IOCH

Immunization and Other Child Health Project

Vaccination Coverage Survey of the Peri-urban Areas of DCC- Nov. 2000

Peri-urban Area Survey- 2

Survey Report No. 29

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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 Tejgaon Circle comprises 9 peri-urban unions around Dhaka City with an estimated population of 5,70,450. Since these peri-urban areas are not the part of the Dhaka City Corporation (DCC), the DCC is not responsible for providing primary health care in these areas. It is the responsibility of the Directorate General of Health Services(DGHS) to provide heath care in these areas; but unlike rural areas it does not have adequate organizational structure and resources to provide primary health care including immunization services in these areas. And, therefore, it is likely that the routine EPI program in these areas might be less organized resulting in low or inadequate immunization coverage. In this context, IOCH decided to conduct two coverage evaluation surveys (one survey for 7 unions and the other one for the rest two unions) in these areas. Accordingly, a coverage evaluation survey (a 30 cluster survey) was conducted in 7 peri-urban unions of DCC under Tejgaon Circle in November 2000. (The names of these 7 unions are listed in Annex-B).

Objectives

The overall objective of the survey was to assess the level of immunization coverage in the selected 7 unions of the peri-urban areas of DCC. 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 eighth 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, 7 peri-urban unions of DCC (selected purposively) comprised the universe and 30 clusters were randomly selected from this universe following PPS sampling procedures. A list of the selected clusters and their unions 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 4.41[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), 87% of the children received at least one dose of antigen (DPT 1st dose in this case) from routine immunization sessions. Twelve percent (12%) children did not receive a dose of any antigen.

Crude coverage between 12-23 months: Eighty eight percent (88%) of the children received BCG, 71% received three doses of OPV and DPT and 65% received measles vaccine. About 65% children were fully immunized.

Valid coverage between 12-23 months: Eighty eight percent (88%) children received BCG, 55% received three doses of OPV, 56% received three doses of DPT and 60% received measles vaccine. Only 48% children were fully immunized.

Valid coverage by 12 months: Eighty five percent (85%) children received BCG, 52% received three doses of OPV, 53% received three doses of DPT and 54% received measles vaccine. Only 45% were fully immunized

Source of immunization and distance of immunization center: Childhood immunization in this area was provided mostly by the GOB outreach centers (63%), followed by the NGO clinics (21%). GOB hospitals/clinics provided 14% of the vaccinations; while only 2% children received immunization from private clinics. Most of the EPI centers were easily accessible. 83% of the EPI centers were within 10 minutes' walk, and the rest could be reached within 11 to 30 minutes' walk.

Reasons for non-immunization and partial immunization of children: Over two-third (69%) of the parents of non-immunized children were not aware of the need to vaccinate their children. 12% parents reported that their children did not receive immunization because of fear of adverse reaction. The other reasons for non-immunization of children as cited by the parents included sickness of children (8%) and lack of knowledge about time and place of vaccination sessions (4%). As regards reasons for partial immunization or dropout, majority of the parents (29%) 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 nearly one-forth (23%) of the parents. The other reasons for dropout as cited by the parents were the lack of knowledge about importance measles vaccine (10%) and the lack of knowledge as to where and when to return to get the subsequent doses (8%).

Problems detected: Although access to immunization was fairly high, there was 19% dropout from DPT1 to DPT3 and 25% from DPT1 to Measles vaccine. There were also a number of invalid doses due to early immunization (4% each for DPT1 and DPT2, 9% for DPT3 and 7% for Measles vaccine). However, prevalence of uncorrected missed opportunity was very low (ranging from 1 for DPT2 and DPT3 to 3% for measles). Child immunization cards were ever given to 88% of the children; but it was available at time of interview in only 42% of the cases. EPI Card retention rate was 48%, which means that over half of EPI Cards were lost. Only 41% 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 72% of women of reproductive age (15-49 years) received a first dose of TT; 68% women received two doses; 49% received 3 doses, and 22% received 5 doses of the TT vaccine. About 28% of the women never received any TT vaccine.

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 (68%). Another 25% women mentioned that there was no provision of TT vaccine when they had their pregnancies, while 5% were afraid of the injection. The major reasons for partial immunization were that the women were either unaware of the need to return for subsequent doses of TT immunization (40%) or the health worker did not specify when to return for the next dose of TT vaccine (20%).

Coverage levels for the 1st Round of the eighth NID campaign

During the 1st Round of the 8th NIDs, 94% of the children <5 years received OPV (90% from NID sites and 4% during child-to-child search). Vitamin A capsules were given to 79% of the eligible children on this first round of the eighth NID campaign.

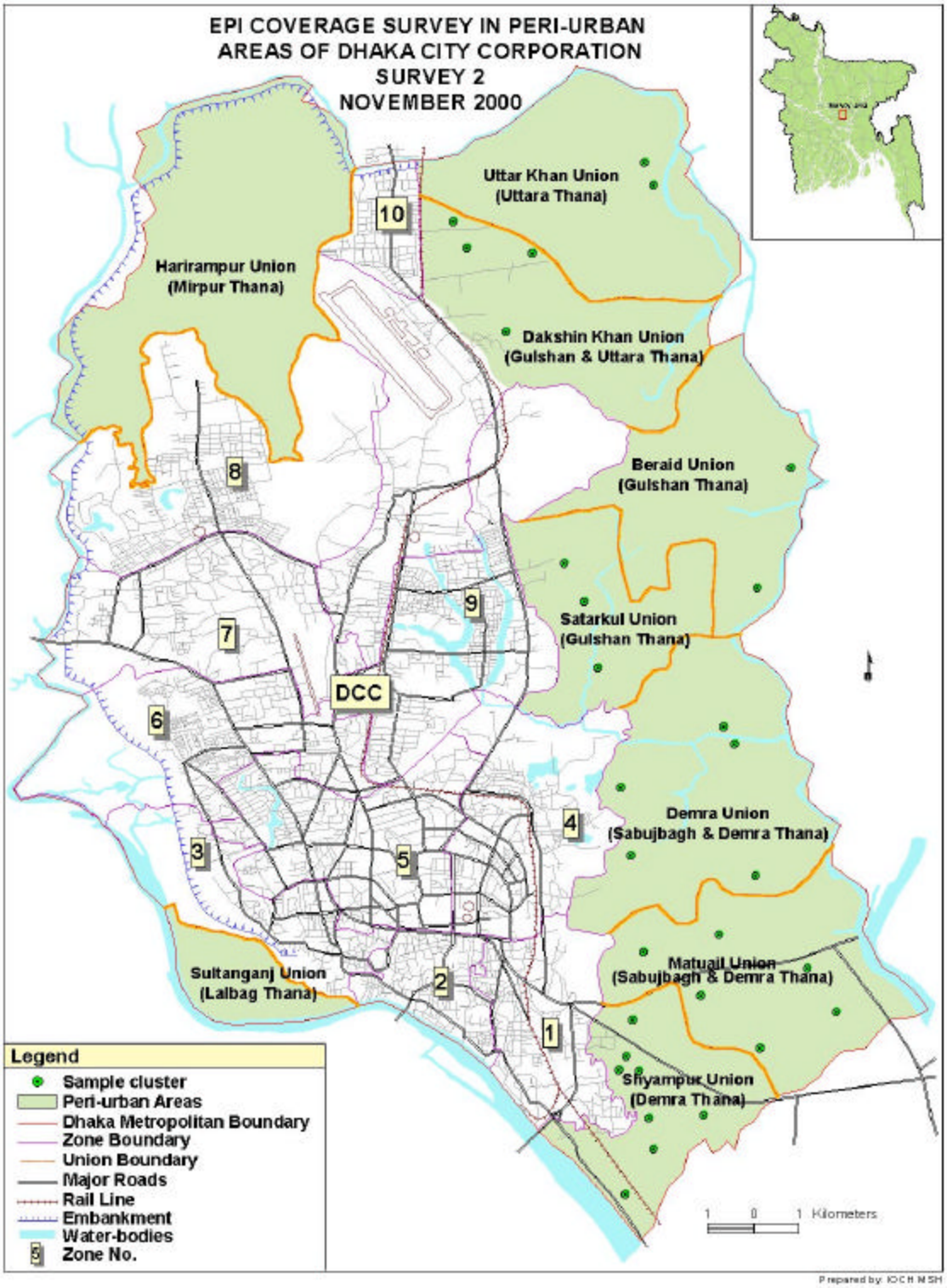
Various reasons were given for the non-receipt of OPV/Vitamin A during the NID. Over half (55%) if the parents said that they did not know about the NID campaign and 32% parents claimed that they were busy for other house hold works.

Majority of the parents learned about the NID campaign through miking (48%), followed by television and radio (34%). The other sources of information included relatives and neighbors (26%) and IPC by health workers (19%).

Suggested solutions

The survey indicates a need to better disseminate appropriate information on immunization and the importance of full immunization for each child among parents/caretakers. 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 (4% for DPT1, 9% for DPT3 and 7% for measles) and dropout rates (19% for DPT1 to DPT3 and 25% 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.


EPI COVERAGE SURVEY IN PERI-URBAN AREAS OF DHAKA CITY CORPORATION
SURVEY 2
NOVEMBER 2000
Uttar Khan Union (Uttara Thana)
Harirampur Union (Mirpur Thana)
Dakshin Khan Union (Gulshan & Uttara Thana)
Beraid Union (Gulshan Thana)
Satarkul Union (Gulshan Thana)
Demra Union (Sabujbagh & Demra Thana)
Matuail Union (Sabujbagh & Demra Thana)
Shyampur Union (Demra Thana)
Sultanganj Union (Lalbag Thana)
DCC
10
8
9
7
6
4
3
5
2
1
Legend
Sample cluster
Peri-urban Areas
Dhaka Metropolitan Boundary
Zone Boundary
Union Boundary
Major Roads
Rail Line
Embankment
Water-bodies
Zone No.
1 0 1 Kilometers
Prepared by: IDCH 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	88	88	85
Polio-1	87	83	78
Polio-2	79	70	66
Polio-3	71	55	52
DPT-1	87	83	78
DPT-2	80	71	67
DPT-3	71	56	53
Measles	65	60	54
Fully immunized	65	48	45
Zero Dose	12	-	-

Chart-1: Drop-out rate for childhood immunization

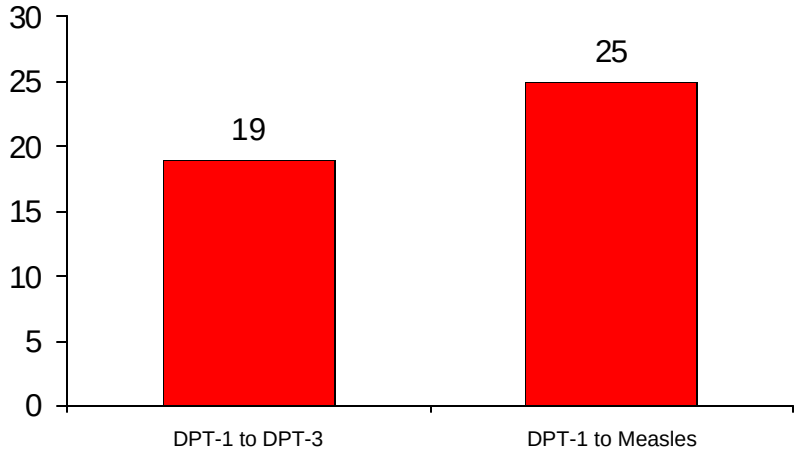


Table 2: Invalid doses of immunization provided to the children

Invalid doses	Percentage
DPT-1	4
DPT-2	4
DPT-3	9
Measles	7

Table 3: Missed opportunities by antigens

Name of the vaccine	Uncorrected		Corrected	
	Number	Percent	Number	Percent
BCG	1	1	8	4
DPT-1	5	2	15	7
DTP-2	2	1	4	2
DPT-3	2	1	3	1
OPV-1	5	2	15	7
OPV-2	2	1	4	2
OPV-3	2	1	3	1
Measles	6	3	7	3

Table 4: EPI card availability and retention

Card Status	Number	Percentage
EPI card available	89	42
EPI card ever given	184	88
EPI card retention	89	48

Chart 2: Sources of childhood immunization services

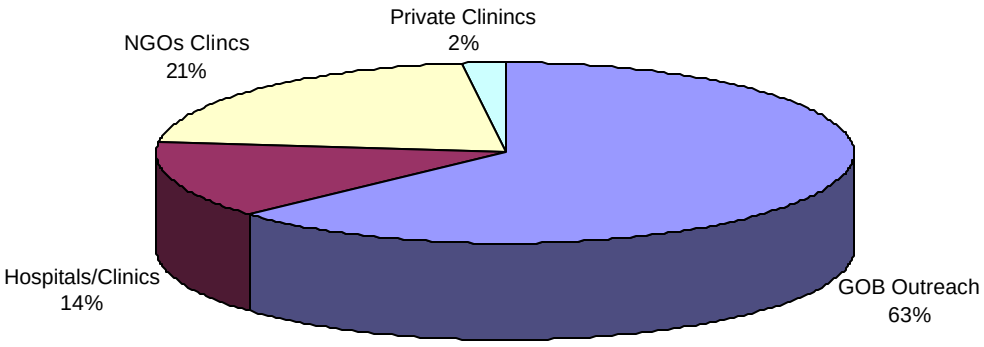


Table 5: Distance between the child's home and the vaccination site

Time (Minutes)	Number	Percentage
1-5 Min.	90	43
6-10 Min.	83	40
11-30 Min.	37	18

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

Reasons	Non- immunized %)	Partially immunized (%)
Did not know about need to vaccinate the child	69	-
Did not know that the child needs to receive the $2^{nd}/3^{rd}$ doses	-	29
Did not know when to return for $2^{nd}/3^{rd}$ dose	-	8
Did not know about importance of Measles vaccine	-	10
Did not know where and when go for vaccination	4	2
Fear of adverse reaction	12	-
Mother busy with other work	-	2
Vaccination site was too far away	4	-
Time inconvenient	-	2
Vaccinator was not available at the site	-	2
Family problem/mother sick	-	2
Child sick, was not taken to site	8	23
Child sick, was taken to site but not given vaccine	-	6
Injection was too painful for the child	4	6
Social/Religion barrier	-	2
Child not at home or away from home	-	2
Others (specify)	-	2

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

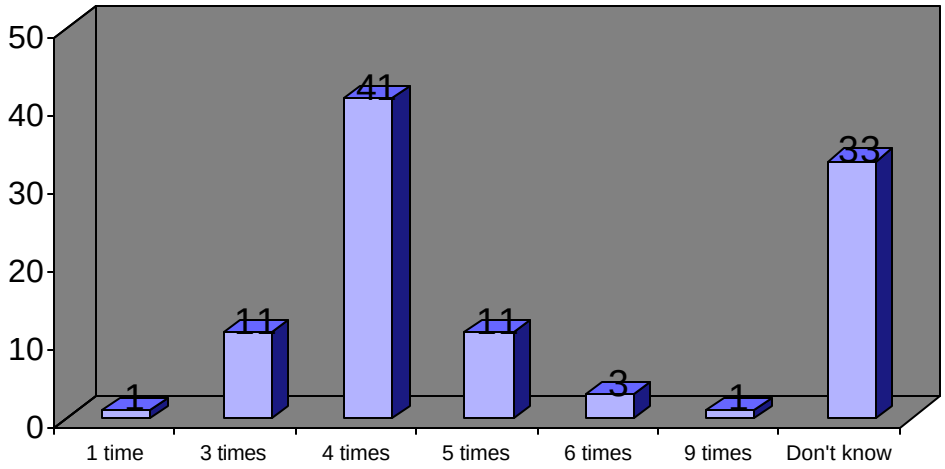


Chart 4: Routine immunization coverage levels for TT of women (15-49 years)

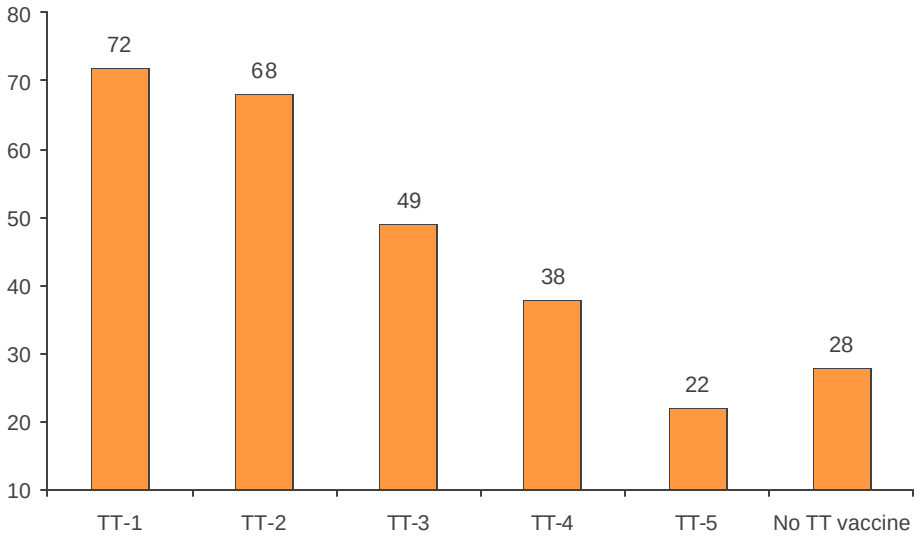


Chart 5: TT Immunization drop-out rate among women 15-49 years

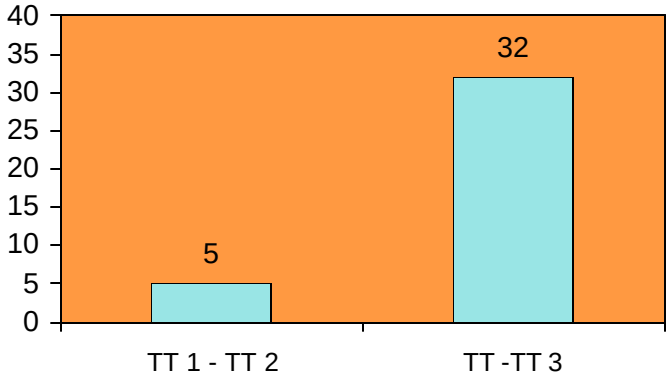


Chart 6: Providers of TT immunization

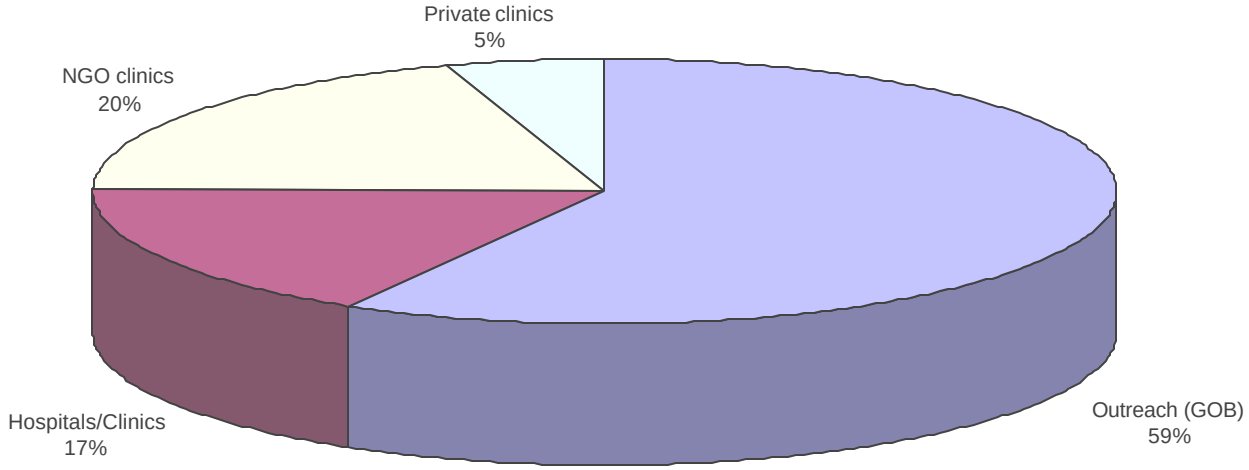


Table 7: Reasons for non-immunization and partial immunization for TT of the women

Reasons	Non- immunized (%)	Partially immunized (%)
Next dose is not yet due	-	7
Don't feel need for immunization	68	2
Health worker did not specify the next dose	-	20
As per HW advice 2/3 TT is enough during the pregnancy	-	17
Unaware of need of next dose	-	40
Place and/or time of immunization unknown	-	1
In our times TT immunization was not in practice	25	
Postponed until another time	-	2
Fear of injection	5	5
Place of immunization too far	2	-
Vaccinator absent	-	3
Too busy with households work	-	2
Women ill, not brought	-	1

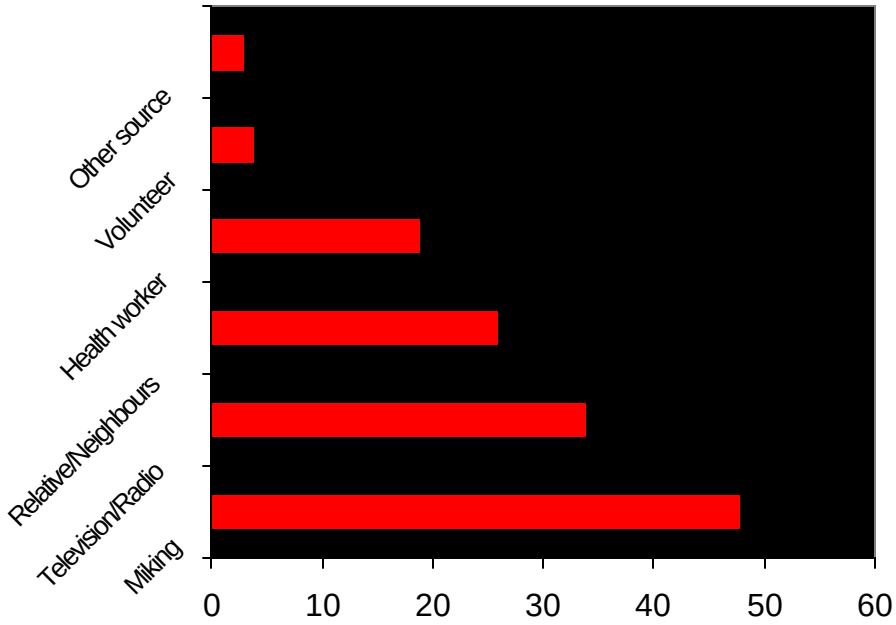
Table 8: Coverage of the 1st Round of the 8th NID Campaign

OPV Status	OPV %	Vit "A" %
NID Sites	90	79
Child-to-child search	4	-
Total	94	79

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

Reasons	Percentage
Did not know about NID	55
Did not know NID place	5
Vaccine not available/vaccinator did not give	5
Child/Mother sick	5
Too busy with other work	32

Chart 7: Source of information about the 8th 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

Thana	Union	Mahalla name	Total Pop.	Cluster no.
Demra	Demra	Gour nagar	1157	1
Sabujbagh		Dakshin gaon	7792	2
		Tek para	1244	3
Demra	Matuail	Dogar	11759	4
		Dakshin Ghop (Hazi nagar)	8300	5
		Kamar ghop	5531	6
		Matuail	22234	7
		Kajir gaon	1108	8
		Tengra	14924	9
		Sarulia	7809	10
Sabujbagh		Manda	21570	11
Demra	Shyampur	Ail bahar	2984	12
		Dhania	45853	13,14,15
		Gobinda pur	5524	16
		Shekhdee	9625	17
		Kadam tali Pal para	3519	18
		Nama shyam pur	3598	19
Gulshan	Beraid	Moral para	3273	20
		Patira	3118	21
Uttara	Dakshin Khan	Anul	350	22
		Askona	7273	23
		Chala band	1134	24
		Faydabad	6432	25
Gulshan	Satarkul	Bhatara	3927	26
		Nurer chala	11165	27
		Khil barir tek	7297	28
Uttara	Uttar Khan	Bara palasia	1588	29
		Raja bari	590	30
				Total

Annex- C

List of never vaccinated children by cluster

Thana	Union	Mahalla name	Total Pop.	Cluster no.	Never Vaccinated Children
Demra	Demra	Gour nagar	1157	1	1
Sabujbagh		Dakshin gaon	7792	2	-
		Tek para	1244	3	1
Demra	Matuail	Dogar	11759	4	-
		Dakshin Ghop (Hazi nagar)	8300	5	1
		Kamar ghop	5531	6	1
		Matuail	22234	7	1
		Kajir gaon	1108	8	1
		Tengra	14924	9	1
		Sarulia	7809	10	1
Sabujbagh		Manda	21570	11	1
Demra	Shyampur	Ail bahar	2984	12	1
		Dhania	45853	13,14,15	-
		Gobinda pur	5524	16	1
		Shekhdee	9625	17	-
		Kadam tali Pal para	3519	18	1
		Nama shyam pur	3598	19	-
Gulshan	Beraid	Moral para	3273	20	1
		Patira	3118	21	4
Uttara	Dakshin Khan	Anul	350	22	-
		Askona	7273	23	-
		Chala band	1134	24	4
		Faydabad	6432	25	2
Gulshan	Satarkul	Bhatara	3927	26	-
		Nurer chala	11165	27	3
		Khil barir tek	7297	28	-
Uttara	Uttar Khan	Bara palasia	1588	29	-
		Raja bari	590	30	-
				Total	26

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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
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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.
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28. Vaccination Coverage Survey of the Peri-urban Areas of DCC- Nov. 2000 (Peri-urban Area Survey-1). Survey Reports No. 28. July 2001

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1. Vaccination Coverage Survey of the Teknaf and Ukhia Upazilas- February 2000. Survey Report No. 01, August2000
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6. Vaccination Coverage Survey of the Raumari Upazila - February 2000. Survey Report No. 06, August 2000
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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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