IOCH

Immunization and Other Child Health Project

Vaccination Coverage Survey of the

Chuadanga Municipality

November 2001

Survey Report No. 53

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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 Program on Immunization
FWC	Family Welfare Center
IOCH	Immunization and Other Child Health
Mahallah	Smaller localities (smaller than a village)
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 1st 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 1st 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 1st 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*.

SUMMARY RESULTS

Background

The routine EPI program in the municipalities is carried out by a variety of private and public providers at fixed (hospitals, clinics, dispensaries, etc.) and at outreach sites. NGOs and private practitioners also provide immunization services in many places. The municipal authorities are primarily responsible for providing and/or coordinating primary health care including routine EPI services in municipal areas. However, in the absence of an effective management information system and reliable service statistics at municipal level, it is often difficult to assess the level of immunization coverage of the municipalities. In view of this situation, the IOCH decided to conduct a series of coverage evaluation surveys in the selected municipal areas to assess the level of immunization coverage in these municipal areas. As a part of this effort, the IOCH conducted a coverage evaluation survey in the Chuadanga Municipality in November 2001.

Objectives

The overall objective of the survey was to assess the level of immunization coverage in the Chuadanga Municipality. The specific objectives were to:

a) assess the level of routine immunization coverage of the children (12-23 months) and find out the reasons for non-immunization and partial immunization.
b) assess the level of TT immunization coverage among women of 15-49 years of age, irrespective of their marital status, and find out the reasons for non-immunization and partial immunization.
c) assess the coverage levels of OPV and Vitamin A administered during the 9th NID campaign.

Methodology

The survey employed the WHO recommended 30-cluster survey methodology that has been widely used in many developing countries to assess immunization coverage (the survey methodology and its limitations are presented in Annex A). In all, 30 clusters were randomly selected from the Chuadanga Municipality following PPS sampling procedures. A list of the selected clusters is provided in Annex- B and their locations are shown on the maps in page 8. From each cluster, 7 children 12 – 23 months and 7 women of reproductive age (15 – 49 years) irrespective of their marital status were selected following 30 cluster survey methodology to ascertain their routine immunization coverage. Also, 7 children < 5 years (0 – 59 months) were selected to assess the immunization coverage of the 9th National Immunization Campaign.

The WHO standard questionnaires were used for documenting the routine immunization status of the children and women. Also, separate questionnaires were used to collect data on NIDs and reasons for non-immunization and dropouts. The data were collected by the experienced Field Investigators of the Survey Team of the IOCH. Data processing and analysis were done by the Monitoring & Evaluation Unit of the IOCH using COSAS 4.41[1] and EpiInfo.

[1] COSAS (Coverage Survey Analysis System) is a dedicated software for analyzing coverage evaluation survey data.

Coverage levels for the routine immunization of children

Access: Based on crude data (card plus history), 96% children received at least one dose of antigen (DPT 1st dose in this case) from routine immunization sessions. Only 4% of the children did not receive a dose of any antigen.

Crude coverage between 12-23 months: 96% children received BCG, 84% children received three doses of OPV, 84% received three doses of DPT and 74% received measles vaccine. 74% children were fully immunized.

Valid coverage between 12-23 months: 96% children received BCG, 81% children received three doses of OPV, 81% received three doses of DPT and 74% received measles vaccine. 72% children were fully immunized.

Valid coverage by 12 months: 96% children received BCG, 81% children received three doses of OPV, 81% received three doses of DPT and 71% received measles vaccine. 69% children were fully immunized.

Source of immunization and distance of immunization center: Childhood immunization in this area was provided mostly by the hospitals and clinics (58%), followed by the GOB EPI outreach centers (34%). NGO clinics provided immunization to 8% cases only. All the EPI outreach centers were located within half an hour walking distance from the homes of the children.

Reasons for non-immunization and partial immunization or dropout of children: The primary reason for non-immunization of children cited by parents was lack of awareness of need and importance of immunization (50%) and sickness of the children (38%). As regards reasons for partial immunization or dropout, about one-fourth of the parents reported that they did not know the importance of 2nd dose or subsequent doses of vaccine; while sickness of children and fear of pain of injection were cited by 18% and 16% of the parents respectively.

Problems detected: Although access to immunization was high (96%), there was 12% dropout from DPT1 to DPT3 and 22% from DPT1 to Measles vaccine. The rate of invalid doses due to early immunization for different antigens was low (ranging 0 to 1%). Prevalence of uncorrected missed opportunity for different antigens was also low, except for measles (4%). Child immunization cards (EPI Cards) were ever given to 95% of the children; but they were available at the time of interview in 50% of the cases. EPI Card retention rate was 53%, which means that 47% of the EPI cards were lost. About half of the parents could mention correctly the number of times (i.e. 4 times) their children needed to visit the immunization centers to get fully immunized.

Coverage levels for the routine TT immunization of women

The survey of coverage levels for immunization against tetanus toxoid showed that about 83% of women of reproductive age (15-49 years) received a first dose of TT; 81% received two doses; and 23% received 5 doses of the TT vaccine. About 18% women never received any TT vaccine.

Dropout rate for TT immunization: The dropout rate for TT immunization among the women of reproductive age was quite high. The dropout rate for TT1 to TT2 was 3%, TT2 to TT3 was

29%, and TT1 to TT5 was 72%. It implies that 72% of the women who received TT1 dose did not get fully immunized for life-long protection against tetanus.

Sources of TT immunization: Majority of the women received TT vaccine from the hospitals and clinics (58%), followed by the EPI outreach centers (38%). NGO clinics provided TT immunization to 4% cases only.

Reasons for non-immunization and partial immunization of women: The primary reason for non-immunization of TT cited by majority of the women (43%) was that there was no provision of TT vaccine when had their pregnancies. About one-third of the women did not feel need of immunization. The primary reasons for partial immunization or dropout were that the women were told by the health workers that 2 or 3 doses were enough for them for their pregnancies, and they were not advised (by health worker) for full immunization (47%) or the health workers did not specify the date of next/subsequent doses (24%) or they were not aware of the need for subsequent doses to get fully immunized against tetanus (16%).

Coverage levels for the 9th NID campaign

During the 9th NIDs, 98% of the children <5 years received OPV in both the rounds. The coverage for OPV in the 1st Round was 99%; whole it was 98% in the 2nd Round. Vitamin A capsules were given to 91% of the eligible children during the 9th NID campaign

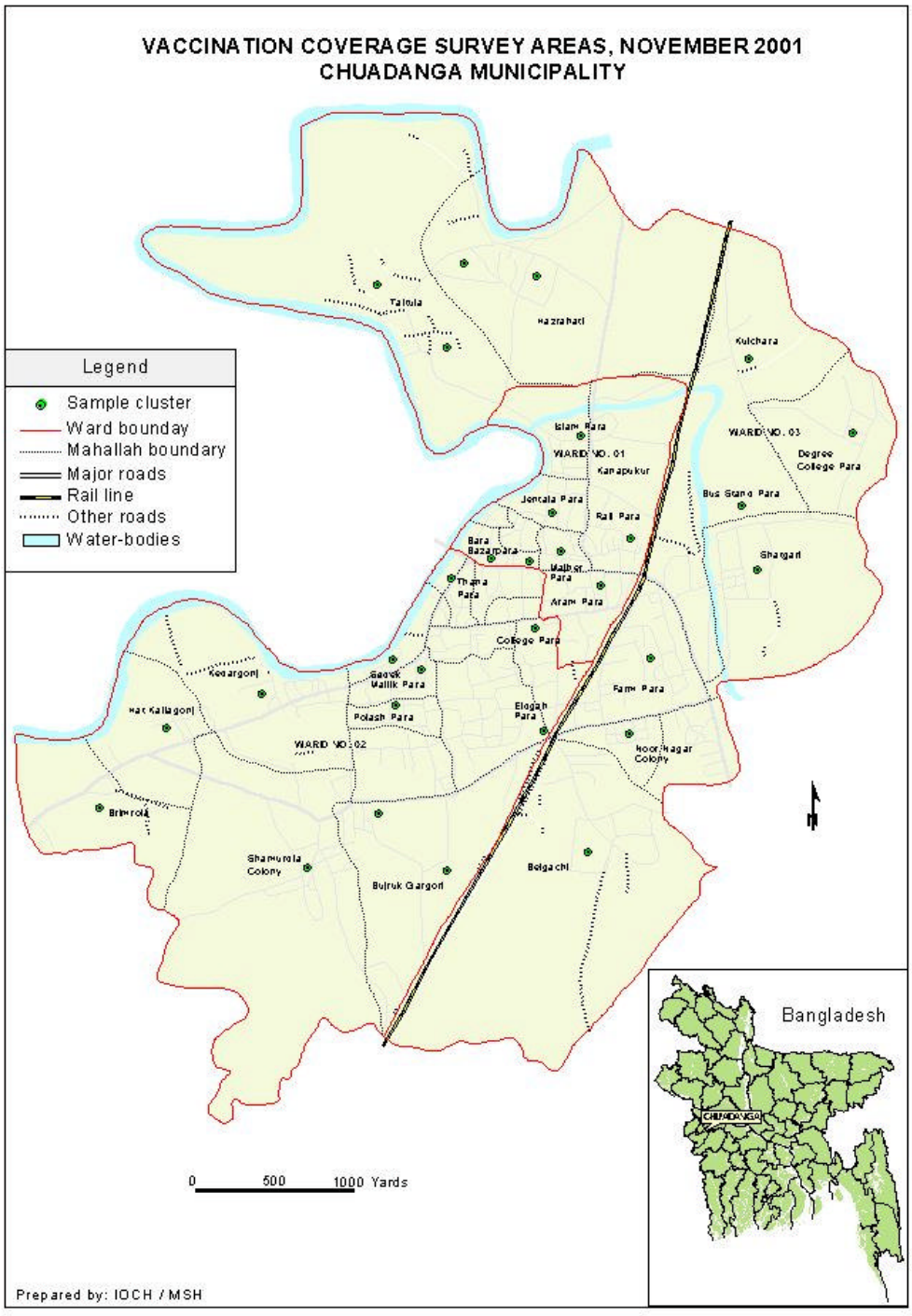
The primary reasons for not receiving OPV during the 9th NIDs included lack of awareness of NID campaign, lack of awareness of importance of vaccine, sickness of children or absence of children from homes on the day of NIDs.

Majority of the parents learned about the 9th NID Campaign from the IPC during home visits by the GOB/municipal field workers (60%), followed by miking (43%). Television and radio as sources of information were cited by 15% of the parents; while 19% came to know about the NIDs from family members and neighbors.

Suggested solutions

The survey indicates the need for appropriate BCC activities and counseling to make the parents/caretakers understand the importance of full immunization of their children. The information must stress that each child, irrespective of sex, must be fully immunized before 12 months of age, and how to achieve full immunization (the time and place of the immunization sessions and the number of doses required). All women of childbearing age must be informed about how to prevent tetanus with 5 doses of TT vaccination to protect herself and her newborn child.

The quality of services as reflected by the dropout rates (12% for DPT1 to DPT3 and 22% for DPT1 to measles) could be further improved by adequate counseling of mothers at the time of vaccination and during home visit. There is also a need to further train the service providers to help them keep up with EPI policies and guidelines and increase their capacity for counseling parents and women of reproductive age about EPI.


VACCINATION COVERAGE SURVEY AREAS, NOVEMBER 2001
CHUADANGA MUNICIPALITY
Legend
Sample cluster
Ward bounday
Mahallah boundary
Major roads
Rail line
Other roads
Water-bodies
Talpla
Hazrahati
Kulchara
Islam Para
WARD NO. 01
Kanapukur
WARD NO. 03
Degree College Para
Bus Stand Para
Jemala Para
Rail Para
Bara Bazarpara
Malhar Para
Thana Para
Aram Para
Shagari
College Para
Kedargonj
Sadek Mallik Para
Hat Kallagonj
Polash Para
Elogah Para
Farm Para
WARD NO. 02
Noor Nagar Colony
Brinrola
Shamurola Colony
Bujruk Gargori
Belgachi
0 500 1000 Yards
Bangladesh
CHUADANGA
Prepared by: IOCH / MSH

TABLES AND CHARTS

Table 1: Routine immunization coverage levels of the children

Name of the vaccine	Coverage (%) Immunization of 12-23 months age group		Coverage (%) Immunized by 12 months of age
	Crude data (Access)	Valid data	Valid data
BCG	96	96	96
OPV1	96	95	95
OPV2	89	88	88
OPV3	84	81	81
DPT1	96	95	95
DPT2	89	88	88
DPT3	84	81	81
Measles	74	74	71
Fully immunized	74	72	69
Zero Dose	4	-	-

Chart-1: Drop-out rate for childhood immunization

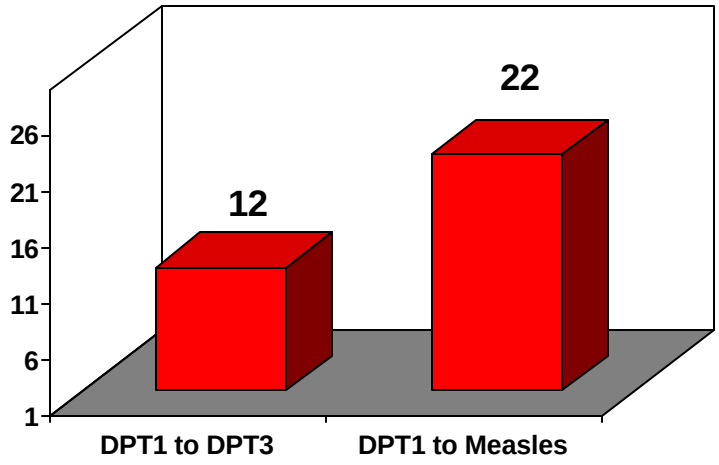


Table 2: Invalid doses of immunization provided to the children

Antigens	Percentage
DPT1	1
DPT2	0
DPT3	1
Measles	0

Table 3: Missed opportunities by antigens

Name of the vaccine	Uncorrected		Corrected	
	Number	Percent	Number	Percent
BCG	3	1	11	5
DPT1	0	-	7	3
DTP2	2	1	5	2
DPT3	3	1	3	1
OPV1	0	-	7	3
OPV2	2	1	5	2
OPV3	3	1	3	1
Measles	8	4	6	3

Table 4: EPI card availability and retention

Card Status	Number	Percentage
EPI card available	106	50
EPI card ever given	199	95
EPI card retention	106	53

Chart 2: Sources of childhood immunization services

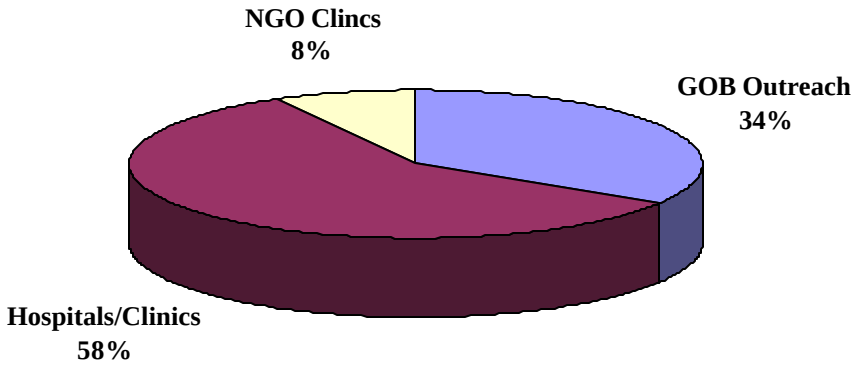


Table 5: Distance between the child's home and the vaccination site

Time (Minutes)	Number	Percentage
1-5 Min.	102	49
6-10 Min.	100	47
11-30 Min.	8	4
Total	210	100

Table 6: Reasons for non-immunization and partial immunization of the children

Reasons	Non-immunized (%) (N=8)	Partially immunized (%) (N=45)
Did not know about need of immunization	50	-
Did not know importance of second dose	-	23
Did not know when to return for 2nd/3rd dose	-	4
Did not know importance of measles vaccine	-	9
Did not know when to return for measles vaccine	-	4
Fear of adverse reaction	-	4
Vaccinator was not available at the site	-	2
Health worker's behavior was not good	-	2
Family problem/mother sick	-	4
Child sick, was not taken to site	38	18
Child sick, was taken to site, not given	-	2
Pain full for the children	-	16
Child away from home	-	12
Others	12	-

Chart 3: Respondents' knowledge about required visits to immunization centers

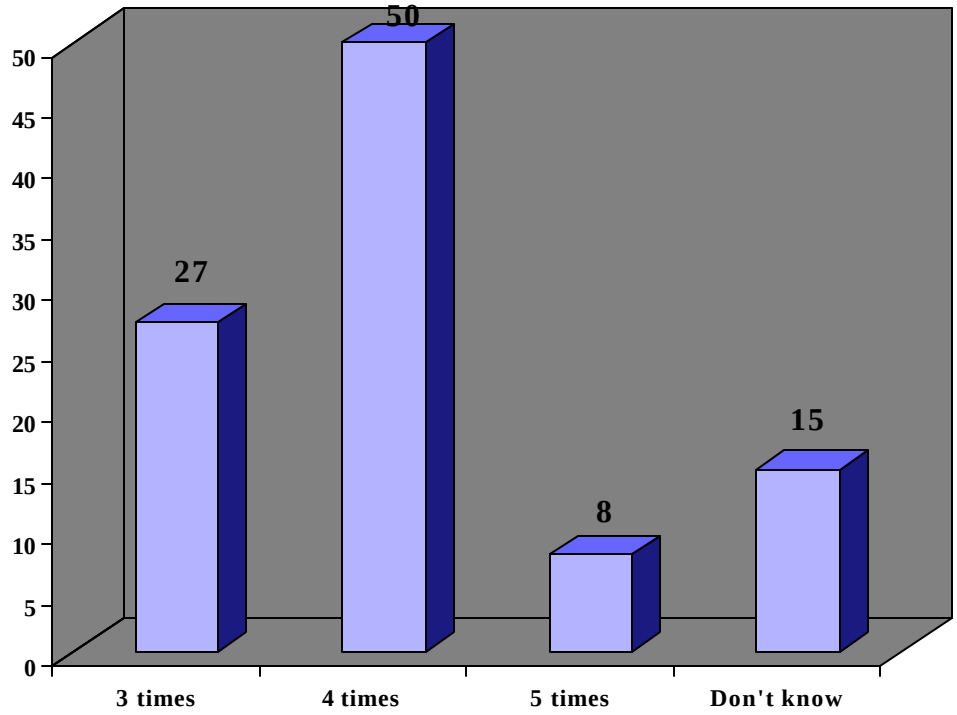


Chart 4: Routine immunization coverage levels for TT of women (15-49 years)

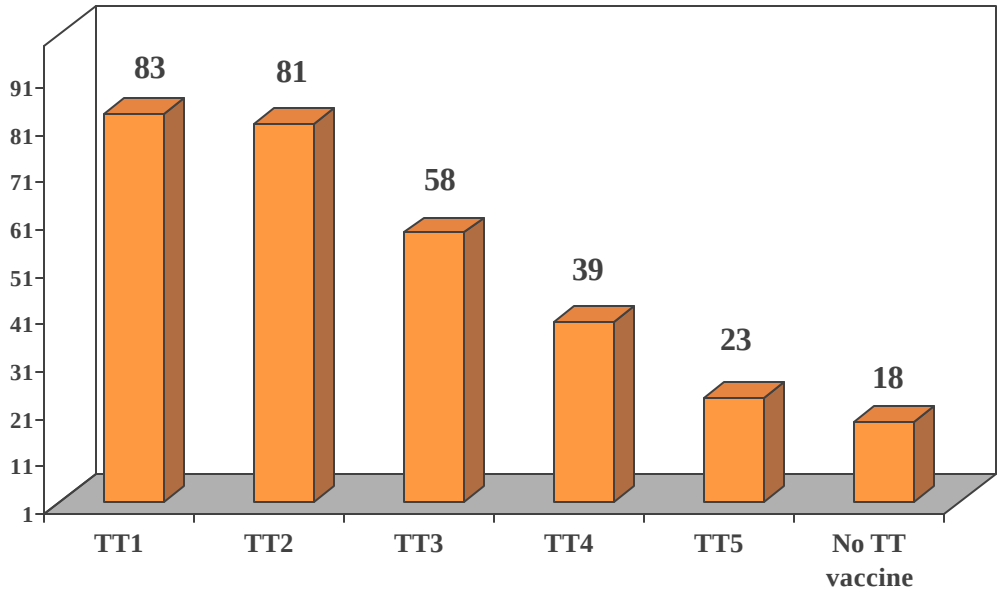


Chart 5: TT Immunization drop-out rate among women 15-49 years

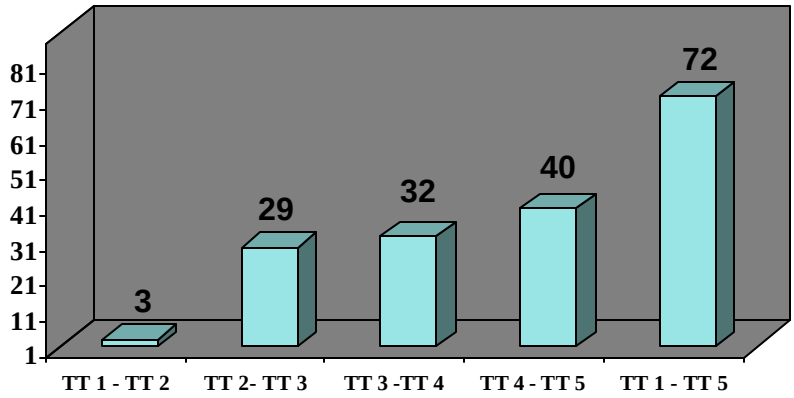


Chart 6: Providers of TT immunization

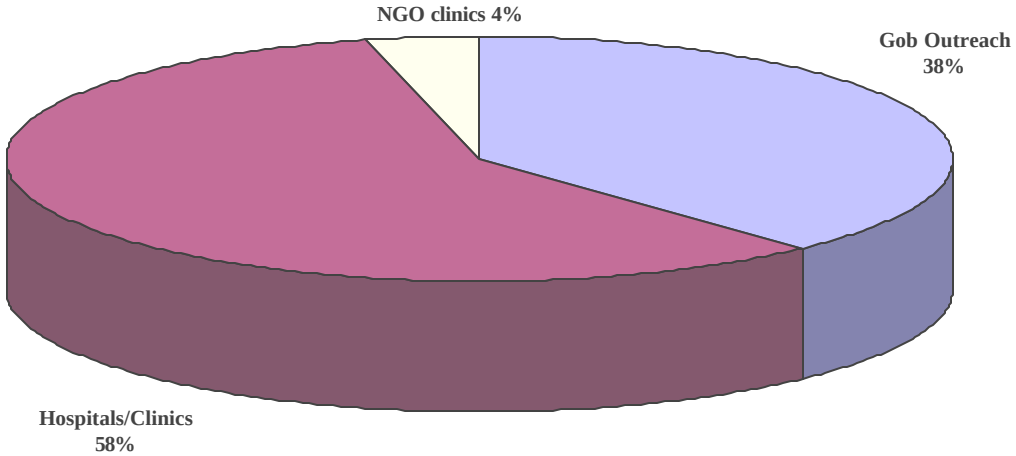


Table 7: Reasons for non-immunization and partial immunization for TT of the women

Reasons	Non-immunization (%) (N=35)	Partially immunization (%) (N=126)
Next dose is not yet due	-	10
Don't feel need for immunization	37	-
Health worker did not specify the next dose	-	24
As per HW advice 2/3 TT is enough during the pregnancy	-	47
Unaware of need of next dose	-	16
In our times TT immunization was not in practice	43	-
Fear of injection	17	3
Fear of adverse reaction	3	1

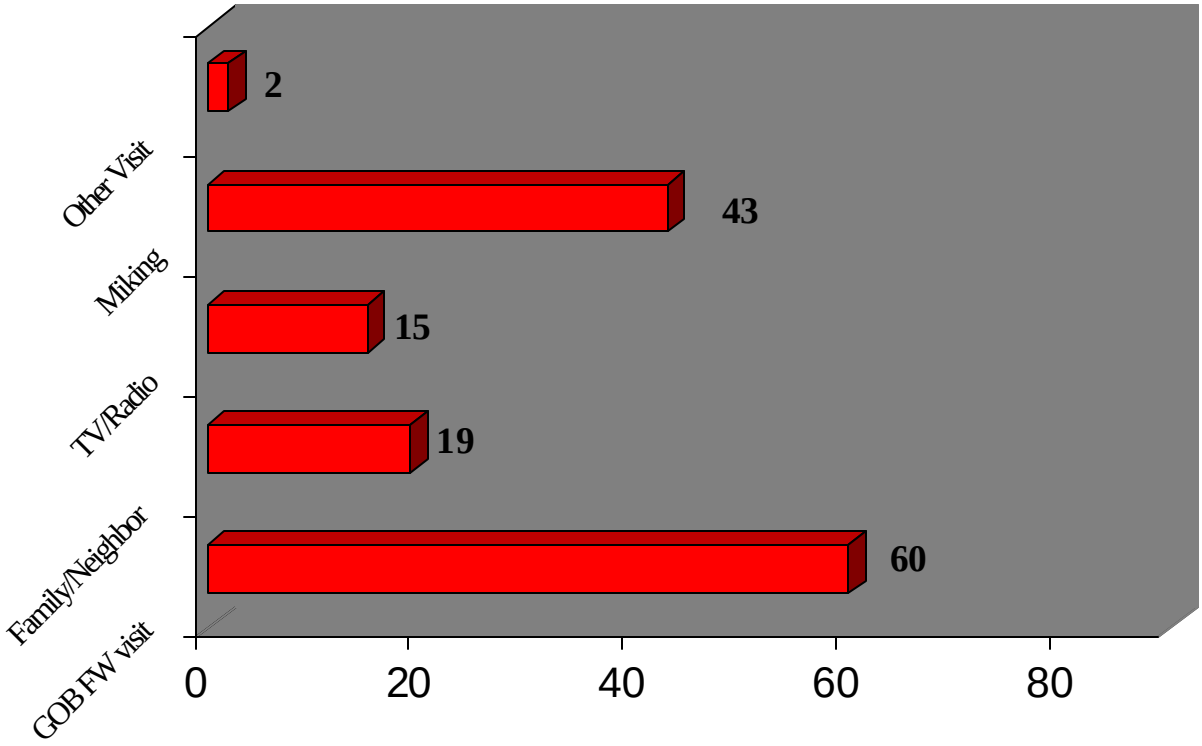
Table 8: Coverage of the 9th NID Campaign

Round	OPV %	Vit "A" %
1st round	99	-
2nd round	98	91
Both rounds	98	-
Any round	99	-

Table 9: Reasons for non-immunization of OPV during 9th NID campaign

Reasons	1st Round %	2nd Round %
Did not know about NID	-	50
Does not believe in vaccine	50	25
Child away from home	-	25
Child/Mother sick, not taken	50	-

Chart 7: Source of information about the 9th NID campaign



Annex- A

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

Ward no.	Mahalla Name	Total HH	Total Population	Cluster No.
1	Aram Para	282	1659	1
	Bara Bazar Para	218	960	2
	Islam Para	328	1676	3
	Jentala Para	121	562	4
	Majher Para	375	2133	5
	Rail Para	172	955	6
	Shekh Para	270	1484	7
2	Brimrola	287	1450	8
	Bujruk Gargori	619	3444	9, 10
	College Para	147	755	11
	Eidgah Para	332	1530	12
	Hat Kaliagonj	285	1554	13
	Kedargonj	331	1840	14
	Sadek Mallik Para	146	843	15
	Malua Para	382	2205	16
	Polash Para	109	603	17
	Shamurdia Colony	429	2123	18
	Thana Council Para	91	540	19
3	Belgachi	475	2587	20
	Bus Stand Para	173	1006	21
	Degree	177	996	22
	Farm Para	466	2326	23
	Hazrahati	901	5027	24, 25
	Kulchara	226	1260	26
	Noor Colony Para	302	1607	27
	Satghari	392	2007	28
	Taltola	580	3053	29, 30

Annex-C

List of Never Vaccinated Children Identified by Clusters

Ward no.	Mahalla Name	Total HH	Total Population	Cluster No.	Never vaccinated children
1	Aram Para	282	1659	1	1
	Bara Bazar Para	218	960	2	-
	Islam Para	328	1676	3	1
	Jentala Para	121	562	4	-
	Majher Para	375	2133	5	-
	Rail Para	172	955	6	-
	Shekh Para	270	1484	7	-
2	Brimrola	287	1450	8	-
	Bujruk Gargori	619	3444	9, 10	-
	College Para	147	755	11	-
	Eidgah Para	332	1530	12	1
	Hat Kaliagonj	285	1554	13	-
	Kedargonj	331	1840	14	1
	Sadek Mallik Para	146	843	15	1
	Malua Para	382	2205	16	-
	Polash Para	109	603	17	-
	Shamurdia Colony	429	2123	18	-
	Thana Council Para	91	540	19	-
3	Belgachi	475	2587	20	-
	Bus Stand Para	173	1006	21	-
	Degree	177	996	22	-
	Farm Para	466	2326	23	-
	Hazrahati	901	5027	24, 25	-
	Kulchara	226	1260	26	1
	Noor Colony Para	302	1607	27	-
	Satghari	392	2007	28	1
	Taltola	580	3053	29, 30*	1*

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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.
22. Vaccination Coverage Survey of the Mymensingh Municipality – April 2000. Survey Report No. 22. February 2001.
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