



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

**Vaccination Coverage Survey of Routine EPI and  
2001 MNT Campaign in the Rural Areas of  
Chittagong, Khulna and Barisal Divisions**

**September 2001**

**MNT Survey Report No. 4**

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## 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 rural areas (where 2001 MNT Campaign was conducted) of Chittagong, Khulna and Barisal Division. 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

### Coverage levels for the Routine Immunization of Children

**Access:** Based on crude data (card plus history), 96% 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. 4% children did not receive any dose of any antigen.

**Crude coverage between 12-23 months:** 95% of the children received BCG, 81% received three doses of OPV, 81% received three doses of DPT and 75% received measles vaccine. 73% children were fully immunized.

**Valid coverage between 12-23 months:** 95% children received BCG, 60% received three doses of OPV and DPT and 74% received measles vaccine. 53% children were fully immunized.

**Valid coverage by 12 months:** 95% children received BCG, 55% received three doses of OPV, 55% received three doses of DPT and 52% received measles vaccine. 43% 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 21 percent

Ten percent of children received an invalid dose for DPT1, 5% an invalid dose of DPT2 while 7 percent children received invalid DPT3 dose. For measles the rate was 2 percent.

***Source of immunization:*** 95% of the immunization services were from the government EPI outreach centers, 1% from GOB hospital/clinic, 3% private clinics and 1% from NGO EPI centers.

***Reasons for non-immunization and partial immunization:*** 4% of the surveyed children were not immunized at all while 23% had partial immunization. Reasons for non-immunization were: lack of knowledge about immunization, inconvenient timing of EPI session, social/religious barrier and child sickness. Most important reasons mentioned by the respondents for partial immunization were: lack of knowledge about the need of second dose, when to return for subsequent dose and fear of adverse reaction.

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

Forty one percent of women interviewed had all five doses of TT. Ninety three percent women had first dose of TT while 84 and 70 percent of women had second and third dose of TT respectively. The rate for fourth dose of TT was 55 percent. Seven percent women had no dose of TT. The drop out rate of first dose of TT vaccine to second dose was nine percent. The corresponding rates for TT1 to TT3 and TT1 to TT5 were 25 and 55 percent respectively. 93 percent of women had received first dose of TT indicating good access to TT immunization. 32 percent of women had TT card at the time of interview. Of the women interviewed 79% of newborn were protected against tetanus

***Knowledge about EPI:*** Eleven percent of the respondents knew that by 12 months a child has to complete the immunization schedule and 25% percent knew that a child has to go four times to the center to complete the EPI schedule. 15% of the respondent knew that 5 doses are required for life- time protection against tetanus. The sources of correct knowledge about number of times required to go to EPI center for full immunization were: government health worker (64%), family/friend (26%), television (6%) and doctor (4%).

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

82 percent of children (0-59 months) had OPV during the campaign, 69 percent of children aged between 9-35 months received measles shot (except those who received measles vaccination during the last one month) and 65 percent women of child bearing age (15-49 years) had TT vaccination

***Comparison with the coverage of the 2000 NNT Campaign:*** The coverage of OPV during the 2001 MNT Campaign was slightly less than that of the previous year's NNT Campaign (82% vs. 87%); while TT coverage improved from 57% to 65%.

***Information and motivation activity during the MNT campaign:*** Fifty eight percent of the respondent mentioned that a health worker visited their household before the MNT campaign. 38% of the household interviewed had a referral slip for OPV provided by the health worker when visited before the campaign while 8% percent of the women got TT card during household visit. The government health workers were the main source of information about the campaign at the household level (61%) followed by miking (24), family/friend/neighbor (9%), doctor (1%) and others (5%). 26 percent of the respondent mentioned that someone came to the household 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 campaign, mothers was too busy, vaccinators or vaccine was not available at the site and child not at home. For measles different reasons given by the respondents were: lack of information about the campaign, vaccine/vaccinator was not available at the site, child had measles vaccination earlier and child not at home. Not knowing about the campaign, too busy at home, mothers' sickness, believing that she is fully immunized and mothers' away from home were the most important reasons for not receiving TT during the campaign

### **Problems detected**

The continuity and quality of the childhood immunization program was affected by drop out rate (15% for DPT1 to DPT3 and 21% for DPT1 to measles) and invalid doses (10% of children received an invalid dose for DPT1, 5% an invalid dose of DPT2 while 7 percent children received invalid DPT3 dose). Basic knowledge of EPI of the mothers was poor (11% of the respondents knew that by 12 months a child has to complete the immunization schedule and 25% percent knew that a child has to go four times to the center to complete the EPI schedule). 21 percent new born are still not protected and knowledge of 5 doses of TT was low (15%). Lack of information about the campaign (27% of the women of 15 – 49 years were not aware of the MNT Campaign) and low motivation of the health workers (38% of the household had a referral slip for OPV and 8% percent of the women got TT card from the health workers during their household visits before the campaign) were the most important limiting factors for coverage of all three antigens during the MNT campaign.

### **Suggested solutions**

In order to reduce drop out rate actions are needed to improve counseling of mothers about the importance of all vaccines and the correct timing of different vaccines by the service providers. Participatory supervision and onsite training of vaccinators can reduce invalid doses and improve the quality of their outreach activities. The service providers and community outreach workers should register all pregnant women in their area and follow up to ensure TT doses to protect their newborns. Behavior Change and Communication (BCC) activities on community awareness on the benefits of 5 doses of TT should be further developed and implemented. Information about campaign should be disseminated through various communication and social mobilization activities and targeted household visits by the health workers.

## 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 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 (554 unions in 1818 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 survey 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 Kishorganj 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. The survey also collected data on routine EPI coverage and information related to knowledge, source and reasons for not receiving vaccines. This report describes the findings of the survey conducted in the selected rural areas (where MNT Campaign- 2001 was conducted) of Chittagong, Khulna and Barisal Division.

## **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

## **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).

One 30 cluster survey was conducted in the unions of Chittagong, Khulna and Barisal Divisions where MNT campaign was conducted. The clusters were selected from the list of villages in unions. The lists of selected clusters are given in Annex B and their locations are shown in the following map.

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) 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:

- a) 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.
- b) 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
- c) 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 gave card 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.

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. Simple tables and graphs were produced to summarize results. Monitoring and Evaluation Unit of IOCH/MSH produced the final report.

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<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:

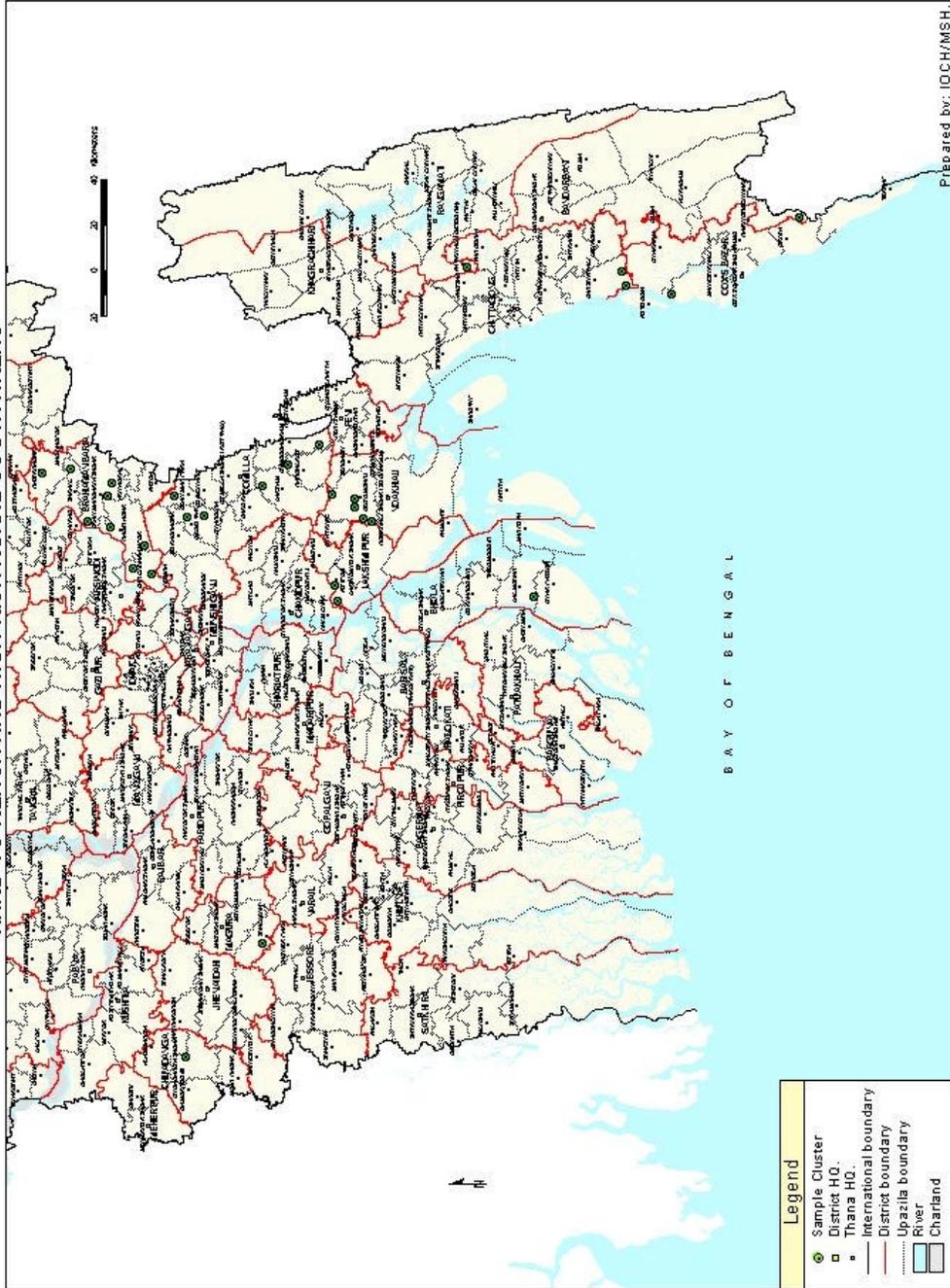
- ? As an inherent bias in the sampling technique in 30 clusters, bigger mouzas are more likely to be selected as a cluster. The survey leaves out scattered small mouzas with poor access to services. It also does not reflect the lack of uniformity in service availability or the behavior of particular 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.

**ROUTINE EPI AND MNT CAMPAIGN COVERAGE SURVEY AREAS, SEPTEMBER 2001  
HARD-TO-REACH AND HIGH-RISK RURAL SOUTH AREAS**



Prepared by: IDCH/MSH.

## Results

### Routine immunization coverage of children

**Table 1** shows childhood immunization coverage achieved by the routine EPI in rural areas of southern Bangladesh. The crude data shows coverage for BCG, OPV3, DPT3 and Measles at 95, 81, 81 and 75 percent respectively. The corresponding valid data for these antigens are 95, 60, 60 and 74 percent. Valid coverage by 12 months for BCG, OPV3, DPT3 and Measles were 95, 55, 55 and 52 percent respectively.

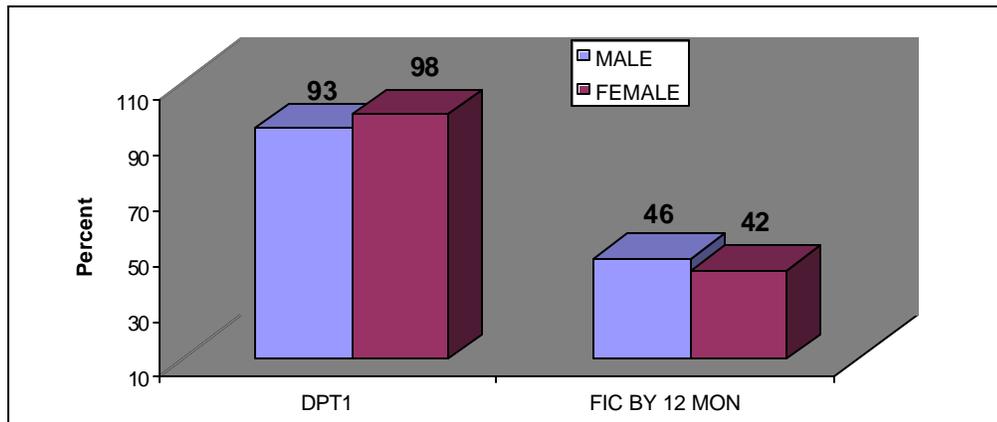
**Table 1. Routine immunization coverage of children**

Name of vaccine	Coverage (12-23 months)		Coverage by 12 months of age
	Crude (%)	Valid (%)	Valid (%)
BCG	95	95	95
OPV1	96	87	87
OPV2	90	75	73
OPV3	81	60	55
DPT1	96	86	86
DPT2	89	75	73
DPT3	81	60	55
Measles	75	74	52
Fully immunized	73	53	43
Zero dose	4	-	-

Crude coverage of full immunization of 12-23 months age group was 73 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 43 percent. The low valid coverage of fully immunized children was mainly due to high dropouts and invalid doses (discussed in page 16).

Table 1 shows significant difference between crude and valid coverage for all antigens except BCG and Measles for 12-23 months age group. It shows that valid coverage was significantly lower than the crude coverage for DPT, OPV and full immunization (96% vs. 86% for DPT1, 81% vs. 60% for DPT3 and 73% vs. 53% for full immunization), representing a very high invalid doses. The valid full immunization coverage reduces by 10 percentage point and measles coverage by 22 percentage points when we consider it by 12 months age, which means that, although the National EPI program advocates to get fully immunized by one year, a large number of children still gets immunized after 12 months of age.

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

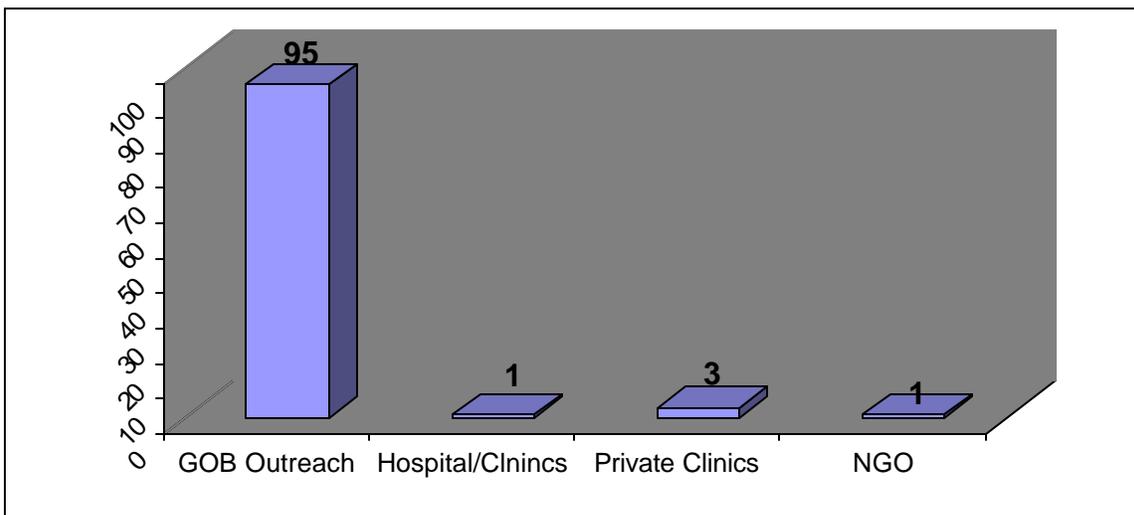


DPT1 (access) and Full Immunization Coverage (FIC) by 12 months by sex are shown in *figure 1*. No significant sex bias was observed either in accessing immunization services or full immunization coverage in the surveyed population.

***Program access***

96 percent of the children surveyed received DPT1. 95% of the immunization services were from the government EPI outreach centers, 1% from GOB hospital/clinic, 3% private clinics and 1% from NGO EPI centers (*figure 2*).

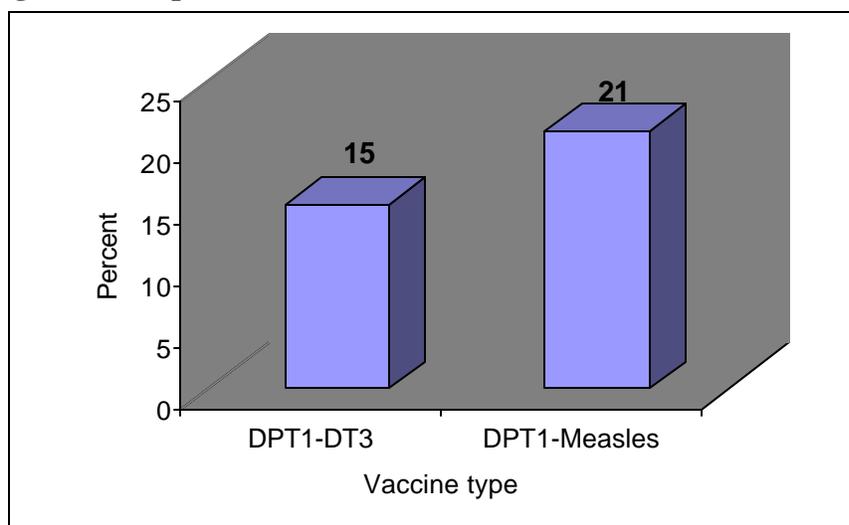
**Figure 2: Providers of childhood immunization**



***Program continuity (dropout 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 DPT to measles dropout rate was 21 percent (*figure 3*).

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



***Program Quality***

Ten percent of children received an invalid dose for DPT1 while 7 percent children received invalid DPT3 dose. For measles the rate was 2 percent (**table 2**).

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

Antigens	Percent
DPT 1	10
DPT2	5
DPT 3	7
Measles	2

95 percent of children received BCG dose. Of them 84 percent children had scar in their arm. 37 percent of households had EPI card at the time of interview. Card retention rate was 43%.

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

4% of the surveyed children were not immunized at all while 23% had partial immunization. Reasons for non-immunization were: lack of knowledge about immunization, inconvenient timing of EPI session, social/religious barrier and child sickness.

In **table 3** reasons for partial immunization of children in the survey area given. Most important reasons mentioned by the respondents for partial immunization were: lack of knowledge about the need of second dose, did not know when to return for subsequent doses and fear of adverse reaction.

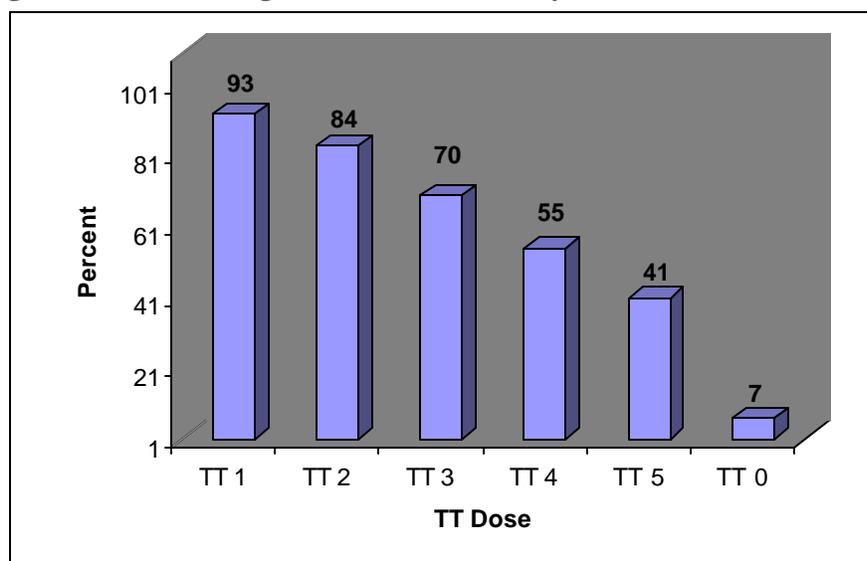
**Table 3. Reasons for partial immunization**

Reasons	Number	Percent
Did not know when to return for 2 <sup>nd</sup> , 3 <sup>rd</sup> dose and measles	20	41
Did not know about the need of second dose	15	31
Child not at home	3	6
Fear of adverse reaction	2	4
Did not know where to go for vaccination	1	2
Child/Mother sick	1	2
Other reaction after pervious	1	2
Vaccinator not available at the site	1	2
Mother too busy	1	2
Others	4	8

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

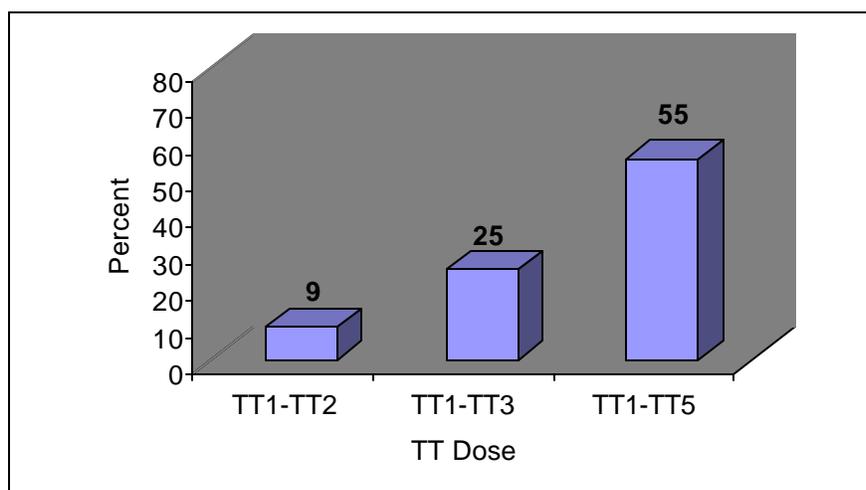
Forty one percent of women interviewed had all five doses of TT. Ninety three percent women had first dose of TT while 84 and 70 percent of women had second and third dose of TT respectively. The rate for fourth dose of TT was 55 percent. Seven percent women had no dose of TT (*figure 4*).

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



The drop out rate of first dose of TT vaccine to second dose was nine percent. The corresponding rates for TT1 to TT3 and TT1 to TT5 were 25 and 55 percent respectively (*figure 5*).

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



93 percent of women had received first dose of TT indicating good access to TT immunization. 32 percent of women had TT card at the time of interview.

***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 delivery or followed TT5 doses schedule. Of the women interviewed 79% of newborn were protected against tetanus

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

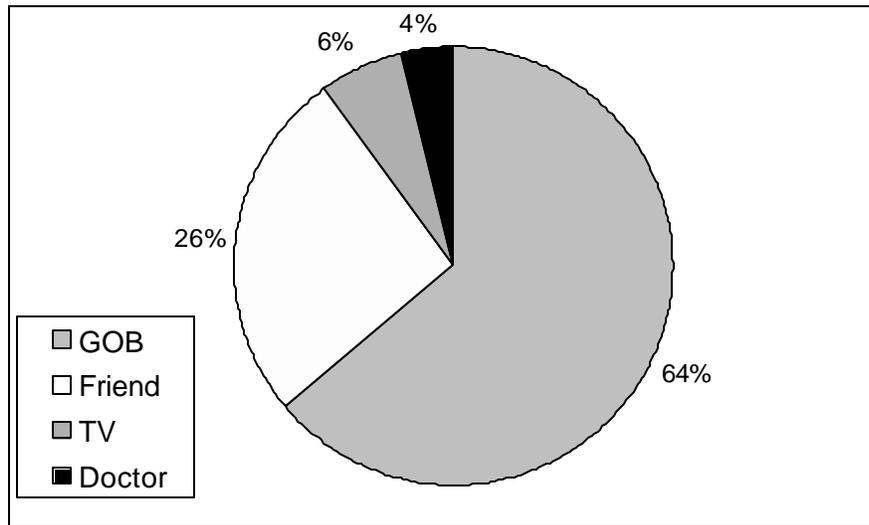
Eleven percent of the respondents knew that by 12 months a child has to complete the immunization schedule and 25% percent knew that a child has to go four times to the center to complete the EPI schedule. 15% of the respondent knew that 5 doses are required for life-time protection (**table 4**).

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

Variable	Correct Knowledge (%)	Incorrect Knowledge (%)	Don't Know (%)
Age of full immunization	11	34	55
Number of times child required to go to EPI center for full immunization	25	22	53
Number of TT doses required for life time protection	15	4	81

The sources of correct knowledge about number of times required to go to EPI center for full immunization were: government health worker (64%), family/friend (26%), television (6%) and doctor (4%) (**figure 6**).

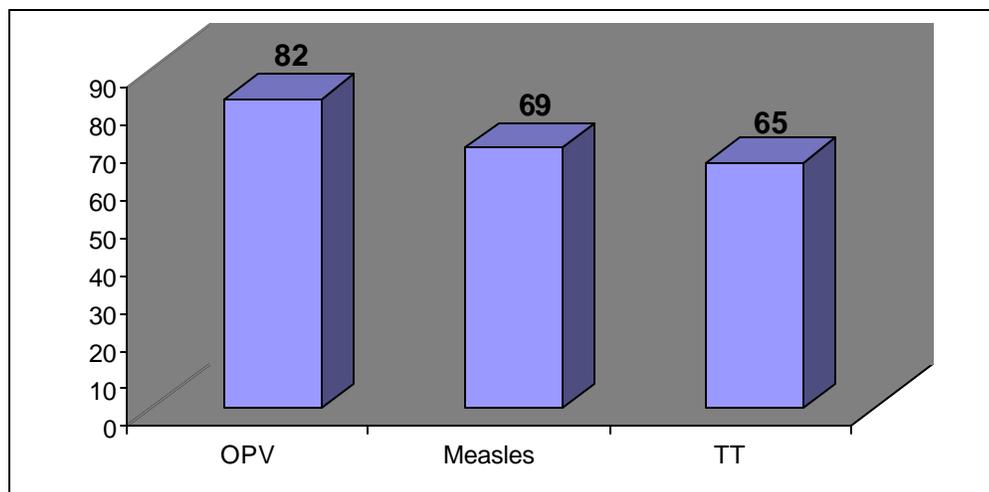
**Figure 6: Sources of correct knowledge about number of times required to go to EPI center for full immunization**



**Coverage of the MNT Campaign 2001**

82 percent of children (0-59 months) had OPV during the campaign, 69 percent of children aged between 9-35 months received measles shot (except those who received measles vaccination in 30 days prior to the MNT Campaign) and 65 percent women of child bearing age (15-49 years) had TT vaccination (*figure 7*).

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



**Comparison with the coverage of the 2000 NNT Campaign:** The coverage of OPV during the 2001 MNT Campaign was slightly less than that of the previous year’s NNT Campaign (82% vs. 87%); while TT coverage improved from 57% to 65%.

***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 campaign, mothers' too busy, vaccinators or vaccine was not available at the site and child not at home. For measles different reasons given by the respondents were: lack of information about the campaign, vaccine/vaccinator was not available at the site, child had measles vaccination earlier and child not at home. Not knowing about the campaign, too busy at home, mothers' sickness, believing that she is fully immunized and mothers' away from home were the most important reasons for not receiving TT during the campaign (**table 5**).

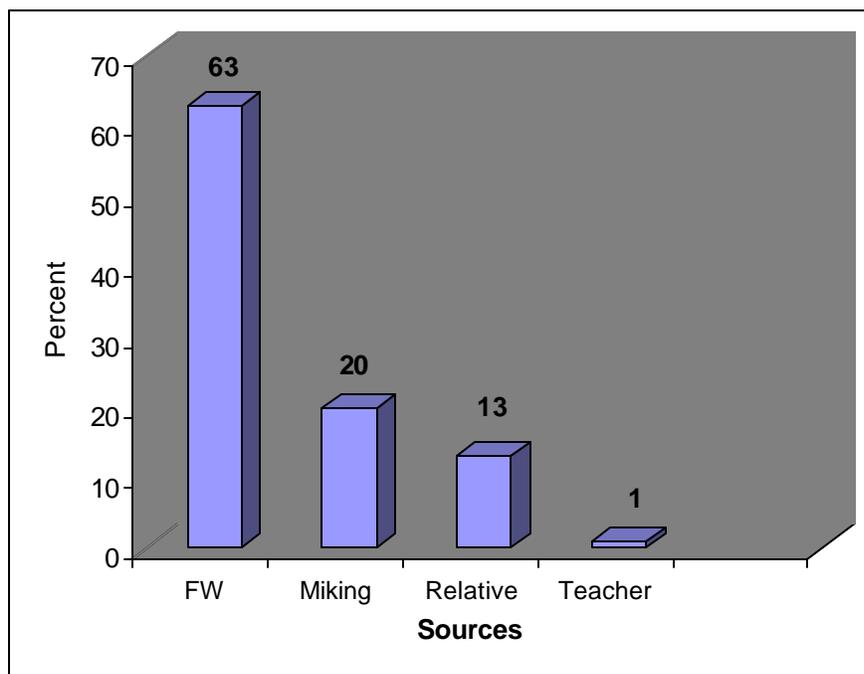
**Table 5. Reasons for not receiving OPV, Measles and TT during MNT Campaign**

Reasons	OPV (%)	Measles (%)	TT (%)
Did not know about MNT	22	16	27
Vaccine/vaccinator was not available at the site	13	10	4
Too busy	14	6	8
Long queue	3	-	1
Waited for house visit	5	-	1
Time inconvenient	3	-	3
Not taken- Child/mother sick	3	6	10
Religious/social barrier	3	-	4
Does not believe in vaccine	-	-	3
Believed she is fully immunized	-	-	10
Received TT/Measles one month prior to MNT	-	3	4
Not given- child/mother sick	-	6	-
Already vaccinated	-	30	-
Child/mother was not at home	35	16	21
Taken to the center, but not given	-	6	-
Others	-	1	4

***Sources of information and household visit during the MNT campaign***

The government health workers were the main source of information about the campaign at the household level (63%) followed by miking (20), family/friend/neighbor (13%) and teacher (1%) (**figure 8**).

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



Fifty eight percent of the respondents mentioned that health worker visited their household before the MNT campaign. 38% of the household interviewed had a referral slip for OPV provided by the health workers when visited before the campaign; while 8% percent of the women got TT card from the health workers during their household visits before the campaign. 26 percent of the respondents mentioned that someone came to their households to inquire about receiving vaccination during the campaign period.

## Discussion

The survey found 73% crude coverage of immunization against six EPI diseases among children aged between 12-23 months with good access (ninety percent) to immunization in rural southern Bangladesh. The coverage is close to national rural average of 74.4 percent. But, the coverage drops to 53 percent when valid doses were considered and further down to 43% when considered by 12 months of age. While the program had very good access with DPT1 coverage at 96 percent the continuity of the program was not good as reflected in drop out rate for DPT1 to DPT3 at 15 percent and DPT1 to Measles at 22 percent. 10% of the DPT1 doses received were invalid. EPI card retention rate was also poor (37%). In case of TT among child bearing aged women (15-49 years) the access rate was high with 93 percent women having TT1. TT5 coverage (41%) was higher compared to the national average which is encouraging; but 21% of newborns were still unprotected from neonatal tetanus.

Lack of knowledge about immunization, social/religious barrier and child sickness were the reasons for non-immunization indicate that the wrong perception about immunization still persists in the community. While lack of knowledge about the need of second dose, when to return for 2<sup>nd</sup>, 3<sup>rd</sup> dose and measles and fear of adverse reaction resulted in high drop out rate and consequently to low full immunization coverage rate in the surveyed population. Proper counseling at every contact for subsequent dose, reminding the EPI schedule and time to return for subsequent dose by the health workers can decrease drop out rate and improve compliance for full immunization by the end of one year age of the child.

Basic knowledge of the respondents about EPI was very low. Only 11 percent of the respondent knew the correct age of full immunization and 15% of the women knew that 5 doses are required for lifetime protection. Approximately 31% percent did not know about the need of second dose and another 41% did not know when to return for subsequent doses.

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 high (96 percent) but the continuity and quality of the program was affected with high drop out rate, invalid doses and low level of knowledge of immunization of mothers/care takers..

### **Recommendations**

- ? Actions are needed to improve counseling of mothers about the importance of all vaccines and the correct timing of different vaccines by the service providers.
- ? Participatory supervision and onsite training of vaccinators can reduce invalid doses and improve the quality of their outreach activities.

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

TT5 coverage (41%) was higher compared to the national rate is encouraging. However, 21 percent newborns were still not protected. Knowledge about 5 doses of TT was very low (15%).

### **Recommendations**

- ? Service providers and community outreach workers should register all pregnant women in their area and follow up to ensure TT doses to protect their newborns.
- ? Behavior Change and Communication (BCC) activities on community awareness on the benefits of 5 doses of TT should be further developed and implemented.

### **MNT Campaign**

Lack of information and low motivation about the campaign were the most important limiting factors for coverage of all three antigens.

### **Recommendations**

- ? Information about campaign should be disseminated through various communication and social mobilization activities.
- ? Household level motivational activities by the health workers should be improved before and during the campaign for increased coverage.

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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

District	Thana	Union	Mouza name	Village name	Total Population	Cluster No.
Bhola	Lalmohan	Pashim Char Umed	Kachukhali	Kachukhali	6714	1
Bandarban	Naikhongchhari	Gandong	Tumbru	Baispari	361	2
Chittagong	Banshkhali	Chhanua	Chhota Chhanua	Chhanua	10625	3
Chittagong		Puichhari	Napora	Napora	5792	4
Comilla	Brahmanpara	Chandla	Bara Dhusia	Bara Dhusia	4959	5
	Chouddagram	Gunabati	Kaitara	Kaitara	997	6
	Debidwar	Dakshin Jafarganj	Harasar	Harasar	341	7
		Subil	Wahedpur	Masuabad	543	8
	Laksham	Baghmara	Ghaniakhali	Ghaniakhali	411	9
	Nangalkot	Bangodda	Gandhachi	Gandhachi	1829	10
Cox's Bazar	Maheshkhali	Matarbari	Matarbari	Fuljan Para	471	11
Lakshmipur	Raipur	Charabail	Jhaudagi	Jhaudagi	1801	12
		Raipur	Gazinagar	Gazinagar	927	13
Noakhali	Begumgonj	Alayerpur	Doalia Bazar	Doalia Bazar	1347	14
		Chhayani	Kamalpur	Kamalpur	620	15
		Gopalpur	Rezakupur	Rezakupur	1682	16
		Mirwarashipur	Lalpur	Lalpur	2135	17
		Sonaimuri	Alokpara	Alokpara	942	18
Rangamati	Kawkhali	Betbunia	Betbunia	Purba Betbunia para	214	19
Chuadanga	Sadar	Padmabila(Ex Mominpur)	Hogaldanga	Hogaldanga	519	20
Magura	Shalikha	Shalikha	Royzadapur	Royzadapur	869	21
B.Baria	Bancharampur	Pahariakandi	Joykali pur	Joykali pur	3512	22
		Uttar Bancharampur	Chunar char	Manik hati	583	23
	Nabinagar	Krishna nagar	Ekai chara	Ekai chara	904	24
		Ratanpur	Bauchit	Bauchit	1497	25
	Nasir Nagar	Nasir Nagar	Nasir Nagar	Anandapur	267	26
	Sadar	Daskhin Araisidha	Arai sidha	Arai sidha	10221	27
		Machihata	Badeshwara	Badeshwara	1581	28
		Ramrail	Bhola chang	Bhola chang	686	29
	Sarail	Sahajadapur	Bhat baria	Bhat baria	573	30

**Annex-C**

**List of Never Vaccinated Children Identified by Clusters**

District	Thana	Union	Mouza name	Village name	Total Population	Cluster No.	Never Vaccinated Children
Bhola	Lalmohan	Pashim Char Umed	Kachukhali	Kachukhali	6714	1	1
Bandarban	Naikhongchhari	Gandong	Tumbru	Baispari	361	2	1
Chittagong	Banshkhali	Chhanua	Chhota Chhanua	Chhanua	10625	3	-
Chittagong		Puichhari	Napora	Napora	5792	4	-
Comilla	Brahmanpara	Chandla	Bara Dhusia	Bara Dhusia	4959	5	-
	Chouddagram	Gunabati	Kaitara	Kaitara	997	6	-
	Debidwar	Dakshin Jafarganj	Harasar	Harasar	341	7	-
			Subil	Wahedpur	Masubad	543	8
	Laksham	Baghmara	Ghaniakhali	Ghaniakhali	411	9	-
	Nangalkot	Bangodda	Gandhachi	Gandhachi	1829	10	-
Cox's Bazar	Maheshkhali	Matarbari	Matarbari	Fuljan Para	471	11	-
Lakshimpur	Raipur	Charabail	Jhaudagi	Jhaudagi	1801	12	1
		Raipur	Gazinagar	Gazinagar	927	13	-
Noakhali	Begumgonj	Alayerpur	Doalia Bazar	Doalia Bazar	1347	14	-
		Chhayani	Kamalpur	Kamalpur	620	15	-
		Gopalpur	Rezakpur	Rezakpur	1682	16	-
		Mirwarashipur	Lalpur	Lalpur	2135	17	-
		Sonaimuri	Alokpara	Alokpara	942	18	-
Rangamati	Kawkhali	Betbunia	Betbunia	Purba Betbunia para	214	19	-
Chuadanga	Sadar	Padmabila(Ex Mominpur)	Hogaldanga	Hogaldanga	519	20	-
Magura	Shalikha	Shalikha	Royzadapur	Royzadapur	869	21	-
B.Baria	Bancharampur	Pahariakandi	Joykali pur	Joykali pur	3512	22	-
		Uttar Bancharampur	Chunar char	Manik hati	583	23	-
	Nabinagar	Krishna nagar	Ekai chara	Ekai chara	904	24	1
		Ratanpur	Bauchit	Bauchit	1497	25	-
	Nasir Nagar	Nasir Nagar	Nasir Nagar	Anandapur	267	26	2
	Sadar	Daskhin Araisidha	Arai sidha	Arai sidha	10221	27	1
		Machihata	Badeshwara	Badeshwara	1581	28	1
		Ramrail	Bhola chang	Bhola chang	686	29	-
	Sarail	Sahajadapur	Bhat baria	Bhat baria	573	30	-

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