



**IOCH**  
**Immunization and Other Child Health Project**

**Vaccination Coverage Survey of Routine EPI and  
2001 MNT Campaign in the Kishoreganj District**

**September 2001**

**MNT Survey Report No. 7**

**This survey was conducted by IOCH, a project of Management Sciences for Health,  
funded by USAID under AID contract No. HRN-I-01-98-00033-00, Task Order No. 01**

*In Collaboration with:*

**Saving Newborn Lives Initiative, Save the Children (USA), Bangladesh**

House 1, Road 23, Gulshan 1, Dhaka 1212, Bangladesh  
Tel: 8828596, 8829279, 8813611, 8813410  
Fax: 880-2-8826229  
E-mail: [ioch@citechco.net](mailto:ioch@citechco.net)

**March 2002**

## Table of Contents

List of Tables and Figures	3
Acronyms	4
Terminology	5
Executive Summary	6
Introduction	9
Objectives	10
Methodology	10
Limitations of the Study	12
Map showing the locations of the selected clusters	13
Results	
Routine immunization coverage of children	14
Routine TT immunization coverage of women	17
Coverage of MNT campaign 2001	20
Comparison with Pre-MNT survey results	22
Discussion	23
Conclusions and Recommendations	24
References	25
<b>Annexures</b>	
Annex A: EPI Cluster Survey design (extracts from an article written by Anthony G Turner, Robert J Magnani and Muhammed Shuaib)	26
Annex B: List of selected clusters for the survey	27
Annex C: List of never vaccinated children by clusters	28
Acknowledgements	29
List of IOCH reports	30

## **List of Tables**

**Table 1.** Routine immunization coverage of children

**Table 2:** Invalid doses of childhood immunization

**Table 3.** Reasons for partial immunization of children

**Table 4.** Knowledge of EPI among women

**Table 5.** Reasons for not receiving vaccines during MNT campaign

## **List of Figures**

**Figure 1:** Access and FIC by 12 months by sex

**Figure 2:** Providers of childhood immunization

**Figure 3:** Dropout rates for childhood immunization

**Figure 4:** TT coverage of women of 15-49 years

**Figure 5:** Dropout rates for TT immunization

**Figure 6:** Sources of correct knowledge about the number of EPI Center visits required for full immunization

**Figure 7:** Coverage of MNT Campaign - 2001

**Figure 8:** Sources of information about MNT Campaign

**Figure 9:** Crude coverage of measles by Pre and Post-MNT survey results

**Figure 10:** TT coverage of women 15 – 49 years by Pre and Post MNT survey results

## Acronyms

BCC	Behavior Change Communication
BCG	Bacillus of Calmette and Guerin
CES	Coverage Evaluation Survey
COSAS	Coverage Survey Analysis System
DPT	Diphtheria, Pertussis and Tetanus
EPI	Expanded Programme on Immunization
FWC	Family Welfare Center
IOCH	Immunization and Other Child Health
MNT	Measles, Neonatal and Tetanus
Mahallah	Smaller localities (smaller than a village, the urban equivalent of a para))
MOHFW	Ministry of Health and Family Welfare
Mouza	Smallest administrative locality in an Upazila
MSH	Management Sciences for Health
NGO	Non Governmental Organization
NID	National Immunization Day
OPV	Oral Polio Vaccine
TT	Tetanus Toxoid
WHO	World Health Organization

## Terminology

This provides the meaning of some of the more technical terms used in this report and a brief explanation of their use.

**By card:** An immunization given to a child is termed as by card if the date of the dose is entered on an immunization card. Only doses recorded by card are treated as valid data in this survey.

**By history:** Immunization history collected from a parent's recall is termed as by history. Often no date will be mentioned. This information is only included in crude data.

**Crude coverage** rate is calculated from the doses recorded by card and/or by history. It is not ascertained whether the doses were given at the correct age and/or following the correct interval (where applicable). Crude data however, helps us to understand how much additional coverage could be achieved if all vaccines were given at the optimum age for the child and following the optimum interval. It also provides useful information on access to the EPI program and on the operational aspects of the provision of health services.

**Valid coverage** rate is calculated from the vaccinations recorded by card plus history. In the calculation process, first the rate of validity is calculated based on cards only, then this rate is applied to history cases too. Valid data includes only the doses of vaccines that were given after the minimum date of eligibility and/or after the minimum interval necessary to be effective and to protect the child. There is no maximum interval for a dose and therefore a dose administered after 52 weeks is still regarded as valid. By comparing crude coverage with valid coverage data of any particular antigen, one can determine how much coverage was lost due to the inability to give vaccine at the appropriate time.

**Invalid doses** are those administered at the wrong age and/or at the wrong interval. Doses administered before the minimum age in the case of DPT/Polio 1<sup>st</sup> doses and Measles vaccine or with less than four weeks interval in the case of DPT or Polio vaccines are classified as "invalid" doses.

The **criteria for a valid dose** used in this survey is the criteria recognized by the Bangladesh EPI program: minimum age for DPT/Polio 1<sup>st</sup> dose - 6 weeks old; minimum DPT/Polio interval - 4 weeks; minimum age for Measles vaccine - 38 weeks old.

**Program access** is measured by the percentage of children surveyed who received DPT 1<sup>st</sup> dose (crude data – by card and history) in the routine immunization session.

**Fully immunized** means the child has received all the doses it requires (BCG, OPV 1-3, DPT 1-3 and measles).

**Missed opportunity** refers to a visit of a child to a vaccination center for a dose that he received. However at that time he was also eligible for another dose of antigen that he did not receive. If the missed dose was provided at a later date, it is a *corrected missed opportunity*. If not, it is an *uncorrected missed opportunity*.

## Executive Summary

### Background

The last round of three year (1999-2001) Measles Neonatal Tetanus (MNT) campaign in selected high-risk urban and rural areas of Bangladesh was conducted between August 26 and September 4, 2001 by the national EPI Program in collaboration with various development partners and organizations. The children aged 9-35 months were given measles vaccination if they had not received one in the previous 30 days and women of child-bearing age (15-49 years) were targeted for TT immunization. In addition Oral Polio Vaccine (OPV) was given to children 0-59 months. The areas were selected on the basis of low EPI coverage, cases of neonatal deaths reported in the last two years, geographically inaccessible and with hard to reach populations like migrants and floating populations. In order to evaluate the coverage of MNT campaign three surveys were conducted in urban areas and four were in rural areas. Standard WHO EPI 30 cluster survey methodology was followed to collect information. The surveys were conducted by the IOCH/MSH in collaboration with UNICEF, WHO and Save the Children, USA in September 2001. In addition to coverage, information related to knowledge, source and reasons for not receiving vaccines both for routine EPI and MNT campaign were collected. This report provides findings of the coverage evaluation survey in the Kishoreganj district of Bangladesh. The objectives of the survey were as follows:

- a) To assess the level of coverage of routine childhood and TT immunization of women including program performance.
- b) To assess the level of coverage of OPV, TT and Measles during the 2001 MNT campaign.
- c) To find the level of knowledge about immunization, reasons for not being immunized (both routine and during the campaign) and sources of information about immunization and the MNT campaign
- d) To compare pre and post MNT coverage levels

### Coverage levels for the Routine Immunization of Children

*Access:* Based on crude data (card plus history), 92% of the children between 12-23 months received at least one dose of antigen (DPT 1<sup>st</sup> dose in this case) from routine immunization sessions. Only 5% children did not receive a dose of any antigen.

*Crude coverage between 12-23 months:* 92% of the children received BCG, 80% received three doses of OPV, 79% received three doses of DPT and 74% received measles vaccine. 71% children were fully immunized.

*Valid coverage between 12-23 months:* 92% children received BCG, 61% received three doses of OPV and 60% received three doses of DPT and 68% received measles vaccine. 53% children were fully immunized.

**Valid coverage by 12 months:** 92% children received BCG, 61% received three doses of OPV, 60% received three doses of DPT and 63% received measles vaccine. 49% were fully immunized.

**Dropout rate and invalid doses:** Crude data for antigens received by 12-23 months of age is used for calculating the drop out rate. In the survey the DPT1 to DPT3 dropout was 15 percent and DPT1 to measles dropout rate was 20 percent.

Four percent of children received an invalid dose for DPT1, 17% had invalid DPT2 dose; while 2 percent children received invalid DPT3 dose. For measles the rate was 9 percent

**Source of immunization:** Childhood immunization in this area was provided mostly from government EPI out reach centers (98%), and rest two percent from GOB hospitals (1%) and NGO facilities (1%).

**Reasons for non-immunization and partial immunization:** The main reasons for non-immunization were that the parents did not know the need and importance of immunization, injection was painful, and the parents did not know where to go for vaccination. With regard to reasons for partial immunization or dropout, three most important reasons were cited by the parents: a) parents were not aware of the need of second or subsequent doses to get fully immunized; b) perceived fear of adverse reaction; and c) parents did not know when to return for 2<sup>nd</sup> or 3<sup>rd</sup> dose.

#### **Coverage levels for the Routine TT Immunization of Women**

Ninety six percent of women had first dose of TT indicating good access to TT immunization. 40 percent of women interviewed had all five doses of TT. The dropout rate of first dose of TT vaccine to second dose was 6 percent. The corresponding rates for TT1 to TT5 was 58%. 20 percent of women had TT card at the time of interview. TT card retention rate was 40%. Of the mothers interviewed, 77% percent of newborn babies were protected against tetanus.

**Knowledge about EPI:** 15 percent of the respondents knew that by 12 months a child had to complete the immunization schedule and 21 percent knew that a child had to go four times to the EPI center to complete the EPI schedule. Only 8 percent of the women of reproductive age knew that 5 doses of TT were required for life-time protection against tetanus.

#### **Coverage levels for the 2001 MNT Campaign**

90 % of children (0-59 months) had OPV during the campaign, 75 percent of children aged between 9-35 months received measles shot (except those who received measles vaccination during one month prior to the campaign) and 69 percent women of child bearing age (15-49 years) had TT vaccination.

**Information and motivational activities during the MNT campaign:** The government health workers were the main source of the information about the campaign at the household level (77%) followed by family/friend/neighbor (9%), miking (9%) and NGO workers (5%). Seventy two percent of the respondent mentioned that health worker visited their households before the MNT campaign. Thirty nine percent of the households interviewed had a referral

slip for OPV provided by the health worker when visited before the campaign; while 11 percent of the women got TT card from the health workers during their household visit before the MNT campaign. Twenty six percent of the respondents mentioned that someone came to their households to inquire about receiving vaccination during the campaign period.

***Reasons for not receiving vaccines during the MNT campaign:*** The most important reasons for not receiving OPV during the campaign were: lack of information about MNT, mothers were too busy at home, vaccine not available at the site and religious and social barrier. For measles, different reasons given by the respondents were: lack of information about MNT, child had measles vaccination before, and fear of side effect of measles vaccination, sickness of child/mother and vaccines were not available at the place of vaccination during the campaign. Lack of information about the MNT campaign, TT dose (next dose) was not due at the time of campaign, too busy at home, fear of side effect and believing that she is already fully immunized against tetanus were the most important reasons mentioned by the respondents as reasons for not receiving TT shot during the 2001 MNT campaign

### **Comparison with Pre-MNT survey results**

There was a significant improvement in the coverage of measles after the MNT campaign compared to Pre-MNT rate (61% vs. 80%). Also, there was an overall improvement in the TT coverage after the MNT campaign. The improvement was mostly marked in TT-1 dose (which reached from 83% to 96% after the MNT campaign) reflecting that there were a large number of women of 15-49 years age group who did not have any TT immunization before the MNT campaign.

### **Problems detected**

The low full immunization coverage can be attributed to high drop out rate (15% for DPT1 to DPT3 and 20% for DPT1 to Measles), invalid doses (17% for DPT2 and 9% for measles) and low level of knowledge of mothers/caretakers about age of full immunization (15%) and number of times required to go to EPI center for full immunization (21%). 23 percent newborn lives were not protected against tetanus. Women's knowledge about number of TT doses required for life-time protection was very low (8%). Lack of information about the campaign was the most important limiting factor for low coverage of measles and TT during the MNT campaign.

### **Suggested solutions**

In order to reduce drop out rate actions needed to improve counseling of mothers about the importance of all vaccines and the correct timing of different vaccines particularly at the time of DPT1 dose by the service providers. At the same time families and communities should be mobilized to raise awareness for routine immunization through various communication channels and social mobilization activities with special emphasis on measles vaccination and the need to return on time for various doses. Micro level planning and monitoring should be improved with supervision and follow up at different levels. Behavior change communication (BCC) activities on community awareness on TT and saving newborn lives against tetanus should be further developed and implemented. Volunteers and health workers should do better motivational work before the campaign and convince mothers/caretakers and decision makers at the household level.

## Introduction

The Ministry of Health and Family Welfare of the Government of Bangladesh in collaboration with various development partners and organizations have been conducting a three years Measles Neonatal Tetanus campaign popularly known as "MNT Campaign" since 1999 in selected areas. The objective of the MNT campaign is to reduce morbidity and mortality from tetanus and measles. In the campaign oral polio vaccine (OPV) was included to facilitate the ongoing polio eradication activities. During the first two years vaccines against tetanus and polio were included while in last round measles vaccine was added. The third round of the campaign was conducted between August 26, 2001 and September 4, 2001 in the selected urban and rural areas of Bangladesh.

The MNT campaign is an additional immunization activity on top of the routine immunization program in the country specially targeted to reach women and children in high-risk areas who would otherwise remain unreached and unprotected. The target areas for MNT campaign were slums in four city corporations (Dhaka, Chittagong, Khulna and Rajshahi), twenty-seven municipalities and high-risk rural areas (542 unions in 181 upzillas). The high-risk rural areas were determined by low coverage of immunization, geographically inaccessible areas, cases of neonatal deaths reported in last two years and hard to reach populations like migrants and floating populations. Targeting these areas will increase overall vaccination coverage and reduce transmission of poliovirus.

The MNT campaign targeted 0-59 months old children for OPV, 9-35 months for Measles (except those who received measles vaccination during the last one month) and 15-49 years women for Tetanus Toxoid (TT). The campaign lasted for eight consecutive days from 8 am until 4 pm. In urban areas this was extended as per local need and the sessions were continued in the evening for working women. Planning meetings of key stakeholders, training of trainers and volunteers, Interpersonal communication through household visits, miking and registration of target groups, supervision and reporting were the major activities in the implementation of campaign. In all cases autodestruct syringes were used to ensure safety.

In order to evaluate the coverage of the MNT campaign of August 2001, a number of coverage evaluation surveys, was conducted following WHO EPI standard 30 cluster survey. The surveys were conducted in collaboration with Unicef, WHO and Save the Children, USA in urban and rural areas. In total 3 urban and four rural cluster surveys were conducted. These included one 30 cluster survey for slums of Dhaka City Corporation, one 30 cluster survey for slums of Chittagong, Khulna and Rajshahi City Corporations, one 30 cluster survey for twenty seven selected municipalities, one 30 cluster survey for the MNT unions of Brahmanbaria district, one 30 cluster survey for the MNT unions of Kishoreganj district and two 30 cluster surveys for all other rural MNT unions. The rural areas were divided into south and north depending on the geographical locations of the selected unions. In addition, two 30 cluster Pre-MNT surveys, one in Brahmanbaria district and the other in Kishoreganj district, were conducted shortly before the 2001 MNT Campaign to see the Pre-MNT coverage levels. This report describes the findings of the Pre-MNT and post MNT surveys conducted in the Kishoreganj district of Bangladesh.

## Objectives

- a) To assess the level of coverage of routine childhood and TT immunization of women including program performance.
- b) To assess the level of coverage of OPV, TT and Measles during the 2001 MNT campaign.
- c) To find the level of knowledge about immunization, reasons for not being immunized (both routine and during the campaign) and sources of information about immunization and the MNT campaign
- d) To compare pre & post MNT coverage levels

## Methodology

Standard WHO EPI 30 cluster survey method was used to collect information. The immunization information were collected on a randomly selected group of 210 children /women from 30 clusters (7 children/women per cluster) in a given community. It gives an estimate of immunization coverage to within +/- 10 percentage points of the true population with 95% statistical confidence, assuming a design effect 2 (The survey methodology and its limitations are presented in Annex A).

From the list of villages of the unions of Kishoreganj district (where MNT campaign was conducted), 30 clusters were selected. The lists of clusters are given in Annex B and their locations are shown in the map in page 13.

In the survey seven children between 12-23 months (children born between September 12, 1999 and September 11, 2000) were selected from each cluster to ascertain their routine vaccination status. Seven women between 15-49 years of age, irrespective of their marital status were selected for TT status.

In case of MNT children born between September 5, 1996 and August 25, 2001 were included for OPV coverage while children born between September 5, 1998 and November 25, 2000 were considered for measles vaccination. Another seven women of childbearing age (15-49 years) from each selected clusters were interviewed for TT immunization during MNT campaign.

For routine immunization information about program coverage (childhood and women TT), program access, continuity, quality, reasons for non-immunization/partial immunization and knowledge about EPI was collected using standard 30 cluster survey questionnaire.

For MNT following information were collected about OPV, Measles and Tetanus:

OPV: OPV received during the campaign, site of OPV vaccination, reason for not receiving OPV, household visited before MNT campaign and referral slip provided and household visited to inquire about receiving vaccine during the MNT campaign.

Measles: measles vaccine received during the campaign, site of measles vaccination, reasons for not receiving measles vaccination, source of information about the MNT campaign, household visited during the MNT campaign

TT: TT vaccine received during the campaign, reason for not receiving TT during the MNT campaign, source of information about MNT campaign, household visited before the MNT campaign to give information about the MNT campaign and household visited during the MNT campaign to inquire about receiving TT vaccination.

All questionnaires were translated into Bangla and pre-tested before the final survey.

Following the same methodology Pre-MNT survey was conducted shortly before the campaign. Information collected during the survey were limited to OPV, Measles and TT coverage only.

IOCH survey team collected field data. Interviewers were trained and the data were collected over a week time between September 22, 2001 and September 29, 2001. The teams were supervised in the field to ensure quality and completeness of data. Data entry and analysis was done by IOCH using COSAS 4.41.<sup>1</sup> EpiInfo and SPSS/PC+. Simple tables and graphs were produced to summarize results. Coverage data were compared with pre- MNT survey conducted prior to the campaign. The final report was produced by the Monitoring and Evaluation Unit of the IOCH/MSH.

---

<sup>1</sup> COSAS (Coverage Survey Analysis System) is a dedicated software for analyzing coverage evaluation survey data

## **Limitations**

### **Limitations of the 30-cluster survey method**

Although the 30-cluster survey method is relatively simple, it has several limitations<sup>2</sup> that can be grouped into two types:

#### **Linked to the sampling method:**

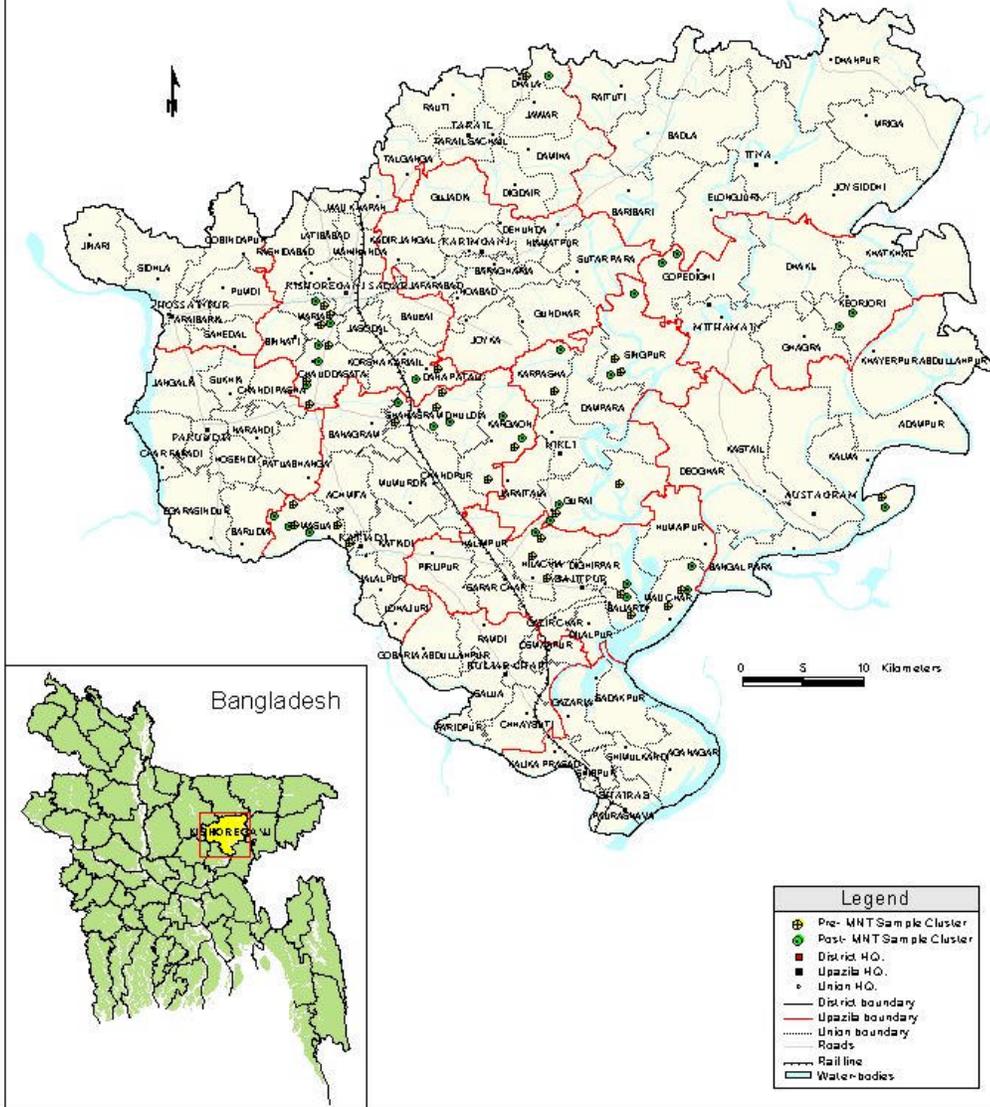
- ? As an inherent bias in the sampling technique in 30 clusters, bigger mouzas are more likely to be selected as a cluster. The survey leaves out scattered small mouzas with poor access to services. It also does not reflect the lack of uniformity in service availability or the behavior of particular populations.
- ? There is a wide confidence interval (+/- 10%). It means that if the result shows 56% of children received a valid dose of measles before 12 months of age, then the “true” figure of measles immunization of children could be anywhere between  $(56-10) = 46\%$  and  $(56+10) = 66\%$ . This type of survey is useful when the coverage is low but is less relevant to assess higher coverage or to compare surveys – unless there is a big difference between two surveys.
- ? To be relevant, the analysis of valid data must apply to a relatively high percentage of available cards.

#### **Linked to the implementation:**

- ? The selection of the index house is key. Too often, the proper method is not followed because the surveyors do not make the effort to number all the houses from their location to the end of the mouzas along the direction indicated by the bottle or by the pencil.
- ? If a household includes an eligible child who is not at home for a few hours, the surveyor often does not return later on but skips the house and substitutes another child. This is, of course, an incorrect procedure that introduces a bias.

It is also important to remember that this survey coverage data gives little information about the current program as it documents the activities of a year earlier.

**PRE AND POST-MNT CAMPAIGN COVERAGE SURVEY AREAS, SEPTEMBER 2001  
KISHOREGANJ DISTRICT**



Prepared by: IOCH/MSH.

## Results

### Routine immunization coverage of children

**Table 1** shows childhood immunization coverage achieved by the routine EPI in Kishoreganj district of Bangladesh. The crude data shows coverage for BCG, OPV3, DPT3 and Measles at 92, 80, 79 and 74 percent respectively. The corresponding valid data for these antigens are 92, 61, 60 and 68 percent. Valid coverage by 12 months for BCG, OPV3, DPT3 and Measles were 92, 61, 60 and 63 percent respectively.

**Table 1. Routine immunization coverage of children**

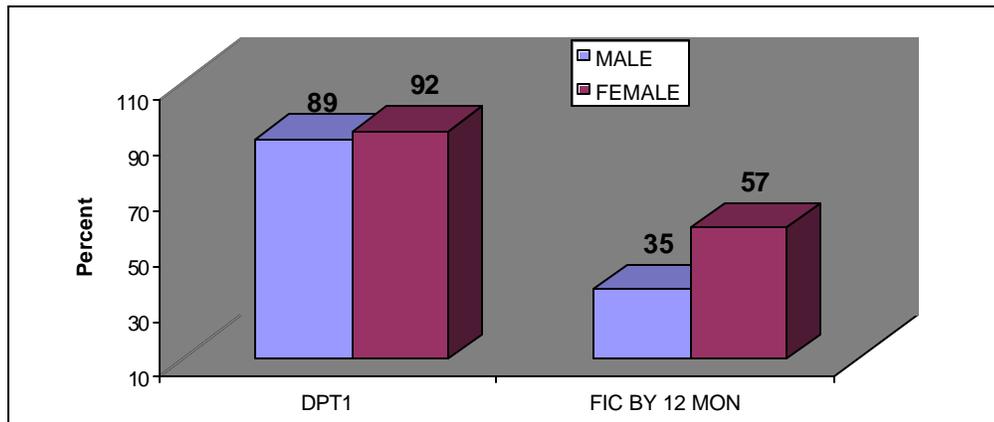
Name of vaccine	Coverage (12-23 months)		Coverage by 12 months of age
	Crude (%)	Valid (%)	Valid (%)
BCG	92	92	92
OPV1	92	89	87
OPV2	86	69	68
OPV3	80	61	61
DPT1	92	88	87
DPT2	85	69	67
DPT3	79	60	60
Measles	74	68	63
Fully immunized	71	53	49
Zero dose	5	-	-

Crude coverage of full immunization of 12-23 months age group was 71 percent. The coverage for the same age group for valid data was 53 percent. When considered for 12 months, the coverage went further down to 49 percent.

**Table 1** shows difference between crude coverage and valid coverage rates. It shows that the valid coverage is significantly lower than the crude coverage for DPT3/OPV3 (60% vs. 79%), measles (68% vs. 74%) and full immunization (53% vs. 71%), reflecting high invalid doses, indicating that many doses were provided before the minimum required age for the antigen or before the minimum interval required between two doses. However, there is little difference in valid coverage between the age group 12-23 months and 0-12 months except for measles (68% vs. 63%), indicating that few children received measles after one year of age.

The coverage of DPT1 (access) and full immunization coverage (FIC) by 12 months by sex are shown in *figure 1*. It shows that the coverage of DPT1 (which is considered as access rate to immunization services) for girls is slightly higher than that for boys (92% vs. 89%), and that the girls are more likely to complete their immunization schedule than the boys (57% vs. 35%).

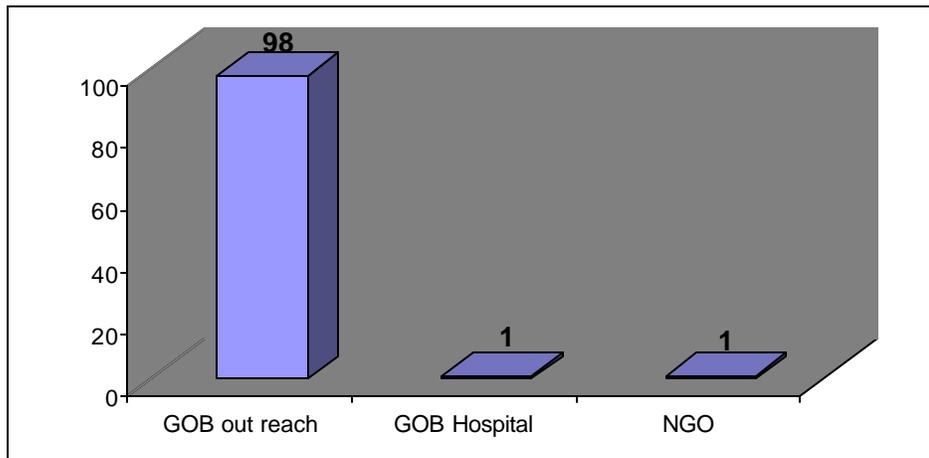
**Figure 1: Access and FIC by 12 months by sex**



***Program access***

*Figure 2* shows that 96% of the immunization services were provided from the government out reach centers, 1% from GOB hospitals and 1% from NGO EPI facilities.

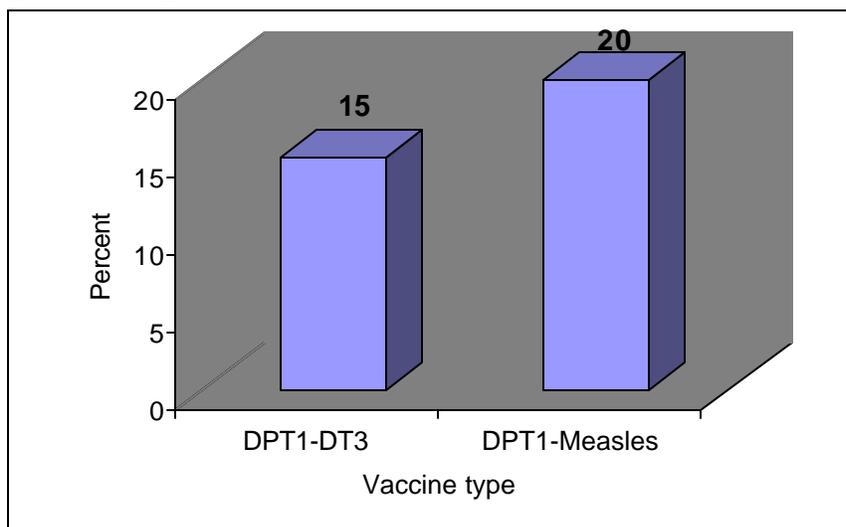
**Figure 2: Providers of childhood immunization services**



***Program continuity (drop out rate)***

Crude data for antigens received by 12-23 months of age is used for calculating the drop out rate. In the survey the DPT1 to DPT3 dropout was 15 percent and DPT1 to measles dropout rate was 20 percent (*figure 3*).

**Figure 3: Dropout rates for childhood immunization**



***Program Quality***

Many children were vaccinated either too early (before the minimum required age) or before the required minimum interval. Four percent of the children received an invalid dose for DPT1 and 17% for DPT2; while 9 percent children received invalid doses for measles (**table 3**). 25 percent of households had EPI card at the time of interview. Card retention rate was 32%.

**Table 3: Invalid doses of childhood immunization**

Antigens	Percent
DPT 1	4
DPT2	17
DPT 3	2
Measles	9

***Reasons for non-immunization and partial immunization of the children***

Only 5% children were never immunized. The main reasons for non-immunization were that the parents did not know the need and importance of immunization, injection was painful, and the parents did not know where to go for vaccination. With regard to reasons for partial immunization or dropout, three most important reasons were cited by the parents: a) parents were not aware of the need of second or subsequent doses to get fully immunized; b) perceived fear of adverse reaction; and c) parents did not know when to return for 2<sup>nd</sup> or 3<sup>rd</sup> dose (**table 4**).

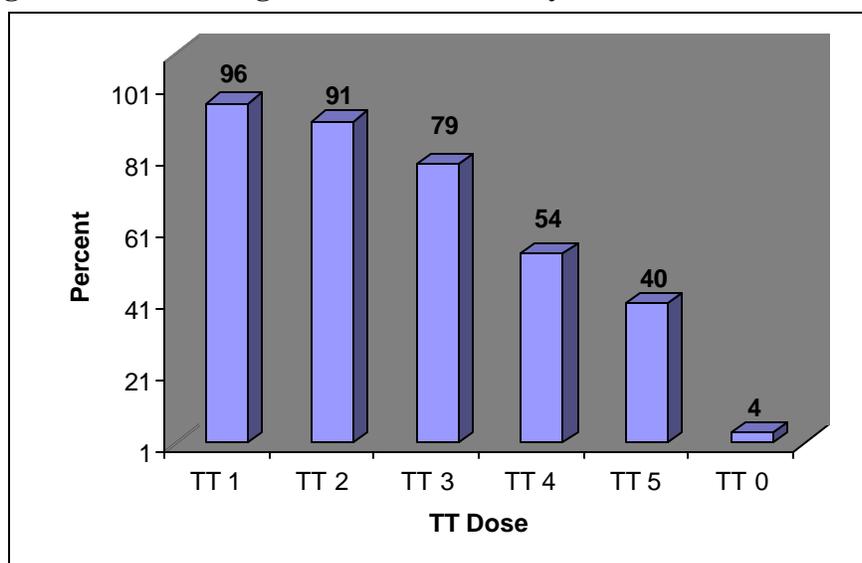
**Table 4. Reasons for partial immunization of children**

Reasons	Number	Percent
Did not know about the need of second dose	29	46
Fear of adverse reaction	11	17
Did not know when to return for 2 <sup>nd</sup> , 3 <sup>rd</sup> dose and measles	8	13
Did not know where to go for vaccination	2	3
Injection was too painful for child	2	3
Abscess after previous vaccination	1	2
Child/Mother sick	2	3
Child sick, taken to the site, not given	1	2
Other reaction after pervious vaccination	1	2
Vaccinator not available at the site	2	3
Time in-convenient	1	2
Others	1	4

**Routine TT immunization coverage of women (15-49 years)**

Fory percent of women interviewed had all five doses of TT. Ninety six percent women had first dose of TT; while 91 and 79 percent of women had second and third dose of TT respectively. The rate for the fourth dose of TT was 54 percent. Four percent women had no dose of TT (*figure 4*). 20 percent of women had TT card at the time of interview. TT card retention rate was 40%.

**Figure 4: TT coverage of women of 15-49 years**



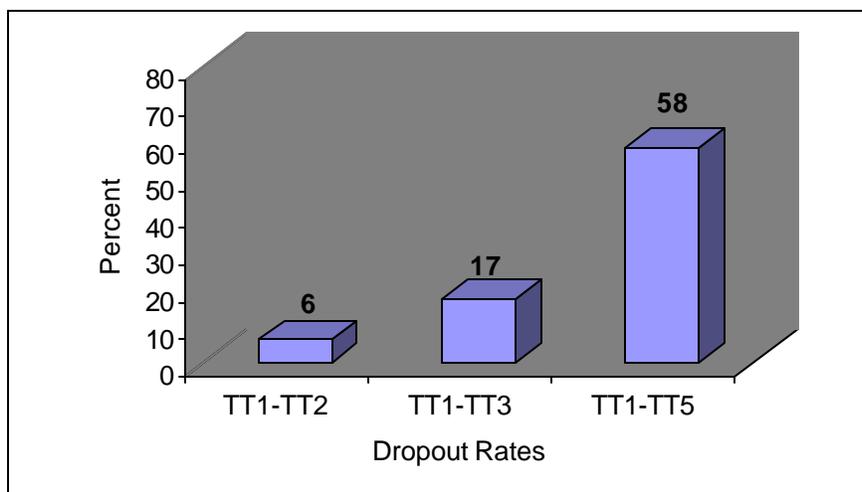
**TT dropout rates**

96 percent of women had received first dose of TT, indicating good access to TT immunizat

ion. However, the dropout rates for different doses of TT are very high. The drop out rate of

first dose of TT vaccine to second dose was 6 percent. The corresponding rates for TT1 to TT3 and TT1 to TT5 were 17 and 58 percent respectively (*figure 5*), indicating low quality of services.

**Figure 5: Dropout rates for TT immunization**



***Protection against tetanus at birth***

Mothers interviewed were asked about their TT status during pregnancy of their last child. The child was considered protected if the mother had two valid doses before the delivery or followed TT5 dose schedule. Of the women interviewed, 77% of newborn lives were protected against tetanus.

***Knowledge of EPI (child immunization and TT)***

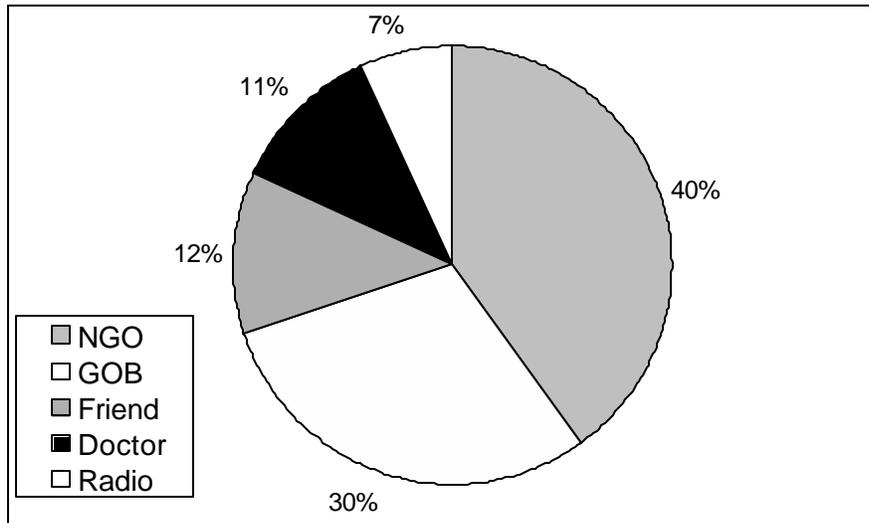
Fifteen percent of the parents knew that by 12 months a child had to complete the immunization schedule and twenty one percent knew that a child had to go four times to EPI center to complete the EPI schedule. Only 8 percent of the women of reproductive age knew that 5 doses of TT were required for life protection against tetanus (**Table 5**).

**Table 5. Knowledge of EPI among women**

Variable	Correct Knowledge (%)	Incorrect Knowledge (%)	Don't Know (%)
Age of full immunization	15	20	65
Number of times a child is required to go to EPI center for full immunization	21	25	54
Number of TT doses required for life time protection	8	3	89

The main sources of correct knowledge about number of times required to go to EPI center for full immunization were: government health worker (30%), NGO worker (40%), friend/relative (12%) and doctor (11%) (*figure 6*).

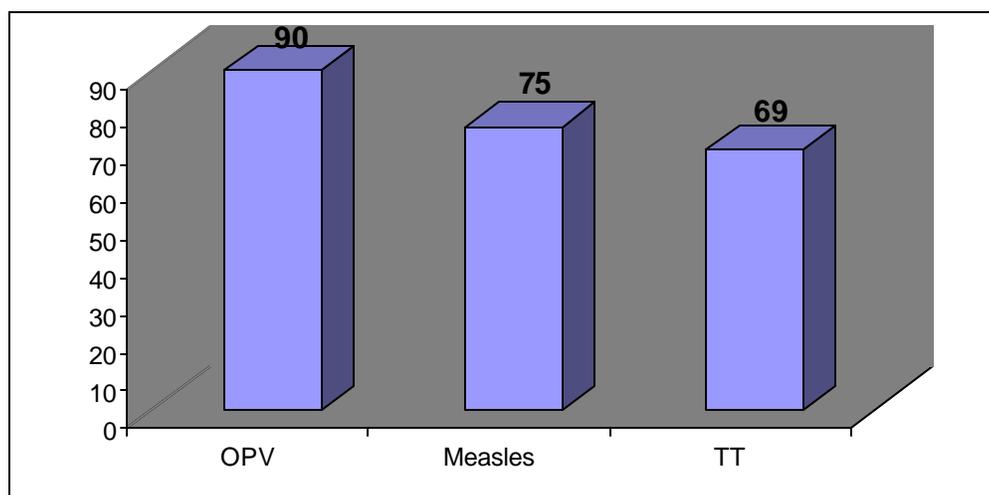
**Figure 6: Sources of correct knowledge about number of times required to go to EPI center for full immunization**



### Coverage of MNT Campaign 2001

Ninety percent of children (0-59 months) had OPV during the campaign, 75 percent of children aged between 9-35 months received measles shot (except those who received measles vaccination during one month prior to the campaign) and 69 percent women of child bearing age (15-49 years) had TT vaccination. (*figure 7*).

**Figure 7: Coverage of MNT Campaign - 2001**



**Table 6. Reasons for not receiving OPV, Measles and TT during MNT Campaign**

Reasons	OPV (%)	Measles (%)	TT (%)
Did not know about MNT	50	32	18
Vaccine/vaccinator was not available at the site	9	7	-
Too busy	23	-	12
Long queue	-	4	4
Time inconvenient	-	-	2
Religious/social barrier	9	-	1
Not taken- Child/mother sick	-	4	6
Does not believe in vaccine	-	6	4
Fear of side effect	-	11	10
Believed she is fully immunized	-	-	7
TT dose was not due at the time of campaign	-	-	23
Not given- child/mother sick	-	9	-
Already vaccinated	-	22	-
Child/mother was not at home	-	2	7
Waited for house visit	5	1	1
Others	4	2	5

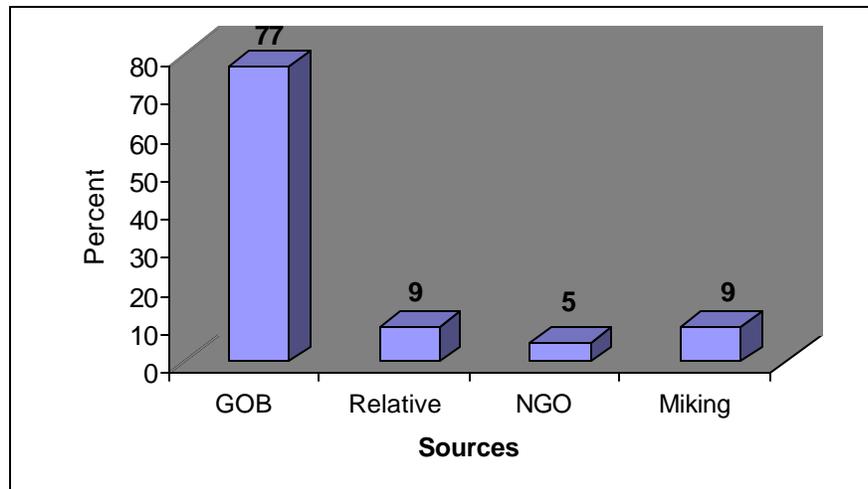
**Reasons for not receiving vaccines during the MNT campaign**

The most important reasons for not receiving OPV during the campaign were: lack of information about MNT, mothers were too busy at home, vaccine not available at the site and religious and social barrier. For measles, different reasons given by the respondents were: lack of information about MNT, child had measles vaccination before, and fear of side effect of measles vaccination, sickness of child/mother and vaccines were not available at the place of vaccination during the campaign. Lack of information about the MNT campaign, TT dose (next dose) was not due at the time of campaign, too busy at home, fear of side effect and believing that she is already fully immunized against tetanus were the most important reasons mentioned by the respondents as reasons for not receiving TT shot during the 2001 MNT campaign (table 6).

**Sources of information and motivational activities during the MNT campaign**

The government health workers were the main source of the information about the campaign at the household level (77%), followed by family/friend/neighbor (9%), miking (9%) and NGO workers (5%) (figure 8).

**Figure 8: Sources of information about MNT Campaign**



Seventy two percent of the respondent mentioned that health worker visited their households before the MNT campaign. Thirty nine percent of the households interviewed had a referral slip for OPV provided by the health worker when visited before the campaign; while 11 percent of the women got TT card from the health workers during their household visit before the MNT campaign. Twenty six percent of the respondents mentioned that someone came to their households to inquire about receiving vaccination during the campaign period.

### Comparison with Pre-MNT Campaign survey results

Figure 9 shows that there was a significant improvement in the coverage of measles after the MNT campaign compared to Pre-MNT rate (61% vs. 80%). However, we could not compare the coverage of OPV with that of the Pre-MNT survey results because of absence of comparable data.

Figure 9. Crude coverage of Measles by Pre and Post-MNT survey results

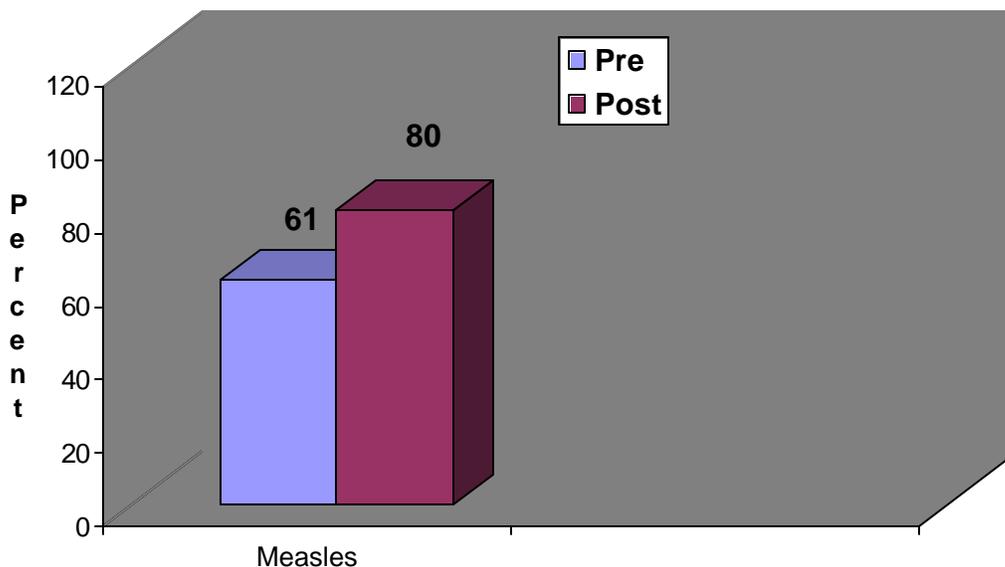
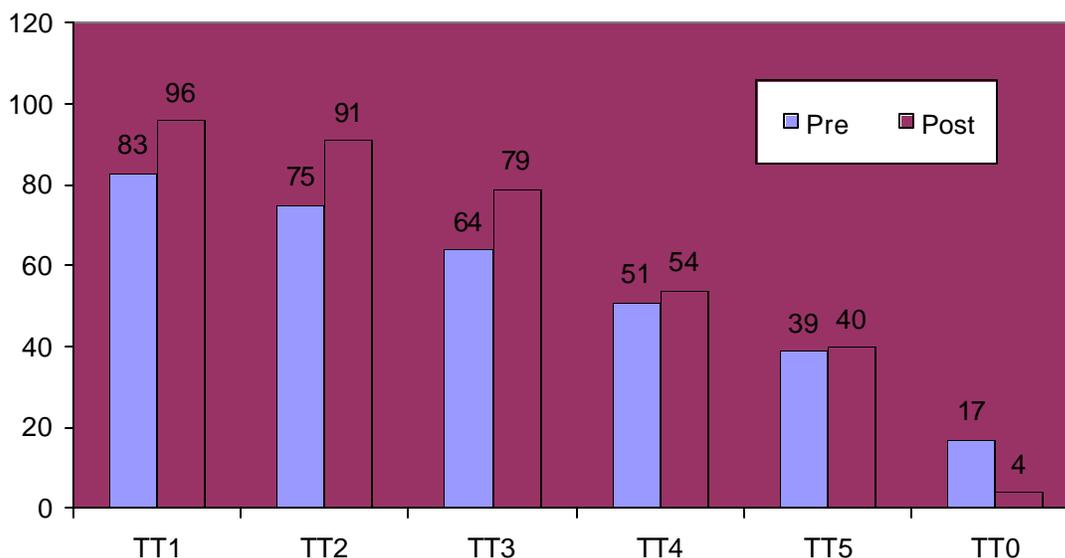


Figure 10 shows an overall improvement in the TT coverage after the MNT campaign. The improvement was mostly marked in TT-1 dose (which reached from 83% to 96% after the campaign), reflecting that there was a large number of women of 15-49 years who did not have any TT immunization before the MNT campaign.

Figure 10. TT coverage of women by Pre and Post-MNT survey results



## Discussion

The survey found 71% crude coverage of immunization against six EPI diseases among children aged between 12-23 months with good access (ninety two percent) to immunization in Kishoreganj district. However, the coverage drops to 53 percent when valid doses are considered and it further goes down to 49% when considered by 12 months of age. While the program had very good access with DPT1 coverage at 92 percent, the continuity of the program was not good as reflected in high dropout rate for DPT1 to DPT3 at 15 percent and DPT1 to Measles at 20 percent and high invalid doses (4% for DPT1, 17% for DPT2 and 9% for measles). In case of TT among child bearing aged women (15-49 years) the access rate was high with 96 percent women having TT1. However, 23% of newborn lives were not protected against neonatal tetanus.

There was a significant improvement in the coverage of measles after the MNT campaign compared to Pre-MNT rate (61% vs. 80%). Also, there was an overall improvement in the TT coverage after the MNT campaign. The improvement was mostly marked in TT-1 dose (which reached from 83% to 96% after the MNT campaign) reflecting that there were a large number of women of 15-49 years age group who did not have any TT immunization before the MNT campaign.

Knowledge base of the respondents about EPI was very low. Only 15 percent of the respondent knew the correct age of full immunization and 21% knew the correct number of times required to go to the EPI center for full immunization. Only 8% of the women knew that 5 doses TT were required for lifetime protection against tetanus. Nearly half of the parents of the dropout cases (46%) were not aware of the need for 2<sup>nd</sup> or subsequent doses to get their children fully immunized.

Lack of information of the campaign was the major reason for not receiving vaccines during the campaign. This reflects inadequate social mobilization and communication activities at the community and household level. Reasons given by the respondents for not receiving measles and TT during the MNT campaign indicate gaps and misconception about measles and TT vaccine in the campaign on top of routine vaccination. Families and communities should be adequately informed about the objective of the campaign and thus the importance of these vaccines during a campaign.

## **Conclusions and Recommendations**

### **Childhood immunization**

Access to EPI services in the survey area was quite high (92 percent); but valid full immunization coverage of children by 12 months of age was low (49 percent). The low immunization coverage can be attributed to high drop out rate, invalid doses and low level of knowledge of mothers/caretakers about immunization.

### **Recommendations**

- ? Actions are needed to improve counseling of mothers about the importance of all vaccines and the correct timing of different vaccines particularly at the time of DPT1 dose by the service providers.
- ? Families and communities should be mobilized to raise awareness for routine immunization through various communication channels and social mobilization activities with special emphasis on measles vaccination and the need to return on time for various doses.

### **TT immunization of women (15-49 years)**

23 percent newborn babies were not protected against tetanus. Women's knowledge about the number of TT doses required for life-time protection was very low (8%).

### **Recommendations**

- ? Service providers and community outreach workers should register all pregnant women in their area and follow up to ensure that a higher percentage of newborn babies are protected against neonatal tetanus.
- ? Behavior change communication (BCC) activities on community awareness on the benefits of 5 doses of TT should be developed and implemented.

### **MNT Campaign**

MNT campaign improved coverage of measles and TT to some extent in the survey areas. However, lack of information about the campaign was the most important limiting factor for low coverage of measles and TT during the campaign.

### **Recommendations**

- ? Volunteers and health workers should do better motivational work before the campaign and convince mothers/caretakers and decision makers at the household level.
- ? Micro level planning and monitoring should be improved with supervision and follow up at different level.

## References

1. WHO EPI Mid Level Managers module. Evaluate Vaccination Coverage (WHO/EPI/MLM/91-11).
2. COSAS 4.3 version manual. WHO. 1991.
3. Training Manual on EPI for the field workers of MOHF&W. 4<sup>th</sup> edition. 1997.
- 4 National Coverage Evaluation Survey- 2001. Expanded Program on Immunization, DGHS. 2001 (Unpublished data)
5. Progotir Pathe. Unicef Dhaka. 2001
6. Coverage Evaluation Survey of Routine EPI and August 2001 OPV+TT (NNT) Campaign Hard- to-reach and High-risk rural areas. Survey Report no. 20. September 2000.
7. Results of Coverage Evaluation Survey of Routine EPI and August 2000 OPV+TT (NNT) campaign. Slums of selected 27 Municipalities. September 2000. Survey Report No. 19. IOCH/MSH

The following are extracts from **Anthony G Turner, Robert J Magnani and Muhammad Shuaib's** article entitled "**A not quick as quick but much cleaner alternative to the Expanded Programme on Immunization (EPI) cluster survey design**" published in the *International Journal of Epidemiology* in 1996, volume 25, Issue No. 1, pages 198-203.

The standard EPI Cluster Survey Design

"The sample design for the EPI Cluster Survey is a two-stage design involving the selection of 30 primary sampling units or 'clusters' (usually village or other area units), from which 210 children with a target age range (usually 12-23 months) are chosen, seven children per cluster. The sample size of 210 children (per domain or stratum) is mandated by the desire to estimate the level of immunization coverage to within +/- 10 percentage points of the true population proportion with 95% statistical confidence, assuming a design effect (i.e. *deff*) of 2.0. Based upon prior experience with immunization coverage surveys (primarily in the US), 30 clusters are generally thought to be necessary to yield sufficiently reliable estimate."

"In the standard design, clusters are chosen from a list of primary sampling units (i.e. villages, urban communities, census enumeration areas etc.) through systematic random sampling with probability proportional to estimated size (*ppes*). The latest estimates of cluster population sizes, which are assumed to be proportional to the number of children in the target age group in each cluster, are typically used as measures of size. The 30 clusters so chosen are then visited by survey field staff who carry out the second stage of sample selection and conduct the household interviews. "

"The original EPI design called for sample children to be chosen randomly from a list of all eligible children in each sample cluster. However, because the creation of lists of households and children tends to be time-consuming, costly, and unfeasible in some settings, this procedure is only infrequently used in actual practice. Instead, one of several simplified second stage sampling procedures is commonly used. In one variant, children are selected by first choosing a random direction from a central location in a village or community (e.g. by spinning a bottle). The number of households in that direction to the edge of the community is then counted, and one household is randomly chosen to be the first sample household. Subsequent households are chosen by visiting the nearest neighboring households until information has been gathered on seven children. In a yet simpler variant, a direction from a central starting point is randomly chosen as described above and households are contacted as the interviewer moves in the chosen direction until the required information has been gathered for seven children."

"The second stage sampling methods described above are 'quota sampling procedures' and some of the problems resulting from the use of this approach have been noted over the years."

"First, quota sampling does not ensure that every eligible member of the target population has a known, non-zero chance of being selected. Hence, the standard EPI design, as it is usually applied, is not a true probability sample design. ...."

"A second problem concern sampling weights. .... However, since measures of size in sampling frames are often inaccurate due to census errors and changes in population since the census was taken, application of the standard EPI Cluster Survey method does not automatically result in a self weighting sample. The survey data must be weighed in order to yield unbiased estimates. .... However, since selection probabilities are not known in most EPI Cluster Survey applications, sampling weights can not be calculated."

"Thirdly, a computer simulation study demonstrates that the EPI Cluster Survey based upon quota sampling at the second stage of sample selection is considerably more prone to sampling bias than conventional cluster sampling, particularly where immunized children are 'pocketed' within clusters. "

"Finally, there is the issue of how second stage sample selection should proceed in surveys with multiple measurement objectives."

**Annex-B**

**List of Selected Clusters for the Survey**

Thana	Union	Mouza	Village	Total Population	Cluster No.	
Austagram	Kalma	Charia Sharifpur	Charia Sharifpur	2299	1	
Bazitpur	Baliardi	Baliardi	Aynarkandi	365	2	
		Yousuf Darber	Naohata	1111	3	
	Maij Char	Aynargop	Aynargop	2085	4	
		Par Kachua	Par Kachua	1822	5	
	Hilachia	Hilachia	Noakandi	1244	6	
	Katiadi	Shahasram Dhuldia	Adhkhola	Adhkhola	1132	7
Purura			Purura	3935	8	
Shahasram Dhuldia			Shahasram Dhuldia	5170	9	
Kargaon		Dangargaon	Dangargaon	2910	10	
		Kargaon Konapara	Kargaon Konapara	5696	11	
Masua		Bairagir Char	Bairagir Char	2878	12	
		Kareha	Kareha	1336	13	
		Mugdia	Mugdia	1137	14	
Mitha Moin		Gopi Dighi	Bajakpur	Bajakpur	953	15
			Sail Dighi	Sail Dighi	801	16
	Keor Juri	Keor Juri	Keor Juri	5501	17	
		Telikhai	Kandi Para	1120	18	
Nikli	Gurai	Gurai	Gurai	6428	19	
		Para Bazitpur	Para Bazitpur	2876	20	
	Shingpur	Nansri	Nansri	1733	21	
		Dubi	Dubi	1477	22	
		Tengaria	Tengaria	3297	23	
Sadar	Danapatali	Mathia	Mathia	2575	24	
	Chauddasata	Chauddasata	Jasiail	832	25	
		Nandla	Nandla	2468	26	
		Sultanpur	Paglar Kanda	881	27	
	Maria	Binnagaon (Part)	Mollah Para	994	28	
		Ronger Kona	Ronger Kona	603	29	
Tarail	Dhala	Kaluma	Kaluma	1947	30	

## Annex-C

### List of Never Vaccinated Children Identified by Clusters

Thana	Union	Mouza	Village	Total Population	Cluster No.	Never Vaccinated Children
Austagram	Kalma	Charia Sharifpur	Charia Sharifpur	2299	1	-
Bazitpur	Baliardi	Baliardi	Aynarkandi	365	2	-
		Yousuf Darber	Naohata	1111	3	-
	Maij Char	Aynargop	Aynargop	2085	4	-
		Par Kachua	Par Kachua	1822	5	-
	Hilachia	Hilachia	Noakandi	1244	6	-
Katiadi	Shahasram Dhuldia	Adhkhola	Adhkhola	1132	7	-
		Purura	Purura	3935	8	1
		Shahasram Dhuldia	Shahasram Dhuldia	5170	9	-
	Kargaon	Dangargaon	Dangargaon	2910	10	-
		Kargaon Konapara	Kargaon Konapara	5696	11	-
	Masua	Bairagir Char	Bairagir Char	2878	12	-
		Kareha	Kareha	1336	13	-
		Mugdia	Mugdia	1137	14	2
Mitha Moin	Gopi Dighi	Bajakpur	Bajakpur	953	15	-
		Sail Dighi	Sail Dighi	801	16	-
	Keor Juri	Keor Juri	Keor Juri	5501	17	-
		Telikhai	Kandi Para	1120	18	-
Nikli	Gurai	Gurai	Gurai	6428	19	-
		Para Bazitpur	Para Bazitpur	2876	20	-
	Shingpur	Nansri	Nansri	1733	21	-
		Dubi	Dubi	1477	22	-
		Tengaria	Tengaria	3297	23	-
Sadar	Danapatali	Mathia	Mathia	2575	24	-
	Chauddasata	Chauddasata	Jasiail	832	25	-
		Nandla	Nandla	2468	26	-
		Sultanpur	Paglar Kanda	881	27	-
	Maria	Binnagaon (Part)	Mollah Para	994	28	-
		Ronger Kona	Ronger Kona	603	29	1
Tarail	Dhala	Kaluma	Kaluma	1947	30	-

## **Acknowledgements**

### **Survey coordination:**

Mr. Md. Mafizur Rahman, Monitoring and Evaluation Specialist, IOCH/MSH

### **Survey management:**

Mr. Jagadindra Majumder, Field Survey Manager, IOCH/MSH

### **Data analysis:**

Mr. Md. Mafizur Rahman, Monitoring and Evaluation Specialist, IOCH/MSH

Mr. Biplob Banerjee, Surveillance Data Manager, IOCH/MSH

### **Report writing:**

Mr. Md. Mafizur Rahman, Monitoring and Evaluation Specialist, IOCH/MSH

Dr. S. Mizan Siddiqui, Short-term Consultant, IOCH/MSH

### **Report review:**

Dr. Pierre Claquin, Chief of Party, IOCH/MSH

### **Digital map preparation:**

Mr. Din Mohammed, Monitoring and Evaluation Assistant, IOCH/MSH

### **Survey Team members, IOCH/MSH:**

Mr. Md. Abdul Hamid, Field Investigator

Mr. Md. Saiful Islam, Field Investigator

Ms. Krishna Rani Shil, Field Investigator

Ms. Khaleda Akhter, Field Investigator

Ms. Mahamuda Parveen, Field Investigator

Ms. Aung Ma Ching Marma, Field Investigator

Ms. Niva Rani Taju, Field Investigator

Ms. Sultana Parvin Maya, Field Investigator

Mr. Mahfuzur Rahman, PEF Assessment Team Member

Mr. Jahangir Alam, PEF Assessment Team Member

Mr. Badrul Alam Mostazir, PEF Assessment Team Member

Mr. Dhiraj Chambugong, PEF Assessment Team Member

Mr. Sahjahan Hossain, Polio Eradication Facilitator

Mr. Nurul Amin Khan, Polio Eradication Facilitator

Mr. Mizanur Rahman, Polio Eradication Facilitator

Mr. Ziaur Rahman, Polio Eradication Facilitator

Mr. Raymond Gomez, Polio Eradication Facilitator

Mr. Mamun-ur-Rashid, Polio Eradication Facilitator

Mr. Ali Ahmed Khan, Polio Eradication Facilitator

Mr. Touhidul Islam, Polio Eradication Facilitator

Mr. Gias Uddin Parvez, Polio Eradication Facilitator

Mr. Sahadat Hossain, Polio Eradication Facilitator

Mr. Samsuzzaman Sarker, Polio Eradication Facilitator

Mr. Khan Md. Rafiqul Alam, Polio Eradication Facilitator

Mr. Khodadat Talukder, Polio Eradication Facilitator

Mr. Shahajahan, Polio Eradication Facilitator

Mr. Wazed Ali, Polio Eradication Facilitator

## List of IOCH Survey/Research/Technical Reports

### Survey Reports

1. Vaccination Coverage Survey of the Slums of Rajshahi City Corporation- January 2000. Survey Report No. 1. May 2000
2. Vaccination Coverage Survey of the Selected Unions along the North-western Border of Bangladesh- February 2000. Survey Report No. 2. June 2000
3. Vaccination Coverage Survey of the Selected Unions along the South-west Border of Bangladesh- February 2000. Survey Report No. 3. July 2000
4. Vaccination Coverage Survey of the Slums of Khulna City Corporation- January 2000. Survey Report No. 4. July 2000
5. Vaccination Coverage Survey of the Slums of Chittagong City Corporation- January 2000. Ward Number 1 to 18. Survey Report No. 5. July 2000
6. Vaccination Coverage Survey of the Slums of Chittagong City Corporation- January 2000. Ward Number 19 to 41. Survey Report No. 6. July 2000
7. Vaccination Coverage Survey of the Dinajpur Municipality- January 2000. Survey Report No. 7. July 2000
8. Vaccination Coverage Survey of the Noakhali Municipality- January 2000. Survey Report No. 8. July 2000
9. Vaccination Coverage Survey of the Slums of Dhaka City Corporation- January 2000. Dhaka Slums of Zones 1, 2 & 4. Survey Report No. 9. July 2000
10. Vaccination Coverage Survey of the Slums of Dhaka City Corporation- January 2000. Dhaka Slums of Zones 5, 6 & 7. Survey Report No. 10. July 2000
11. Vaccination Coverage Survey of the Slums of Dhaka City Corporation- January 2000. Dhaka Slums of Zones 3, 8, 9 & 10. Survey Report No. 11. July 2000
12. Vaccination Coverage Survey of the Tribal and Non-tribal Populations in the North-east Border Areas of Bangladesh. Survey Report No. 12. August 2000
13. Vaccination Coverage Survey of the Sylhet Municipality – January 2000. Survey Report No. 13. August 2000.
14. Vaccination Coverage Survey of the Kishoreganj Municipality – April 2000. Survey Report No. 14. September 2000.
15. Vaccination Coverage Survey of the Rangpur Municipality – May 2000. Survey Report No. 15. September 2000.
16. Vaccination Coverage Survey of the Greater Faridpur Municipalities – June 2000. Survey Report No. 16 September 2000.
17. Results of Coverage Evaluation Survey of Routine EPI and August 2000 OPV + TT (NNT) Campaign, Chittagong, Khulna and Rajshahi City Corporation Slums – September 2000. Survey Report No. 17. November 2000.
18. Results of Coverage Evaluation Survey of Routine EPI and August 2000 OPV + TT (NNT) Campaign, Dhaka City Corporation Slums – September 2000. Survey Report No. 18. November 2000
19. Results of Coverage Evaluation Survey of Routine EPI and August 2000 OPV + TT (NNT) Campaign, Slums of selected 27 Municipalities– September 2000. Survey Report No. 19. November 2000
20. Results of Coverage Evaluation Survey of Routine EPI and August 2000 OPV + TT (NNT) Campaign, Hard-to-reach and High-risk rural areas – September 2000. Survey Report No. 20. November 2000
21. Vaccination Coverage and Other Health Care Practices Survey in the Pabna Char Areas—August 2000. Survey Report No. 21. January 2001.
21. Vaccination Coverage Survey of the Mymensingh Municipality – April 2000. Survey Report No. 22. February 2001.
22. Vaccination Coverage Survey of the Jessore Municipality – October 20-30, 2000. Survey Report No. 23. February 2001.
23. Vaccination Coverage Survey of the Comilla Municipality - October 1-9, 2000. Survey Report No. 24. February 2001
24. Vaccination Coverage Survey of the Pabna Municipality - July 2000. Survey Report No. 25. February 2001
25. Vaccination Coverage Survey of the Sirajganj Municipality - July 2000. Survey Report No. 26. February 2001
26. Vaccination Coverage Survey of the Bogra Municipality - February 2001. Survey Report No. 27. April 2001
28. Vaccination Coverage Survey of the Peri-urban Areas of DCC- Nov. 2000 (Peri-urban Area Survey-1). Survey Report No. 28. July 2001
29. Vaccination Coverage Survey of the Peri-urban Areas of DCC- Nov. 2000 (Peri-urban Area Survey-2). Survey Report No. 29. July 2001
30. Vaccination Coverage Survey of the Patuakhali, Jhalokathi and Pirojpur Municipalities- Aug. 2000. Survey Report No. 30. July 2001
31. Vaccination Coverage Survey of the Bandarban, Rangamati and Khagrachari Municipalities- January 2001. Survey Report No. 31. July 2001
32. Vaccination Coverage Survey of the Naogaon Municipality- February 2001. Survey Report No. 32. July 2001

33. Vaccination Coverage Survey of the Tongi Municipality- March 2001. Survey Report No. 33. July 2001
34. Vaccination Coverage Survey of the Tangail Municipality- March 2001. Survey Report No. 34. July 2001
35. Vaccination Coverage Survey of the Savar Municipality- May 2001. Survey Report No. 35. July 2001
36. Vaccination Coverage Survey of the Rangpur District- June 2001. Survey Report No. 36. July 2001
37. Vaccination Coverage Survey of the Nawabganj Municipality- June 2001. Survey Report No. 37. July 2001
38. Vaccination Coverage Survey of the Expanded Areas of the Proposed Barisal City Corporation- June 2001. Survey Report No. 38. July 2001
39. Vaccination Coverage Survey of the Barisal Municipality- June 2001. Survey Report No. 39. July 2001
40. Vaccination Coverage Survey of the Kadam Rasul Municipality- July 2001. Survey Report No. 40. August 2001
41. Vaccination Coverage Survey of the Jamalpur Municipality- July 2001. Survey Report No. 41. August 2001
42. Vaccination Coverage Survey of the Brahmanbaria Municipality- June 2001. Survey Report No. 42. September 2001
43. Vaccination Coverage Survey of the Gazipur Municipality- July 2001. Survey Report No. 43. September 2001
44. Vaccination Coverage Survey of the Narsingdi Municipality- August 2001. Survey Report No. 44. September 2001
45. Vaccination Coverage Survey of the Hard-to-Reach Unions of Dewanganj, Raumari and Rajibpur Upalizas- July 2001. Survey Report No. 45. September 2001
46. Vaccination Coverage Survey of the Satkhira Municipality- September 2001. Survey Report No. 46. September 2001
47. Vaccination Coverage Survey of the Barguna Municipality- October 2001. Survey Report No. 47. November 2001
48. Vaccination Coverage Survey of the Bhola Municipality- October 2001. Survey Report No. 48. November 2001
49. Vaccination Coverage Survey of the Kushtia Municipality- October 2001. Survey Report No. 49. November 2001
50. Vaccination Coverage Survey of the Chandpur Municipality- October 2001. Survey Report No. 50. December 2001
51. Vaccination Coverage Survey of the Bhairab Municipality- November 2001. Survey Report No. 51. December 2001
52. Vaccination Coverage Survey of the Jhenaidah Municipality- November 2001. Survey Report No. 52. December 2001
53. Vaccination Coverage Survey of the Chuadanga Municipality- November 2001. Survey Report No. 53. December 2001
54. Vaccination Coverage Survey of the Sherpur Municipality- November 2001. Survey Report No. 54. December 2001
55. Vaccination Coverage Survey of the Mongla Municipality- December 2001. Survey Report No. 54. January 2002

#### **MNT- 2001 Survey Reports**

1. Vaccination Coverage Survey of Routine EPI and 2001 MNT Campaign in the Slums of Dhaka City Corporation. MNT Survey Report No. 1. March 2002
2. Vaccination Coverage Survey of Routine EPI and 2001 MNT Campaign in the Slums of Chittagong, Khulna and Rajshahi City Corporations. MNT Survey Report No. 2. March 2002
3. Vaccination Coverage Survey of Routine EPI and 2001 MNT Campaign in the Selected 27 Municipalities . MNT Survey Report No. 3. March 2002
4. Vaccination Coverage Survey of Routine EPI and 2001 MNT Campaign in the Rural Areas of Chittagong, Khulna and Barisal Divisions. MNT Survey Report No. 4. March 2002
5. Vaccination Coverage Survey of Routine EPI and 2001 MNT Campaign in the Rural Areas of Dhaka, Rajshahi and Sylhet Divisions. MNT Survey Report No 5. March 2002
6. Vaccination Coverage Survey of Routine EPI and 2001 MNT Campaign in the Brahmanbaria District. MNT Survey Report No 5. March 2002

#### **Unicef & IOCH Survey Reports**

1. Vaccination Coverage Survey of the Teknaf and Ukhiya Upazilas- February 2000. Survey Report No. 01. August 2000
2. Vaccination Coverage Survey of the Brahmanbaria Sadar Upazila- February 2000. Survey Report No. 02. August 2000
3. Vaccination Coverage Survey of the Debidwar Upazila- February 2000. Survey Report No. 03. August 2000
4. Vaccination Coverage Survey of the Madaripur Upazila- February 2000. Survey Report No. 04. August 2000
5. Vaccination Coverage Survey of the Maulvi Bazar District- February 2000. Survey Report No. 05. August 2000
6. Vaccination Coverage Survey of the Raumari Upazila - February 2000. Survey Report No. 06. August 2000
7. Vaccination Coverage Survey of the Gangachara Upazila - February 2000. Survey Report No. 07. August 2000

8. Vaccination Coverage Survey of Chittagong Hill Tracts - February 2000. Survey Report No. 08.October 2000

**Technical Report**

1. Joint National/International Review of EPI Program in Urban Areas of Bangladesh—23 January – 3 February 2000. Technical Report No. 01. July 2000

---

*Additional copies of any of these reports, if needed, will be provided free of cost on request to: Mamunul Haque, Communications Advisor, IOCH. E-mail: [mh@citechco.net](mailto:mh@citechco.net)*