



IOCH

Immunization and Other Child Health Project

Vaccination Coverage Survey of Bandarban, Rangamati and Khagrachari Municipalities- January 2001

Survey Report No. 31

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

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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. 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 Bandarban, Rangamati and Khagrachari municipalities in January 2001.

Objectives

The overall objective of the survey was to assess the level of immunization coverage in Bandarban, Rangamati and Khagrachari municipalities. 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 8th 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 this survey, Bandarban, Rangamati and Khagrachari municipalities were taken as a unit or universe and 30 clusters were randomly selected from these three municipalities 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 8th 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 4.41¹ 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), 94% of the children received at least one dose of antigen (DPT 1st dose in this case) from routine immunization sessions. Only 6% children did not receive a dose of any antigen.

Crude coverage between 12-23 months: 94% children received BCG, 87% received three doses of OPV, 87% received three doses of DPT and 80% received measles vaccine. 80% children were fully immunized.

Valid coverage between 12-23 months: 94% children received BCG, 77% received three doses of OPV, 77% received three doses of DPT and 83% received measles vaccine. 66% children were fully immunized.

Valid coverage by 12 months: 93% children received BCG, 76% received three doses of OPV, 76% received three doses of DPT and 70% received measles vaccine. 64% children were fully immunized.

Source of immunization and distance of immunization center: Childhood immunization in this area was provided mostly by the GOB hospitals (53%), followed by the GOB EPI outreach centers (45%). NGO clinics provided only 3% of the vaccinations. Almost all the EPI centers (94%) were located within half an hour walking distance from the residence of the children.

Reasons for non-immunization and partial immunization of children: Majority of the parents (85%) of non-immunized children were not aware of the need and importance of immunization. The other reasons for non-immunization included sickness of the children (8%) and fear of adverse reaction to immunization (8%). As regards reasons for partial immunization or dropout, 13% of the parents reported that they did not know that their children needed to be brought again to the vaccination centers for subsequent doses to get fully immunized. Sickness of children as a reason for dropout was cited by 20% of the parents. The other reasons for dropout as cited by the parents included fear of adverse reaction to immunization (13%) and the inconvenient location of the EPI centers (10%).

Problems detected: Although access to immunization was fairly high, there was 7% dropout from DPT1 to DPT3 and 15% from DPT1 to Measles vaccine. There were also a number of invalid doses due to early immunization (8% for DPT1 and 9% for Measles vaccine). However, prevalence of uncorrected missed opportunity was very low (ranging 0 for DPT3 to 2% for measles). Child immunization cards (EPI Cards) were ever given to 93% of the children; but they were available at the time of interview in 52% of the cases. EPI Card retention rate was 56%, which means that 44% 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 76% of women of reproductive age (15-49 years) received a first dose of TT; 72% women received two doses; 51% received 3 doses, and 28% received 5 doses of the TT vaccine. About one-fourth of the women never received any TT vaccine.

Dropout rate for TT immunization: The dropout rate for TT immunization among the women of reproductive age was very high. The dropout rate for TT1 to TT2 was 5% and for TT1 to TT 3 was 34%.

Reasons for non-immunization and partial immunization of women: The major reason cited for non-immunization was that the women were unaware of the need for immunization (52%). One-fifth of the women mentioned that there was no provision of TT vaccine when they had their pregnancies, while 22% were afraid of the pain of TT injection. The major reasons for partial immunization or dropout were that the women were either unaware of the need to return for subsequent doses of TT immunization (52%) or the health worker did not specify when to return for the next dose of TT vaccine (14%).

Coverage levels for the 8th NID campaign

During the 8th NIDs, 98% of the children <5 years received OPV in both the rounds. The coverage for OPV in the 1st Round, as well as in the 2nd Round was as high as 99%. Vitamin A capsules were given to 97% of the eligible children in the first round of the 8th NID campaign.

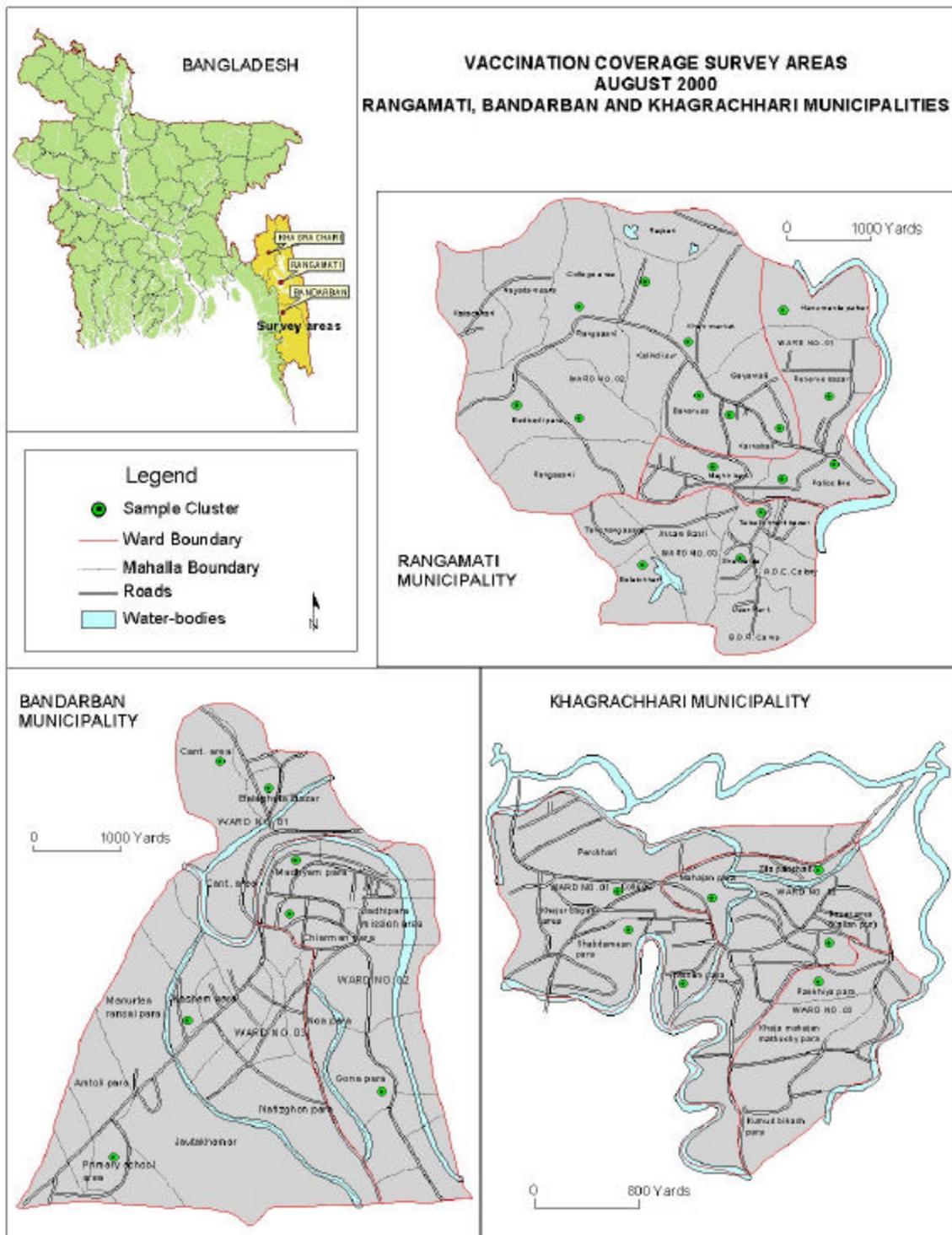
Various reasons were given for the non-receipt of OPV/Vitamin A during the NIDs. About half of the parents said that they were not aware of the NIDs. Another 50% said that their children were away from home on the day of the 1st Round. One parent reported that one physician advised him not to give his child OPV any more, since his child has already received 3 doses of OPV, which is required for full protection.

Majority of the parents learned about the NID campaign from IPC by the GOB health workers (67%) and miking (45%). The other sources of information included family members and neighbors (39%) and television/radio (28%).

Suggested solutions

The survey indicates the need for appropriate BCC activities and counseling to make the parents/caretakers understand the importance of full immunization for each child. 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 poor quality of services, as reflected by the percentage of invalid doses (8% for DPT1, and 9% for measles) and dropout rates (7% for DPT1 to DPT3 and 15% for DPT1 to measles) could be improved by proper screening of eligibility of clients for each antigen at the time of vaccination, and by adequate counseling of mothers. 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.



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	94	94	93
Polio-1	94	86	85
Polio-2	91	81	81
Polio-3	87	77	76
DPT-1	94	86	85
DPT-2	91	81	81
DPT-3	87	77	76
Measles	80	83	70
Fully immunized	80	66	64
Zero dose	6	-	-

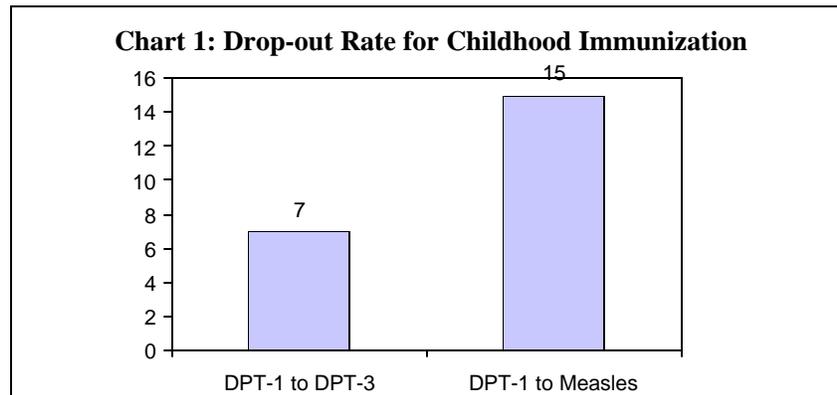


Table 2: Invalid doses of immunization provided to the children

Invalid doses	Percentage
DPT-1	8
DPT-2	1
DPT-3	1
Measles	9

Table 3: Missed opportunities by antigens

Vaccine	Uncorrected		Corrected	
	Number	Percent	Number	Percent
BCG	1	0.48	6	2.86
DPT-1	1	0.48	5	2.38
DPT-2	1	0.48	0	-
DPT-3	0	-	0	-
OPV-1	1	0.48	5	2.38
OPV-2	1	0.48	0	-
OPV-3	0	-	0	-
Measles	4	1.90	7	3.33

Table 4: EPI card availability and retention

Card Status	Number	Percentage
EPI card available	109	52
EPI card ever given	196	93
EPI card retention	109	56

Chart 2: Sources of childhood immunization services

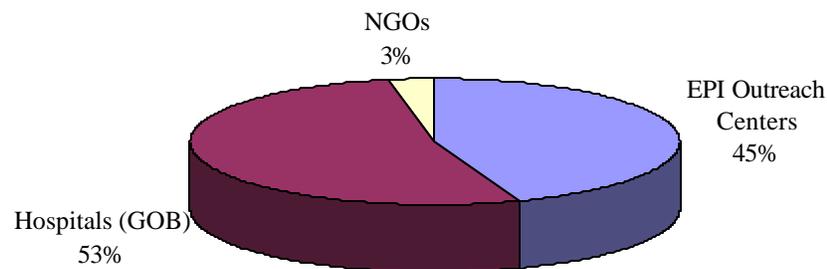


Table 5: Distance between the child’s home and the vaccination site

Time (Minutes)	Number	Percentage
1-5 Min.	105	50
6-10 Min.	48	23
11-30 Min.	44	21
30 + More min.	13	6

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

Reasons	Non-immunized (%) (N=13)	Partially immunized (%) (N=30)
Did not know about importance of immunization	85	-
Unaware that the child needs to be brought again for the 2nd/3 rd doses	-	13
Fear of adverse reaction to immunization	8	13
Vaccination site location was too inconvenient.	-	10
Vaccine was not available	-	10
Mother too busy	-	3
Child was sick and not taken to the vaccination session	8	20
Sick child was taken to the vaccination site but vaccine not given	-	10
Mother was sick / family problem	-	13
Others	-	7

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

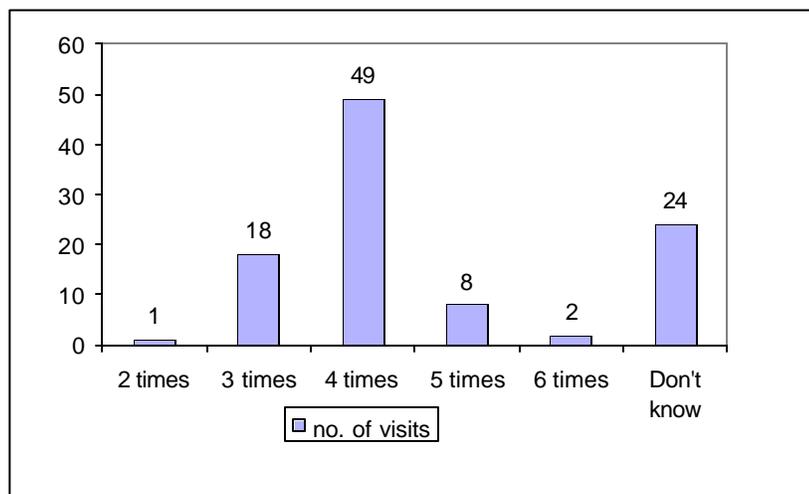


Chart 4: Routine immunization coverage levels for TT of women (15-49 years)

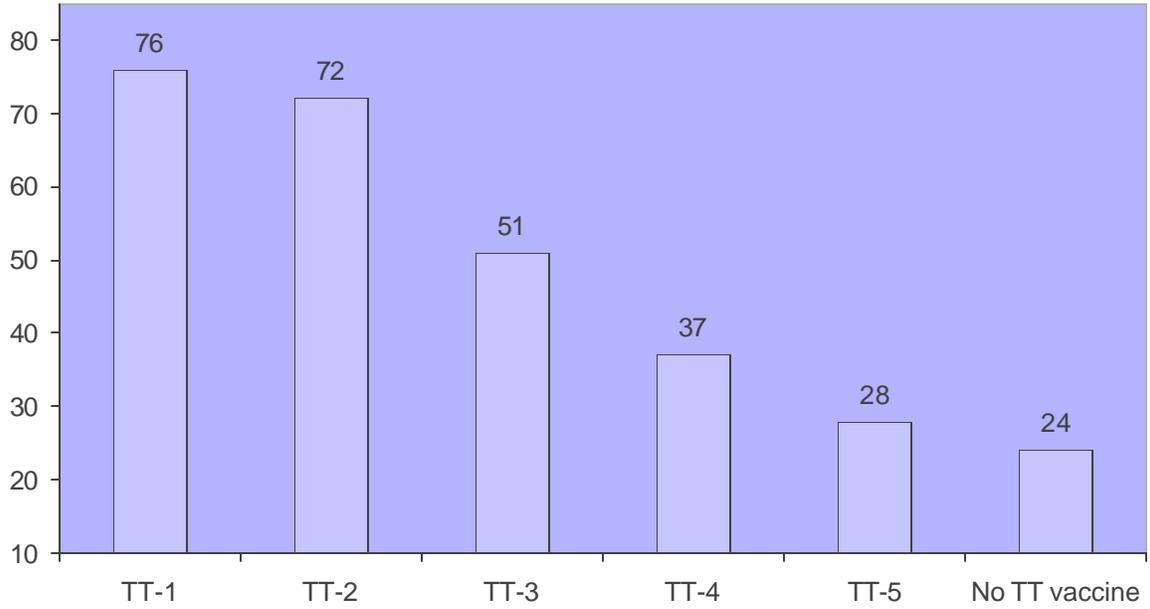


Chart 5: TT immunization drop-out rate among women 15-49 years

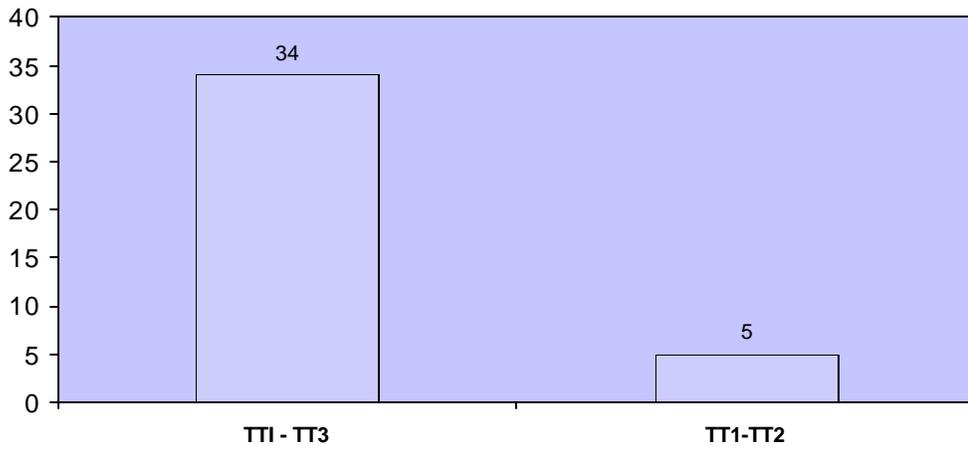


Chart 6: Providers of TT immunization

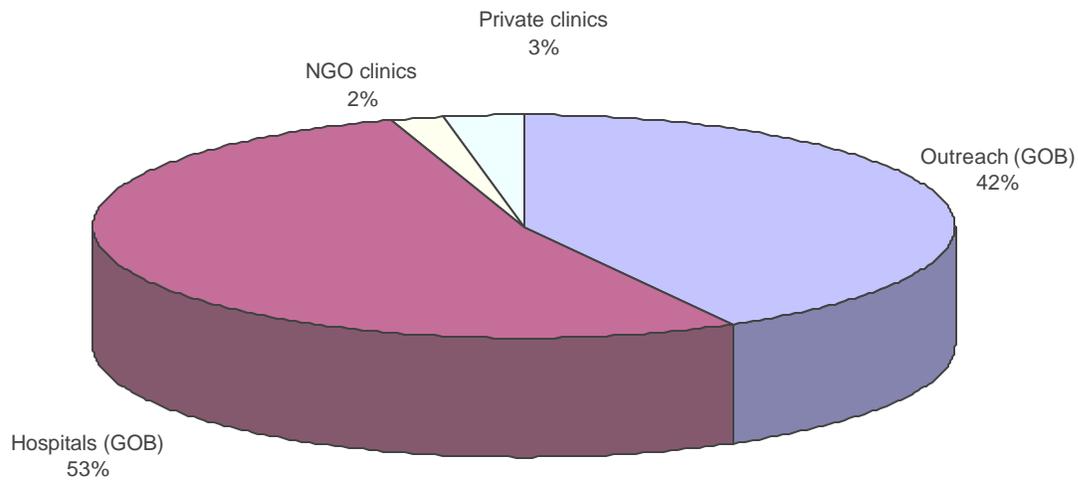


Table 7: Reasons for non-immunization and partial immunization for TT of the women

Reasons	Non-immunization (%) (N=50)	Partial immunization (%) (N=100)
Next dose is not due yet	-	12
Unaware of need for immunization	52	-
Health Worker did not specify when to return for next dose.	-	14
Health Worker said 2/3 doses of TT enough during pregnancy	-	14
Unaware of need to return for subsequent doses	-	52
“In our times TT immunization was not practiced”	22	-
Fear of taking injection	22	6
Place/time of immunization unknown	2	-
Family problem	-	2
Others	2	-

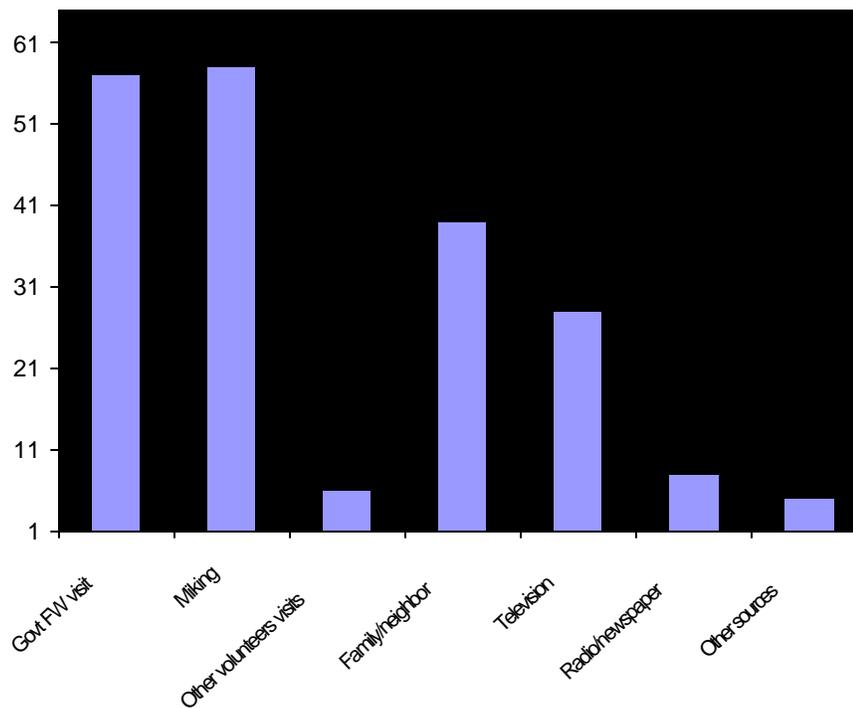
Table 8: Coverage of the 8th NID Campaign

Round	OPV %	Vit "A" %
1 st round	99	-
2 nd round	99	97
Both rounds	98	-
Any round	100	-

Table 9: Reasons for non-immunization of OPV during the 8th NID campaign

Reasons	1st round (%) N=2	2nd round (%) N=2
Unaware about NID	50	50
Doctor's advice	-	50
Child away from home	50	-

Chart 7: Source of information about the 8th NID campaign



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."

List of selected cluster for the survey

Municipality	Mahallah name	Total Population	Cluster Number
Khagrachari	College (Khejur Bangan area)	1208	1
	Muslim Para	1800	2
	Shabdamean Para	479	3
	Bazar Area (kallan pur)	2895	4
	Mahajan Para	642	5
	Zila Parishad (Khagrampur)	2687	6
	Pankhaiya para	1303	7
Rangamati	Hanumanian Pahar	1867	8
	Majhir Basti	3477	9
	Ploice Line	2261	10
	Reserve bazaar	8300	11,12
	Bedbedi para	3799	13,14
	Banarupa	3200	15
	Garjan Tali	1552	16
	Kalindi Pur	5269	17
	Kathal tali	1972	18
	Khan Market	1647	19
	Ranga Pani	1493	20
	Belai Chhari	401	21
	Sharna Tila	2204	22
	Tabal Chhari Bazar	2538	23
Bandarban	Balaghata Bazar	872	24
	Bandor Ban Bazar	1306	25
	Ghona Para	916	26
	Madhyam Para	2057	27
	Army Para	969	28
	Kashem Para	298	29
	Primary School Area	384	30

List of never vaccinated children by cluster

Municipality	Mahallah name	Total Population	Cluster Number	Never Vaccinated Children
Khagrachari	College (Khejur Bangan area)	1208	1	-
	Muslim Para	1800	2	-
	Shabdamean Para	479	3	-
	Bazar Area (kallan pur)	2895	4	-
	Mahajan Para	642	5	-
	Zila Parishad (Khagrampur)	2687	6	1
	Pankhaiya para	1303	7	1
Rangamati	Hanumanian Pahar	1867	8	1
	Majhir Basti	3477	9	-
	Ploice Line	2261	10	-
	Reserve bazar	8300	11,12	-
	Bedbedi para	3799	13,14	-
	Banarupa	3200	15	-
	Garjan Tali	1552	16	-
	Kalindi Pur	5269	17	1
	Kathal tali	1972	18	-
	Khan Market	1647	19	-
	Ranga Pani	1493	20	1
	Belai Chhari	401	21	5
	Sharna Tila	2204	22	-
	Tabal Chhari Bazar	2538	23	-
Bandarban	Balaghata Bazar	872	24	1
	Bandor Ban Bazar	1306	25	1
	Ghona Para	916	26	-
	Madhyam Para	2057	27	-
	Army Para	969	28	1
	Kashem Para	298	29	-
	Primary School Area	384	30	-
			Total	13

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Survey coordination:

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

Survey management:

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

Data analysis:

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

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

Report preparation:

Md. Mafizur Rahman, Monitoring & Evaluation Specialist, IOCH/MSH

Report review:

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

Digital map preparation:

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

Cover photo:

Moumina Dorgabekova/Image Jinn

Survey team members, IOCH/MSH:

Md. Abdul Hamid, Field Investigator

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

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.
23. Vaccination Coverage Survey of the Jessore Municipality – October 20-30, 2000. Survey Report No. 23. February 2001.
24. Vaccination Coverage Survey of the Comilla Municipality - October 1-9, 2000. Survey Report No. 24. February 2001
25. Vaccination Coverage Survey of the Pabna Municipality - July 2000. Survey Report No. 25. February 2001
26. Vaccination Coverage Survey of the Sirajganj Municipality - July 2000. Survey Report No. 26. February 2001
27. 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. 29. July 2001

Unicef & IOCH Survey Reports

1. Vaccination Coverage Survey of the Teknaf and Ukhaia 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

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Mamunul Haque, Communications Advisor, IOCH. E-mail: mh@citechco.net