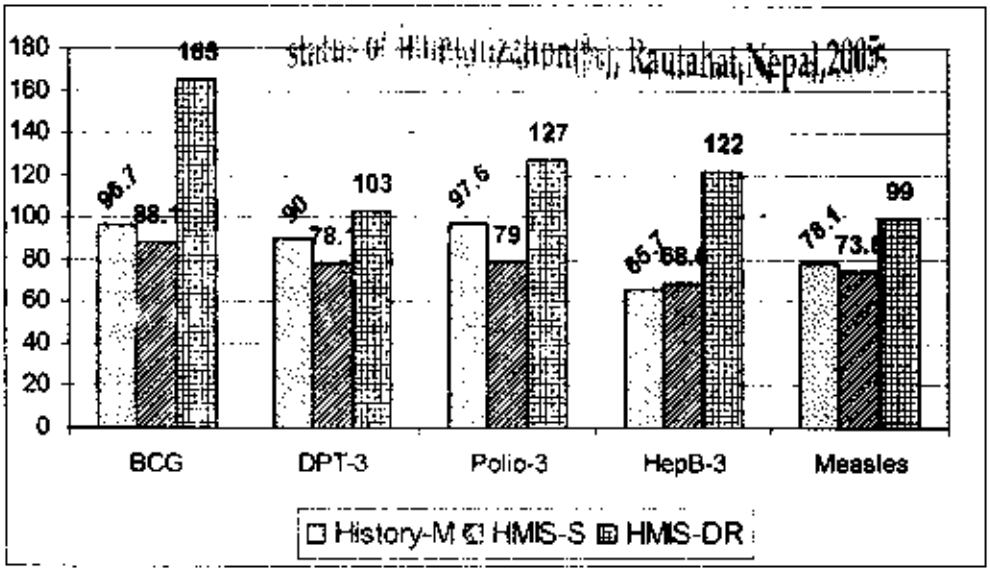
Ministry of Health and Population
Department of Health Services
District Health Office,
Rautahat,
Nepal



# A CLUSTER SURVEY FOR DETERMINATION OF REGULAR VACCINATION COVERAGE AMONG CHILDREN IN RAUTAHAT DISTRICT, 2005

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## ACKNOWLEDGEMENTS

The world is passing through poverty and deprivation amidst plenty. This also true for our country. Nepal is one of the world's poorest countries in the world. The social indicators reveal most the populations illiterate, unskilled and vulnerable to even common diseases and health care problems. Besides difficult topography with highly sloppy mountains and settlement even in the environmentally risky areas are endemic to natural calamities and disasters.

Millennium Development Goals (MDGs) place health at the heart of development and represent commitments throughout the world including Nepal. The second long term health plan of the Ministry of Health and Population has set a vision for having a health care system with equitable access and quality services in both rural and urban areas. These are our Herculean tasks.

Health services have become complex. There has been a growing concern about their functioning. Questions are raised about the quality, utilization, and coverage and benefits of health services to the community health in terms of morbidity and mortality reduction and improvement in the health status of the recipients of care.

The report of this cluster survey should necessarily be a useful attempt to solve some problems regarding immunization services as well as its coverage. This report has not only tried to make contributions towards visualizing the situation of the problems, but also has added some knowledge to the store of knowledge.

I want to thank all those who helped me in accomplishing the survey and putting it in your hand. My sincere gratitude goes to all the friends who offered me their time, support, and valuable feedback. I heartily express my wish for the friends who brought the information required for the survey. At last, but certainly not least, I wish for congratulation on the occasion of happy new year **B.S.2063** to all the readers and users of this report. **Thanks.**

Harishchandra Shah
प्रोजेक्ट स्वास्थ्य प्रशासक

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**List of Abbreviation**

| | |
|---|---|
| EPI | Expanded program on Immunization |
| d.f. | Degree of freedom |
| FCHVs | Female community Health Volunteers |
| HMIS | Health Management Information System |
| H-DPT | Diphtheria,pertussis,tetanus vaccine record available in HMIS records |
| Hd | DPT of HMIS records |
| Hep-B/Hepb | Hepatitis B vaccine |
| NIDs | National Immunization Days |
| History-M | Survey records received from the interview of mothers |
| HMIS-S | Survey of HMIS records of health institutions |
| HMIS-DR | HMIS district reports cent to the centre |

## ABSTTRACT

**Background:** A survey was conducted to assess the coverage of immunization in children 10-23 months of age and tetanus vaccine in the mothers of target children in the district; and determine possible factors associated with incomplete immunization.

**Methods:** For target population, a sample of 210 individuals ( 30 clusters with seven individuals per cluster) were randomly selected by the 30-cluster sampling method. Mothers of the children were interviewed by trained health personnel during Bhadra and Ashoj months of B.S.2062. The questionnaire included information about socio-economic characteristics, knowledge of diseases prevented by immunization, history of vaccination, doses of vaccines, and health institutions for routine immunization records. Rate and proportions were used to present the results of descriptive epidemiologic analysis.

**Results:** The greatest immunization coverage for the surveyed children 10-23 months of age were BCG and polio-3 (> 95%.). The coverage of HepatitisB-3 and Measles were 65.7% and 78.1% respectively. The coverage of complete immunization was 65.7% . The coverage of each immunization by the survey was markedly greater than that obtained by the HMIS records of the health institutions. The coverage of immunization, in either way, by interviewing mothers in the survey or obtained from auditing HMIS records of the health institutions, was markedly lower than the reports of coverage sent by the district to the centre. The male children (79.7%) received higher coverage of immunization than female one (65.5%). A total of 65(31%) mothers only had vaccine cards.TT-2 coverage in pregnant mothers was 34.29% and was associated with ANC services provided during pregnancy.

**Conclusion:** The greatest immunization coverage for the surveyed children 10-23 months of age were BCG and polio-3 (> 95%.), The coverage of complete immunization was 65.7% . Greater efforts are needed to improve the immunization coverage and the routine reports of immunization data in the district. Better estimation of the target population for calculation of the immunization coverage is needed. Immunization survey for EPI coverage should be conducted at regular intervals for monitoring the progress in coverage and identifying possible factors associated with low coverage.


**Keywords:** Expanded program on immunization(EPI), cluster survey, coverage.

# A CLUSTER SURVEY FOR DETERMINATION OF REGULAR VACCINATION (EPI) COVERAGE AMONG CHILDREN IN RAUTAHAT DISTRICT, 2005

## 1. Backgrounds:

The expanded program on Immunization (EPI) is a priority public health program of His Majesty's Government of Nepal. The EPI program is considered as one of the most cost effective health interventions. The over all goal of the EPI program is to reduce child morbidity and mortality associated with vaccine preventable diseases.

Since 1988, the expanded program on immunization under the Ministry of Health has covered all 75 districts of Nepal. The program in Nepal follows the guidelines set by the World Health Organization(WHO).To be fully immunized, a child should receive the following vaccinations: one dose of BCG, three doses of DPT, polio and Hepatitis-B, and one dose of measles vaccine. The annual report (2061/62) of the department of health services shows that overall coverage for BCG vaccination is 85.4%,DPT-3 90.3%,OPV-3 90.2% and Tetanus Toxoid (TT-2) 65%. Hepatitis-B has been introduced in 2002 in the country and during 2060/61 B.S. in the district [1].

The population of Rautahat District is 545,132. The population under 4 years is 76,333. The population growth rate is 2.75%.(exponential). The number of the total household is 88162.The population density is 484/km.The total area of the district is 1126 square km. The sex ratio is 107. The literacy rate (over six years) of the district is 32.7%. There is a district hospital,4 primary health care centers,8 health posts, 85 sub-health posts and 482 EPI clinics.

In addition to the routine doses of polio vaccines, the EPI program in Nepal includes supplemental immunization activities like national immunization days(NIDs) for polio eradication in the previous years. A campaign for measles vaccination with the objective for the disease elimination has already been executed in the district in B.S.2061.

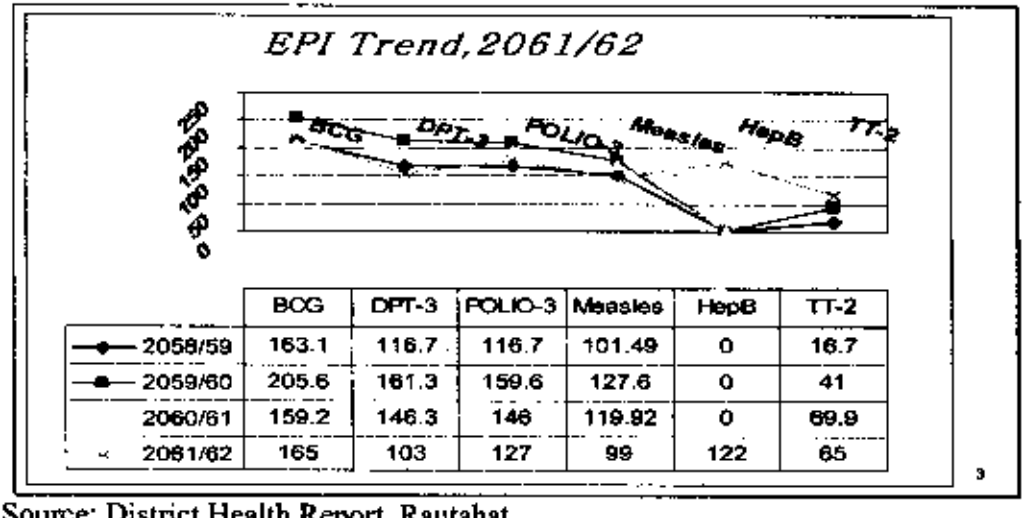
The vaccination coverage of EPI(2061/62) of the district, reported by the health facilities is very high. However, the coverage is not uniform within the district, some of the area achieving more than 100% while others are far behind. The drop out of BCG versus measles is also very high(60.31%). Rautahat has been categorized as a problematic one in category-2 (2003/2004) with high drop out(>10%) and high coverage(>80%) by the department of child health division [2]. The children are brought from outer side (India, Bihar) of Nepal for vaccination in a large number to the EPI clinics especially in Gaur Municipality. The Indian children are registered in the separate register and are not included in the routine records health management information system(HMIS)( Table No.1).

Table No 1: HMIS record of the District Health office, Rautahat, showing annual target with achievements of the F.Y. 2062/63

| EPI antigens | Annual target | Achievement | % |
|---|---|---|---|
| BCG | 14078 | 23195 | 165 |
| DPT-3 | 14078 | 14594 | 103 |
| POLIO-3 | 14078 | 18266 | 127 |
| MEASLES | 14078 | 13990 | 99 |
| TT-2(pregnancy) | 14078 | 13534 | 65 |

Source: District Health Report, Rautahat

**Chart No: 1:** District Health Office, Rautahat, showing the trends of immunization of the F.Y. 2062/63




Source: District Health Report, Rautahat.

The trends of the regular vaccination coverage of all antigens, as the district records shows, have always been maintained as high more enough the targets provided by the Departments of Health Services.

**2. Objectives:**

1. To assess the coverage of immunization among children 10-23 months of age in the district
2. To determine the proportions of immunization in the children by the health institutions
3. To determine the factors associated with incomplete immunizations
4. To determine the coverage of tetanus vaccine(TT) in mothers of target children

**3. Rationale of the study:**

The irregularities in maintaining the continuation of the trends of the vaccination coverage and high drop out rates suggest for the actual figures in the coverage of the vaccination of the children and the need for identifying their concerning factors. The district has been kept under the micro-planning by the child health division of the department of health services to strengthen the EPI program. So, the real situation of the vaccination is essential to plan, evaluate and monitor the EPI program.

## 4. Methodology

**4.1 Study Design:**

Cross sectional study by the 30- cluster sampling method recommended by the WHO.

4,2. Study site:

Rautahat, District of Nepal.

4.3. Study population:

4.3.1. Mothers or care takers of children aged 10-23 months, who lived in Rautahat District.

4.3.2. Mothers of target children.

**4.4. Study Sample:**

For each target population, a sample of 210 individuals ( 30 clusters with seven individuals per cluster) were randomly selected by the 30–cluster sampling methods, which was a two- stage cluster sampling[3][4]. In the first stage, 30 clusters were sampled with probability proportionate to the size of the population. In the cluster from 96 Village

Development Committee(VDC) and one Municipality in the District. In the second stage, seven subjects were selected within each cluster. The subjects were chosen by selecting a household and one eligible subject in the household was included in the sample. The first household was selected by the following steps: choosing the temple/center of the village, choosing a random direction from that point, and randomly selecting one of those households in that direction to be the first household of the survey. After the first household was visited, the surveyors moved to the next household, which was defined as the one whose front door was closest to the one just visited. This process was continued until the required seven subjects were studied.

4.5. Definition of Complete Immunization:

Complete immunization for children 10-23 months of age included one dose of BCG, three doses of OPV, DPT, Hepatitis-B, and one dose of measles vaccine.

4.6. Collection of Data:

Before collection of data, the permissions for collecting information were obtained from the acting VDC chair man. Six health personnel from the District Health office, Rautahat were trained for interview in the survey. They received one day training in order to understand the research objectives, how to interview the eligible subjects, and how to fill up the questionnaire. The questionnaire included information about socio-economic characteristics, knowledge of diseases prevented by immunization, history of immunization, and health institutions for immunization records. The survey period in the village was from Shrawan to Ashoj of B.S.2062

4.7. Analysis of data: Collected data were analyzed by using EPI2000 software. Rate and proportion were used to present the results of descriptive epidemiologic analysis. The chi-square test was used for comparison of proportions between those with lower and higher immunization coverage.

**5. Results:**

The clusters and the VDCs selected for the study were as follows:

Table No.2: showing the list of names of VDCs selected for clusters in the survey.

| Cluster No. | VDC/ Municipality |
|---|---|
| 1 | Gaur Municipality, ward - 10,Safagarha |
| 2 | Basatpur |
| 3 | Jhunkunwa |
| 4 | Aurahia |
| 5 | Jatahara |
| 6 | Gangagnipra |
| 7 | Mithuaba |
| 8 | Rajpur Tulsi |
| 9 | Inarbari |
| 10 | Aajgaibi |
| 11 | Debahi |
| 12 | Dharhari |
| 13 | Jainagar |
| 14 | Basbiti Jingadia |
| 15 | Kanakpur |
| 16 | Pratappur Paltua |
| 17 | Birtiprastoka |
| 18 | Sonarnia |
| 19 | Mariayadpur |
| 20 | Samanpur |
| 21 | Bariyarpur |
| 22 | Gamharia Parsa |
| 23 | Simra bhawanipur |
| 24 | Shakhuwabadhamaura |
| 25 | Santapur(M) |
| 26 | Ramauli bairiya |
| 27 | Bairiya |
| 28 | Laukaha |
| 29 | Ch.pur |
| 30 | Paurahi |

Father's education: 5

Out of 210,104(49.5%) children' fathers had no school education. Others had primary and secondary school education as shown in the table No. 3. Only 38(18.1%) had S.L.C. and above education.

Table No.3: showing the levels of education of the children' father

| Children father's education | No | % |
|---|---|---|
| No education | 104 | 49.5% |
| primary | 47 | 22.4% |
| Some secondary | 21 | 10.0% |
| S.L.C./above | 38 | 18.1% |
| Total | 210 | 100.0% |

Father's Occupation:

Of 210,127(60.5%) children' fathers were farmers. Others were in smaller percent like laborers, businessman, office workers as shown in the Table No 4.

Table No.4: showing the occupations of the children' fathers

| father's occupation | Number | percent |
|---|---|---|
| laborer | 35 | 16.7% |
| farmer | 127 | 60.5% |
| Office worker | 19 | 9.0% |
| businessman | 21 | 10.0% |
| others | 8 | 3.8% |
| Total | 210 | 100.0% |

The mean age of the children' mothers was 25.5 years. Most of them were Hindu (91.43%).Muslims(8.09%) were in fewer numbers as shown in the Table No 5.

**Table** No 5. showing the religion of the children

| Religion | Number | Percent |
|---|---|---|
| Hindu | 192 | 91.429% |
| Muslim | 17 | 8.095% |
| Budha | 1 | 0.476% |
| Total | 210 | 100.0% |

Mothers' literacy: Most of the mother were illiterate(83.3%) while only 4.3% of mothers were S.L.C. or above as shown in the Table No 6.

**Table** No.6 : showing the literacy levels of mothers

| Mothers Education | Number | Percent |
|---|---|---|
| No education | 175 | 83.3% |
| primary | 16 | 7.6% |
| Some secondary | 10 | 4.8% |
| S.L.C./above | 9 | 4.3% |
| Total | 210 | 100.0% |

Mothers occupation: Most of the mothers were housewives (92.9%).Some were involved in farming (2.9%) and business(1.9%) also as shown in the Table.7.

**Table** No.7: showing occupations of mothers

| Mothers' occupation | Number | Percent |
|---|---|---|
| housewife | 195 | 92.9% |
| farmer | 6 | 2.9% |
| business | 4 | 1.9% |
| Office work | 3 | 1.4% |
| laborer | 2 | 1.0% |
| Total | 210 | 100.0% |

ANC services: The ratio of the mothers received ANC service during their previous pregnancy was fewer(46.2%) than the non-receivers(53.8%), as shown in the table No.8.

**Table** No.8: showing ANC services

| ANC Service | Number | percent |
|---|---|---|
| Yes | 97 | 46.2% |
| No | 113 | 53.8% |
| Total | 210 | 100.0% |

TT Vaccine: Most of the mothers (91.9%) replied that they had received TT vaccine during their previous pregnancy as shown in the Table No 9 below.

Table No.9: showing the practice of receiving TT vaccine during their pregnancy

| TT vaccine received | Number | percent |
|---|---|---|
| Yes | 193 | 91.9% |
| No | 17 | 8.1% |
| Total | 210 | 100.0% |

The ratio of the mothers (19.5%) having one living children was smaller than the mothers (31.9%) having 4 or more children as shown in the Table No. 10.

Table No.10: showing living children

| No. of living children | Number | percent |
|---|---|---|
| one | 41 | 19.5% |
| two | 57 | 27.1% |
| three | 45 | 21.4% |
| Four and above | 67 | 31.9% |
| Total | 210 | 100.0% |

Birth places: Out of 210 targeted children, 200(95.2%) were born at home while only 10(4.8%) were born at hospital as shown in the table No 11.

Table No. 11: showing birth places of children

| Birth places | No of children | % |
|---|---|---|
| Home | 200 | 95.2% |
| Hospital | 10 | 4.8% |
| PHC/HP/SHP | 0 | 0% |
| **others** | 0 | 0% |
| Total | 210 | 100% |

Sex of child: Of 210 children, the number of female one was smaller (87) than the male(123) as shown in the Table No12.

Table No.12: sex of children

| Sex of child | Number | percent |
|---|---|---|
| female | 87 | 41.4% |
| male | 123 | 58.6% |
| Total | 210 | 100.0% |

Birth order: The birth orders of the target children were mostly 1(21.0%),2(24.8%),3(23.8%) and 4(21.0%) then declined as shown in the Table No.13.

Table No. 13: showing birth orders

| Birth order of child | No of children | percent |
|---|---|---|
| 1 | 44 | 21.0% |
| 2 | 52 | 24.8% |

8

| | | |
|---|---|---|
| 3 | 50 | 23.8% |
| 4 | 44 | 21.0% |
| 5 | 10 | 4.8% |
| 6 | 3 | 1.4% |
| 7 | 2 | 1.0% |
| 8 | 2 | 1.0% |
| 9 | 3 | 1.4% |
| **Total** | 210 | 100.0% |

Places for vaccination: Most of the mothers (84.3%) used to bring their children to the EPI clinic for vaccination and some to the district health institution (11.9%) as shown in the Table No.14.

Table No.14: showing places for vaccination

| Places for vaccination | Number | percent |
|---|---|---|
| District health institution | 8 | 3.8% |
| EPI clinic | 177 | 84.3% |
| others | 25 | 11.9% |
| Total | 210 | 100.0% |

Distance: The distances of the nearest clinic or hospital from the majority (91.9%) of the respondents' homes were within 1 kilometer while only minimal (0.5%) was farther to 3 km as shown in the Table No.15. below.

Table No.15: showing distance from home

| Distance(km) | Number | percent |
|---|---|---|
| <=1 | 193 | 91.9% |
| >1-2 | 10 | 4.8% |
| >2-3 | 6 | 2.9% |
| > 3 | 1 | 0.5% |
| Total | 210 | 100.0% |

Source of information: Female community health volunteers (FCHVs) were the most common(62.9%) source of information about the vaccination. Second common source was health personnel like village health workers and maternal child health workers as shown in the Table No.16.

Table No.16 : showing sources of information

| Source of information | Number | percent |
|---|---|---|
| Health personnel | 55 | 26.2% |
| FCHV | 132 | 62.9% |
| Education before marriage | 10 | 4.8% |
| T.V./Radio | 5 | 2.4% |
| Community leader | 8 | 3.8 |
| Total | 210 | 100.0% |

Vaccine cards: Only 65(31.0%) out of 210 respondents had vaccine card while 145(69.0%) hadn't as shown in the Table No17.

Table N. 17: showing vaccine card with mothers

| vaccine card | No | percent |
|---|---|---|
| yes | 65 | 31.0% |
| no | 145 | 69.0% |
| **Total** | 210 | 100.0% |

The mean age of the children for both sexes was 16.57 months. The minimum age was 10.0 months and the maximum was 23 months.

When the mothers were asked whether their children were vaccinated or not, they replied that 207(98.6%) children, out of 210, had been vaccinated as shown in the table 18.

Table N.18: Mothers reply on child's vaccination

| mothers' history about child's vaccination | No | % |
|---|---|---|
| yes | 207 | 98.6% |
| no | 3 | 1.4% |
| **Total** | 210 | 100.0% |

The reply for the question about the dose of the BCG was mostly in favor of one dose. From the total of 210, 176(83.8%) mothers were in the opinion with single dose

of BCG. Some 29(13.8%) of mothers didn't know about the dose of BCG( Table No 19.)

Table No. 19: showing replies on the dose of BCG vaccine

| mothers' history about BCG dose | No | % |
|---|---|---|
| One dose | 176 | 83.8% |
| Two doses | 5 | 2.4% |
| Do not know | 29 | 13.8% |
| **Total** | 210 | 100.0% |

Of 210 parents, 69(32.9%0) were able to say the name of disease, i.e., protected by the inoculation of the vaccine BCG, while 141(67.1% were not.(Table No.20 )

Table No. 20: showing the response for the names of the disease protected by BCG.

| mothers' history about names of the disease protected by BCG | Number | % |
|---|---|---|
| yes | 69 | 32.9% |
| no | 141 | 67.1% |
| **Total** | 210 | 100.0% |

Of the 210 parents,46(21.9%) could say the names of all the vaccines given in the regular immunization program for the children, i.e. BCG, Polio, DPT, Hep-B, and Measles (see the Table No. 21).

Table No. 21: showing knowledge on the names of vaccines

| mothers' history about names of the regular vaccines | Number | % |
|---|---|---|
| Name all vaccines | 46 | 21.9% |
| Name some vaccines | 130 | 61.9% |
| Name not any vaccine | 34 | 16.2% |
| **Total** | 210 | 100.0% |

Of 210 Mothers,203 (96.7%) replied that their children had been vaccinated with BCG vaccine, while only 7(3.3%) replied for not vaccinated( see Table No.22.).

Table No. 22: mothers' history about BCG

| Mothers history | Number | % |
|---|---|---|
| Received BCG | 203 | 96.7% |
| Did not Received BCG | 7 | 3.3% |
| **Total** | 210 | 100.0% |

Of 210 parents, 145(69.0%) were able to say the name of disease, i.e., protected by the inoculation of the polio vaccine, while 65(31.0%) were not. (Table No.23 )

Table No. 23: showing the mothers knowledge about names of the disease against Polio vaccine.

| mothers' history about names of the disease protected by polio | Number | % |
|---|---|---|
| yes | 145 | 69.0% |
| no | 65 | 31.0% |
| **Total** | 210 | 100.0% |

The reply for the question about the dose of the OPV was mostly in favor of correct dose of three. From the total of 210, 155(73.8%) mothers were in the opinion with 3 doses of OPV. Some 27(12.9%) of mothers didn't know about the dose of OPV( Table No 24).

Table No. 24; showing response on the doses of OPV

| mothers' history about OPV doses | No | % |
|---|---|---|
| 1 dose | 5 | 2.4% |
| 2 doses | 23 | 11.0% |
| 3 doses | 155 | 73.8 |
| Do not know | 27 | 12.9% |
| **Total** | 210 | 100.0% |

Of 210 Mothers, 205(97.6%) replied that their children had been vaccinated with oral polio vaccine, while only 5(2.4%) replied for not vaccinated( see Table No25.).

Table No. 25: mothers' history about polio vaccine

| Mothers history | Number | % |
|---|---|---|
| Received OPV | 205 | 97.6% |
| Did not Received OPV | 5 | 2.4% |
| **Total** | 210 | 100.0% |

Of 210 parents, 47(22.4%) were able to say the name of disease, i.e., protected by the inoculation of the vaccine DPT, while 163(77.6%) were not.(Table No. 26)

Table 26: showing the mothers knowledge about names of the disease against DPT

| mothers' history about names of the disease protected by DPT | Number | % |
|---|---|---|
| yes | 47 | 22.4% |
| no | 163 | 77.6% |
| **Total** | 210 | 100.0% |

The reply for the question about the dose of the DPT was mostly in favor of correct dose of three. From the total of 210, 120(57.1%) mothers were in the opinion with 3 doses of OPV. 52(24.8%) of mothers didn't know about the dose of DPT( Table No 27).

Table No. 27: showing responses on the doses of DPT

| mothers' history about DPT doses | No | % |
|---|---|---|
| 1 dose | 8 | 3.8% |
| 2 doses | 30 | 14.3% |
| 3 doses | 120 | 57.1% |
| Do not know | 52 | 24.8% |
| **Total** | 210 | 100.0% |

Of 210 Mothers, 89 (90.0%) replied that their children had been vaccinated with DPT vaccine while only 21(10.0%) replied for not vaccinated (see Table No 28.).

Table No. 28: mothers' history about DPT vaccine

| Mothers history | Number | Percent |
|---|---|---|
| Received DPT | 189 | 90.0% |
| Did not Received DPT | 21 | 10.0% |
| **Total** | 210 | 100.0% |

Of 210 parents, 48(22.9%) were able to say the name of disease, i.e., protected by the inoculation of the vaccine HepB, while 162(77.1% ) were not.(Table No.29 )

Table No. 29: showing the mothers knowledge about names of the disease against Hep-B vaccine

| mothers' history about names | Number | % |
|---|---|---|

| of the disease protected by Hep-B | | |
|---|---|---|
| yes | 48 | 22.9% |
| no | 162 | 77.1% |
| **Total** | 210 | 100.0% |

The replies for the question about the dose of the Hep-B were mostly not in the favor of correct dose of three. From the total of 210, 120(57.1%) mothers didn't know about the doses OPV. Nearly a quarter,53(25.2%) of mothers were in the opinion with 3 doses of HepB. ( Table No30).

Table No. 30: showing the responses on the doses of Hep-B vaccine

| mothers' history about Hep-B doses | Number | percent |
|---|---|---|
| 1 dose | 8 | 3.8% |
| 2 doses | 29 | 13.8% |
| 3 doses | 53 | 25.2% |
| Do not know | 120 | 57.1% |
| **Total** | 210 | 100.0% |

Of 210 Mothers, 138(65.7%) replied that their children had been vaccinated with Hep-B vaccine, while 72(34.3%) replied for not vaccinated ( see Table .No31.).

Table N.31: mothers' history about Hep-B vaccine

| Mothers reply | Number | percent |
|---|---|---|
| Received Hep-B | 138 | 65.7% |
| Did not Received Hep-B | 72 | 34.3% |
| Total | 210 | 100.0% |

Of 210 parents, 111(52.9%) were able to say the name of disease, i.e., protected by the inoculation of the vaccine Measles, while 99(47.1% ) were not.(Table No.32 )

Table No. 32: showing the mothers' knowledge about names of the disease against Measles

Table No. 32

| mothers' history about names of the disease protected by Measles | Number | % |
|---|---|---|
| yes | 111 | 52.9% |
| no | 99 | 47.1% |

| | | |
|---|---|---|
| **Total** | 210 | 100.0% |

The replies for the question about the dose of the Measles vaccine were mostly in the favor of correct dose of one. From the total of 210, 146(69.5%) mothers knew about the doses of measles vaccine. Only 1(0.5%) of mothers were in the opinion with 2 doses of measles. 62(29.5%) didn't know at all about the dose of measles vaccine. (Table No 33).

Table No. 33: showing responses of mothers on the doses of measles vaccine

| mothers' history about the dose Measles vaccine | Number | percent |
|---|---|---|
| 1 dose | 146 | 69.5% |
| 2 doses | 1 | 0.5% |
| 3 doses | 1 | 0.5% |
| Do not know | 62 | 29.5% |
| **Total** | 210 | 100.0% |

Of 210 Mothers,164(78.1%) replied that their children had been vaccinated with measles vaccine, while 46(21.9%) replied for not vaccinated ( see Table No.34.).

Table No. 34: mothers' history about measles vaccine

| Mothers history | Number | percent |
|---|---|---|
| Received Measles vaccine | 164 | 78.1% |
| Didn't Received Measles vaccine | 46 | 21.9% |
| **Total** | 210 | 100.0% |

Of 210 children, 23(11.0%) had been suffered from measles in the past (Table No. 35 ).

Table No. 35: mothers' reply on measles suffering

| Mothers history | Number | percent |
|---|---|---|
| Suffered from Measles | 23 | 11.0% |
| Didn't suffered from Measles | 187 | 89.0% |
| **Total** | 210 | 100.0% |

**HMIS/Vaccine Card Records:**

The HMIS records kept by the village health workers or maternal child health workers and records of the vaccine cards kept by the mothers showed the following status of routine vaccination for the children.
BCG: The coverage of BCG was 88.1% as shown in the Table No 36.

Table No. 36: showing BCG vaccination

| BCG | Number | % |
|---|---|---|
| yes | 185 | 88.1% |
| no | 25 | 11.9% |
| **Total** | 210 | 100.0% |

H-DPT1,H-DPT2, H-DPT3 reports:

Table No. 37: showing DPT1 in the reports survey

| Diptheria Hd1 | Number | % |
|---|---|---|
| yes | 183 | 87.1% |
| no | 27 | 12.9% |
| **Total** | 210 | 100.0% |

Table No.: 38 showing DPT2 in the reports survey

| Diptheria Hd2 | Number | % |
|---|---|---|
| yes | 184 | 87.6% |
| no | 26 | 12.4% |
| **Total** | 210 | 100.0% |

Table No. 39: showing DPT2 in the reports survey

| Diphtheria Hd3 | Number | % |
|---|---|---|
| yes | 164 | 78.1% |
| no | 46 | 21.9% |
| **Total** | 210 | 100.0% |



Polio Vaccination:

Polio vaccination coverage was 87.1% in the first round while in the third round it was 79.0%. (Table No. 40,41,42)

Table No. 40: showing Polio 3

| polio 1 | Number | % |
|---|---|---|
| Yes | 183 | 87.1% |
| No | 27 | 12.9% |
| **Total** | 210 | 100.0% |

Table No. 41: showing Polio 2

| polio 2 | Number | % |
|---|---|---|
| Yes | 183 | 87.1% |
| No | 27 | 12.9% |
| **Total** | 210 | 100.0% |

Table No. 42: showing Polio 2

| polio 3 | Number | % |
|---|---|---|
| Yes | 166 | 79.0% |
| No | 44 | 21.0% |
| **Total** | 210 | 100.0% |

The coverage of hepatitis-$B_1$ vaccine was 72.9% while that of Hep-$B_3$ was 68.6%. (Table No. 43,44,45)

Table No. 43: showing HepB-1

| Hep-$B_1$ | Number | % |
|---|---|---|
| Yes | 153 | 72.9% |
| No | 57 | 27.1% |
| **Total** | 210 | 100.0% |

Table No. 44: showing HepB-2

| | Number | % |
|---|---|---|

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| Hep-$B_2$ | | |
|---|---|---|
| Yes | 154 | 73.3% |
| No | 56 | 26.7% |
| **Total** | 210 | 100.0% |

Table No. 45: showing HepB-3

| Hep-$B_3$ | Number | % |
|---|---|---|
| Yes | 144 | 68.6% |
| No | 66 | 31.4% |
| **Total** | 210 | 100.0% |

The coverage of measles vaccine was 73.8% as shown in the table (No. 46.)

Table No. 46: showing measles coverage

| Measles | Number | % |
|---|---|---|
| yes | 155 | 73.8% |
| no | 55 | 26.2% |
| **Total** | 210 | 100.0% |

The drop out rate of BCG versus measles was 30(14.28%) in the HMIS records of the health institutions.

TT coverage as seen from the HMIS Record:

The $TT_1$ coverage was 35.24% in the HMIS record while $TT_2$ (34.29)was very close to the $TT_1$ as shown in Table No.47. This figure is remarkably smaller than the numbers obtained from the interview of the mothers. Many records were not filled up by the health workers due to over business during the immunization session. This was the reply from the interviewers.

Table No. 47: showing TT-1 vaccine coverage in pregnancy

| $TT_1$ | Number | % |
|---|---|---|
| yes | 34 | 35.24% |
| no | 136 | 64.76% |
| **Total** | 210 | 100.0% |

Table No. 48: showing TT-2 vaccine coverage in pregnancy

| $TT_2$ | Number | % |
|---|---|---|
| yes | 72 | 34.29% |
| no | 138 | 65.71% |
| **Total** | 210 | 100.0% |

**Comparison on the Survey vaccination records obtained from the mother's responses during their interviews:**

The number of BCG,Polio-3, DPT-3, and measles vaccine were bigger as shown by mothers' replies than the number of HMIS records which were obtained from Government's health institutions of the same cluster. Only the number of HepB-3 was smaller than the HMIS records. Since the Hep-B vaccine was newly introduced in the district, the mothers were not so familiar with the name of the Hep-B vaccine as from the others.(Table No. 49,50,51.52,53,54, and chart No 2 )

Table No. 49:BCG received as from mothers' replies and HMIS record.

| Sources: Mothers reply and HMIS record | BCG received not received | Number | % |
|---|---|---|---|
| *Mothers reply for* | Received BCG | 203 | **96.7%** |
| HMIS Record for | Received BCG | 185 | **88.1%** |
| *Mothers reply for* | Did not Received BCG | 7 | 3.3% |
| HMIS Record for | Did not Received BCG | 25 | 11.9% |
| | Total | 210 | 100.0% |

Table No. 50: Polio received as from mothers' replies and HMIS record.

| Sources: Mothers reply and HMIS record | Polio received not received | Number | % |
|---|---|---|---|
| *Mothers reply* | Received Polio | 205 | 97.6% |
| HMIS Record | HMIS record of Polio-3 | 166 | 79.0% |
| *Mothers reply* | Did not Received Polio | 5 | 2.4% |
| HMIS Record | HMIS record of not received Polio-3 | 44 | 21.0% |
| | Total | 210 | 100.0% |

Table No. 51:DPT received as from mothers' replies and HMIS record.

| Sources: Mothers reply and HMIS record | Polio received not received | Number | % |
|---|---|---|---|
| *Mothers reply* | Received DPT | 189 | 90.0% |
| HMIS Record | HMIS record of DPT-3 | 164 | 78.1% |
| *Mothers reply* | Did not Received DPT | 21 | 10.0% |
| HMIS Record | HMIS record of not received DPT-3 | 46 | 21.9% |

| | | | |
|---|---|---|---|
| | Total | 210 | 100.0% |

Table No. 52:HepB received as from mothers' replies and HMIS record.

| Sources: Mothers reply and HMIS record | Polio received not received | Number | % |
|---|---|---|---|
| *Mothers reply* | Received Hepb | 138 | 65.7% |
| HMIS Record | HMIS record of Hepb-3 | 144 | 68.6% |
| *Mothers reply* | Did not Received Hepb | 72 | 34.3% |
| HMIS Record | HMIS record of not received Hepb-3 | 66 | 31.4% |
| | Total | 210 | 100.0% |

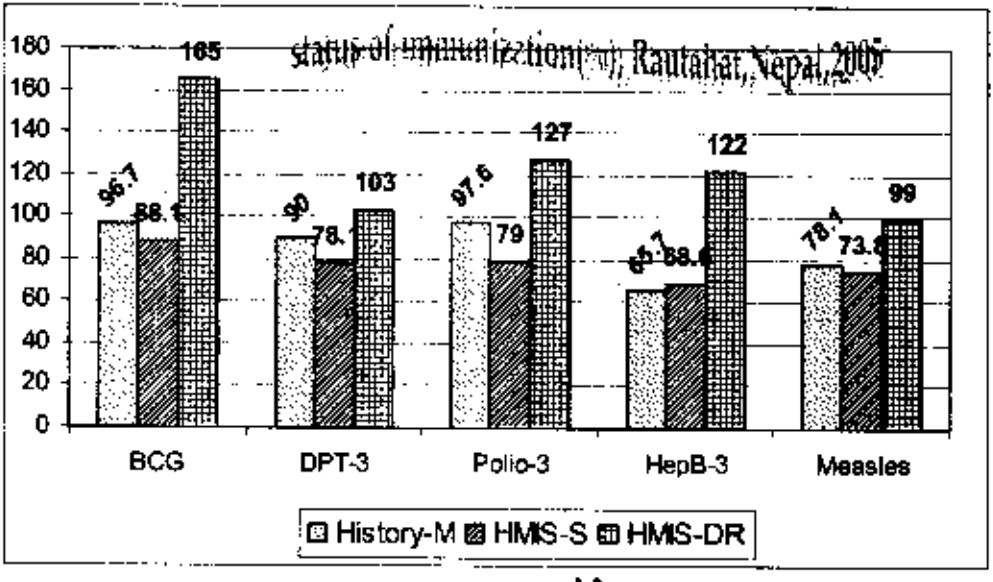
Table No. 53: Measles received as from mothers' replies and HMIS record.

| Sources: Mothers reply and HMIS record | Polio received not received | Number | % |
|---|---|---|---|
| *Mothers reply* | Received measles | 164 | 78.1% |
| HMIS Record | HMIS record of measles received | 155 | 73.8% |
| *Mothers reply* | Did not Received measles | 46 | 21.9% |
| HMIS Record | HMIS record of not received measles | 55 | 26.2% |
| | Total | 210 | 100.0% |

Table No. 54 Immunization coverage (%) of the children 10- 23 of age, by the survey compared to that by the routine report and DHS (2001).

| Immunization | survey by history from mothers | HMIS records survey | HMIS routine report of the district | DHS(2001) | difference |
|---|---|---|---|---|---|
| BCG | 96.7% | 88.1% | 165% | 82.9% | 8.6% |
| DPT3 | 90.0% | 78.1% | 103% | 70.6% | 11.9% |
| Polio3 | 97.6% | 79.0% | 127% | 90.4% | 18.6% |
| HepB-3 | 65.7% | 68.6% | 122 | Non-available | -2.9% |
| Measles | 78.1% | 73.8% | 99% | 63.6% | 4.3% |
| Complete | 78.1% | 73.8% | 99% | 63.6% | 4.3% |

Chart No. 2: showing sources of immunization data(%) for coverage in children of Rautahat District, Nepal



## Association of the factors with the vaccination coverage

The vaccination coverage was similar in all groups of educational levels. The education of the fathers of the children were not associated with the coverage of measles vaccine ( Table No 55.). The vaccine coverage was not significantly different among the children of different groups of the fathers with different levels of school education.(chi square =4.02,degree of freedom = 3, p value = 0.259, rounded ).

Table No: 55: showing association for education with vaccine coverage

| S.N. | Father's education | Measles Vaccine | | Total |
|---|---|---|---|---|
| | | yes | no | |
| 1 | No education | 76 | 28 | 104 |
| | Row% | 73.1 | 36.9 | 100.0 |
| | Col% | 49.0 | 50.9 | 49.5 |
| 2 | primary | 38 | 9 | 47 |
| | Row% | 80.9 | 19.1 | 100.0 |
| | Col% | 24.5 | 16.4 | 22.4 |
| 3 | Some secondary | 17 | 4 | 21 |
| | Row% | 81.0 | 19.0 | 100.0 |
| | Col% | 11.0 | 7.3 | 10.0 |
| 4 | S.L.C./above | 24 | 14 | 38 |
| | Row% | 63.2 | 36.8 | 100.0 |
| | Col% | 15.5 | 25.5 | 18.1 |
| | Total | 155 | 55 | 210 |
| | Row% | 73.8 | 26.2 | 100.0 |
| | Col% | 100.0 | 100.0 | 100.0 |

When grouping fathers into illiterate and literate, as in Table No.56. shown, the coverage of measles vaccination didn't differ significantly between the two groups( odds ratio= 0.93, p value = 0.81).

Table No. 56: showing association between father's literacy and vaccine coverage

| Fathers' education | Measles vaccine | | Total |
|---|---|---|---|
| | yes | no | |
| Illiterate | 76 | 28 | 104 |
| Literate | 79 | 27 | 106 |
| Total | 155 | 55 | 210 |

The vaccination coverage was similar in all groups of children of the fathers with different occupations. The occupations of the fathers of the children were not associated with the coverage of measles vaccine( Table No 57.). The vaccine coverage was not significantly different among the children of different groups. (chi square =4.24,degree of freedom = 4, p value = 0.692, rounded ).

Table No. 57: showing association between father's occupation and vaccine coverage

| S.N. | Father's occupations | Measles Vaccine | | Total |
|---|---|---|---|---|
| | | yes | no | |
| 1 | labor | 23 | 12 | 35 |
| | Row% | 65.7 | 34.3 | 100.0 |
| | Col% | 14.8 | 21.8 | 16.7 |
| 2 | farmer | 96 | 31 | 127 |
| | Row% | 75.6 | 24.4 | 100.0 |
| | Col% | 61.9 | 56.4 | 60.5 |
| 3 | Businessman | 13 | 6 | 19 |
| | Row% | 68.4 | 31.6 | 100.0 |
| | Col% | 8.4 | 10.9 | 9.0 |
| 4 | Office worker | 17 | 4 | 21 |
| | Row% | 81.0 | 19.0 | 100.0 |
| | Col% | 11.0 | 7.3 | 10.0 |
| 5 | Others | 6 | 2 | 8 |
| | Row% | 75.0 | 25.0 | 100.0 |
| | Col% | 3.9 | 3.6 | 3.8 |
| | **Total** | 155 | 55 | 210 |
| | Row% | 73.8 | 26.2 | 100.0 |
| | Col% | 100.0 | 100.0 | 100.0 |

The vaccination coverage was similar in all groups of children of mothers with different educational levels. The education of the mothers of the children were not

associated with the coverage of measles vaccine (Table No 58.). The vaccine coverage was not significantly different among the children of different groups of the mothers with different levels of school education.(chi square =1.59,degree of freedom = 3, p value = 0.661, rounded ).

Table No. 58: showing association between mother's education and vaccine coverage

| S.N. | mother's education | Measles vaccine | | Total |
|---|---|---|---|---|
| | | yes | no | |
| 1 | No education | 131 | 44 | 175 |
| | Row% | 74.9 | 25.1 | 100.0 |
| | Col% | 84.5 | 80.0 | 83.3 |
| 2 | primary | 10 | 6 | 16 |
| | Row% | 62.5 | 37.5 | 100.0 |
| | Col% | 6.5 | 10.9 | 7.6 |
| 3 | Some secondary | 8 | 2 | 10 |
| | Row% | 80.0 | 20.0 | 100.0 |
| | Col% | 5.2 | 3.6 | 4.8 |
| 4 | S.L.C./above | 6 | 3 | 9 |
| | Row% | 66.7 | 33.3 | 100.0 |
| | Col% | 3.9 | 5.5 | 4.3 |
| | **Total** | 155 | 55 | 210 |
| | Row% | 73.8 | 26.2 | 100.0 |
| | Col% | 100.0 | 100.0 | 100.0 |

When grouping mothers into illiterate and literate, ( as shown in Table No.59), the coverage of measles vaccination didn't differ significantly between the two groups( odds ratio= 1.36,,RR = 1.09, p value = 0.44).

Table No. 59: showing association between mother's education and vaccine coverage

| Mothers' education | Measles vaccine | | Total |
|---|---|---|---|
| | yes | no | |
| Illiterate | 131 | 44 | 175 |
| Literate | 24 | 11 | 35 |
| Total | 155 | 55 | 210 |

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The vaccination coverage was similar in all groups of children of the mothers with different occupations. The occupations of the mothers of the children were not associated with the coverage of measles vaccine (Table No. 60). The vaccine coverage was not significantly different among the children of different groups of mothers. (chi square =4.13,degree of freedom = 4, p value = 0.388, rounded ).

Table No. 60: showing association between mother's occupation and vaccine coverage

| S.N. | mothers' occupations | Measles vaccine | | Total |
|---|---|---|---|---|
| | | yes | no | |
| 1 | housewife | 141 | 54 | 195 |
| | Row% | 72.3 | 27.7 | 100.0 |
| | Col% | 91.0 | 98.2 | 92.9 |
| 2 | farmer | 6 | 0 | 6 |
| | Row% | 100.0 | 0 | 100.0 |
| | Col% | 3.9 | 0.0 | 2.9 |
| 3 | Businesswoman | 3 | 1 | 4 |
| | Row% | 75.0 | 25.0 | 100.0 |
| | Col% | 1.9 | 1.8 | 1.9 |
| 4 | Office worker | 3 | 0 | 3 |
| | Row% | 100.0 | 0.0 | 100.0 |
| | Col% | 1.9 | 0.0 | 1.4 |
| 5 | labor | 2 | 0 | 2 |
| | Row% | 100.0 | 0.0 | 100.0 |
| | Col% | 1.3 | 0.0 | 1.0 |
| | **Total** | 155 | 55 | 210 |
| | Row% | 73.8 | 26.2 | 100.0 |
| | Col% | 100.0 | 100.0 | 100.0 |

**Birth places of children:** The birth place of children was not associated with the coverage of the vaccine (Table No61.). The birth place of children either at home or health institutions like hospital, primary health care centers or health posts did not differ significantly in making the vaccination different.(odds ratio= 0.69, 95% confidence interval 0.1427-3.3698,2 tailed p=0.65 rounded)

Table No. 61: showing association between child's birth place and vaccine coverage

| S.N. | Birth places | Measles vaccine | | Total |
|---|---|---|---|---|
| | | yes | no | |
| 1 | Home | 147 | 53 | 200 |
| | Row% | 73.5 | 26.5 | 100.0 |
| | Col% | 94.8 | 96.4 | 95.2 |
| 2 | Hospital/PHC/Health posts | 8 | 2 | 10 |
| | Row% | 80.0 | 20 | 100.0 |
| | Col% | 5.2 | 3.6 | 4.8 |
| | **Total** | 155 | 55 | 210 |
| | Row% | 73.8 | 26.2 | 100.0 |
| | Col% | 100.0 | 100.0 | 100.0 |

Sex of children: The Sex of children was associated with the coverage of the vaccine(Table No62.). The coverage of vaccine in male children was higher than female children and differ significantly..(odds ratio= 0.48, 95% confidence interval 0.2599-0.9039,2 tailed p=0.022 rounded)

Table No. 62: showing association between child's birth place and vaccine coverage

| S.N. | Sex of children | Measles vaccine | | Total |
|---|---|---|---|---|
| | | yes | no | |
| 1 | Female | 57 | 30 | 87 |
| | Row% | 65.5 | 34.5 | 100.0 |
| | Col% | 36.8 | 54.5 | 41.4 |
| 2 | Male | 98 | 25 | 123 |
| | Row% | 79.7 | 20.3 | 100.0 |
| | Col% | 63.2 | 45.5 | 58.6 |
| | **Total** | 155 | 55 | 210 |
| | Row% | 73.8 | 26.2 | 100.0 |
| | Col% | 100.0 | 100.0 | 100.0 |

Order of children :

The coverage of vaccine was not so different among children of orders 1,2,3, and 4.But, the coverage declines from the order of 5 and above to 9, as shown in the Table No. 63

Table No. 63 showing association of order of children with vaccine coverage

| Order of children | Measles vaccine | | Total |
|---|---|---|---|
| | yes | no | |
| 1 | 35 | 9 | 44 |
| Row% | 79.5 | 20.5 | 100.0 |
| Col% | 22.6 | 16.6 | 21.0 |
| 2 | 37 | 15 | 52 |
| Row% | 71.2 | 28.8 | 100.0 |
| Col% | 23.9 | 27.3 | 24.8 |
| 3 | 40 | 10 | 50 |
| Row% | 80.0 | 20.0 | 100.0 |
| Col% | 25.8 | 18.2 | 23.8 |
| 4 | 30 | 14 | 44 |
| Row% | 68.2 | 31.8 | 100.0 |
| Col% | 19.4 | 25.5 | 21.0 |
| 5 | 7 | 3 | 10 |
| Row% | 70.0 | 30.0 | 100.0 |
| Col% | 4.5 | 5.5 | 4.8 |
| 6 | 3 | 0 | 3 |
| Row% | 100.0 | 0.0 | 100.0 |
| Col% | 1.9 | 0.0 | 1.4 |
| 7 | 2 | 0 | 2 |
| Row% | 100.0 | 0.0 | 100.0 |
| Col% | 1.3 | 0.0 | 1.0 |
| 8 | 1 | 1 | 2 |
| Row% | 50.0 | 50.0 | 100.0 |
| Col% | 0.6 | 1.8 | 1.0 |
| 9 | 0 | 3 | 3 |
| Row% | 0.0 | 100.0 | 100.0 |
| Col% | 0.0 | 5.5 | 1.4 |
| **Total** | 155 | 55 | 210 |
| Row% | 73.8 | 26.2 | 100.0 |
| Col% | 100.0 | 100.0 | 100.0 |

Place for vaccination: The coverage of the vaccine differed according to the places for vaccination from where the children had been vaccinated.. The coverage was the highest (79.7%) in the area where children were received vaccination from EPI centers (Table No 64.). The coverage of the vaccine through the EPI clinic was significantly high. (chi square = 20.26, d,f,= 2, p value = 0.000039).

Table No. 64 : showing association of immunization sites and coverage of vaccine in children

| S.N. | Place for vaccination | Measles vaccine | | Total |
|---|---|---|---|---|
| | | yes | no | |
| 1 | Health Institutions | 4 | 4 | 8 |
| | Row% | 50.0 | 50.0 | 100.0 |
| | Col% | 2.6 | 7.3 | 3.8 |
| 2 | EPI clinics | 141 | 36 | 177 |
| | Row% | 79.7 | 20.3 | 100.0 |
| | Col% | 91.0 | 65.5 | 84.3 |
| 3 | Others | 10 | 15 | 25 |
| | Row% | 40.0 | 60.0 | 100.0 |
| | Col% | 6.5 | 27.3 | 11.9 |
| | **TOTAL** | 155 | 55 | 210 |
| | Row% | 73.8 | 26.2 | 100.0 |
| | Col% | 100.0 | 100.0 | 100.0 |

Association between the distances for vaccination places and the coverage of vaccination: Most children brought for vaccination from within the distance of one kilometer (Table No65).

**Table** No. 65: showing the range of distances for walking to vaccination site.

| Distance Group(km) | Measles vaccinate | | Total |
|---|---|---|---|
| | Yes | no | |
| <=1 | 139 | 54 | 193 |
| Row% | 72.0 | 28.0 | 100.0 |
| Col% | 89.7 | 98.2 | 91.9 |
| >1-2 | 10 | 0 | 10 |
| Row% | 100.0 | 0.0 | 10 |

| | | | |
|---|---|---|---|
| Col% | 6.5 | 0.0 | 4.8 |
| >2-3 | 5 | 1 | 6 |
| Row% | 83.3 | 16.7 | 100.0 |
| Col% | 3.2 | 1.8 | 2.9 |
| > 3 | 1 | 0 | 1 |
| Row% | 100.0 | 0.0 | 100.0 |
| Col% | 0.6 | 0.0 | 0.5 |
| **Total** | 155 | 55 | 210 |
| Row% | 73.8 | 26.2 | 100.0 |
| Col% | 100.0 | 100.0 | 100.0 |

The coverage of the measles vaccine in children of vaccine card holder mothers was 28.4%. The percentage of non-vaccinated children among vaccine card holders was 38.2%,(Table No 66.).Of 155 vaccinated children, 111(76.6%) children' mothers had no vaccine card. The difference in coverage of the measles vaccine between the children of card holders and non-card holders was not significant. (odds ratio = 0.64, 95% confidence interval = 0.3462-1.2250), 2 tailed p = 0.17704).

Table No. 66: showing vaccine card and vaccination coverage

| S.N. | Have vaccine card | Measles vaccine | | Total |
|---|---|---|---|---|
| | | yes | no | |
| 1 | yes | 44 | 21 | 65 |
| | Row% | 67.7 | 32.3 | 100.0 |
| | Col% | 28.4 | 38.2 | 31.0 |
| 2 | no | 111 | 34 | 145 |
| | Row% | 76.6 | 23.4 | 100.0 |
| | Col% | 71.6 | 61.8 | 69.0 |
| | **TOTAL** | 155 | 55 | 210 |
| | Row% | 73.8 | 26.2 | 100.0 |
| | Col% | 100.0 | 100.0 | 100.0 |

A total of 155 children had received the measles vaccine. Of them, 17(11%) of children had developed measles by the history (H/O) of their mothers. Similarly, 55 children hadn't received the measles vaccine. Of them, nearly same number 6(10.9%). of children were blamed for measles by their mothers( Table No.67). There was no

significant difference (Odds ratio, RR, and p value = 0.99) Table No. 66 There may be rashes related with some other shorts of illness.

Table No. 67: showing measles vaccine coverage by HMIS records and measles in children by history of mothers

| Measles vaccine | H/O Measles | | Total |
|---|---|---|---|
| | yes | no | |
| **yes** | 17 | 138 | 155 |
| Row% | 11.0 | 89.0 | 100.0 |
| Col% | 73.9 | 73.8 | 73.8 |
| **no** | 6 | 49 | 55 |
| Row% | 10.9 | 89.1 | 100.0 |
| Col% | 26.1 | 26.2 | 26.2 |
| **TOTAL** | 23 | 187 | 210 |
| Row% | 11.0 | 89.0 | 100.0 |
| Col% | 100.0 | 100.0 | 100.0 |

ANC services in mothers and Measles vaccine coverage in children: From a total of 93 mothers who had received ANC services, their 70(75.3%) children had been received measles vaccines. Similarly, from a group of 117 mothers, who hadn't received ANC services, 85(72.6%) children had been received measles vaccines. Hence, there was non-significant difference (Odds ratio = 1.15, 95% confidence interval = 0.62-2.13, p value = 0.6680). (Table No. 68)

Table No. 68: showing ANC services in mothers and coverage of measles vaccine in children

| ANC services | Measles vaccine | | Total |
|---|---|---|---|
| | yes | no | |
| **yes** | 70 | 23 | 93 |
| Row% | 75.3 | 24.7 | 100.0 |
| Col% | 45.2 | 41.8 | 44.3 |
| **no** | 85 | 32 | 117 |
| Row% | 72.6 | 27.4 | 100.0 |
| Col% | 54.8 | 58.2 | 55.7 |
| **TOTAL** | 155 | 55 | 210 |
| Row% | 73.8 | 26.2 | 100.0 |

| | | | |
|---|---|---|---|
| Col% | 100.0 | 100.0 | 100.0 |

ANC services and TT vaccine in mothers: From a total of 97 mothers who had received ANC services, 93(95.9%) of them had been got TT inoculations. From 113 mothers who hadn't received ANC services,100(88.5%) had got TT inoculations. (Table No69).There was significant difference (odds ratio = 3.02, 95% uncorrected chi. Square 3.82, p value = 0.05). From a total of 113 non-receivers of ANC mothers, 13(76.5%) out of 17 mothers hadn't got TT vaccines.

Table No. 69: showing association for vaccination with ANC services in pregnant mothers.

| ANC services | TT vaccine | | Total |
|---|---|---|---|
| | **yes** | **no** | |
| **yes** | 93 | 4 | 97 |
| Row% | 95.9 | 4.1 | 100.0 |
| Col% | 48.1 | 23.5 | 44.3 |
| **no** | 100 | 13 | 113 |
| Row% | 88.5 | 11.1 | 100.0 |
| Col% | 51.8 | 76.5 | 55.7 |
| **TOTAL** | 193 | 17 | 210 |
| Row% | 91.9 | 8.1 | 100.0 |
| Col% | 100.0 | 100.0 | 100.0 |

**6. Discussion:**

Of the surveyed children according to the history from the mothers, only the coverage of B.C.G., Polio-3 and DPT-3 have achieved the recommended national coverage level of >= 95%.The coverage of HepatitisB-3 and Measles haven't reached the standard level. The coverage of HepatitisB-3 and Measles are 65.7% and 78.1% respectively, higher than DHS survey 2001[1] . For the Hepatitis-B, the reason may be that it is newly introduced into the community. The coverage of complete immunization for the children was 78.1% by the survey. A number of mothers or parents reported that they had received information about immunization only from FCHVs. Many sources of information like health workers and radio/T.V. were escaped. Low proportions of children with complete immunizations were observed in the mothers having no education or low education and more than > 4 children, who did not know that the nearest EPI clinic/health institution could provide immunization.

In this survey, most of the mothers (62.9%) received information from the FCHVs and some(26.2%) from health workers of the health institutions. T.V./radios were not so often used. Only 31.0% of mothers had vaccination card which is considered as a tool of health education for the mother. Most of the mothers (98.65%) replied that their children had been immunized. When they were further asked about the names of the vaccines, the names of the diseases prevented by the vaccines and the numbers of doses, they showed low level of knowledge accordingly.83.8% of mothers were right about the dose of B.C.G. whereas only 32.9% were true about the disease protected by the vaccine BCG.A few (21.9%) of mothers were able to give the names of all routine vaccines i.e. BCG, DPT, Hep-B, and Measles., whereas a majority (61.9%) of mothers described some names of vaccines. Similarly, most of the mothers (69.0%) could speak the name of the disease prevented by the oral polio vaccine and 73.8% were correct about its doses. The reason may be the frequent campaigns of NIDs. About a quarter of mothers were sure about the name (22.9%) of the Hep-B vaccine protected disease, and its doses(25.2%). This smaller number may be due to the vaccine to be newer than others. The gap between the knowledge and practice of measles immunization was not much wide. About a half (52.9%) of mothers could say the name of the disease protected by measles vaccine, and a greater numbers were able to reply its correct dose. The coverage of all routine vaccines showed greater ratios by asking history from mothers than from those by conducting survey to HMIS records kept at health institutions. BCG and DPT-3 coverage were bigger by 8.6% and 11.9% respectively while polio3 showed a difference of 18.6% .Interestingly, Hepatis-B and Measles vaccines were very close to each other with the difference of -2.9% and 4.3% respectively. The coverage of immunization, in either way, by the

survey interviewing from mothers or obtained from auditing HMIS records of the health institutions was markedly lower than the reports of coverage sent by the district. This might be because the coverage through the report of the district included the number of the injections of individuals who received immunization from outside of the district or from Bihar of India. This study revealed that many children were immunized coming from outside the district, or there might be under estimation of the target population not consistent with the current population growth rate. The sex of children was associated with the coverage of the immunization. The male children (79.7%) received higher coverage than female one (65.5%) with significant difference ( p= 0.022). Not having the vaccine card was important problem. The coverage of TT vaccination was related with the coverage of ANC services.

**7. Recommendation:**

The coverage of the immunization in the district may be improved by:

1) Educating the parents intensively on the importance of immunization, particularly those who had low immunization coverage.
2) Encouraging the health personnel to pay attention to EPI services.
3) Strengthening the EPI clinics which have been shown to increase the coverage of immunization particularly in the low coverage area.
4) Community mobilization by conducting better BCC or IEC program to strengthen routine immunization.
5) Exploiting the opportunity of immunization campaigns like NID by providing public awareness on routine immunization.
6) Better estimation of the target population for calculation of the immunization coverage.
7) Immunization surveys for monitoring EPI coverage and identifying possible factors should be conducted at regular intervals.

**8. References:**


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