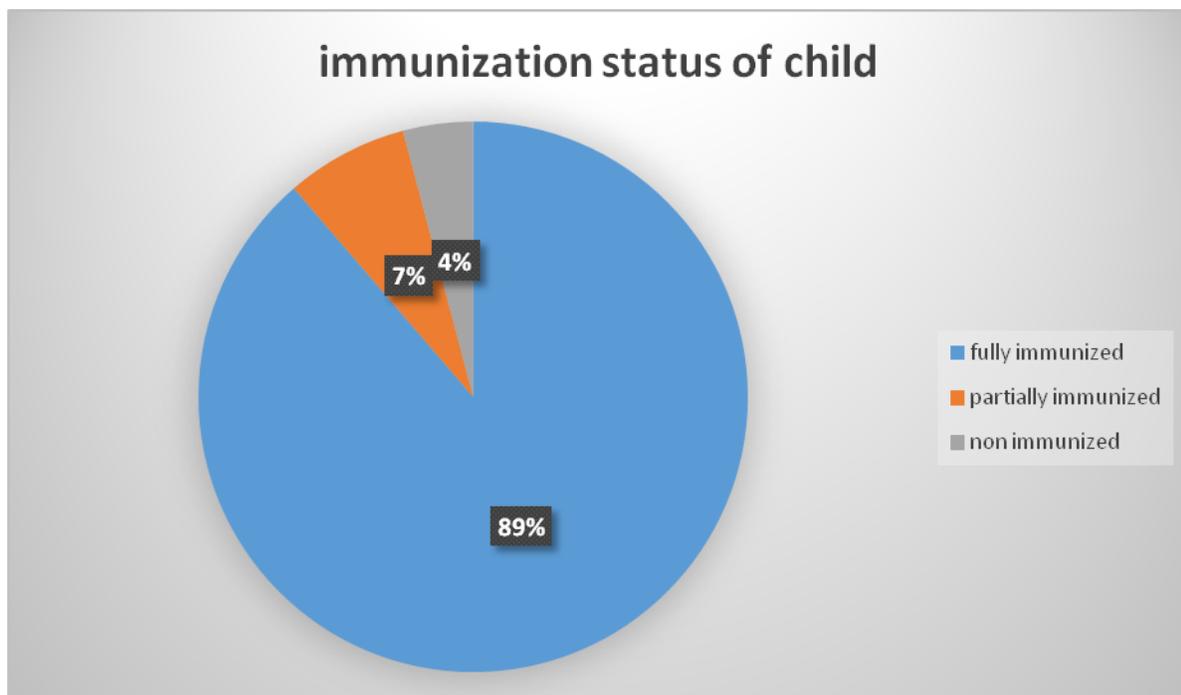


Table – 2: Confirmation of BCG vaccination by scar mark (n=93)

Scar mark in children	Frequency	Percent
Absent	4	4.3%
Present	89	95.7%
Total	93	100%

In 93 children who were fully or partially immunized, 4 (4.3%) of them didn't have BCG scar mark while 89 (95.7%) of them had scar mark.

Table – 3: Reasons for immunization failure of children (n=11)

Reasons	Frequency	Percent
Parents were not willing for vaccination	3	27.3%
Parents were willing but due to some obstacles could not immunize their child	8	72.7%
Total	11	100%

3 children out of a total of 11 who were not immunized or partially immunized didn't get vaccine because their parents were not willing to have it however parents of 8 children were willing to have their child get vaccine but child remained non-immunized or partially immunized due to some obstacles.

Table – 4: Reasons given by parents for their child being non-immunized or partially immunized (n=11)

Obstacles	Frequency	Percent
Lack of information	1	9.1%
False beliefs	2	18.2%
Vaccination center is not approachable	5	45.5%
Child sickness	2	18.2%
Unavailability of vaccinator	1	9.1%
Total	11	100%

Lack of information for child being non-immunized or partially immunized was the reason given by 1 (9.1%) parent out of 11 parents whose child were non-immunized or partially immunized. On the other hand 2 (18.2%) parents gave the reason of false beliefs, for 5 (45.5%) parents vaccination center was not approachable; while 2 (18.2%) gave the reason of child sickness besides this for 1 (9.1%) there was unavailability of vaccinator.

Figure – 2

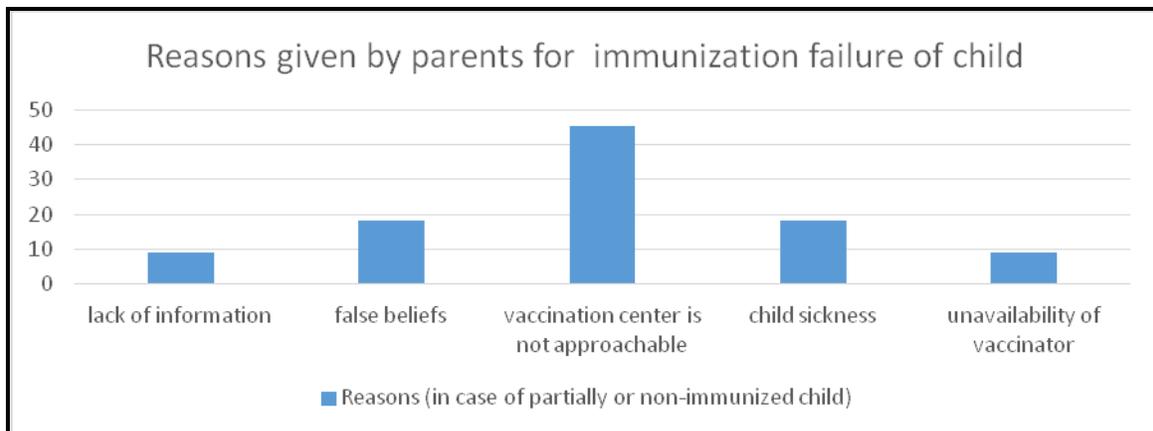
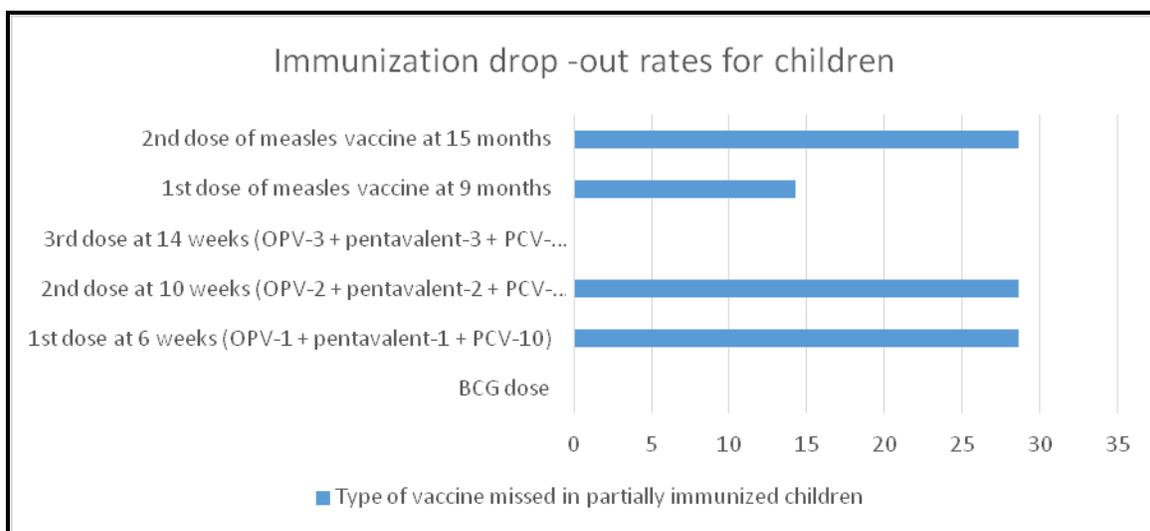


Table – 5: Immunization drop-out rates for children (n=7)

Vaccines	Frequency	Percent
BCG dose	0	---
1 <sup>st</sup> dose at 6 weeks (OPV-1+ Pentavalent-1 + PCV-10)	2	28.6%
2 <sup>nd</sup> dose at 10 weeks OPV-2+ Pentavalent-2 + PCV-10)	2	28.6%
3 <sup>rd</sup> dose at 14 weeks (OPV-3+ Pentavalent-3 + PCV-10)	0	0%
1 <sup>st</sup> dose of measles at 9 months	1	14.3%
2 <sup>nd</sup> dose of measles at 15 months	2	28.6%
Total	7	100%

Regarding a total of 7 partially immunized children 2 (28.6%) of them had 1<sup>st</sup> dose at 6 weeks (OPV-1 + pentavalent- 1+ PCV-10) missed, 2<sup>nd</sup> dose at 10 weeks (OPV-2 + pentavalent- 2+ PCV-10) was also missed by 2 (28.6%) children; further more 1 (14.3%) child missed 1<sup>st</sup> dose of measles vaccine at 9 months while 2 (28.6%) children missed 2<sup>nd</sup> dose of measles vaccine at 15 months.

Figure - 3



### DISCUSSION:

The higher coverage rate achieved show a gradual improvement in awareness and participation of community towards acceptance of immunization as a compulsory practice. According to PDHS (Pakistan demographic and health survey) in 1990 vaccination coverage for neonates was only 35%, it gradually rose up to 2002 to be 53% in PIHS (Pakistan Integrated Household survey), but this improvement was not significant. During 2007-2008, vaccination coverage has raised significantly to 78% shown in PSLM (Pakistan Social and Living Standards

Measurement survey) [22]. But we are still lagging behind regional countries like Bangladesh and Sri Lanka in achieving the desired rated of 90% fully immunized children.

The coverage rate is quite high as compared to the coverage rate of EPI assessed overall in Pakistan 56% to 88%, Punjab 65.5% and Lahore 82.0%<sup>10</sup>, the reasons for this are the facts that this study was not conducted on a representative sample of population rather it included only parents coming to Paeds OPD for medical checkup or for follow up. So coverage rate is

expected to be high. Secondly study was conducted in a well-developed Urban Area in a tertiary care hospital and most of the people presenting in this scenario are assumed to be well aware of the benefits of vaccination. A cross sectional study conducted in Peshawar showed significant differences in immunization rates between rural and urban areas i.e. 76% and 48% respectively.

As far as gender distribution of immunized children is concerned, it involves 86 children out of which 40 are males and 46 are females. It does not reflect any gender disparity among people although it prevails in many rural areas of developing countries like Pakistan.

Gender distribution among non-immunized children throws a light on high percentage of girls being non immunized i.e. 7 out of 11. It might have been putting forward the backward thinking of a male dominated society where people think that women need not much protection and cure against diseases or disabilities. Similar results were reported in India in rural area of Pune.Maharashtra where status of complete immunized children was marginally higher in males (87.61%) than in females (85.57%) [27].

As far as parents' willingness regarding immunization follow up is concerned, 3 out of 11 (27%) showed non cooperative attitude toward vaccination program. They couldn't give any sound or acceptable reason. This reflects a high degree of lack of interest in promoting health of their children in addition to lack of knowledge or awareness.

The other few reasons given by the parents who were aware fully of the importance of immunization, gave nominal reasons for non-immunization of their children; which cannot be embraced at all, as it is a major issue concerning health and better survival of children. The most presented reason seems to be non-availability of approachable vaccination center, argued by 5 parents out of 11 (45%). A cross sectional study conducted in Peshawar showed that the low immunization rates among children of rural areas was lack of accessibility to health centers.<sup>24</sup> Another research in 2011 on availability of EPI services provided to children in rural Pakistani village showed that and home delivery of vaccines was directly linked to higher rates of immunization amongst children [21].

The other highlighted reason is false beliefs about vaccination i.e. 2 out of 11 parents (18%) figured out this reason. False beliefs only prevail in a low educated society where people are reluctant to accept new advancements in science and stick to their old theories and life experience. Misconceptions about vaccination seem to be a prevailing reason in non-immunized children in rural areas of Peshawar in a research published in Journal of Ayub medical college [24].

2 parents argued about their child being sick and not contraindication of vaccination. Child sickness seems to be a logical point but the parents could not give any sound reason neither presented any authentic medical certificate confirming contraindication of vaccine in their child by any registered medical practitioner or health care unit.

Lack of information about vaccination schedule and its benefits is another reason quoted amplifying the need to expand the awareness and education about vaccination benefits. Similar results were reported by a research published in Journal of Ayub medical college Abbottabad where major cause of non-immunization in Urban Areas was lack of awareness and parents being busy.<sup>24</sup>

Unavailability of vaccinator at vaccination center is complained by 1 participant which is an alarming message for the health authorities and managers in a country like Pakistan where vaccination preventable diseases are already on a rise like polio.<sup>17,18.</sup>

Finally if we focus a light on dropout rates in partially immunized children, it shows a high drop out at 6 weeks and 10 weeks of schedule as compared to vaccines given at birth. It reflects lack of interest of parents besides availability of vaccination services in their range and laziness and questioning attitude of parents for not completing the immunization schedule.

Lower dropout rate for measles at 9 months shows that, people who follow the immunization course up to 6 months tend to be regular and show serious concern towards getting their children completely vaccinated. It will also help in achieving WHO goal toward eliminating measles in EMRO region up to 2015. It is in contrast to the statistics obtained in a research in Dhaka where immunization coverage rate for

DPT1 and OPV1 is 97%, 75% For DPT3 and OPV3 and 67% for measles [27].

Dropout rate for 2<sup>nd</sup> dose of measles at 12 months is again significant. It may be due to wrong perception of people that vaccination is only needed during 1<sup>st</sup> year of life and children are protected against diseases after this time period. Or they may be unaware of the complete schedule or are lazy to follow up routine immunization.

### CONCLUSION:

- In our research on expanded program of immunization coverage in children less than 2 years of age coming to Paeds OPD SHL 88.7% children were fully immunized, 7.2% children were partially immunized and 4.1% were completely non-immunized.
- This study revealed that major reasons for non-immunization of most children were inaccessibility of vaccination centers false beliefs and misconceptions among parents about immunization, child sickness that if sick child got vaccinated it would be dangerous for him or her and bad consequences would come and lack of information among parents about EPI and its schedule
- The other minor reasons that accounted for non-immunization of children were unavailability of vaccinator and busy life of parents.
- We found that some gender discrimination was also present our result showed that among non-immunized children 63.6% were females while 36.6% were males
- Our result showed that the dropout rate of BCG vaccine was 0% the reason behind it was that most of the children were in hospital or clinical and they were given BCG vaccine by hospital or clinic vaccination team
- The dropout rate of vaccine dosage (OPV-1, Pentavalent-1, PCV-10) at 6 weeks, 10 weeks (OPV-2, Pentavalent-2, PCV-10) and the 2<sup>nd</sup> dose of measles at 15 months was found to be high 28.6% while that of the first dose of measles vaccine at 9 months was found to low 14.3%
- We concluded that immunization status of children can be improved by making more immunization centers, spreading awareness among people about immunization importance and benefits and counseling them about their misconceptions and beliefs.

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