BANGLADESH

EPI

COVERAGE EVALUATION SURVEY 2007

EXPANDED PROGRAMME ON IMMUNIZATION
Directorate General of Health Services
Mohakhali, Dhaka-1212

EPI COVERAGE EVALUATION SURVEY 2007

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Preface

Government of Bangladesh is committed to provide basic health services to all with special attention to children and women. Accordingly in 1979 government took the initiatives for implementing immunization programme with six conventional vaccines to prevent diseases - Diphtheria, Whooping cough, Tetanus, Poliomyelitis, Tuberculosis and Measles. In 1985, the Government of Bangladesh had taken further initiative to increase immunization coverage levels, which was 2% up to that period. It was decided that a revitalized plan of action needed to be developed to achieve Universal Childhood Immunization (UCI). So, comprehensive service delivery system was introduced in a step-by-step manner over four years, beginning with eight sub-districts and eventually covering all districts throughout the country.

It is estimated that annually, the programme is saving more than 4 million children from premature death and 2.5 million from the agonizing life of polio victim. The programme also aims at women of childbearing age (CBA) and pregnant women to give TT vaccine against maternal and neonatal tetanus. As a result Bangladesh has now reached the threshold of elimination of neonatal tetanus (NT). From 2003 Hepatitis-B vaccine had been incorporated in EPI in a phased manner that was completed nationwide in 2005. To ensure injection safety EPI has introduced AD (Auto Disable) syringe in the programme.

EPI in Bangladesh has brought visible and tangible changes over the years in terms of mortality and morbidity. This survey result shows that despite high accessibility of EPI service a large number of children did not complete all doses of vaccine at right interval and at right time. The previous National Coverage Evaluation Surveys (CES) revealed that the percentage for Fully Vaccinated Children (FVC) remained in a plateau, between 52% - 64%, for some years.

In 2002, for the first time in Bangladesh, district wise Coverage Evaluation Survey was conducted. The 13th & 4th EPI Coverage Evaluation Survey 2005 & 2006 had also been undertaken district wise. This survey provides us district wise information on EPI coverage, qualitative aspect of the EPI services and drop out rates and invalid doses. The report also gives area specific reasons for not availing the service at all or on reasons for incomplete doses. It will help the policy makers, national and local level managers and field level staff to compare and analyze different districts situation in order to plan accordingly and undertake necessary steps for improving the coverage of those districts.

Similar to the previous years this is a joint effort undertaken by GoB and partners. I would like to express my sincere thanks to UNICEF and WHO for their generous support in conducting this survey- EPI Coverage Evaluation Survey 2007.

Finally, I would like to thank ACNielsen Bangladesh for carrying out this study maintaining the requisite quality. Also, special thanks to the respondents who provided their valuable time with required information for the survey without which this study would not have been possible.

August 2008

Director General
Directorate General of Health Services
Mohakhali, Dhaka-1212

Foreward

It is in deed a great pleasure for me to write forwarding note for EPI National Coverage Evaluation Survey (CES) 2007.

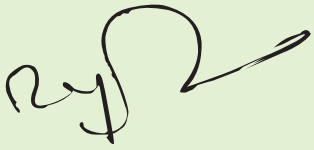
Since 1991 Bangladesh has been conducting national coverage evaluation survey every year. Established in 1991 as monitoring tool to assess performances, achievements and progress of the Bangladesh Expanded Programme on Immunization (EPI), the periodic EPI National Coverage Evaluation Survey also known as CES were conducted every year except 1996.

EPI is considered a success story in Bangladesh because of its remarkable progress made during the past 20 years. It provides almost universal access to immunization services as measured by the percentage of children under the age of one year receiving BCG, which has increased a mere 2% in 1985 to over 98% in 2006. However, the percentage of children under the age of one receiving all doses of vaccines at right time with right interval has reached to 75% only during the same period due to dropout rates and invalid doses.

EPI Coverage Evaluation Survey (CES) 2007 was carried out by ACNielsen Bangladesh in collaboration with EPI, UNICEF and WHO. The purpose of conducting 2007 CES is to assess (a) the routine childhood vaccination coverage; (b) TT vaccination coverage; (c) OPV coverage during 16th NIDs; (d) TT vaccination coverage among the women of 15-49 years age; (e) immunization programme quantity coverage (valid and crude). The survey was carried out from November 2007 to January 2008. The survey was conducted for 15 low performing districts, 6 divisions and 6 city corporations. This survey results will give us a better picture of 15 low performing districts for EPI and it would be possible for us to analyze the coverage of each district to identify the performances and also to take special initiatives to improve the situations.

I would like to thank all experts of EPI HQ specially Dr. Md. Tazul Islam, Programme Manager, Child Health and Limited Curative Care for their valuable contributions to the CES 2007. I would like to appreciate Dr. Md. Shamsuzzaman, Medical Officer, EPI who had taken active participation in different stages of this survey. My sincere thanks go to ACNielsen who has supported the government of Bangladesh conducting the study and preparing this report. My sincere thank also goes to UNICEF for arranging necessary fund to carrying out this important survey. Finally, Dr. Ataur Rahman and Dr. Jucy Merina Adhikari of Unicef and Mr. M. Sharifuzzaman of WHO deserves special thanks for their valuable contributions.

I believe this CES report will serve as a useful monitoring tool for all managers working in government and non-government organizations. We look forward to the widespread use of the CES 2007 in the country.



August 2008

Director PHC & Line Director, ESD
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Mohakhali, Dhaka-1212

Acknowledgement

Since 1991, EPI is conducting national Coverage Evaluation Survey (CES) every year. This survey provides us with the opportunity to have a look on EPI performance at national, divisional and district level in current situation with particular focus on 15 low-performing districts along with 6 divisions and 6 city corporations. The survey results give us a better picture of 15 low-performing districts in order to analyze the performance of those districts that was responsible for bringing down the overall national coverage of EPI in previous years. As a result of special thrust and initiatives the situation in those poor performing districts has been improved that also contributed to increase the national coverage at present.

The officials of EPI HQ worked hard and provided their valuable contribution in this endeavor. I must congratulate them for their support in planning, organizing and conducting this survey. I would like to thank UNICEF and WHO for their valuable contributions that made this enormous task a success. Special thanks to Dr. Ataur Rahman from UNICEF who had worked hard in this survey.

Finally, my sincere thank goes to ACNielsen Bangladesh for conducting the quality study and preparing this report.

I hope this survey report would be very useful for all those related to EPI in Bangladesh.

August 2008

Program Manager
Child Health and Limited Curative Care
Directorate General of Health Services
Mohakhali, Dhaka-1212

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Acronyms

AEFI	Adverse Events Following Immunization
BBS	Bangladesh Bureau of Statistics
BCG	Bacillus Calmette Guerin
BCC	Barisal City Corporation
BDHS	Bangladesh Demographic & Health Survey
CCC	Chittagong City Corporation
CES	Coverage Evaluation Survey
DCC	Dhaka City Corporation
DPT	Diphtheria, Pertussis and Tetanus
EA	Enumeration Area
EPI	Expanded Programme on Immunization
FVC	Fully Vaccinated Child
IU	International Unit
KCC	Khulna City Corporation
NGO	Non-Government Organization
NID	National Immunization Days
NT	Neonatal Tetanus
OPV	Oral Polio Vaccine
PAB	Protected at Birth
PPS	Probability Proportional-to- Size
RCC	Rajshahi City Corporation
SCC	Sylhet City Corporation
SPSS	Statistical Package for Social Science
TT	Tetanus Toxoid
UNICEF	United Nations Children's Fund
NVAS	National Vitamin A Supplementation
VAS	Vitamin A Supplementation
WHO	World Health Organization

Glossary

Cluster	Cluster is defined an enumeration area which constitute of on average with 120 households
Crude	Vaccine received irrespective of vaccination schedule such as exact age and interval for each vaccine
Fixed Sites	Received vaccine from EPI outreach/ mobile center/hospital
Fully Vaccinated Child (FVC)	Children received all recommended vaccines under EPI
Invalid	Vaccine received not following EPI vaccination schedule of exact age and interval for each vaccine
Mahallah	Smallest identifiable area of municipalities, which is known to the inhabitants as mahallah
Mouza	A revenue village with a jurisdiction list number and defined area is called mouza
PAB	Protection at birth, the newborn is protected if the mother has tetanus antibody status while born. The mother achieved this status by taking TT vaccine
FVC by 12 Months	All the vaccines received following EPI recommended vaccination schedule before first birthday
FVC by 23 Months	All the vaccines received following EPI recommended vaccination schedule before second birthday
Valid	Vaccine received following EPI recommended exact age and interval for each vaccine
Upazila	Lowest administrative unit

Executive Summary

Expanded Programme on Immunization (EPI) was launched in Bangladesh on 7th April, 1979, aiming at reducing child mortality and morbidity through vaccination against 6 vaccine preventable diseases. The seventh vaccine, Hepatitis-B vaccine has been incorporated in the programme in 2003.

With a view to evaluate the vaccination coverage, EPI Coverage Evaluation Survey is carried out since 1991. Since then, a total of 15 surveys are carried out by the government in collaboration with development partners - WHO and UNICEF. In 2007, the 15th EPI CES was carried out for National EPI, being supported by UNICEF Bangladesh.

The purpose of conducting CES 2007 was to assess: (a) the routine childhood vaccination coverage; (b) TT vaccination coverage among mothers with children aged 0-11 months; (c) OPV coverage during 16th NIDs; (d) TT vaccination coverage among the women aged 15-49 years; (e) immunization coverage in 15 low-performance districts. In addition to 15 low performance districts, the survey covered six divisions and six city corporations as individual survey units to get national and city corporations' estimation. The survey was carried out between December 2007 and January 2008.

ROUTINE CHILDHOOD VACCINATION COVERAGE

Nationally, the coverage rate was found high for BCG at 98 percent among 12-23 months' old children, and it was equally high for crude DPT1 (98 percent). But, there were small drops in the crude rates for the subsequent doses/vaccines, declining to 97 percent for DPT2, 95 percent for DPT3, but marked drop in measles (89 percent). Thus, the national rate of crude coverage for fully vaccination was found to be only 89 percent among the 12-23 months' old children. By area type, crude coverage rate was found to be higher (92 percent) in rural than in urban areas (87 percent). There was a marginal gap in the coverage of BCG (98 percent in urban and 99 percent in rural areas) while the gap was 5 percent in case of measles (Figure A1).

Similar trend was observed for vaccine-specific coverage by age 23 months. The coverage was 98 percent for BCG, 98 percent for DPT1, 96 percent for DPT2, 87 percent for DPT3, 98 percent for OPV1, 98 percent for OPV2, 93 percent for OPV3, and 85 percent for measles.

Seventy-five percent of children found fully vaccinated with all vaccines by the age of 12 months in the CES 2007 following proper vaccination schedule. The coverage rate was four percentages points higher (by 12 months) than that in 2006 and 11 percentage points from that in 2005. Likewise, 79 percent of the children aged between 12-23 months found fully vaccinated by the age 23 months following proper vaccination schedule in the CES 2007. Specific vaccine-wise coverage was marginally increased for all the vaccines except BCG. BCG coverage has already reached to 98 percent in 2007. However, vaccination coverage for measles increased by 3 percentage points - from 78 percent in 2006 to 81 percent in 2007.

The vaccine-specific coverage by the age of 12 months was 98 percent for BCG, 98 percent for DPT1, 96 percent for DPT2, 87 percent for DPT3, 98 percent for OPV1, 97 percent for OPV2, 93 percent for OPV3, and 81 percent for measles.

By area, there is a small difference between rural and urban areas. Crude coverage was 5 percentage points higher in rural areas compared to urban areas (92 percent in rural and 87 percent in urban areas). A similar trend was found in the vaccination coverage by 23 months, i.e. 79 percent in the urban and 81 percent in the rural areas. The percentage of the children fully vaccinated, along with valid doses of all recommended vaccines by age 12 months was 74 percent in the urban areas, compared to 77 percent in the rural areas.

Similar patterns of rural-urban variations were also seen in the vaccination coverage of specific vaccines by 12 months. In the rural areas by division, the coverage was the highest in Rajshahi division (82 percent) and the lowest in Khulna and Dhaka divisions (72 percent). However, in city corporations - the rate was the highest (83 percent) in Rajshahi City Corporation (RCC), which was being followed by Barisal City Corporation - BCC (79 percent), Chittagong City Corporation - CCC (74 percent), Dhaka City Corporation - DCC (73), Khulna City Corporation - KCC (72 percent), and Sylhet City Corporation - SCC (57 percent).

It is evident from the survey that the information on vaccination coverage is collected from two basic sources - card and mother's history, i.e. estimates of vaccination coverage among the children aged 12-23 months are based on the information taken from the vaccination card. That shows the national vaccination coverage rate for each specific vaccine as well as full vaccination coverage by the age of 12 months. The coverage based on vaccination card is 48 percent and history is 28 percent. Therefore, the overall coverage from card and history revealed that 75 percent of the children aged 12-23 months had received all recommended vaccinations before their first birthday.

The fully vaccination coverage by 12 months was 4 percentage points higher (75 percent) in the CES 2007 than that in the CES 2006 (71 percent). The extensive intervention and involvement of the programme contributed towards the increase of vaccination coverage in 2007 compared to that in 2006.

PROGRAMME QUALITY

INCIDENCE OF INVALID DOSE: It is found in the survey that a certain percentage of vaccines was administered without maintaining recommended vaccination schedule. Nationally, 6 percent of the total DPT1 doses, 8 percent of the total DPT2, 9 percent of DPT3, and 5 percent of measles doses were found to be "invalid", i.e. administered without maintaining recommended vaccination schedule (Figure C5-C6). There were variations found in the proportions of invalid DPT1, and measles between the rural and urban areas (DPT1 7 percent in rural areas and 6 percent in urban areas), (measles 6 percent in rural areas and 4 percent in urban areas). Overall, 23 percent of the doses of DPT were found invalid nationally, with a little variation between rural (25 percent) and urban areas (22 percent) (Figure C6).

DROPOUT: Nationally, the dropout rate for DPT1-DPT3 was 3 percent and for DPT1-measles was 9 percent (Figure C11). However, these rates were higher in urban areas compared to those in rural areas: i.e. for DPT1-DPT3, it was 4 percent in urban areas against 2 percent in rural areas, and similarly, for DPT1-measles it was 9 percent in urban areas against 7 percent in rural areas.

ABSCESS DUE TO VACCINATION: In terms of abscess due to vaccination, nationally, 6 percent of the children who received vaccines were reported to have had an abscess after receiving vaccines (Figure C21). The occurrence of abscesses was marginally more prevalent among the children in urban areas (5.8 percent) compared to those in the rural areas (5.3 percent).

CARD RETENTION RATE: Nationally, it is found that 68 percent of the surveyed children retain the vaccination card. Retention rate was higher in rural areas (71 percent) compared to that in urban areas (66 percent) (Figure C1). The current card retention rate was found 1 percentage point higher than that in the last year i.e. 67 percent in CES 2006.

The CES 2007 findings show noticeable improvement of Expanded Programme on Immunization in increasing the overall vaccination coverage. However, with a view to increase further, following issues on programme perspective may be considered.

REASONS FOR NEVER OR PARTIAL VACCINATION: A Large number of mothers found not to fully vaccinate their children due to various reasons. The frequently-mentioned major reasons for never vaccination were:

- Fear of side effect (24 percent)
- Lack of awareness about vaccination (15 percent)
- Don't believe in vaccination (15 percent)
- Parents/caregivers were busy with other daily household chores (7 percent)
- Didn't remember (5 percent)
- Rumor (5 percent)

PARTIAL VACCINATION:

- Parents/caregivers reported that the child was sick, therefore was not taken to the site (20 percent)
- Parents/caregivers were busy with other daily household chores (13 percent)
- Parents/caregivers did not know when to go for the measles dose (10 percent)
- Parents/caregivers forgot to vaccinate the child (5 percent)
- Parents/caregivers did not know when to go for the 2nd /3rd dose (3 percent)

Similar findings were found in both rural and urban areas.

KNOWLEDGE ON COMMON SIDE EFFECTS OF VACCINATION: Many children experience minor side effects due to vaccination. It is found that 86 percent of the mothers/caregivers reported fever as a common side effect of vaccination. A small proportion of the mothers/caregivers (4 percent) mentioned about abscess and pain (Figure C24). In rural areas, fever revealed as the highest common reported side effect (Figure C25). Similar findings were observed in the city corporations.

TETANUS TOXOID (TT) VACCINATION COVERAGE

TT VACCINATION COVERAGE: The nationwide vaccination coverage following proper vaccination schedule for TT1, TT2, TT3, TT4, and TT5 were 96 percent, 93 percent, 76 percent, 49 percent, and 25 percent respectively (Figure F2.). The valid TT coverage was almost similar both in the rural and urban areas for every dose except TT4 and TT5.

One-fourth of the total surveyed mother received 5 doses of TT vaccination nationally - 29 percent in rural and 22 percent in urban areas. Overall, the prevalence of TT2 was 93 percent - 92 percent in rural and 94 percent in urban areas. A decreasing trend in the coverage of TT3 and TT4 was observed irrespective of areas. A little over three-fourths (76 percent) of the surveyed mothers received TT3, and about half (49 percent) of the mothers received TT4 nationally. The proportion was 78 percent in rural areas as against 74 percent in urban areas for TT3. However, for TT4 it was 54 percent in rural and 44 percent in urban areas (Figure F2).

TT VACCINATION COVERAGE IRRESPECTIVE OF VACCINATION SCHEDULE: Vaccination coverage irrespective of vaccination schedule revealed 47 percent for TT5 and 93 percent for TT2. TT5 coverage was much lower in urban areas (43 percent) compared to that in the rural areas (51 percent). Difference in coverage of TT2 was 2 percentage points between urban (94 percent) and rural (92 percent) areas. Nationally, a gradual decreasing trend in coverage was observed in the finding. Among the surveyed mothers, 81 percent received TT3 and 64 percent TT4. The declining trend was similar to both the rural and urban areas. Eighty-three percent of the surveyed rural mothers received TT3 as against 79 percent those in urban areas. For TT4, 68 percent of rural mothers received it as against 60 percent of urban mothers (Figure F1).

RETENTION OF TT VACCINATION CARDS: Retention of TT vaccination cards among the surveyed mothers receiving TT vaccine was relatively low. Overall, 48 percent of the vaccinated mothers retained their TT cards at the time of the survey. Retention rate was four percentage points higher in rural areas (50 percent) compared to that in urban areas (46 percent) (Figure G1). Nationally, 45 percent of the mothers reported of losing their TT cards with 5 percentage points variation between urban (48 percent) and rural (43 percent) areas (Figure GI).

Among the rural divisions, TT card retention rate was the highest in Khulna division (57 percent), which was being followed by Rajshahi (53 percent), Barisal (52 percent), Chittagong (50 percent), and Sylhet (45 percent) divisions. The rate was the lowest in Dhaka division (44 percent) (Figure G2).

In the urban areas by city corporations, TT card retention rate was the highest in RCC and CCC (50 percent in both CCs) and the lowest in DCC (32 percent) (Figure G3).

INCIDENCE OF "INVALID" DOSES: Incidence of "invalid" doses, i.e. without maintaining proper vaccination schedule at the national level - rural and the urban areas - rose steeply for TT3, and then declined during the 4th dose and again increased during the 5th dose. This type of declination of incidence of invalid doses was observed both in the urban and rural areas (Figure G4).

By divisions, the incidence of invalid TT3 doses was found to be the highest in Chittagong division (32 percent), which was being followed by Sylhet (29 percent), Dhaka (27 percent), Barisal (26 percent), Rajshahi (25 percent), and Khulna (15 percent) divisions (Figure G5).

In city corporations, incidence of invalid TT3 doses was the highest in BCC (27 percent) and the lowest in KCC (11 percent) (Figure G6).

CHILDREN PROTECTED AT BIRTH (PAB) AGAINST TETANUS

Nationally, 90 percent of the infants born between 1 December 2006, and 13 November 2007, were protected at birth (PAB) against tetanus. The proportion of the children protected at birth against tetanus was marginally higher in the urban areas (90 percent) compared to that in the rural areas (89 percent) (Figure G10).

In the rural areas by division, the proportion of the infants receiving PAB against tetanus was the highest in Rajshahi (93 percent), which was being followed by Barisal (91 percent), Khulna (90 percent), Chittagong, and Dhaka (89 percent) divisions. However, the lowest proportion was found in Sylhet divisions (82 percent) (Figure G12).

In the city corporations, the proportion of children PAB was almost universal (i.e. 96 percent in DCC, CCC and RCC; 86 percent in BCC and KCC; and 82 percent in SCC) (Figure G13).

TT VACCINATION COVERAGE AMONG WOMEN AGED 15-49 YEARS

Nationally, 20 percent of women aged between 15-49 years had received all five doses of TT vaccines. The rural-urban findings show that TT coverage was higher in the rural areas (21 percent) compared to that in the urban areas (18 percent). Similarly, nationwide coverage irrespective of vaccination schedule (i.e. crude) was 36 percent (34 percent in the urban and 38 percent in the rural areas) (Figure J2 and Figure J1).

Nationally, a gradual decreasing trend in coverage was observed for the subsequent doses. Among the surveyed women, 87 percent received TT1, 83 percent TT2, 71 percent TT3, and 54 percent of the women received TT4. The declining trend was similar in both the rural and urban areas. Eighty-eight percent of rural surveyed women in the rural areas received TT1 as against 86 percent in urban areas.

TT2 coverage rate was 84 percent, TT3 72 percent, and TT4 56 percent in the rural areas as against the coverage rate of TT2 81 percent, TT3 69 percent, and TT4 52 percent in the urban areas respectively (Figure J1).

By rural division, the highest valid TT5 coverage was in Rajshahi and Chittagong (25 percent), which was being followed by Dhaka (22 percent), Khulna (21 percent), Sylhet (20 percent), and Barisal divisions (13 percent) (Figure J4).

The valid coverage rate was the highest in RCC (30 percent), which was being followed by KCC (21 percent), CCC (19 percent), BCC (16 percent), and DCC (12 percent). The SCC had the lowest coverage (11 percent) (Figure J6).

SIXTEENTH NID COVERAGE

In 16th NIDs, the national (considering divisional clusters) OPV coverage in the 1st round was 98 percent. Among them, 97 percent received OPV at fixed sites, and rest 3 percent at home through child-to-child search programme. Rural-urban coverage was similar to the national findings.

In the 2nd round, the national coverage was 96 percent. Among them, 96 percent was vaccinated at fixed sites and 4 percent vaccinated at home through child-to-child search programme (Figure N4).

The overall OPV coverage in the 16th NIDs had no variations between rural and urban areas. In the 1st round, 98 percent children in both rural and urban areas, received OPV, while in the 2nd round nationally 96 percent of the children received OPV. There was no difference in the coverage between rural and urban areas.

VITAMIN A COVERAGE AMONG INFANTS, VITAMIN A SUPPLEMENTATION COVERAGE AMONG POSTPARTUM WOMEN AND 12-59 MONTHS OLD CHILDREN

INFANTS: The national coverage of Vitamin A supplementation among the infants aged between 9-11 months was 89 percent. The coverage in the rural areas (91 percent) was higher compared to that in the urban areas (87 percent) (Figure P1). Nationally, difference between measles vaccination coverage and Vitamin A supplementation was 8 percentage points. Among the children aged 12-23 months, measles vaccination coverage by the age of 12 months was 81 percent nationally.

CHILDREN AGED 12-59 MONTHS: The national coverage of Vitamin A Supplementation among the children aged 12-59 months during the 1st round of 16th NIDs held on 27th October 2007 was 95 percent. The coverage in the rural areas (95 percent) was 1 percentage point lower to that in the urban areas (96 percent) (Figure P1).

Among the rural divisions, the coverage was the highest in Barisal division (97 percent) and the lowest in Rajshahi division (91 percent) (Figure P2). In urban areas by city corporations, SCC had the highest coverage (99 percent), which was being followed by KCC, and CCC (97 percent), DCC and RCC (96 percent), and BCC (92 percent) (Figure P3).

POSTPARTUM WOMEN: The national coverage of Vitamin A Supplementation among the postpartum women within 6 weeks of delivery was 35 percent - 31 percent in rural areas, and 39 percent in urban areas (Figure P1).

By rural division, the coverage ranged from 23 percent in Sylhet division to 39 percent in Barisal division (Figure P2), and in the city corporations, the coverage ranged from 19 percent in SCC to 57 in KCC (Figure P3).

Chapter 1

INTRODUCTION

Established in 1991 as a monitoring tool to assess performances, achievements and progress of the Expanded Programme on Immunization (EPI) in Bangladesh, the periodic EPI National Coverage Evaluation Surveys, also known as CES, were conducted every year annually, except in 1996 and 2004. So far, 15 CESs were carried out; the last one in the series was in 2007.

The CES 2007 was carried out with the following specific objectives

- To assess the routine EPI coverage among 12-23 months old children (the date of birth from 01-12-2005 to 30-11-2006)
- To assess the TT vaccination coverage among women who delivered child between 01-12-2006 and 30-11-2007
- To measure the postpartum Vitamin A coverage among the mothers having children less than one year
- To assess the TT vaccination coverage among the women 15-49 years of age
- To evaluate the Immunization programme quantity (coverage; valid and crude, dropout rates) and quality (percent of invalid doses, vaccination card retention, post-vaccination abscesses, other AEFI, reasons of left outs and drop outs, etc.)
- To determine trends in vaccination coverage and dropout rates at the national and divisional levels
- To measure OPV coverage among those children who were 0-59 months old in the 1st round and 2nd round of 16th NID held on 27th October and 8th December 2007 respectively
- To measure Vitamin A coverage among those children who were 12-59 months old in the 1st round of 16th NID held on 27th October, 2007
- To measure Anthelmintic coverage among those children who were 24-59 months old at the time of the 2nd round of 16th NID held on 8th December, 2007
- To provide information as a basis for making concrete recommendations and planning for improving routine immunization activities

The 2007 CES was commissioned for the government (EPI-DGHS) with financial support from UNICEF Bangladesh and technical collaboration with WHO. The survey was carried out by ACNielsen Bangladesh. The specific survey tasks included selecting sample clusters; development, pre-testing the questionnaires, and finalizing the questionnaires with the approval of the EPI-DGHS, UNICEF, and WHO; recruiting and providing training to the survey staff; planning and implementing the fieldwork. ACNielsen was also given the responsibilities of processing EPI survey data set, analyzing the data, and writing all the required reports of the survey.

1.1 SURVEY DESIGN

In addition to generating estimates for the national level by Divisions (rural and municipalities) and by city corporations, CES 2007 was also intended to provide separate estimates for each of the 27 survey units, which covered the whole population. The 27 survey units were in 15 low performing districts, 6 divisions, and 6 city corporations - namely Dhaka City Corporation (DCC), Rajshahi City Corporation (RCC), Chittagong City Corporation (CCC), Khulna City Corporation (KCC), Barisal City Corporation (BCC), and Sylhet City Corporation (SCC). The 2007 CES was implemented using the WHO - recommended 30-cluser coverage survey sampling technique.

1.2 INDIVIDUAL SURVEYS

The CES 2007 consisted of four individual surveys by subject groups. The surveys were:

- Childhood Vaccination Coverage Survey, or the Child Survey;
- Tetanus Toxoid Vaccination Coverage Survey among the mothers who delivered child between 01.12.2006 and 30.11.2007 (TT survey);
- Tetanus Toxoid Vaccination Coverage Survey among women of 15-49 years age (TT5 Survey); and
- OPV coverage Survey in the 16th NIDs, which also include Vitamin A and Anthelmintic coverage.

The subjects for the Child Survey were 12-23 months old children, and for the TT Survey mothers having 0-11 months old children, TT vaccination coverage among the women of 15-49 years age, and OPV coverage survey among 0-59 months old children. For Vitamin A, the age of the child was 12-59 months, and it was 24-59 months for Anthelmintic coverage survey.

Objectives of the child survey were to ascertain -

- Childhood vaccination coverage including Vitamin A among 12-23 months old children
- Vaccination card retention rate
- Incidence of invalid doses
- Incidence of post-vaccination abscesses
- Vaccination dropout rates
- Reasons for not having children vaccinated fully, or at all
- Sources of vaccination services.

Objectives of the TT survey were to ascertain -

- TT vaccination coverage among mothers having 0-11 months old children
- Rates of TT card retention among these mothers

- Incidence of invalid TT doses among these mothers
- Sources of TT vaccination for these mothers
- Proportion of the newborn babies of these mothers who were protected during their birth against tetanus
- Post-partum Vitamin A coverage among mothers having 0-11 months children

Objectives of the TT Vaccination coverage of Women aged between 15-49 were to ascertain -

- TT vaccination coverage among women between 15-49 years
- Rates of TT card retention among these women
- Sources of TT vaccination for these women
- Reasons for not having TT by these women

Objectives of the 16th NIDs survey were to ascertain -

- OPV coverage among 0-59 months old children
- Reasons for not having OPV vaccination
- To assess Vitamin A and Anthelmintic coverage in the 1st and 2nd rounds respectively
- Reasons for not having Vitamin A and Anthelmintic

1.3 SAMPLE SIZE

Using the WHO 30-cluster coverage survey sampling technique, 30 clusters were sampled from each of the divisions, city corporations, and 15 low performing districts. The 30 clusters were selected using systematic random sampling technique from the mouza/mahallah list available with BBS. For selecting 30 clusters from each survey unit, mouza/ mahallah was considered as a primary sampling unit (PSU). After selecting the mouza/mahallah, each mouza/mahallah was divided into several EAs. Each EA has on an average 120 households. This EA was considered as a cluster in CES 2007. In a cluster, each household was visited to identify the eligible children (aged 12-23 months) along with information on the age composition of target samples and the total household population. From this information, eligible children aged 12-23 months were listed for the sampling frame. From this sampling frame, 7 children aged 12-23 months (Child Sample) were randomly selected for detailed interviews on childhood vaccination coverage. For the CES 2007, 810 clusters were selected from the 27 survey units, i.e. 15 low performing districts, 6 divisions, and 6 city corporations. Similarly, 7 mothers having 0-11 months old children were treated as subjects in the TT Sample for the TT Survey, 7 children of 0-59 months old were chosen as subjects for OPV coverage, and 7 women aged 15-49 years as subjects for TT 5 coverage. In all, 19,530 subjects were selected for four subjects, which comprised CES 2007 sample. To estimate the coverage of Vitamin A and Anthelmintic, the survey was carried out among the eligible respondents of OPV coverage survey. The total sample is presented in Table 1 below.

TABLE 1

Distribution of Survey Units, Clusters and Survey Subjects by Division/City Corporation Areas

Divisions/ Cities	Number of Survey Units	Number of Clusters	Number of Mothers with Children of 0-11 Months (The TT and PNVAC Sample)	Number of 12-23 Months Old Children (The Child Sample)	Number of 15-49 Years Old Women (The TT5 Sample)	Number of 0 to 59 Months Old Children (OPV Coverage in 16th NIDs)*
Dhaka Division	4+1	150	1050	1050	1050	210
Rajshahi Division	3+1	120	840	840	840	210
Chittagong Division	6+1	210	1,470	1,470	1,470	210
Khulna Division	1	30	210	210	210	210
Barisal Division	1	30	210	210	210	210
Sylhet Division	2+1	90	630	630	630	210
City Corporations	6	180	1,260	1,260	1,260	1,260
Total	**27**	**810**	**5,670**	**5,670**	**5,670**	**2,520**

* 15 low performing districts were not included for OPV coverage

1.4 SELECTION OF SAMPLES

The samples for the CES 2007 were selected using the following procedure.

- **Step-1:** 30 clusters for each sampling unit were selected by using the systematic random sampling technique following PPS method
- **Step-2:** Mouzas/Mahallas were used to define a cluster. Each defined cluster has on an average 120 households; a sketch map of each cluster was drawn with land identification
- **Step-3:** From each selected cluster, a sampling frame was prepared to identify the target population, and 7 samples for each survey were selected randomly
- **Step-4:** It included interview of the selected samples with the help of pre-designed questionnaire.

1.4.1 SELECTION OF SAMPLE CLUSTERS

In each survey unit, i.e. a district/division/city corporation, 30 clusters were selected at two stages.

- For a district, unit clusters were obtained on PPS basis.
- For each survey unit, 30 clusters were selected. In this way, a total of 810 clusters were selected from the 27 survey units.

1.4.2 SELECTION OF SAMPLE HOUSEHOLDS

For a sample cluster (i.e. enumeration areas - EA), all households were visited (on an average an EA had 120 households), and detailed information for the target samples were obtained. A separate sampling frame was prepared for each target population. From the sampling, 7 target samples for each survey were randomly selected.

1.5 QUESTIONNAIRES

Following four questionnaires or forms were used for four individual surveys:

- Household listing format
- Child Form administered for obtaining data for the Child Vaccination Coverage Survey
- TT Form administered for obtaining data from mothers to ascertain protection of their children against tetanus during their birth
- TT-5 Form administered for women aged 15-49 years
- NID Form administered for 0-59 months old children to ascertain OPV, Vitamin A, and Anthelmintic coverage

All questionnaires used in CES 2007 are included in the appendix of this report.

1.6 IMPLEMENTATION OF THE SURVEY

1.6.1 RECRUITMENT

The field staff for the CES 2007 was recruited in November. They included Assistant Survey Coordinators, Quality Control Officers, Field Supervisors, and Interviewers. The recruitment criteria included educational attainment, maturity, group cohesiveness/team spirit, experiences from other surveys, and ability to work away from home for one month. All field personnel were initially recruited as trainees each of whom was appointed to a particular post finally in the light of her/his performances in the training. Trainees with best performances were appointed as Field Coordinator, Supervisors and interviewers. For possible later-replacement of unsuitable recruits, more staff members needed were recruited as trainees.

1.6.2 TRAINING

A total of eight-day comprehensive training programme on interviewing was held for the field personnel from 28th November, 2007 to 5th December, 2007. ACNielsen Bangladesh trained the interviewers in three batches each of which comprised 25-30 trainees. The training methods employed included classroom lectures using OHP, Multimedia, demonstration interviews, role-playing, field practices, and problem reviewing. Medical Officers, EPI, Deputy Program Manager, EPI and Program Manager, CH&LCC-DGHS, and key members of the Survey Team imparted the training. Representatives from UNICEF and WHO also took part as resource persons in the training programme.

1.6.3 FIELD WORK

The fieldwork was carried out from 8th December 2007 to 15 January 2008 with a total of 30 interviewing teams. ACNielsen deployed 30 interviewing teams for data collection, each consisting of two Field Interviewers and one Supervisor. Besides, 10 interviewers worked as reserve resource. Thus, totaling 100 field personnel were involved in CES 2007. Moreover, there were 5 quality control teams, each of which comprised two people to check the quality of the fieldwork. Besides, quality controller and researchers from the firm monitored the fieldwork. In addition, representatives from the partner agencies - EPI-DGHS and UNICEF - visited the field to monitor the fieldwork.

1.6.4 DATA MANAGEMENT AND STATISTICAL ANALYSIS

For data analysis, a powerful statistical package called SPSS and Quantum version 5.8 was used. The package is capable of producing any kind of cross-tabs and statistical analysis in conjunction with SPSS.

Data processing and analysis included code construction, coders' training, coding, data punching, data verification and quality control, data processing and, finally, the analysis to facilitate the required output generation. Data of CES 2007 has been entered using data base software FOXPRO version 2.6 and cleaned using software clipper version 5.3. Tables were generated using Quantum version 5.8.

1.7 WEIGHTING

Since the sample of this study has been selected by using PPS method, the data of this survey is self-weighted.

1.8 REPORTS

As required by the scope of the CES 2007, a national report, 15 low performing districts' report, and 21 separate survey unit reports were prepared. This national report consists of six chapters.

- Chapter 1 describes the background, objectives, design, and implementation of the CES 2007,
- Chapter 2 provides an analysis of the findings received from the Childhood Vaccination Coverage Survey,
- Chapter 3 that of the TT vaccination coverage survey among mothers with 0-11 months' old children,
- Chapter 4 TT vaccination coverage survey among women aged between 15-49 years,
- Chapter 5 OPV, Vitamin A, and Anthelmintic coverage, and
- Chapter 6 presents Discussions and Programmatic Implications

Chapter 2

CHILDHOOD VACCINATION COVERAGE SURVEY

This chapter provides information from the CES 2007 on the childhood vaccination coverage conducted among the children aged between 12-23 months. The information was collected from their mothers/caregivers. It presents the findings on the level of vaccination coverage, programme quality, and reasons for not receiving vaccines.

Before explaining the findings, the selection process of the samples is discussed below.

2.1 SELECTION OF SAMPLE

Sample of Childhood Vaccination Coverage Survey was drawn in two stages:

- Selection of clusters, and
- Selection of respondents.

The process of selecting clusters and respondents were as follows:

- The cluster was randomly selected from the list of mouzas/mahallas developed by Bangladesh Bureau of Statistics.
- A total of 120 households were listed from each cluster. All the listed households were visited to identify the target samples and, therefore, a sampling frame of eligible children was made. From this frame, 7 children were randomly selected for detailed interview. Mothers of the selected children were interviewed.
- If the required number of children were not found in the selected clusters, the remaining sample was covered from the nearest area following the straight direction (Not belonging to the other selected cluster).

A total of 5,670 child samples were interviewed for the childhood vaccination coverage survey; out of which, 3150 children represented districts and 2520 six administrative divisions, which included rural areas, municipalities, and city corporations.

2.2 CHILDHOOD VACCINATION

Vaccines help make children immune to serious diseases without getting sick first. The principle objective of the Expanded Programme on Immunization (EPI) is to reduce mortality, morbidity, and disability associated with tuberculosis, tetanus, diphtheria, measles, pertussis, poliomyelitis, and Hepatitis-B. Today, children in Bangladesh routinely get vaccines that protect them from seven deadly diseases. As per the vaccination schedule, children must get vaccines against seven diseases before their first birth day.

A child is vaccinated to protect him/ her against seven deadly childhood diseases -

- Tuberculosis
- Diphtheria
- Pertussis (whooping cough)
- Tetanus
- Poliomyelitis
- Hepatitis-B
- Measles

The full course of child immunization in Bangladesh under EPI programme includes:

- BCG - one dose against tuberculosis
- Three doses of DPT against diphtheria, pertussis, and tetanus
- Four doses of Oral Polio Vaccine (OPV) against poliomyelitis
- Three doses of Hepatitis-B vaccine against Hepatitis-B
- One dose of Measles vaccine against measles

Besides, along with measles vaccination Vitamin A (100,000 IU) capsule is given against night blindness to the child after completion of his/her 9 months. As per EPI policy, a child should be vaccinated with all the doses of each vaccine by the age of 12 months. Expanded Programme on Immunization (EPI) is implemented in Bangladesh, aiming to vaccinate all children before he/she reaches his/her first birthday, following a standard schedule explained in Table A1; which is -

- BCG at birth;
- DPT1/OPV1/Hepatitis-B1 at an age of six weeks or after;
- Measles and vitamin A capsule at the age of 270 days or after completion of 9 months and after.

The interval between consecutive doses of DPT/OPV/Hepatitis-B should be four weeks or more, which means that DPT2/OPV2/Hepatitis-B2 should be given after four weeks, or more of DPT1/OPV1/Hepatitis-B1 and DPT3/OPV3/Hepatitis-B3 should be given after four weeks or more, after DPT2/OPV2/Hepatitis-B3. OPV4 is given along with measles vaccine.

The following table shows the schedule of complete childhood vaccination.

TABLE A1

The Childhood Vaccination Schedule

Name of Disease	Name of Vaccine	Number of Doses	Minimum Interval between Doses	Age of Start
Tuberculosis	BCG	1	-	At birth
Diphtheria, Pertussis, Tetanus	DPT	3	4 weeks	6 weeks
Hepatitis-B	Hepatitis-B	3	1st dose is given with DPT1, 2nd dose is DPT2 and 3rd dose is given with DPT3	6 weeks
Polio	OPV	4*	4 weeks	6 weeks
Measles	Measles	1**	-	9 months (270 days)

* 4th Dose of OPV is given with measles dose

** Vitamin A (100,000 IU) capsule is given with measles dose

2.3 LEVELS OF CHILDHOOD VACCINATION COVERAGE

Vaccination coverage is assessed in three ways -

- Crude vaccination coverage
- Valid vaccination coverage by the age of 23 months
- Valid vaccination coverage by the age of 12 months

Crude vaccination coverage includes access to vaccination services irrespective of maintaining EPI vaccination schedule. Vaccination coverage by the age of 23 months includes coverage by maintaining minimum interval and the period of starting the specific vaccines within 23 months of age. However, vaccination coverage by the age of 12 months is the percentage of children vaccinated as per EPI vaccination schedule before observing their first birthday.

The childhood vaccination coverage was assessed using information gathered from the EPI CES 2007. Card was used as the basis of information. In case of non-availability of the card, mother's/caregiver's history was considered to record the vaccination status. The information required to assess the coverage was -

- Whether the child received any vaccine
- If s/he had card
- Date of birth of the child
- Dates of each vaccine/each dose of vaccine received was collected through a pre-designed questionnaire

2.4 COVERAGE RATES FROM CARD AND HISTORY

The estimates of vaccination coverage among the children aged 12-23 months are based on the information taken from the vaccination card and information provided by the mother/caregiver where the card was not available. Therefore, this section deals with the estimation of vaccination coverage rates derived from the record through vaccination cards of the children and gathered information on the children's vaccination history.

2. 4.1 LEVELS OF CRUDE VACCINATION COVERAGE

Table A2 shows the crude vaccination coverage obtained from both the sources - card and history. Nationally, 89 percent of the children had access to vaccination service. By vaccine, the crude coverage rate was found high for BCG - 98 percent among 12-23 months' old children; and it was equally high for DPT1 (98 percent). But, there were small drops in the crude rate for subsequent doses/vaccine - declining to 97 percent for DPT2, 95 percent for DPT3, but marked drop in Measles (89 percent). Thus, the national rate of crude coverage for full immunization was found to be only 89 percent among the 12-23 months' old children.

TABLE A2

Crude Vaccination Coverage by Age 23 Months by Card and History

(fig. in %)

Sources	BCG	DPT1	DPT2	DPT3	OPV1	OPV2	OPV3	OPV4	HB1	HB2	HB3	Measles	FVC
Card	65.4	65.6	64.7	63.1	65.5	64.6	63.0	56.5	65.4	64.6	62.8	56.7	56.5
History	33.0	32.7	32.5	32.2	32.8	32.6	32.3	32.7	32.9	32.6	32.4	32.5	32.7
Both	98.4	98.3	97.2	95.3	98.3	97.2	95.3	89.2	98.3	97.2	95.2	89.2	89.2

By area type, crude coverage rate was found to be higher (92 percent) in the rural than in urban areas (87 percent). There was no urban-rural gap in the case of BCG while the gap was 5 percent in case of measles (Figure A1).

2.4.2 LEVELS OF VACCINATION COVERAGE BY 23 MONTHS

Although the government and the development partners plan to vaccinate all children before their first birthday, there are cases where children are vaccinated between the first and second birthdays i.e. they are vaccinated by the age of 23 months. The national vaccination coverage by the age of 23 months calculated from card+history are shown in Table A3.

TABLE A3

Valid Vaccination Coverage by Age 23 Months by Card and History

(fig. in %)

Sources	BCG	DPT1	DPT2	DPT3	OPV1	OPV2	OPV3	OPV4	HB1	HB2	HB3	Measles	FVC
Card	65.4	65.4	64.2	57.5	65.4	64.4	61.7	51.3	65.2	64.0	57.3	54.2	50.3
History	33.0	32.7	32.2	29.4	32.8	32.4	31.7	29.7	32.8	32.4	29.5	31.0	29.2
Both	98.4	98.1	96.4	86.9	98.1	96.9	93.4	81.0	98.0	96.4	86.8	85.2	79.5

Nationally, valid vaccination coverage by the age of 23 months is 79 percent. Vaccination coverage by specific vaccine was found to be higher for BCG and OPV1/DPT1 (98 percent) and the lowest for measles (85 percent). The findings further indicate no difference in the coverage among the vaccines by dose.

However, a slow decreasing trend in vaccination coverage is observed for the subsequent doses. The gap of 1 percentage point is found between OPV1/DPT1 and OPV2/DPT2 and 4 percentage points between OPV2 and OPV3. There has been significant improvement in the vaccination coverage between OPV3 (93 percent) and measles (85 percentage). The urban-rural gap among the vaccines by dose was almost similar to the national data (Figure A2). In terms of full vaccination, the coverage is 2 percentage points higher in the rural (81) areas compared to the urban areas (79) (Figure A2).

2.4.3 LEVELS OF THE VACCINATION COVERAGE BY 12 MONTHS

The following table shows vaccination coverage by the age of 12 months among the children aged between 12-23 months by specific vaccine as well as fully vaccination coverage derived from vaccination cards and history given by mothers/caregivers.

TABLE A4

Valid Vaccination Coverage by Age 12 Months by Card and History

(fig. in %)

Sources	BCG	DPT1	DPT2	DPT3	OPV1	OPV2	OPV3	OPV4	HB1	HB2	HB3	Measles	FVC
Card	65.2	65.4	64.2	57.3	65.4	64.4	61.5	50.4	65.2	64.0	57.1	51.2	47.5
History	33.0	32.6	32.2	29.3	32.8	32.4	31.6	29.2	32.8	32.4	29.5	29.3	27.5
Both	98.2	98.0	96.4	86.6	98.1	96.8	93.1	79.7	98.0	96.4	86.6	80.6	75.0

Vaccinations are most effective when given at the proper age. It is recommended that children complete the schedule of immunizations during their first year of life, i.e. by 12 months of age.

Table A4 shows 75 percent of the 12-23 months' old surveyed children received all doses of each vaccine while following the recommended age and interval by the age of 12 months nationally. The vaccine-specific coverage rate was the highest for BCG (98 percent), and the lowest for the measles (81 percent). The coverage rates for DPT3 and OPV3 were 87 and 93 percents respectively. The variation of coverage rates between OPV2 and DPT2 were 1 percentage point.

In terms of area type, full vaccination coverage rate was 3 percentage points higher in rural areas (77 percent) compared to that in the urban areas (74 percent). By vaccine, urban-rural disparities were very close except for measles (83 percent in rural and 79 percent in the urban areas) (Figure A3).

It is noticed that the urban-rural gap was high for measles that contributes to the higher vaccination coverage in the rural areas compared to urban areas. The dropout rate of DPT1-DPT3 and DPT1-Measles also indicate the low coverage in the urban areas. DPT1- DPT3 drop rates were 2 percent in the rural compared to 4 percent in the urban areas. Similarly, DPT1- measles dropout rates were 2 percentage points higher in the urban areas (9 percent) compared to that in the rural areas (7 percent) (Figure C11).

2.4.4 TRENDS IN VACCINATION COVERAGE

As shown in Figure A4, A5, and A6, there has been significant improvement in the vaccination coverage (crude coverage, by the age of 23 months and 12 months). The trend is shown by a time series estimates produced by the EPI Coverage Evaluation Survey started since 1991 (crude and valid by the age of 12 months). However, the vaccination coverage trend by the age of 23 months is shown from the year 2005. Figure A4 shows trend in crude coverage, A5 shows vaccination coverage by the age of 23 months; and Figure A6 shows vaccination coverage by the age of 12 months. All coverage rates show a rapid gradual increase in vaccination coverage.

CRUDE VACCINATION COVERAGE: Trend in crude coverage is shown in Figure A4. A rapid upward trend was observed since 1991 to 1994. The crude coverage decreased from 84 percent in 1994 to 67 percent in 1997. Again, a gradual upward trend with fluctuation started since 1998. The crude coverage increased by 6 percentage points from - 70 percent in 1998 to 76 percent in 2002. However, this trend decreased by 2 percentage points - 76 percent in 2002 to 74 percent in 2003. A rapid increase in crude coverage was noticed between 2003 and 2007. The crude coverage increased from 74 percent in 2003 to 89 percent in 2007. Between 2005 and 2007, the crude coverage increased by 8 percentage points (80 percent in 2005, and 89 percent in 2007).

By vaccine, BCG coverage was almost stagnant since 1999. BCG coverage was 95 percent in 1999. However, it increased with fluctuations to 96 percent in 2005. BCG coverage was similar in 2006 and 2007 (98 percent). As similar upward trend with fluctuation was observed in the coverage of OPV3 and measles.

VALID VACCINATION COVERAGE BY 23 MONTHS: A similar trend is observed in the valid vaccination coverage by the age of 23 months. The coverage is 69 percent in 2005, and it gradually increased to 77 percent in 2006. The latest survey (CES 2007) shows further improvement in the vaccination coverage, which achieved to 79 percent nationally (Figure A5). This trend in the vaccination coverage might be the contribution of the rising trend of measles and OPV3 coverage. Since 2005, measles coverage rate increased from 78 percent to 85 in 2007, and OPV3 rose from 84 percent in 2005 to 93 percent in 2007.

VALID VACCINATION COVERAGE BY 12 MONTHS: There has been a significant improvement in the valid vaccination coverage by 12 months in the recent years. Compared to the last year 2006 - valid vaccination coverage has increased by 4 percentage points from 71 percent in 2006 to 75 percent in 2007 (Figure A6). This trend in vaccination coverage might be the contribution of proper vaccination to the child by following vaccination schedule as well as by the minimizing the dropout rates for the subsequent doses. The dropout rate of DPT1- DPT3 significantly decreased from 21 percent in 2003 to 3 percent in 2007, and DPT1- measles decreased from 14 percent in 2005 to 9 percent in 2007 (Figure C12) . It is also to be mentioned here that the coverage of OPV3 has increased by 72 percent to 93 percent during the period 2003-2007 and, similarly, measles coverage increased from 69 percent in 2003 to 81 percent in 2007.

However, the trend was almost plateau in the period between 1991 and 1993. A sudden uprising trend was observed in 1994. The coverage increased from 50 percent in 1993 to 62 percent in 1994. Since 1994, the trends fluctuated, but almost plateau upto 2001. The trend of increase in the vaccination coverage started again from 2002.

2.4.5 DIVISIONAL TRENDS IN VACCINATION COVERAGE

Similar to rural-urban coverage, there has also been improvement in the vaccination coverage in all divisions in recent years. The trend of crude vaccination coverage - vaccination coverage by the age of 12 and 23 months - is shown in the Figures A7-A18. The division-wise vaccination coverage is as follows;

DHAKA DIVISION: Figure A7 shows the trend in crude coverage in Dhaka division. A gradual decreasing trend was noticed since 1994. However, the crude coverage increased with fluctuations by 10 percentage points - 61 percent in 1997 to 71 percent in 2003. Likewise, the coverage rate increased from 71 percent in 2003 to 92 percent in 2007.

Similarly, the vaccination coverage by the age of 23 months also increased by 17 percentage points in 2007 (63 percent in 2005 and 80 percent in 2007) (Figure A8).

Improvement of vaccination coverage by the age of 12 months in Dhaka division is quite noticeable. The coverage rate increased from 58 percent in 2005 to 72 percent in 2006. Compared to the CES 2006, vaccination coverage has increased by 2 percentage points - from 72 percent in 2006 to 74 percent in 2007.

Since 1999, an increasing trend in this domain has been observed. The coverage was fluctuating before 1999. Figure A9 shows that the vaccination coverage was 65 percent in 1994; it drastically declined to 39 percent in 1997. However, vaccination coverage of Dhaka division started increasing since 1997 from 39 percent to 74 percent in 2007.

CHITTAGONG DIVISION: Crude coverage rate in Chittagong division increased with fluctuations from 59 percent in 1997 to 76 percent in 2002. However, the coverage decreased by 5 percentage points between 2002 and 2003. Again, a gradual increasing trend started since 2003. The crude coverage increased 71 percent in 2003 to 89 percent in 2007 (Figure A10).

Similarly, trend in vaccination coverage by the age of 23 months also increased from 65 percent in 2005 to 81 percent in 2007. Improvement of vaccination coverage between 2006 and 2007 was 10 percentage points (71 percent in 2006 and 81 percent in 2007) (Figure A11).

In Chittagong division, a gradual increasing trend in vaccination coverage by the age of 12 months began since 1997 with exceptions in 2000 and 2005. The vaccination coverage was 44 percent in 1997. The rate was almost stagnant in the period 1998-2000. Since 2001, vaccination coverage rate has increased by 29 percentage points (47 percent in 2001 and 76 percent in 2007). The coverage rate has increased by 10 percentage points compared to that in the CES 2006 (Figure A12).

BARISAL DIVISION: Crude coverage rate was 60 percent in 2003. It increased to 83 percent in 2005 and 90 percent in 2007. Likewise, trend of vaccination coverage by the age of 23 months was similar to crude coverage. The coverage rate improved by 13 percentage points in 2007 compared to that in 2005 (Figure A13 - A14).

In Barisal division, a much higher increasing trend in coverage by the age of 12 months occurred since 2003. Vaccination coverage in the year 2003 was 50 percent; it increased to 67 percent in 2005, 71 percent in 2006, and 80 percent in 2007. Compared to 2006, the coverage rate improved by 9 percentage points (71 percent in 2006 and to 80 percent in 2007 (Figure A15).

KHULNA DIVISION: In terms of crude vaccination coverage by the age of 23 months, a slow increasing trend with fluctuation was noticed from 2000. The coverage rate was 75 percent in 2000 it increased to 88 percent in 2003 and 93 percent in 2007(Figure A16).

However, in case of valid vaccination coverage by the age of 23 months an upward trend with fluctuations was revealed from 2005 to 2007. In 2005, the coverage rate was 75 percent while it was 77 percent in 2007. The rate declined by 4 percentage points in 2007 compared to that in 2006 (Figure A17).

Valid vaccination coverage trend by the age of 12 months in Khulna division was characterized by fluctuations since 1997. A much higher improvement occurred between 2002 and 2003. The coverage rate improved to 77 percent in 2003 from 67 percent in 2002. From then, a fluctuating trend again begun with the year 2003 with variations of 5 percentage points. The vaccination coverage rate decreased from 77 percent in 2002 to 72 percent in 2003. Again, it increased to 77 percent in 2006; but it further declined to 72 percent in 2007 (Figure A18).

RAJSHAHI DIVISION: The trend of crude vaccination coverage is shown in Figure A15. The coverage rate was plateau from 1997 to 2003. An upward trend was observed since 2003. The coverage increased by 20 percents - from 75 percent in 2003 to 95 percent in 2007 (Figure A19).

Likewise, the trend of valid vaccination coverage by the age of 23 months in Rajshahi division started to increase since 2005. A much higher increase in trend was observed between 2005 and 2007 (72 percent in 2005, and 86 percent in 2007) (Figure A20).

Almost a stagnant upward trend in valid vaccination coverage by the age of 12 months observed in Rajshahi division since 1993. However, a remarkable increase in vaccination coverage was noticed since 2002. It increased by 28 percentage points between 2002 and 2007. The rate was 54 percent in 2002; it increased to 82 percent in 2007. Compared to the 2006 data, the coverage rate increased by 9 percentage points (73 percent in 2006, and 82 percent in 2007) (Figure A21).

SYLHET DIVISION: An upward trend in crude coverage in Sylhet division started since 2001. The crude coverage was 42 percent in 2001. It increased to 83 percent in 2006, and declined to 77 percent in 2007. The overall increase in the crude coverage was 35 percentage points - from 42 percent in 2001 to 77 percent in 2007 (Figure A22). Similar to the crude coverage, trend in valid vaccination coverage by the age of 23 months was observed higher since 2005. The coverage rate has improved by 13 percentage points in 2007 compared to that in 2005 (Figure A23).

An improvement in valid vaccination coverage by the age of 12 months was observed in Sylhet division since 2001. Valid vaccination coverage improved by 42 percentage points during the period 2001-2007. A higher improvement occurred in 2002 - 17 percentage points from 2001. This higher improvement might be the effect of higher OPV3 and measles coverage as well as the administering the vaccine in exact age and interval. Besides, the reduction of dropout rates resulted in higher vaccination coverage (Figure A24). However, improvement in coverage was found much lower between 2006 and 2007. Vaccination coverage rate by the age of 12 months has improved by 1 percentage point as against the year 2006.

2.4.6 LEVELS OF THE RURAL COVERAGE BY DIVISION

CRUDE VACCINATION COVERAGE: Overall, 92 percent of the children had access to vaccination coverage in the rural areas of Bangladesh. Crude coverage was the highest in Khulna division and the lowest in Sylhet division. Crude coverage in other divisions ranged from 91 percent in Barisal division to 93 percent in Dhaka division (Figure A25).

VALID VACCINATION COVERAGE BY 23 MONTHS: As expected from the above findings, rural vaccination coverage by the age of 23 months is 81 percent. The coverage was the highest in Rajshahi division (86 percent), which was being followed by Barisal (83 percent), Chittagong (82 percent), Sylhet (79 percent), Khulna (77 percent), and Dhaka divisions (76 percent) (Figure A26).

The lowest performance in Dhaka division was due to the administering of the vaccine by not following the vaccination schedule properly.

VACCINATION COVERAGE BY 12 MONTHS: Vaccination coverage with all recommended doses maintaining the exact age and interval by the age of 12 months is 77 percent in rural Bangladesh. The vaccination coverage was the highest in Rajshahi division (83 percent), which was being followed by Barisal (81 percent), Chittagong (78 percent), and Sylhet divisions (73 percent) (Figure A27). The lowest coverage was found in Khulna and Dhaka divisions (72 percent).

By vaccines, vaccination coverage by the age of 12 months was almost universal for BCG in all divisions. On an average, the coverage is 99 percent. Differential to other vacciness are also less pronounced for OPV3. However, differential of measles vaccine is more pronounced in Sylhet and Khulna divisions compared to those in Dhaka, Rajshahi, Chittagong and Barisal divisions (Figure A27).

2.4.7 LEVELS OF THE URBAN COVERAGE BY CITY CORPORATION

Vaccination coverage in the urban areas varied by the city corporations, while there is no separate 30-cluster samples drawn for the major municipalities available as an independent survey unit. Estimates for those areas were developed in the following manner: clusters from major municipalities was included in the division sample units; estimates were then derived from this sample as estimates for major municipalities.

CRUDE VACCINATION COVERAGE: Crude vaccination coverage was the highest - 98 - percent in RCC and the lowest - 66 percent - in SCC. Crude coverage of other city corporations was intermediary; it ranged between 86 percent in CCC and 91 percent in DCC. Crude coverage in KCC was 90 percent which was being followed by CCC (88 percent) (Figure A28).

VALID VACCINATION COVERAGE BY 23 MONTHS: In terms of valid vaccination coverage by the age of 23 months, the performance was also the highest in RCC (86 percent) and the lowest in SCC (65 percent). The coverage rate in DCC was 81 percent, which was being followed by BCC (80 percent), CCC (79 percent), and KCC (76 percent) (Figure A29).

VALID VACCINATION COVERAGE BY 12 MONTHS: Similar to rural divisional coverage, urban valid vaccination coverage by the age of 12 months were the highest in Rajshahi City Corporation - RCC (83 percent). Coverage in other city corporations, such as, Dhaka, Chittagong, Khulna, and Barisal ranged between 72 percent in Khulna City Corporation and 79 percent in Barisal City Corporation - BCC (Figure A30). RCC achieved the best position due to higher accessibility in the vaccination service as well as lower incidence in DPT1- measles doses. Moreover, there was no dropout in DPT1-DPT3 dose in RCC (Figure C14).

On the other hand, the coverage rate was the lowest in Sylhet City Corporation - SCC (57 percent). The dropout rate in SCC was also high (27percent).

2.4.8 SEX DIFFERENTIALS IN THE VACCINATION COVERAGE

CRUDE VACCINATION COVERAGE: Nationally 88 percent of the females and 90 percent of the males had access to vaccination service. By vaccine, difference in coverage rates was 1 percentage for BCG, DPT1, DPT2, OPV1 and OPV2, and 2 percentage points for measles between males and females. However, the coverage rate was similar for DPT3 and OPV3 (Figure A31).

VACCINATION COVERAGE BY 23 MONTHS: Vaccination coverage by the age of 23 months was similar for both males and females for OPV1. A lower difference was noticed in the vaccination coverage of BCG, OPV2, OPV3 and DPT2. The coverage was 1 percentage point higher for the males compared to the females for these vaccines (Figure A32).

Although access to measles vaccine was found lower among both males and females compared to OPV3 (Figure A31), the dropout rate for measles vaccine was higher among females (78 percent) compared to males (83 percent) (Figure A33).

VACCINATION COVERAGE BY 12 MONTHS: Figure A33 shows the sex-wise distribution of vaccination coverage by the age of 12 months. Seventy-seven percent of males and 73 percent of females found to be vaccinated by age 12 months.

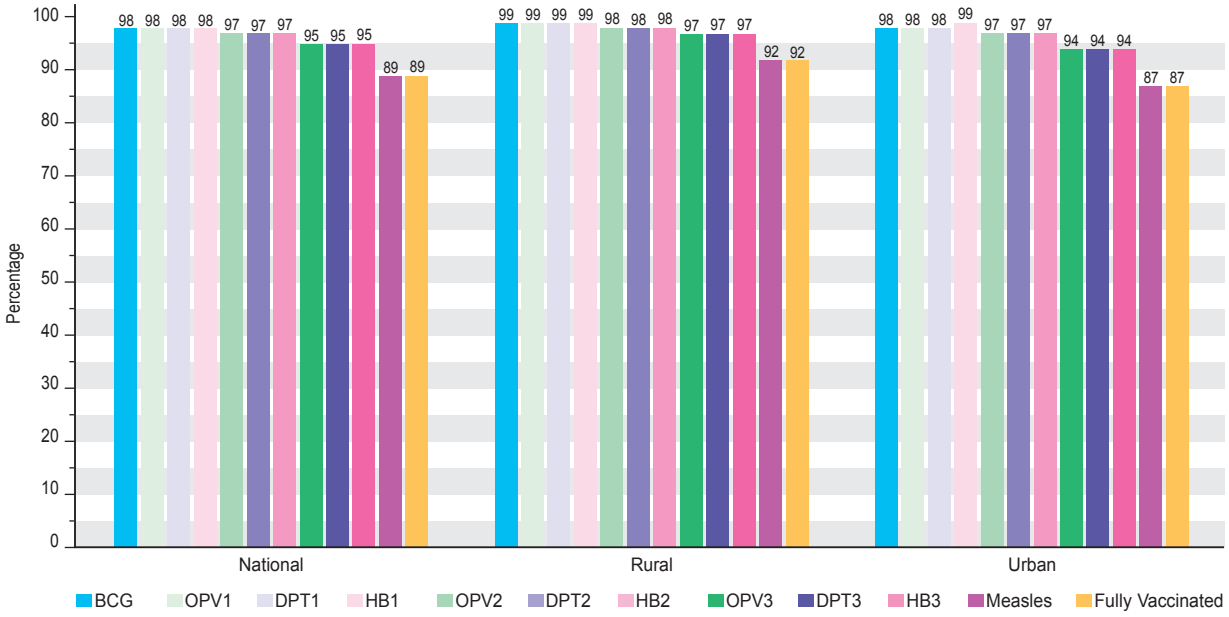
In terms of vaccines, difference of coverage between males and females is slightly lower for OPV3 (94 percent for males as against 92 percent for females). The difference is higher for measles vaccine - 83 percent of the males received measles compared to 78 percent of females; which indicates a higher proportion of female children dropout after taking OPV3 (Figure A33). The difference of coverage for OPV3 between males and females was two percentage points.

2.4.9 LEVELS OF THE COVERAGE BY SURVEY UNIT

As a ready reference, rates of valid vaccination coverage by 12 months of age among 12-23 months' old children, by division/city corporation, are given in Table 1 in the Appendix. Full vaccination coverage by 12 months of age by Division /city corporation are also presented graphically in the Figures in the Appendix.

FIGURE A1

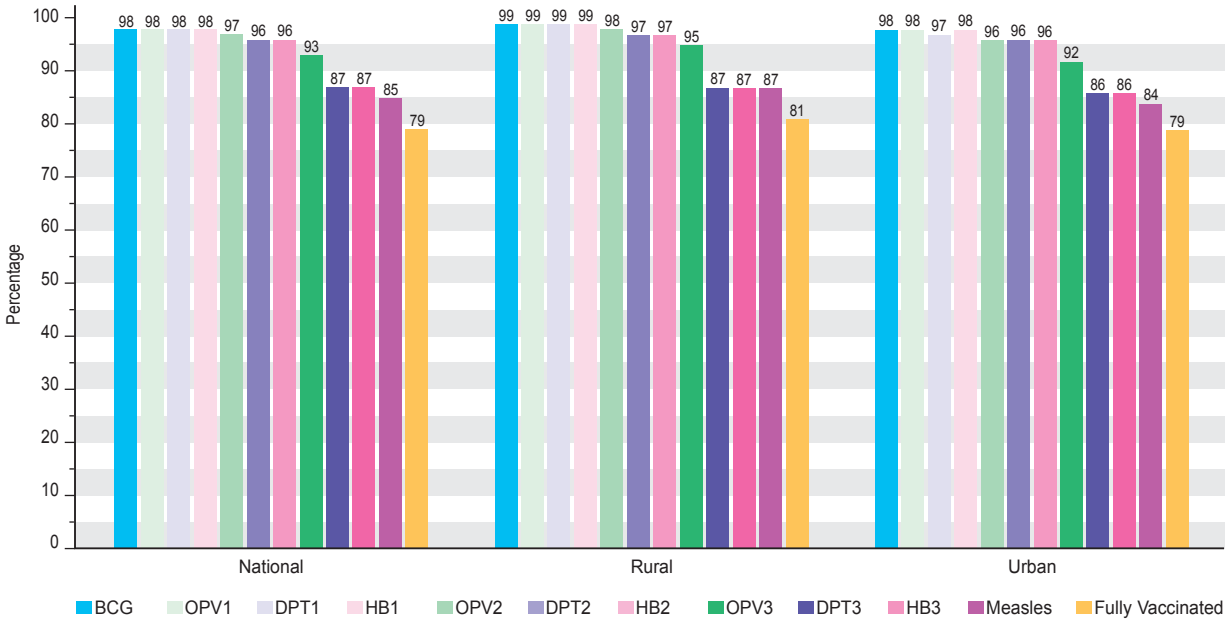
Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children by National, Rural and Urban Areas in 2007 (Card+History)



Source: CES 2007

FIGURE A2

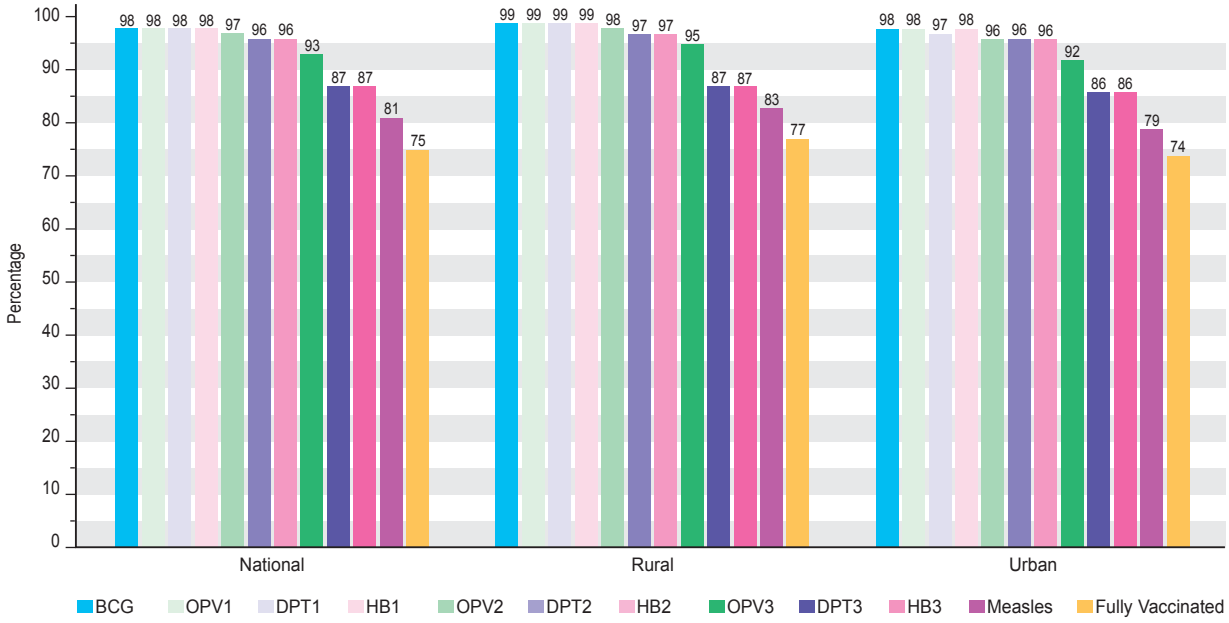
Valid Vaccination Coverage by Age 23 Months among 12-23 Months Old Children by National, Rural and Urban Areas in 2007 (Card+History)



Source: CES 2007

FIGURE A3

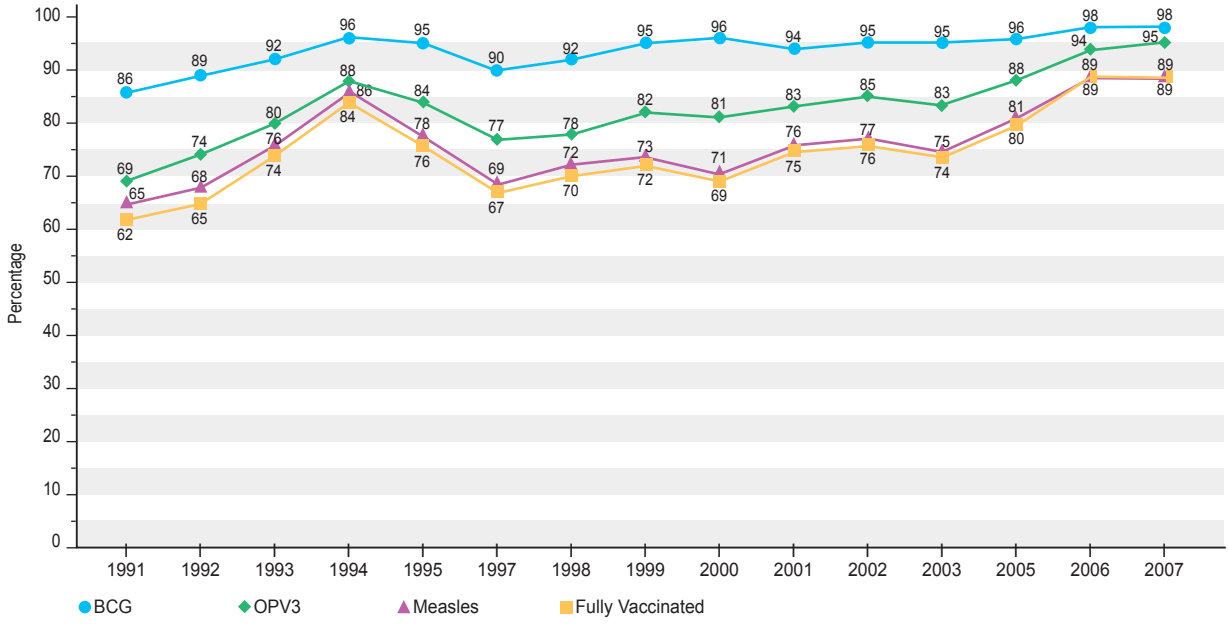
Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children by National, Rural and Urban Areas in 2007 (Card+History)



Source: CES 2007

FIGURE A4

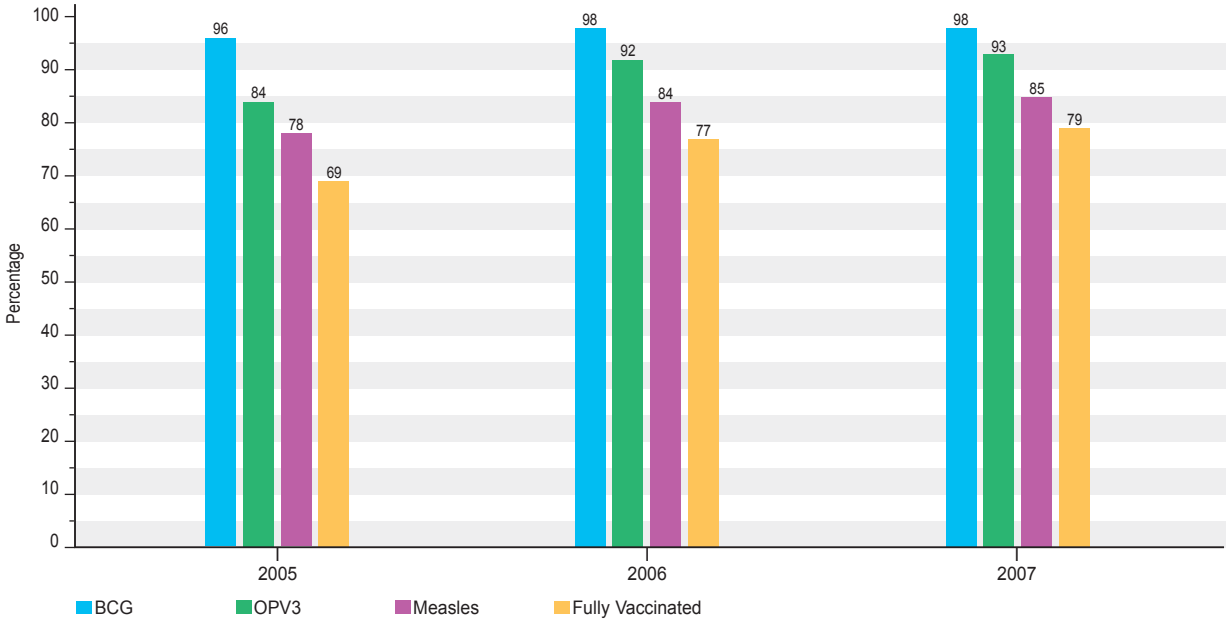
Annual Trend in National Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children from 1991 to 2007 (Card+History)



Source: Coverage Evaluation Survey 1991-1995, 1997-2002, 2003, 2005, 2006 and 2007

FIGURE A5

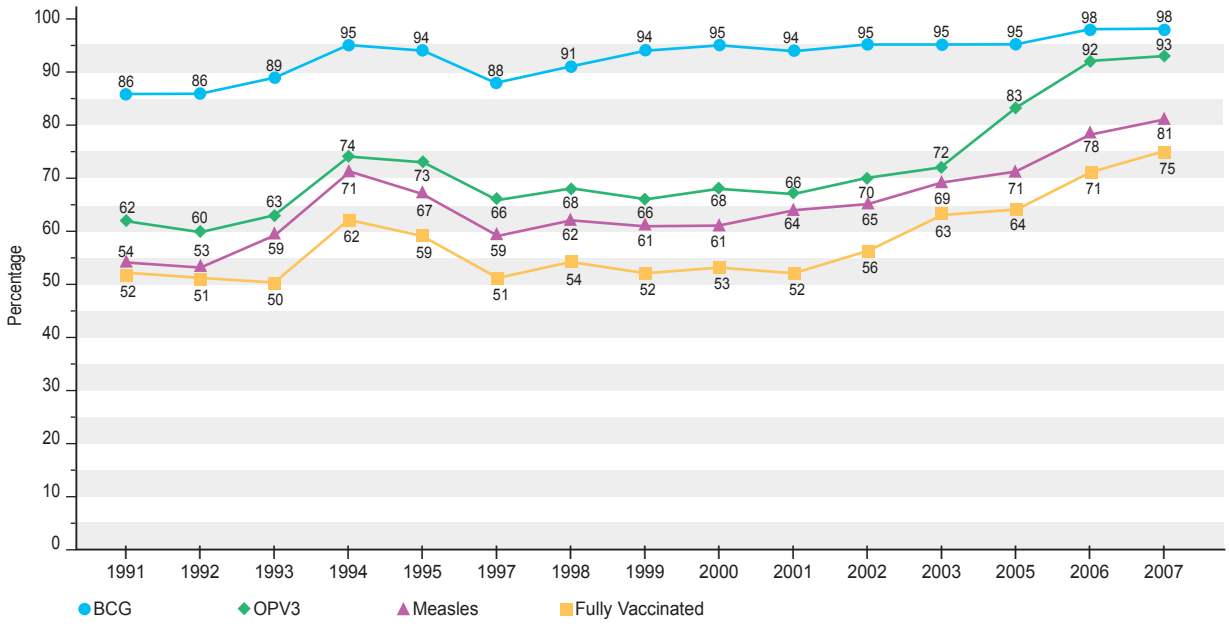
Annual Trend in National Valid Vaccination Coverage by age 23 months among 12-23 Months Old Children from 2005 to 2007 (Card+History)



Source: CES 2007

FIGURE A6

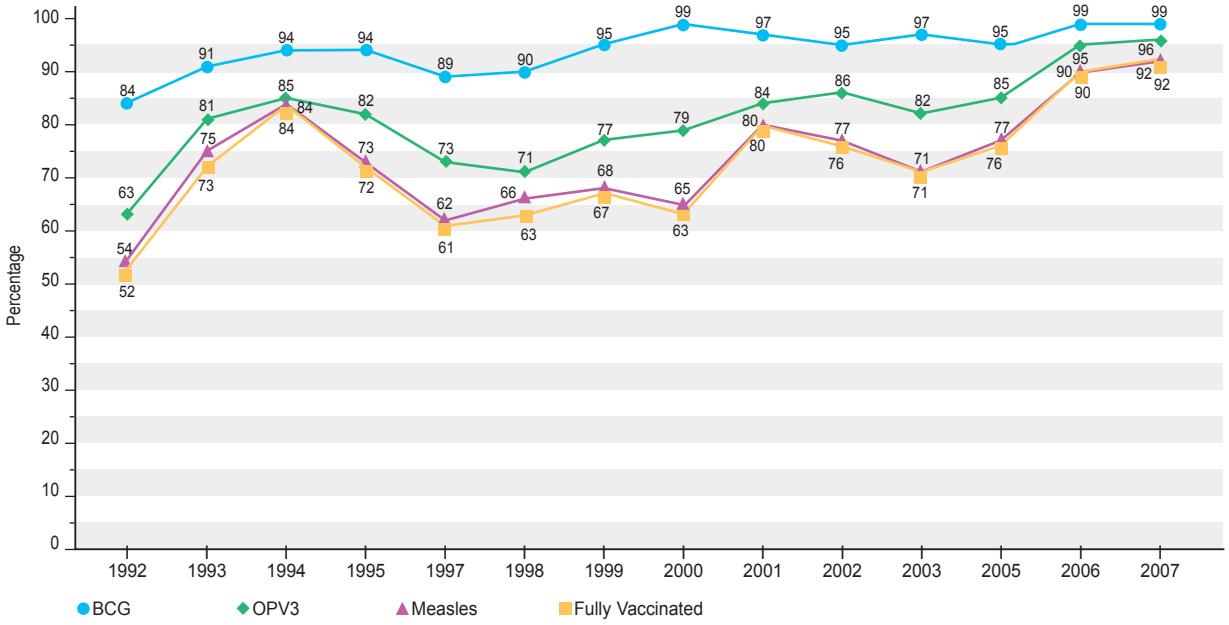
Annual Trend in National Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children from 1991 to 2007 (Card+History)



Source: Coverage Evaluation Survey 1991-1995, 1997-2002, 2003, 2005, 2006 and 2007

FIGURE A7

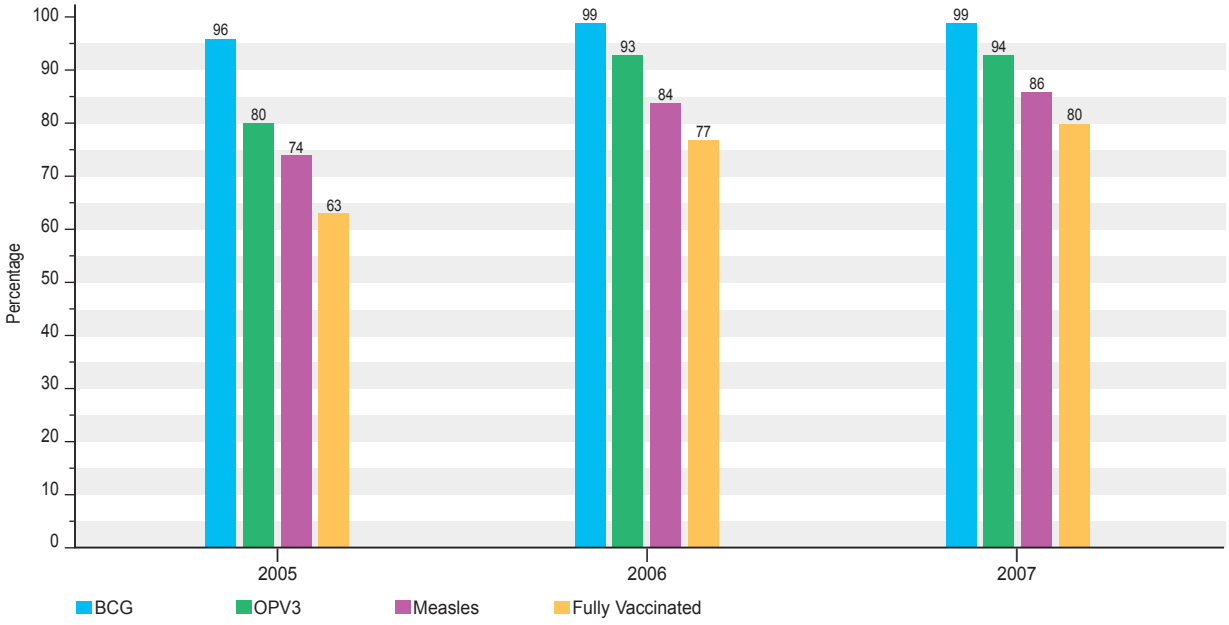
Annual Trend in Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Dhaka Division from 1992 to 2007 (Card+History)



Source: Coverage Evaluation Surveys (CESs) 1992-1995, 1997-2002, 2003, 2005, 2006 and 2007

FIGURE A8

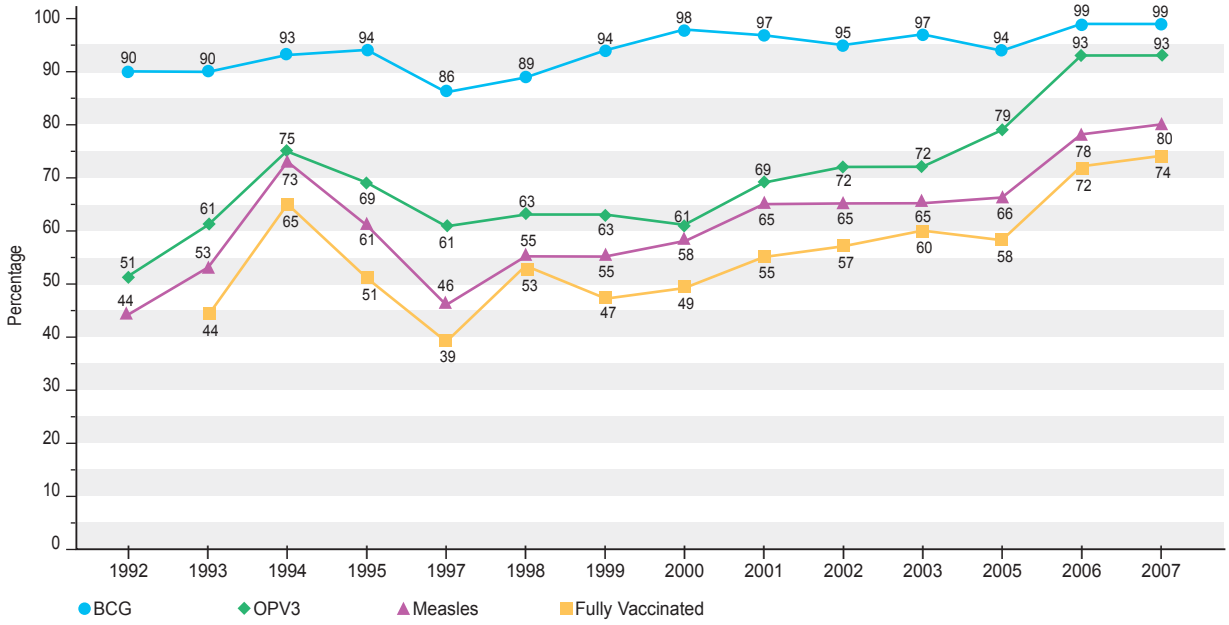
Annual Trend in Valid Vaccination Coverage by age 23 months among 12-23 Months Old Children in Dhaka Division from 2005 to 2007 (Card+History)



Source: CES 2007

FIGURE A9

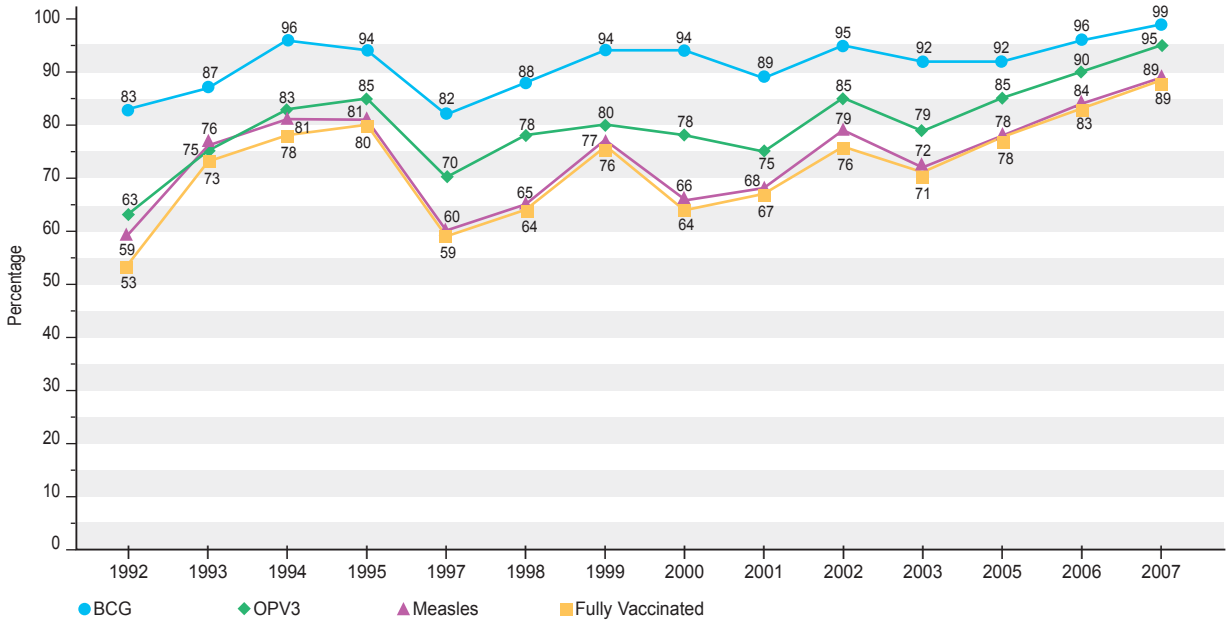
Annual Trend in Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children in Dhaka Division from 1992 to 2007 (Card+History)



Source: Coverage Evaluation Survey 1992-1995, 1997-2002, 2003, 2005, 2006 and 2007

FIGURE A10

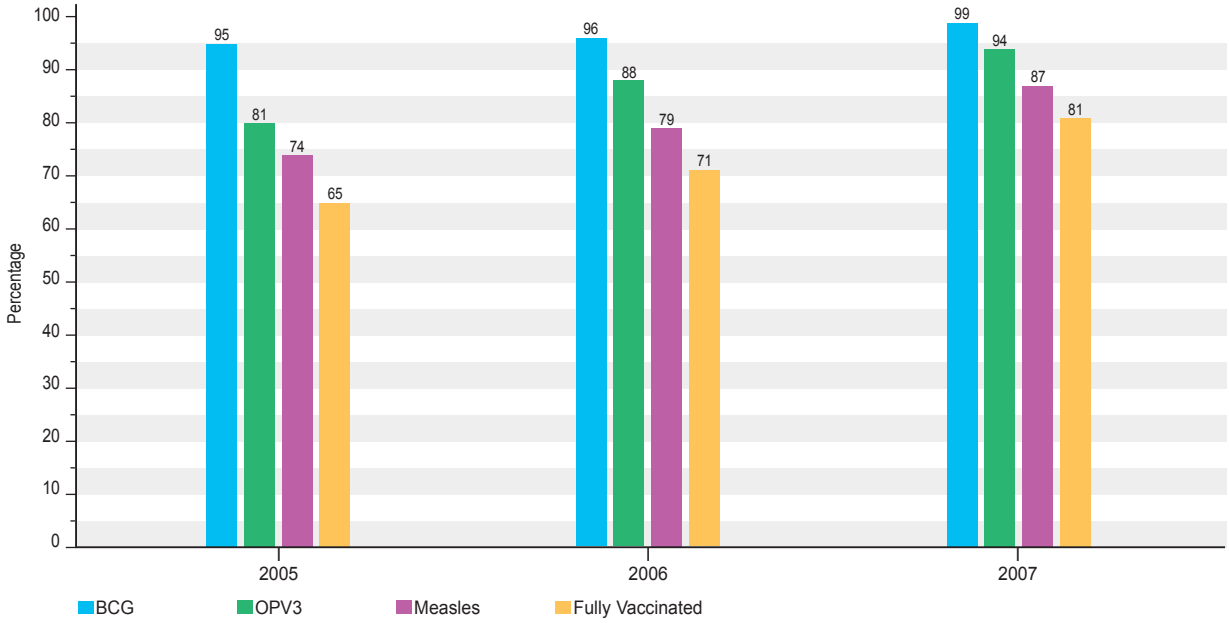
Annual Trend in Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Chittagong Division from 1992 to 2007 (Card+History)



Source: Coverage Evaluation Surveys (CESs) 1992-1995, 1997-2002, 2003, 2005, 2006 and 2007

FIGURE A11

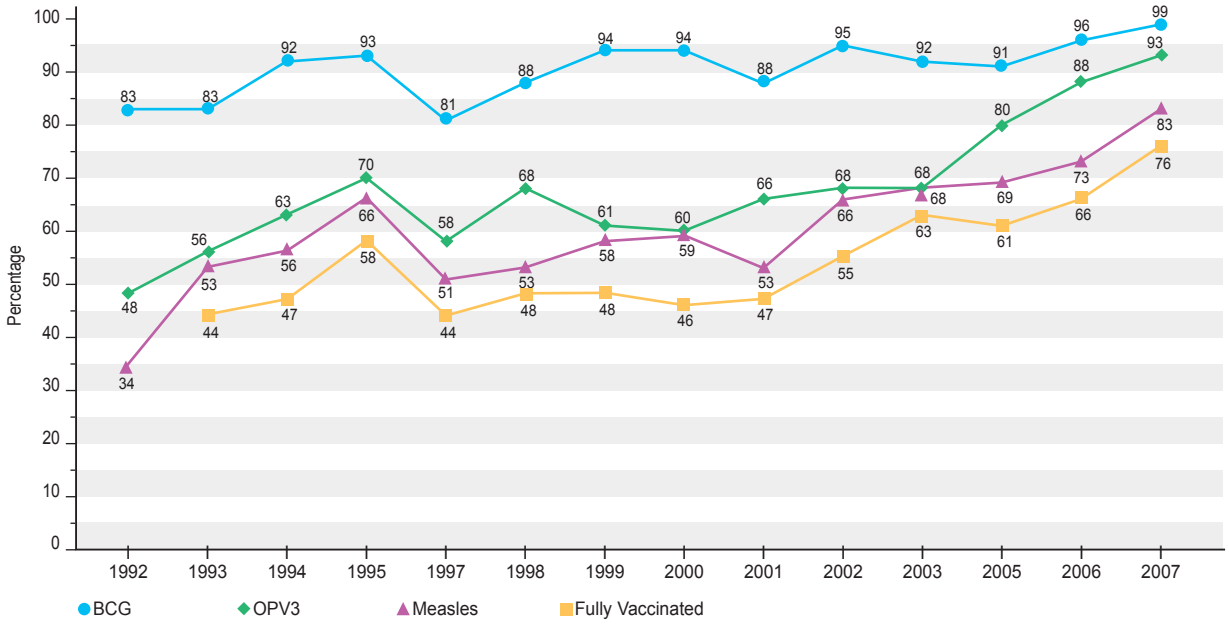
Annual Trend in Valid Vaccination Coverage by age 23 months among 12-23 Months Old Children in Chittagong Division from 2005 to 2007 (Card+History)



Source: CES 2007

FIGURE A12

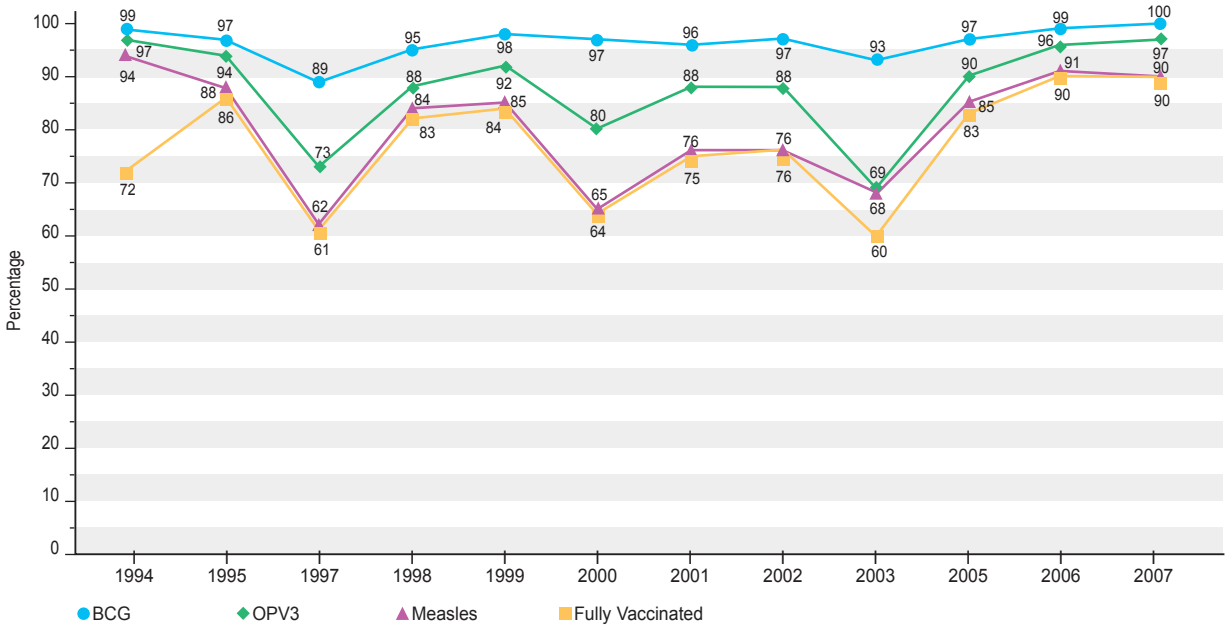
Annual Trend in Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children in Chittagong Division from 1992 to 2007 (Card+History)



Source: Coverage Evaluation Surveys (CESs) 1992-1995, 1997-2002, 2003, 2005, 2006, and 2007

FIGURE A13

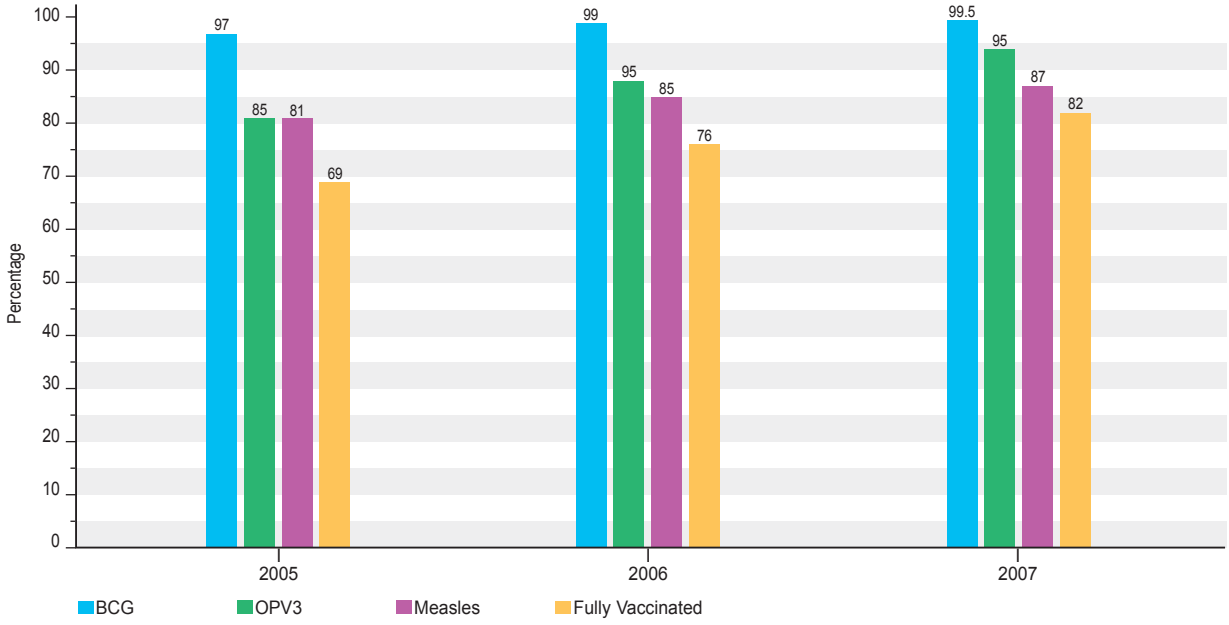
Annual Trend in Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Barisal Division from 1994 to 2007 (Card+History)



Source: Coverage Evaluation Survey 1994-1995, 1997-2002, 2003, 2005, 2006 and 2007

FIGURE A14

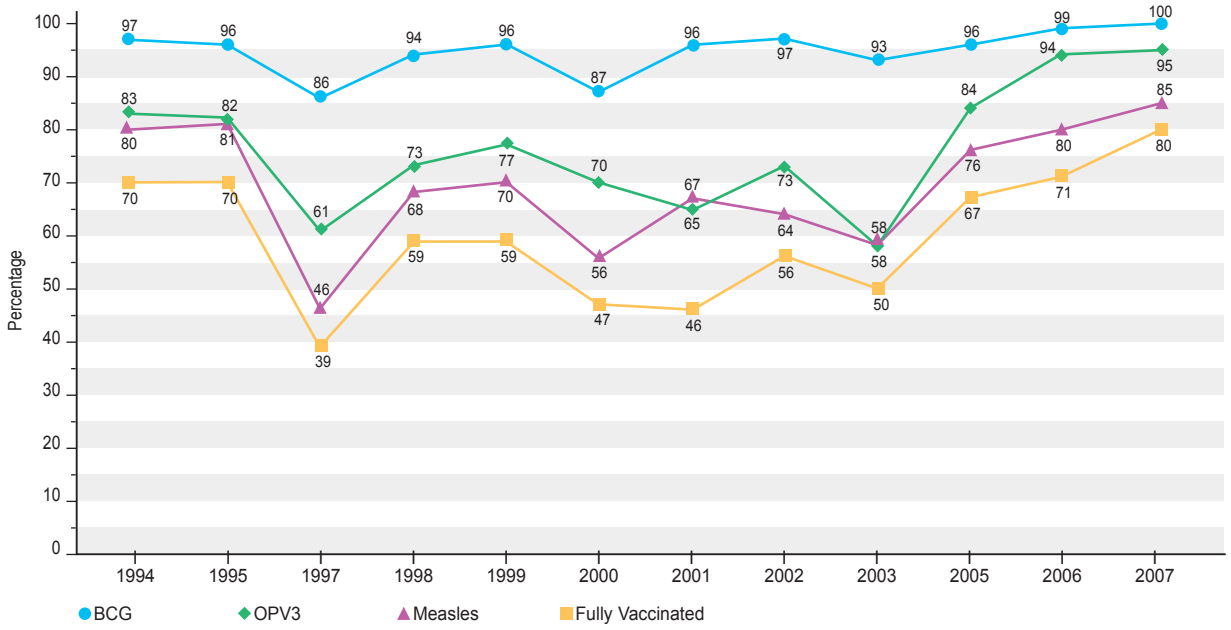
Annual Trend in Valid Vaccination Coverage by age 23 Months among 12-23 Months Old Children in Barisal Division from 2005 to 2007 (Card+History)



Source: CES 2007

FIGURE A15

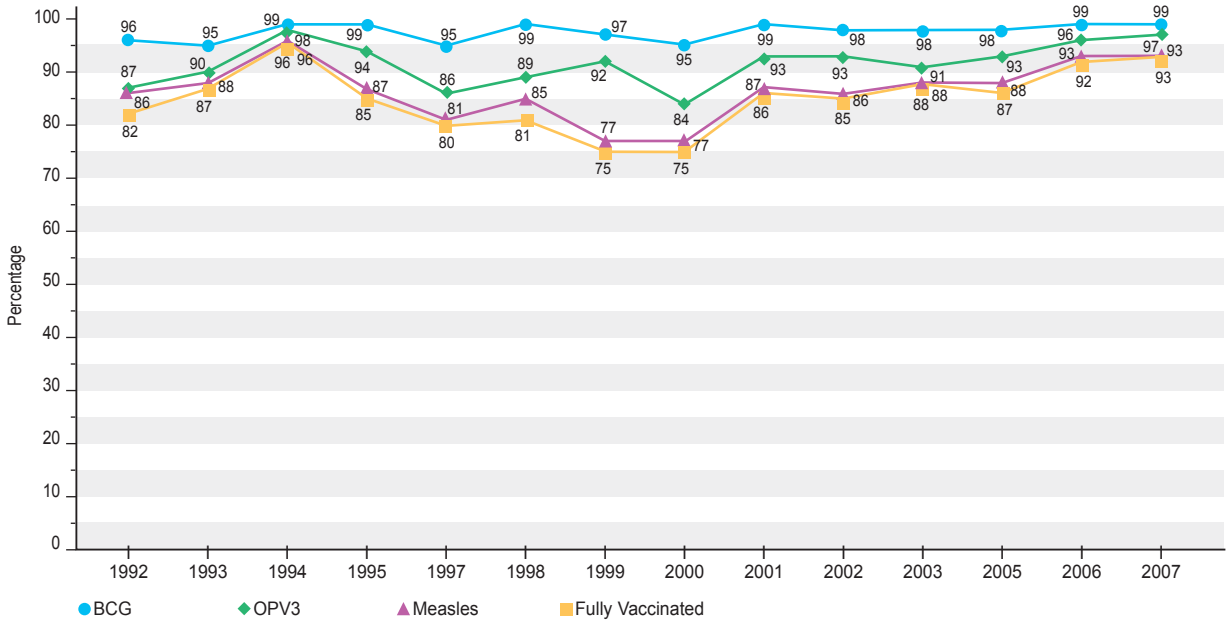
Annual Trend in Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children in Barisal Division from 1994 to 2007 (Card+History)



Source: Coverage Evaluation Surveys (CESs) 1994-1995, 1997-2002, 2003, 2005, 2006 and 2007

FIGURE A16

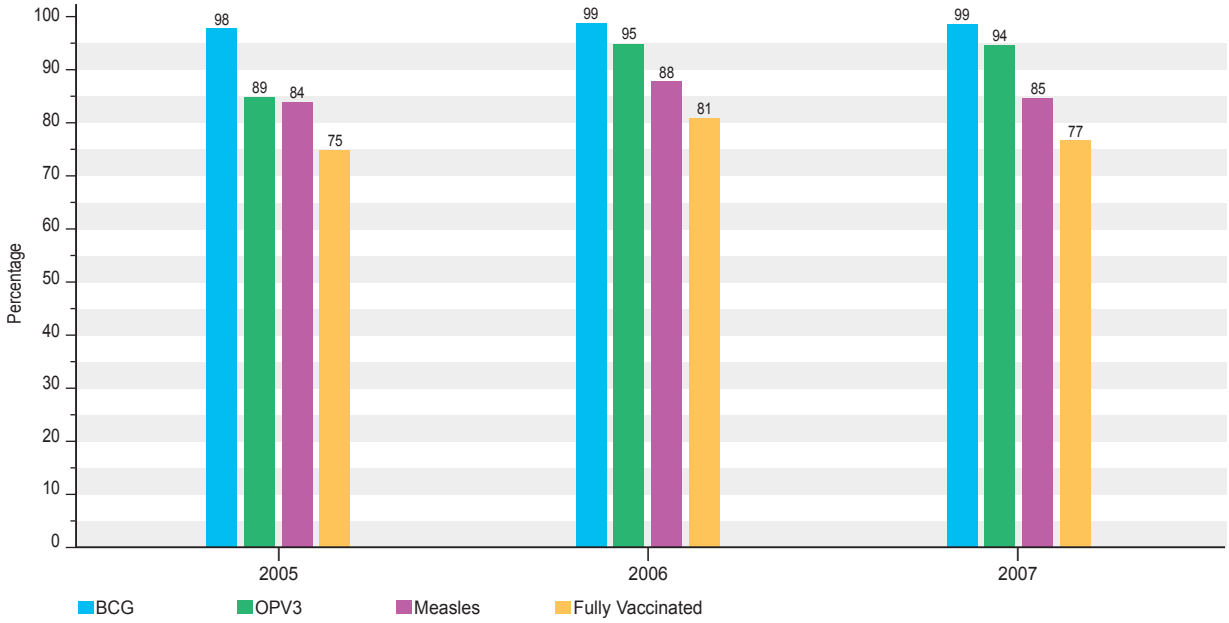
Annual Trend in Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Khulna Division from 1992 to 2007 (Card+History)



Source: Coverage Evaluation Surveys (CESs) 1992-1995, 1997-2002, 2003, 2005, 2006, and 2007

FIGURE A17

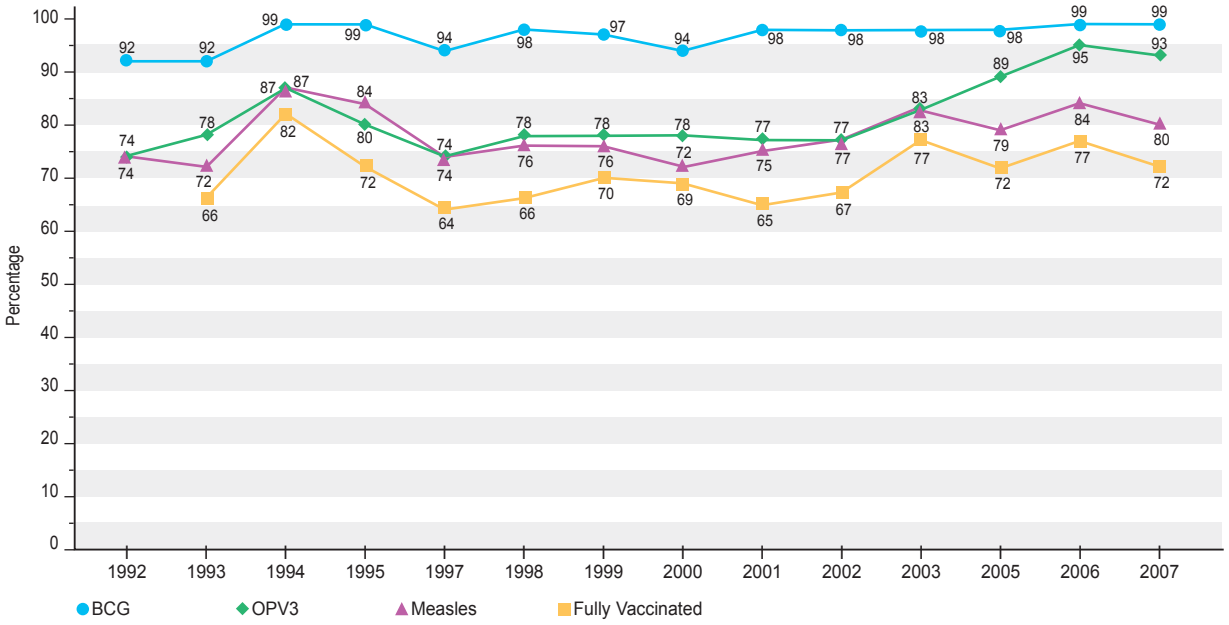
Annual Trend in Valid Vaccination Coverage by age 23 Months among 12-23 Months Old Children in Khulna Division from 2005 to 2007 (Card+History)



Source: CES 2007

FIGURE A18

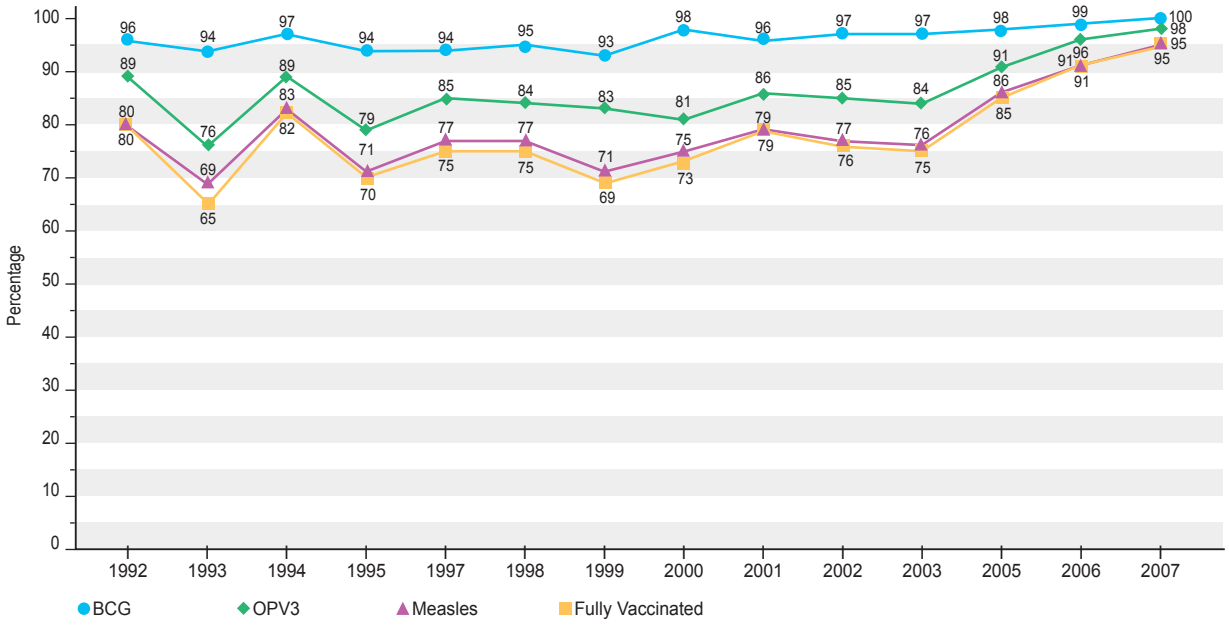
Annual Trend in Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children in Khulna Division from 1992 to 2007 (Card+History)



Source: Coverage Evaluation Surveys (CESs) 1992-1995, 1997-2002, 2003, 2005, 2006, and 2007

FIGURE A19

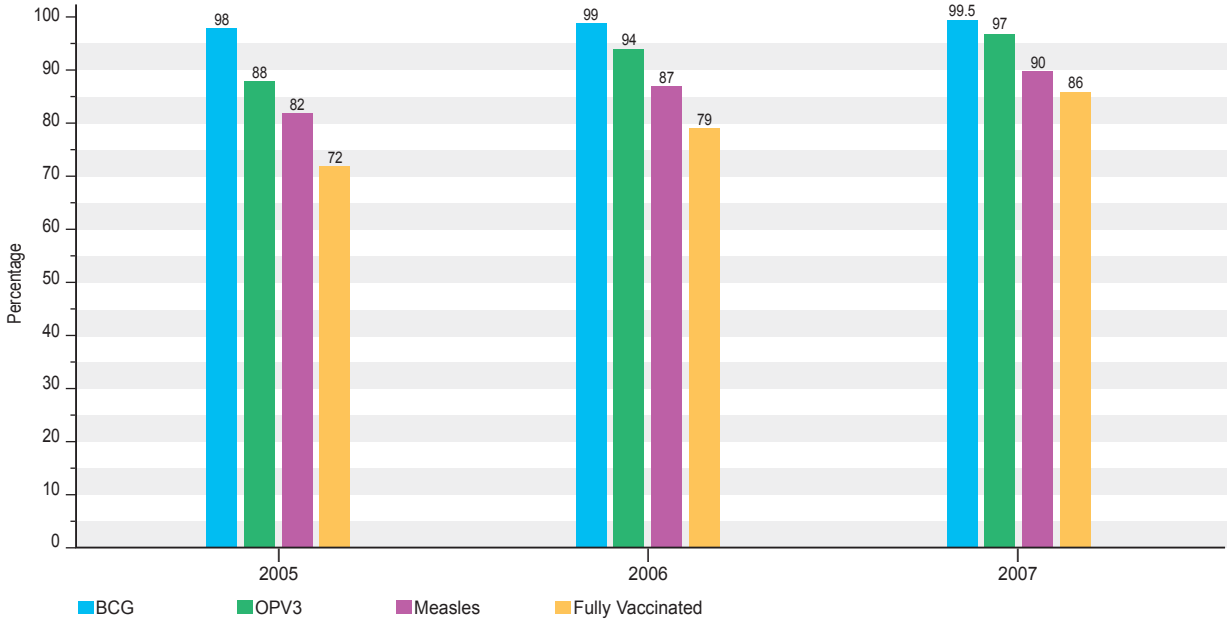
Annual Trend in Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Rajshahi Division from 1992 to 2007 (Card+History)



Source: Coverage Evaluation Surveys (CESs) 1992-1995, 1997-2002, 2003, 2005, 2006, and 2007

FIGURE A20

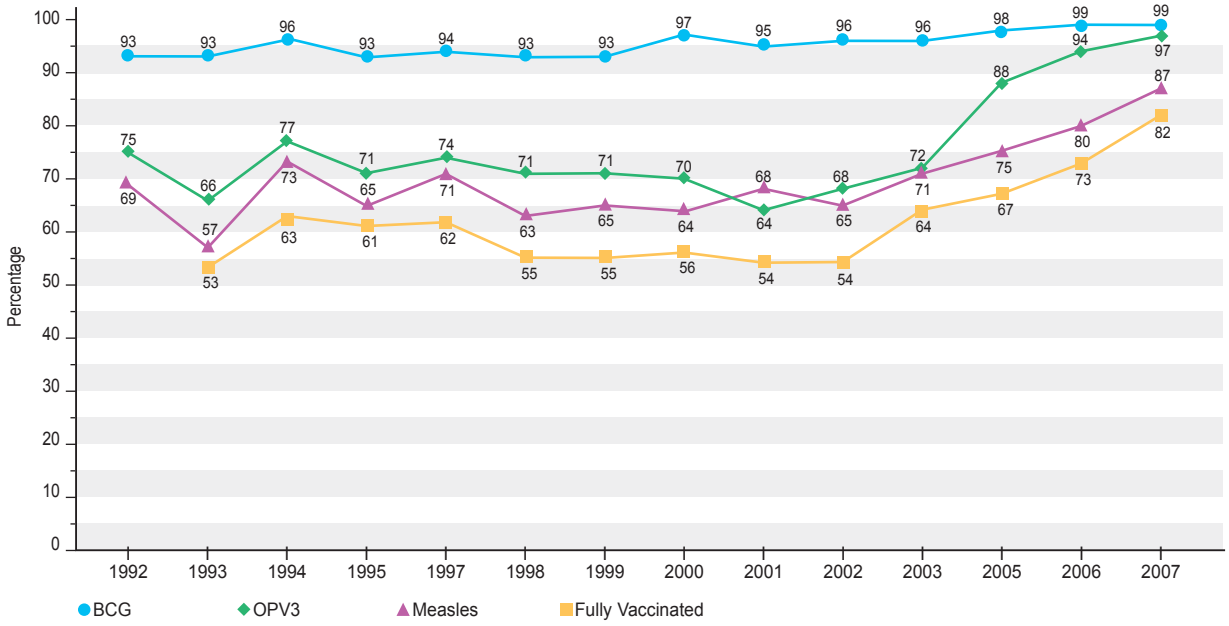
Annual Trend in Valid Vaccination Coverage by age 23 Months among 12-23 Months Old Children in Rajshahi Division from 2005 to 2007 (Card+History)



Source: CES 2007

FIGURE A21

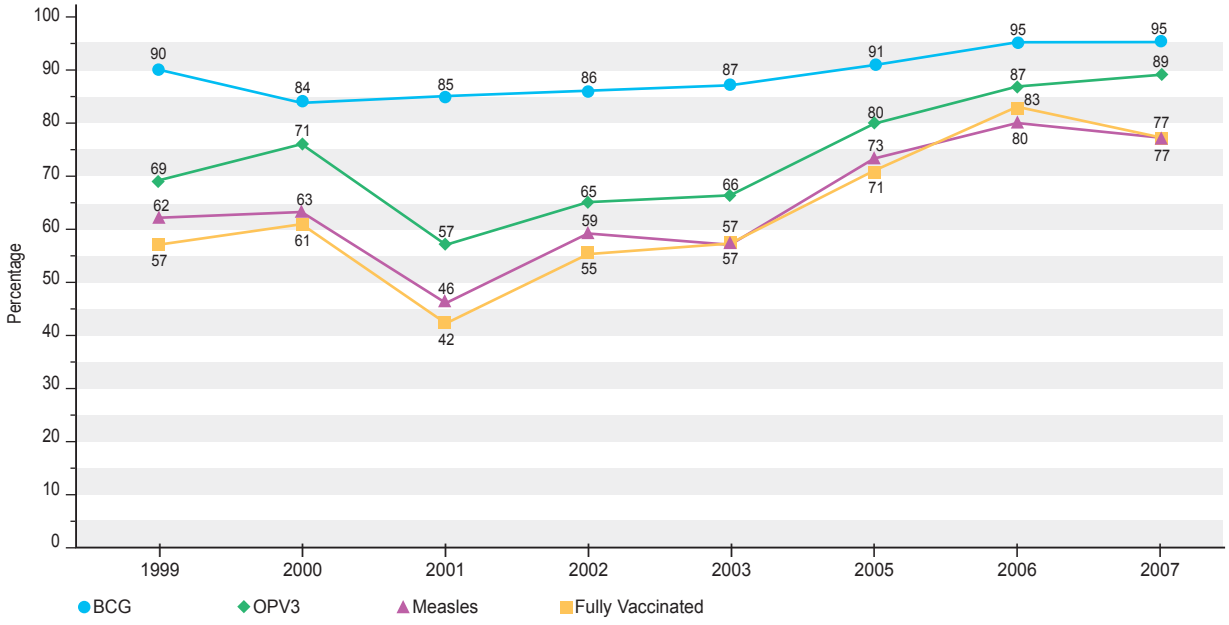
Annual Trend in Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children in Rajshahi Division from 1992 to 2007 (Card+History)



Source: Coverage Evaluation Surveys (CESs) 1992-1995, 1997-2002, 2003, 2005, 2006, and 2007

FIGURE A22

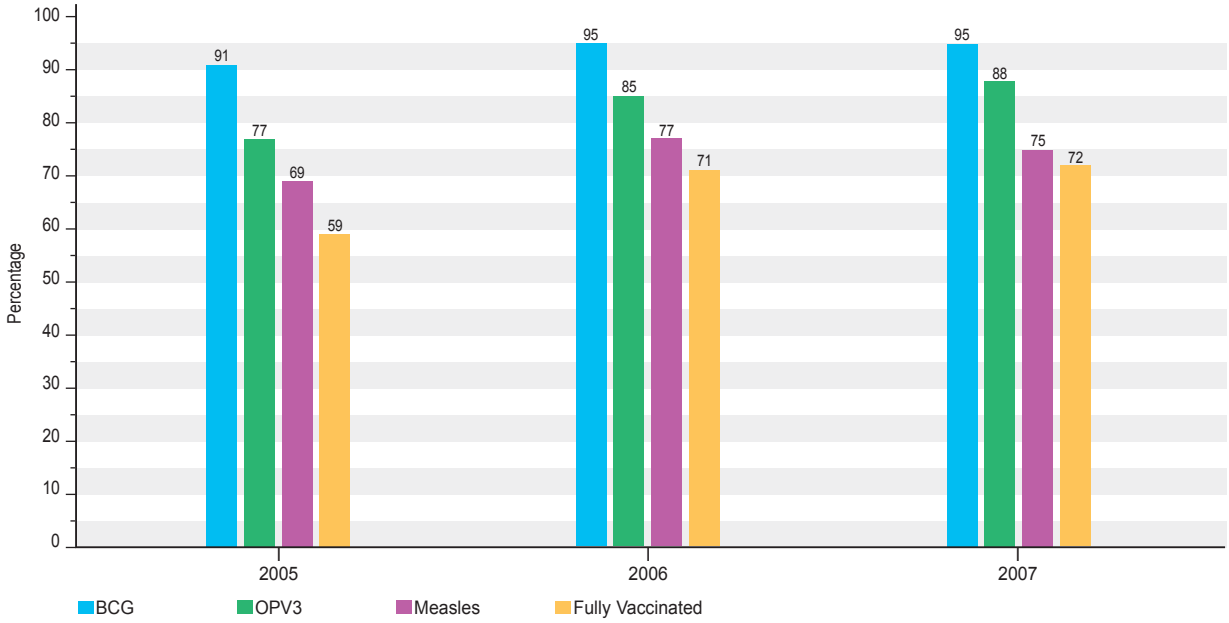
Annual Trend in Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Sylhet Division from 1999 to 2007 (Card+History)



** Before 1999, Sylhet division was a part of Chittagong division*
Source: Coverage Evaluation Survey 1999-2002, 2003, 2005, 2006 and 2007

FIGURE A23

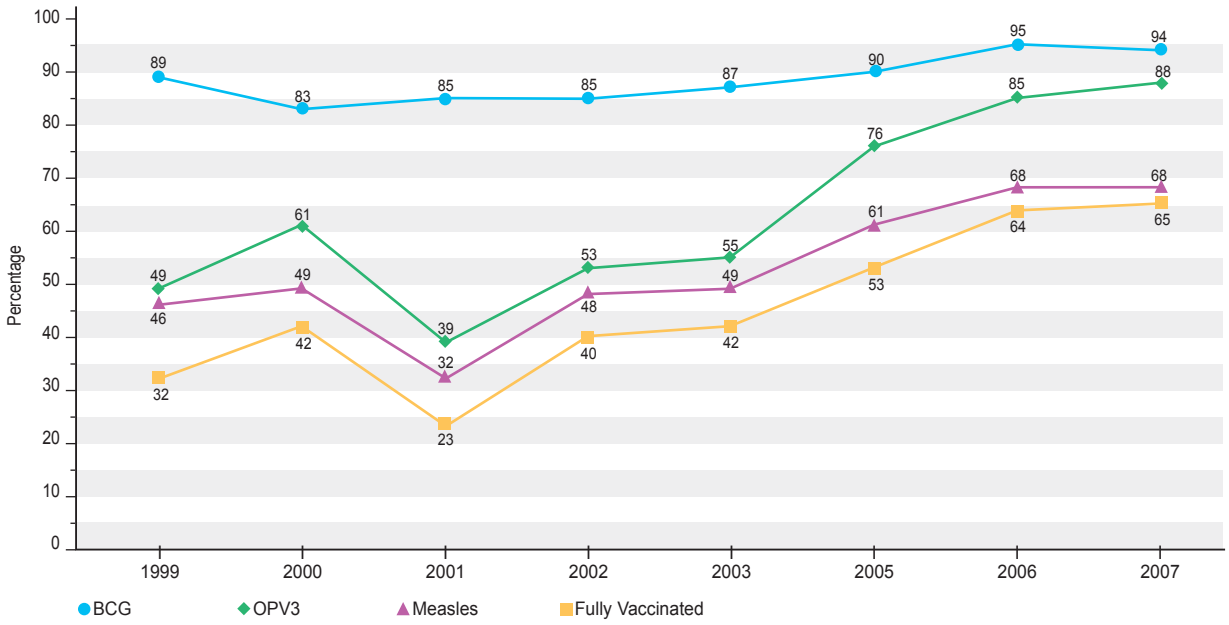
Annual Trend in Valid Vaccination Coverage by age 23 Months among 12-23 Months Old Children in Sylhet Division from 2005 to 2007 (Card+History)



Source: CES 2007

FIGURE A24

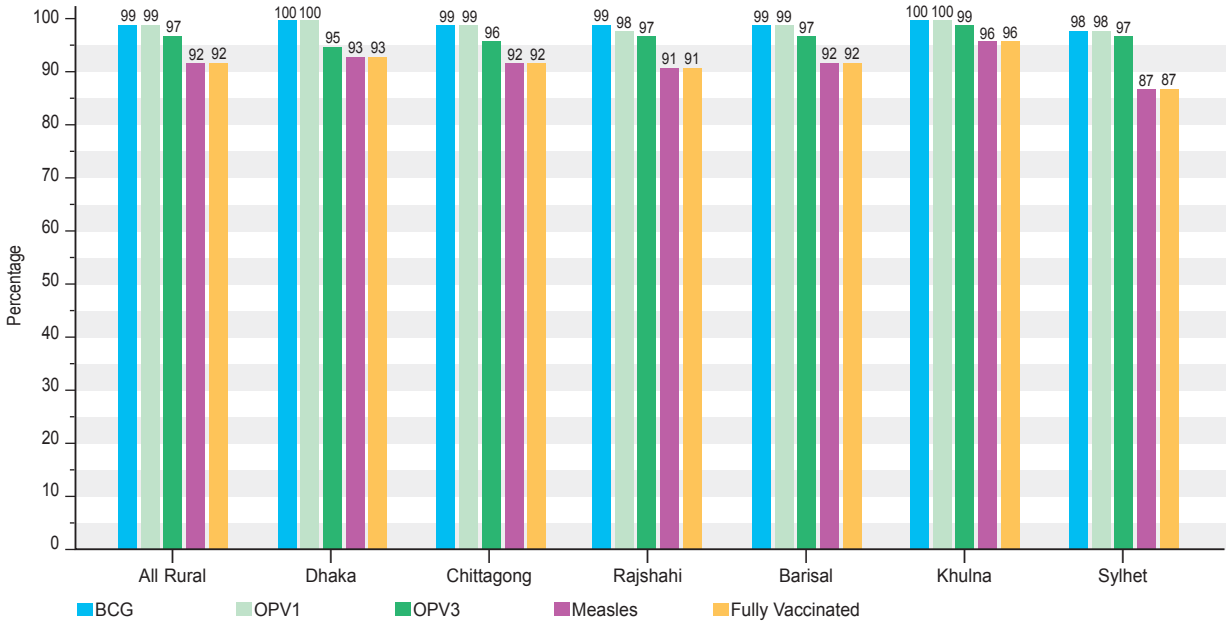
Annual Trend in Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children in Sylhet Division from 1999 to 2007 (Card+History)



** Before 1999, Sylhet division was a part of Chittagong division*
Source: Coverage Evaluation Survey 1999-2002, 2003, 2005, 2006 and 2007

FIGURE A25

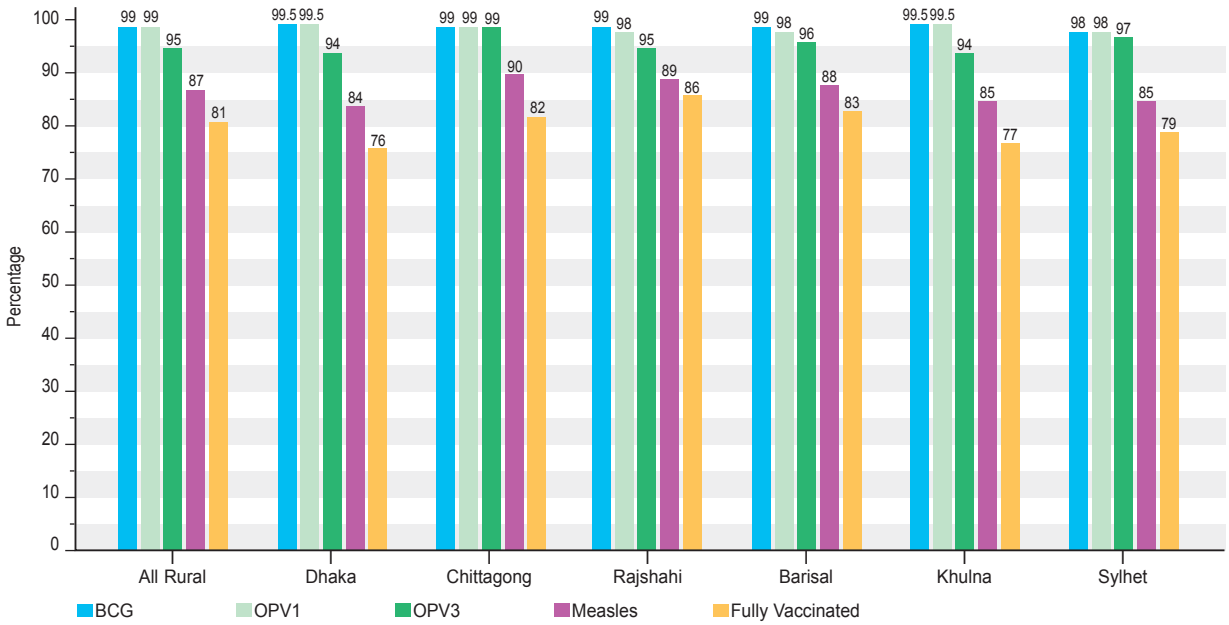
Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Rural Areas by Division in 2007 (Card+History)



Source: CES 2007

FIGURE A26

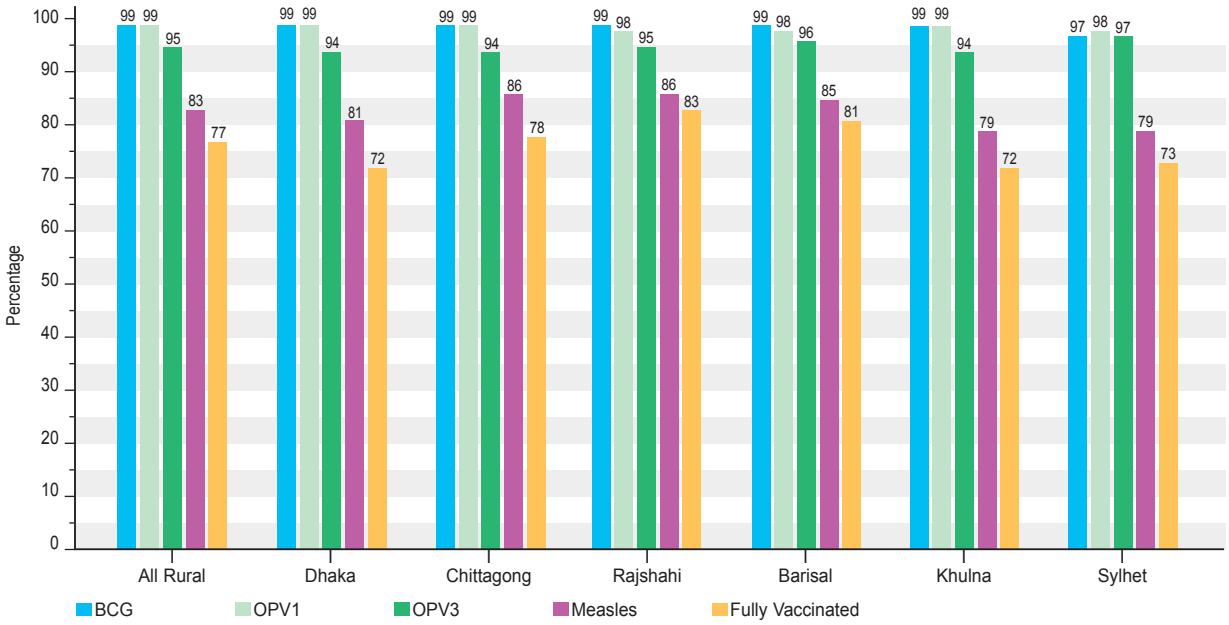
Valid Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Rural Areas by Division in 2007 (Card+History)



Source: CES 2007

FIGURE A27

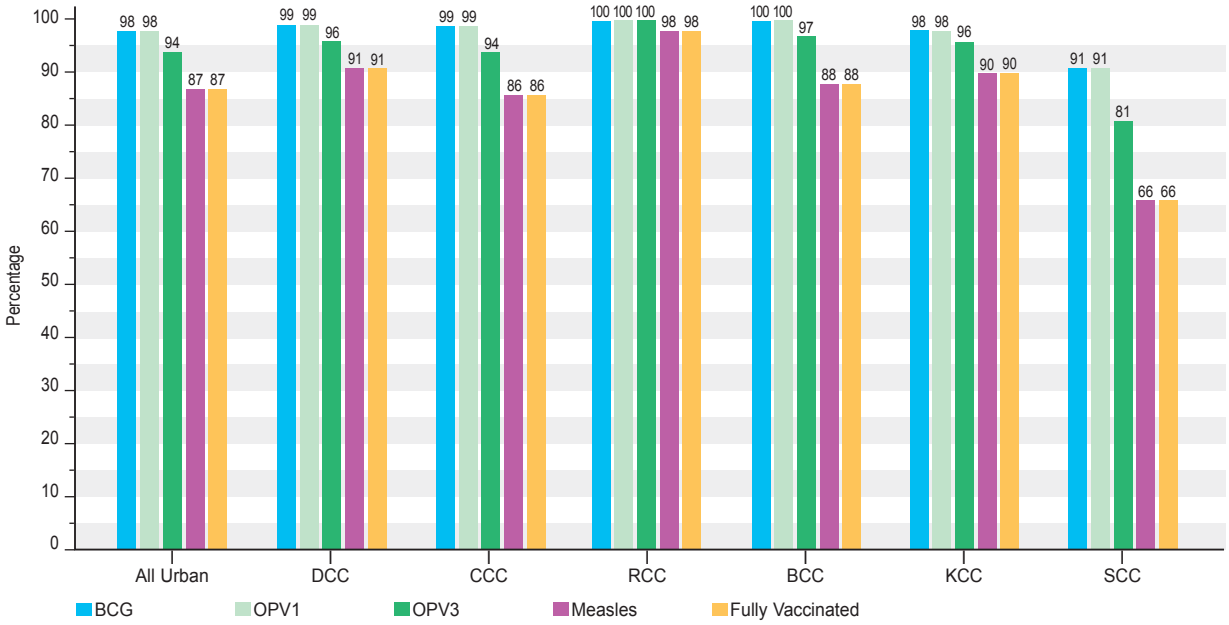
Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children in Rural Areas by Division in 2007 (Card+History)



Source: CES 2007

FIGURE A28

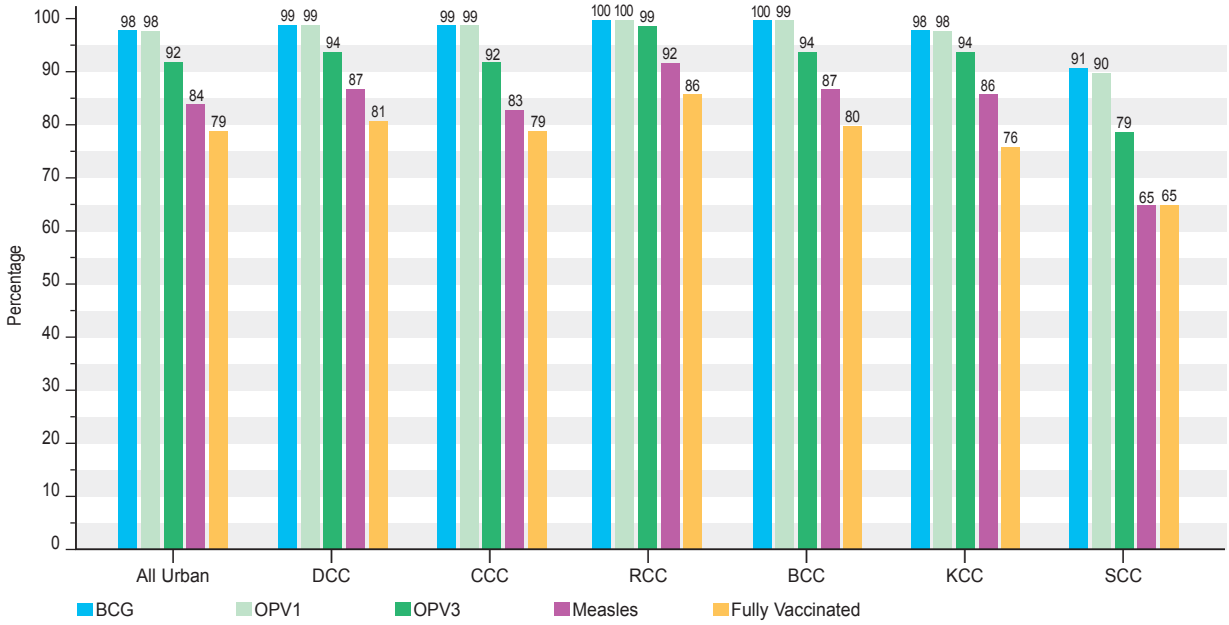
Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Urban Areas by City Corporation in 2007 (Card+History)



Source: CES 2007

FIGURE A29

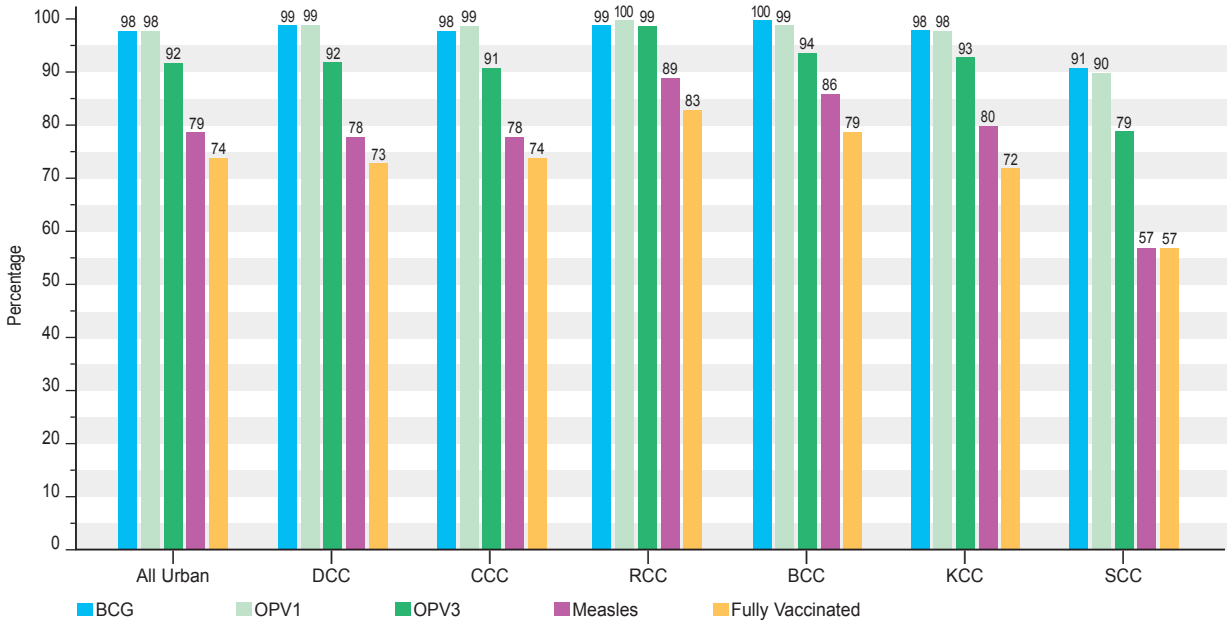
Valid Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Urban Areas by City Corporation in 2007 (Card+History)



Source: CES 2007

FIGURE A30

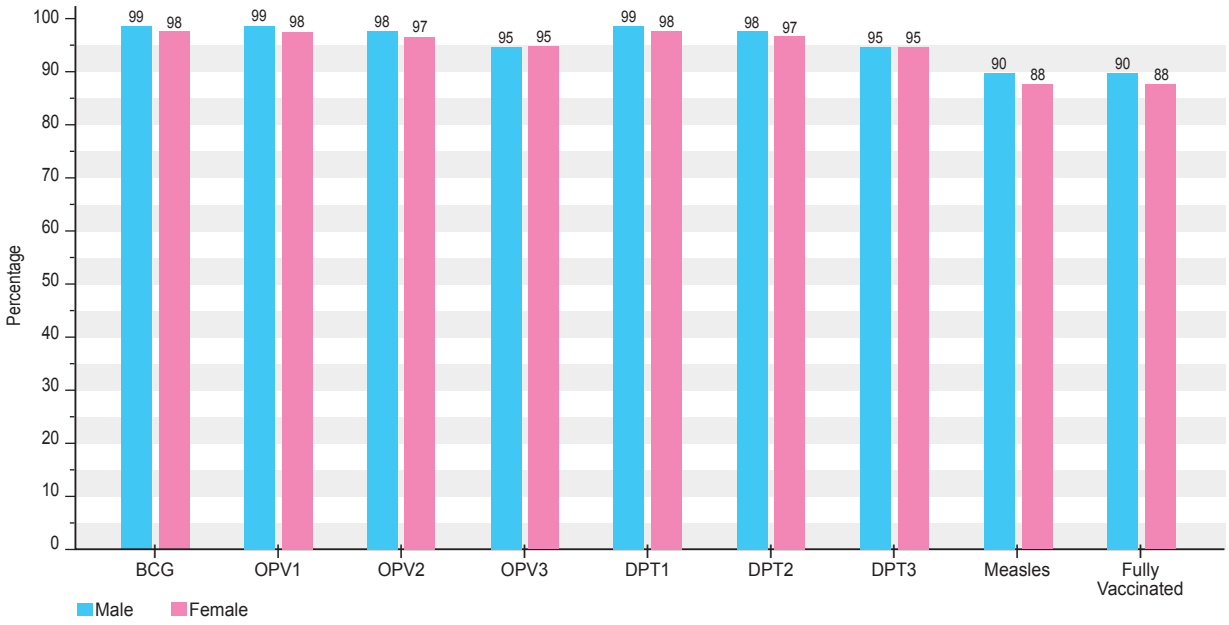
Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children in Urban Areas by City Corporation in 2007 (Card+History)



Source: CES 2007

FIGURE A31

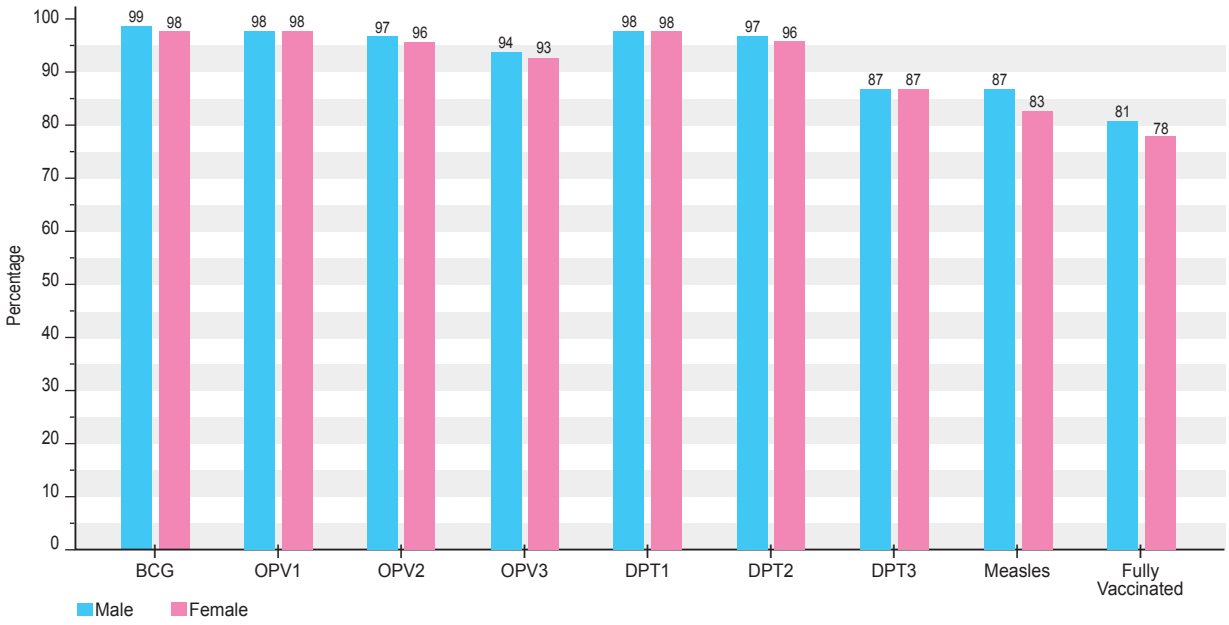
National Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children by Sex in 2007 (Card+History)



Source: CES 2007

FIGURE A32

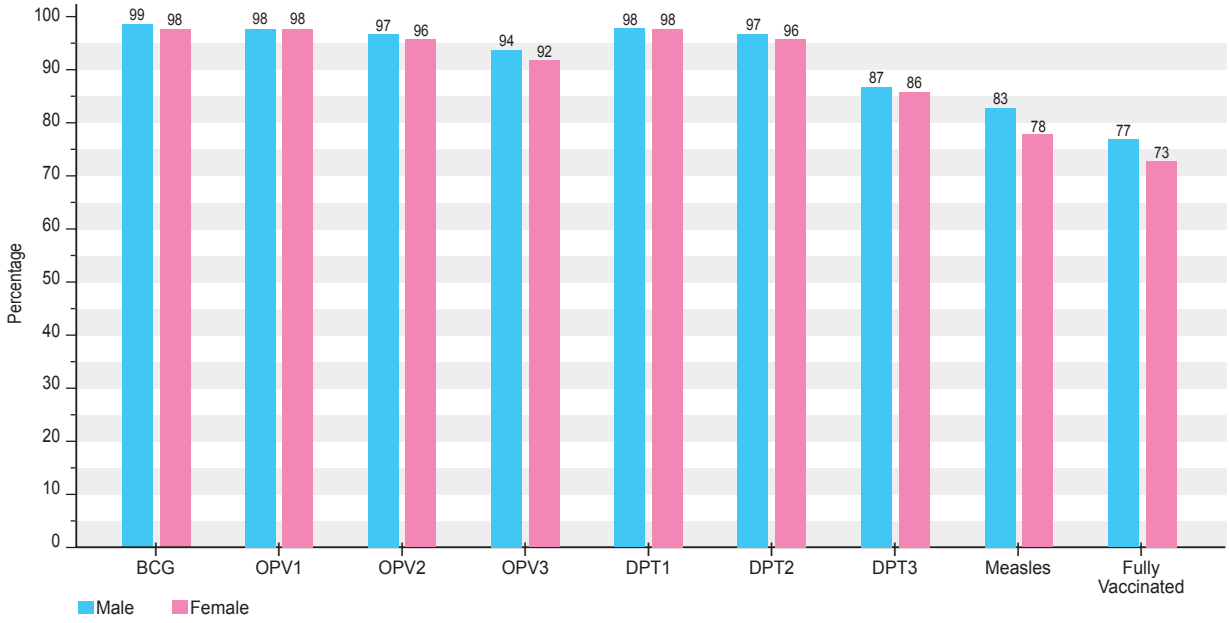
National Valid Vaccination Coverage by Age 23 Months among 12-23 Months Old Children by Sex in 2007 (Card+History)



Source: CES 2007

FIGURE A33

National Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children by Sex in 2007 (Card+History)



Source: CES 2007

2.5 VACCINATION COVERAGE FROM CARD ONLY

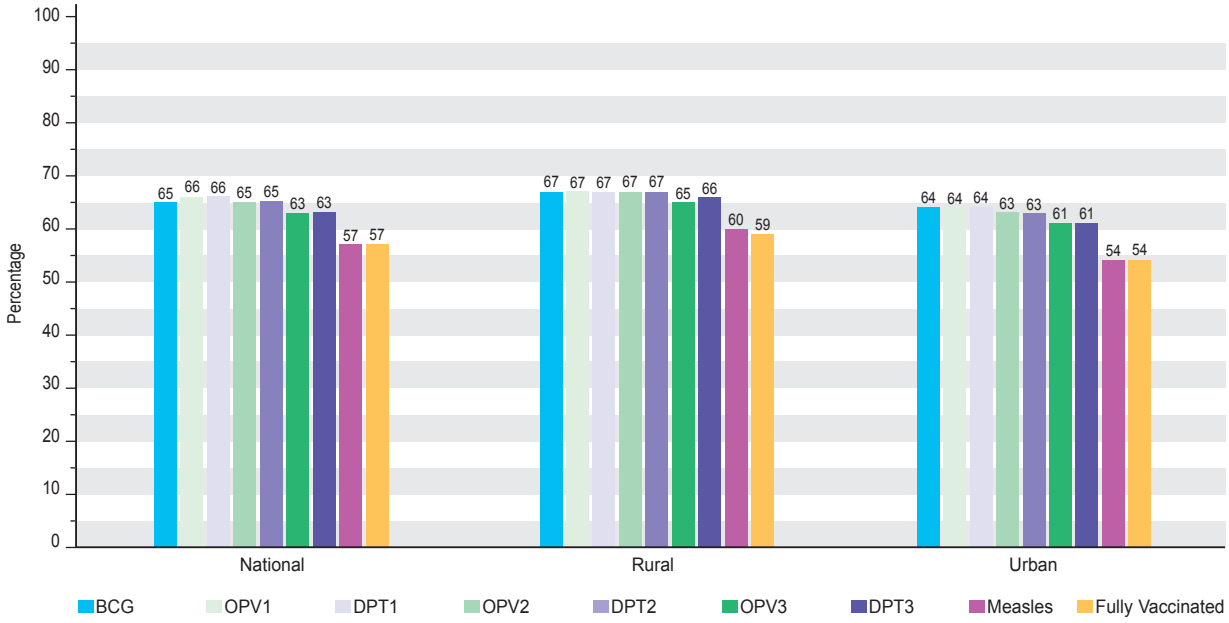
This section presents an analysis of vaccination coverage among children aged 12-23 months based on the information taken from the vaccination cards provided by the mothers/caregivers.

2.5.1 LEVELS OF THE VACCINATION COVERAGE BY THE AGE OF 12 MONTHS

National vaccination coverage by the age of 12 months computed from card-only is displayed in Figure B1-B9. The expected vaccination coverage computed from card-only was found to be consistently lower than from that found from card+history for all the vaccination coverage; crude, coverage by age 23 and by age 12 months. No decline in coverage in card+ history data was observed in rural areas by divisions and urban areas by city corporations.

FIGURE B1

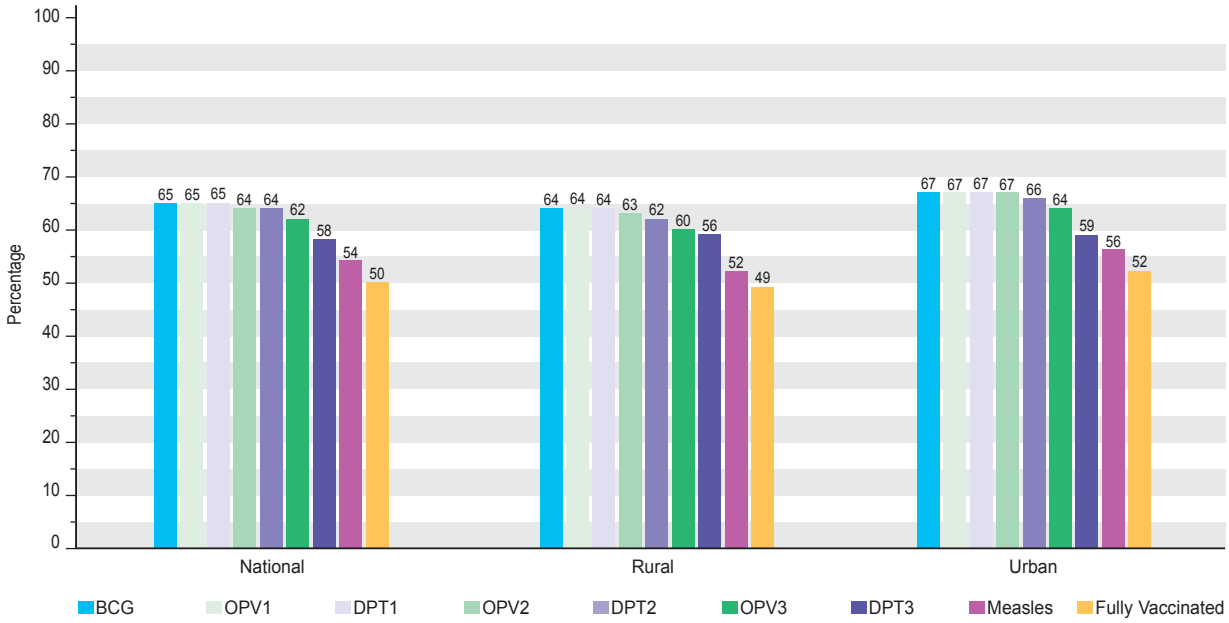
Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children by National, Rural and Urban Areas in 2007 (Card-Only)



Source: CES 2007

FIGURE B2

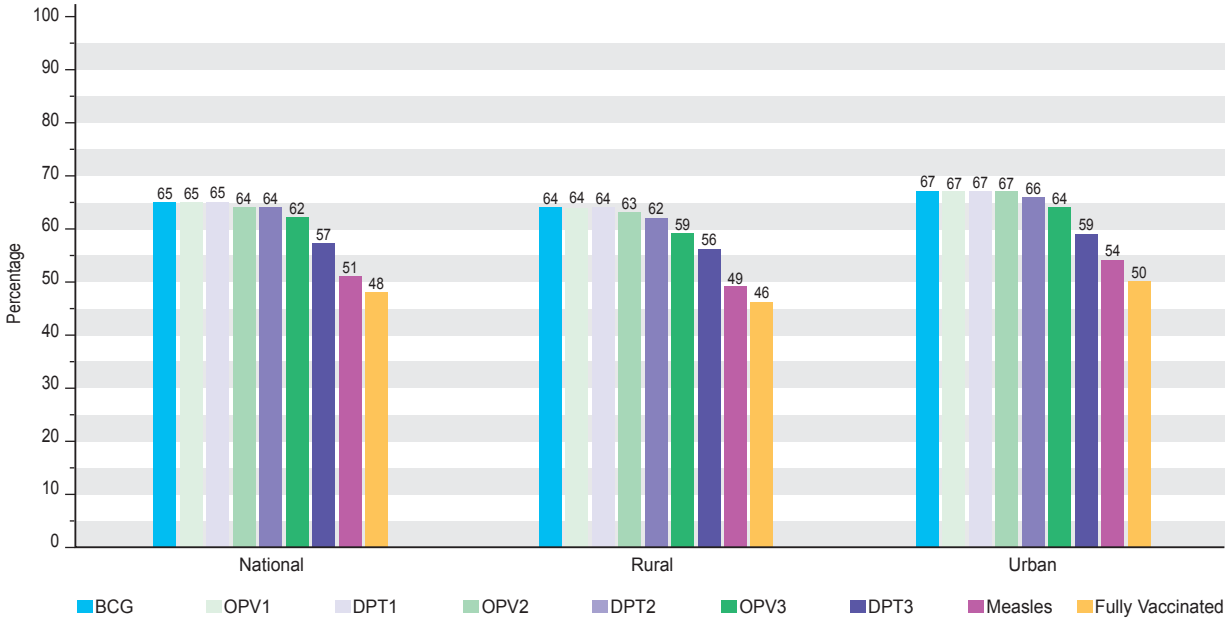
Valid Vaccination Coverage by Age 23 Months among 12-23 Months Old Children by National, Rural and Urban Areas in 2007 (Card-Only)



Source: CES 2007

FIGURE B3

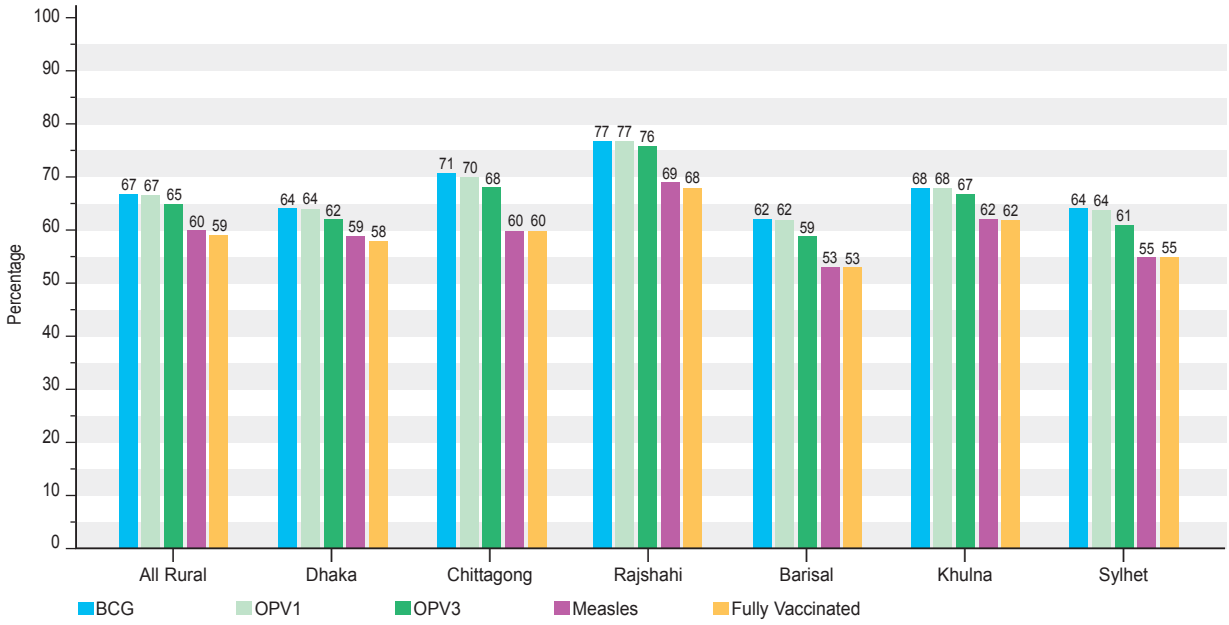
Valid Vccination Coverage by Age 12 Months among 12-23 Months Old Children by National, Rural and Urban Areas in 2007 (Card-Only)



Source: CES 2007

FIGURE B4

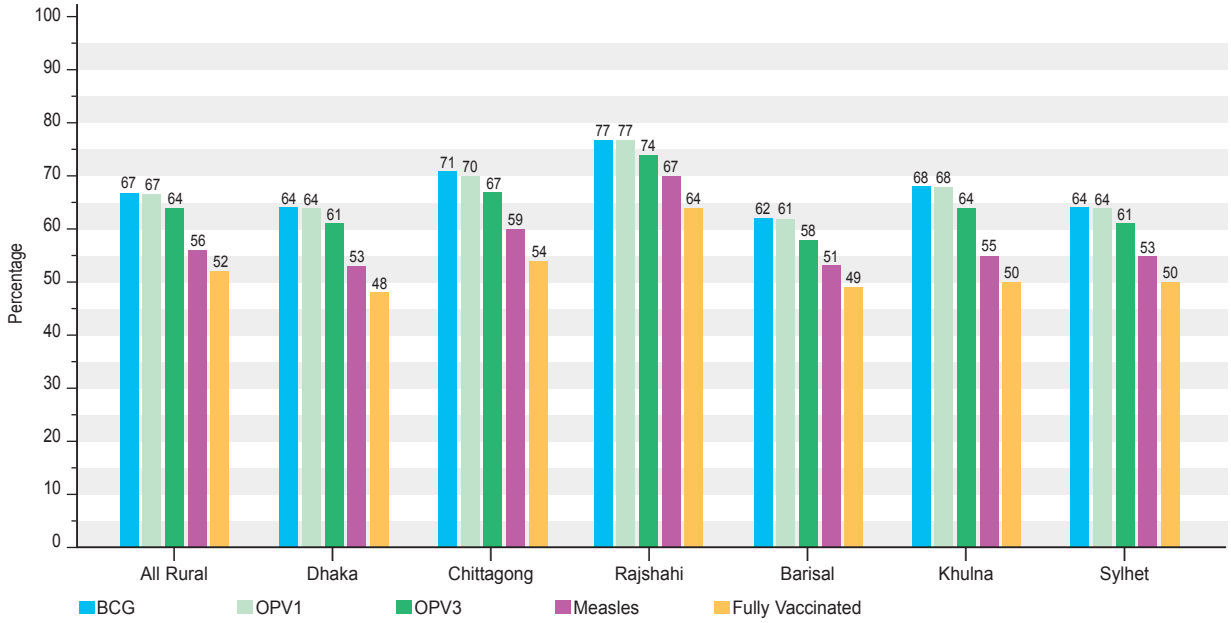
Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Rural Areas by Division in 2007 (Card-Only)



Source: CES 2007

FIGURE B5

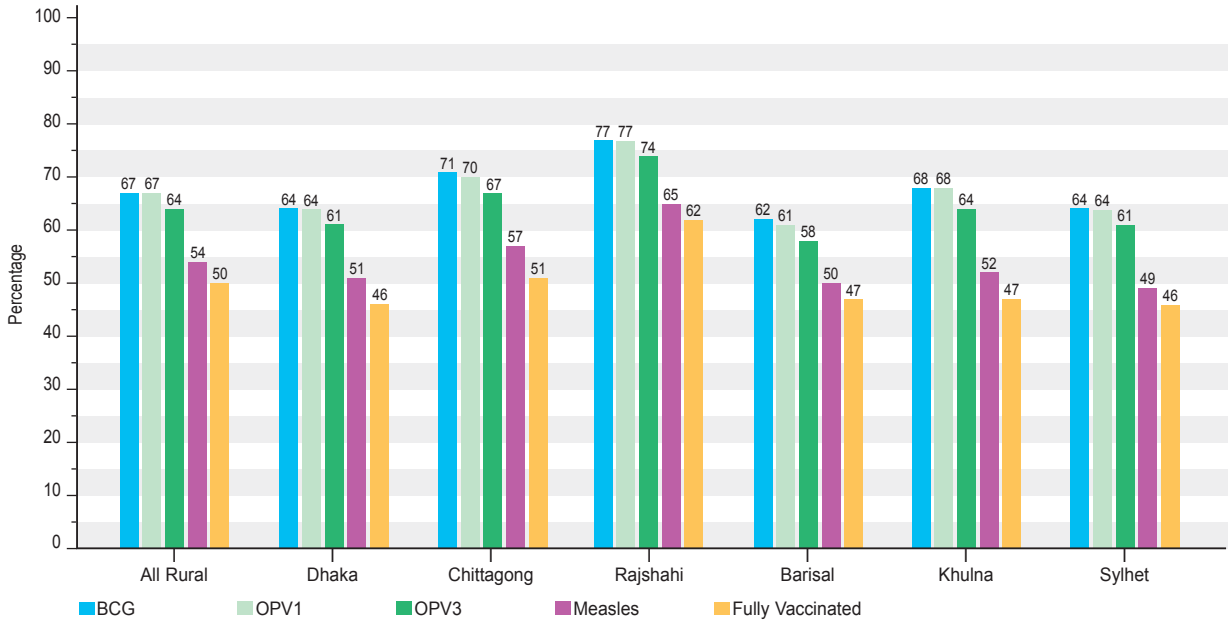
Valid Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Rural Areas by Division in 2007 (Card-Only)



Source: CES 2007

FIGURE B6

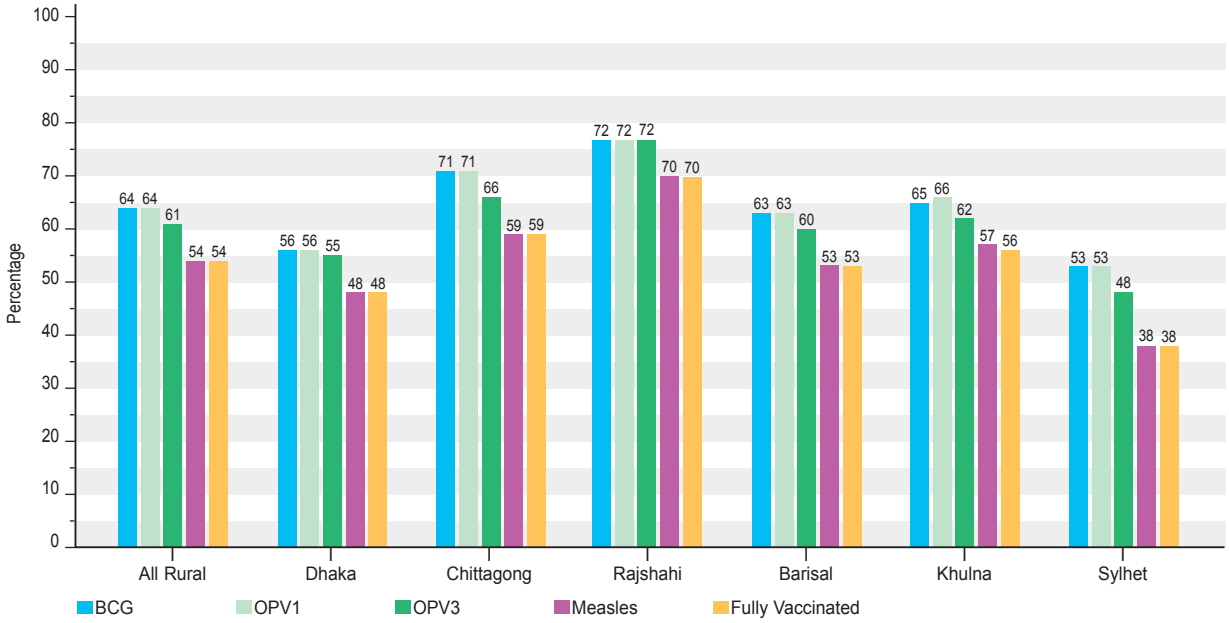
Valid Vaccinaton Coverage by Age 12 Months among 12-23 Months Old Children in Rural Areas by Division in 2007 (Card-Only)



Source: CES 2007

FIGURE B7

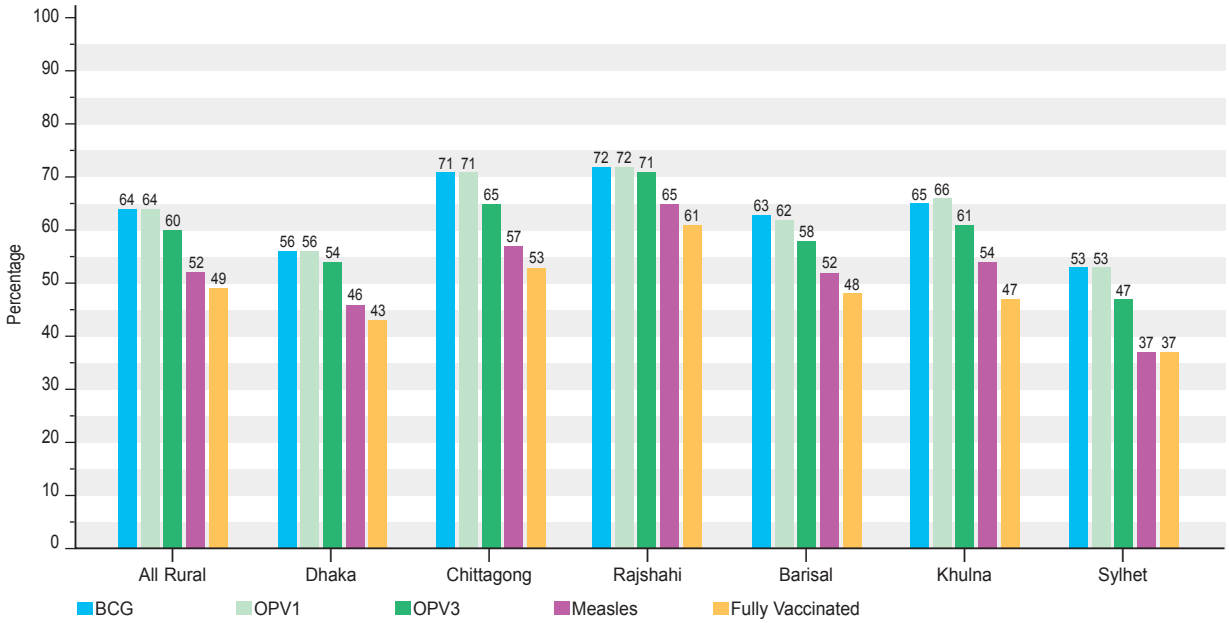
Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Urban Areas by City Corporation in 2007 (Card-Only)



Source: CES 2007

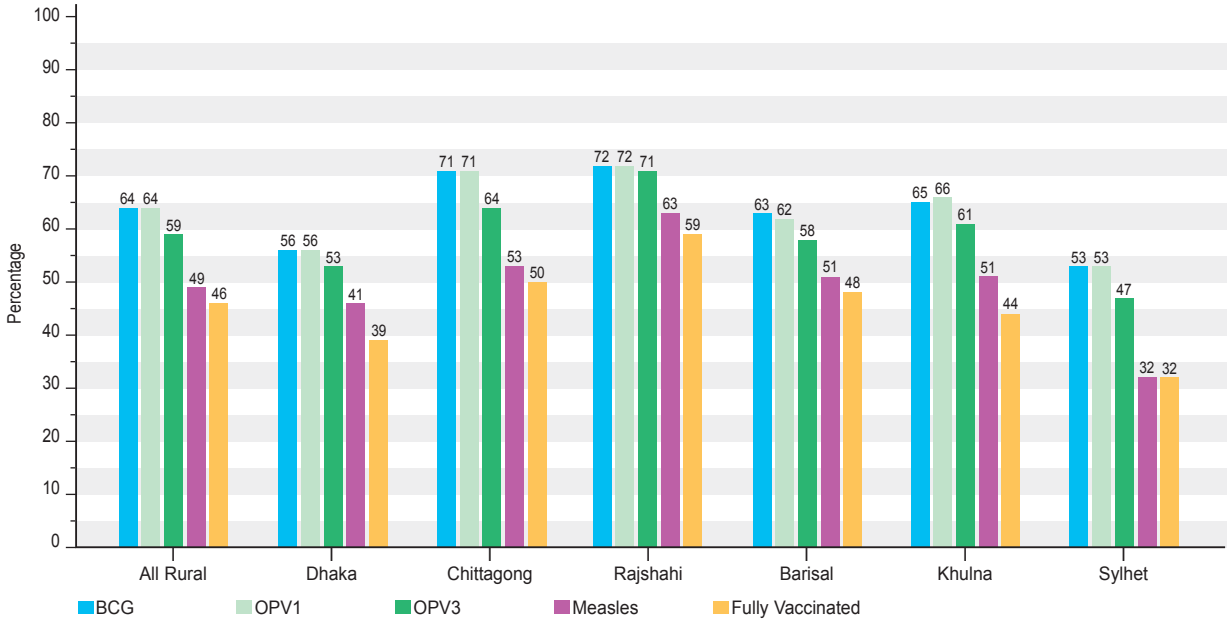
FIGURE B8

Valid Vaccination Coverage by Age 23 Months among 12-23 Months Old Children in Urban Areas by City Corporation in 2007 (Card-Only)



Source: CES 2007

FIGURE B9
Valid Vaccination Coverage by Age 12 months among 12-23 Months Old Children in Urban Areas by City Corporation in 2007 (Card-Only)



Source: CES 2007

2.6 PROGRAMME QUALITY

The quality of the EPI services was assessed through the analysis of major indicators - such as, vaccination card retention rates, incidences of invalid doses, vaccination dropout rates, and occurrences of post-vaccination abscesses.

2.6.1 RETENTION OF VACCINATION CARDS

In overall Bangladesh, it is found that 68 percent of the surveyed children retain the vaccination card. Retention rate is higher in rural areas (71 percent) compared to that in urban areas (66 percent) (Figure C1). The current card retention rate was found 1percentage point higher than the last year, i.e. 67 percent in CES 2006.

In rural areas by division, the card retention rate was the highest in Rajshahi (79 percent) and the lowest in Barisal divisions (64 percent). The retention rate ranged from 69 to 73 percents in other four divisions, such as, Dhaka (69 percent), Chittagong (73 percent) Khulna (69 percent), and Sylhet (71 percent) (Figure C3).

Figure C4 shows card retention rate found in the city corporation areas. The card retention rate was the highest in CCC (73 percent) and the lowest in DCC (59 percent). Card retention rate in RCC was found 72 percent, which was being followed by KCC (67 percent), BCC (64 percent), and SCC (60 percent).

2.6.2 INCIDENCE OF INVALID DOSES

An "invalid" dose of an vaccine is a dose administered before the recommended age and/or interval. A DPT1/OPV1/Hepatitis B1 dose administered before the age of six weeks, or a DPT2/Hepatitis B2 dose administered before four weeks of DPT1/Hepatitis B1 vaccination, and a measles dose administered before the age of 270 days are termed as "invalid".

Nationally, 6 percent of the total DPT1 doses and 5 percent of the total measles doses administered to the children surveyed were found invalid (Figure C5). There were a little variation in the proportions of invalid DPT1 and measles doses administered between the urban and rural areas (DPT1 7 percent in the rural and 6 percent in the urban areas; measles 6 percent in the rural areas as against 4 percent in the urban areas). Overall, 6 percent DPT1 dose was found to be invalid nationally, with a little variation between the rural (7 percent) and urban areas (6 percent) (Figure C6).

Figure C7 shows the incidence of invalid DPT1, DPT2, and DPT3 in rural areas by division. Incidents of invalid DPT1 dose were the highest in Khulna (13 percent) and the lowest in Sylhet divisions (3 percent). Incidents of invalid DPT1 dose in Dhaka division was 9 percent, which was being followed by Chittagong (6 percent) and Rajshahi divisions (4 percent).

Invalid rate of DPT2 was the highest in Khulna division (14 percent), which was being followed by Dhaka (13 percent), Chittagong (8 percent), Sylhet (6 percent), Barisal (5 percent), and Rajshahi divisions (4 percent).

Incidents of invalid rate of all DPT doses was found the highest in Khulna division (41 percent). The second highest invalid doses of all DPT was in Dhaka division (37 percent), which was being followed by Chittagong (24 percent), Barisal (16 percent), Sylhet (15 percent), and Rajshahi divisions (15 percent). Overall, 25 percent of all DPT doses found invalid in rural Bangladesh nationally (Figure C8).

In the city corporations, 10 percent of the DPT1 doses administered were found to be invalid in BCC, which was being followed by 7 percent in KCC, 7 percent in RCC, 5 percent in CCC, 4 percent in DCC. The lowest - 3 percent - was in SCC. Overall, invalid doses of all DPT revealed the highest in KCC (32 percent) and the lowest in SCC (9 percent). The second highest incidence of invalid doses of all DPT was found in BCC (29 percent). Incidents of invalid doses in other city corporations was 23 percent in RCC, 20 percent in DCC, and 18 percent in CCC respectively (Figure C10).

In rural areas by division, incidents of invalid measles dose was the highest in Khulna division (9 percent). Incidence rate of invalid measles was similar in Chittagong, Rajshahi and Dhaka divisions (7 percent). The rate of invalid dose of measles in Barisal division was close to that in the Sylhet division (3 percents both respectively) (Figure C7).

Likewise, among the city corporations' invalid dose of measles was found to be the highest in RCC (6 percent), which was being followed by KCC (5 percent), DCC (4 percent), CCC (3 percent), and SCC (3 percent). The lowest rate of invalid dose of measles was in BCC (2 percent) (Figure C9).

2.6.3 VACCINATION DROPOUT RATES

Vaccination dropout rates, being defined as "dropout rates for DPT1-DPT3, give the proportion of the children receiving DPT1 who fail to receive DPT3. Thus, the dropout rate for DPT1- measles gives the proportion of the children receiving DPT1, who fail to receive the measles vaccine".

Nationally, the dropout rate for DPT1-DPT3 was 3 percent and for DPT1-measles 9 percent (Figure C11). Urban-rural variations were more pronounced for the dropout rate of DPT1-measles than DPT1-DPT3. In urban areas, DPT1-measles dropout rate was 9 percent compared to 7 percent in rural areas. Likewise, DPT1-DPT2 dropout rate was 4 percent in urban areas as against 2 percent in rural areas.

Over the time, national dropout rates declined substantially, particularly since 2003. The dropout rate for DPT1-DPT3 declined from 21 percent in 2003 to 3 percent in 2007, and DPT1-measles from 13 percent in 2003 to 9 percent in 2007 (Figure C12).

In the rural areas by division, DPT1-DPT3 dropout rate was the highest in Dhaka division (4.3 percent), which was being followed by Chittagong (2.6 percent), Barisal (2.1 percent), Sylhet (1.5 percent), and Rajshahi divisions (1.2 percent). The DPT1-DPT3 dropout rates were the lowest in Khulna division (1 percent). However, DPT-measles dropout rate was the highest in Sylhet (11 percent) and the lowest was in Khulna divisions (4 percent). The dropout rate of other divisions ranged from 7 percent to 8 percent (Figure C13).

In city corporations, the dropout rate for DPT1-DPT3 was the highest in SCC (11.0 percent), which was being followed by CCC (5.3 percent), BCC (3 percent), DCC (3 percent), and KCC (2 percent) while that for DPT1-Measles was the highest in SCC (27 percent), which was being followed by CCC (13 percent), BCC (12 percent), DCC (8 percent), and KCC (7.8 percent). Much improvement in the dropout rate of DPT1-DPT3 was observed in RCC. There was no dropout in DPT1-DPT3 doses in Rajshahi City Corporation.

Figure C15- Figure C16 shows the trend in dropout rate since 1993. A gradual declining dropout trend was observed throughout the period. A considerable decline in the dropout rate was noticed in almost every division since 2002. In Dhaka division, the dropout rate for DPT1-DPT3 went down from 10 percent in 2002 to 3 percent in 2007; in Chittagong division from 10 percent to 4 percent; in Sylhet division from 22 percent to 6 percent; in Rajshahi division from 12 percent to 1 percent; in Khulna division from 5 percent to 1 percent; and in, Barisal division from 9 percent to 3 percent. Likewise, for DPT1-measles, Dhaka division experienced a decrease in the dropout rate from 19 percent in 2002 to 7 percent in 2007; Chittagong division from 17 percent to 10 percent; Rajshahi division from 19.6 percent to 5 percent; Sylhet divisions from 30 percent to 19 percent; Khulna division from 12 percent to 6 percent; and, Barisal division from 21 percent to 9 percent (Figures C15 -C20).

Although there was a declining trend in the dropout rate for both DPT-DPT3 and DPT-measles in all divisions, a noticeable improvement was observed in Rajshahi division. In Rajshahi division, the drop out rate DPT1-DPT3 stands at 1 percent and DPT-measles was 4.8 percent) (Figure C15-Figure C20). The declining trend in the dropout rate may be attributed to the act of better monitoring and supervision by the EPI staff at all levels.

2.6.4 INCIDENCE OF POST-VACCINATION ABSCESSES

The incidence of abscesses following DPT or measles vaccination was calculated in order to assess the safety of injections for childhood vaccination. This rate was computed as the proportion of the recipients of DPT/Hepatitis B/measles vaccine, who had an abscess after receiving any of these vaccines.

Nationally, 6 percent of the children who received DPT/Hepatitis-B/measles vaccines were reported to have had an abscess after receiving a DPT dose or the measles vaccine (Figure C21). The occurrence

of abscesses following DPT, Hepatitis-B, or measles vaccination was almost similar in both urban and rural areas (6 percent in urban and 5 percent in rural areas).

In the rural areas by division, Khulna had the highest incidence of abscesses 16 percent, which was followed by Barisal (6 percent), Dhaka (6 percent), Rajshahi (3 percent), and Sylhet divisions (1 percent) (Figure C22).

In the city corporations, the incidence of abscesses was unusually high: 25 percent in KCC, which was followed by SCC (5 percent), RCC and CCC (2 percent), BCC (1 percent) and DCC (1 percent) (Figure C23).

2.6.5 KNOWLEDGE ABOUT COMMON SIDE-EFFECTS OF VACCINATION

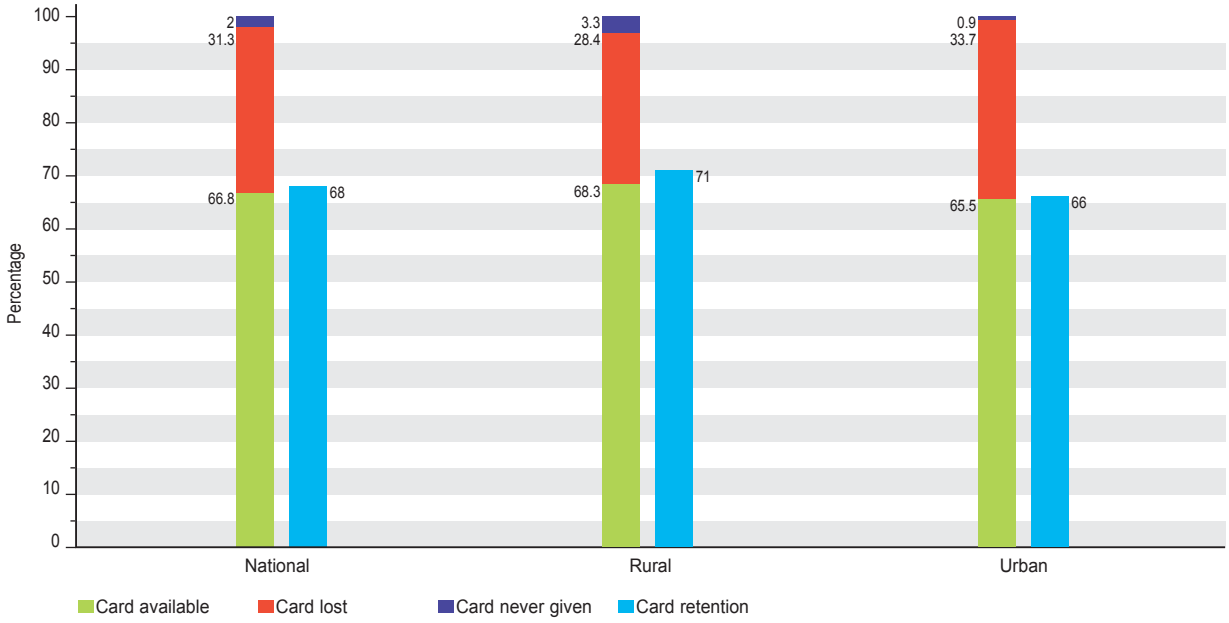
Many children experience minor side effects following immunization. Most of the side effects last a short time and the child recovers without any problem. A child needs comforting if side effects occur. EPI CES 2007 examine the knowledge level of adverse side effects of vaccination. Eighty-six percent of the mothers/caregivers reported fever as the common side effect of vaccination. A very small proportion (4 percent) of mothers/ caregivers mentioned about abscess and pain (Figure C24).However, very negligible percentage of the mothers (1 percent) two side effects (pain and fever) after vaccination. Similar response was noticed both in urban and rural areas.

In rural areas by division, fever was revealed as the highest common reported side effect in all divisions. The percentage ranged from 65 percent in Rajshahi division to 98 percent in Sylhet division. The range for other divisions was found in the intermediary level (Figure C25).

Likewise, Figure C26 shows fever was the highest reported common side effect. More than ninety percent of the mothers/caregivers of RCC and BCC (94 percent), 93 percent of DCC, 91 percent of SCC reported fever as the common side effect. Almost three-fourths of the mothers/caregivers mentioned fever in KCC and CCC.

FIGURE C1

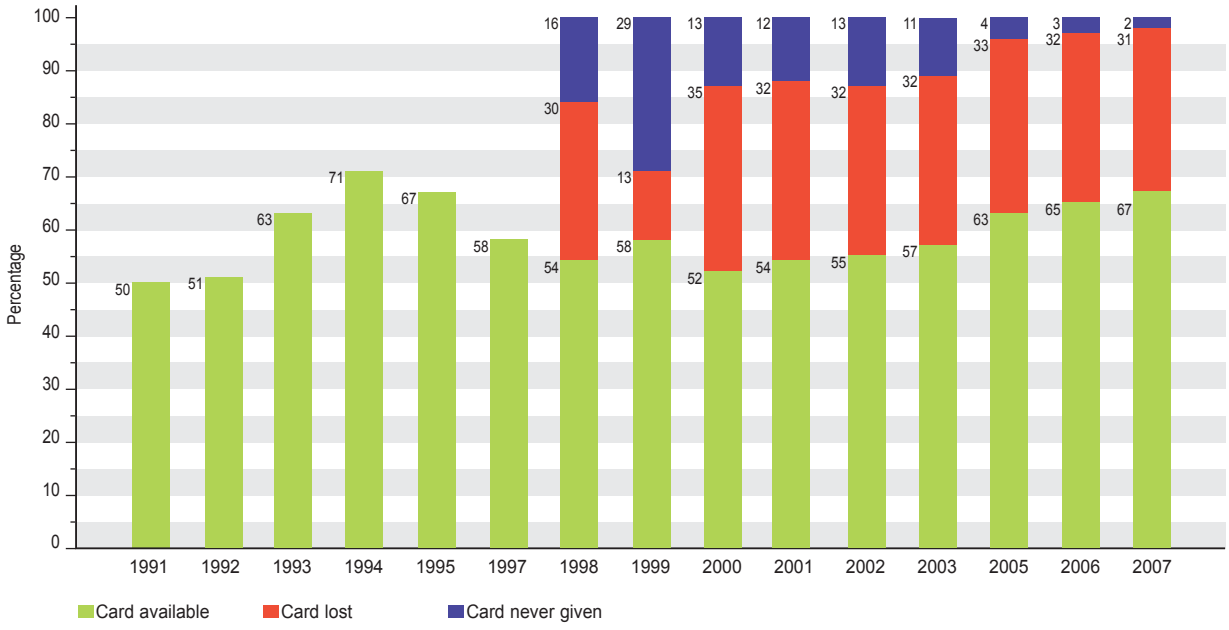
Vaccination Card Status among 12-23 Months Old Children By National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE C2

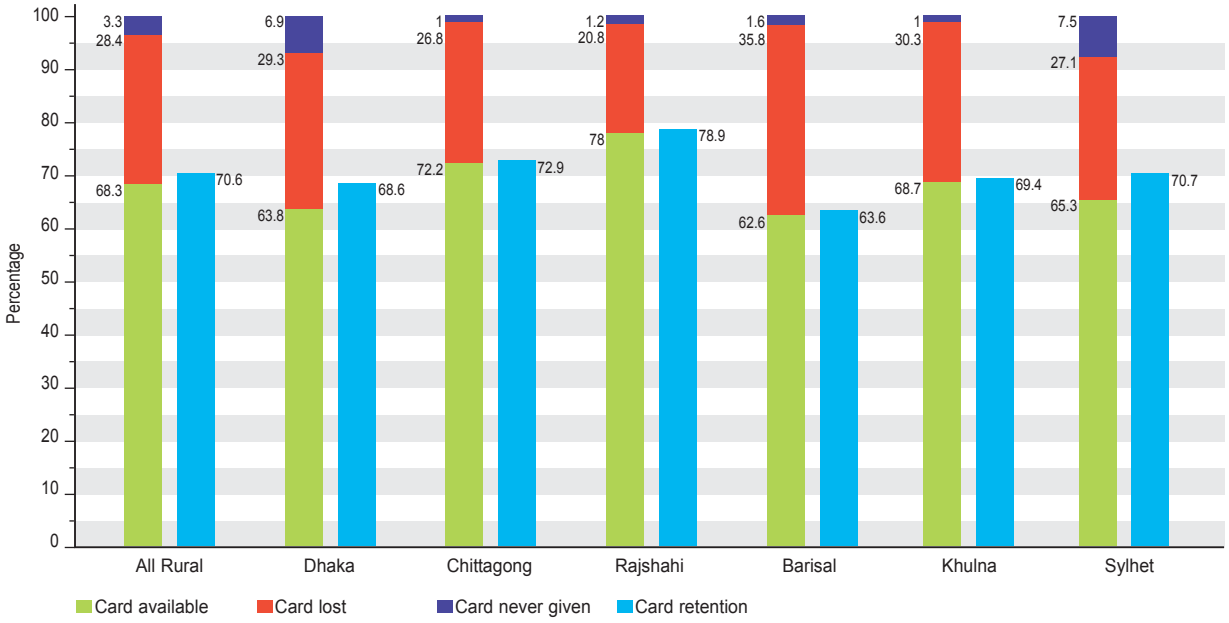
Vaccination Card Status among 12-23 Months Old Children Nationally from 1991 to 2007



Source: Coverage Evaluation Surveys (CESs) for 1991-1995, 1997-2000, 2001, 2002, 2003, 2005, 2006 & 2007

FIGURE C3

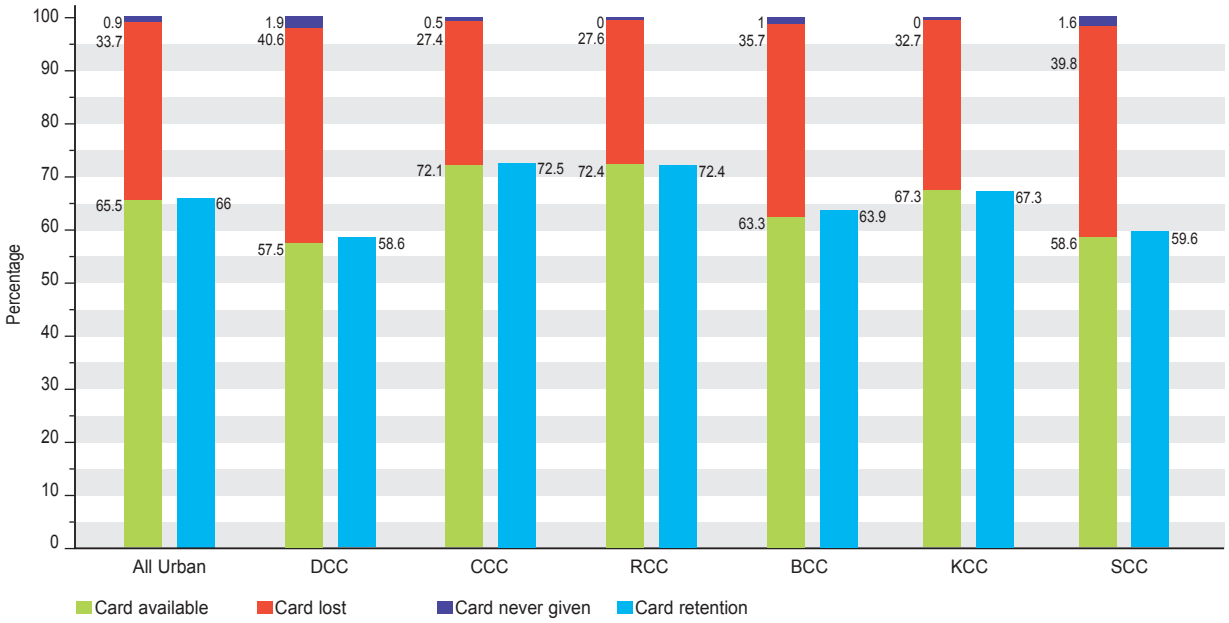
Vaccination Card Status among 12-23 Months Old Children In Rural Areas by Division in 2007



Source: CES 2007

FIGURE C4

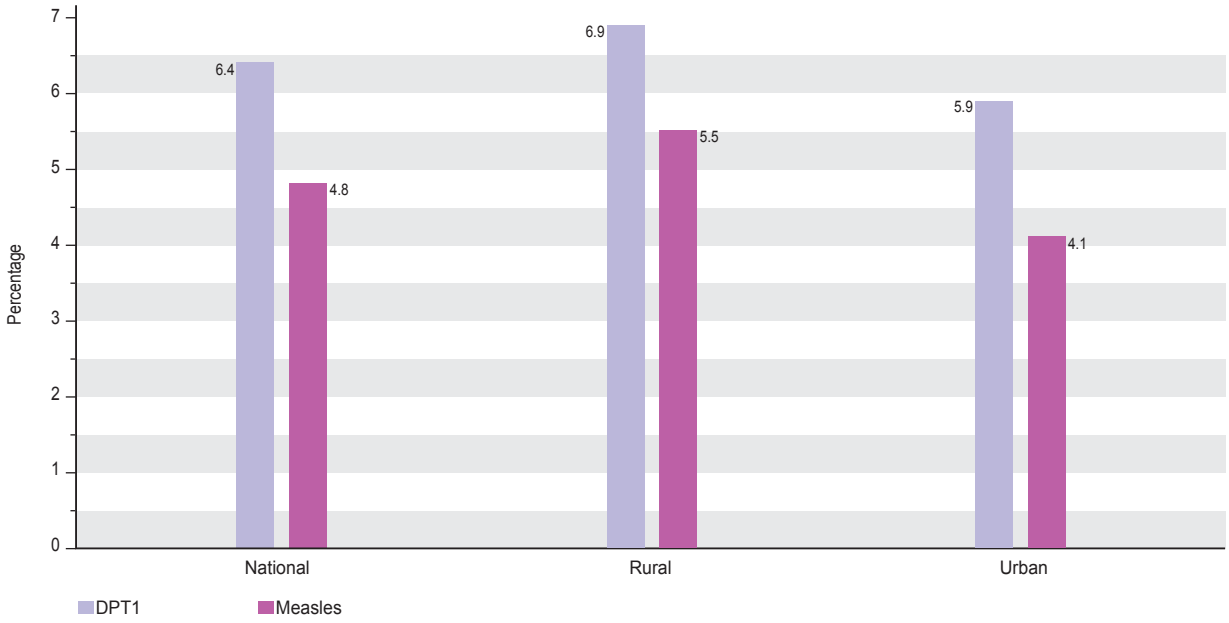
Vaccination Card Status among 12-23 Months Old Children In Urban Areas by City Corporation in 2007



Source: CES 2007

FIGURE C5

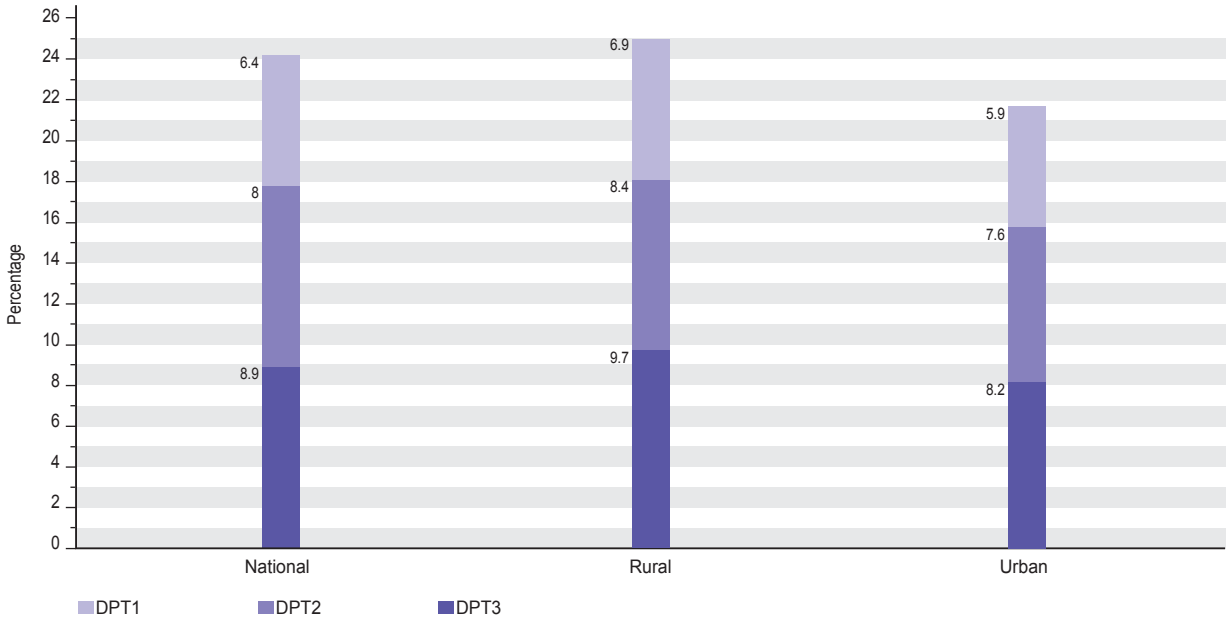
Incidence of Invalid DPT1 and Measles Doses by Age 12 Months among 12-23 Months Old Children by National, Rural and Urban Areas in 2007 (Card-Only)



Source: CES 2007

FIGURE C6

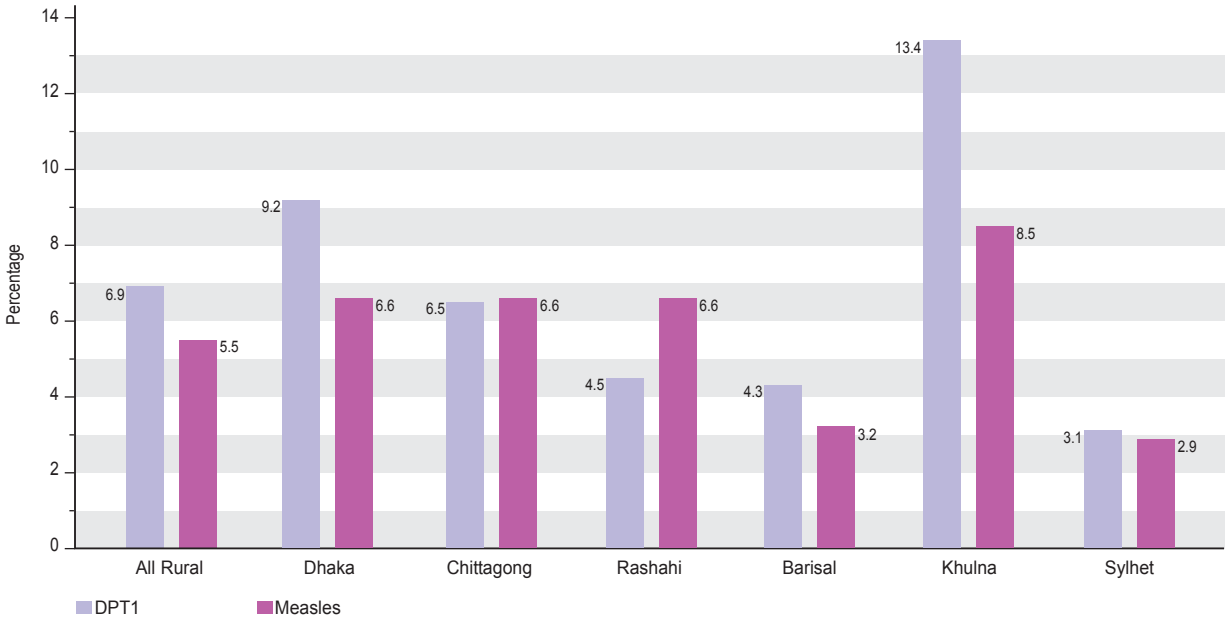
Incidence of Invalid DPT1, DPT2 and DPT3 Doses by Age 12 Months among 12-23 Months Old Children by National, Rural and Urban Areas in 2007 (Card-Only)



Source: CES 2007

FIGURE C7

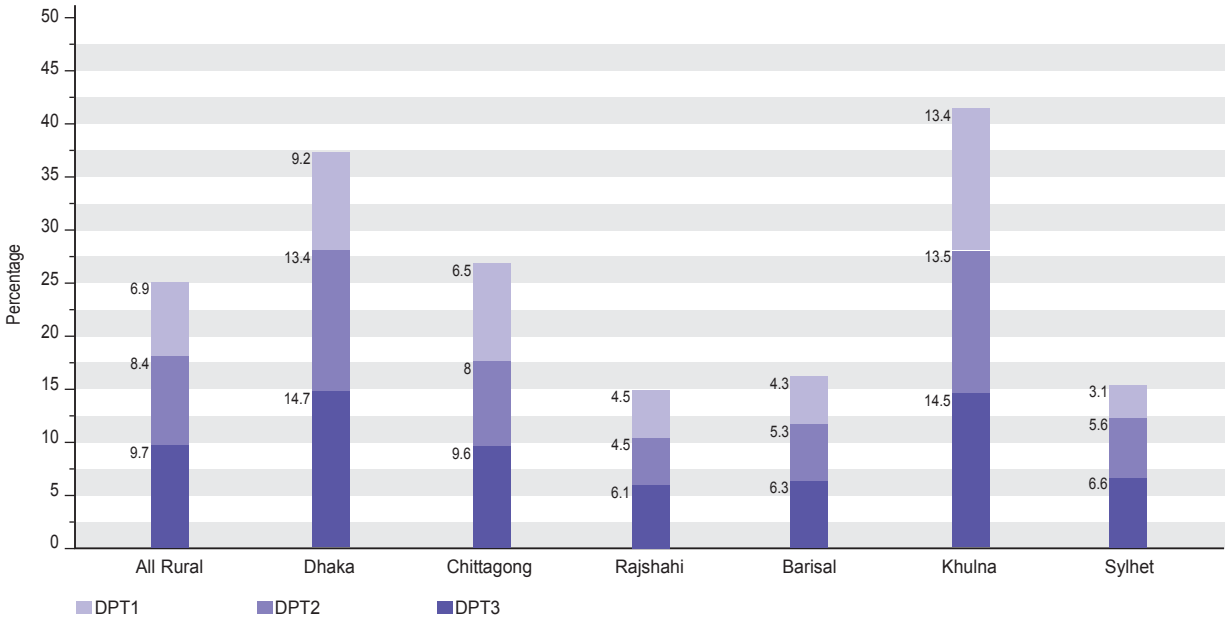
Incidence of Invalid DPT1 and Measles Doses by Age 12 Months among 12-23 Months Old Children in Rural Areas by Division in 2007 (Card-Only)



Source: CES 2007

FIGURE C8

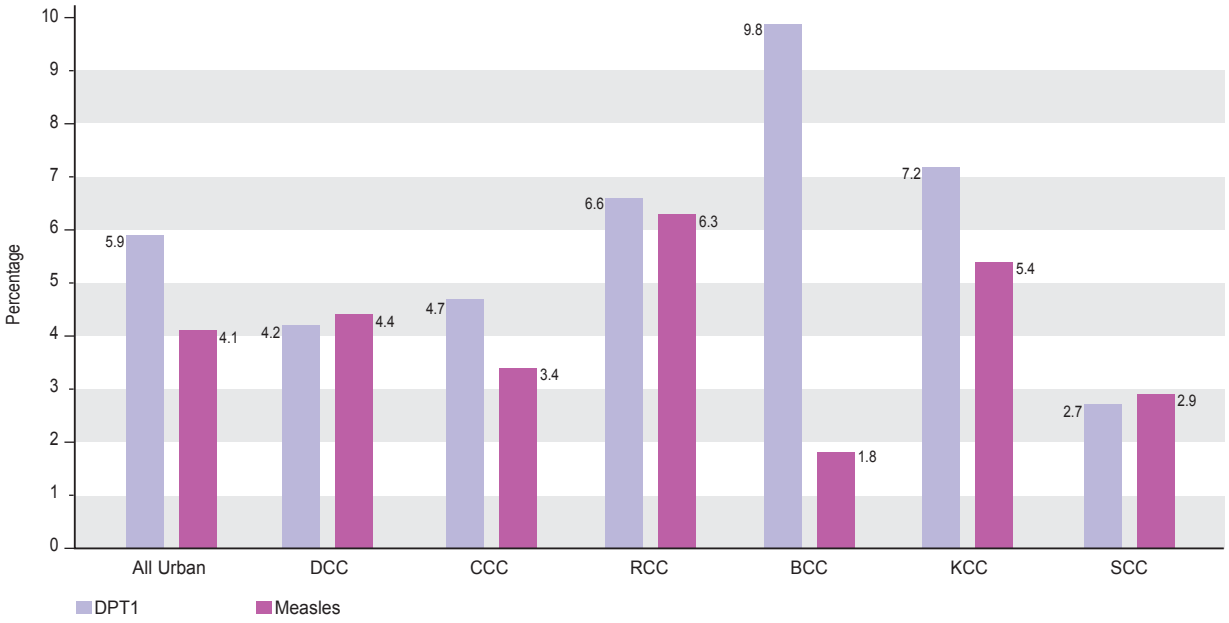
Incidence of Invalid DPT1, DPT2 and DPT3 Doses by Age 12 Months among 12-23 Months Old Children in Rural Areas by Division in 2007 (Card-Only)



Source: CES 2007

FIGURE C9

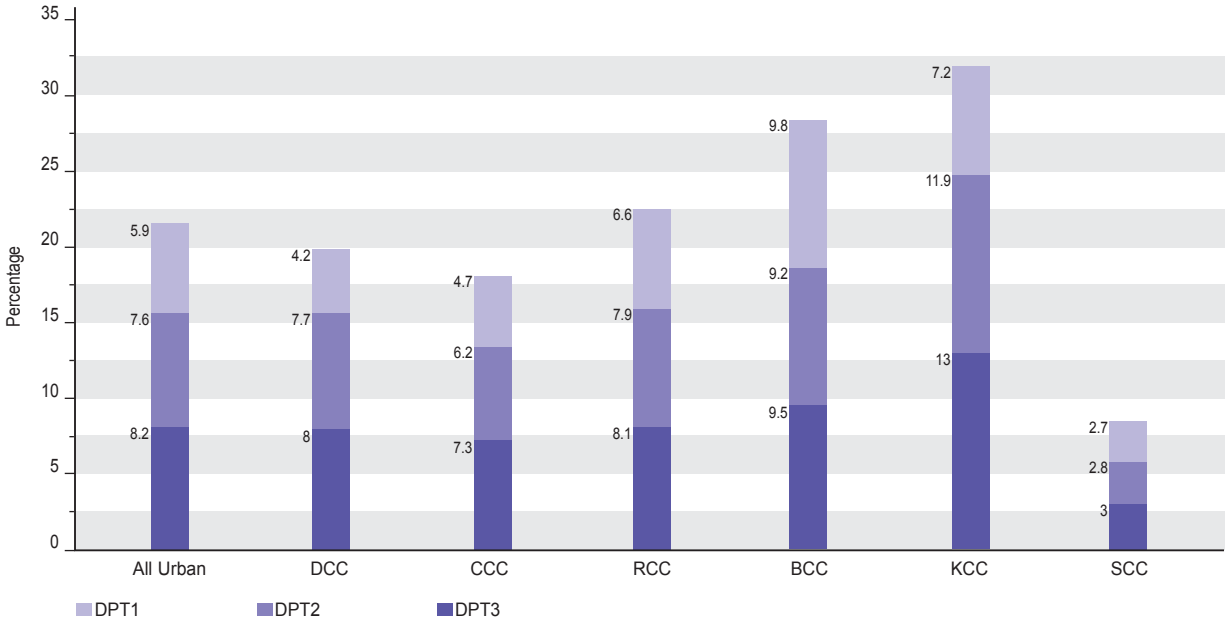
Incidence of Invalid DPT1 and Measles Doses by Age 12 Months among 12-23 Months Old Children in Urban Areas by City Corporation in 2007 (Card - Only)



Source: CES 2007

FIGURE C10

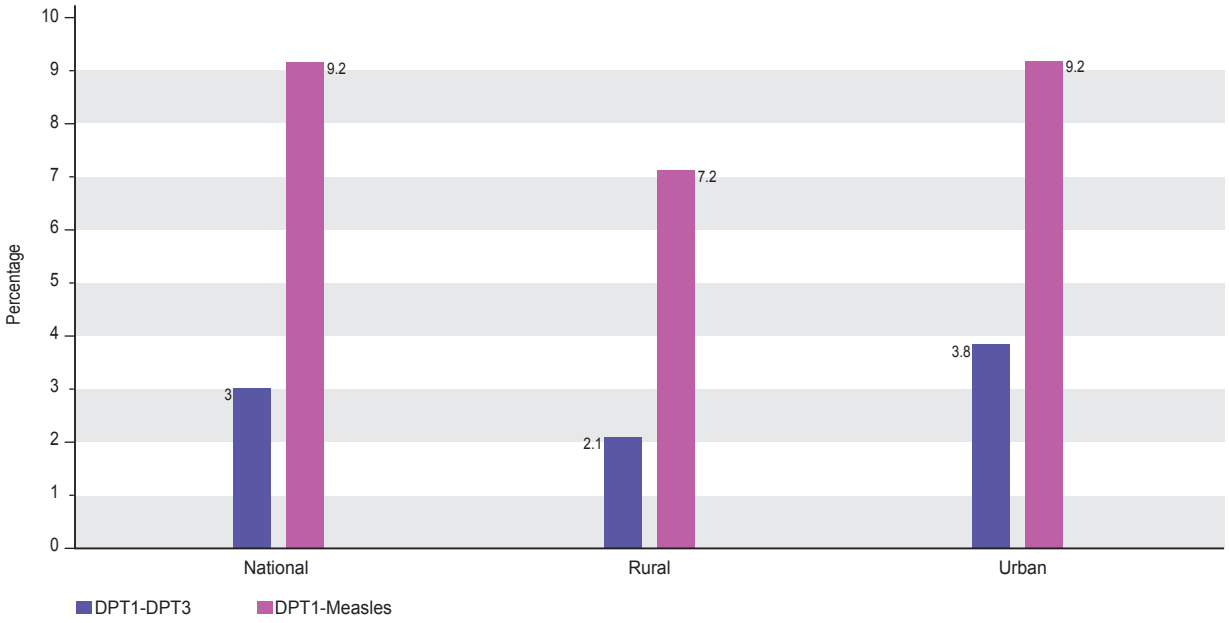
Incidence of Invalid DPT1, DPT2 and DPT3 Doses by Age 12 Months among 12-23 Months Old Children in Urban Areas by City Corporation in 2007 (Card - Only)



Source: CES 2007

FIGURE C11

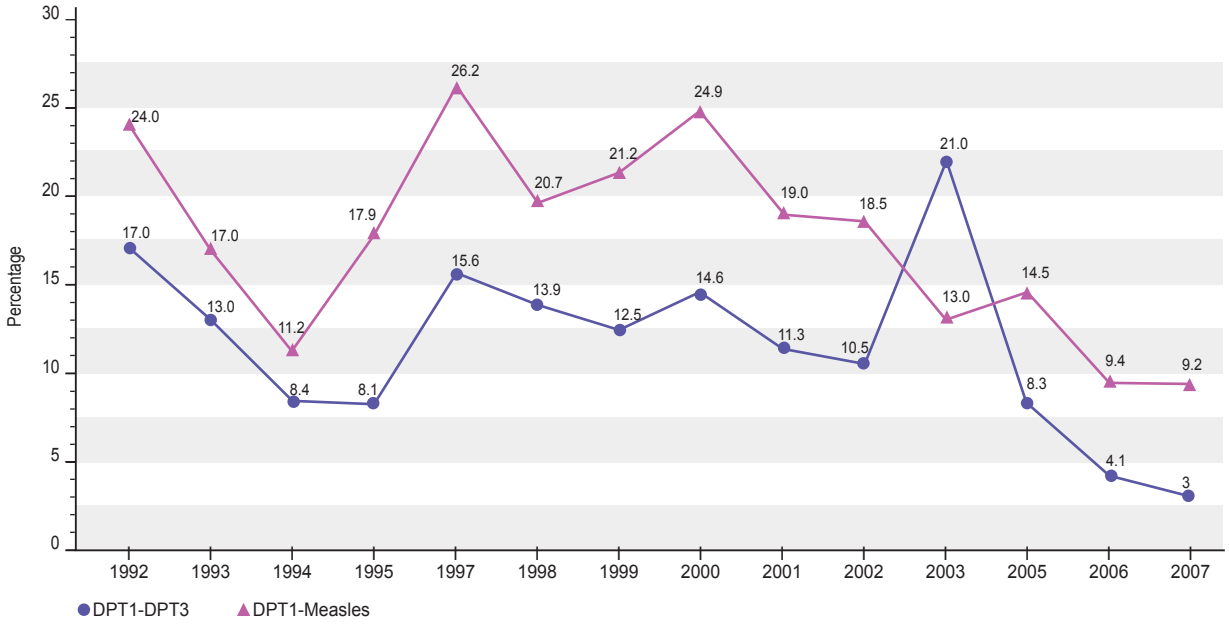
Vaccination Dropout Rates for DPT1-DPT3 and DPT1-Measles among 12-23 Months Old Children in Rural and Urban Areas in 2007



Source: CES 2007

FIGURE C12

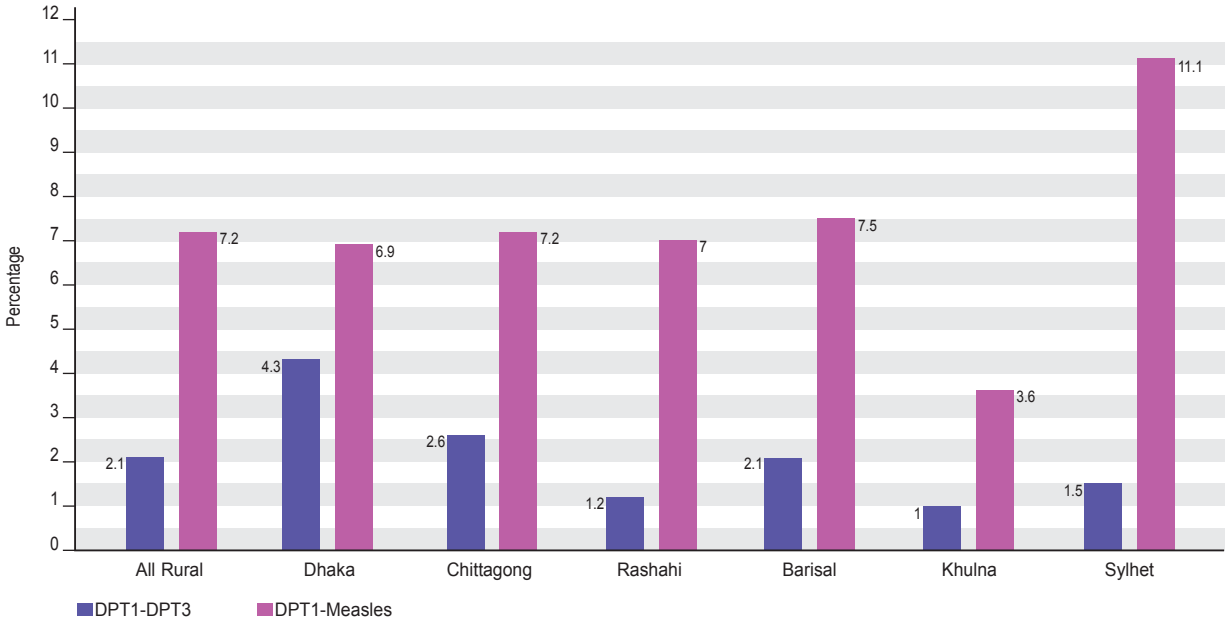
Annual Trend in National Vaccination Dropout Rates for DPT1-DPT3 and DPT1-Measles among 12-23 Months Old Children from 1992 to 2007



Source: Coverage Evaluation Survey 1992-1995, 1997-2002, 2003 , 2005, 2006 and 2007

FIGURE C13

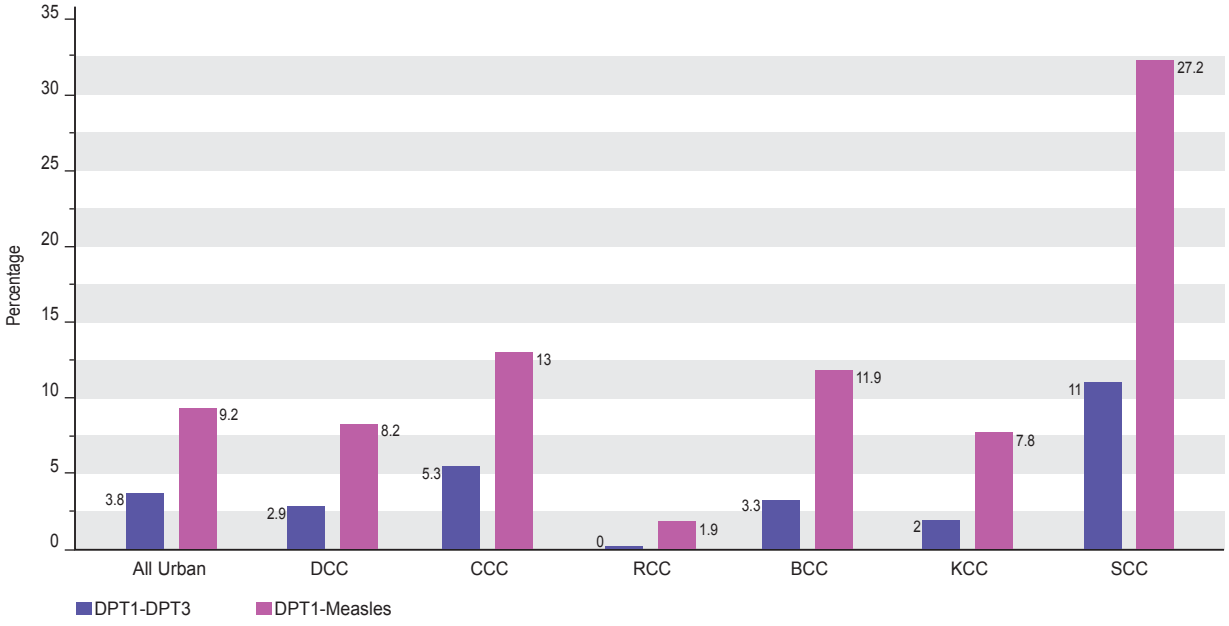
Vaccination Dropout Rates for DPT1-DPT3 and DPT1-Measles among 12-23 Months Old Children in Rural Areas by Division in 2007



Source: CES 2007

FIGURE C14

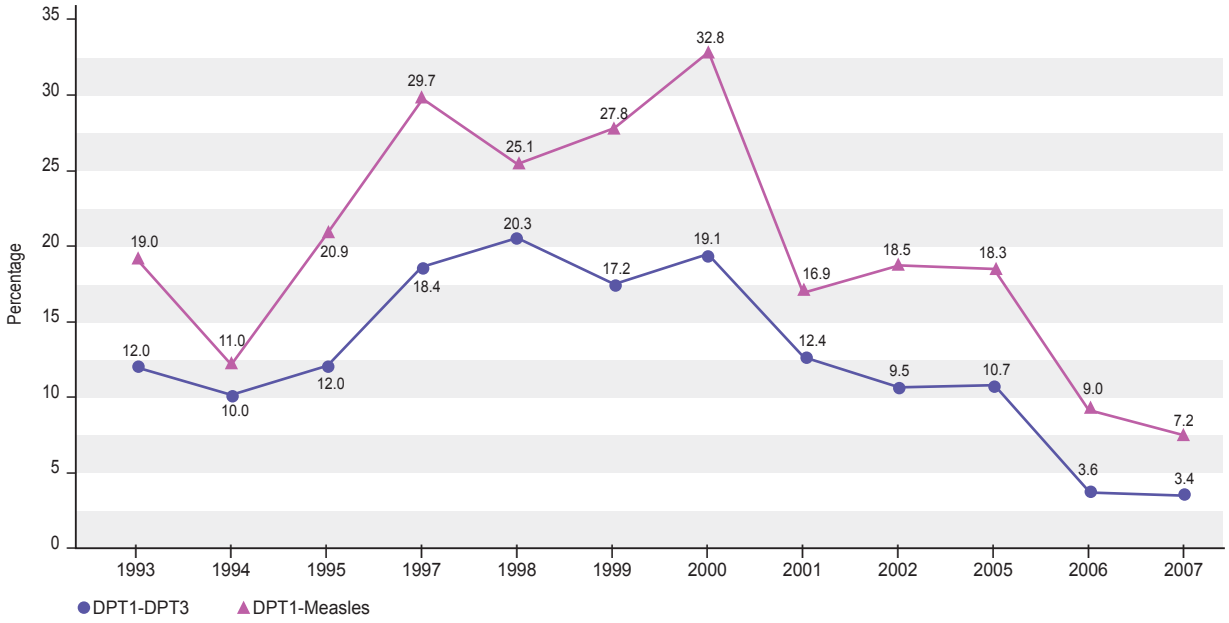
Vaccination Dropout Rates for DPT1-DPT3 and DPT1-Measles among 12-23 Months Old Children in Urban Areas by City Corporation in 2007



Source: CES 2007

FIGURE C15

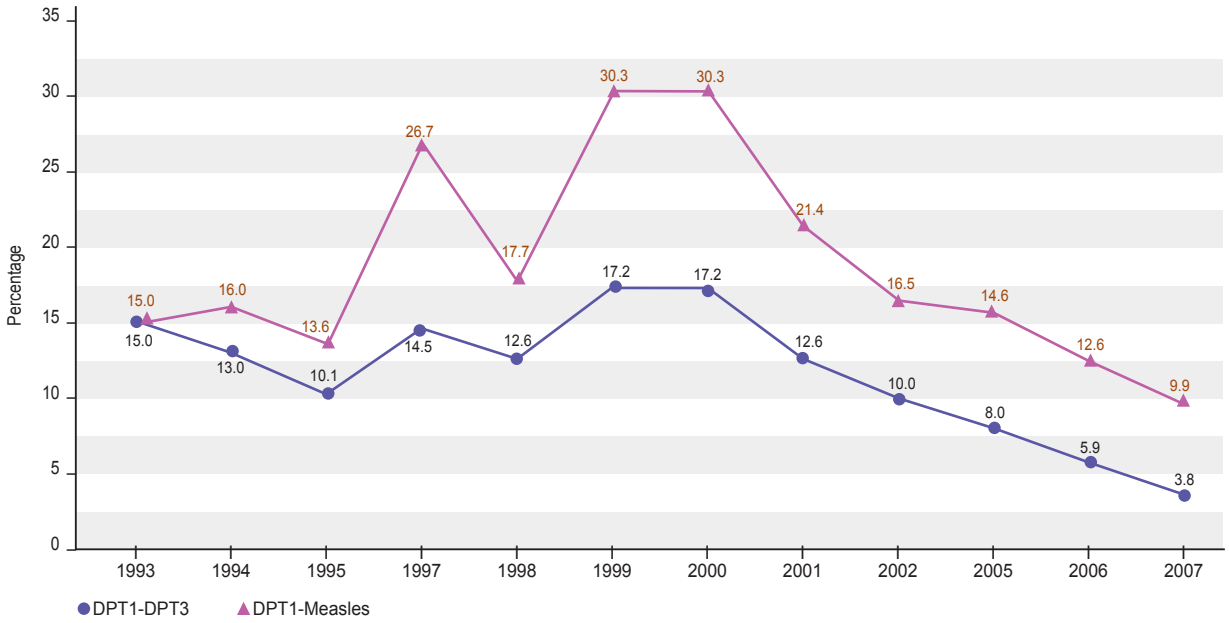
Annual Trend in Vaccination Dropout Rates for DPT1-DPT3 and DPT1-Measles among 12-23 Months Old Children in Dhaka Division from 1993 to 2007



Source: Coverage Evaluation Survey 1993-1995, 1997-2002, 2005, 2006 and 2007

FIGURE C16

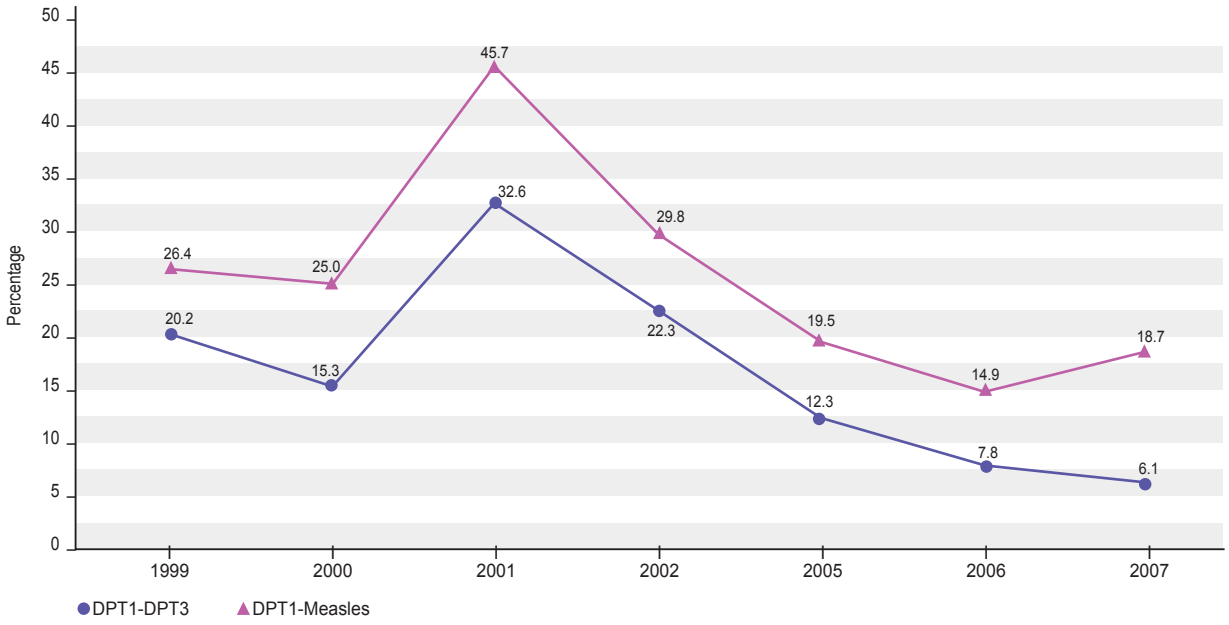
Annual Trend in Vaccination Dropout Rates for DPT1-DPT3 and DPT1-Measles among 12-23 Months Old Children in Chittagong Division from 1993 to 2007



Source: Coverage Evaluation Survey 1993-1995, 1997-2002, 2005, 2006 and 2007

FIGURE C17

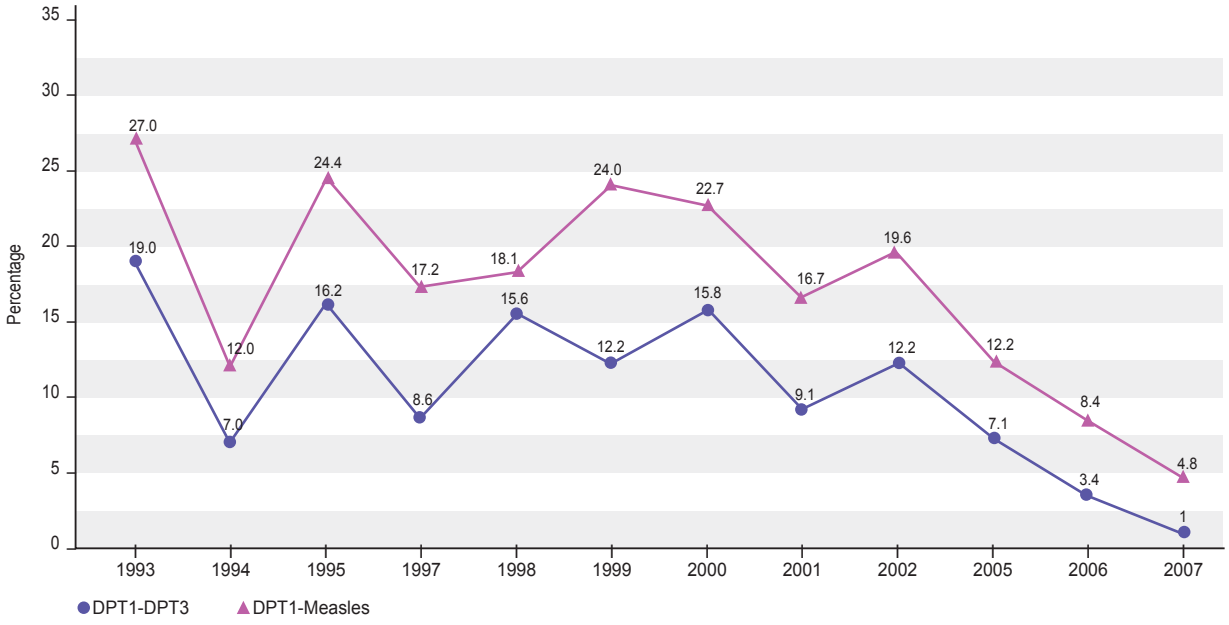
Annual Trend in Vaccination Dropout Rates for DPT1-DPT3 and DPT1-Measles among 12-23 Months Old Children in Sylhet Division* from 1999 to 2007



Source: Coverage Evaluation Survey 1999-2002, 2005, 2006 and 2007

FIGURE C18

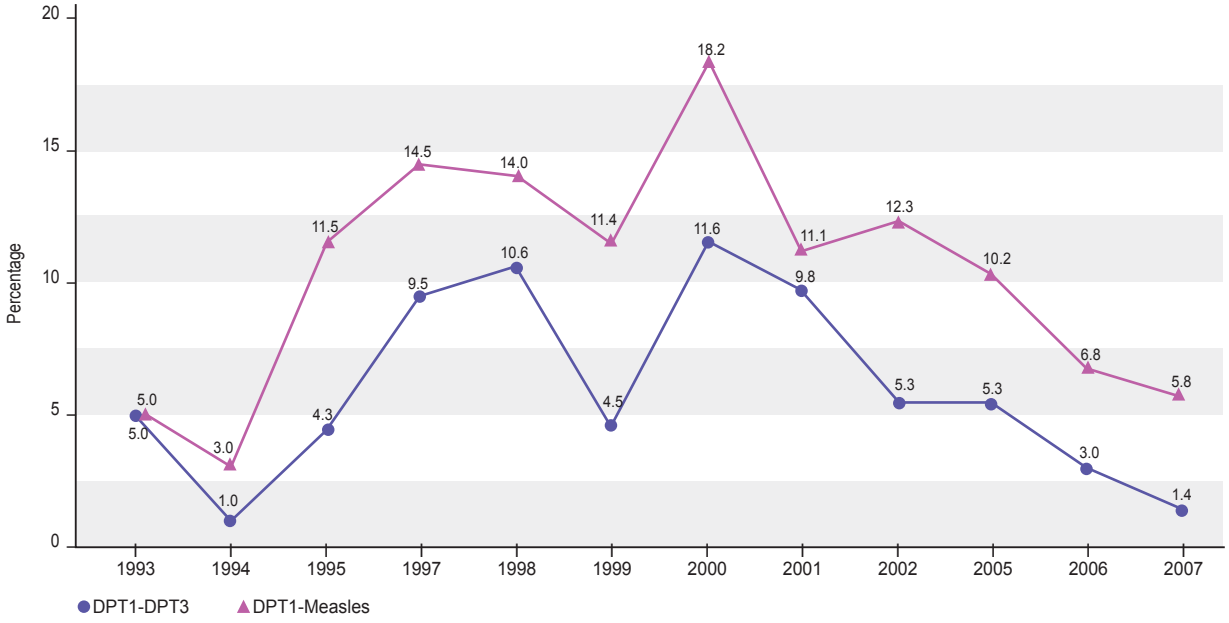
Annual Trend in Vaccination Dropout Rates for DPT1-DPT3 and DPT1-Measles among 12-23 Months Old Children in Rajshahi Division from 1993 to 2007



Source: Coverage Evaluation Survey 1993-1995, 1997-2002, 2005, 2006 and 2007

FIGURE C19

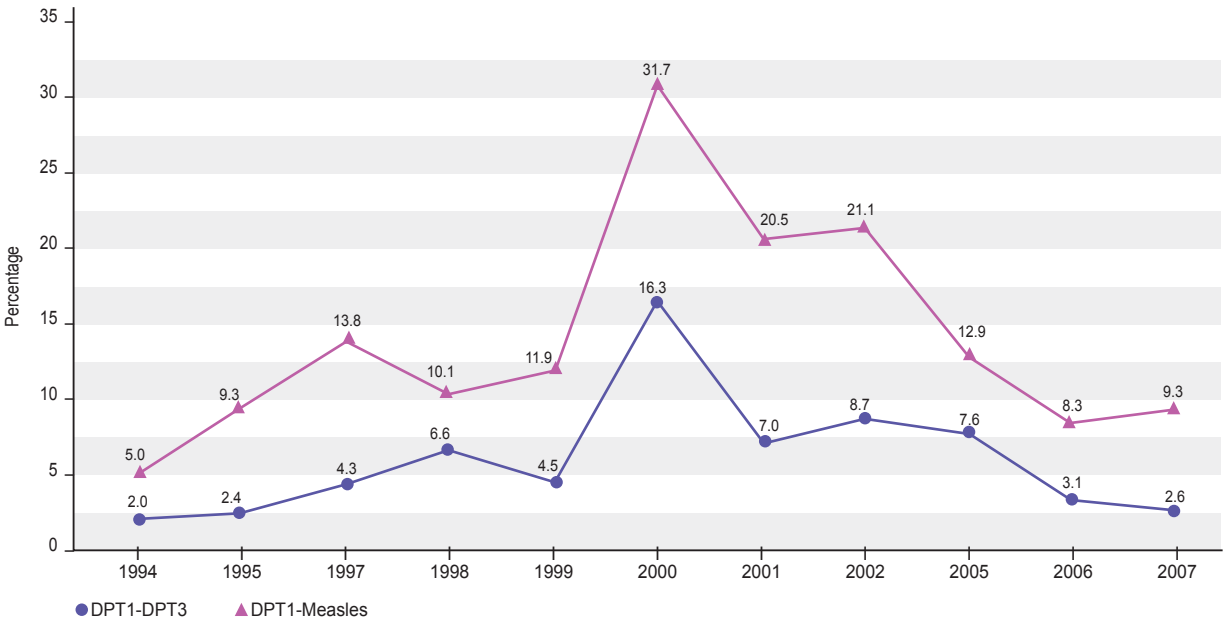
Annual Trend in Vaccination Dropout Rates for DPT1-DPT3 and DPT1-Measles among 12-23 Months Old Children in Khulna Division from 1993 to 2007



Source: Coverage Evaluation Survey 1993-1995, 1997-2002, 2005, 2006 and 2007

FIGURE C20

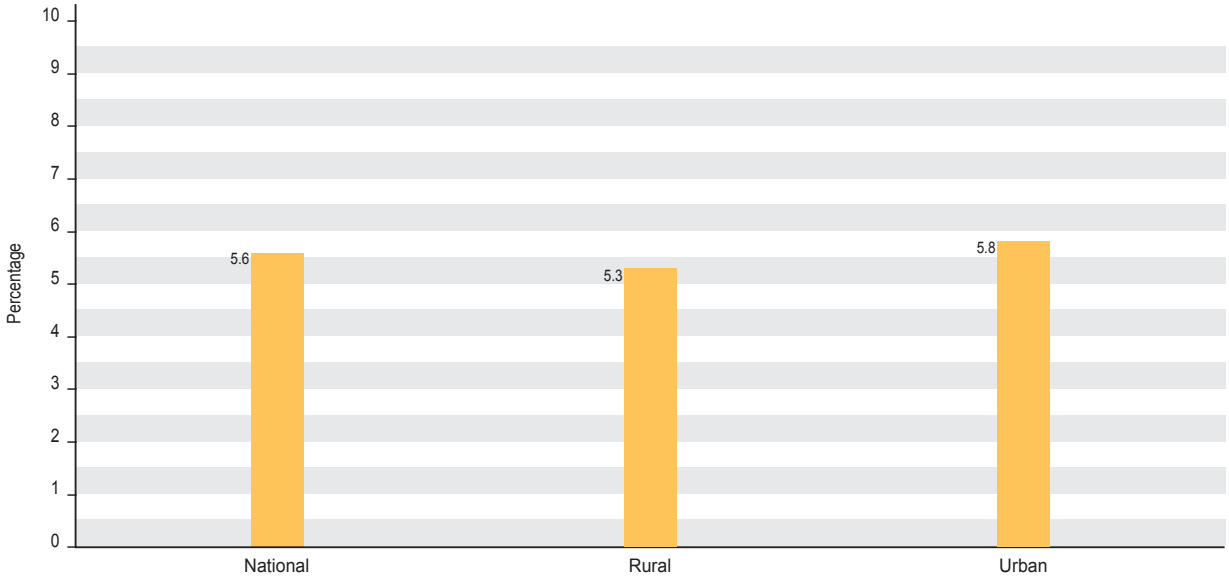
Annual Trend in Vaccination Dropout Rates for DPT1-DPT3 and DPT1-Measles among 12-23 Months Old Children in Barisal Division from 1994 to 2007



Source: Coverage Evaluation Survey 1994-1995, 1997-2002, 2005, 2006 and 2007

FIGURE C21

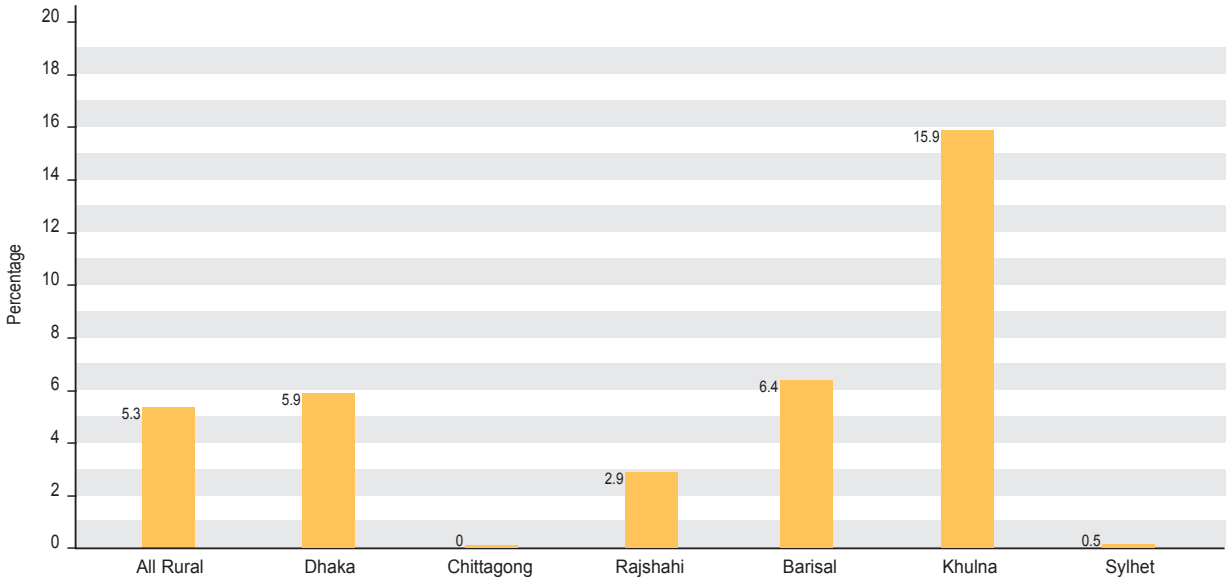
Incidence of Abscesses Following DPT or Measles Vaccination among 12-23 Months Old Children by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE C22

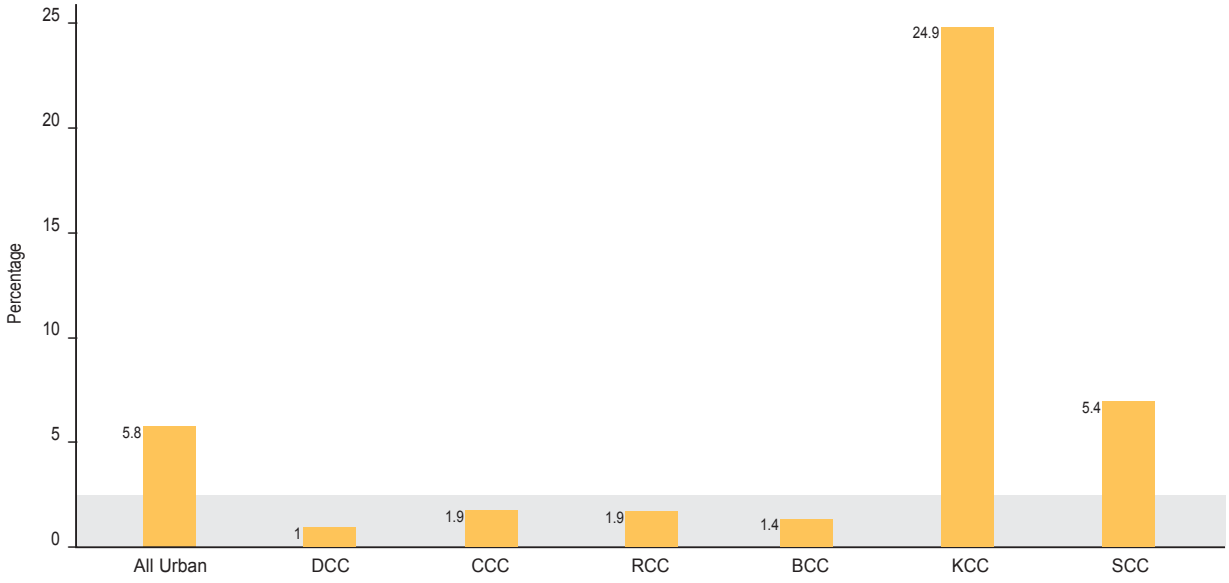
Incidence of Abscesses Following DPT or Measles Vaccination among 12-23 Months Old Children in Rural Areas by Division in 2007



Source: CES 2007

FIGURE C23

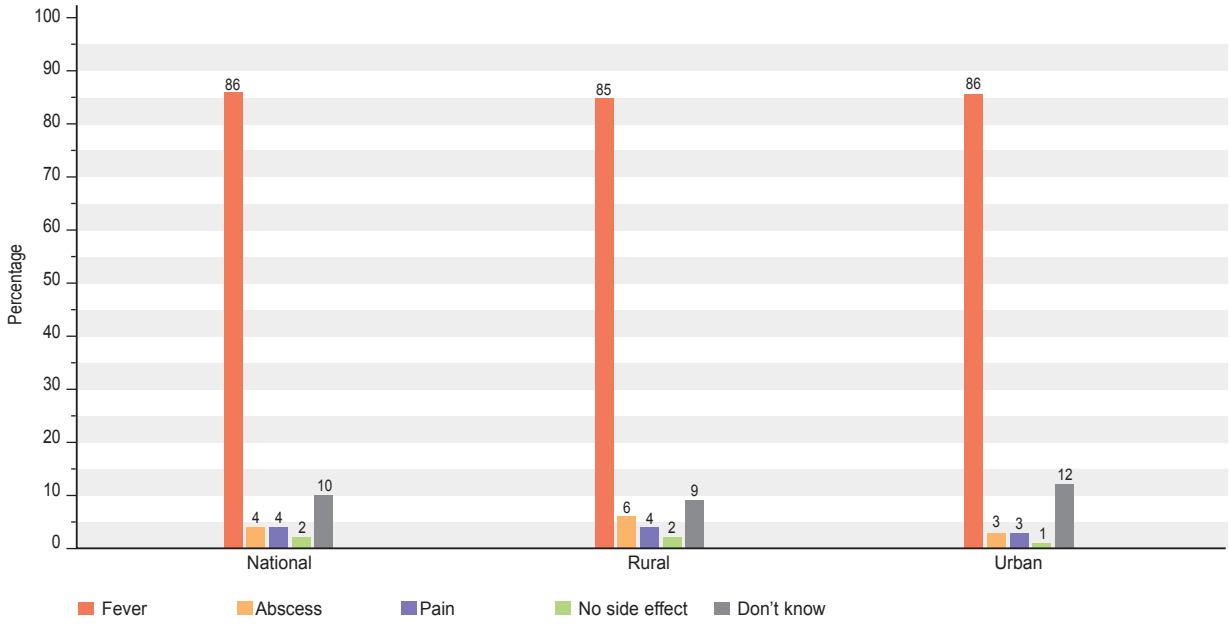
Incidence of Abscesses Following DPT or Measles Vaccination among 12-23 Months Old Children in Urban Areas by City Corporation in 2007



Source: CES 2007

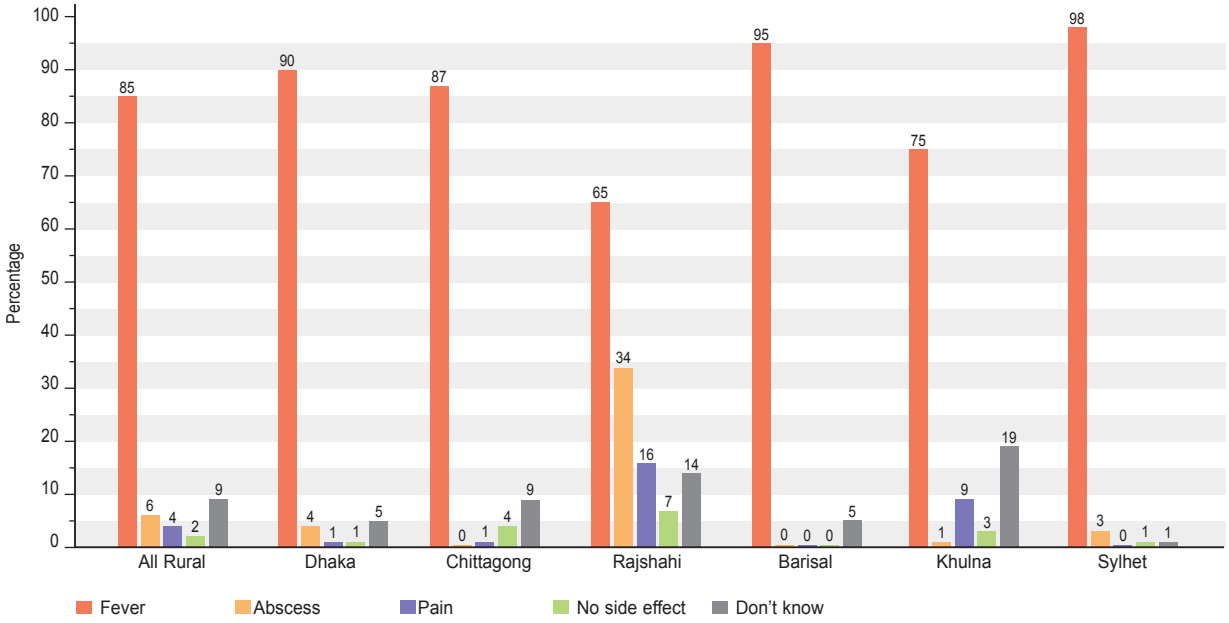
FIGURE C24

Knowledge on Adverse Event Following Immunization by National, Urban and Rural Areas in 2007



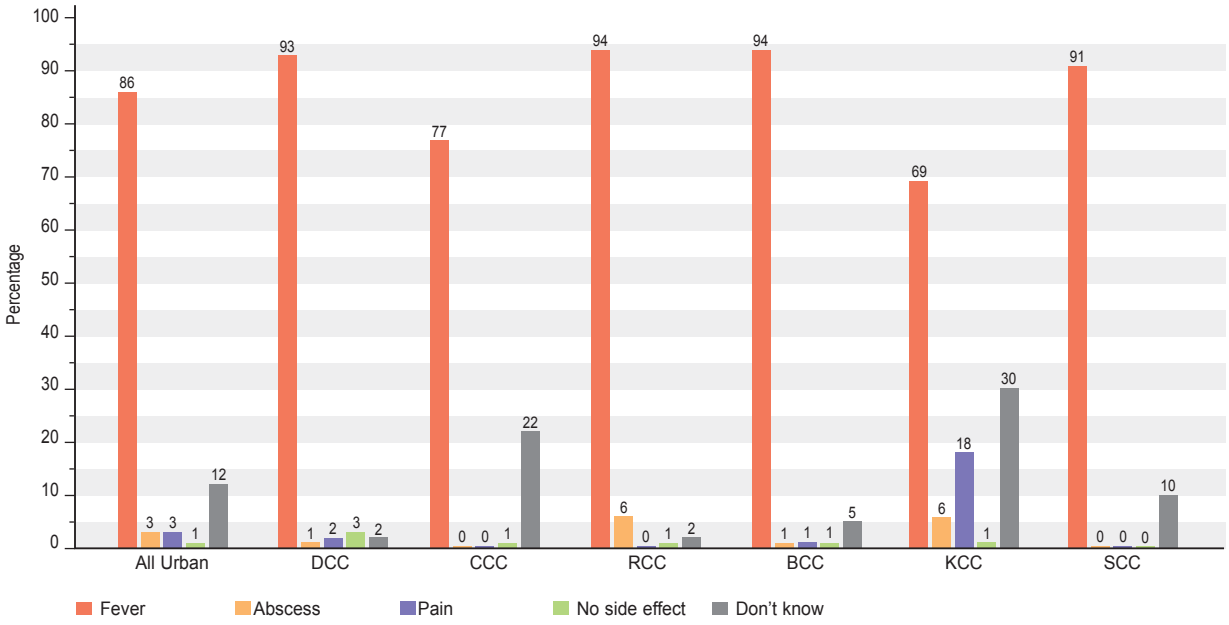
Source: CES 2007

FIGURE C25
Knowledge on Adverse Event Following Immunization in Rural Areas by Division in 2007



Source: CES 2007

FIGURE C26
Knowledge on Adverse Event Following Immunization in Urban Areas by City Corporations in 2007



Source: CES 2007

2.7 REASONS FOR CHILDREN NOT HAVING VACCINATED

A primary concern of the CES 2007 was to address the reasons for which children were not vaccinated at all or fully. For every surveyed child who was never vaccinated or partially vaccinated, the mother/caregiver was interviewed with an aim to understand the underlying reasons behind it. The reasons shown, presented in Figures D1-D5, are analyzed below in two different sub-sections: reasons for children never been vaccinated, and reasons for children not been fully vaccinated.

2.7.1 REASONS FOR CHILDREN NEVER BEEN VACCINATED

Nationally, the most frequently mentioned reason appeared in the survey for a child never been vaccinated was "fear of side effects" (24 percent). The other most common reasons were "lack of awareness about vaccination" (15 percent), "don't believe in vaccination" (15 percent), "the parent's/caregiver's preoccupation with work" (7 percent), "mothers/caregivers forget to vaccinate the child" (5 percent), and "rumor" (5 percent) (Figure D1). There were small variations in the reasons reported for never having a child vaccinated between the rural and the urban samples (Figure D1a &D1b).

2.7.2 REASONS FOR CHILDREN BEING PARTIALLY VACCINATED

Nationally, the frequently mentioned reasons for the mothers who do have not fully vaccinating children are:

- "Parents/caregivers were busy" (23 percent),
- "Parents/caregivers reported that the child was sick and, therefore, was not taken to the site" (20 percent),
- "Parents/caregivers did not know when to go for the 2nd /3rd dose" (10 percent),
- "Parents/caregivers forgot to vaccinate the child" (5 percent),
- "Parents/caregivers did not know when to go for the measles dose" (4 percent) and
- "Parents/caregivers were not at home" (3 percent) (Figure D1).

The common reasons for children not being fully vaccinated in the rural areas were: "child was sick and, therefore, was not taken to the site" (16 percent); this was followed by: "parents/caregivers were too busy to take the child for vaccination" (13 percent), "parents/caregivers did not know when to go for measles dose" (12 percent), "health worker didn't give due attention to illness of child" (6 percent), "vaccination site was too far" (4 percent) and "thought vaccinator would come at home" (4 percent).

In urban areas, common reasons for children not being fully vaccinated were; "parents/caregivers were too busy to take the child for vaccination" (29 percent); "child was sick and, therefore, was not taken to the site" (23 percent); "parents/caregivers did not know when to go for measles dose" (10 percent); "fear of side effects" (5 percent), "forgot to vaccinate the child" (5 percent); "the vaccinator charged money" (4 percent); "parents/caregivers didn't know when to go for the 2nd/3rd dose" (3 percent).

2.8 KNOWLEDGE OF THE NUMBER OF VISITS REQUIRED FOR COMPLETE VACCINATION

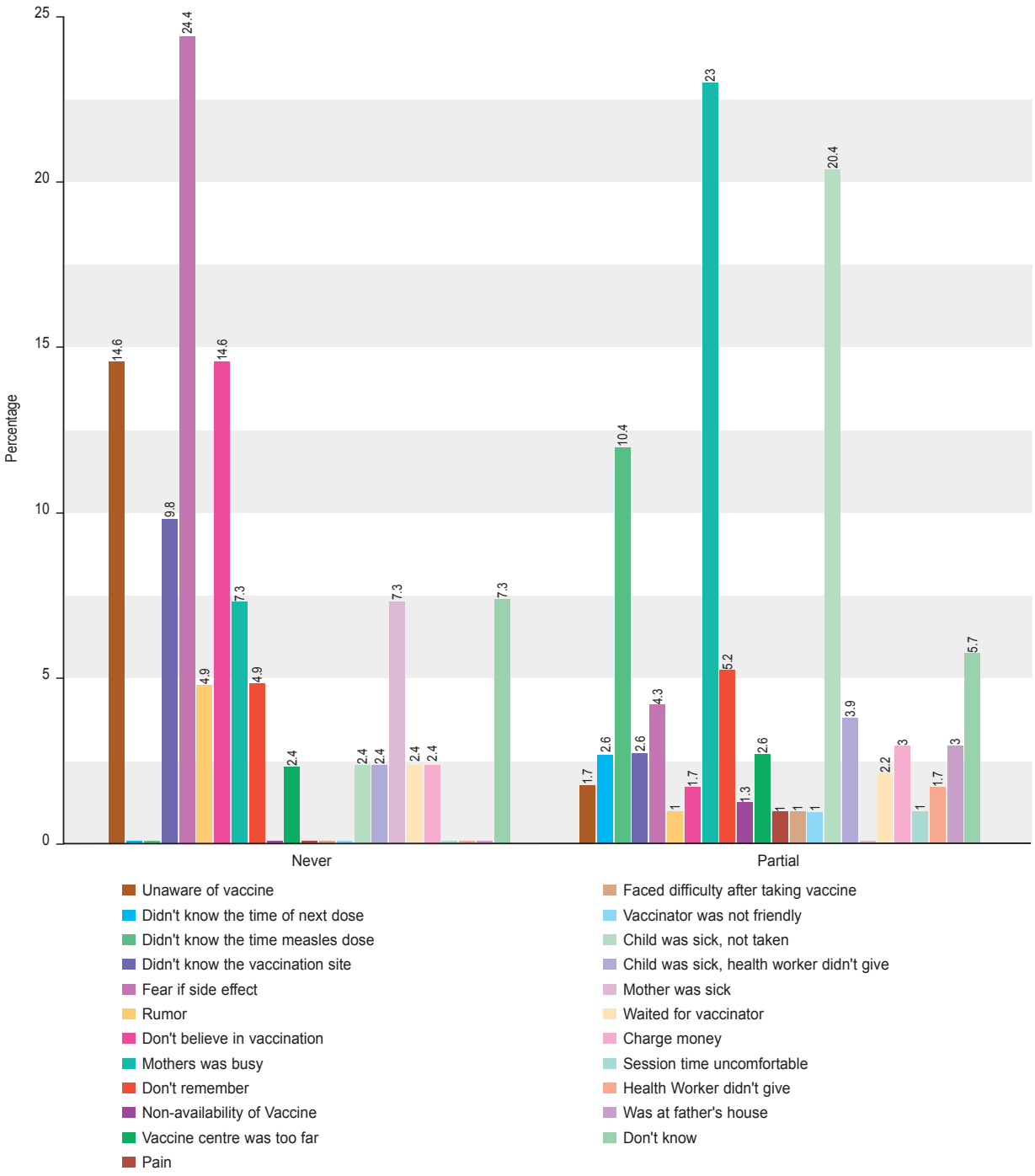
Mothers'/caregivers' knowledge about the number of visits required to complete all doses were assessed in the CES 2007. Thirty-five percent of the mothers/ caregivers mentioned about 4 visits. More than one-third of the mothers/ caregivers referred to more than 4 visits. One-fourth (25 percent) of the respondents were found unaware of the number of visits. By area type, no marked variation in response was observed between urban and rural areas. However, 38 percent of the respondents in urban areas had proper knowledge of 4 visits compared to 30 percent in rural areas. The percentage of mothers/ caregivers who were unaware of the proper number of visits was 29 percent in the rural areas. This percentage was 23 percent in the urban areas. Incorrect knowledge about the number of visits revealed 8 percent in the urban and 11 percent in the rural areas among the surveyed mothers/ caregivers (Figure D6).

In the rural areas by division, the proportion of the mothers/caregivers having proper knowledge of the required four vaccination visits was the highest in Khulna division (52 percent) and the lowest in Rajshahi division (15 percent). The percentage of mothers/caregivers having proper knowledge of vaccination visits in other divisions ranged from 16 percent to 34 percent (Figure D7). However, 50 percent of the mothers/caregivers of Dhaka division had no idea about the required number of visits, which was followed by Sylhet (43 percent), Rajshahi (28 percent), Barisal (20 percent), Khulna (9 percent), and Chittagong divisions (15 percent).

In the city corporations, proper knowledge about the required four visits for vaccination was least prevalent in DCC (24 percent) and the most prevalent in KCC (50 percent), which was followed by BCC (42 percent), CCC (42 percent), RCC and SCC (38 percent), and DCC 24 (percent) (Figure D8).

FIGURE D1

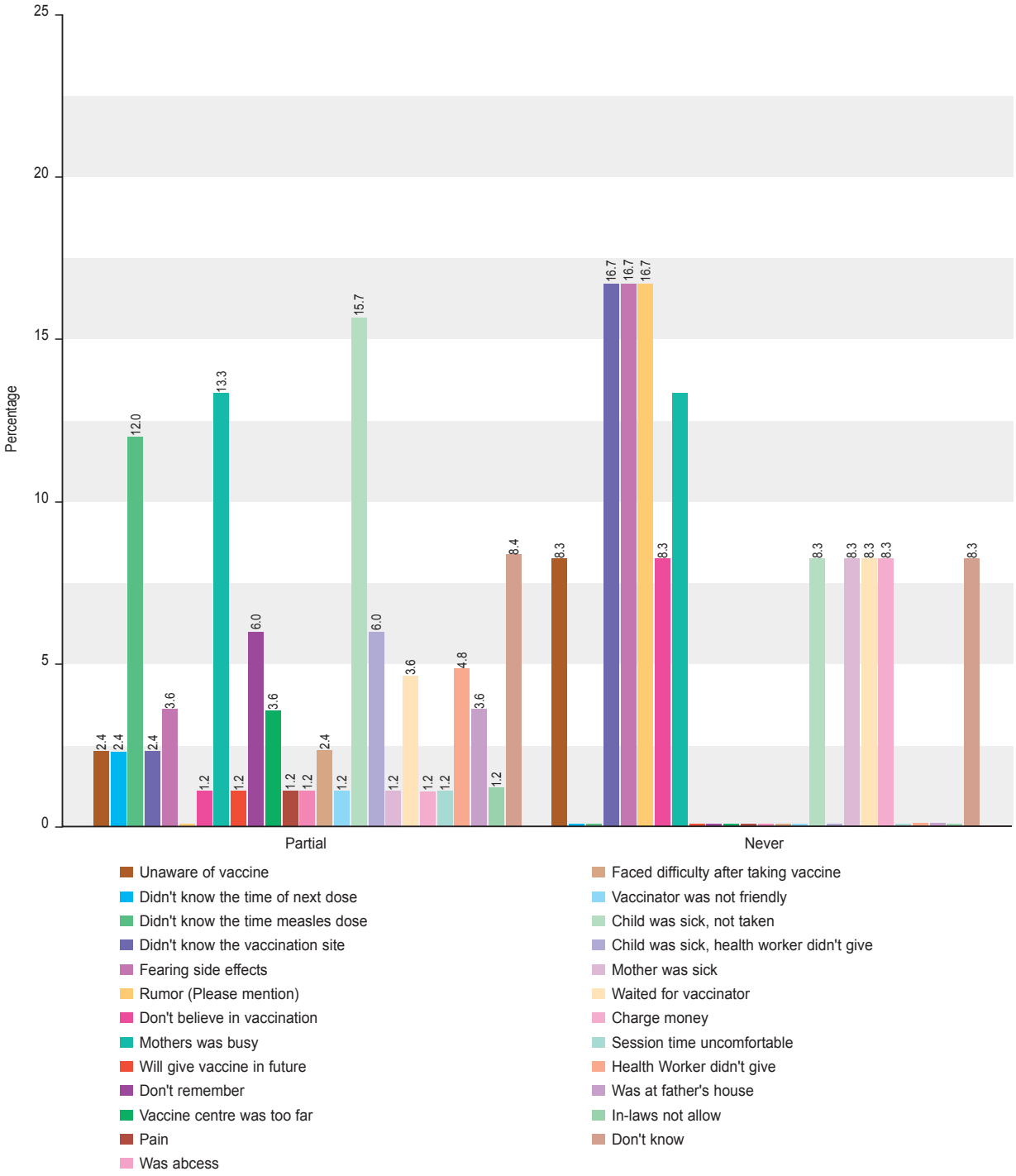
Reasons for Partial or Never Vaccination among 12-23 Months Old Children Nationally in 2007



Source: CES 2007

FIGURE D1a

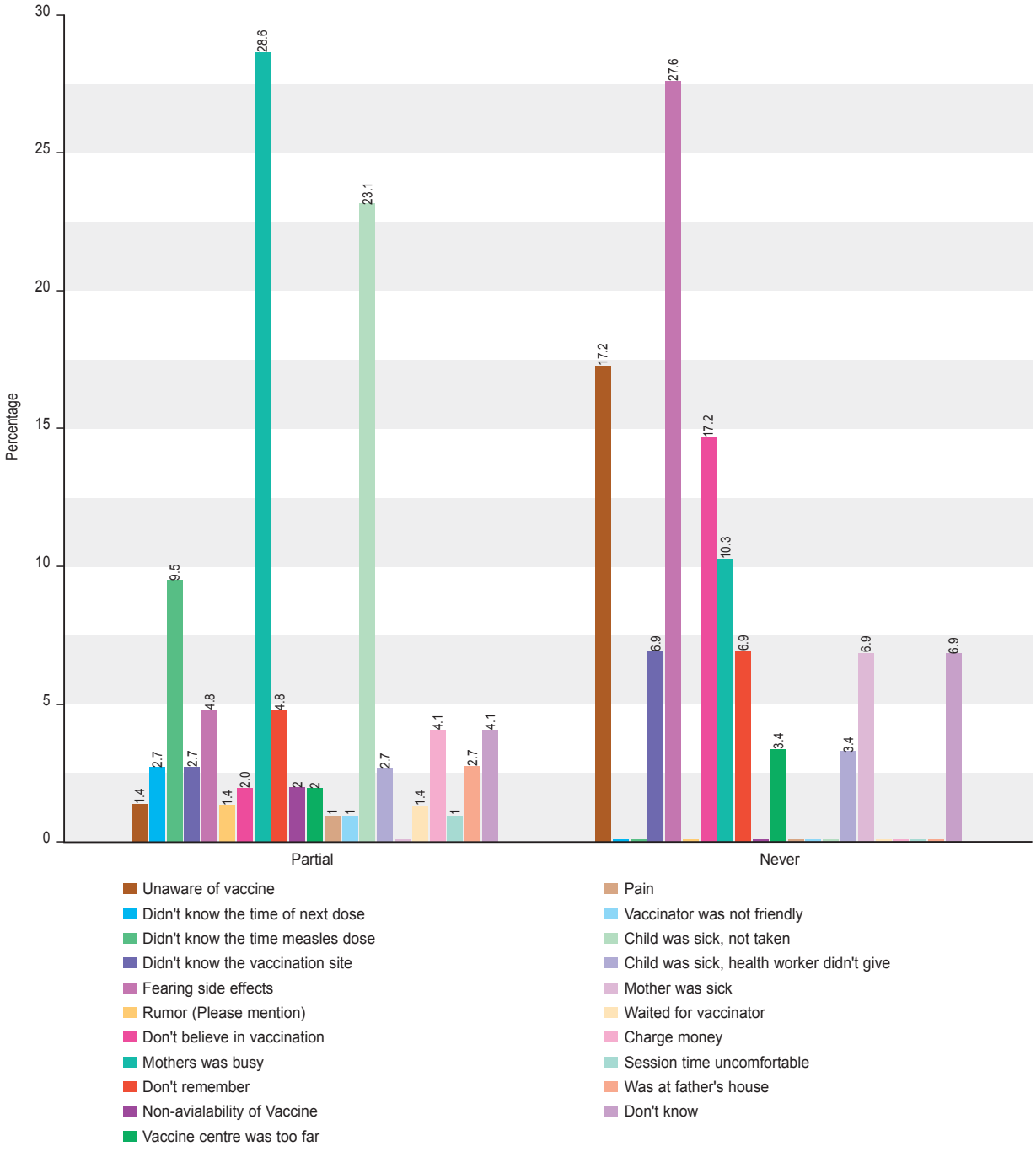
Reasons for Partial or Never Vaccination among 12-23 Months Old Children by Rural Area in 2007



Source: CES 2007

FIGURE D1b

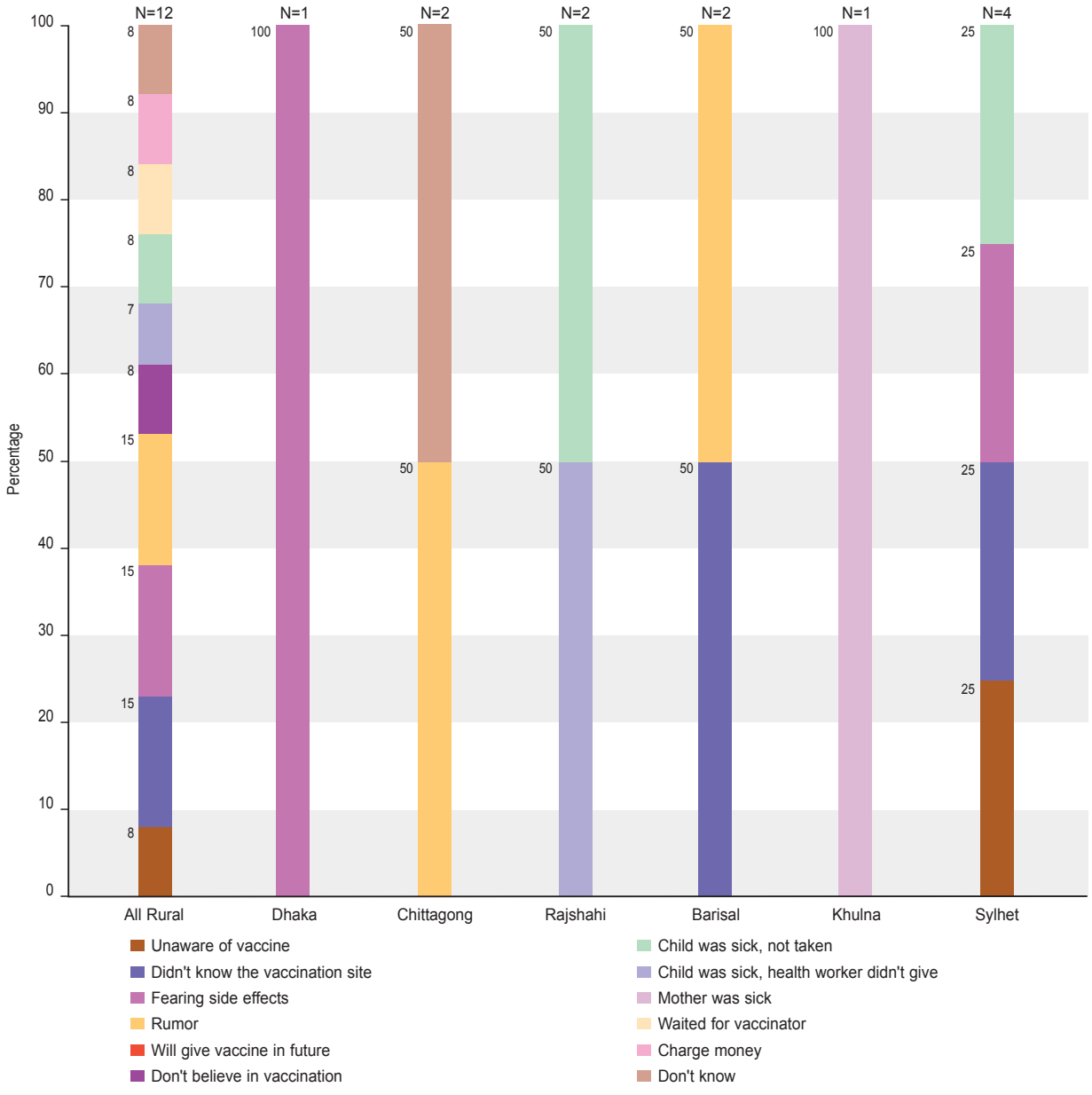
Reasons for Partial or Never Vaccination among 12-23 Months Old Children by Urban Area in 2007



Source: CES 2007

FIGURE D2

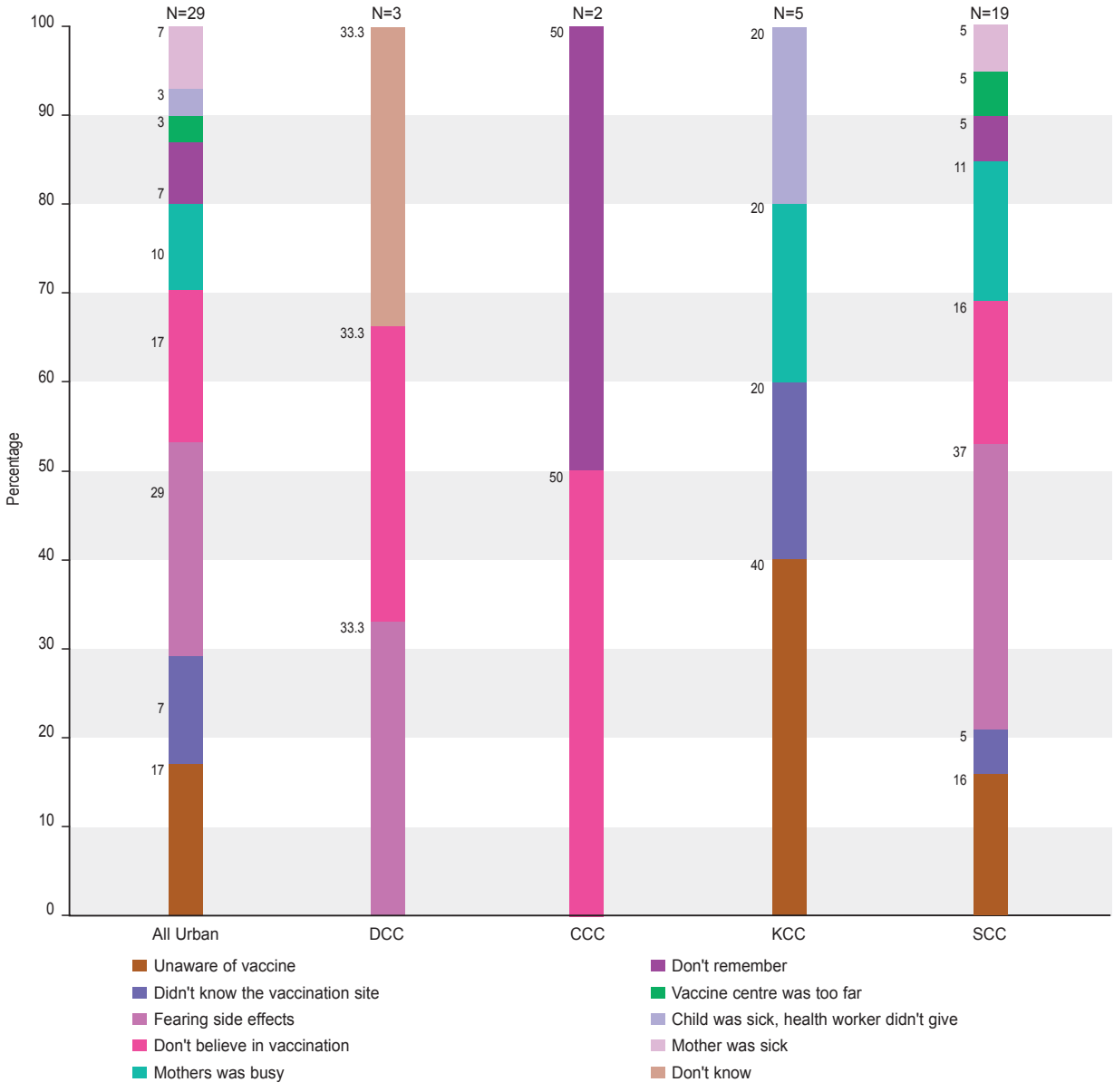
Reasons for Never Vaccination among 12-23 Months Old Children in Rural Areas by Division in 2007



Source: CES 2007

FIGURE D3

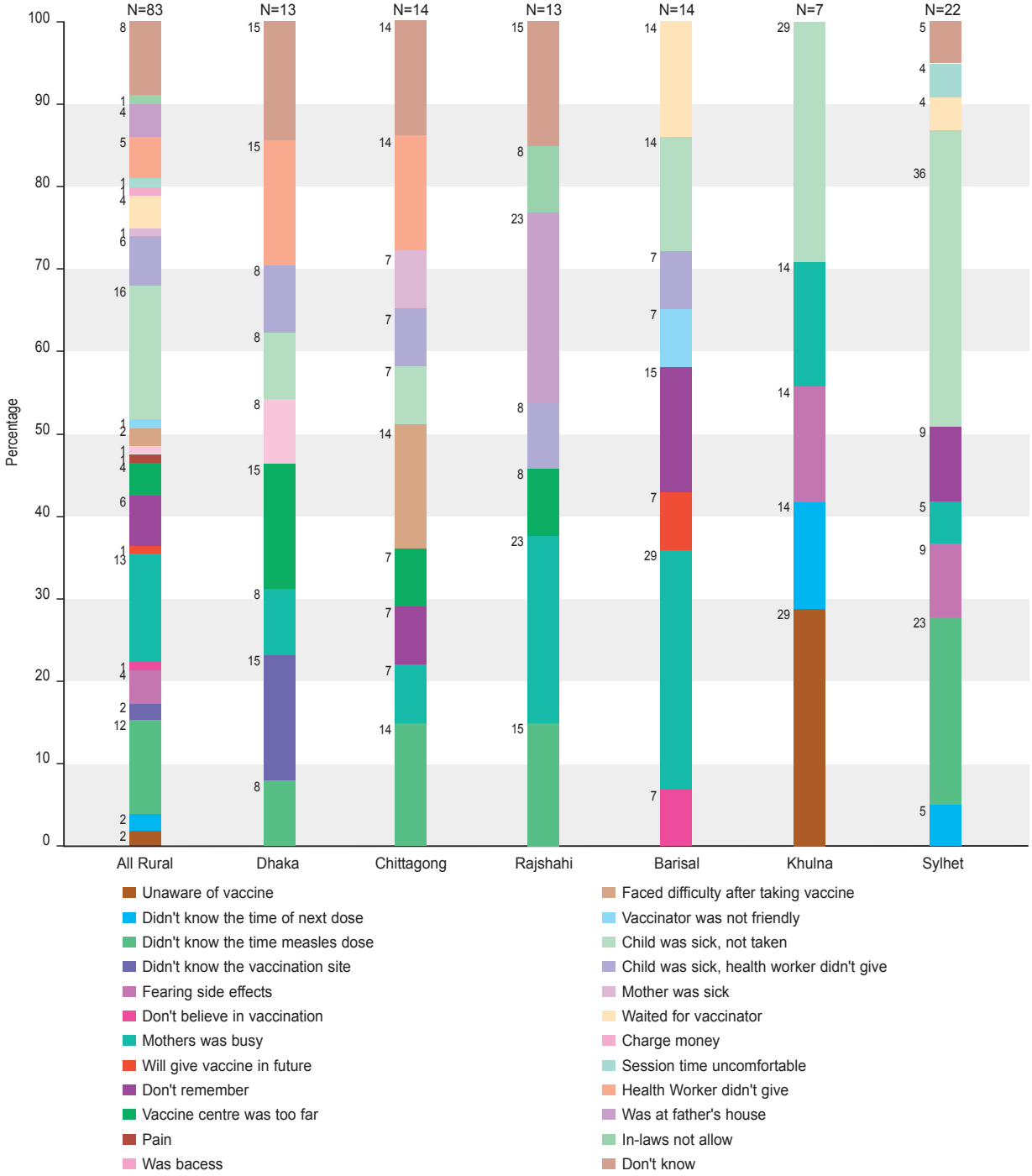
Reasons for Never Vaccination among 12-23 Months Old Children in Urban Areas by City Corporation in 2007



Source: CES 2007

FIGURE D4

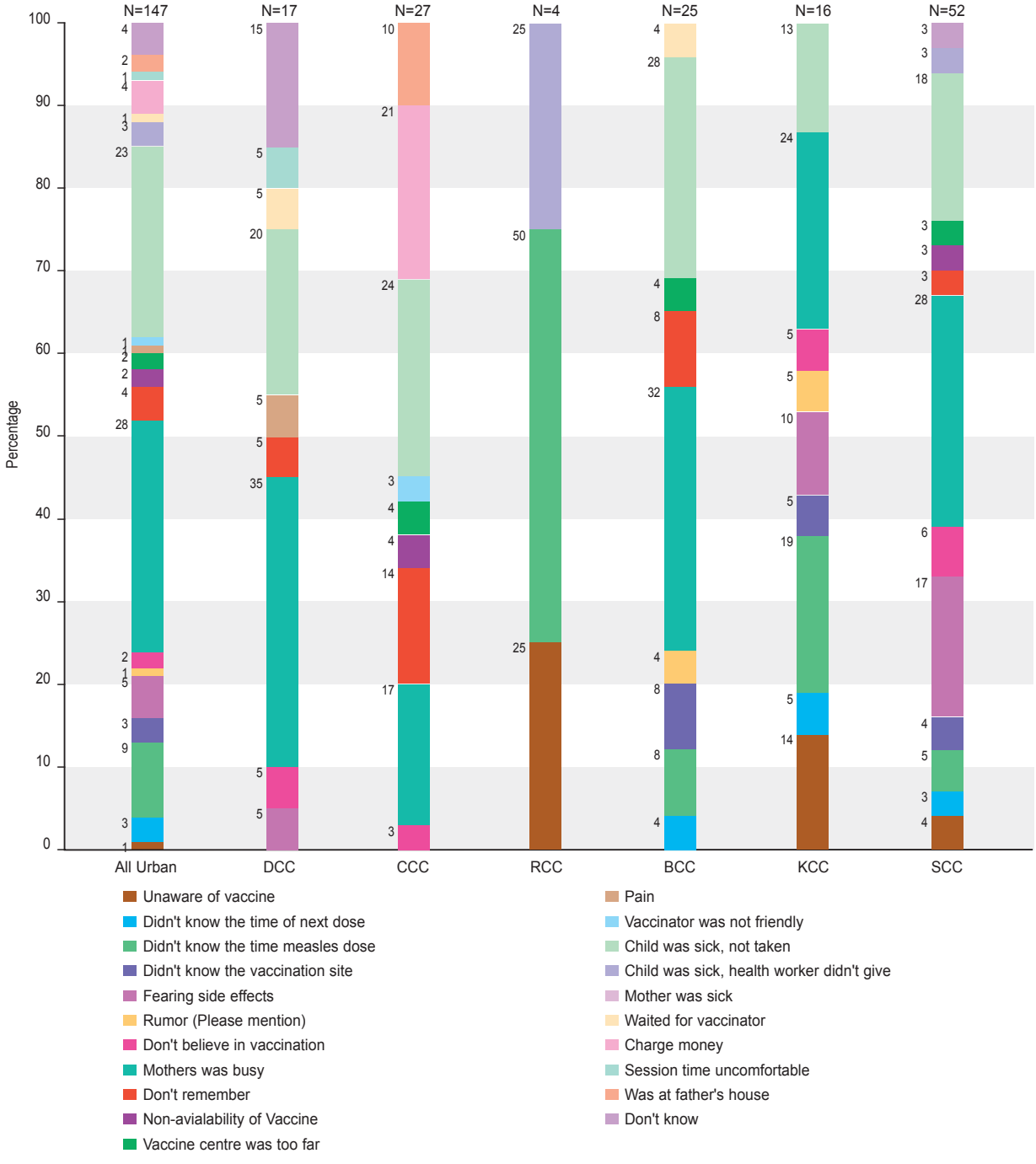
Reasons for Partial Vaccination among 12-23 Months Old Children in Rural Areas by Division in 2007



Source: CES 2007

FIGURE D5

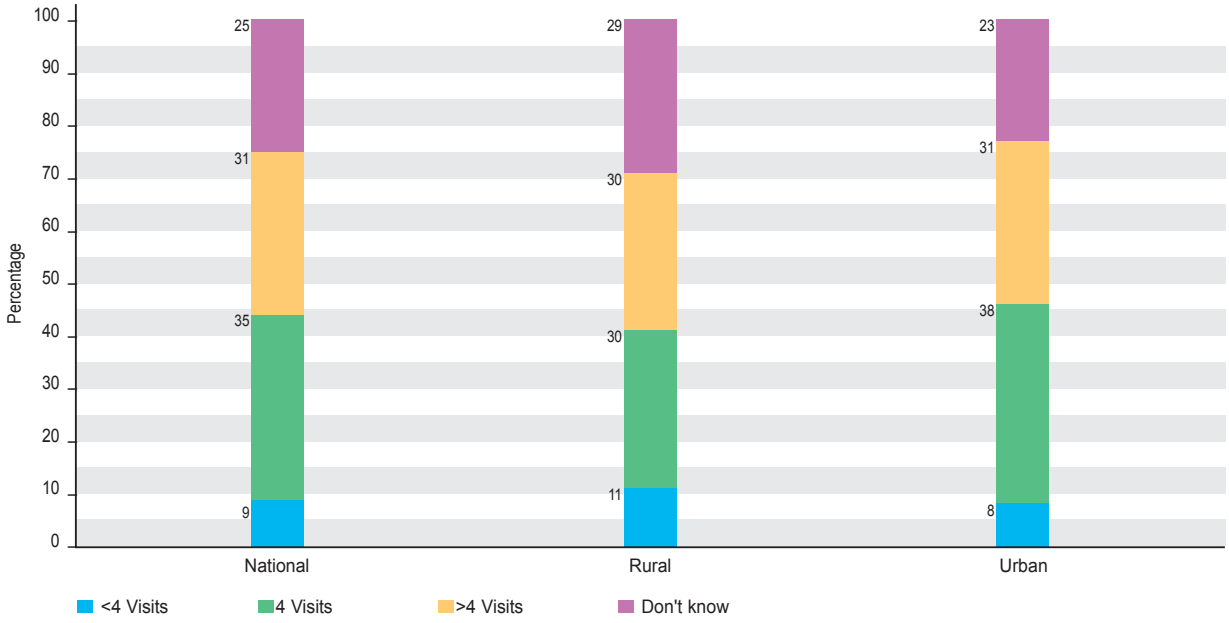
Reasons for Partial Vaccination among 12-23 Months Old Children in Urban Areas by City Corporation in 2007



Source: CES 2007

FIGURE D6

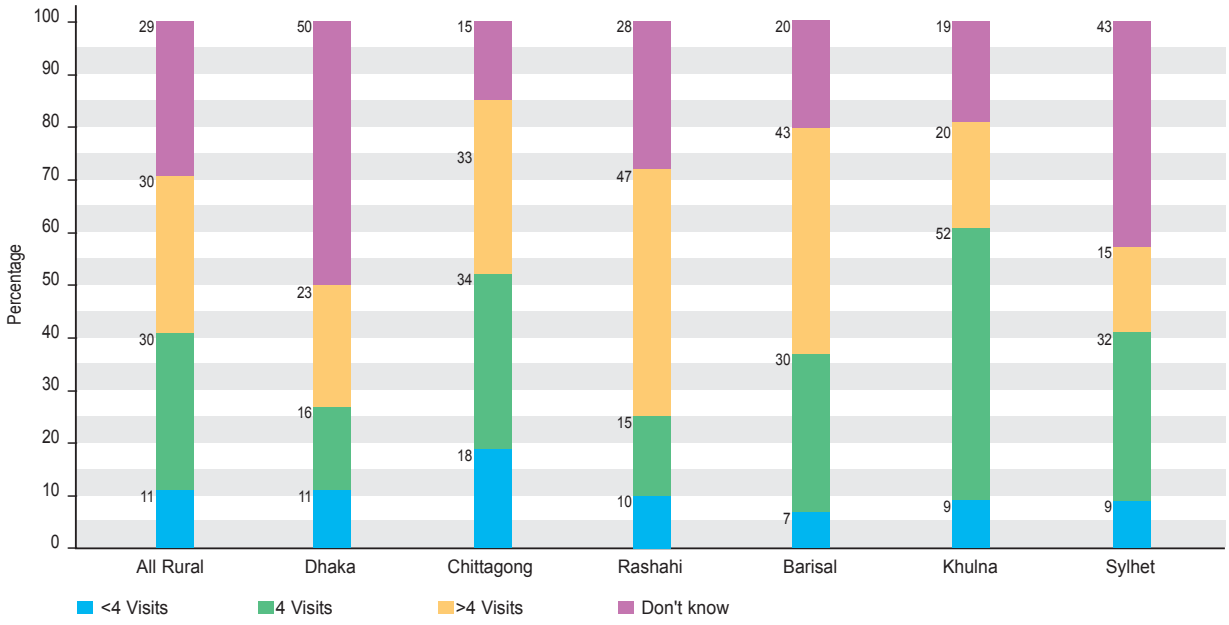
Number of Visits Required to Have a Child Fully Vaccinated as Reported by Mother/Caregivers of 12-23 Months Old Children by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE D7

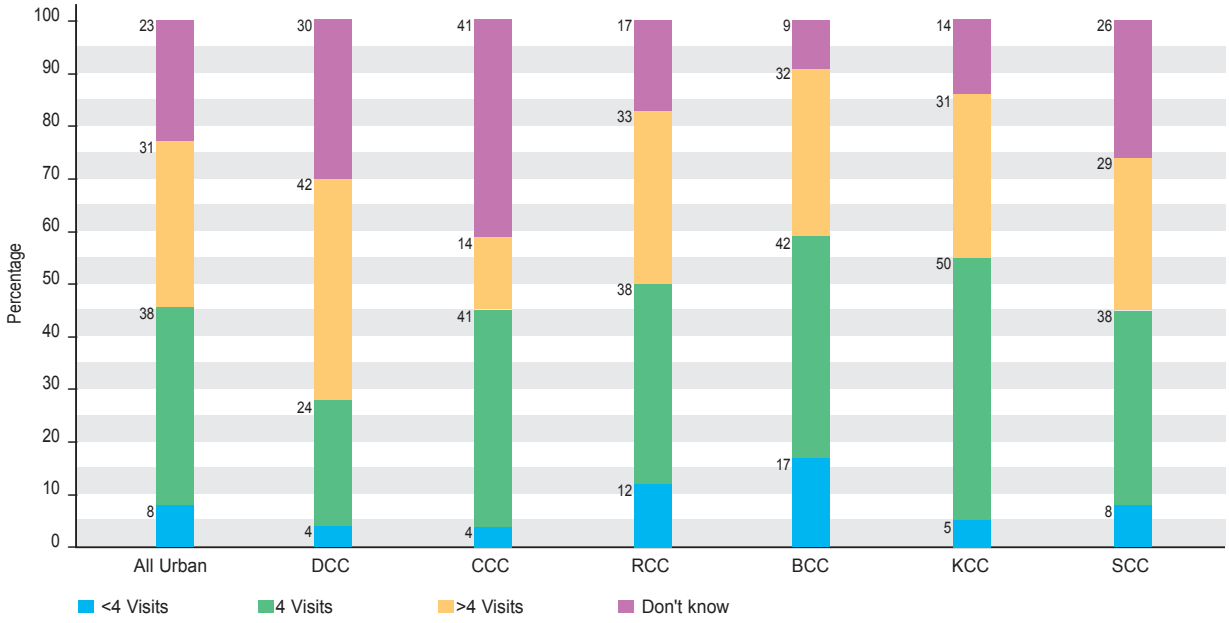
Number of Visits Required to Have a Child Fully Vaccinated as Reported by Mother/Caregivers of 12-23 Months Old Children in Rural Areas by Division in 2007



Source: CES 2007

FIGURE D8

Number of Visits Required to Have a Child Fully Vaccinated as Reported by Mother/Caregivers of 12-23 Months Old Children in Urban Areas by City Corporation in 2007



Source: CES 2007

2.9 SOURCES OF CHILDHOOD VACCINATION

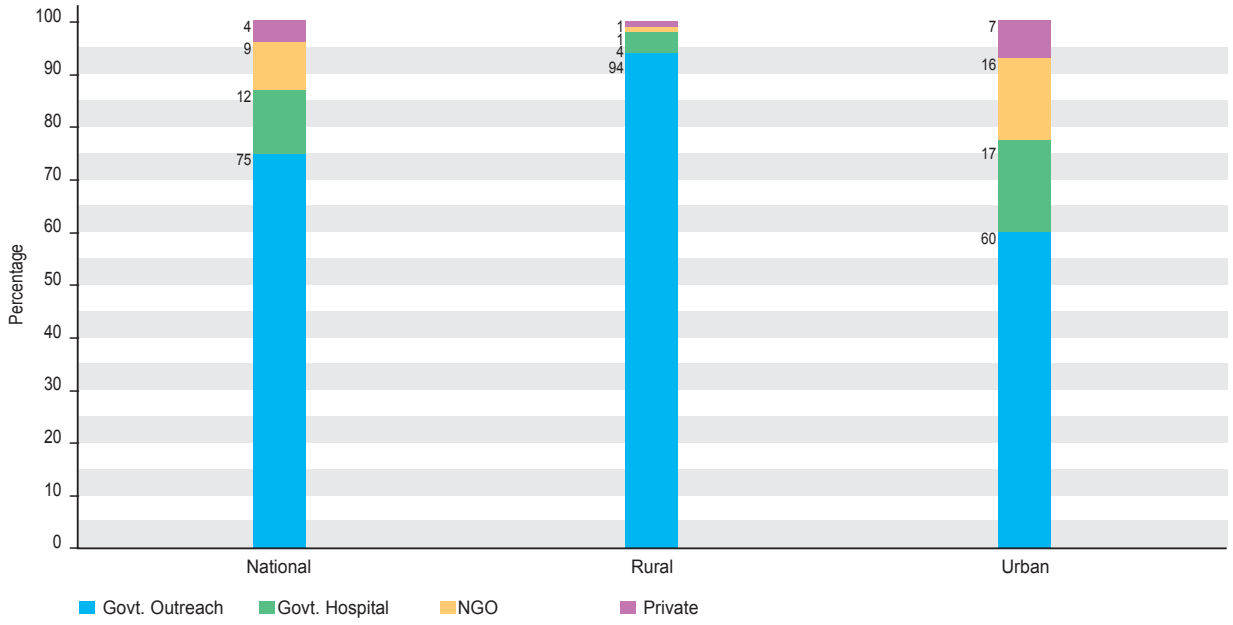
To ascertain the sources of childhood vaccination source of DPT1 was investigated. Figure E1 shows that three quarters of surveyed children were vaccinated in the government outreach center. More than one in ten mothers/ caregivers reported about government hospital. As reported by mothers/ caregivers NGOs and private service providers accounted for the vaccination of 13 percent of the surveyed children. By type of area government sources (98 percent) emerged as the principal provider of childhood vaccination services in the rural areas of Bangladesh. However, in the urban areas utilization of government sources was 77 percent. Higher proportion children of urban areas receiving vaccination services from the NGOs and private health facilities (23 percent) compared to the rural areas.

In the rural areas by divisions, the government outreach sites were most widely used in all the divisions ranged from 90 percent in Sylhet division to 99 percent in Chittagong division while the use of these centers was at an intermediate level in other divisions, 95 percent in Dhaka division, 95 percent in Barisal division, and 93 percent Rajshahi and Khulna divisions (Figure E2). The use of government hospital service was higher in Khulna division and in Sylhet division (6 percent), 5.8 percent in Rajshahi division 3.2 percent both in the Barisal and Dhaka division. The use of NGO and private service was found absent in Chittagong division.

In city corporations, the government outreach services had the highest coverage 68 percent in BCC, which was followed by 67 percent in CCC and 63 percent in KCC , 61 percent in RCC , 51 percent in DCC and 38 percent in SCC (Figure E3). In contrast, vaccination services from the government hospitals/clinics were used most in BCC (21 percent), which was followed by DCC and SCC (20 percent), RCC (19 percent), CCC (17 percent), and KCC (8 percent). Vaccination by NGOs was most discernible in KCC (27 percent), which was followed by SCC (25 percent), DCC (15 percent) and CCC (14 percent). The use of NGO service found to be the lowest in BCC (9 percent).

FIGURE E1

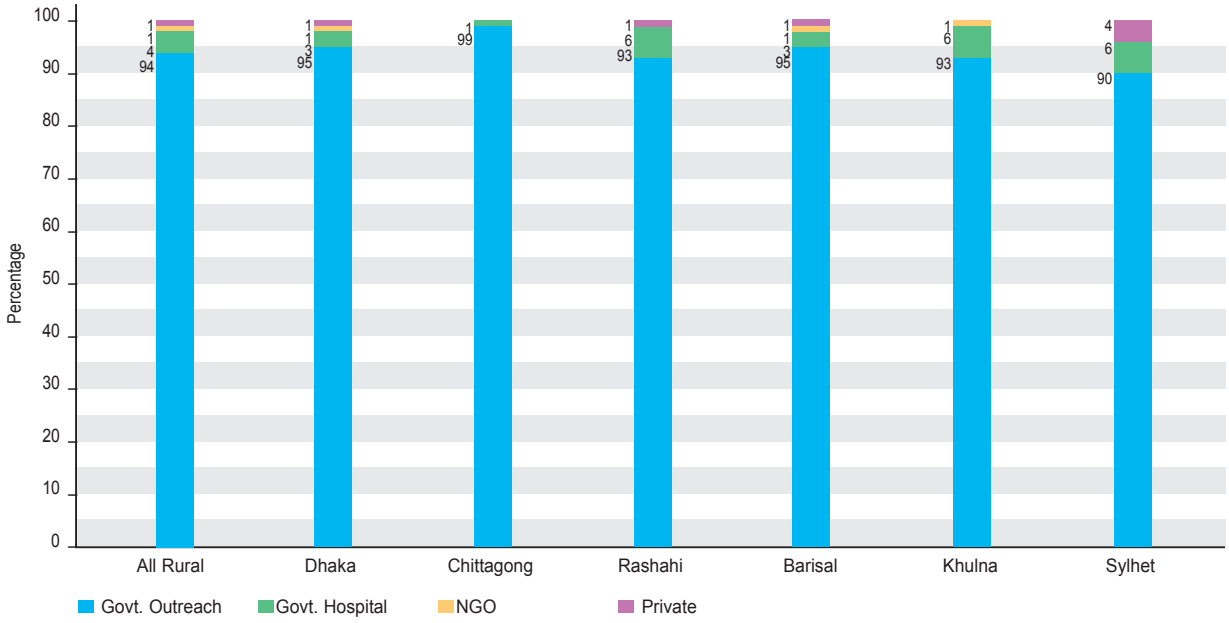
Source of DPT1 Vaccination among 12-23 Months Old Children by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE E2

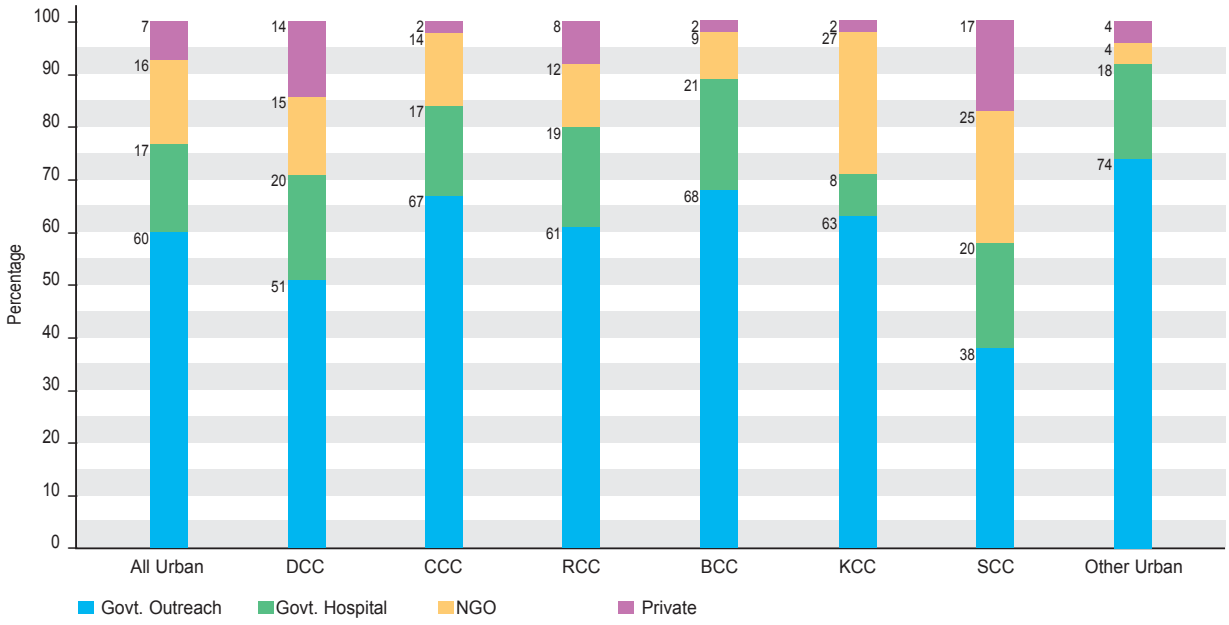
Source of DPT1 Vaccination among 12-23 Months Old Children in Rural Areas by Division in 2007



Source: CES 2007

FIGURE E3

Source of DPT1 Vaccination among 12-23 Months Old Children in Urban Areas by City Corporation in 2007



Source: CES 2007

Chapter 3

TETANUS TOXOID VACCINATION COVERAGE SURVEY AMONG MOTHERS OF 0-11 MONTHS OLD CHILDREN

This chapter provides information from the CES 2007 on the Tetanus Toxoid (TT) Vaccination Coverage Survey conducted among the mothers with children aged 0-11 months. Specifically, it presents the findings on the level of TT vaccination coverage (focusing TT2), programme quality and PAB status.

Before explaining the findings, the selection process of samples is discussed below.

3.1 SELECTION OF SAMPLE

Mothers who gave birth to child between 01-12-2006 and 30-11-2007 were the targeted samples to assess the vaccination status against tetanus as well as post partum Vitamin A coverage. Samples were selected from the same clusters assigned for the child at the age of 12-23 months. At first, mothers who gave birth to child between 01-12-2006 and 30-11-2007 were searched at every household for making a list. Secondly, a sampling frame with all eligible mothers was made. Seven mothers were selected randomly to examine their TT vaccination and post partum Vitamin A status through a pre-designed structured questionnaire.

A total of 5,670 child samples were interviewed for the childhood vaccination coverage survey; out of which, 3150 children represented districts and 2520 six administrative divisions, which included rural areas, municipalities, and city corporations.

3.2 TT VACCINATION

Maternal and neonatal tetanus (MNT) can be prevented by effective vaccination. MNT is the most common form of tetanus in the developing countries, and is responsible for about 5% of global neonatal mortality[1,2]. Based on the 2004 global figures by the World Health Organization (WHO) report, it was estimated that 290,000 people died because of tetanus, including 257,000 cases of neonatal tetanus (NT). The tetanus anti-toxin is passively transferred from the immunized mother to the fetus and provides transient protection from tetanus to the newborn infant[3].

[1] World Health Organization. Tetanus Surveillance, Assessment and Monitoring, http://www.who.int/topics/tetanus/en.

[2] Vandelaer, J, et al: tetanus in developing countries: an update on the maternal and neonatal tetanus elimination initiative. Vaccine 21, 3442-3445, 2003

[3] Galazka, A.M. The immunological basis for immunization series, Module 3: Tetanus. Global Program for Vaccines and Immunization. WHO/EPI/Gen/93.13 WHO 1993

In 1989, the World Health Assembly called for the elimination of NT, with elimination being defined as less than one case of NT per 1000 live births at the district level. The year 2005 was mentioned as the target date for the worldwide elimination of NT by all member states of WHO, United Nations Children's Fund (UNICEF), and United Nations Population Fund (UNFPA)[4]. According to the reports, 104 developing countries had achieved this goal by 2000, but MNT was still a public health problem in 57 developing countries. EPI Bangladesh also committed to achieve this goal through vaccinating women of Child Bearing Age (CBA) with TT vaccines.

A woman needs a total of five doses TT vaccine to get tetanus antibody during the whole reproductive period; and these should be administered according to the EPI vaccination guideline: TT1, the first dose, as soon as she reaches the age of 15 years; TT2, four weeks or more after TT1 is given; TT3, six months or more, after TT2; TT4, one year or more, after TT3; and TT5, one year or more, after TT4.

Since a single dose of TT does not make any antibody against tetanus, it requires two doses of duly administered TT vaccines to create antibody for 3 years. TT3 creates antibody for 5 years, TT4 for 10 years, and after administering TT5 a woman gets tetanus antibody for her whole reproductive life.

Table A5 below shows the complete TT vaccination schedule.

TABLE A5

The TT Vaccination Schedule

TT Doses	Minimum Interval between Doses	Years Protected
TT1	Age of 15 years	0
TT2	4 weeks after TT1	3 years after the administration of TT2
TT3	6 months after TT2	5 years after the administration of TT3
TT4	1 year after TT3	10 years after the administration of TT4
TT5	1 year after TT4	Reproductive period

3.3 LEVELS OF THE TT COVERAGE

EPI CES 2007 gathered TT information from the mothers who had given birth to children between the period of 01-12-2006 and 30-11-2007 to assess protection level of newborn child. TT status of the surveyed mothers was analyzed as TT vaccination coverage (previously termed valid) achieved following proper immunization schedule and crude TT vaccination coverage.

Access to TT vaccination is defined as crude vaccination coverage irrespective of TT vaccination schedule. Access to TT vaccination service was displayed by Figure F. Figure F1 shows that 47 percent of the mothers received TT 5, and 93 percent TT2. The urban-rural variation was marked lower with 51

[4] WHO, UNICEF and UNFPA: Maternal and Neo-natal Tetanus Elimination by 2005. Strategies for achieving and maintaining elimination. WHO/V&B/02.09.WHO, Geneva, Switzerland. 2000

percent mothers of rural area as against 43 percent of the urban area. Difference in coverage of TT2 was 2 percentage points between urban (94 percent) and rural (92 percent) areas. Nationally, a gradual decreasing trend in coverage was observed in the findings. Among the surveyed mothers, 81 percent received TT3, and 64 percent TT4. The declining trend was similar in both the rural and urban areas. Eighty-three percent of the surveyed rural mothers received TT3 as against 79 percent in urban areas. For TT4, 68 percent of the rural mothers received it as against 60 percent in urban mothers (Figure F1).

One-fourth of the total surveyed mothers received 5 doses of valid TT vaccines nationally - 29 percent in rural and 22 percent in urban areas. Prevalence of TT2 was 93 percent with 92 percent in rural and 94 percent in urban areas. A decreasing trend in the coverage of TT3, and TT4 was observed both in urban and rural areas. A little over three-fourths (76 percent) of the surveyed mothers received TT3. The proportion was 78 percent in rural areas as against 74 percent in urban areas. About half (49 percent) of the mothers received TT4 nationally. By area type, the coverage was 54 percent in the rural and 44 percent in the urban areas (Figure F2).

The above analysis indicates the protection status of the women against tetanus by time period. Lifetime protection was acquired by 25 percent mothers nationally. It is 29 percent in rural areas and 22 percent in urban areas. As per the neonatal tetanus is concerned, the programme personnel would be more interested about TT2 coverage. The analysis shows that 93 percent of the surveyed mothers achieved protection status against tetanus nationally - 92 percent in rural and 94 percent in urban areas. It is important to mention here that this TT2 coverage does not always indicate the PAB status of children of the surveyed mothers. PAB status is discussed separately in this report.

3.4 TRENDS IN CRUDE TT COVERAGE

Figure F3 shows the national trend of crude coverage of TT2 and TT3. It shows that TT3 coverage is increasing rapidly without any fluctuation since 2000. It increased 56 percent to 81 percent between 2000 and 2007. Compared to the CES 2006, TT3 coverage rate increased by 1 percentage point (80 percent in 2006, and 81 percent in 2007). On the other hand, TT2 coverage is increasing slowly with fluctuations. By the same period, this coverage increased by 4 percentage points. Eighty-nine percent of the surveyed mothers received TT2 in 2000. It increased to 93 percent in 2007. Although the overall coverage rate increased by 4 percentage points by this period, it declined by 1 percentage point compared to the CES 2006 (Figure F3).

Trends in the crude TT coverage by divisions were shown in Figure F4-F9. Since 1997, a significant increase in the crude coverage of TT2 was noticed in every division. Between 2002 and 2007, crude TT2 coverage increased in Dhaka division from 91 percent to 95 percent, and in Chittagong division from 90 percent to 97 percent. The rate has increased from 90 percent to 96 percent in Rajshahi division, and from 86 percent to 94 percent in Barisal division. However, in Khulna division, the coverage rate decreased by 1 percentage point (92 percent to 91). Compared to 2006, it deceased by 4 percentage points in 2007. TT2 coverage rate was 95 percent in 2006, which decreased to 91 percent in 2007. Likewise, Sylhet divisions' coverage rate decreased from 90 percent in 2006 to 86 percent in 2007. Over the period 2002-2007, the overall increase in coverage rate in Sylhet division was 6 percentage points (Figure F4).

3.5 RURAL COVERAGE BY DIVISION

The crude TT coverage in the rural areas by divisions is displayed in Figure F10. Access to TT1 vaccination was the highest in Rajshahi division (99 percent) and the lowest in Sylhet division (94 percent). The Coverage rate was intermediary that ranged from 96 percent in Chittagong and Khulna divisions to 97 percent in Dhaka division. Barisal division with 98 percent had the second highest coverage rate.

The highest coverage rate of TT2 was observed in Rajshahi division (96 percent), which was followed by Dhaka and Barisal divisions (95 percent). The coverage rate was 93 percent in Chittagong and Khulna divisions. However, the coverage rate was the lowest in Sylhet division (91 percent).

As expected, TT3 coverage rate was lower compared to TT2 in every division. The highest TT3 coverage rate was again revealed in Rajshahi division (88 percent) and the lowest in Sylhet division (81 percent). Coverage of other divisions was 85 percent in Khulna and Barisal, which was followed by Chittagong (79 percent) and Dhaka divisions (77 percent).

Similar to TT3 coverage, TT4 coverage was the best in Rajshahi division (80 percent). TT4 coverage was the lowest in Dhaka division. Coverage of other divisions was in intermediary level that ranged from 64 percent in Sylhet division to 69 percent in Barisal division.

Access to TT5 vaccination was the lowest in Khulna division (43 percent) and the highest in Rajshahi division (62 percent). Barisal division scored the second highest position for TT5 coverage with 53 percent, and it was followed by Dhaka division (46 percent), Chittagong division (50 percent), and Sylhet division (47 percent).

In terms of valid TT vaccination coverage, the survey findings show that the TT1 coverage was almost universal for all the divisions except Sylhet and Khulna. The coverage rate was at or above 96 percent for Dhaka, Chittagong, Rajshahi, and Barisal divisions. The lowest TT1 coverage rate was revealed in Sylhet division (90 percent), being followed by Khulna division with 94 percent (Figure F11).

In most of the cases, TT2 vaccination coverage was related to PAB. One dose of TT does not make any antibody against tetanus. To protect the child against tetanus at birth throughout the reproductive period, a woman should take all the 5 doses of TT vaccines following EPI vaccination schedule, or completion of 2 doses of TT by maintaining proper vaccination schedule at least 1 month prior to the delivery of the child. Analysis of EPI CES 2007 revealed that the TT2 coverage was the highest in Chittagong division (96 percent) and the lowest in Sylhet division (87 percent). The coverage rate of other divisions ranged from 91 percent in Khulna division to 95 percent in Rajshahi division.

Likewise, TT3 vaccination coverage rate was also the highest in Chittagong division (84 percent) and the lowest in Dhaka division (73 percent). Coverage rates of other divisions were 81 percent in Rajshahi, 78 percent in Barisal and Khulna, and 77 percent in Sylhet divisions.

Regarding the TT4 coverage among the surveyed mothers, the highest coverage was in Chittagong division with 65 percent and the lowest coverage rate was in Barisal division having 48 percent. The rates were at or over 50 percent in other divisions (Figure F11).

Similarly, TT5 coverage rate was found the highest in Chittagong division (41 percent) and the lowest in Barisal division (21 percent). The coverage rate was 27 percent in Rajshahi and Sylhet divisions, which was being followed by Khulna (29 percent) and Dhaka divisions (28 percent).

3.6 TT COVERAGE BY CITY CORPORATION

Crude TT vaccination coverage rate is shown in Figure F12. By city corporations, access to TT vaccination was found the same in DCC, CCC, and RCC (99 percent). The rate was found to be the lowest in SCC (90 percent), which was being followed by KCC (95 percent) and BCC (97 percent).

TT2 coverage was found to be the highest in CCC (98 percent) and the lowest in SCC (84 percent). The coverage rate in other city corporations was intermediary and ranged from 91 percent in KCC to 97 percent in RCC. The rate was 96 percent in DCC, which was followed by BCC (94 percent). Likewise, TT3 coverage rate was found to be the highest in RCC (89 percent) and the lowest in SCC (66 percent). The second lowest coverage rate was revealed in BCC and KCC (81percent). However, the intermediary coverage rate was found in DCC (76 percent) and RCC (71 percent). Furthermore, coverage rate of TT4 was the highest in RCC (71 percent), which was followed by KCC (66 percent), CCC (62 percent), BCC (60 percent), DCC (55 percent), and SCC (45 percent).

Among the surveyed mothers, TT5 dose was found to be the highest in RCC (50 percent) and the lowest in SCC (31 percent). The rates of other city corporations' ranged from 41 percent to 45 percent (Figure F12).

Valid TT vaccination coverage is shown in Figure F13. TT2 coverage was the highest in CCC (98 percent) while SCC had the lowest TT2 coverage rate (84 percent). However, the TT2 coverage rate was at or above 91 percent in other city corporations.

More than four-fifths of the surveyed mothers received TT3 in RCC as against 78 percent in KCC, 76 percent in BCC, 68 percent in DCC, and 57 percent in SCC. Fifty-six percent of the mothers received TT4 in RCC, which was followed by KCC (54 percent), CCC (46 percent), BCC (39 percent), DCC (38 percent), and SCC (30 percent).

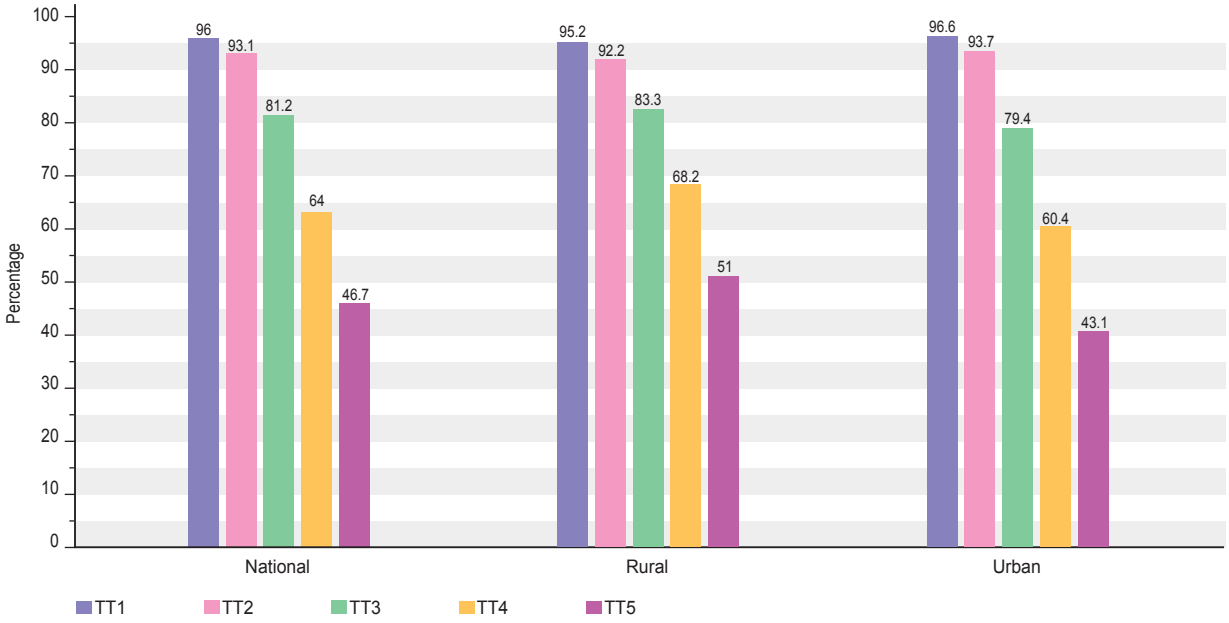
The coverage of TT5 dose was found to be the highest in RCC (31 percent) and the lowest in SCC and BCC (16 percent). About one-third (28 percent) of the surveyed mothers of KCC and one-fourths of the mothers of CCC received it (Figure F13).

3.7 LEVELS OF THE COVERAGE BY SURVEY UNIT

As ready reference, rates of the valid TT coverage among the mothers aged 15-49 years by Divisions/city corporations are given in Appendix. Valid TT2 coverage rates among the mothers with 0-11 month old children by Divisions/city corporations are also presented in the Appendix.

FIGURE F1

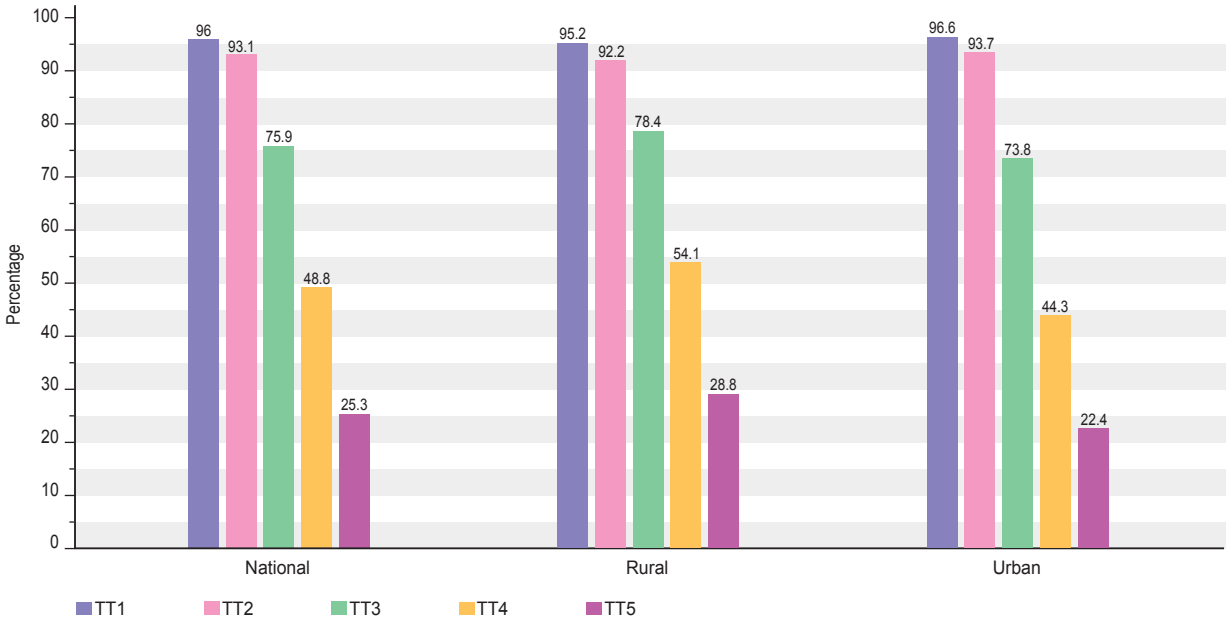
Crude TT Vaccination Coverage among Mothers of 0-11 Months Old Children by National, Rural and Urban Areas in 2007(Card+History)



Source: CES 2007

FIGURE F2

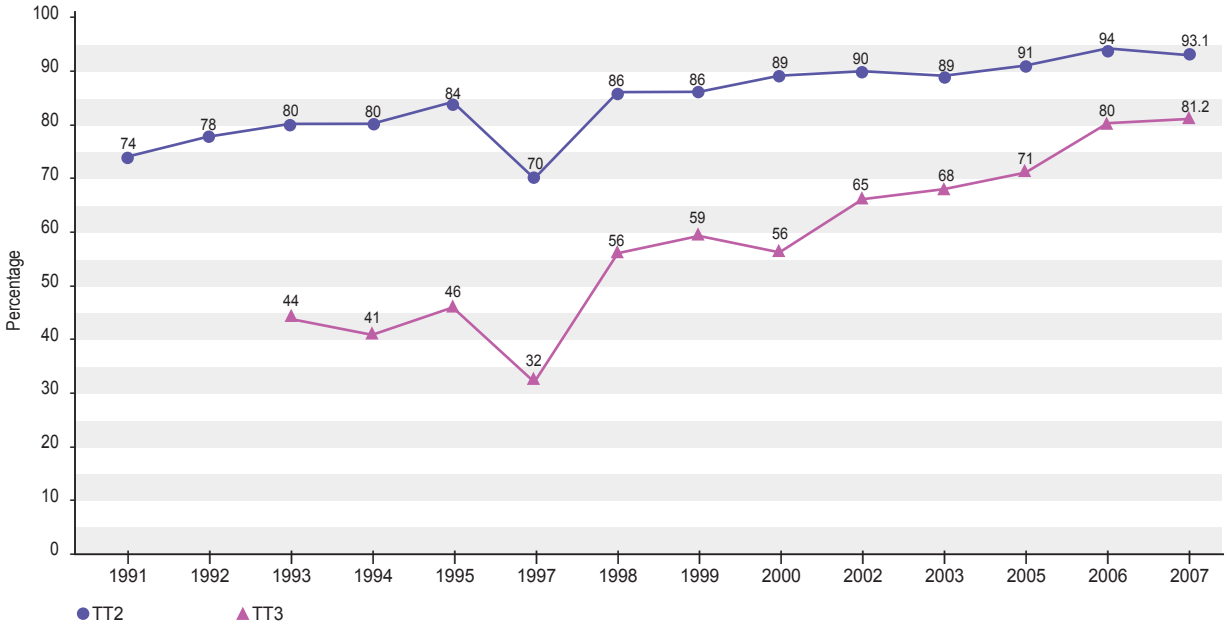
Valid TT Vaccination Coverage among Mothers of 0-11 Months Old Children by National, Rural and Urban Areas in 2007 (Card+History)



Source: CES 2007

FIGURE F3

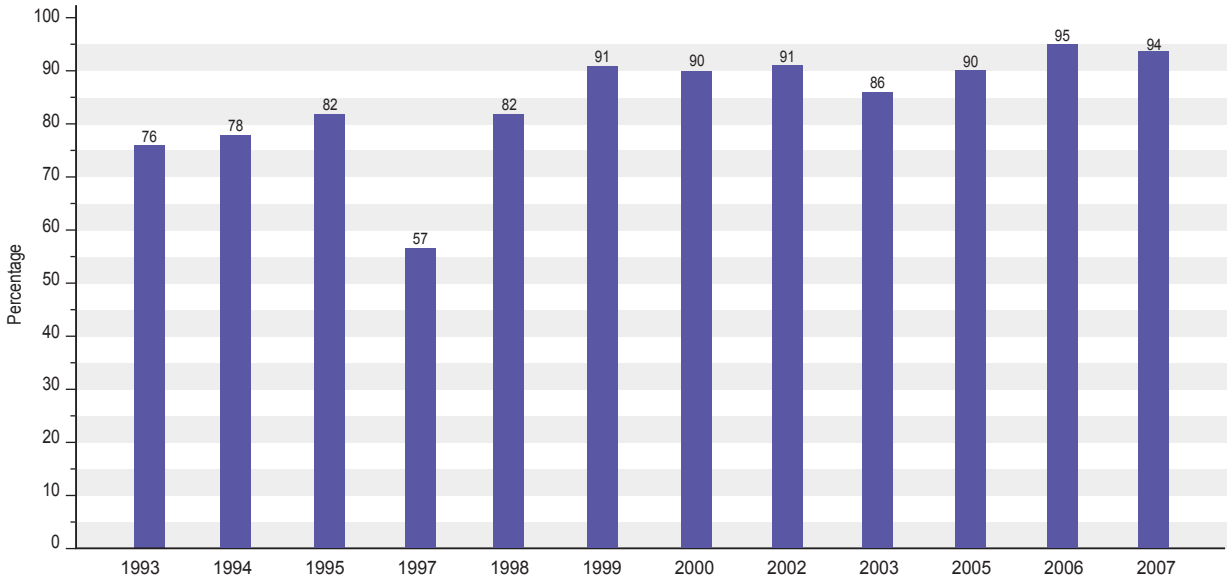
Annual Trend in Crude TT Vaccination Coverage among Mothers of 0-11 Months Old Children at National Level from 1991 to 2007* (Card+History)



Source: Coverage Evaluation Survey 1991-1995, 1997-2002, 2003, 2005, 2006 & 2007
** Since the TT3 coverage rate was not available for 1992, it is given from 1993 instead of 1991.*

FIGURE F4

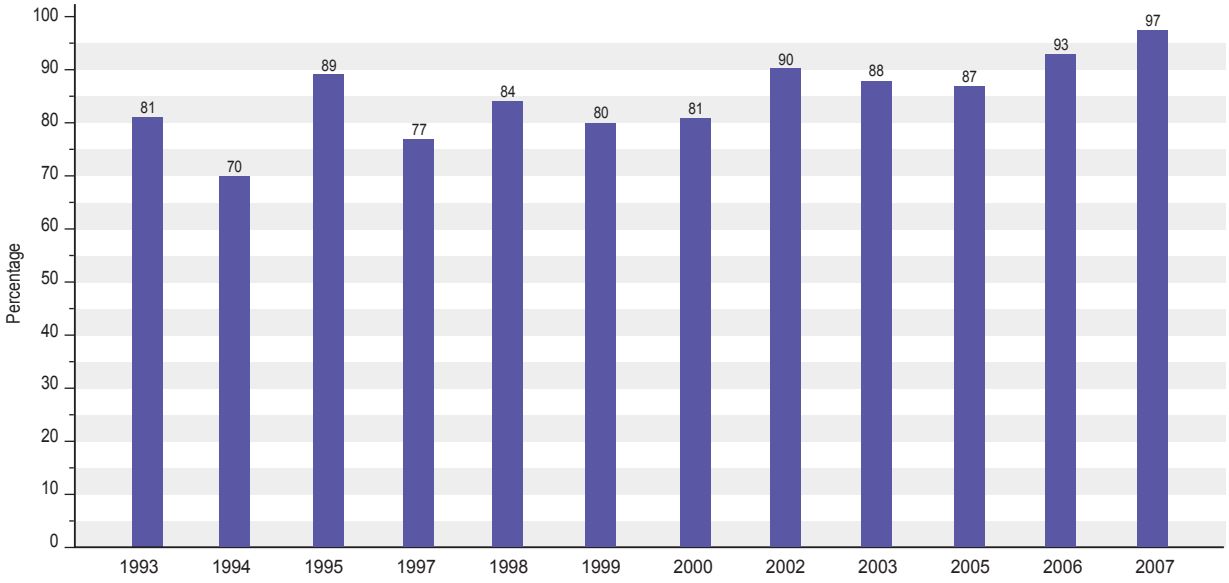
TT2 Vaccination Coverage among Mothers of 0-11 Months Old Children by Dhaka Division from 1993 to 2007 (Card + History)



Source: CES 2007

FIGURE F5

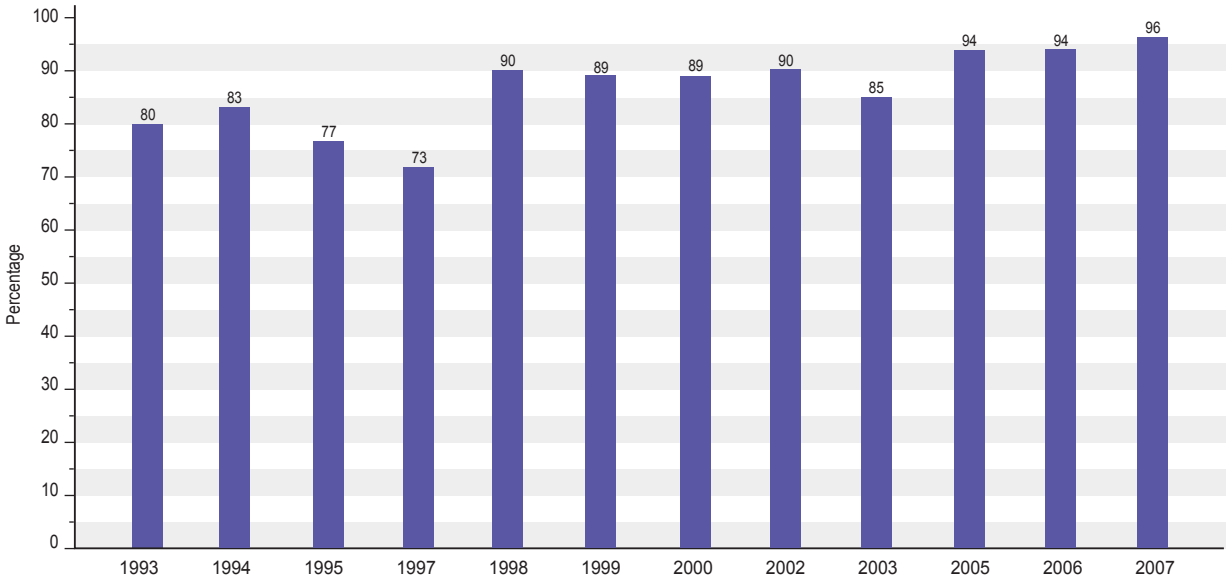
TT2 Vaccination Coverage among Mothers of 0-11 Months Old Children by Chittagong Division from 1993 to 2007 (Card + History)



Source: CES 2007

FIGURE F6

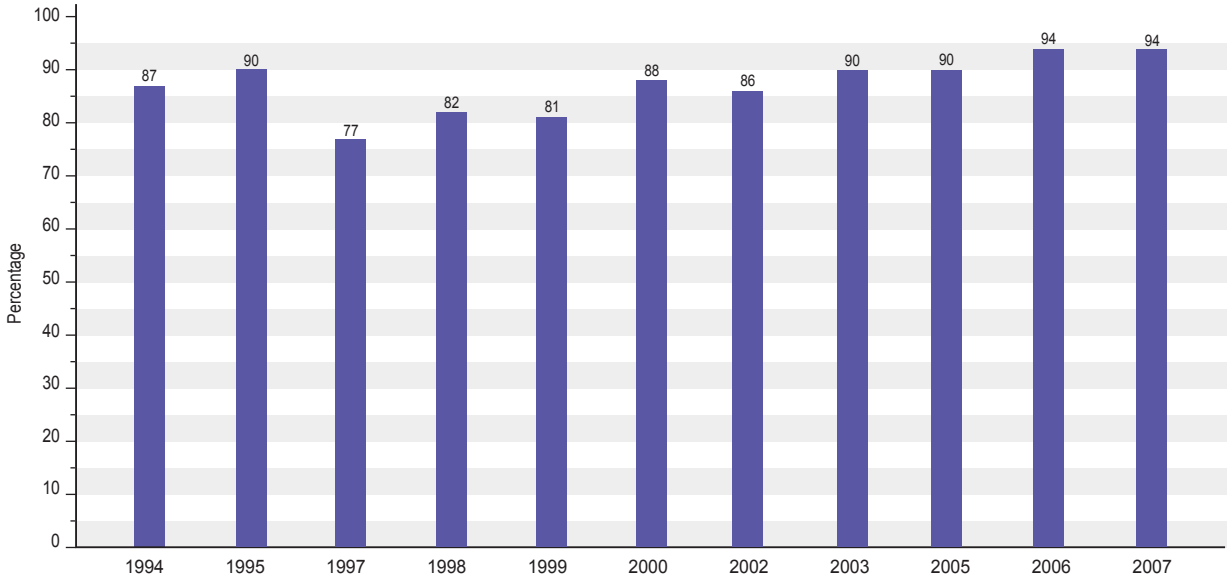
TT2 Vaccination Coverage among Mothers of 0-11 Months Old Children by Rajshahi Division from 1993 to 2007 (Card + History)



Source: CES 2007

FIGURE F7

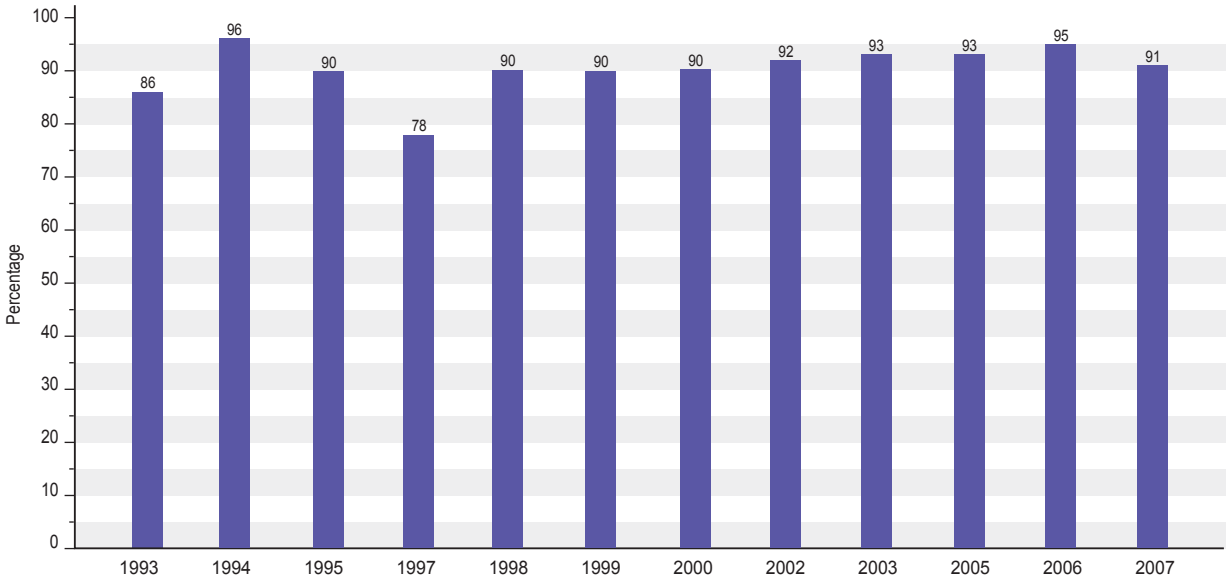
TT2 Vaccination Coverage among Mothers of 0-11 Months Old Children by Barisal Division from 1994 to 2007 (Card + History)



Source: CES 2007

FIGURE F8

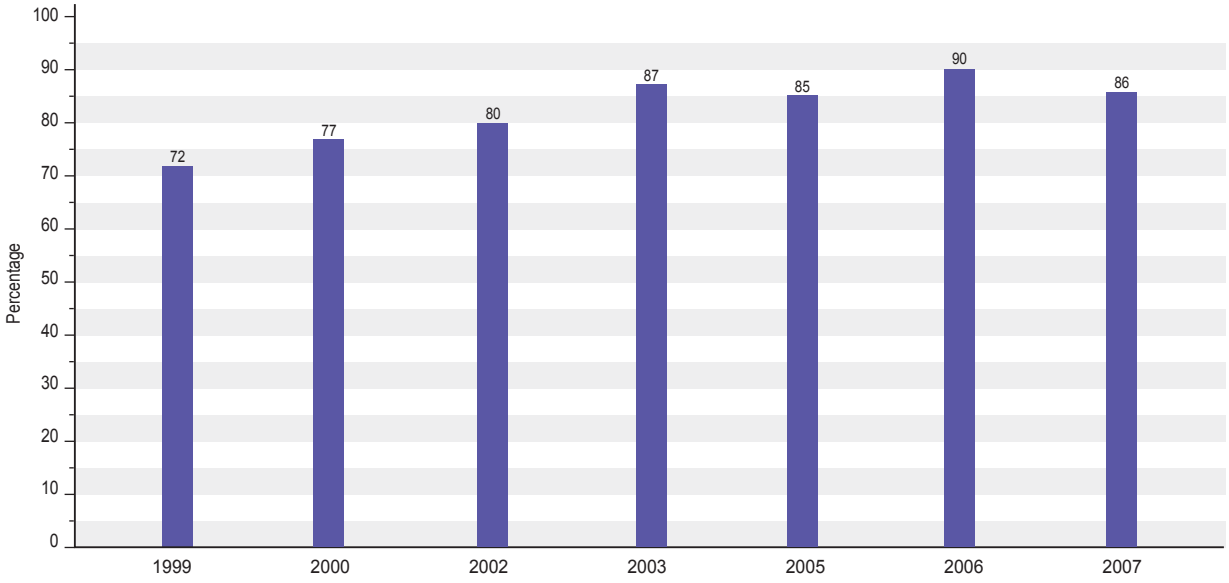
TT2 Vaccination Coverage among Mothers of 0-11 Months Old Children by Khulna Division from 1993 to 2007 (Card + History)



Source: CES 2007

FIGURE F9

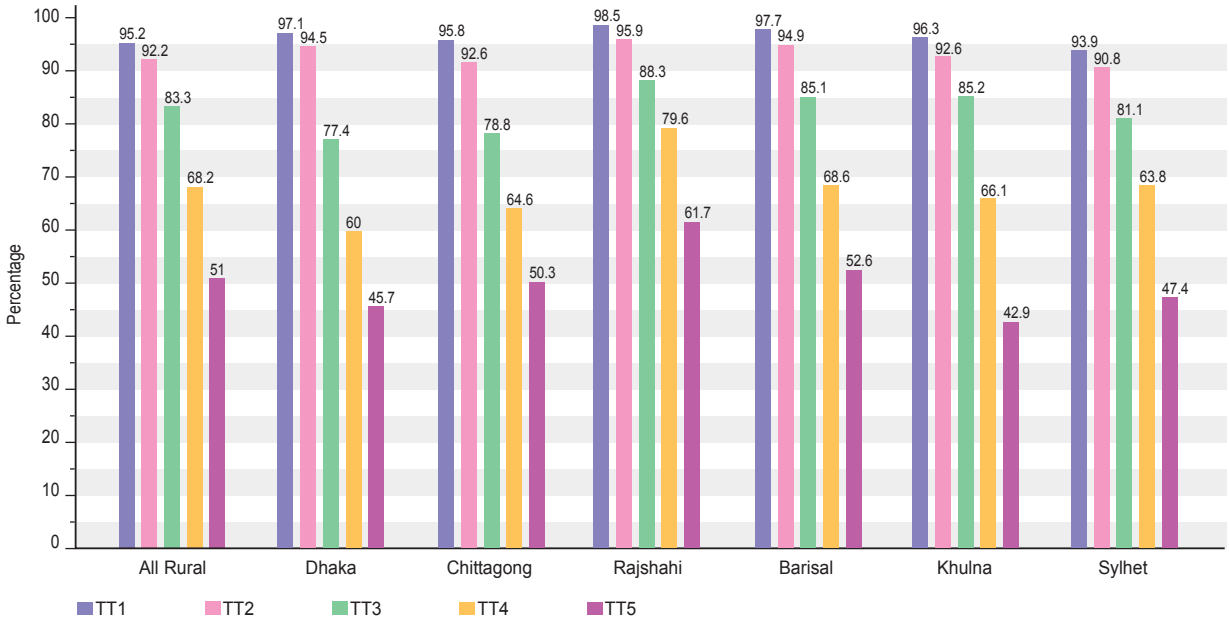
TT2 Vaccination Coverage among Mothers of 0-11 Months Old Children by Sylhet Division from 1999 to 2007 (Card + History)



Source: Coverage Evaluation Surveys (CESs) for 1994-1995, 1997, 2002, 2003, 2005, 2006 & 2007
Note: Before 1999, Sylhet division was a part of Chittagong division.

FIGURE F10

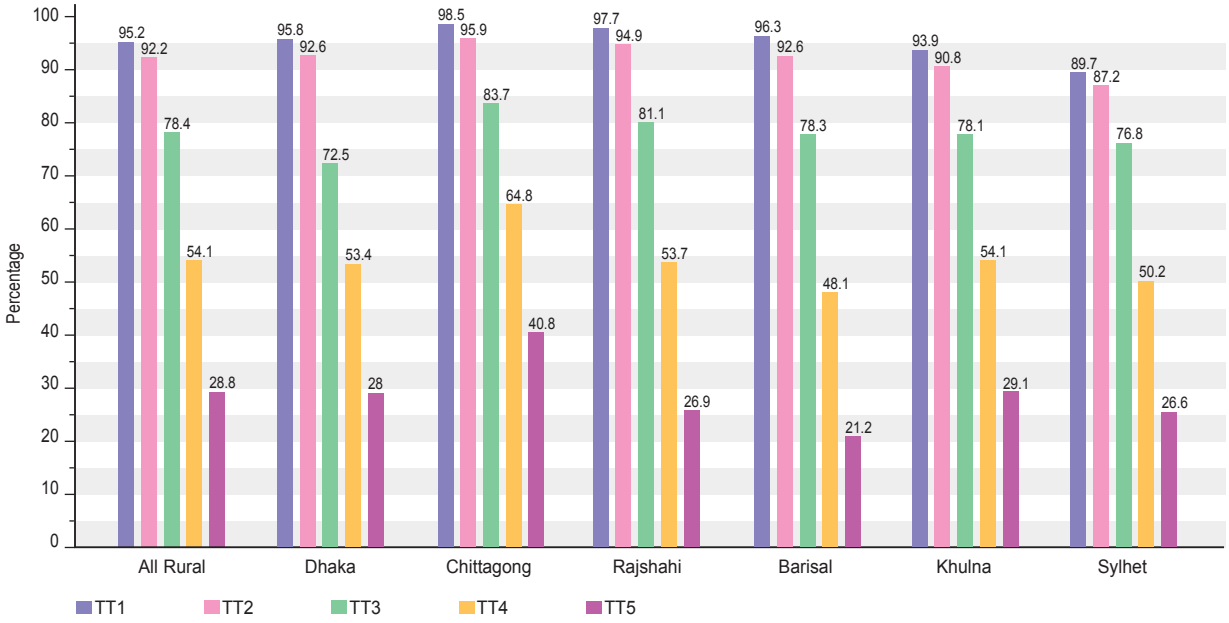
Crude TT Vaccination Coverage among Mothers of 0-11 Months Old Children in Rural Areas by Division in 2007(Card+History)



Source: CES 2007

FIGURE F11

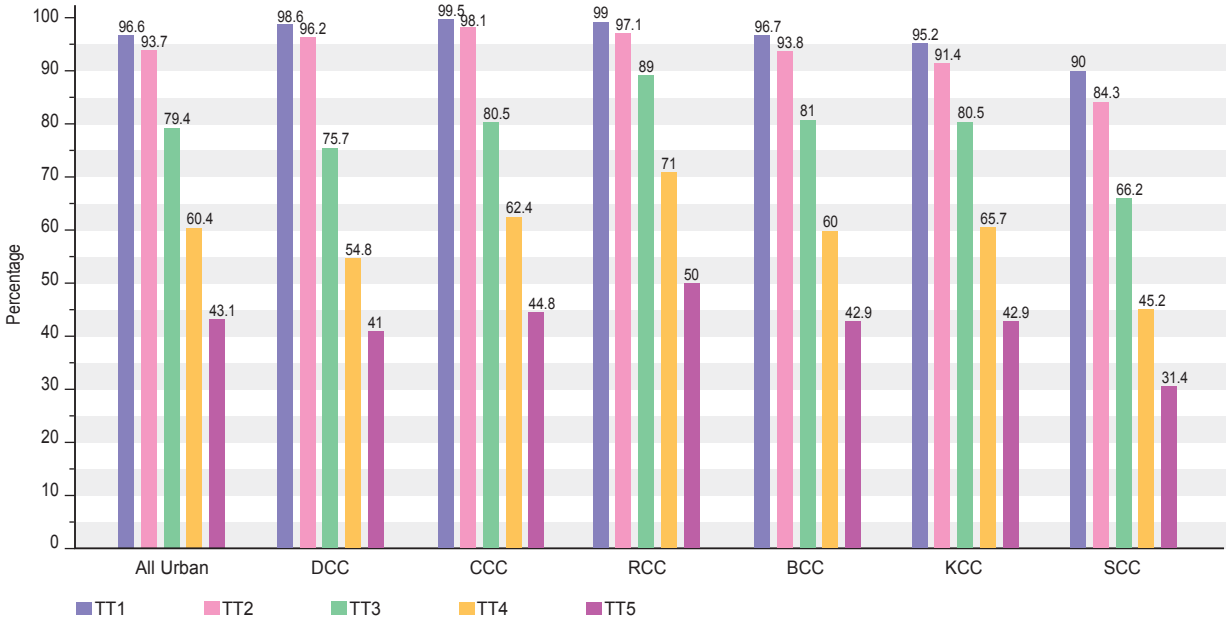
Valid TT Vaccination Coverage among Mothers of 0-11 Months Old Children in Rural Areas by Division in 2007 (Card+History)



Source: CES 2007

FIGURE F12

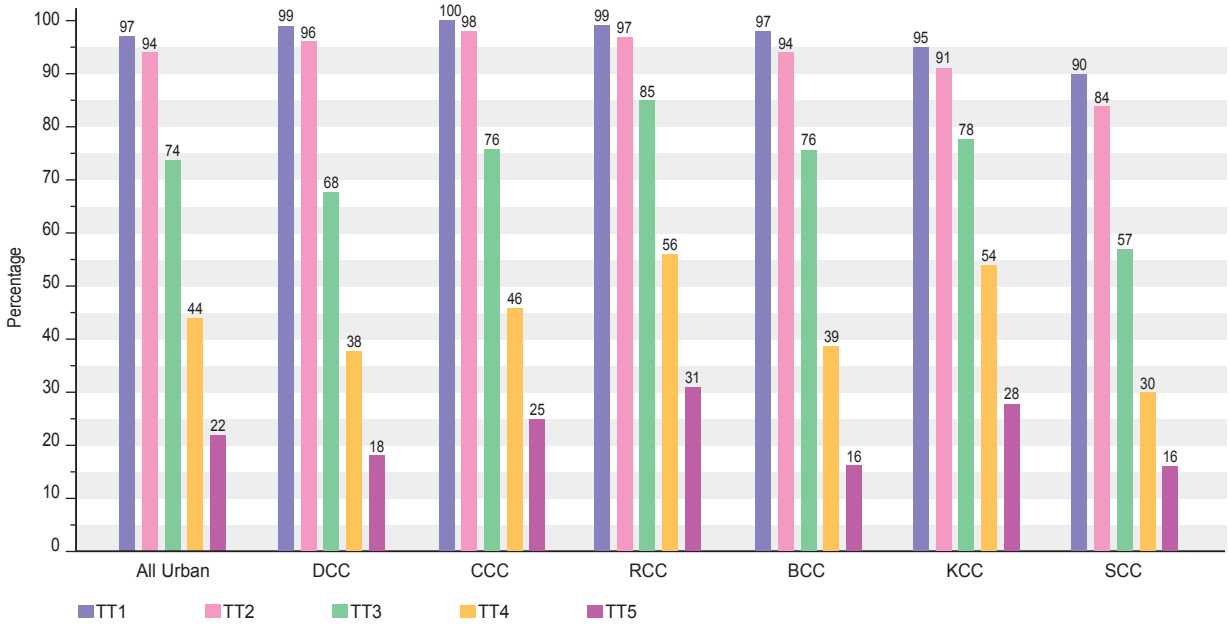
Crude TT Vaccination Coverage among Mothers of 0-11 Months Old Children in Urban Areas by City Corporation in 2007 (Card+History)



Source: CES 2007

FIGURE F13

Valid TT Vaccination Coverage among Mothers of 0-11 Months Old Children in Urban Areas by City Corporation in 2007 (Card+History)



Source: CES 2007

3.8 TT CARD STATUS AMONG MOTHERS

Availability of TT vaccination cards was assessed among the surveyed mothers. Findings were displayed in Figure G1. Nationally, card retention rate revealed 48 percent urban rural variation: it was 4 percentage points (50 percent in rural and 46 percent in urban areas).

In rural areas by division, retention rate was the highest in Khulna division (57 percent) and the lowest in Dhaka division (44 percent). The intermediary rates ranged from 45 percent in Sylhet division to 53 percent in Rajshahi division (Figure G2).

Likewise, among the city corporations card retention rate was the highest in RCC and CCC (50 percent) and the lowest in DCC (32 percent). About half (49 percent) of the mothers in KCC and 46 percent in SCC retained the card. Similarly, 45 percent of the surveyed mothers of BCC retained it (Figure G3).

The above data shows higher card retention rate among the rural mothers compared to the urban mothers. Among the rural areas by division, card retention rate was the lowest in Dhaka division. Similar to Dhaka division, the retention rate was the lowest in DCC. The programme personnel should give more effort to motivate mothers of Dhaka division and city corporation along with other divisions to retain the card since more than half of the mothers are not retaining it nationally.

3.9 INCIDENCE OF INVALID DOSES

Figure G4 shows the incidence of invalid TT doses among the surveyed mothers. It shows that the incidence was more prevalent for TT3. About one-fourth of the total surveyed mothers received invalid

dose of TT3 nationally. The rural-urban variation was 4 percentage points (26 percent in rural as against 22 percent in urban areas). Invalid rate of TT4 revealed 16 percent nationally - 15 percent in rural and 17 percent in urban areas. However, for TT5 the rate was 20 percent (23 percent in rural and 17 percent in urban areas).

In rural areas by division, a little over one-fourth of the women found to be received invalid TT3 and TT5 in Dhaka division. Invalid rate of TT3 dose was the highest (32 percent) in Chittagong division and the lowest (15 percent) in Khulna division. Invalid rate ranged from 25 to 29 percent in other divisions. However, for TT4 dose invalid rate found to be the highest in Rajshahi and Barisal divisions (17 percent) and the lowest in Khulna division (12 percent). In contrast, the invalid rate of TT5 dose found to be the lowest in Khulna division and the highest in Dhaka division (27 percent). For other divisions, the rate ranged from 19 percent in Rajshahi division to 26 percent in Chittagong and Sylhet divisions (Figure G5).

Among the city corporations, the highest rate of invalid TT3 dose was revealed in BCC (27 percent) and the lowest in KCC (11 percent). Similarly, BCC had the highest (22 percent) invalid TT4 dose compared to other city corporations. However, invalid rate of TT4 dose was the lowest in CCC and RCC (14 percent) (Figure G6). It was revealed in the findings that the invalid doses of TT5 was the highest in CCC (22 percent) and the lowest in KCC (10 percent).

Analysis of the Figures G4-G6 shows that there was no invalid dose for TT2. This might be the result of receiving TT2 within a short period of time after getting TT1 (at least 28 days after TT1). The highest invalid dose for TT3-TT5 can be minimized through increasing the card retention rate as well as refraining oneself from administering unnecessary dose even the newborn is protected. EPI programme can save a huge number of vaccine through effective communication programme.

3.10 SCREENING FOR TT VACCINATION OF MOTHERS

Screening of mothers while vaccinating child is the most important opportunity to increase TT vaccination coverage rate. Access to vaccination service of child is 89 percent nationally. Mothers mostly accompany the child. This data shows the opportunity to vaccinate for the subsequent dose. Figure G7 shows the screening for TT status of mothers. It shows that overall, 39 percent of the mothers were screened for TT status nationally with 35 percent in the rural and 42 percent in the urban areas.

In rural areas by division, the proportion of the screened mothers was the highest (61 percent) in Khulna and the lowest (25 percent) in Sylhet divisions. The proportion for other divisions ranged from 28 percent in Rajshahi division to 37 percent in Dhaka division (Figure G8).

In the city corporations, the proportion of the screened mothers was the highest in KCC (78 percent), being followed by CCC (58 percent), RCC (51 percent), DCC (28 percent), SCC (23 percent), and BCC (21 percent) (Figure G9).

The above findings show that the missed opportunity was taken for 35 percent of the mothers nationally. Among the rural divisions, the proportion was the lowest in Sylhet (25 percent screened) and the highest in khulna division (61 percent). However, for city corporation the missed opportunity rate was the lowest in BCC (21 percent screened) and the highest in KCC (78 percent). EPI programme should address this high miss opportunity through the health workers.

3.11 CHILDREN PROTECTED AT BIRTH (PAB) AGAINST TETANUS

Protection at birth of the newborn baby in order to reduce NT death is the ultimate outcome of TT vaccination. The EPI CES 2007 estimated the PAB of newborn through examining the time of receiving TT doses against the recommended TT vaccination schedule (shown in Table A1). Nationally, 90 percent of the children are found to be protected at birth against tetanus. The rural-urban variation was 1 percentage point (89 percent in rural and 90 percent in urban areas). The national trend of PAB is shown in Figure G11. The trend shows a slow gradual increase with minor fluctuations in PAB since 1999. PAB against tetanus increased by 7 percentage points - from 83 percent in 1999 to 90 percent in 2007. Compared to that in 2006, PAB status decreased to 3 percentage points - from 93 percent in 2006 to 90 percent in 2007. This might be the result of marginally higher percentage of mothers found to be never receiving TT in the CES 2007.

Among the rural divisions, PAB against tetanus found to be the highest in Rajshahi division (93 percent) and the lowest in Sylhet division (82 percent). Eighty-nine percent of the children were protected at birth against tetanus in Dhaka and Chittagong divisions. Ninety percent or above of the children were protected at birth against tetanus in Barisal and Khulna divisions (Figure G12).

Likewise, proportion of the children protected at birth against tetanus was found same in DCC, CCC, and RCC (96 percent). Eighty-six percent of the newborn of BCC and KCC were protected at birth against tetanus. The proportion was the lowest in SCC (82 percent) (Figure G13).

3.12 TT2 COVERAGE AND PAB STATUS

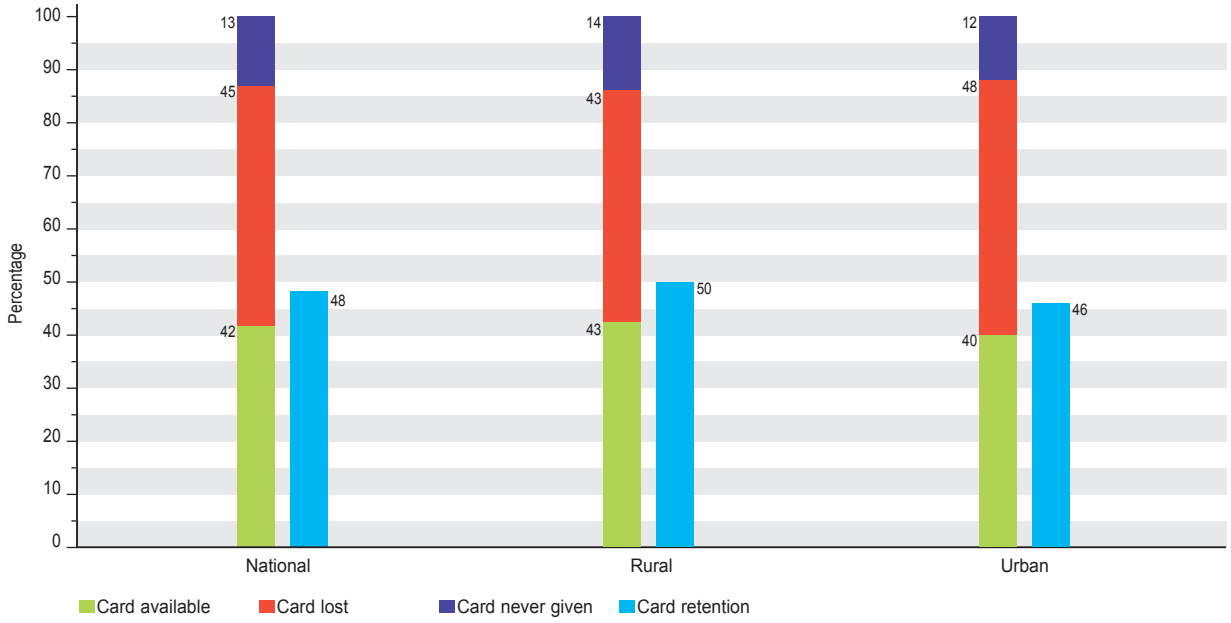
TT2 coverage and PAB status by age are presented in Figures G14-G16. Ninety percent of the newborns were protected nationally although the TT2 coverage rate was 93 percent. By age, differences between PAB and TT2 is more at the age of 40 and above. Sixty-seven percent of the newborns whose mothers' age was or above 40 were protected at birth against tetanus with 82 percent coverage of TT2 dose. However, the difference was found smaller among the lower age groups. There was a marginal difference between the coverage rate of TT2 dose and PAB at the age of 15-19 years (Figure G14).

A similar trend was observed in both the coverage rate and PAB status among the rural areas by divisions and urban areas by city corporations. A gradual decreasing trend in PAB status as against the coverage rate of TT2 dose with the higher age groups was observed in both the divisions and city corporations. Both in the rural divisions and city corporations there was almost no difference between TT2 coverage rate and PAB in the age group of 15-19 years of mothers (Figure G15-G16).

It is important to mention here that the coverage rate of TT2 dose and PAB status is not always related in all cases. For example, a mother can give birth after 4 years of receiving TT2 dose. She can receive 3rd dose of TT during that pregnancy period. Then the newborn is protected in relation to TT3 dose, but not TT2 (because TT2 protects for three years). In contrast, she may not receive any TT dose at that pregnancy period. In that case, her TT2 dose is valid, but in relation to TT2, the child is not protected.

FIGURE G1

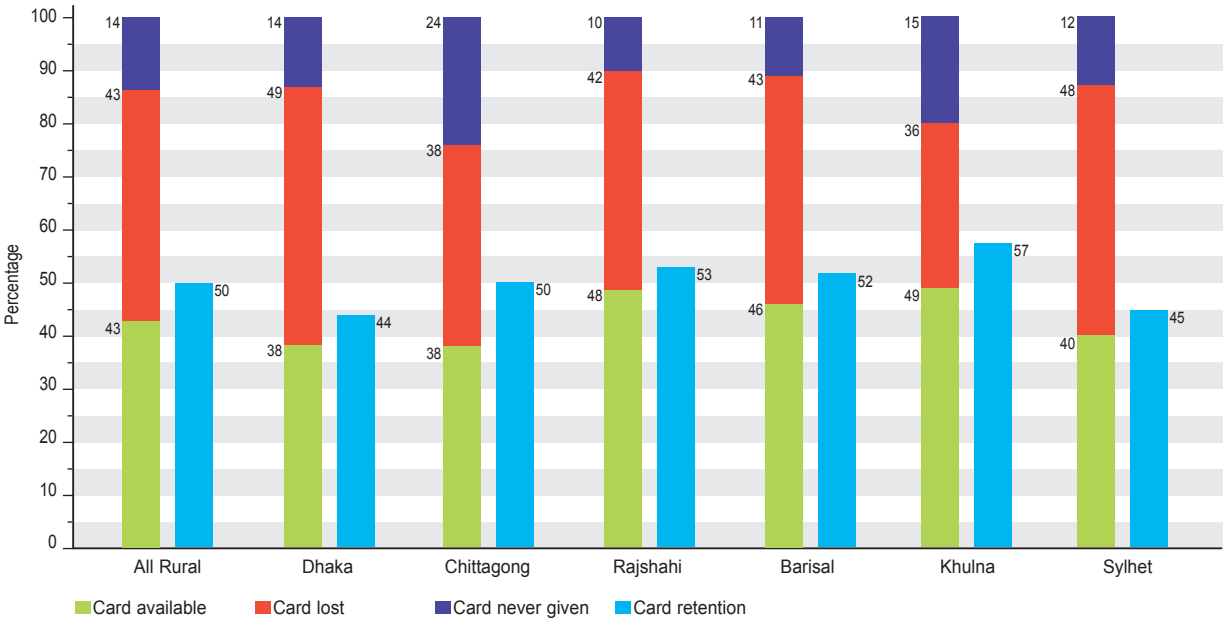
TT Vaccination Card Status among Mothers of 0-11 Months Old Children by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE G2

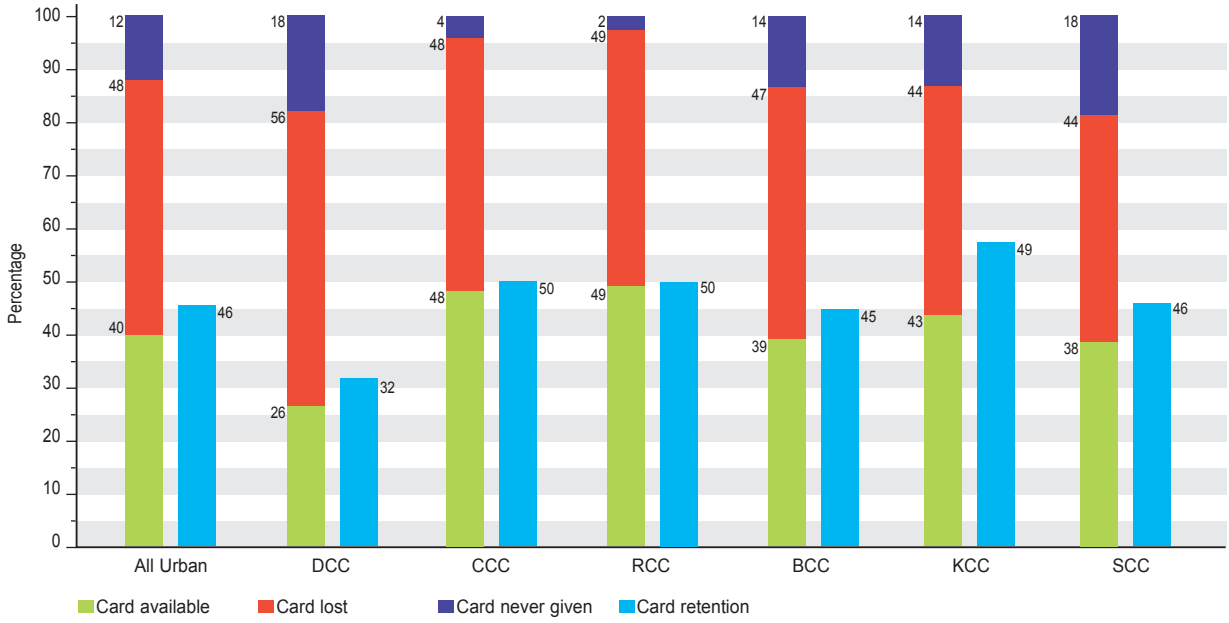
TT Vaccination Card Status among Mothers of 0-11 Months Old Children in Rural Areas by Division in 2007



Source: CES 2007

FIGURE G3

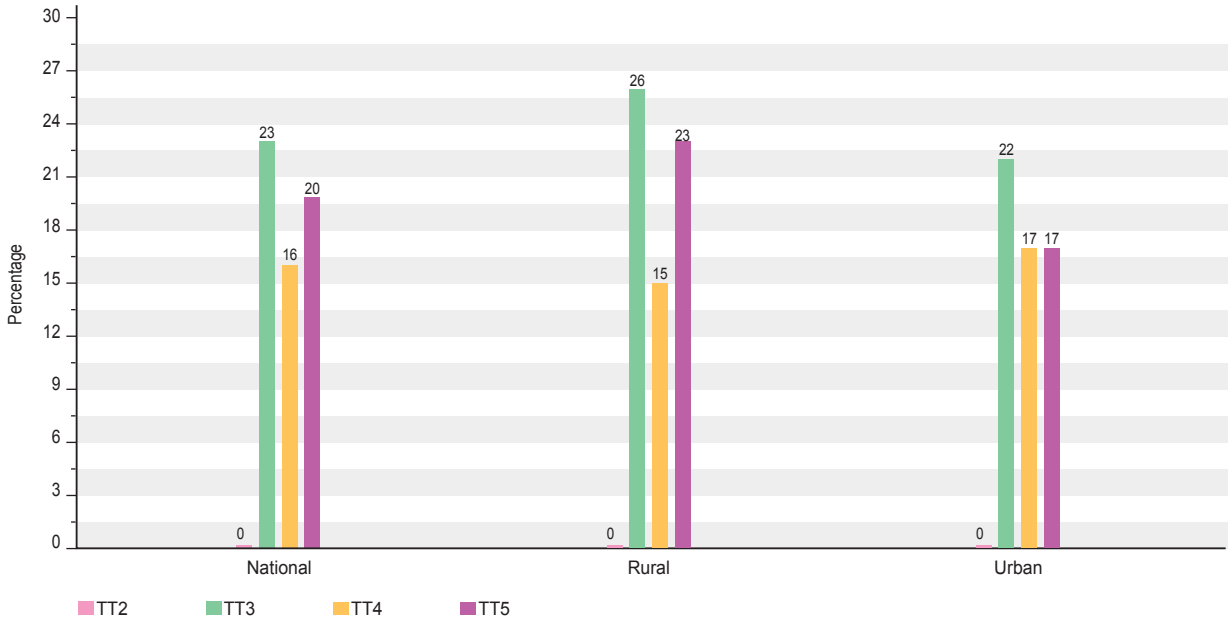
TT Vaccination Card Status among Mothers of 0-11 Months Old Children in Urban Areas by City Corporation in 2007



Source: CES 2007

FIGURE G4

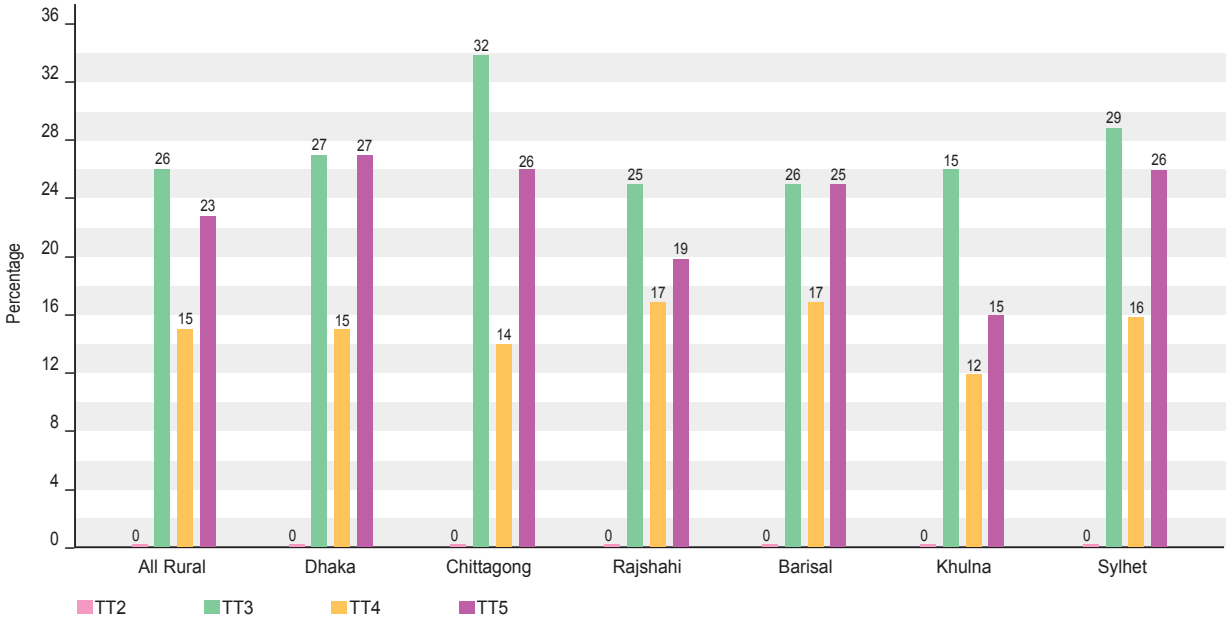
Incidence of Invalid TT Doses among Mothers of 0-11 Months Old Children by National, Rural and Urban Areas in 2007 (Card+History)



Source: CES 2007

FIGURE G5

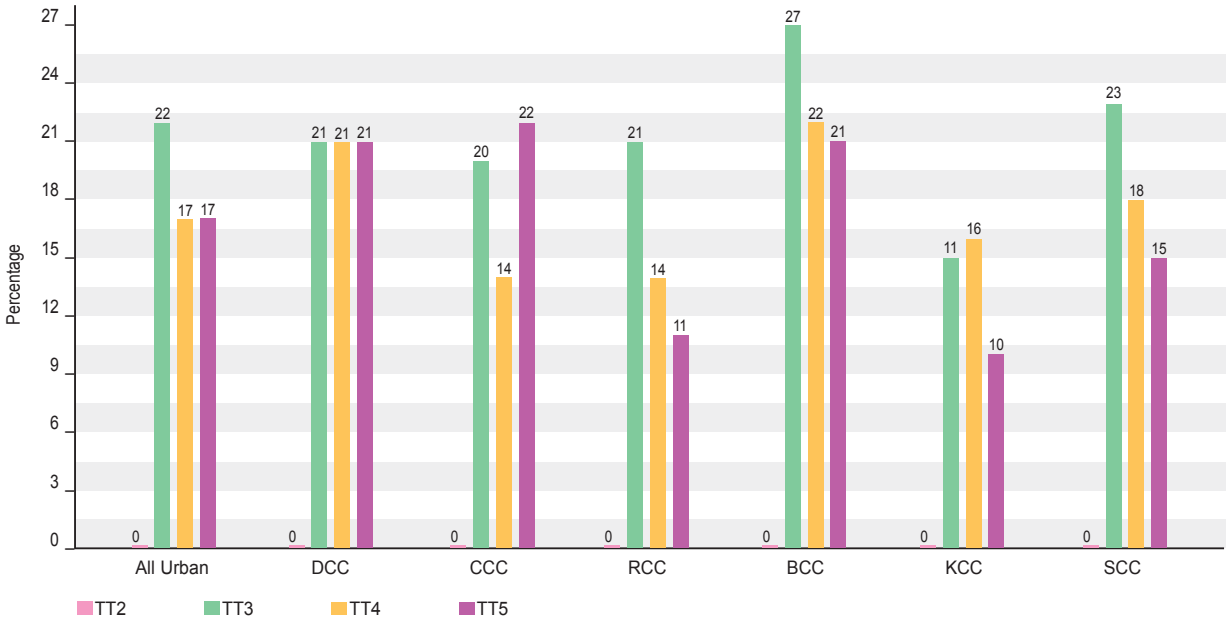
Incidence of Invalid TT Doses among Mothers of 0-11 Months Old Children in Rural Areas by Division in 2007 (Card+History)



Source: CES 2007

FIGURE G6

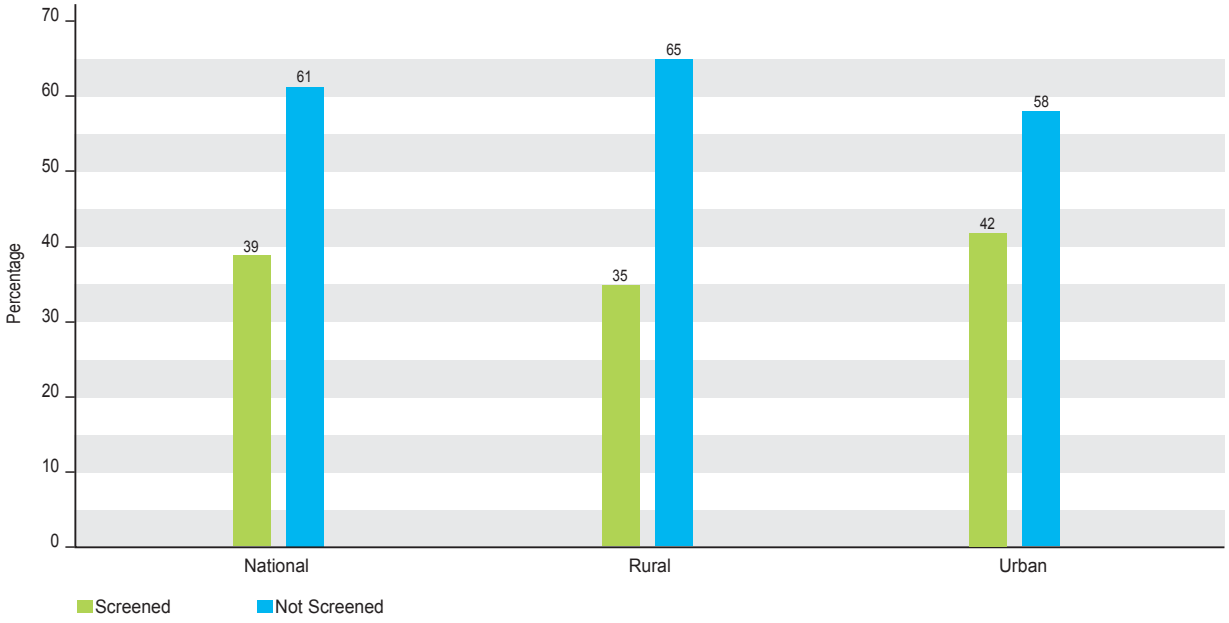
Incidence of Invalid TT Doses among Mothers of 0-11 Months Old Children in Urban Areas by City Corporation in 2007 (Card+History)



Source: CES 2007

FIGURE G7

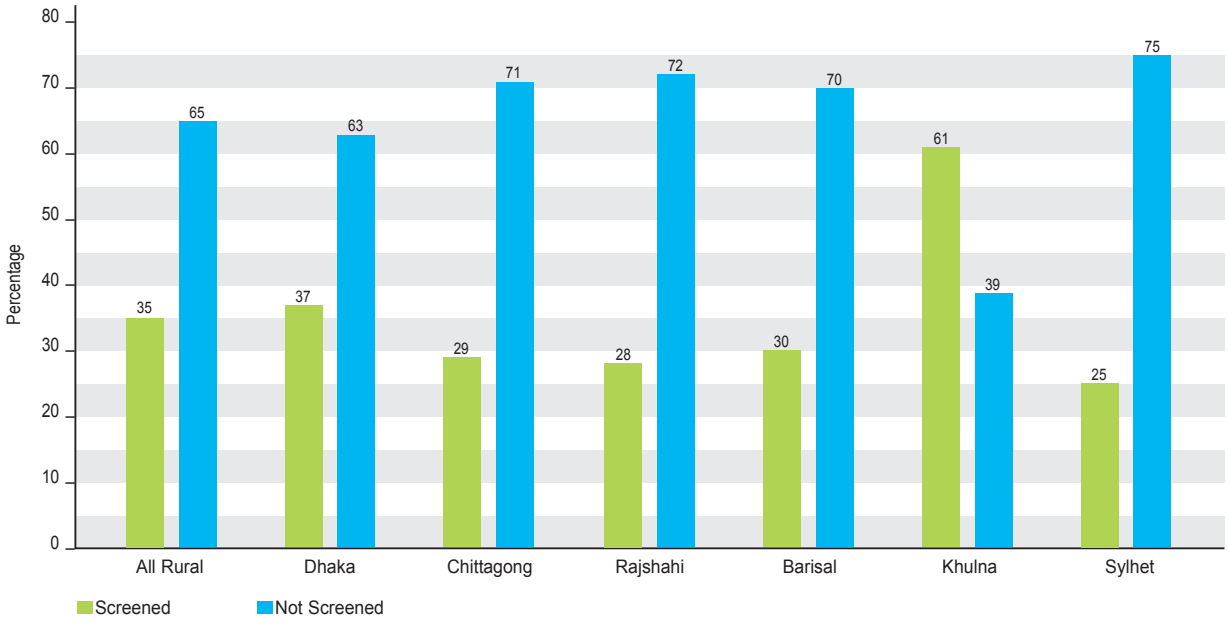
Percentage of Mothers of 0-11 Months Old Children Screened for TT Status during Child's Vaccination by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE G8

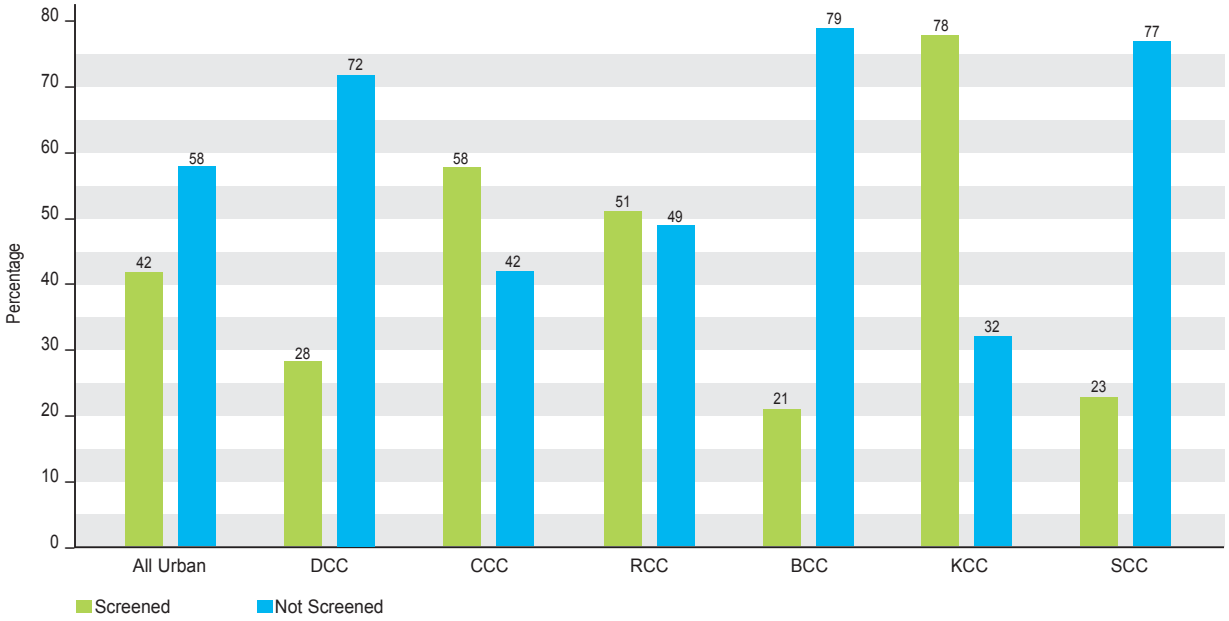
Percentage of Mothers of 0-11 Months Old Children Screened for TT Status during Child's Vaccination in Rural Areas by Division in 2007



Source: CES 2007

FIGURE G9

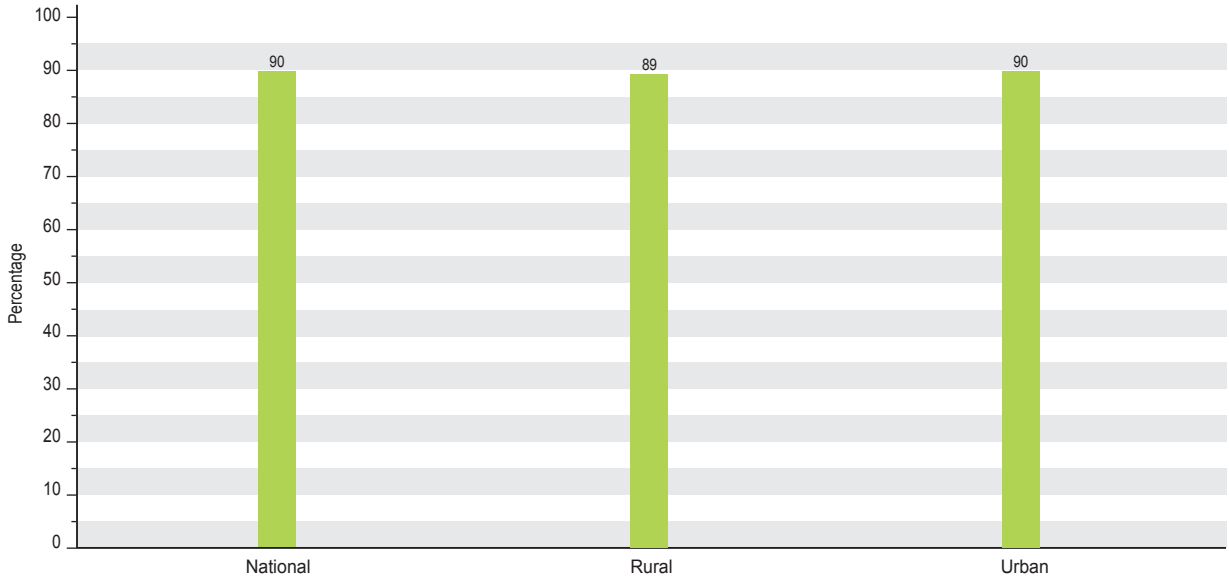
Percentage of Mothers of 0-11 Months Old Children Screened for TT Status during Child's Vaccination in Urban Areas by City Corporation in 2007



Source: CES 2007

FIGURE G10

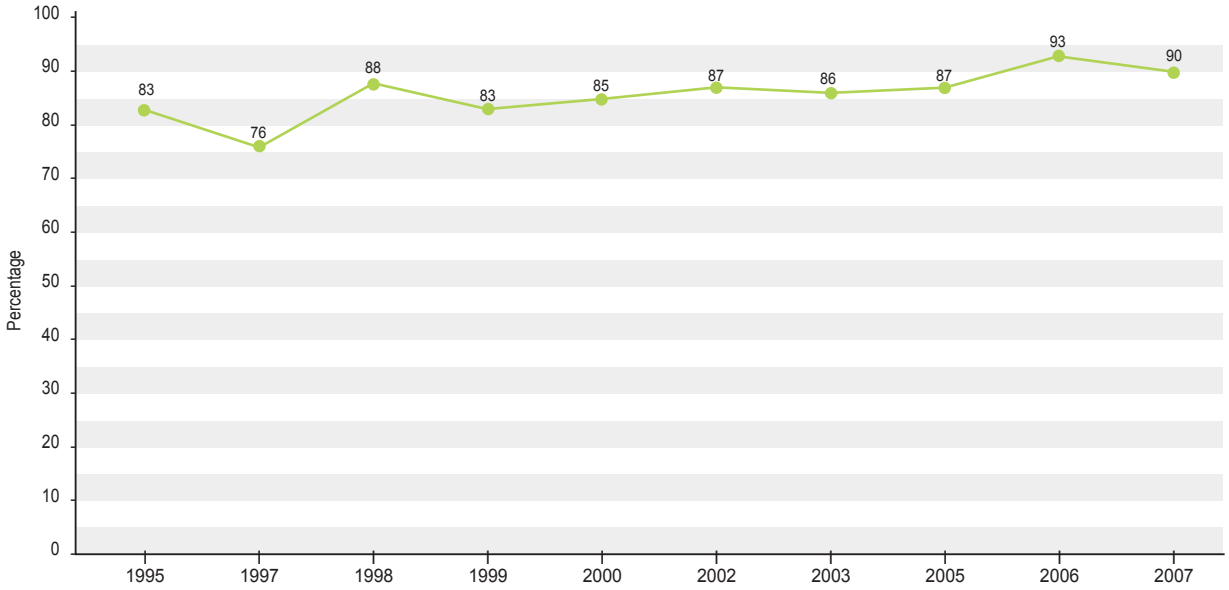
Percentage of Newborns Protected at Birth against Tetanus by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE G11

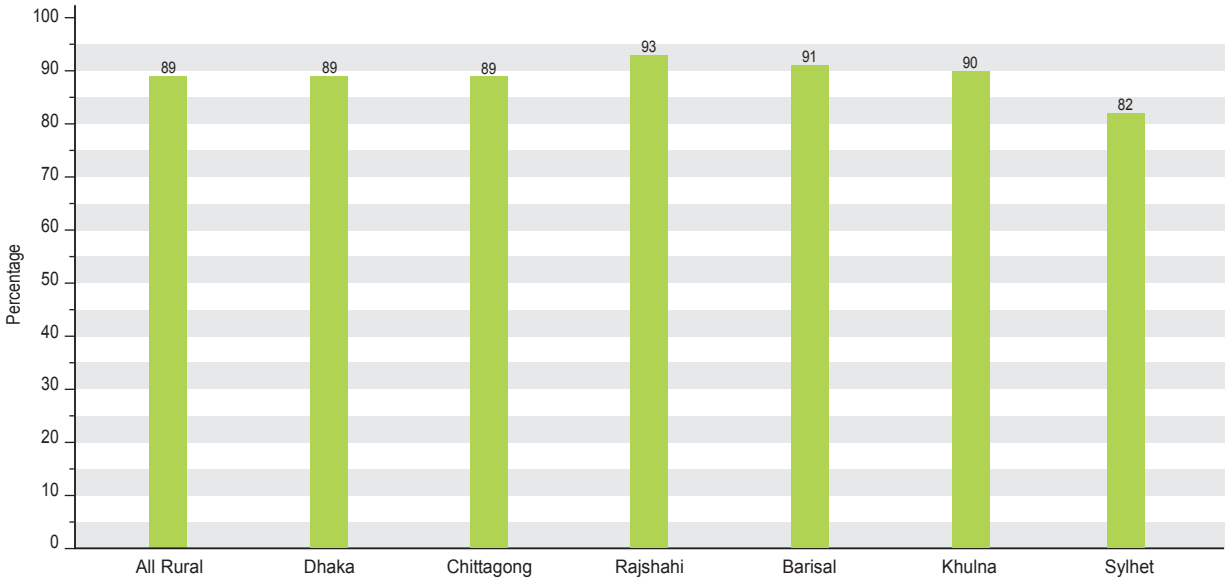
Percentage of Newborns Protected at Birth against Tetanus at National Level from 1995 to 2007



Source: Coverage Evaluation Surveys (CESs) for 1995, 1997, 1998, 1999, 2000, 2002, 2003, 2005, 2006 & 2007

FIGURE G12

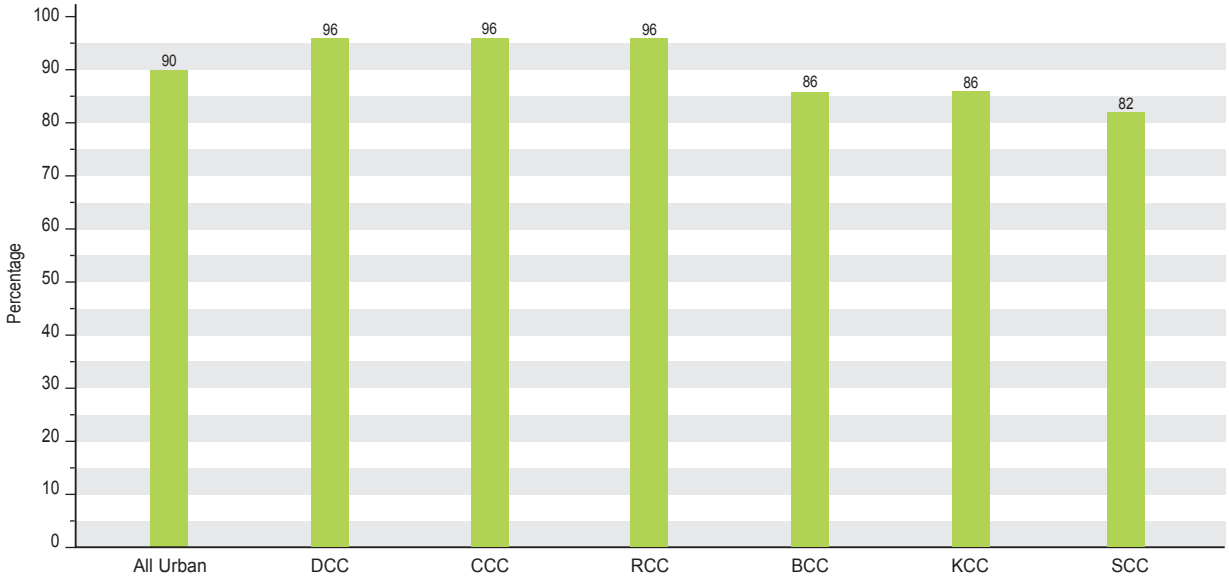
Percentage of Newborns Protected at Birth against Tetanus in Rural Areas by Division in 2007



Source: CES 2007

FIGURE G13

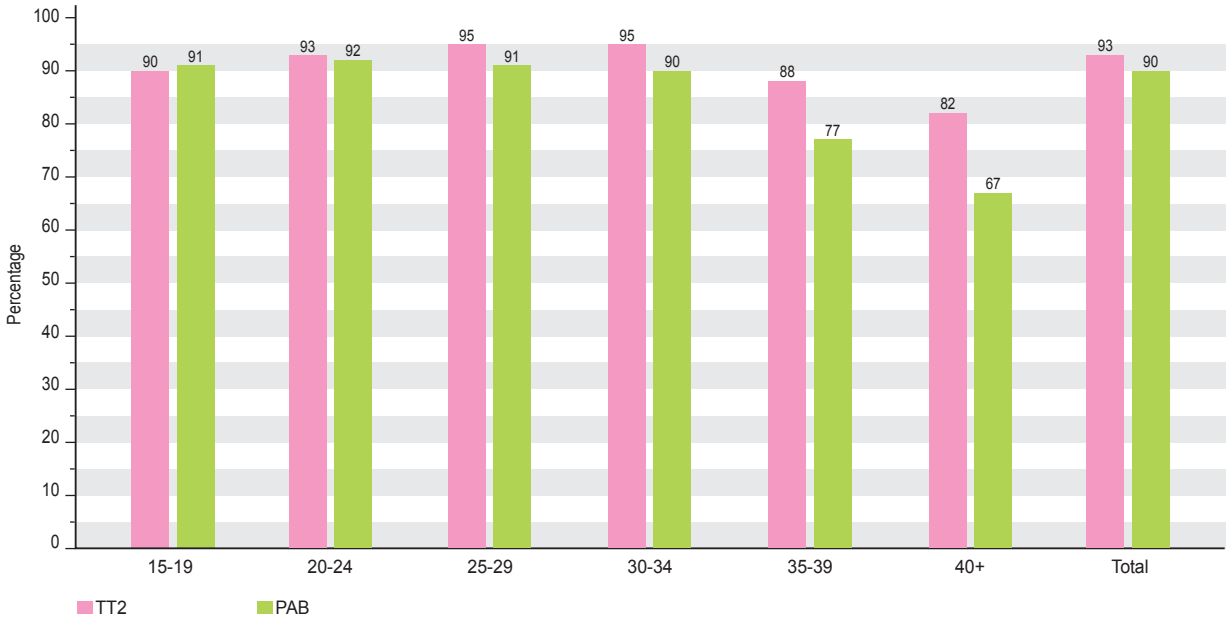
Percentage of Newborns Protected at Birth against Tetanus in Urban Areas by City Corporation in 2007



Source: CES 2007

FIGURE G14

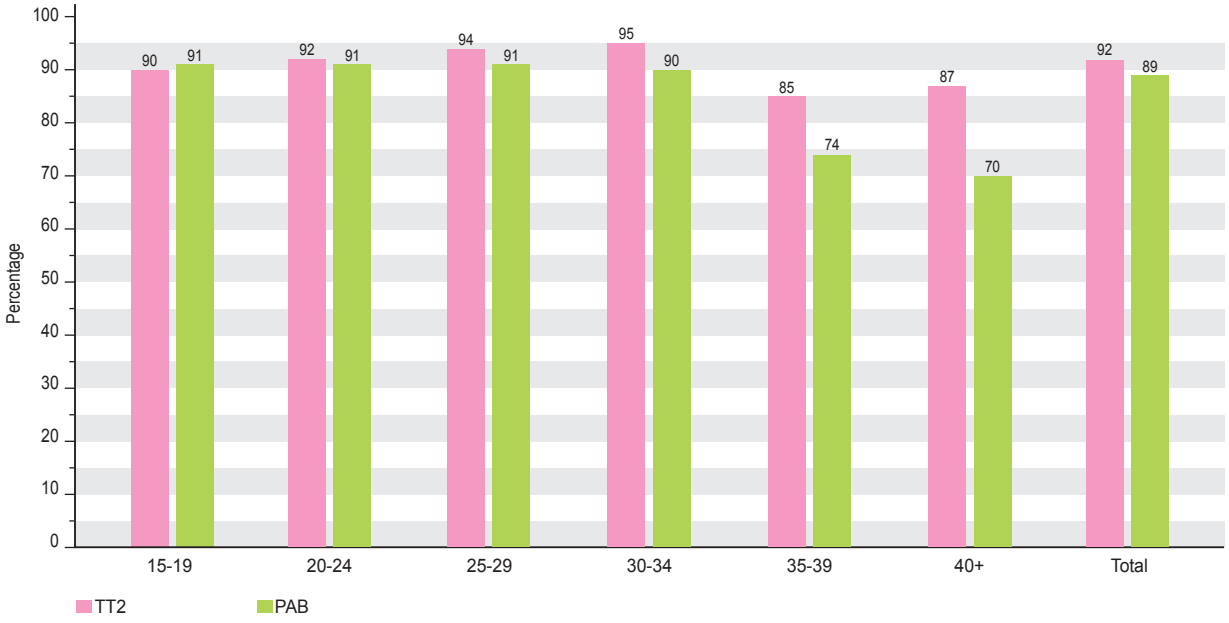
Percentage of Mother Received TT2 and Percentage of New Born Protected at Birth by Age Group of Mother in 2007



Source: CES 2007

FIGURE G15

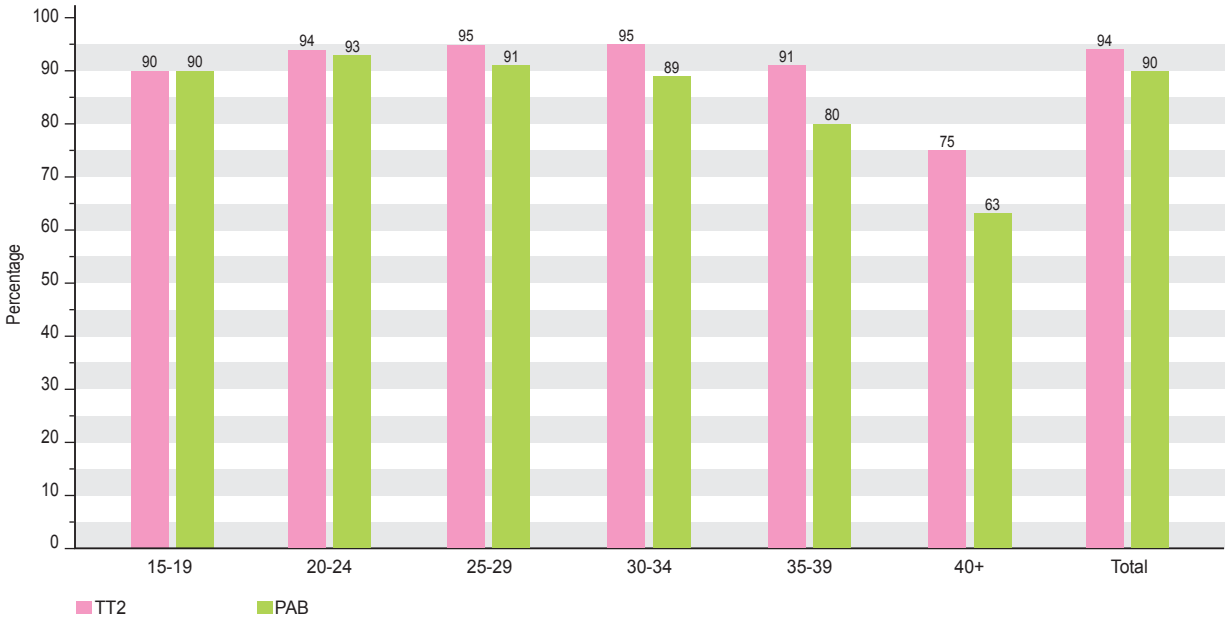
Percentage of Mother Received TT2 and Percentage of New Born Protected at Birth by Age Group of Mother in Rural Areas in 2007



Source: CES 2007

FIGURE G16

Percentage of Mother Received TT2 and Percentage of New Born Protected at Birth by Age Group of Mother in Urban Areas in 2007



Source: CES 2007

3.13 MOTHERS' KNOWLEDGE OF TT VACCINATION

A woman requires 5 doses of TT vaccine for gaining lifetime tetanus antibody. The EPI CES 2007 assessed the knowledge of mothers about the number of doses required. The survey findings are displayed in the figures H1. The figure shows that about fifty percent of the mothers mentioned about 5 or more doses of TT vaccine. The variation is 4 percentage points between the rural and the urban areas. Forty-five percent of the rural mothers reported 5 or more doses as against 49 percent urban mothers (Figure H1).

In rural areas by divisions, knowledge of 5 or more doses was the highest in Khulna division (69 percent) and the lowest in Barisal division (35 percent). Knowledge of 5 or more doses for other divisions ranged from 37 percent in Sylhet to 49 percent in Chittagong divisions (Figure H2).

However, in the city corporations' areas, knowledge of 5 or more doses was found to be the highest in RCC (71 percent) and the lowest in BCC (37 percent). The intermediary range of the other city corporations was from 38 percent in SCC to 41 percent in DCC (Figure H3).

Overall, about half (48 percent) of the mothers nationally reported that they were unaware about the number of TT doses. Proper knowledge about number of doses is important both for the proper use of TT vaccine as well as PAB of newborn. To increase mother's knowledge, more BCC through courtyard meeting, interpersonal communication, and counseling in the EPI session need to be ensured.

3.14 SOURCES OF TT VACCINATION

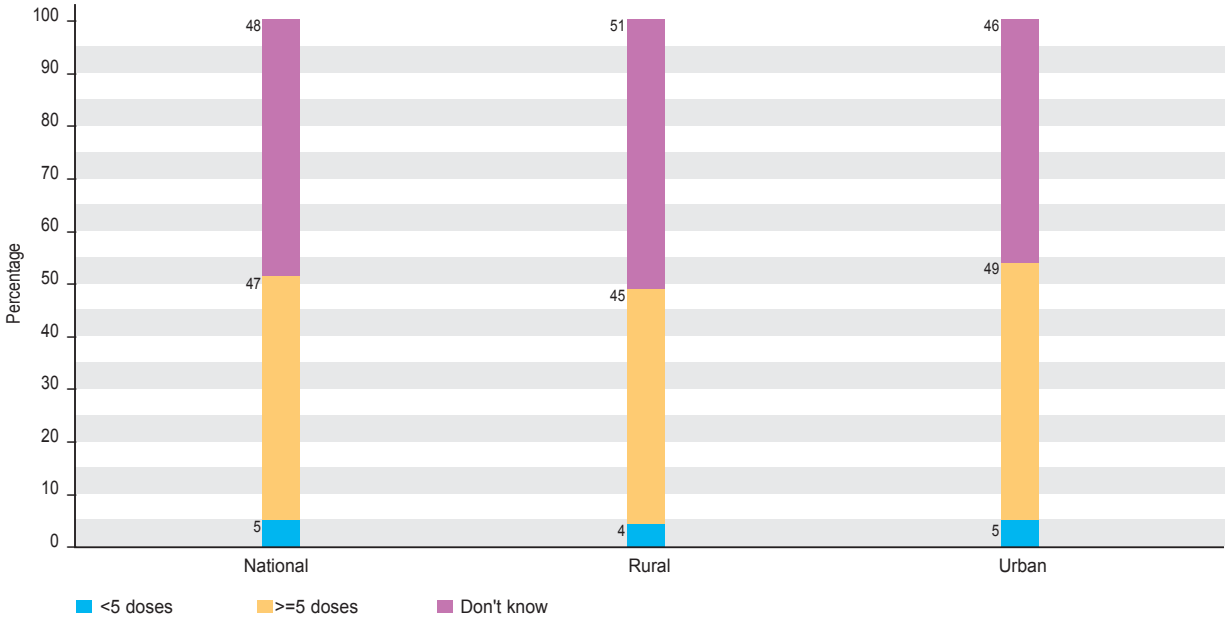
Sources of TT1 vaccination was investigated in the EPI CES 2007. An overwhelming majority (78 percent) of the mothers reported about government outreach centers nationally. One in ten mothers reported about the government hospital. A small percentage (6 percent) of mothers reported about NGOs and private health facilities. However, sources varied a little by area types. Overall, almost all the mothers in rural areas received TT1 from the government source as against 80 percent in the urban areas. One in ten mothers reported about NGOs and private sources in the urban areas as against 1 percent in the rural areas.

Similar to the national findings, 91 percent or above of the mothers received TT1 from the government outreach centers in Chittagong, Dhaka, Khulna, and Rajshahi divisions. Eighty-eight percent of the mothers of Barisal division reported about outreach centers, being followed by Sylhet division (82 percent). The percentage of private sources was revealed higher with 3 percent in Sylhet and Chittagong divisions (Figure I2).

In the city corporation areas, the government outreach centers were used most commonly in CCC (72 percent) and the least used in BCC and SCC (59 percent and 61 percent respectively). On the contrary, the government hospitals/clinics were the least used in DCC (8 percent) and the most used in BCC (23 percent). However, delivery of vaccination by NGOs was most prevalent in KCC (15 percent) and least in CCC (6 percent) (Figure I3).

FIGURE H1

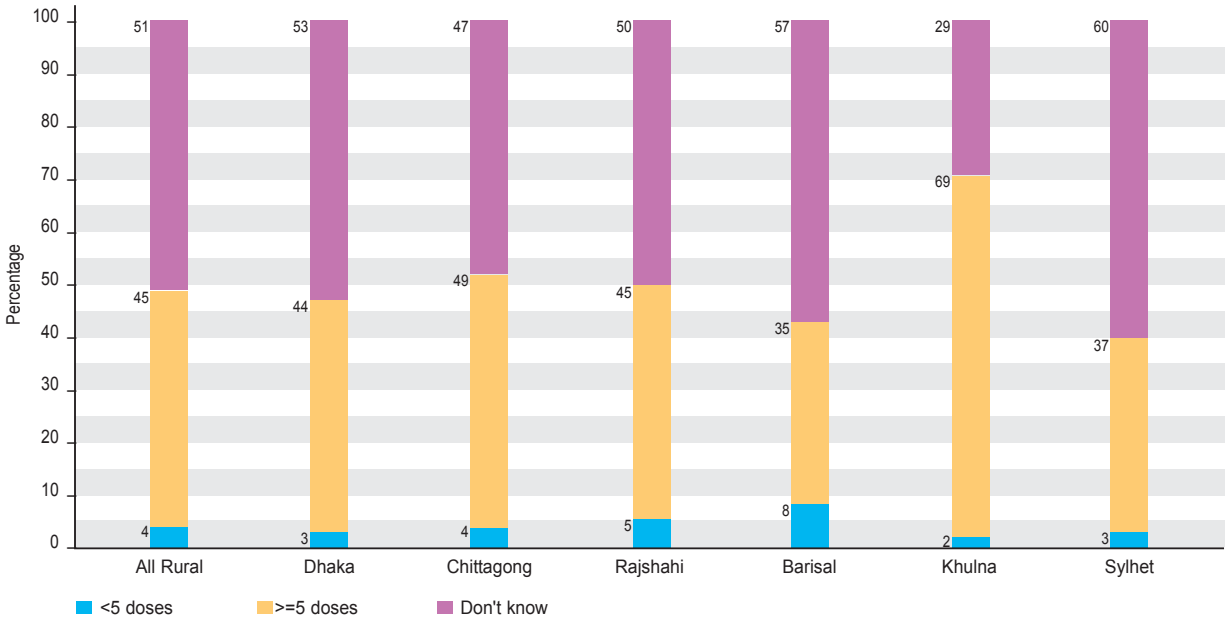
Number of TT Doses Required During Reproductive Period for Protection against Tetanus as Reported by Mothers of 0-11 Months Old Children by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE H2

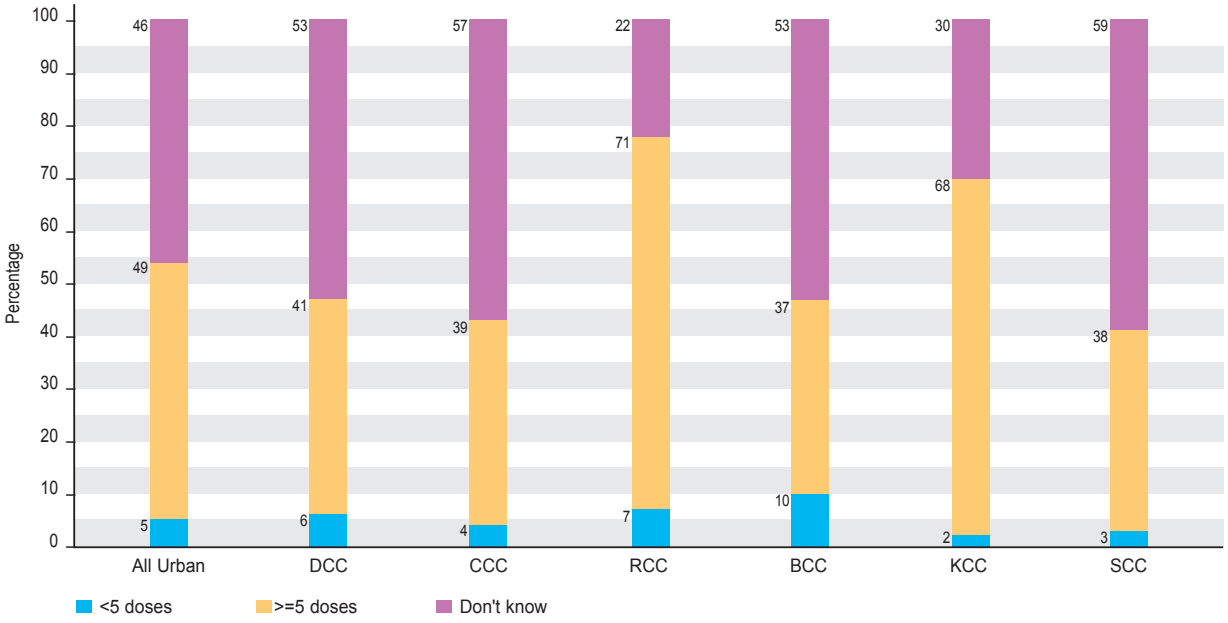
Number of TT Doses Required During Reproductive Period for Protection against Tetanus as Reported by Mothers of 0-11 Months Old Children in Rural Areas by Division in 2007



Source: CES 2007

FIGURE H3

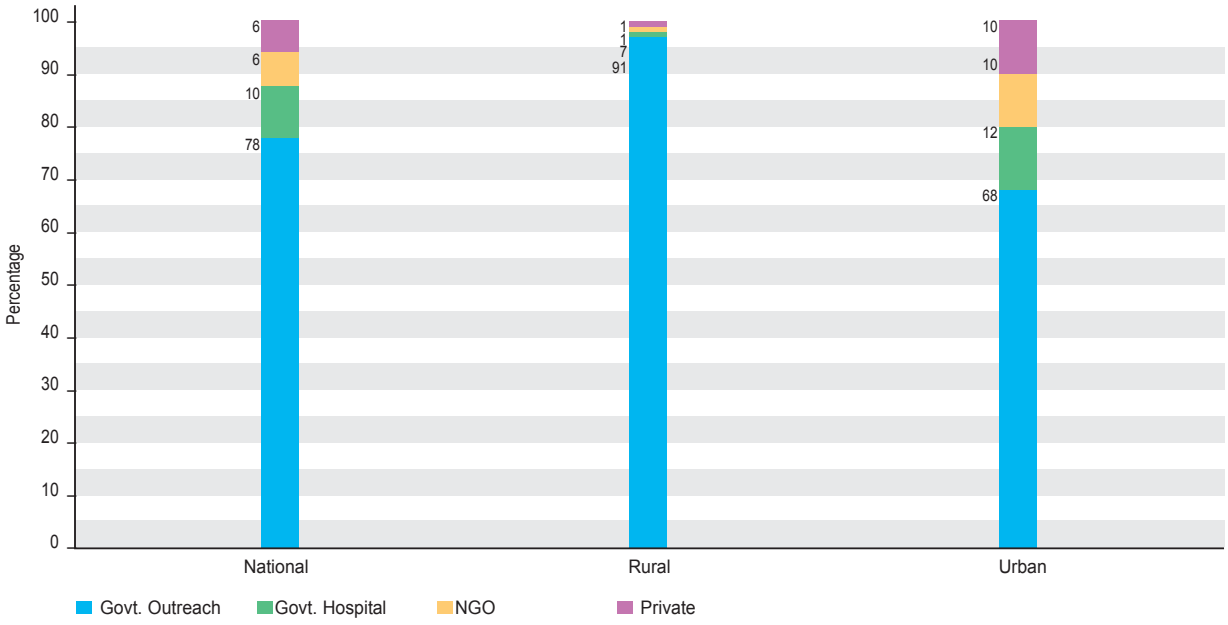
Number of TT Doses Required During Reproductive Period for Protection against Tetanus as Reported by Mothers of 0-11 Months Old Children by City Corporation in 2007



Source: CES 2007

FIGURE I1

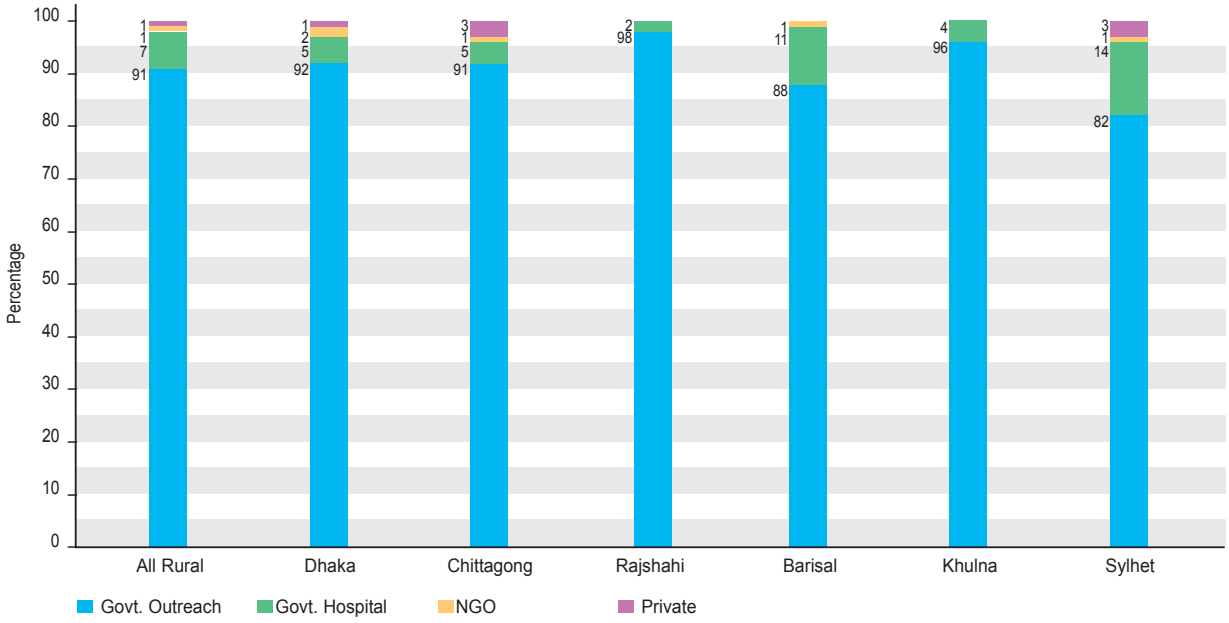
Sources of TT1 Vaccination among Mothers of 0-11 Months Old Children by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE I2

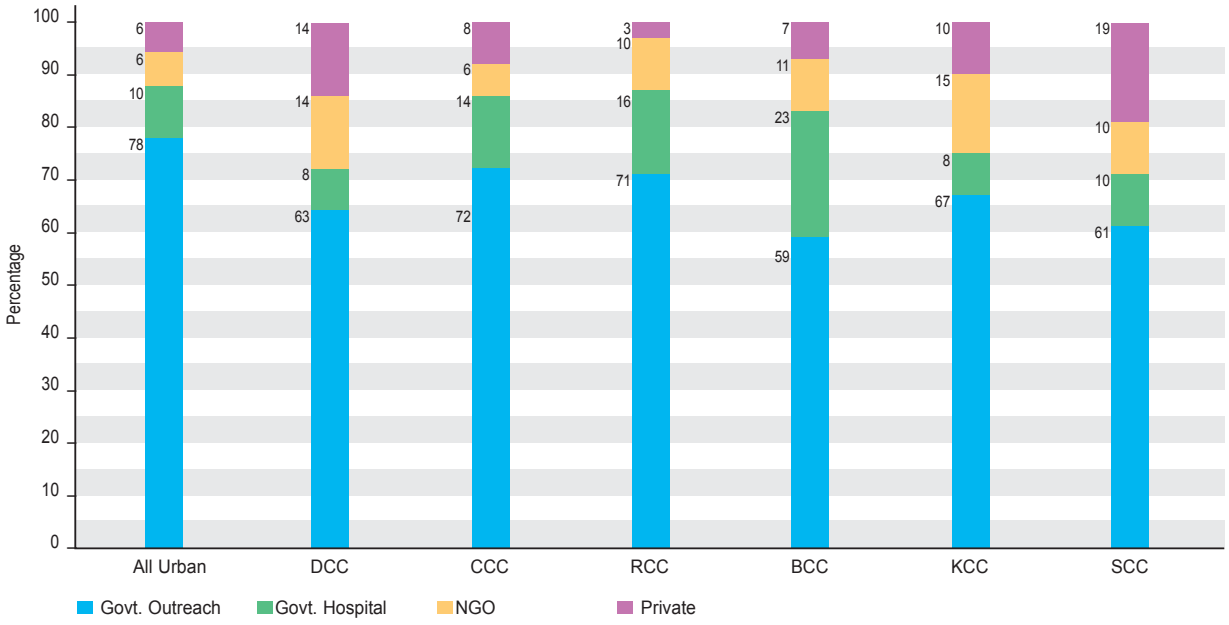
Sources of TT1 Vaccination among Mothers of 0-11 Months Old Children in Rural Areas by Division in 2007



Source: CES 2007

FIGURE I3

Sources of TT1 Vaccination among Mothers of 0-11 Months Old Children in Urban Areas by City Corporation in 2007



Source: CES 2007

Chapter 4

TETANUS TOXOID VACCINATION COVERAGE SURVEY AMONG WOMEN OF 15-49 YEARS

This chapter provides information from the CES 2007 on the Tetanus Toxoid (TT5) Vaccination Coverage conducted among the women aged 15-49 years. It presents the findings on the level of TT vaccination coverage, programme quality, sources of TT vaccination, and card retention rate.

Before explaining the findings, the selection process of samples is discussed below.

4.1 SELECTION OF SAMPLE

TT vaccination coverage survey among the women of childbearing aged 15-49 years irrespective of marital status was conducted along with childhood vaccination coverage survey in the EPI CES 2007. Samples were selected from the same clusters assigned for the child at the age of 12-23 months. At first, women of childbearing aged 15-49 years were searched at every household for making a list. Secondly, a sampling frame with all eligible women was made. Finally, seven women were selected randomly to examine their TT vaccination status through a pre-designed structured questionnaire.

4.2 LEVELS OF TT VACCINATION COVERAGE

EPI CES 2007 gathered TT vaccination information from the women of childbearing age (15-49 years) to assess the vaccination coverage irrespective of their marital status. TT vaccination coverage of the surveyed women was analyzed as valid and crude vaccination coverage.

Crude vaccination coverage is defined as administration of TT vaccines without following the vaccination schedule which was displayed in Figure J1. It shows that 36 percent of the women received all 5 doses of TT nationally. The rural-urban variation is very small. Thirty-eight percent of the mothers in rural areas received all doses of TT as against 34 percent in the urban areas. Nationally, a gradual decreasing trend in coverage for the subsequent doses was observed in the findings. Among the surveyed women, 87 percent received TT1, 83 percent TT2, 71 percent TT3, and 54 percent TT4. The declining trend was similar in both the rural and urban areas. Eighty-eight percent of the surveyed women in rural areas received TT1 as against 86 percent in urban areas. TT2 coverage rate was 84 percent, TT3 72 percent, and TT4 56 percent in the rural areas as against the coverage rate of 81 percent for TT2, 69 percent for TT3, and 52 percent for TT4 in urban areas (Figure J1).

Figure J2 shows the valid TT vaccination coverage among women age at 15-49 years. One-fifth of the total surveyed women received 5 doses of TT vaccination nationally - 21 percent in rural and 18 percent in urban areas. Prevalence of TT2 was more than eighty percent (82 percent) nationally with 84 percent in rural and 81 percent in urban areas. A decreasing trend in the coverage of TT3 and TT4 was observed irrespective of areas. A little over two-thirds (64 percent) of the surveyed women received TT3 and about two-fifths (39 percent) TT4 nationally. The proportion was 67 percent in rural areas as against 62 percent in urban areas for TT3. However, for TT4 it was 41 percent in the rural and 37 percent in the urban areas.

4.3 TT VACCINATION COVERAGE BY RURAL DIVISION

The crude TT vaccination coverage in the rural areas by divisions is displayed in Figure J3. Access to TT1 vaccination was the highest in Rajshahi division (94 percent) and the lowest in Sylhet division (78 percent). Coverage rate of other divisions was intermediary that ranged from 88 percent in Dhaka division to 91 percent in Chittagong divisions. Barisal and Khulna divisions had the same coverage rate (90 percent).

The highest coverage of TT2 was observed in Chittagong and Rajshahi divisions (88 percent), which was being followed by Khulna (86 percent), Barisal (85 percent), Dhaka (84 percent), and Sylhet divisions (74 percent).

As expected, TT3 coverage was lower compared to TT2 in every division. The highest TT3 coverage rate was revealed in Chittagong division (78 percent) and the lowest in Sylhet division (60 percent). Coverage rates of other divisions were 75 percent in Rajshahi, 74 percent in Khulna, 73 percent in Dhaka, and 72 percent in Barisal divisions.

Similar to TT3, coverage of TT4 was the highest in Chittagong division (65 percent) and the lowest in Sylhet divisions (43 percent). Coverage of other divisions was in intermediary level that ranged from 56 percent in Dhaka and Barisal divisions to 58 percent in Rajshahi division.

Access to TT5 vaccination was the lowest in Sylhet division (30 percent) and the highest in Chittagong division (45 percent). The coverage rates were 40 percent in Dhaka and Rajshahi divisions and 38 percent in Barisal and Khulna divisions (Figure J3).

Figure J4 shows TT1 vaccination coverage following proper vaccination schedule was at or over 90 percent for all the divisions except Sylhet and Dhaka divisions. The lowest TT1 coverage rate was revealed in Sylhet division (78 percent).

Regarding TT2 coverage, the rates were at or above 84 percent for Dhaka, Barisal Khulna, Rajshahi and Chittagong divisions. The lowest TT2 coverage rate was found in Sylhet division (74 percent)

Likewise, TT3 vaccination coverage rate was found to be the highest in Chittagong division (74 percent) and the lowest in Sylhet division (57 percent). Coverage rates of other divisions were 69 percent in Rajshahi and Khulna, 68 percent in Dhaka and 65 percent in Barisal divisions.

For TT4 coverage, the rate was the highest in Chittagong division with 51 percent and the lowest in Barisal division with 34 percent. The rate was at or over 36 percent for other divisions.

Similarly, TT5 coverage rate was revealed the highest in Chittagong and Rajshahi divisions (25 percent) and the lowest in Barisal division (13 percent). Twenty percent or above of the women in Sylhet, Khulna, and Dhaka divisions received TT5 dose (Figure J4).

4.4 TT VACCINATION COVERAGE BY CITY CORPORATION

Crude TT vaccination coverage rate is shown in Figure J5. City corporation's TT1 vaccination coverage was revealed the highest in KCC (90 percent) and the lowest in SCC (77 percent). The coverage rates were found to be similar in DCC and BCC (86 percent). The coverage was 87 percent in RCC, being followed by CCC (84 percent).

TT 2 coverage was found to be the highest in KCC (86 percent) and the lowest in SCC (71 percent). The coverage rates of other city corporations were intermediary that ranged from 80 percent in CCC to 83 percent in DCC. The rate was 82 percent in BCC and RCC.

Likewise, TT3 coverage rate was found 72 percent or above in all city corporations except SCC and CCC. SCC had the lowest TT3 coverage rate (56 percent). The coverage rate in CCC was 68 percent. Furthermore, TT4 coverage rate was found to be the highest in RCC (57 percent), which was followed by BCC (55 percent), KCC (54 percent), DCC (53 percent), CCC (49 percent), and SCC (40 percent).

Among the surveyed women, crude TT5 dose was found to be the highest in RCC (40 percent). The lowest TT5 coverage rate was noticed in SCC (25 percent). TT5 coverage rates of other city corporations ranged from 33 percent in KCC to 36 percent in CCC (Figure J5).

Valid TT vaccination coverage is shown in Figure J6. The figure shows that TT1 vaccination coverage rate was the highest in KCC (90 percent) and the lowest in SCC (77 percent). Coverage rates in other city corporations were; 87 percent in RCC, 86 percent in BCC and DCC, and 84 percent in CCC.

Similar to TT1, TT2 coverage was the highest in KCC (86 percent) and the lowest in SCC (71 percent). Coverage in other city corporations was intermediary that ranged from 80 percent in CCC to 83 percent in DCC.

As expected, compared to TT2, TT3 coverage rates were lower in all city corporations. Among the city corporations, coverage rates were the highest in RCC, BCC, and KCC with 66 percent coverage rate and the lowest in SCC (45 percent). The second highest TT3 coverage rate was found in DCC with 64 percent, which was followed by CCC (63 percent).

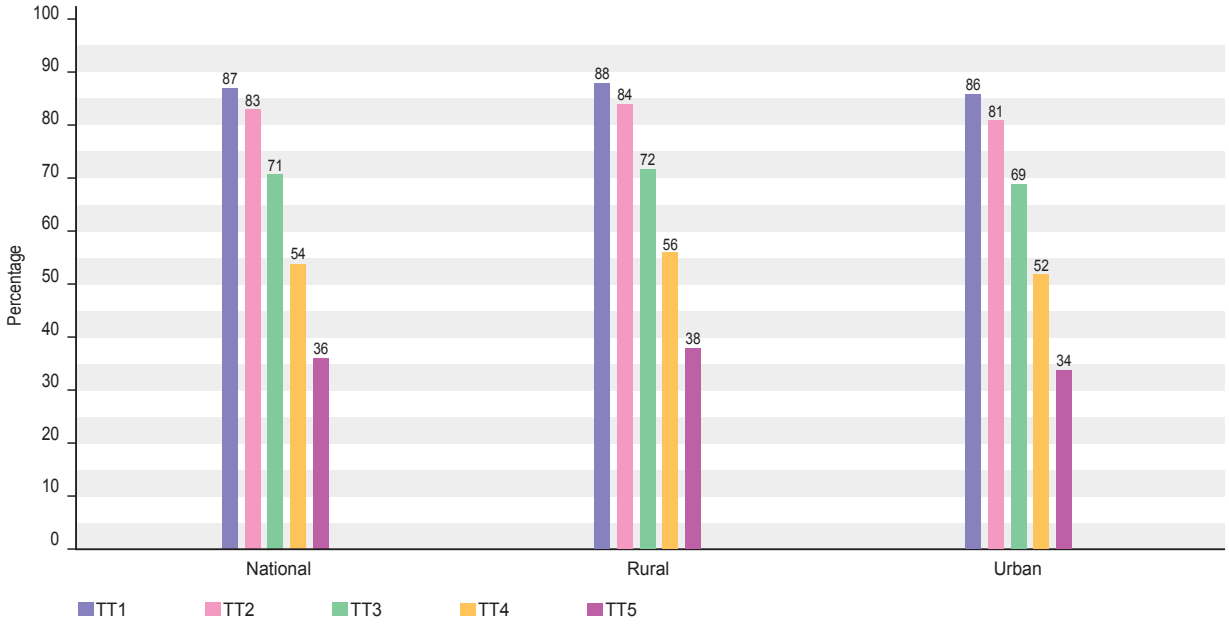
For TT4 coverage, the highest coverage rate was revealed in RCC (47 percent), and the lowest in SCC (24 percent). TT4 coverage rates in other divisions ranged from 31 percent in DCC to 41 percent in KCC. Likewise, coverage of TT5 dose was found to be the highest in RCC (30 percent) and the lowest in SCC (11 percent). Coverage rates of other city corporations were intermediary that ranged from 12 percent in DCC to 21 percent in KCC (Figure J6).

4.5 LEVELS OF THE COVERAGE BY THE SURVEY UNIT

As a ready reference, rates of the valid TT coverage among the women aged 15-49 years by Divisions/city corporations are given in Appendix.

FIGURE J1

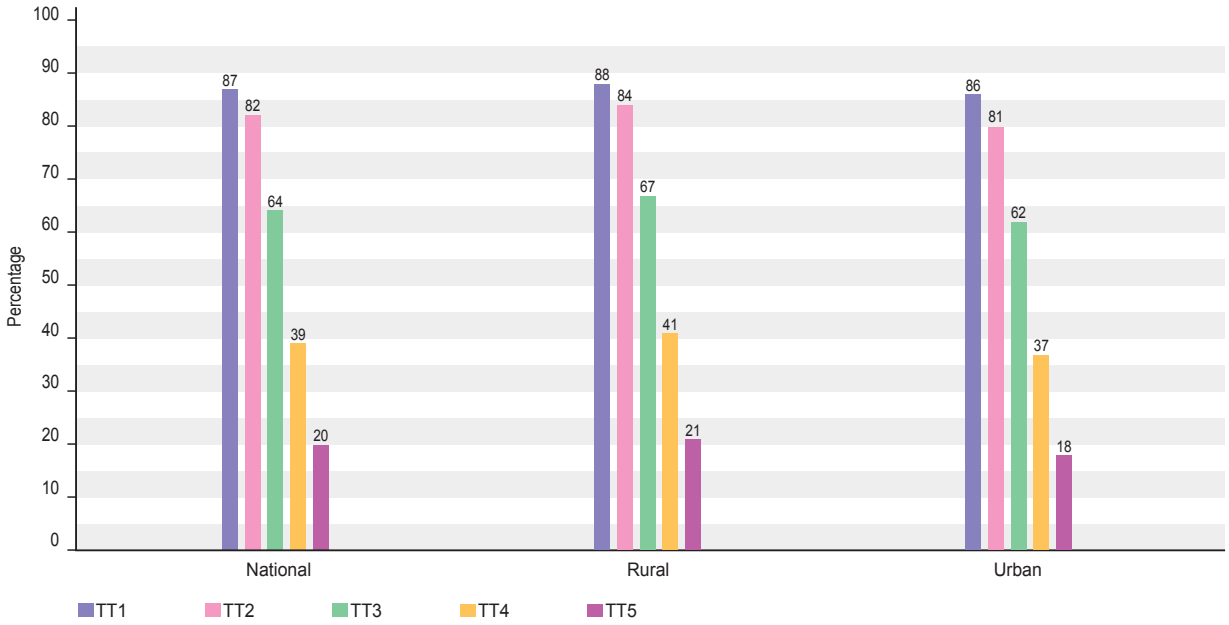
Crude TT Vaccination Coverage among Women Aged 15-49 Years Old by National, Rural and Urban Areas in 2007 (Card+History)



Source: CES 2007

FIGURE J2

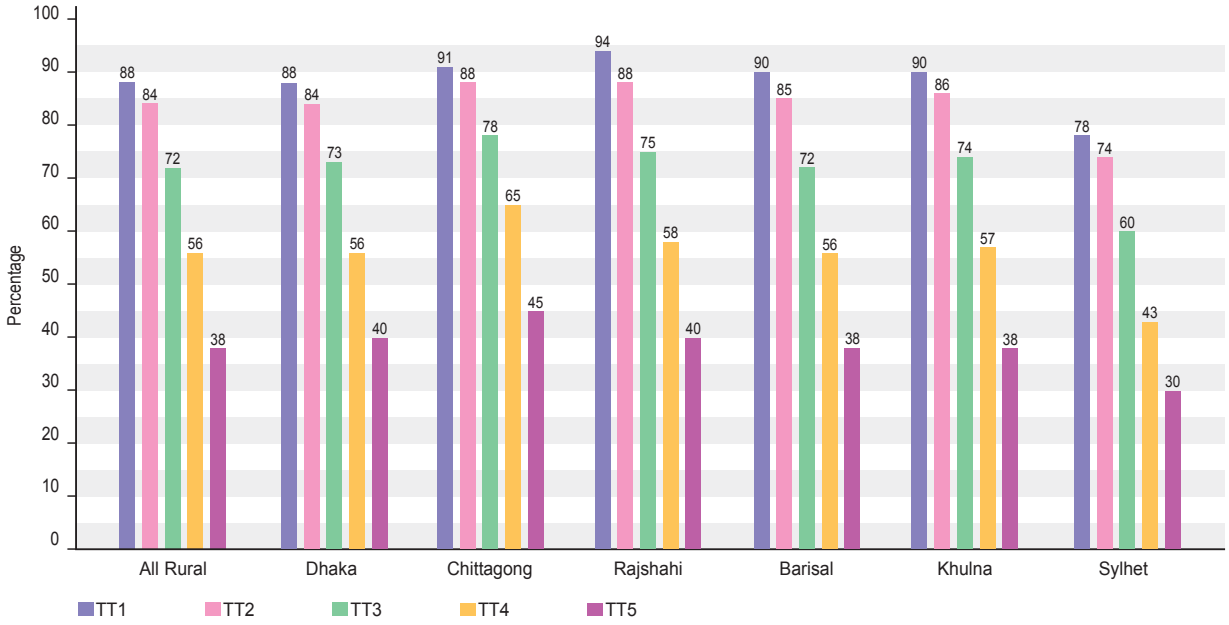
Valid TT Vaccination Coverage among Women Aged 15-49 Years Old by National, Rural and Urban Areas in 2007 (Card+History)



Source: CES 2007

FIGURE J3

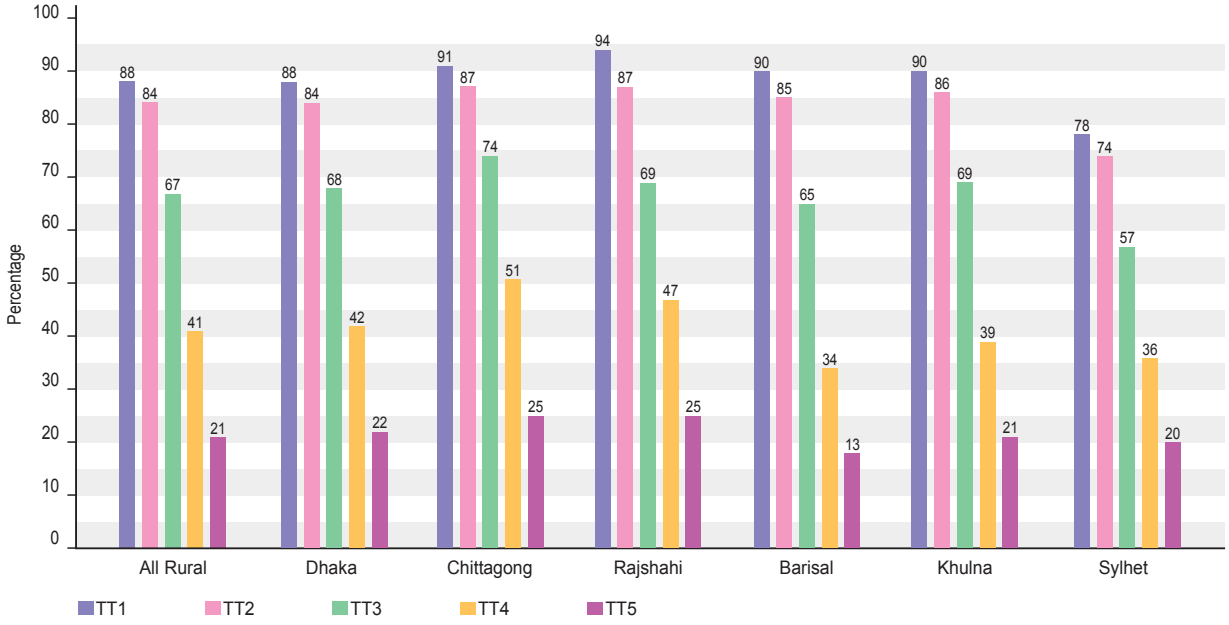
Crude TT Vaccination Coverage among Women Aged 15-49 Years Old in Rural Areas by Division in 2007 (Card+History)



Source: CES 2007

FIGURE J4

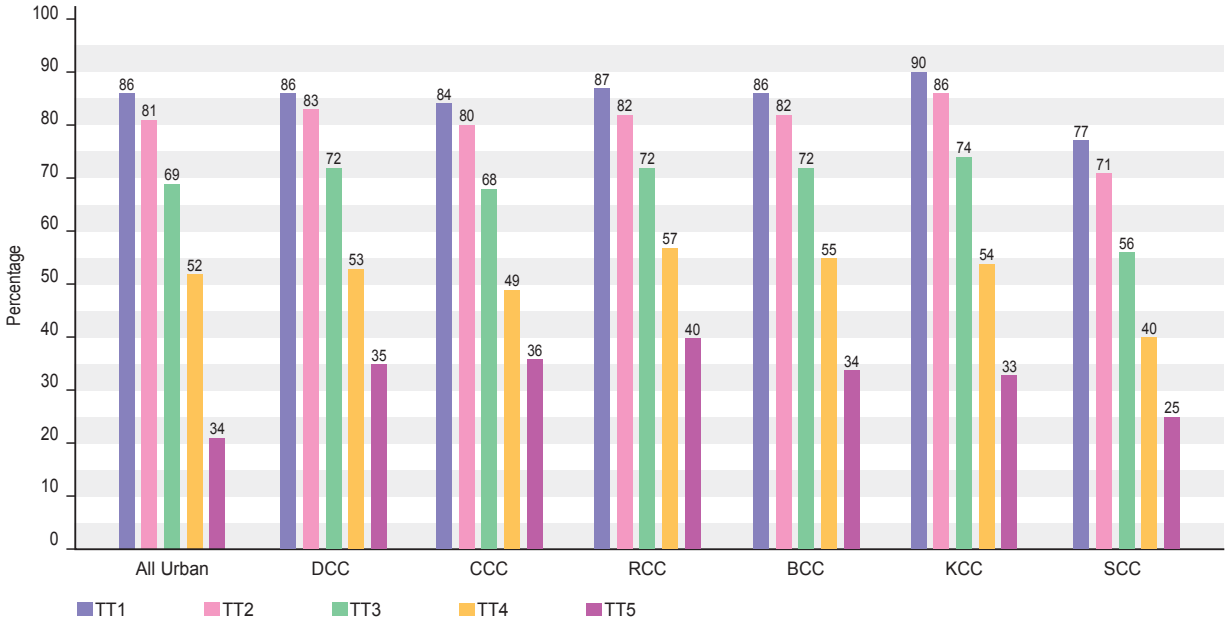
Valid TT Vaccination Coverage among Women Aged 15-49 Years Old in Rural Areas by Division in 2007 (Card+History)



Source: CES 2007

FIGURE J5

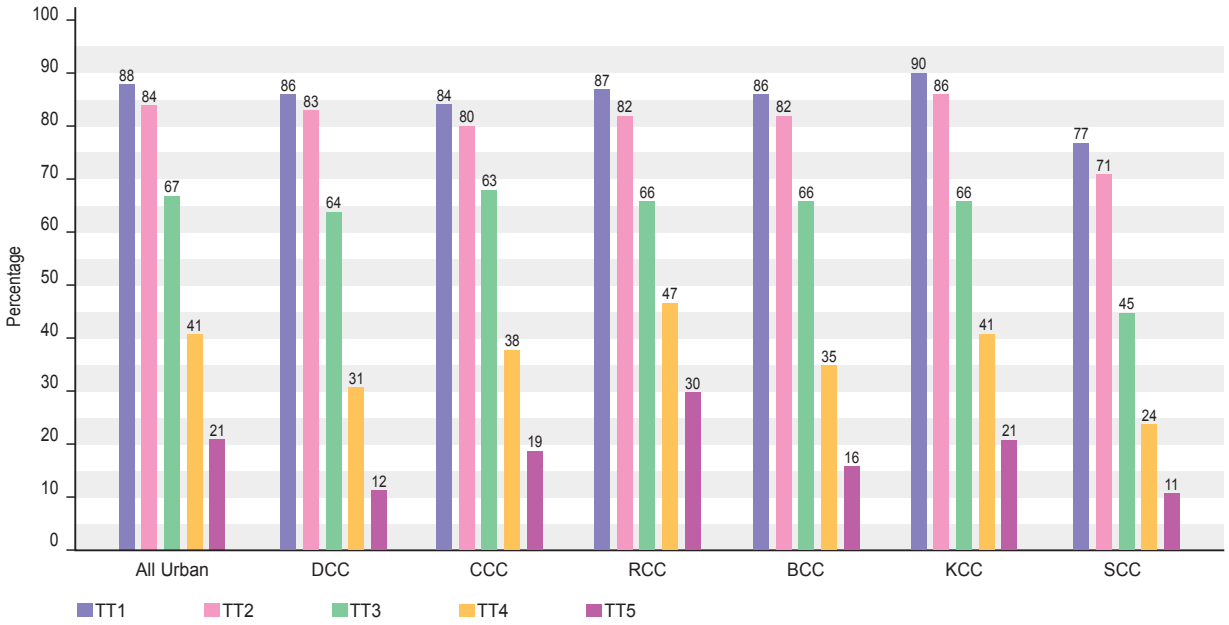
Crude TT Vaccination Coverage among Women Aged 15-49 Years Old in Urban Areas by City Corporation in 2007 (Card+History)



Source: CES 2007

FIGURE J6

Valid TT Vaccination Coverage among Women Aged 15-49 Years Old in Urban Areas by City Corporation in 2007 (Card+History)



Source: CES 2007

4.6 STATUS OF RETENTION OF TT CARD AMONG WOMEN

Availability and retention rate of TT vaccination card was assessed among the surveyed women who received TT vaccine. Findings are displayed in Figure K1. Nationally, card retention rate was revealed 43 percent. Urban-rural variation was 10 percentage points. The retention rate was 48 percent in rural and 38 percent in urban areas.

In rural areas by division, card retention rate was the highest in Barisal division (59 percent) and the lowest in Sylhet division (42 percent). The intermediary rates ranged from 43 percent in Dhaka division to 50 percent in Chittagong division (Figure K2).

Similar to rural divisions, card retention rate was found to be the highest in BCC (52 percent) and the lowest in DCC (15 percent). The second highest retention rate was revealed in KCC (45 percent), which was followed by CCC (38 percent), RCC (37 percent), and SCC (35 percent) (Figure K3).

4.7 INCIDENCE OF INVALID DOSES

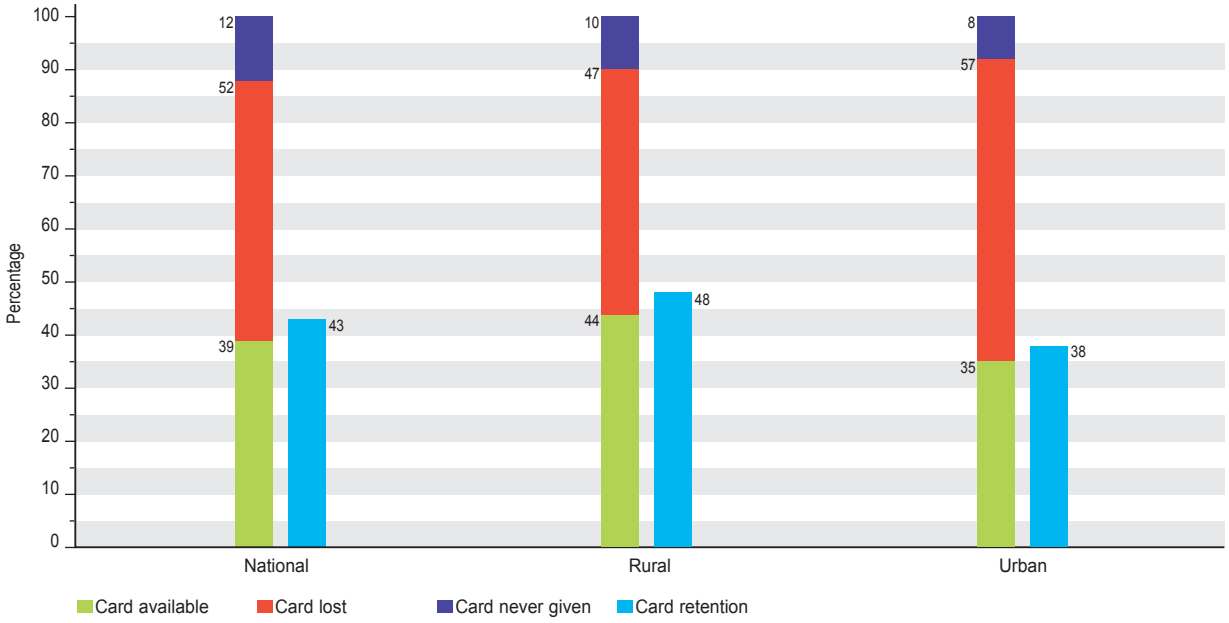
Figure K4 shows the incidence of invalid TT doses among the surveyed women. The figure shows that the incidence was more prevalent for TT3. About one-fifth of the total surveyed women received invalid dose of TT3 nationally. The rural-urban incidence rate was almost similar to the national findings. The finding shows a declining trend in invalid TT vaccination rates for the subsequent doses. Nationally, the incidence rates of invalid doses of TT4 and TT5 were the same (13.6 percent). However, a slight variation was observed in the case of invalid doses between urban and rural areas. Twenty-one percent women of the rural areas received invalid TT3, 12 percent invalid TT4, and 15 percent TT5 as against 18 percent invalid TT3, 15 percent invalid TT4, and 12 percent invalid TT5 in urban areas. It is important to mention here that a very few women received invalid TT2.

Similar to the national findings, incidence rate of invalid TT3 was higher than that of TT4 and TT5 in all rural divisions. Among the rural divisions, the invalid TT3 rate was the highest in Barisal division (28 percent) and the lowest in Sylhet division (13 percent). Similarly, incidence of invalid doses of TT4 were the highest in Chittagong and Barisal divisions (16 percent). The lowest incidence of invalid doses of TT4 was in Sylhet division (8 percent). As expected for TT5, the highest invalid dose was revealed in Barisal division (21 percent), being followed by Dhaka (16 percent), Rajshahi, Chittagong, Khulna (15 percent) and Sylhet divisions (8 percent) (Figure K5).

As expected in the city corporations, the rate of invalid TT3 was the highest in BCC (21 percent) and the lowest in SCC (19 percent). The rate of invalid TT4 was the lowest in CCC (8 percent) and the highest in DCC (23 percent). Likewise, invalid dose of TT5 was the lowest compared to TT3 and TT4. Similar to the above findings, rates of invalid TT5 dose was the highest in CCC (18 percent) and the lowest in RCC (5 percent). The rates were intermediary that ranged from 3 to 5 percent in other city corporations (Figure K6).

FIGURE K1

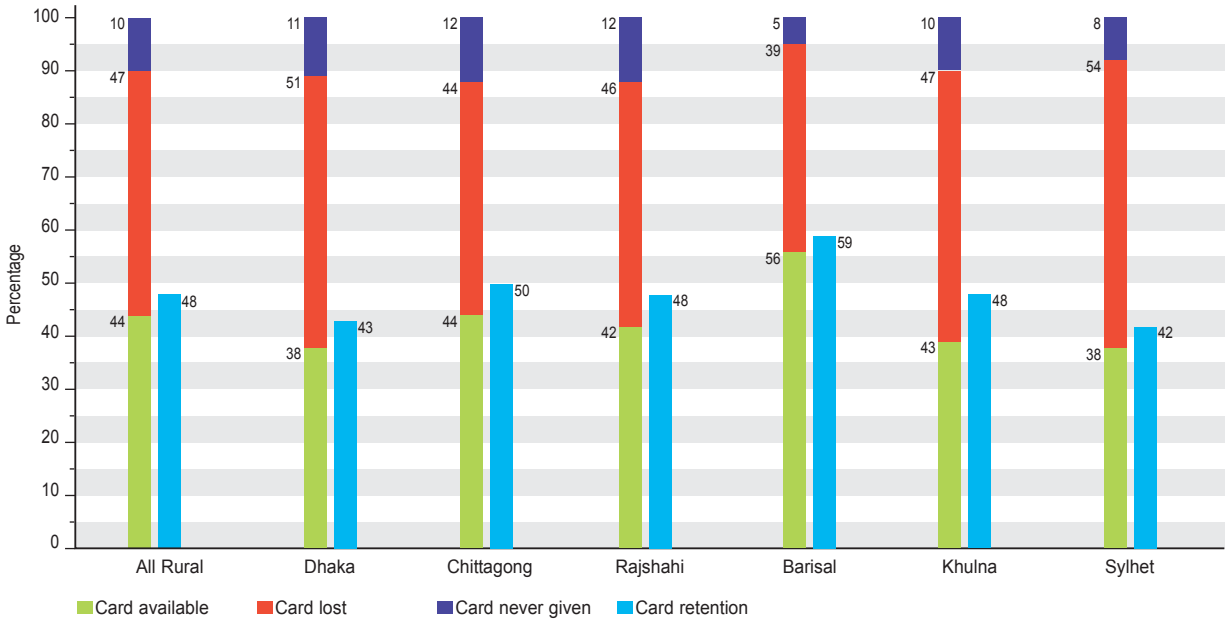
TT Vaccination Card Status among Women Aged 15-49 Years Old by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE K2

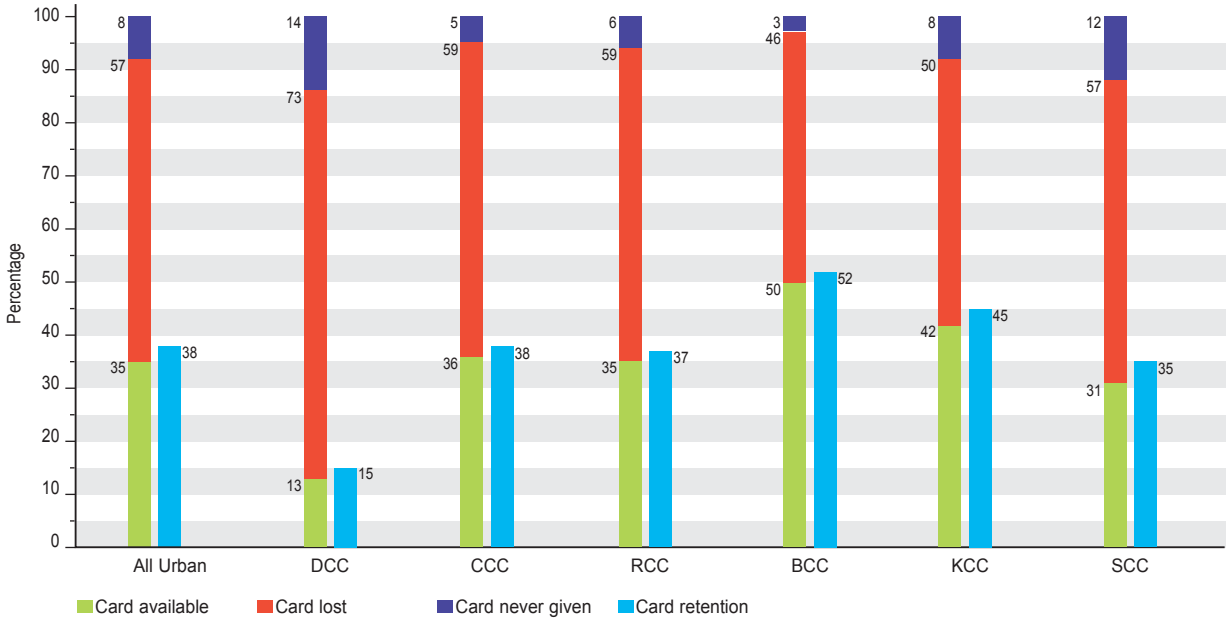
TT Vaccination Card Status among Women Aged 15-49 Years Old in Rural Areas by Division in 2007



Source: CES 2007

FIGURE K3

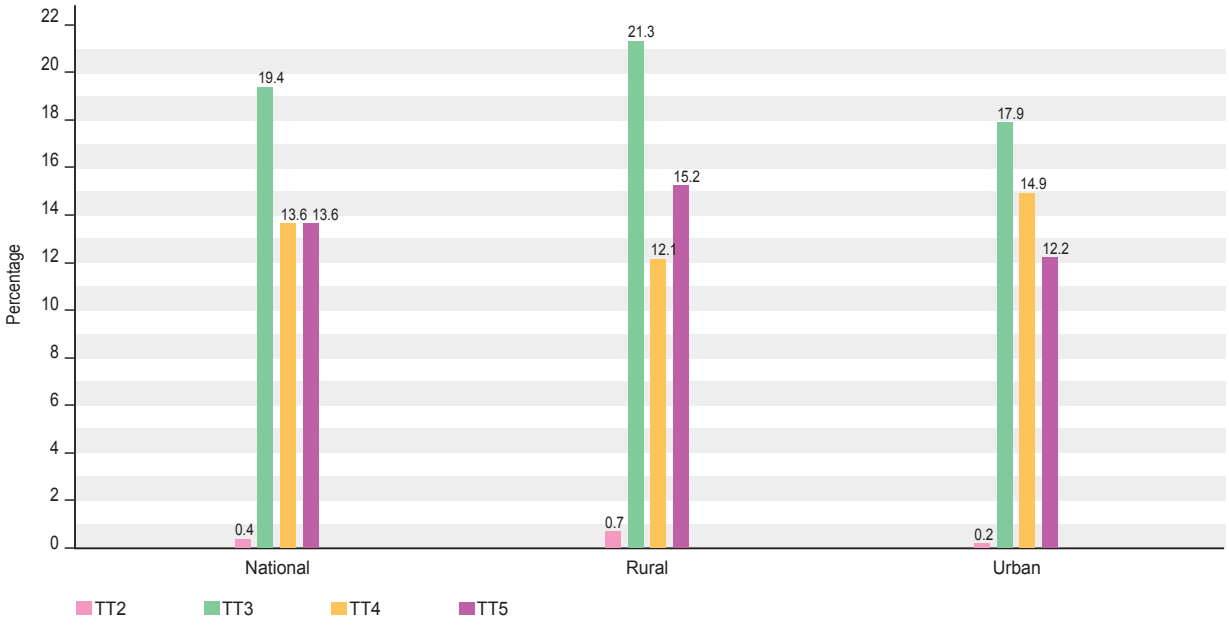
TT Vaccination Card Status among Women Aged 15-49 Years Old in Urban Areas by City Corporation in 2007



Source: CES 2007

FIGURE K4

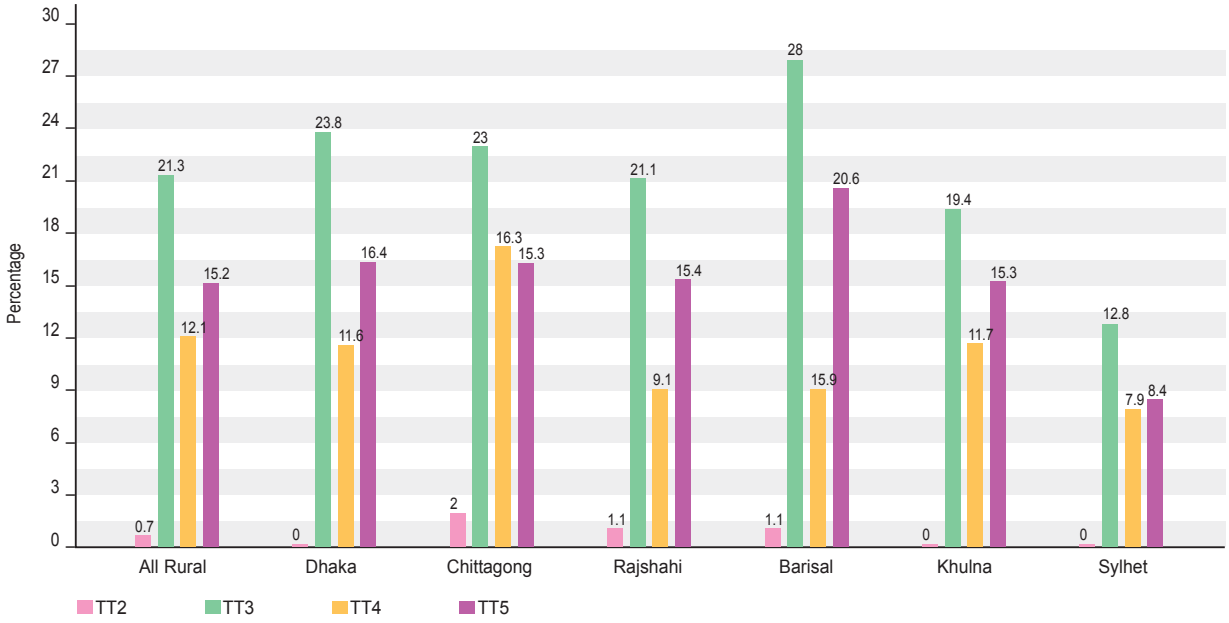
Incidence of Invalid TT Doses among Women Aged 15-49 Years Old by National, Rural and Urban Areas in 2007 (Card+History)



Source: CES 2007

FIGURE K5

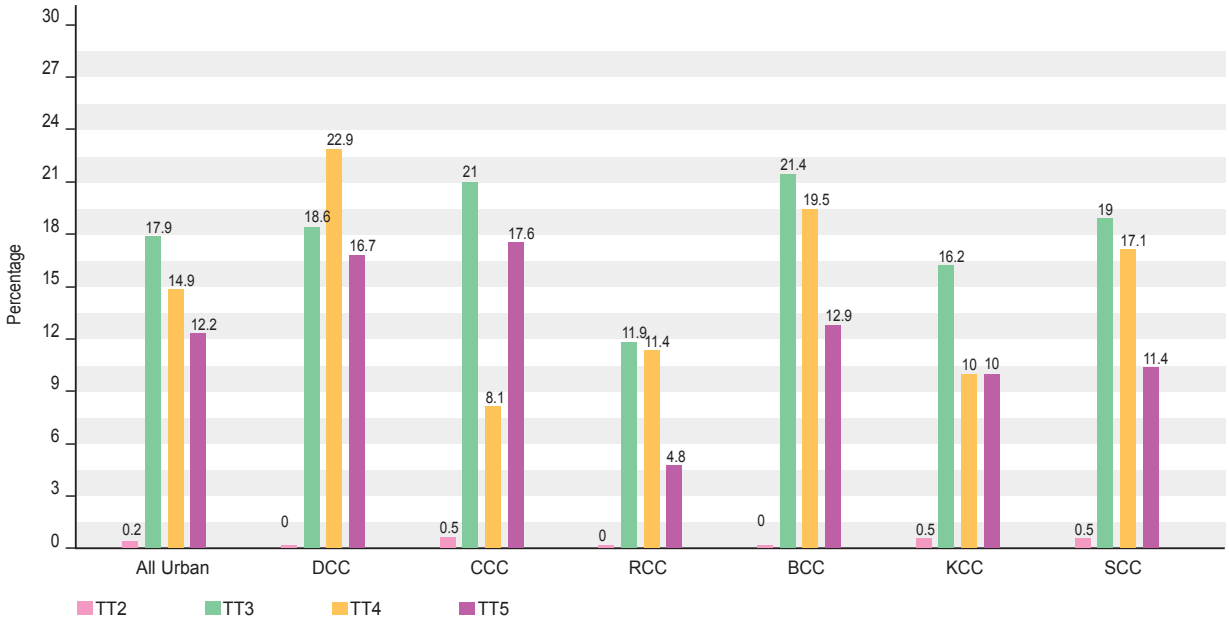
Incidence of Invalid TT Doses among Women Aged 15-49 Years Old in Rural Areas by Division in 2007(Card+History)



Source: CES 2007

FIGURE K6

Incidence of Invalid TT Doses among Women Aged 15-49 Years Old in Urban Areas by City Corporation in 2007 (Card+History)



Source: CES 2007

4.8 KNOWLEDGE OF THE WOMEN ON TT DOSES

A woman requires 5 doses of TT vaccine for gaining lifetime tetanus antibody. The EPI CES 2007 was assessed the knowledge of women about the number of doses required. The survey findings are displayed in the figures L1- L3. The figure L1 shows that about fifty percent of the women reported 5 or more doses of TT vaccine. As expected, the proportion of women who had proper knowledge about the number of TT required for achieving lifetime tetanus antibody was 1 percentage points higher in the urban areas (48 percent) compared to that in the rural areas (47 percent).

In the rural areas by division, proportion of women with knowledge of 5 or more doses of TT vaccine was revealed the highest in Dhaka division (56 percent) and the lowest in Sylhet division (34 percent). Moreover, more than fifty percent (53 percent) of the surveyed women reported 5 or more doses in Chittagong division, being followed by Khulna (51 percent), Rajshahi (48 percent), and Barisal divisions (37 percent) (Figure L2).

In the urban areas by city corporation, fifty-eight percent of the women of RCC reported 5 or more doses, which was followed by KCC (57 percent), CCC (48 percent), BCC and SCC (44 percent), and DCC (39 percent) (Figure L3).

4.9 SOURCES OF TT VACCINATION

The women of CBA who received TT1 vaccination were asked to mention the sources of receiving the vaccine. Nationally, 80 percent of the respondents mentioned that they received TT vaccines from the government outreach centers. The other sources were government hospitals (11 percent), NGOs (5 percent), and private health facility (4 percent) (Figure M1).

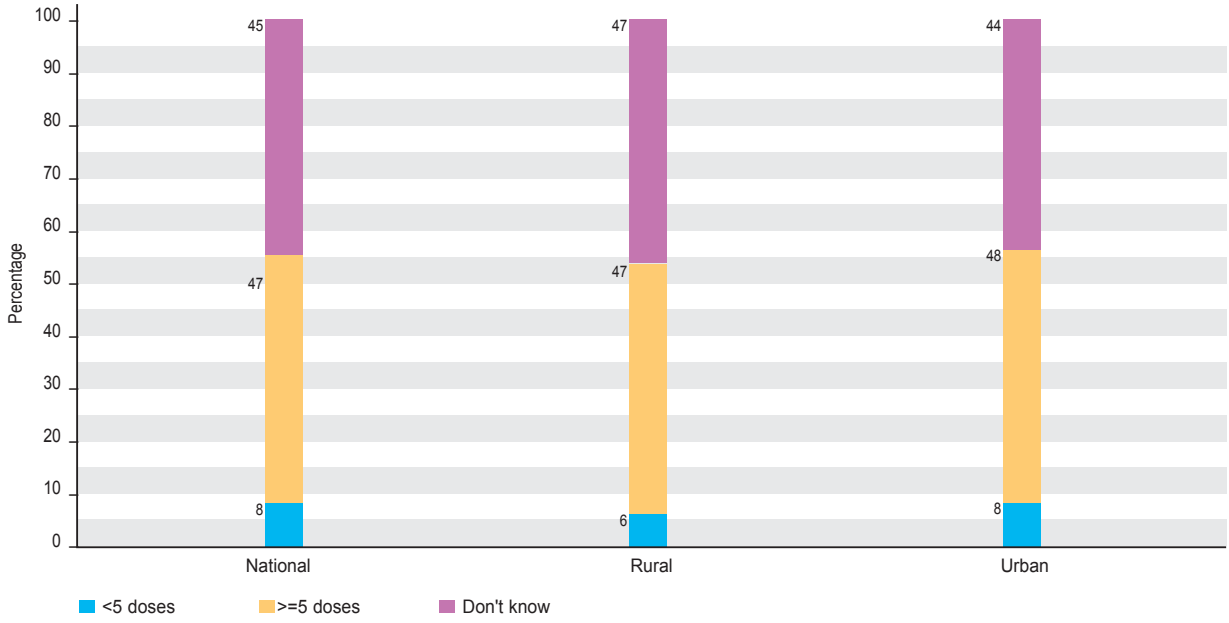
In the rural areas, the majority of the respondents (91 percent) received TT1 vaccination from the government outreach, as compared to 70 percent in the urban areas. In the urban areas, 16 percent of them received TT from the government hospitals as against 7 percent in the rural areas (Figure M1).

In the rural divisions, the sources of receiving TT1 varied from one division to another (Figure M2). In Khulna division, the majority (96 percent) of the women received TT1 from the government outreach centers while it was 94 percent in Chittagong division, 92 percent in Sylhet division, 91 percent in Rajshahi division, 90 percent in Barisal division, and 85 percent in Dhaka division. However, 14 percent of the women of Dhaka division received TT1 from the government hospitals as against four percent in Khulna division.

In the city corporations, Govt. outreach centers were mostly used in RCC (82 percent), being followed by SCC (71 percent), CCC (68 percent), KCC (67 percent), DCC (65 percent), and BCC (62 percent) (Figure M3).

FIGURE L1

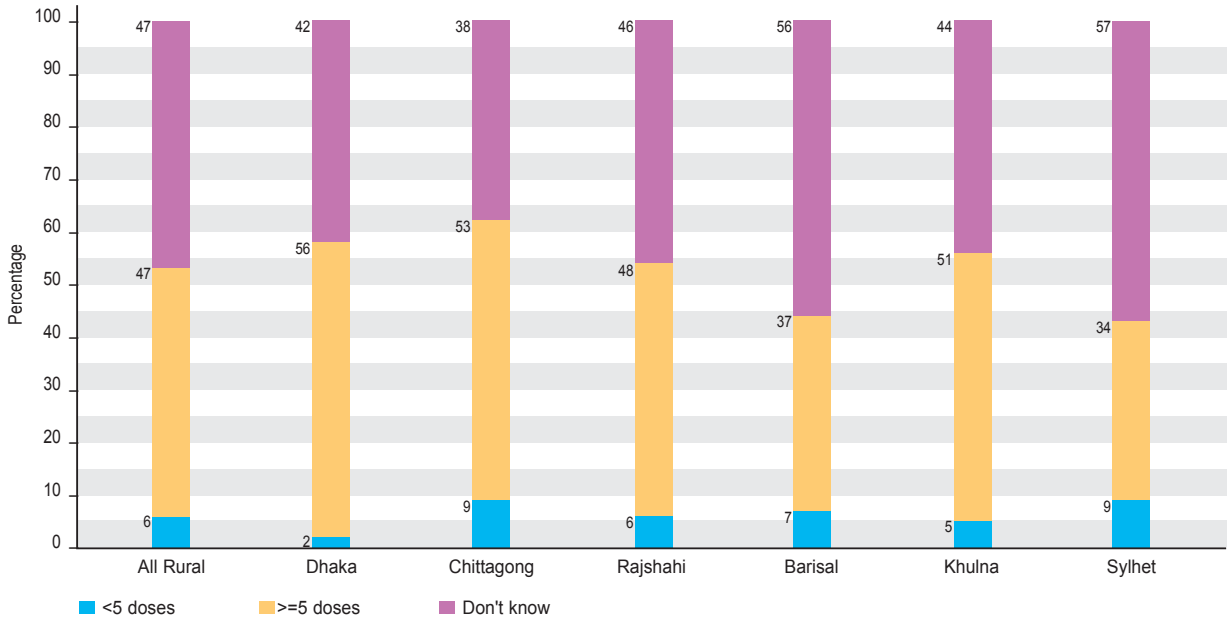
Number of TT Doses Required During Reproductive Period for Protection against Tetanus as Reported by Women Aged 15-49 Years Old by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE L2

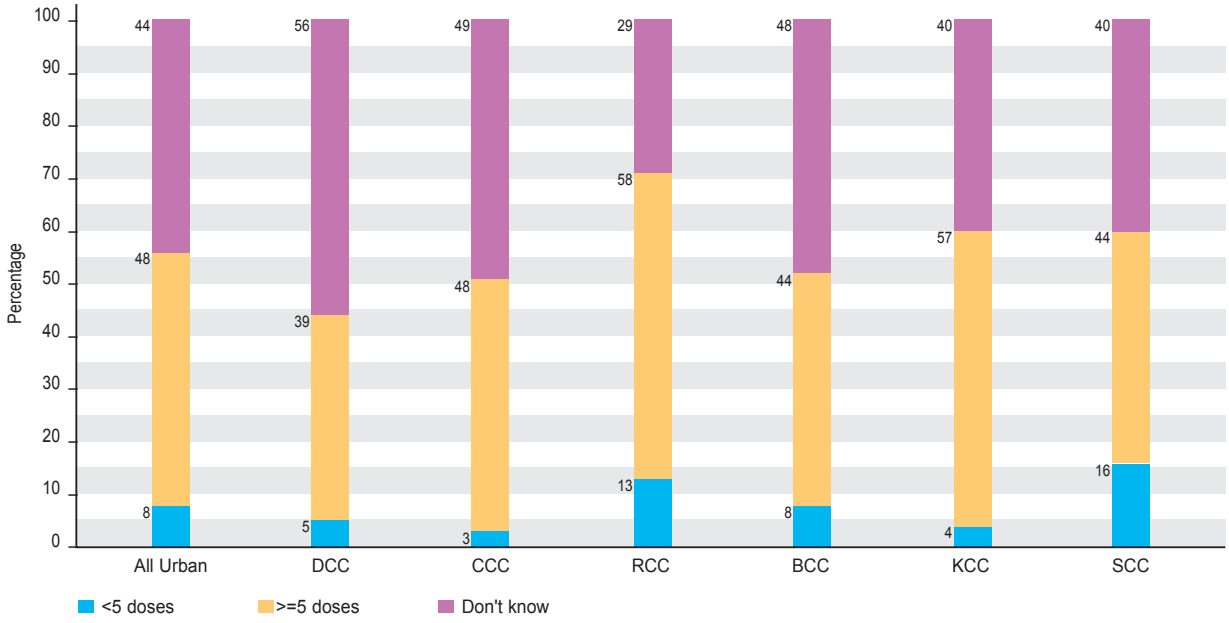
Number of TT Doses Required During Reproductive Period for Protection against Tetanus as Reported by Women Aged 15-49 Years Old in Rural Areas by Division in 2007



Source: CES 2007

FIGURE L3

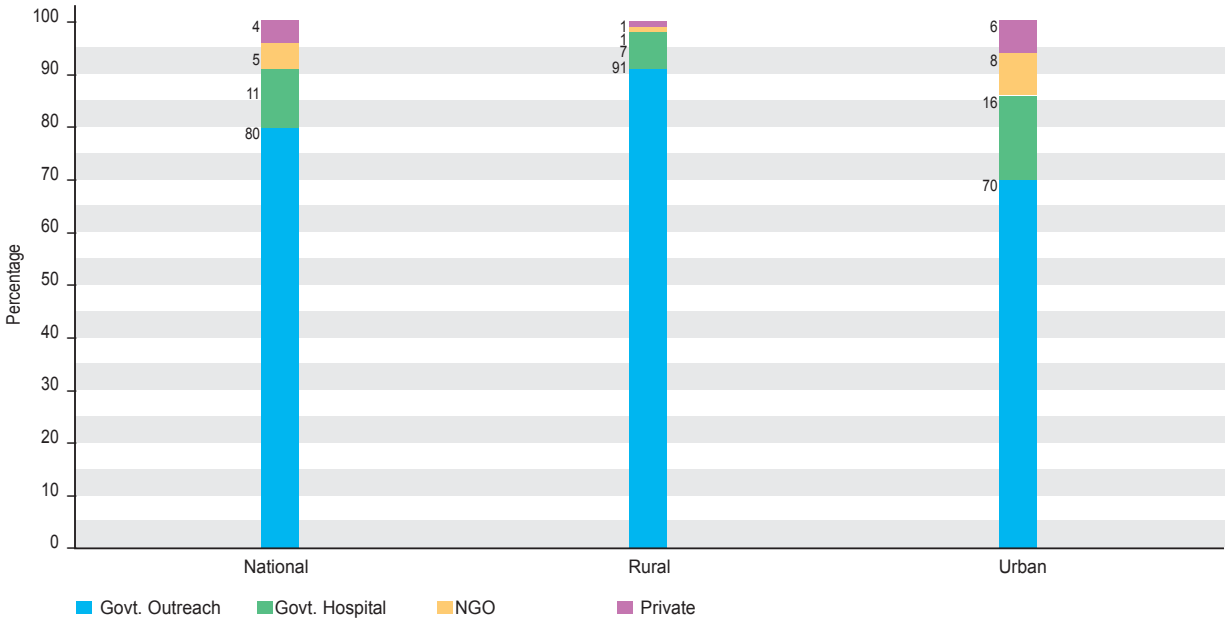
Number of TT Doses Required During Reproductive Period for Protection against Tetanus as Reported by Women Aged 15-49 Years Old in Urban Areas by City Corporation in 2007



Source: CES 2007

FIGURE M1

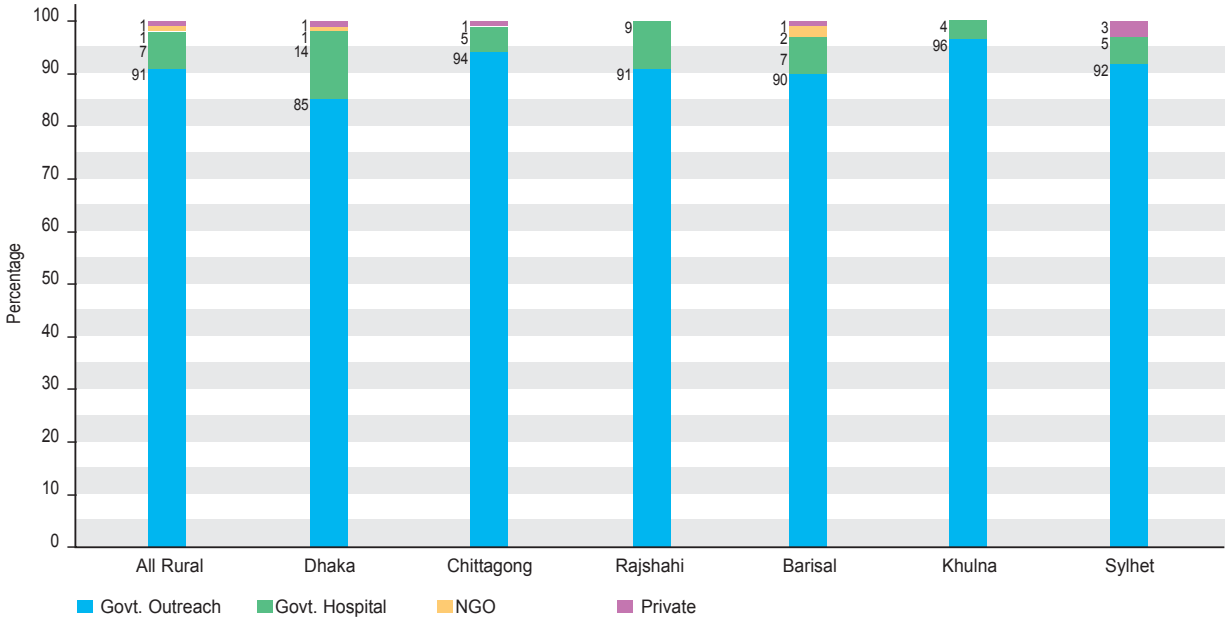
Sources of TT1 Vaccination among Women Aged 15-49 Years Old by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE M2

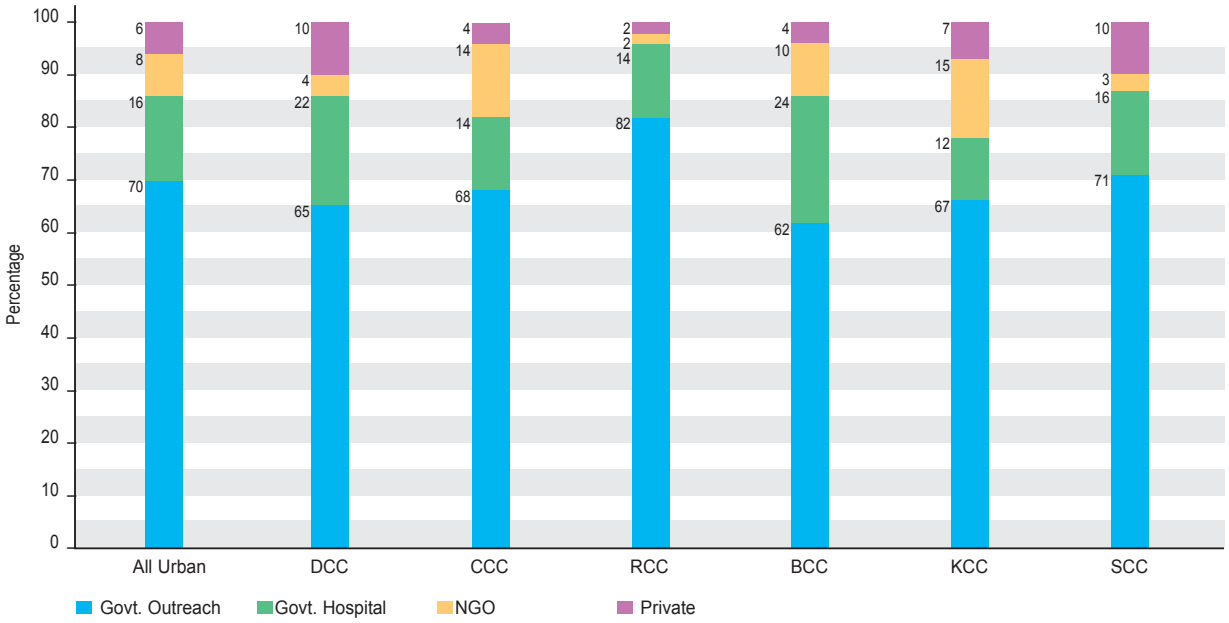
Sources of TT1 Vaccination among Women Aged 15-49 Years Old in Rural Areas by Division in 2007



Source: CES 2007

FIGURE M3

Sources of TT1 Vaccination among Women Aged 15-49 Years Old in Urban Areas by City Corporation in 2007



Source: CES 2007

Chapter 5

OPV, VITAMIN A AND ANTHELMINTIC COVERAGE DURING 16TH NIDS

This chapter provides information from the CES 2007 on OPV coverage during 16th NIDs, Vit A, and Anthelmintic coverage. Specifically, it presents the findings on OPV coverage during the first and the second rounds of 16th NIDs, Anthelmintic coverage among 23-59 months children, Vit A coverage among 12-59 months of children and reasons for not receiving OPV, Anthelmintic, and Vit A supplementation. In addition, sources of information about NID is discussed.

In order to present the national OPV coverage during 16th NIDs as well as for an understanding of the methodology and findings of the 16th NIDs Survey, a brief description of NIDs is provided in the following section. It describes the purposes of NIDs as a supplementary immunization strategy, how they are conducted in Bangladesh, and how a child-to-child search is carried out to identify and vaccinate the children left out of the NID fixed-site vaccination.

5.1 NIDS AS A SUPPLEMENTARY STRATEGY

Poliomyelitis is a deadly childhood disease that kills or cripples a child, if not properly immunized against the disease. Eradication of Poliomyelitis is a global issue. Although, 3 regions of the world have already been certified as polio-free, the remaining 3 regions are yet to get the aforesaid certificate. As a part of Global Polio Eradication initiative and being recommended by the World Health Assembly (WHA) in May 1988, National Immunization Days (NIDs) are conducted as one of the four strategies to make a country polio-free through mass vaccination to the targeted children. In Bangladesh, 1st NID was conducted in the year 1995.

Usually, two rounds are being conducted in every NIDs in 4-6 weeks apart with the exception of 13th special NIDs where there were 4 rounds. OPV is being administered to all under-5 children regardless of their previous OPV vaccination status. The purpose of the additional mass OPV vaccination is to interrupt the transmission of wild polio virus by replacing it with the vaccine virus, since once the wild polio virus is ousted from the body into the environment, it cannot live for long. Besides OPV, as a part of National Vitamin A Campaign, high-potency vitamin A capsule is administered to all 12-59 months old children in one of the two rounds of NIDs by maintaining the recommended interval between two doses of high potency vitamin A.

5.1.1 ORGANIZING THE NIDS

The Government of Bangladesh conducts NIDs, in collaboration with WHO, UNICEF, and other partners. Before conducting the National Immunization Day (NIDs), wide publicity is carried out using all types of available communication channels, including the mass media, i.e. television, radio, press, miking (mobile and mosque), posters, and banners. In addition, with support from community gate-keepers.

NIDs are held in a festive mood, with spontaneous participation of parents in particular and people in general. On NIDs, banners, posters, and flags particularly at and around the vaccination sites, highlighting the importance of immunization/NIDs and urging parents/caregivers to have their 0-59 months old children vaccinated from vaccination sites. Mobile & mosque mikes are also used to remind the parents of their responsibility taking their children for vaccination.

For an immunization day, around 140,000 vaccination sites are set up across the country, ensuring easy access for all people everywhere so that parents/caregivers face no difficulties in bringing their children to the site for vaccination.

Alongside the 68,000 government health workers plus the other semi-government and NGO workers, about 650,000 community volunteers from all walks of life worked as usual as vaccinators in the 16th NIDs. The volunteers represented participation from a cross-section of people, including teachers, students, religious personalities, women groups, members of community-based micro-finance organizations, members of the Village Defense Party (VDP), and many indigenous organizations.

5.1.2 CHILD-TO-CHILD SEARCH

For the four consecutive days following the day of NID, child-to-child search is undertaken to identify and vaccinate the children who could not be reached and vaccinated during the day of NID. These children are usually referred to as the 'left-out children'. The workers visit every household in their respective wards/mohallas, looking for the left-out children to provide them OPV as they have missed it at the fixed site.

5.2 SELECTION OF SAMPLE

The 16th NIDs Survey was implemented over a representative national NID Sample of 0-59 month's old children, drawn from the cluster samples for the 2007 CES in the following manner. While visiting all the households in every cluster, the interviewers listed all eligible Children (0-59 month's) of that cluster to make the sampling frame. Then seven children were selected randomly from the sampling frame to administer the questionnaires. The NID Sample consisted of 2,520 children of 0-59 months old nationally; 1,260 children from divisional areas, and 1,260 children from city corporation areas.

5.3 OPV COVERAGE

In the 16th NIDs, the national OPV coverage in the 1st round was 98 percent of the targeted children. Among them, 97 percent were vaccinated at fixed sites and 3 percent at home through child-to-child search. The rural-urban coverage was similar to that in the national findings.

In the 2nd round, the national coverage was 96 percent. Among them 96 percent were vaccinated at fixed sites and 4 percent at home through child-to-child search. Overall, in the 16th NIDs, 99 percent targeted children were given at least one OPV dose, and only one percent could not be reached at all (Figure N2).

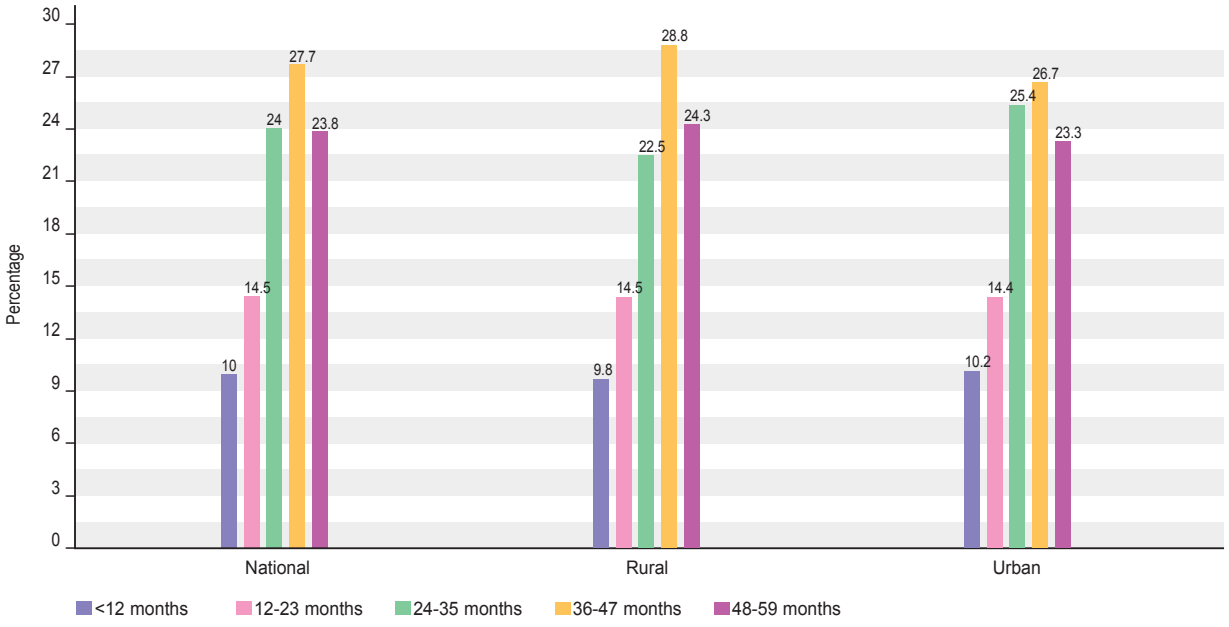
The overall OPV coverage in the 16th NIDs there was no variation in between rural and urban areas. In the 1st round, 98 percent children of both rural and urban areas received OPV, while in the 2nd round nationally 96 percent of the children received OPV. There was no difference in the coverage between rural and urban areas. Thus, the percentage of children received at least one OPV dose was 99 percent both in the rural and urban areas (Figure N2). However, there was a slight variation observed between rural division and city corporation areas in respect to fixed-site vaccination. In the 1st round, 98 percent of the city corporation's children were vaccinated at fixed sites compared to a slightly lower (96 percent) in the divisional children.

By rural divisions, 94 percent children received OPV in all 2 rounds. In rural divisions, the OPV coverage for the 1st round was the lowest in Dhaka, Barisal, and Sylhet divisions, with 97 percent and the highest in Khulna and Chittagong divisions with 100 percent. The OPV coverage rate in the 2nd round was the lowest in Sylhet division (88 percent) and the highest in Khulna division (100 percent). However, for all rounds the coverage rate was revealed the lowest in Sylhet division (87 percent) and the highest in Khulna division with 99 percent (Figure N5).

In urban areas, a little variation was noticed among the six city corporations in respect to OPV coverage in the 16th NIDs. In the 1st round, the OPV coverage varied from 96 percent in DCC to 100 percent in RCC and KCC, during the 2nd round it varied from 92 percent in SCC to 99 percent again in KCC (Figure N6).

FIGURE N1

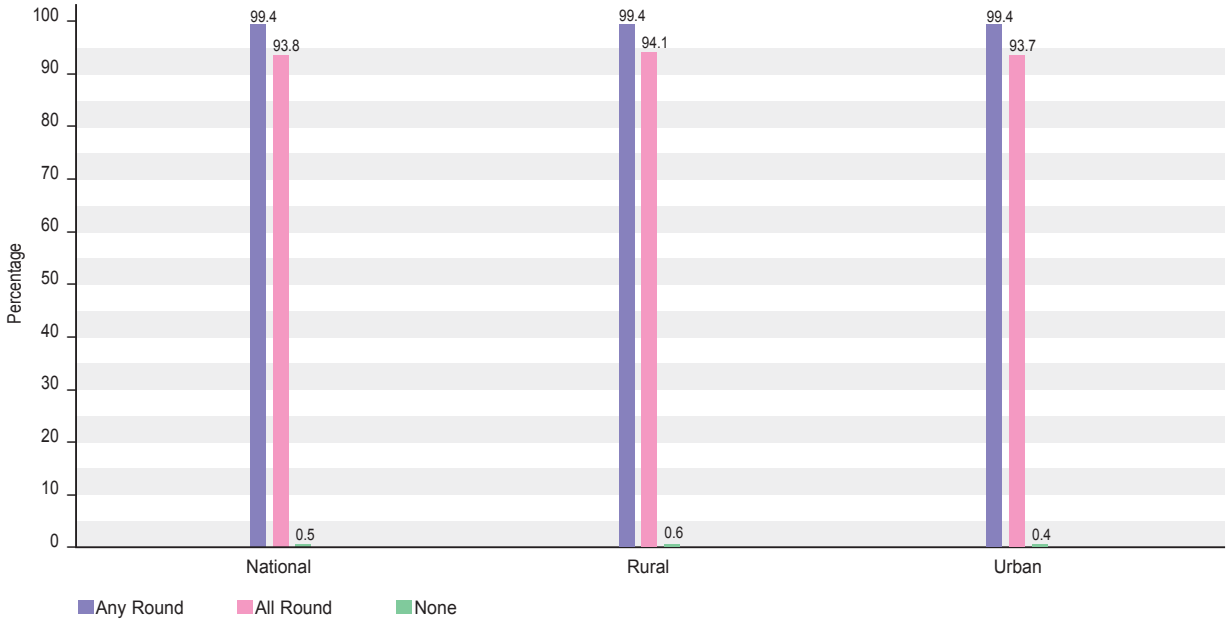
Age Distribution of Children Sampled for 16th NIDs Survey by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE N2

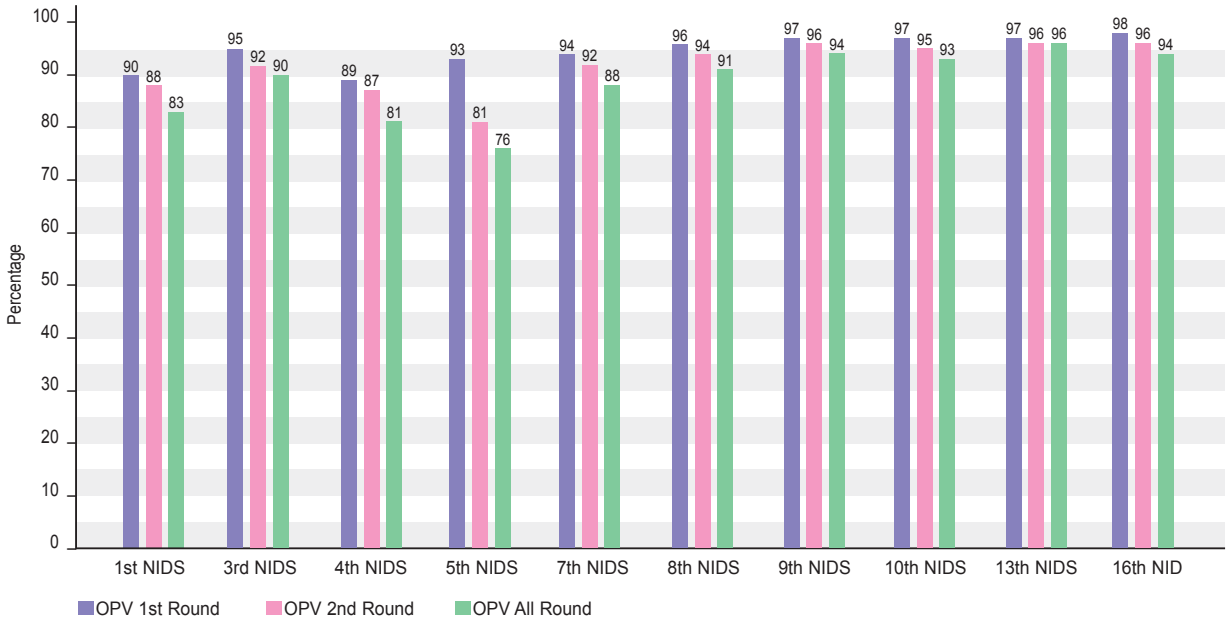
OPV Coverage among 0-59 Months Old Children in 16th NIDs by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE N3

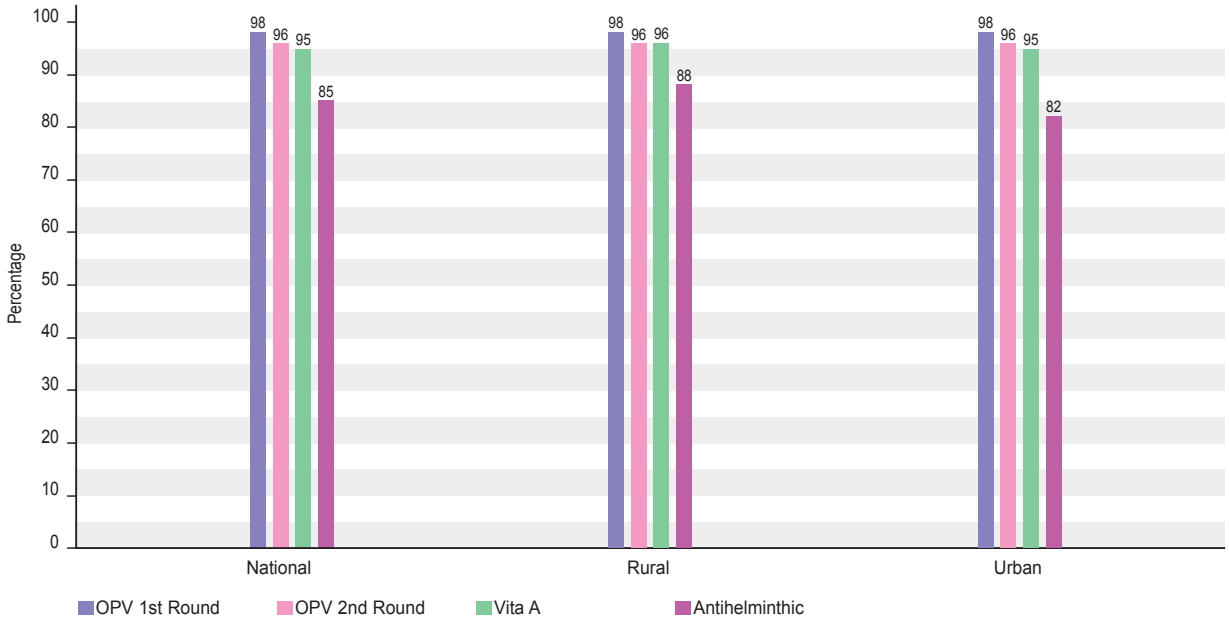
OPV Coverage among 0-59 Months Old Children by NIDs from 1995 to 2007



Source: CES 2007

FIGURE N4

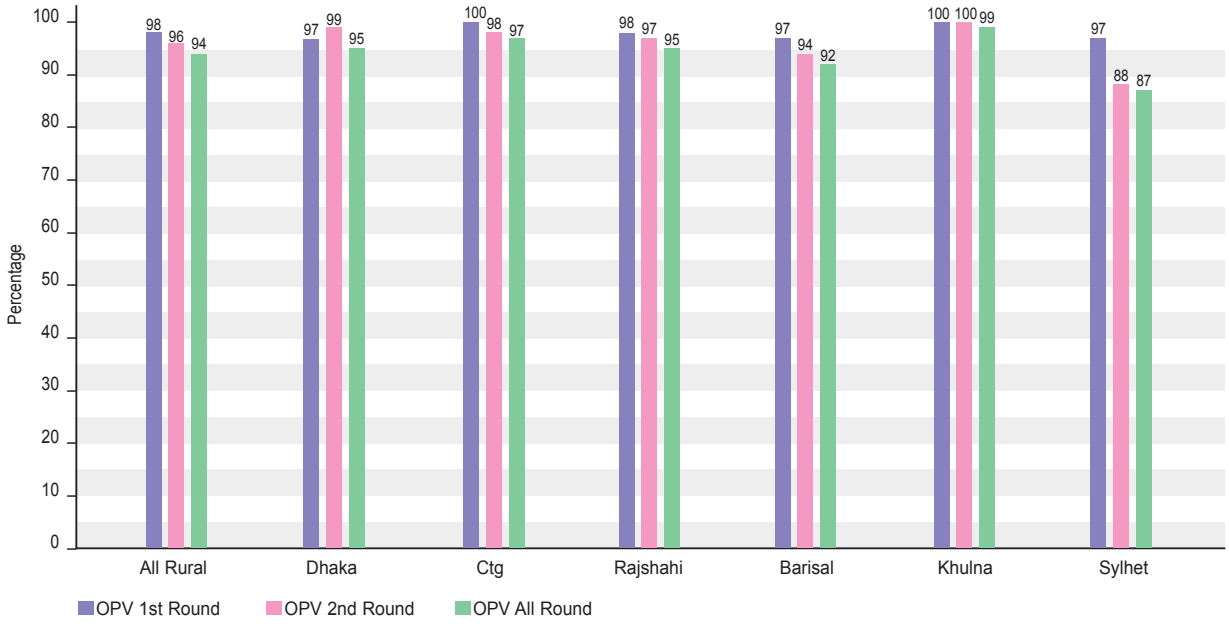
Round Specific OPV Coverage among 0-59 Months Old Children, Vitamin A Coverage among 12-59 months Old Children and Antihelminthic Coverage among 24-59 Months Old Children in 16th NIDs by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE N5

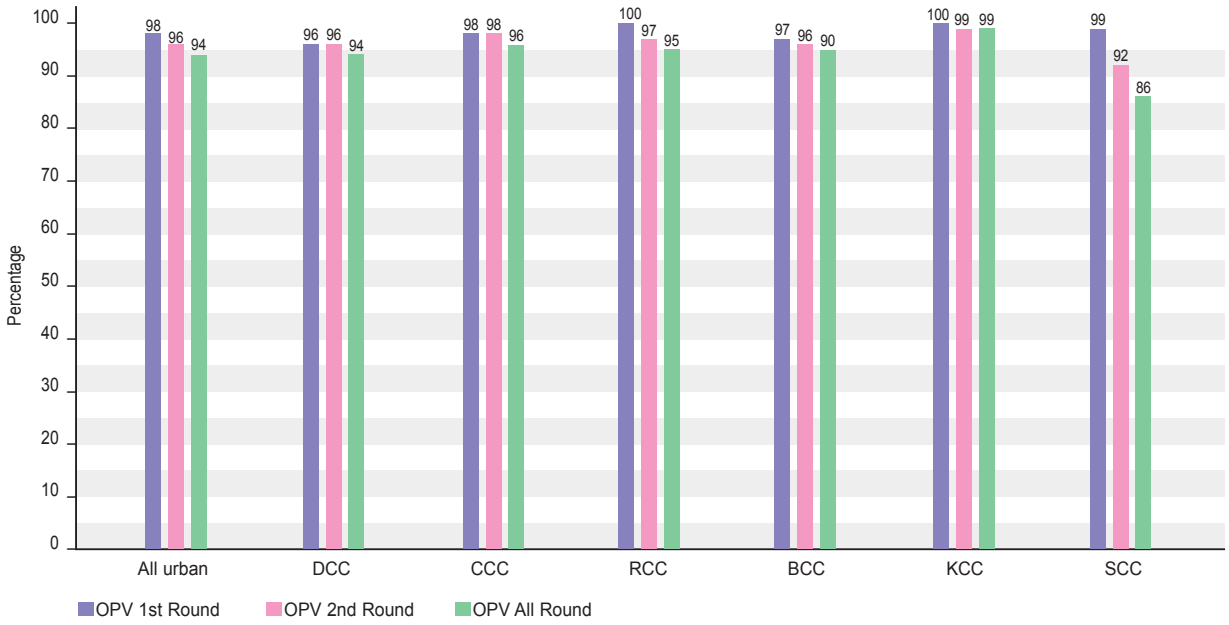
OPV Coverage among 0-59 Months Old Children in 16th NIDs in Rural Areas by Division in 2007



Source: CES 2007

FIGURE N6

OPV Coverage among 0-59 Months Old Children in 16th NIDs in Urban Areas by City Corporations in 2007



Source: CES 2007

5.4 REASONS FOR NOT HAVING CHILDREN VACCINATED AT FIXED SITES

If a child was not being vaccinated with OPV at the fixed site in the 16th NIDs, his/her mother/caregiver was asked why s/he was not vaccinated there. If the mother/caregiver gave more than one reason, only the most important one was recorded.

In the first round, nationally, forty-four percent of the mothers reported that they did not know about the campaign - 46 percent in the rural and 42 percent in the urban areas. Eighteen percent Mothers/caregivers stated that they were busy - 8 percent in the rural and 30 percent in the urban areas. A little over one in ten mothers/caregivers reported that they were not at home during the day of NIDs. The other reasons were; mothers/ caregivers were traveling (6 percent); they waited for the home visit (7 percent) (Figure O1).

As was expected, similar reasons were found for not receiving OPV at the fixed site in the second round. The most common reasons were; they did not know about the campaign (41 percent); mothers/caregivers were not at home (26 percent); and 13 percent mothers/ caregivers were busy (Figure O2).

5.5 SOURCES OF INFORMATION ABOUT 16TH NIDS

Nationally, television was found as the most common source of information from whom parents/caregivers learnt about the 16th NIDs, it was followed by mobile miking (28 percent), health

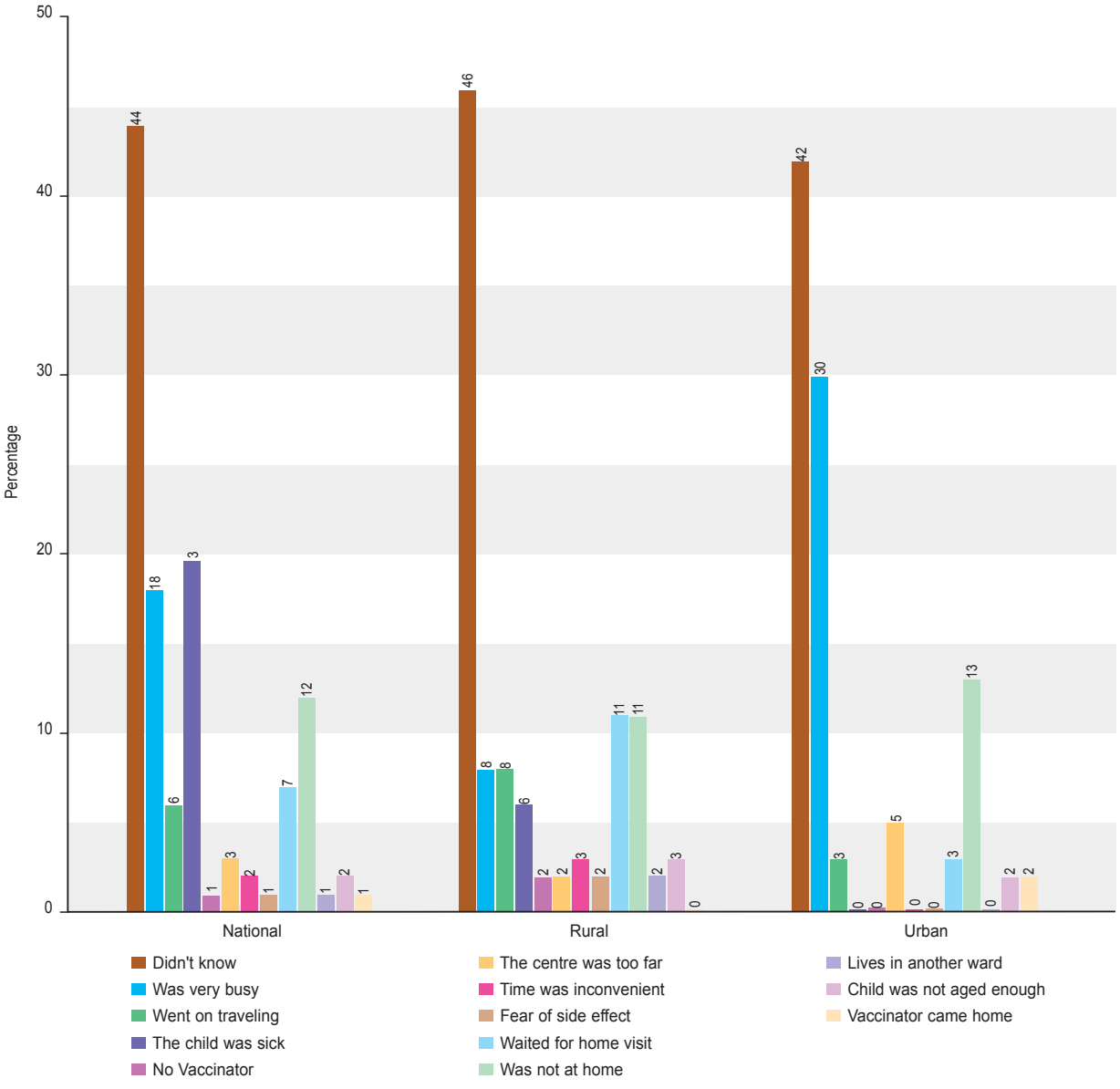
workers' home visit (23 percent), mosque miking (16 percent), and family members/ neighbors/friends (13 percent).

However, in rural areas, the most common sources of information about the 16th NIDs were: Health workers (34 percent against 14 percent in urban areas); mobile miking (26 percent), television (25 percent), and mosque miking (23 percent).

As expected in the urban areas, the most common source of information was found to be the television (65 percent), which was being followed by mobile miking (30 percent), family members (16 percent), health workers (14 percent), and mosque miking (11 percent) (Figure O3).

FIGURE O1

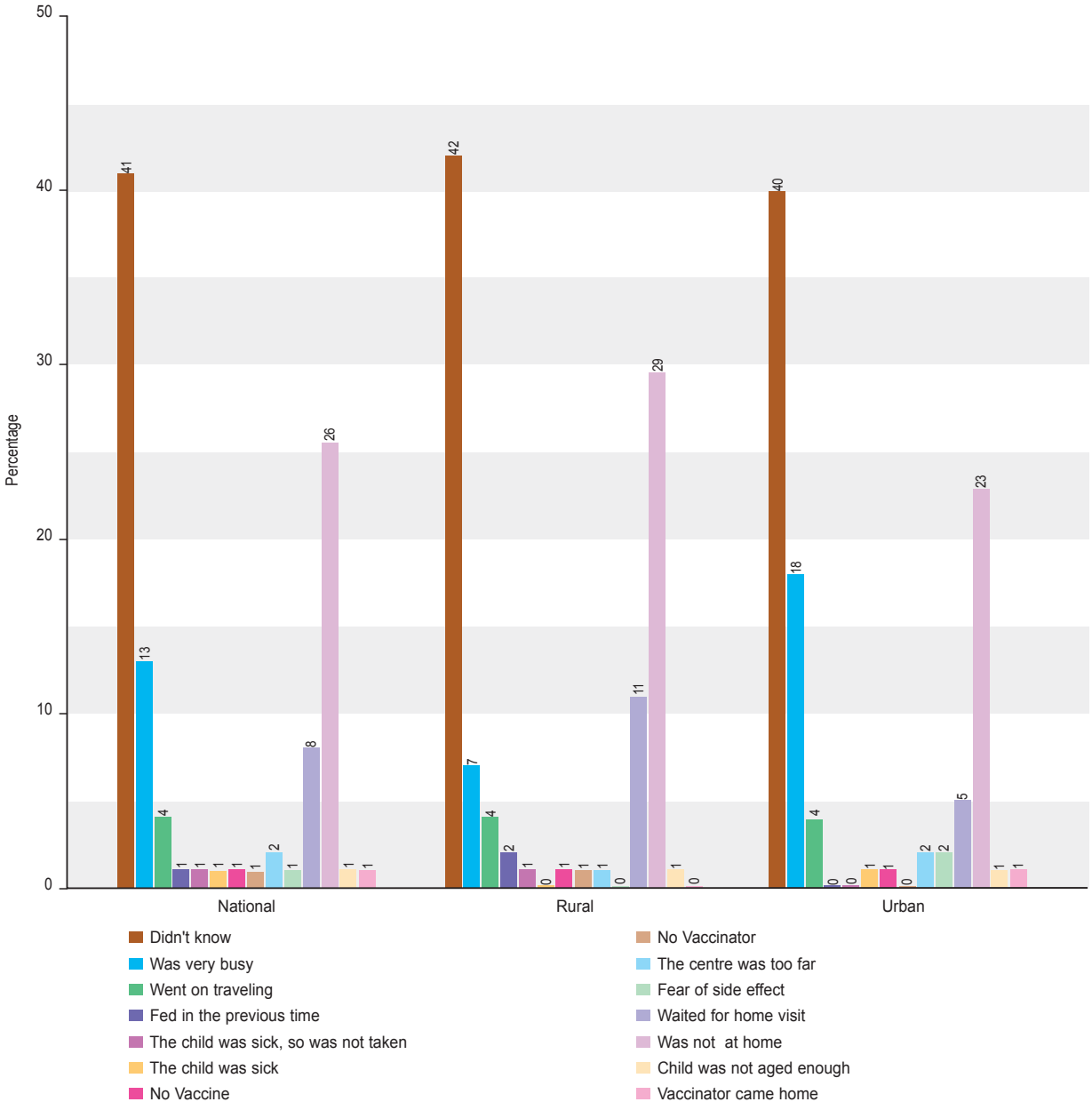
Reasons Why Children were not Vaccinated in 1st Round of 16th NIDs by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE O2

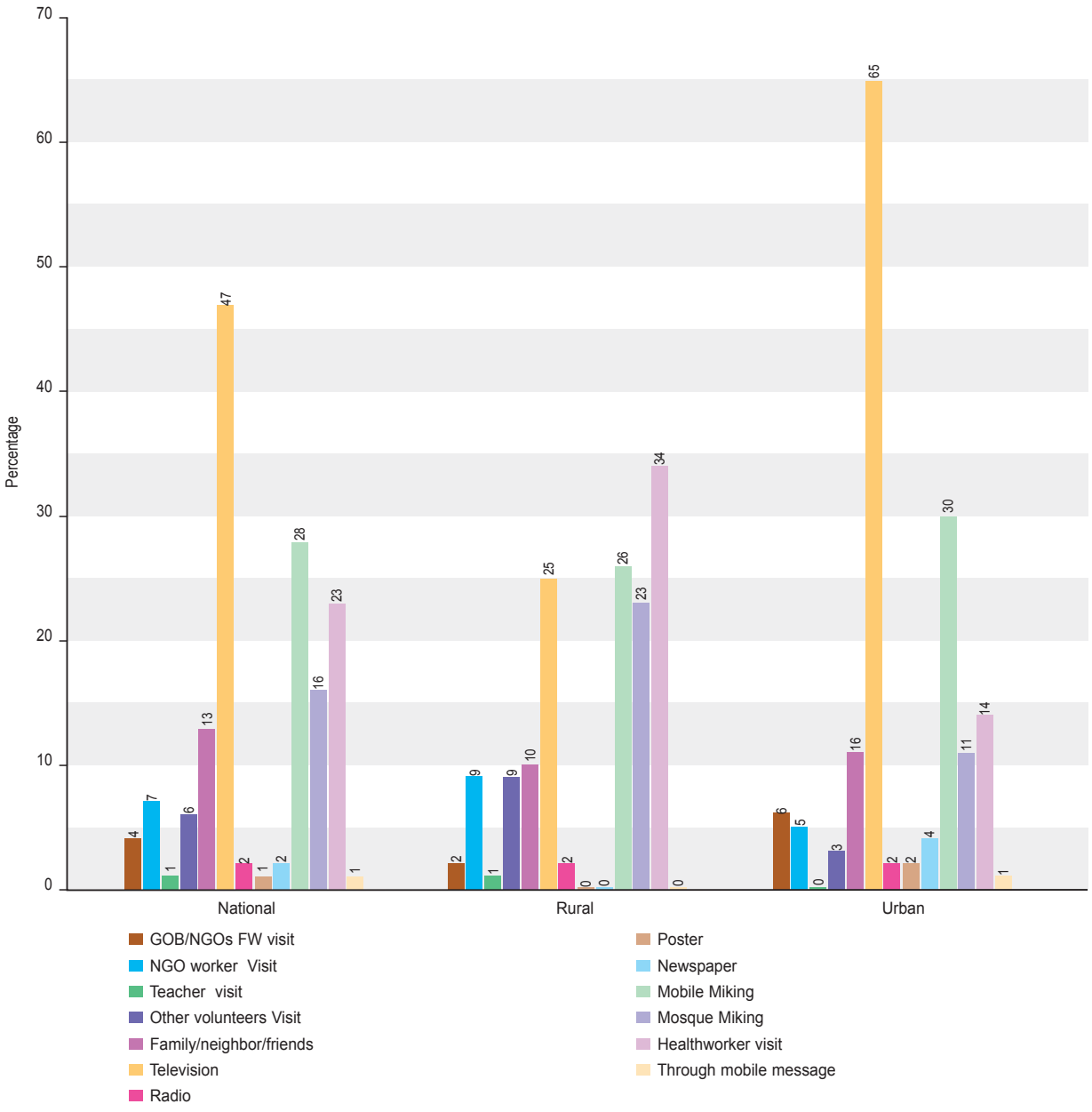
Reasons Why Children were not Vaccinated in 2nd Round of 16th NIDs by National, Rural and Urban Areas in 2007



Source: CES 2007

FIGURE O3

Sources of Information of 16th NIDs by National, Rural and Urban Areas in 2007



Source: CES 2007

5.6 VITAMIN A SUPPLEMENTATION COVERAGE AMONG INFANTS, POSTPARTUM WOMEN AND CHILDREN

INFANTS

The national coverage of vitamin A Supplementation among the infants aged 9-11 months was 89 percent. In rural areas, the coverage was 91 percent while the coverage was 87 percent in urban areas (Figure P1). Nationally, difference between measles vaccination coverage and vitamin A supplementation was 8 percentage points. Among the children aged 12-23 months, measles vaccination coverage by the age of 12 months was 81 percent nationally.

In the rural divisions, coverage of vitamin A supplementation among the infants ranged from 87 percent in Sylhet to 95 percent in Khulna division (Figure P2), and in city corporations, it ranged from 66 percent in SCC to 97 percent in RCC (Figure P3).

In rural areas, there was a 1 percentage point difference in the coverage between boys (92 percent) and girls (91 percent), while in urban areas, there was a 2 percent point difference between boys (88 percent) and girls (86 percent) (Figure P4).

CHILDREN AGED 12-59 MONTHS

The national coverage of Vitamin A Supplementation among the children aged 12-59 months during the 1st round of 16th NIDs held on 27th October 2007 was 95 percent. Coverage in the rural areas (95 percent) was one percentage point lower to that in the urban areas (96 percent) (Figure P1).

Among the rural divisions, the coverage was the highest in Barisal division (97 percent) and the lowest in Rajshahi division (91 percent) (Figure P2).

In the urban areas by city corporations, Sylhet City Corporation had the highest coverage (99 percent), which was followed by KCC and CCC (97 percent), DCC and RCC (96 percent), and BCC (92 percent) (Figure P3).

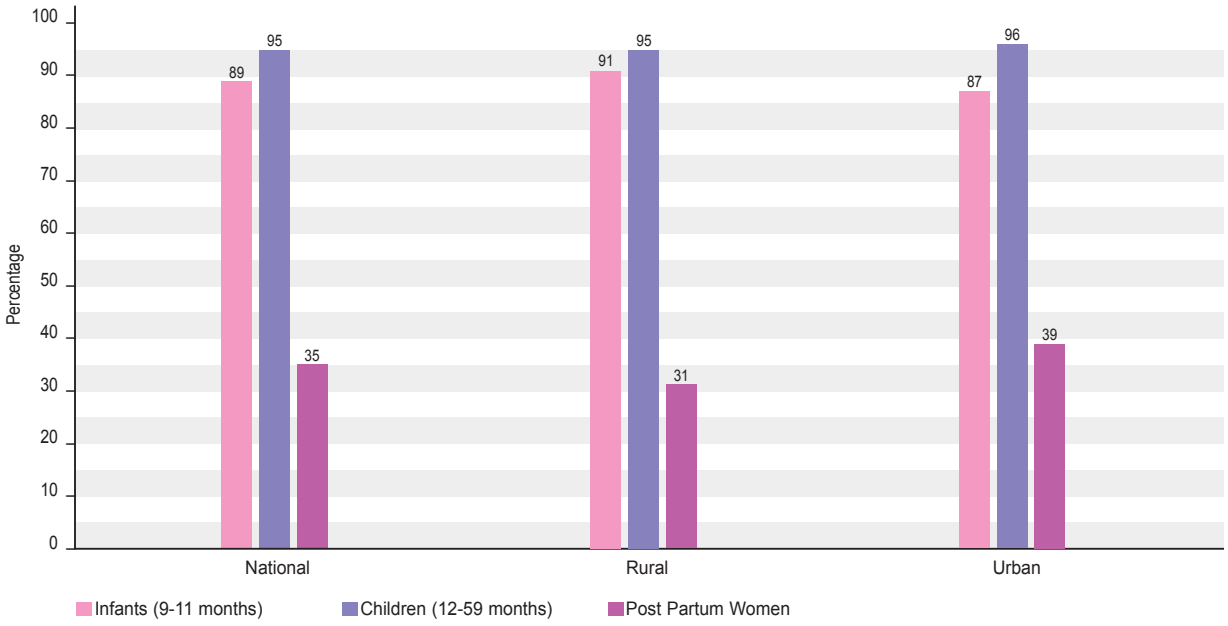
POSTPARTUM WOMEN

The national coverage of vitamin A Supplementation among the postpartum women within 6 weeks of delivery was 35 percent; 31 percent in rural areas and 39 percent in urban areas (Figure P1).

By rural divisions, the coverage ranged from 23 percent in Sylhet division to 39 percent in Barisal division (Figure P2), and in the city corporations, it ranged from 19 percent in SCC to 57 in KCC (Figure P3).

FIGURE P1

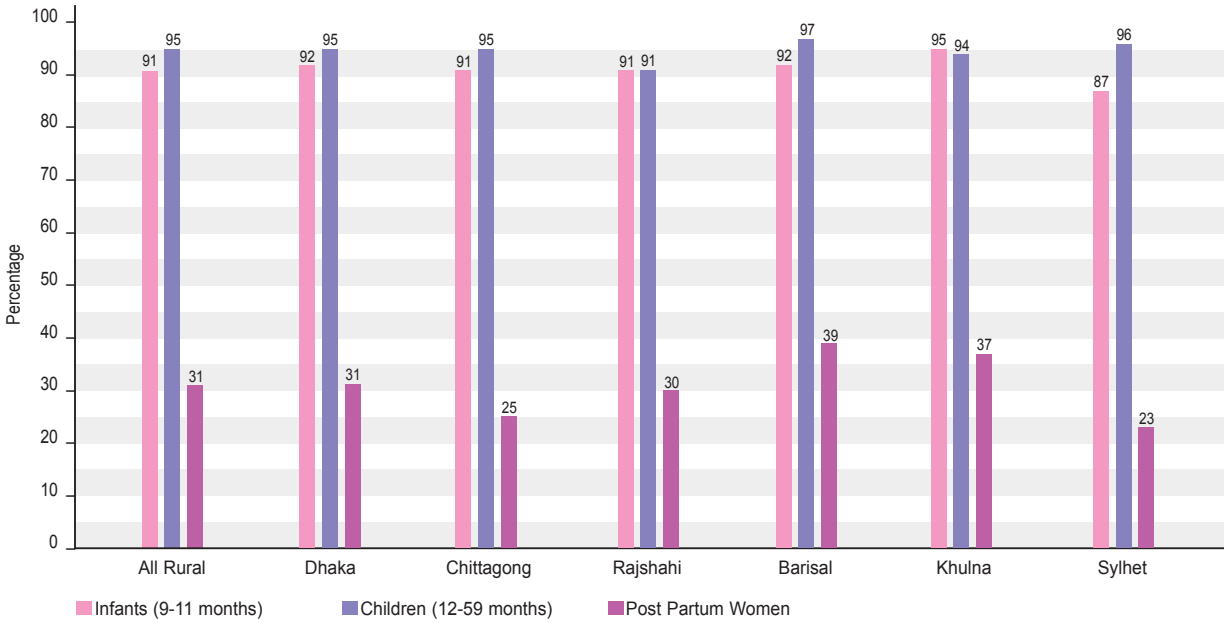
Vitamin A Coverage among Infants Aged 9-11 Months in Childhood Vaccination Survey, Vitamin A Supplementation Coverage among Children 12-59 Months in 16th NIDs and Vitamin A coverage among Postpartum Women in TT Survey by National, Rural and Urban Areas



Source: CES 2007

FIGURE P2

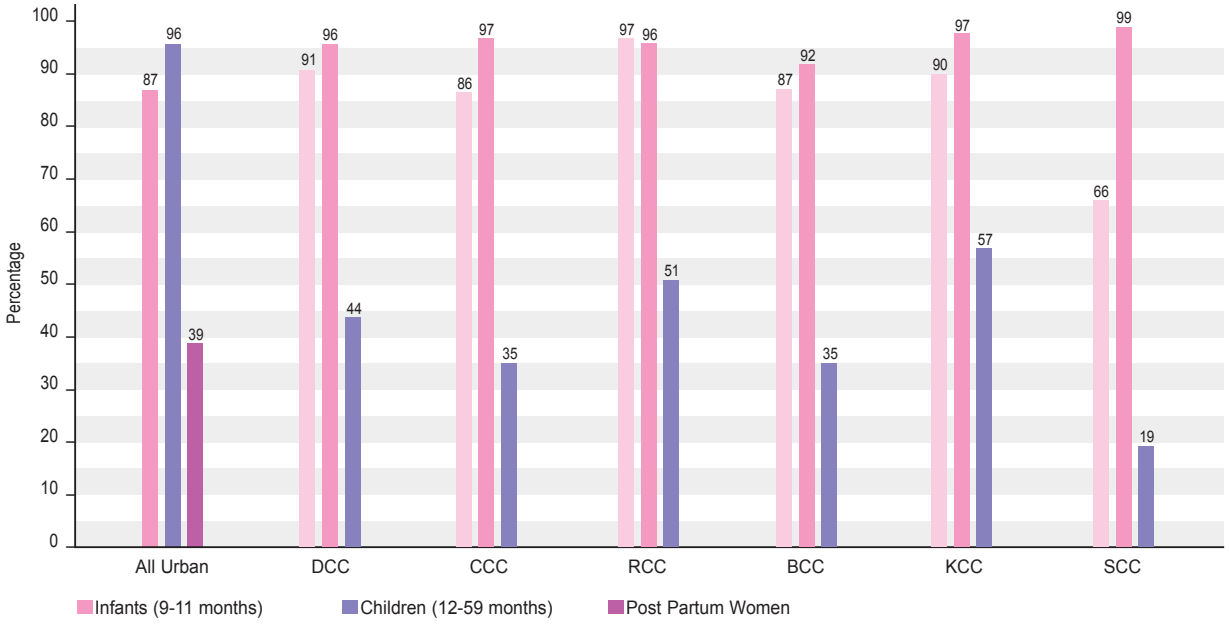
Vitamin A supplementation Coverage during 16th NIDs among Children Aged 12-59 Months, Infants Aged 9-11 Months and Postpartum Women in Rural Areas by Division



Source: CES 2007

FIGURE P3

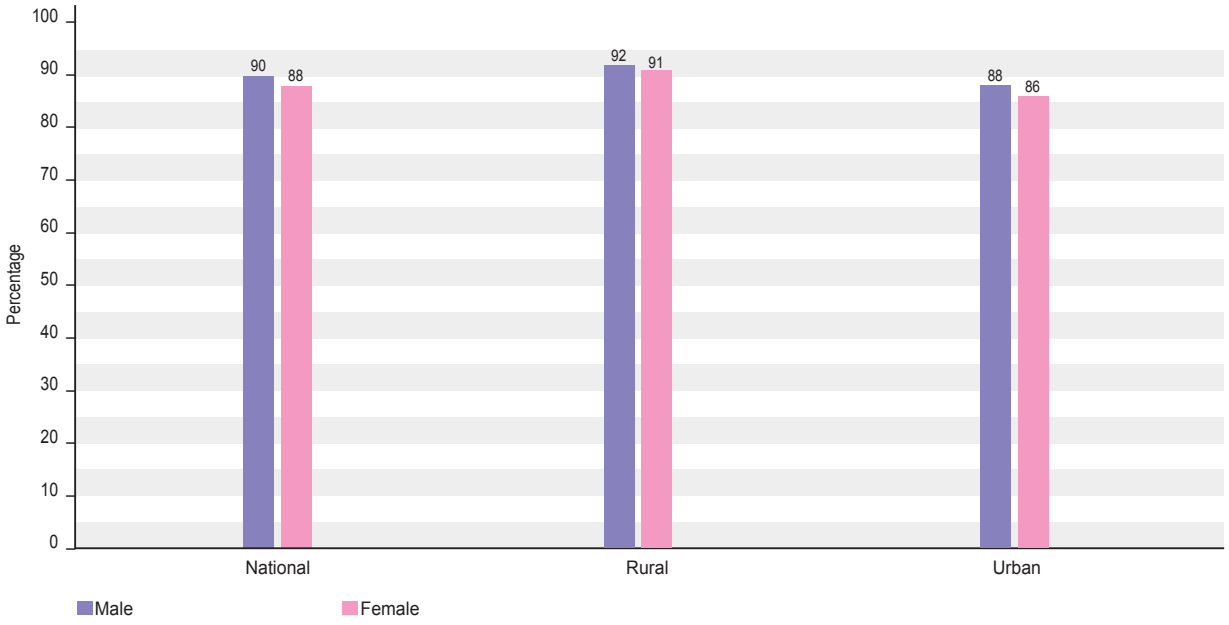
Vitamin A Supplementation Coverage during 16th NIDs among Children Aged 12-59 Months, Infants Aged 9-11 Months, and Postpartum Women in Urban Areas by City Corporations



Source: CES 2007

FIGURE P4

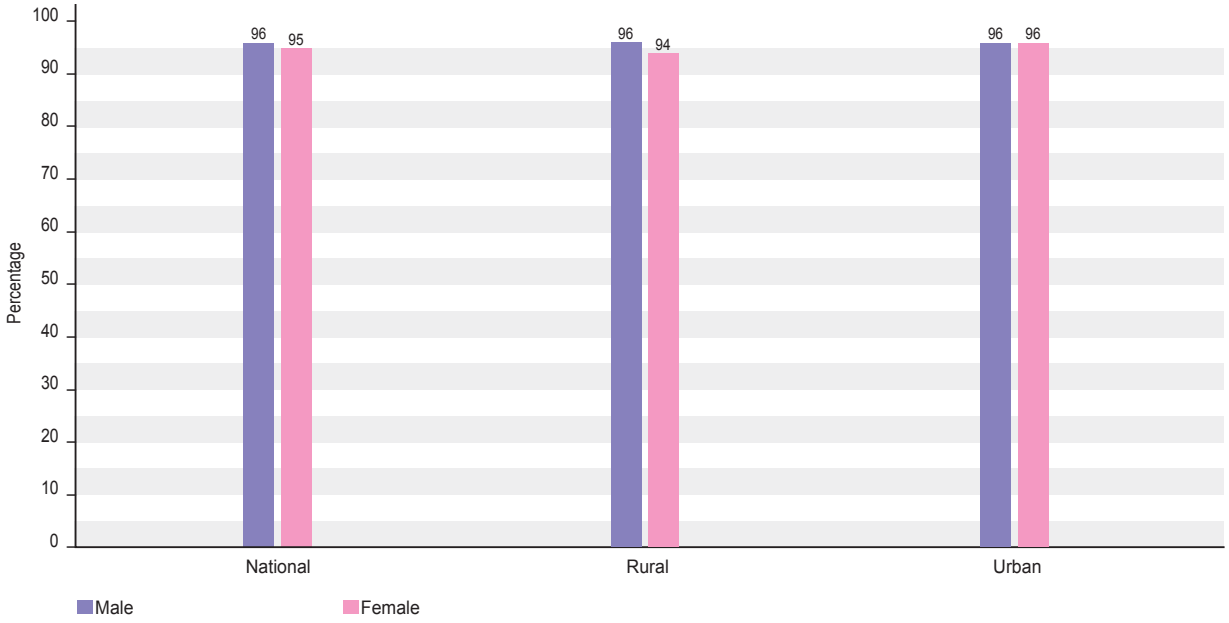
Vitamin A Coverage among Infants Aged 9-11 Months in Childhood Vaccination Survey by Region and Sex



Source: CES 2007

FIGURE P5

Vitamin A Supplementation Coverage among Children Aged 12-59 Months in 16th NIDs by Region and Sex



Source: CES 2007

5.6.1 REASONS FOR WHY CHILDREN DID NOT RECEIVE VAC DURING THE 16TH NIDS

Mothers and caregivers of children aged 12-59 months who did not receive a Vitamin A capsule (VAC) during the 1st round of 16th NIDs held on 27th October 2007 were asked the reason why their children did not receive VAC (Tables P1-P3). Nationally, the most common responses were: lack of awareness about the NID/Vitamin A supplementation (48 percent), which was being followed by the non-availability of VAC at the site (21 percent); absence from home (11 percent); and mothers/caregivers were busy (8 percent).

Lack of awareness about the NID/Vitamin A supplementation was the most common reason for not receiving a VAC in both rural (42 percent) and urban (54 percent) areas (Table P1). In rural areas, the percentage of children who did not receive VAC due to lack of awareness was the highest in Khulna division (90 percent), which was followed by Barisal (40 percent), Dhaka (38 percent), Rajshahi (23 percent), and Chittagong divisions (22 percent) (Table P2). In urban areas, the corresponding data was RCC (86 percent), KCC (83 percent), DCC (63 percent), CCC (40 percent), BCC (33 percent), and SCC (33 percent) (Table P3). The variations might be due to the lack of social mobilization efforts to inform mothers and caregivers about the campaign.

TABLE P1

Reasons why Children did not receive Vitamin A Supplement during 16th NIDs in 2007 by National, Rural and Urban Areas

Reasons for not receiving Vitamin A	National	Rural	Urban
Didn't know	47.6	41.5	54
Was very busy	7.8	5.7	10
Went on traveling	2.9	1.9	4
The child was fed in the previous time	1	0	2
The child was sick, so he/she was not taken	1.9	3.8	0
The child was sick, so vaccine was not given	1	0	2
Vitamin A was not available	21.4	26.4	16
No Vaccinator	1	0	2
The centre was too far	1	0	2
Fear of side effect	2.9	3.8	2
Waited for home visit	1	1.9	0
Was not at home	10.7	15.1	6
Number of Children who did not receive vitamin A	**103**	**53**	**50**

TABLE P2

Reasons why Children did not receive Vitamin A Supplement during 16th NIDs in 2007 in Rural Areas by Division

Reasons for not receiving Vitamin A	Rural Total	Dhaka	CTG	RAJ	BSL	KHL	SYL
Didn't know	41.5	37.5	22.2	23.1	40	90	37.5
Was very busy	5.7	12.5	0	0	20	10	0
Went on traveling	1.9	12.5	0	0	0	0	0
The child was fed in the previous time	0	0	0	0	0	0	0
The child was sick, so he/she was not taken	3.8	0	0	15.4	0	0	0
The child was sick, so vaccine was not given	0	0	0	0	0	0	0
Vitamin A was not avialable	26.4	25	77.8	30.8	0	0	12.5
No Vaccinator	0	0	0	0	0	0	0
The centre was too far	0	0	0	0	0	0	0
Fear of side effect	3.8	0	0	15.4	0	0	0
Waited for home visit	1.9	12.5	0	0	0	0	0
Was not at home	15.1	0	0	15.4	40	0	50
Number of Children who did not receive vitamin A	**53**	**8**	**9**	**13**	**5**	**10**	**8**

TABLE P3

Reasons why Children did not receive Vitamin A Supplement during 16th NIDs in 2007 in Urban Areas by City Corporation

Reasons for not receiving Vitamin A	Urban Total	DCC	CCC	RCC	BCC	KCC	SCC
Didn't know	54	62.5	40	85.7	33.3	83.3	33.3
Was very busy	10	25	0	0	20	0	0
Went on traveling	4	12.5	0	14.3	0	0	0
The child was fed in the previous time	2	0	0	0	6.7	0	0
The child was sick, so he/she was not taken	0	0	0	0	0	0	0
The child was sick, so vaccine was not given	2	0	0	0	0	0	0
Vitamin A was not available	16	0	40	0	20	16.7	33.3
No Vaccinator	2	0	0	0	6.7	0	0
The centre was too far	2	0	0	0	6.7	0	0
Fear of side effect	2	0	0	0	6.7	0	0
Waited for home visit	0	0	0	0	0	0	0
Was not at home	6	0	20	0	0	0	33.3
Number of Children who did not receive 50 Anthelmintic tablet	**8**	**5**	**7**	**15**	**6**	**3**	

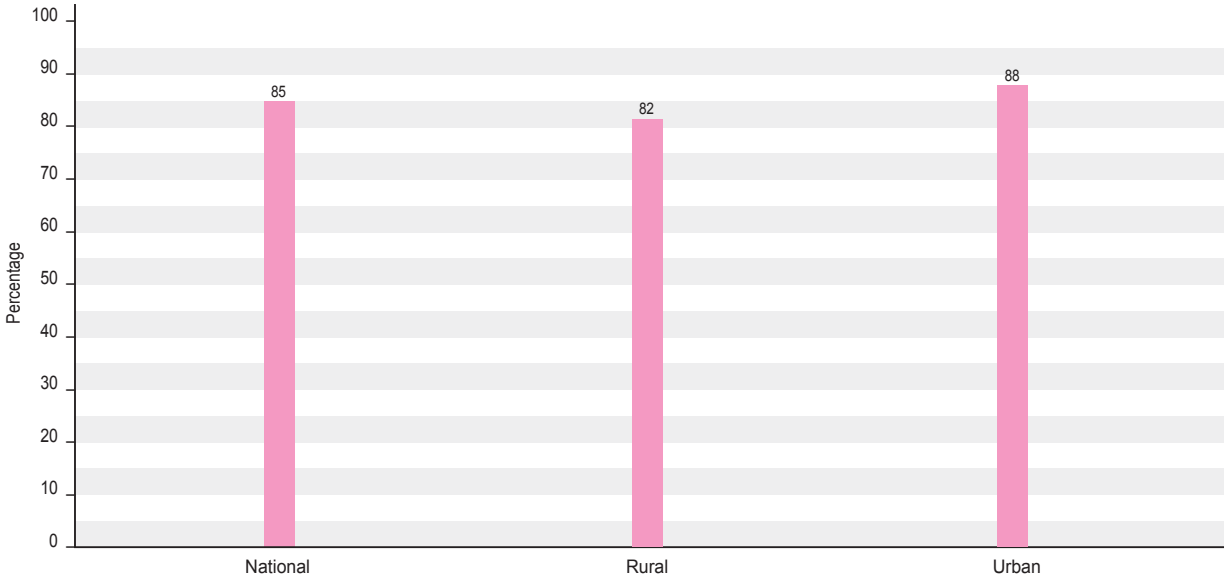
5.7 ANTHELMINTIC COVERAGE AMONG CHILDREN

Coverage of Anthelminthic treatment among children aged 24-59 months during the second round of 16th NID in all areas of the country except districts covered by filariasis programme was 85 percent (Figure Q1). The coverage was 6 percentage points higher in urban areas (88 percent) compared to that in the rural areas (82 percent). There was a slight difference between the boys (85.8 percent) and girls (84.7 percent).

By rural division, the coverage of Anthelminthic treatment ranged from 70 percent in Barisal division to 92 percent in Khulna division (Figure Q2). Among the city corporations, data on coverage of Anthelmintic treatment was collected in all city corporations except RCC since this city corporation was covered by filariasis programme. However, the Anthelmintic coverage among the city corporations ranged from 92 percent in BCC to 99 percent in SCC (Figure Q3).

FIGURE Q1

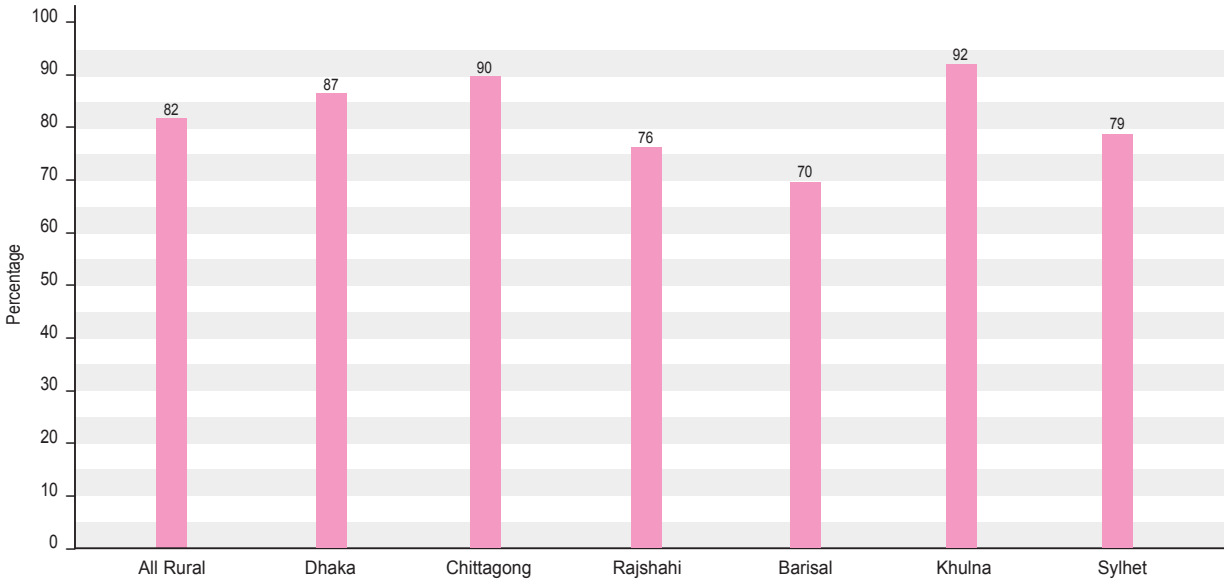
Anthelmintic Coverage among Children Aged 24-59 Months in 16th NIDs in 2007 by National, Rural and Urban Areas



Source: CES 2007

FIGURE Q2

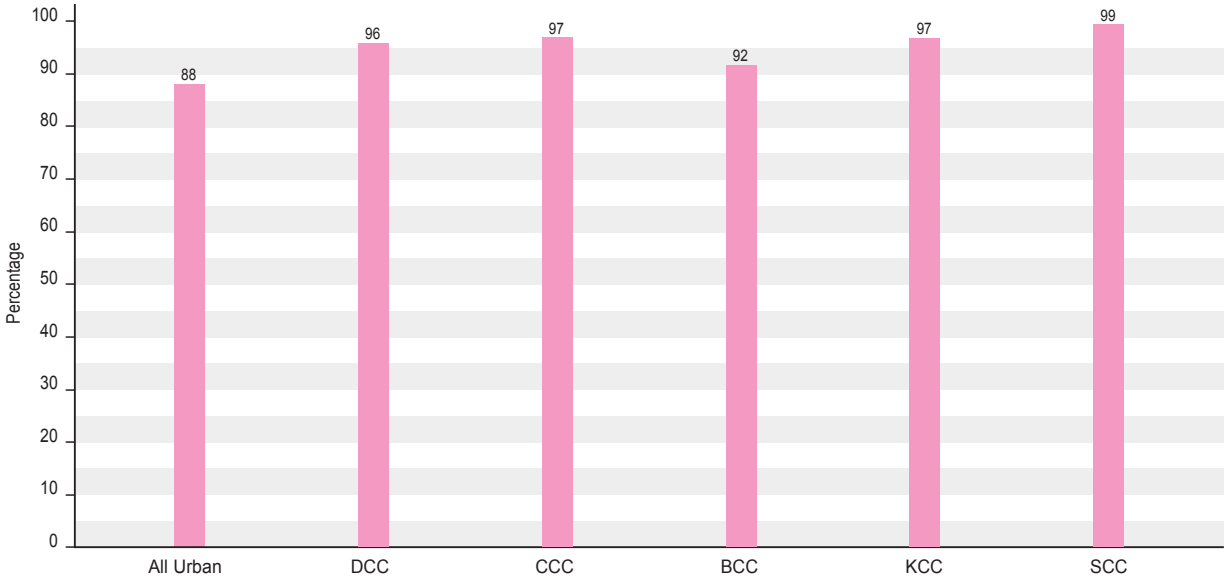
Anthelmintic Coverage among Children Aged 24-59 Months in 16th NIDs in 2007 in Rural Areas by Division



Source: CES 2007

FIGURE Q3

Anthelmintic Coverage among Children Aged 24-59 Months in 16th NIDs in 2007 in Urban Areas by City Corporation



Source: CES 2007

5.7.1 REASONS WHY CHILDREN DID NOT RECEIVE ANTHELMINTIC

Mothers and caregivers of children aged 24-59 months who did not receive Anthelminthic treatment during the 2nd round of 16th NIDs held on 8th December 2007 were asked the reason why their children did not receive the treatment (Table Q1-Q3). Nationally, the most common reason was lack of awareness (44 percent) about NIDs, which was followed by the facts that Anthelmintic tablets were not available (14 percent), and that the child was not at home (13 percent).

Lack of awareness about the NID was the most common reason for not receiving Anthelminthic in both rural (44 percent) and urban (43 percent) areas (Table Q1). In the rural areas, most of the mothers/caregivers reported lack of awareness as a cause of not receiving Anthelmintic. The proportion was 58 percent in Rajshahi division, 50 percent in Barisal and Khulna divisions, 42 percent in Sylhet division, 21 percent in Chittagong division, and 20 percent in Dhaka division (Table Q2).

Similar to the rural areas, most of the mothers/caregivers of the city corporation's areas reported about lack of awareness. The proportion was 81 percent in the BCC, which was being followed by SCC (67 percent), CCC (47 percent), DCC (43 percent), RCC (22 percent), and KCC (19 percent) (Table Q3). The variations might be due to the lack of social mobilization efforts to inform mothers and caregivers about the campaign.

TABLE Q1

Reasons why Children did not receive Anthelmintic during 16th NIDs in 2007 by National, Rural and Urban Areas

Reasons for not receiving Anthelmintic	National	Rural	Urban
Didn't know	43.5	43.6	43.3
Was very busy	4.8	3.4	6.7
Went on traveling	1.5	0	3.3
The child was fed in the previous time	10	5.4	15.8
The child was sick, so didn't take him to the vaccination centre	0.4	0.7	0
The child was sick, so the health worker didn't give vaccine	2.6	3.4	1.7
Anthelmintic tablet was not available	13.8	14.8	12.5
There was a long queue	0.4	0.7	0
The centre was too far	0.7	1.3	0
Was afraid of side effects	1.9	2.7	0.8
Was waiting to come back home with Anthelmintic tablet	3	2	4.2
Was not at home	13.4	16.1	10
Child was not aged enough	3.7	5.4	1.7
Child did not want to eat	0.4	0.7	0
Number of Children who did not receive Anthelmintic tablet	**269**	**120**	**149**

TABLE Q2

Reasons why Children did not receive Anthelmintic during 16th NIDs in 2007 in Rural areas by Division

Reasons for not receiving Anthelmintic	Rural Total	Dhaka	CTG	RAJ	BSL	KHL	SYL
Didn't know	43.6	20	21.4	58.3	50	50	41.7
Was very busy	3.4	6.7	7.1	0	4.2	0	2.8
Went on traveling	5.4	20	14.3	8.3	2.1	0	0
The child was fed in the previous time	0.7	0	0	0	0	0	2.8
The child was sick, so didn't take him to the vaccination centre	3.4	6.7	0	0	0	25	2.8
The child was sick, so the health worker didn't give vaccine	14.8	26.7	14.3	33.3	10.4	8.3	5.6
Anthelmintic was not available	0.7	0	0	0	0	0	2.8
There was a long queue	1.3	0	14.3	0	0	0	0
The centre was too far	2.7	6.7	14.3	0	0	0	2.8
Was afraid of side effects	2	6.7	0	0	0	0	5.6
Was waiting to come back home with Anthelmintic tablet	16.1	0	7.1	0	20.8	8.3	33.3
Was not at home	5.4	0	7.1	0	12.5	8.3	0
Child was not aged enough	0.7	6.7	0	0	0	0	0

TABLE Q3

Reasons why Children did not receive Anthelmintic during 16th NIDs in 2007 in Urban areas by City Corporation

Reasons for not receiving Anthelmintic	Urban Total	DCC	CCC	BCC	KCC	SCC
Didn't know	43.6	43.3	47.4	81.3	18.5	66.7
Was very busy	3.4	6.7	10.5	0	7.4	0
Went on traveling	0	3.3	5.3	0	7.4	0
The child was fed in the previous time	5.4	15.8	26.3	0	33.3	0
The child was sick, so didn't take him to the vaccination centre	0.7	0	0	0	0	0
The child was sick, so the health worker	3.4	1.7	0	0	0	0
Vitamin A was not available	14.8	12.5	5.3	0	22.2	11.1
There was a long queue	0.7	0	0	0	0	0
The centre was too far	1.3	0	0	0	0	0
Was afraid of side effects	2.7	0.8	5.3	0	0	0
Was waiting to come back home with vitamin A	2	4.2	0	6.3	0	0
Was not at home	16.1	10	0	12.5	11.1	11.1
Child was not aged enough	5.4	1.7	0	0	0	11.1
Child did not want to eat	0.7	0	0	0	0	0
Number of Children who did not receive Anthelmintic tablet	**149**	**19**	**18**	**27**	**9**	**24**

Chapter 6

DISCUSSIONS ON PROGRAMATIC IMPLICATIONS

6.1 DISCUSSIONS AND PROGRAMMATIC IMPLICATIONS

The EPI CES 2007 was conducted on the nationally representative samples. The sampling design used here is the same as that was adopted in the CES 2006. This is also a cluster survey, and clusters were drawn from the mouzas. Each cluster has got a map for its identification with land marking and it comprises on an average 120 households. This has ensured larger area coverage of eligible children. The Coverage Evaluation Survey 2007 indicates that, overall, in Bangladesh 75 percent of the eligible children were fully vaccinated (by 12 months) and 79 percent (by 23 months). It shows an increase of four percentage points by 12 months of age from the last survey that was held in 2006. Although the coverage has increased compared to that found in the previous survey, there is enough room for improvement to reach the goal.

This chapter addresses the programmatic issues and provides clarification to increase vaccination coverage in future. Low card retention is one of the challenges of EPI in Bangladesh since mothers of the children failed to vaccinate their children with the subsequent doses in time. As a result, the coverage is depended on the history, Illiteracy among the mothers, absence of birth registration, and age misreporting which has become a common phenomenon. This situation has affected the overall performance of the EPI coverage survey. Among the 6 divisions, the fully vaccination coverage rate by 12 months is the highest in Rajshahi division (82 percent) and the lowest in Sylhet division (65 percent). Similarly, in the city corporation areas, the rate is highest (82 percent) in Rajshahi City Corporation and lowest in Sylhet City Corporation (57.0 percent). The 75 percent fully vaccination coverage by 12 months at the national level in the CES 2007 is 4 percentage points higher than that in the CES 2006 (71 percent). It is mostly due to the increase from 78 percent to 81 percent in the Measles coverage. There is also increase in the DPT3 coverage in 2007 compared to that in the CES 2006 (from 84 percent to 87 percent). There is improvement in the valid coverage for the other vaccines also from 2006 to 2007.

6.2 POLICY IMPLICATIONS

The detailed analysis of EPI CES Survey 2007 shows that between CES 2006 and 2007 there has been a significant improvement in the percent of children fully vaccinated. Trends can be seen for assessing the programme efforts between the two surveys.

The EPI CES 2007 has shown an increase in the full vaccination coverage among 12-23 months old children. Despite this improvement in the coverage rate, the achievement is still below the targeted level. There are a number of reasons behind it. Usually, every vaccinated child is provided with a card, which provides detailed information about the timing of every vaccination. The nationwide survey data shows that 32 percent of mothers/caregivers could not retain the cards, which was due to one particular reason - they lost the cards.

Since the card was lost, mothers/caregivers were asked about ages of their children. As most of the mothers are illiterate and there is no birth registration record, most often mothers reported their children's ages by guess (or using historical events). There is also a tendency to report the age in years than in exact months; but for the vaccination coverage information regarding the correct age is important to measure the actual coverage following vaccination schedule. During the survey, some unknown portion of error is found regarding the age recording of the child by the mothers/caregivers. Besides, the interviewer's error is also possible while recording the age of the child.

There are problems of dropouts as well. From DPT1 to DPT3, the rate was 3 percent nationally. It varied from division to division from 1 percent to 6 percent. DPT1 to Measles dropout rate was more than the dropout rate of DPT1 to DPT3. Nationally, it was 9 percent. It also varied from one division to another. Incidence of invalid doses (early vaccination or beyond the recommended age) was one of the important factors for low vaccination coverage. Nationally, 6 percent DPT1 doses were invalid, while the DPT2 invalid doses were 8 percent. Nationally, 5 percent Measles doses were invalid. Among all divisions, the rate of invalid doses was the highest in Khulna division. For both DPT1 and DPT2, it was 14 percent. A similar trend was observed in case of measles doses. It was 8 percent in this division. This was the main reason for low vaccination coverage among all divisions.

Since a considerable percent of mothers loss their children's vaccination cards because of illiteracy accompanied by ignorance, poor housing condition, natural calamities, like floods, cyclones, movement to relatives' house etc, it is crucial that EPI workers should maintain register appropriately for each child of his/her area. Records should be verified each week and eligible children's mother houses should be visited for counseling for bringing the target children to the vaccination center. At the same time, how their cards could be preserved- ways and means- should be determined considering the geographical locations and internal communication in some districts. Some children will not visit the vaccination centers because they will migrate to other places, i.e., they will visit relatives' houses. How could these children be reached? Some mechanism should be developed in this regard. Finally, there is a large difference between the overall vaccination coverage and the valid (Recommended/Programme design) coverage rates in almost all divisions of Bangladesh. In some divisions, the situation is worth considering. The major question is how this gap could be minimized. What are the strategies that should be considered? All these issues required a detailed discussion.

In the light of the discussion above the following issues need particular attention:

- How to preserve the card is to be decided upon since 32 percent of the children's vaccination cards are lost by mothers. This is more important in natural hazard-prone zones, such as cyclone and flood-prone areas.
- How to minimize the dropouts from DPT1 to DPT3. Missing of DPT2 or DPT3 will discourage mothers not to visit EPI center for the next vaccination because they do not give importance to it.
- Dropout rates from DPT1 to DPT3 are also high in low performing divisions. These divisions need regular supervision and monitoring to minimize the rates.
- Dropout rate is also high among the children from DPT1 to measles and requires strong supervision and monitoring so that it can be minimized, and this can ensure improvement of EPI vaccination coverage rate automatically.
- There is large gap between the overall vaccination coverage and the valid coverage - the important challenge to the EPI programme management is what strategy should be adopted to reduce the gap so that valid coverage can increase significantly.
- Overall, the success of EPI Programme depends on three important factors; preservation of vaccination card and minimizing the dropout rates of multi-doses vaccines, strict maintenance of the recommended dose schedule of vaccines to avoid invalid doses for ensuring reduction of the gap between overall/total coverage and valid coverage. If EPI programme management could improve this, valid coverage will increase significantly.
- EPI headquarter management should supervise and monitor the low performing divisions quite often in order to improve the vaccination coverage. If it is not dealt with seriously, vaccination coverage will not increase as per the expectation.

The immediate step of the EPI management is to visit the low performing divisions/districts and identify the true reasons for such failures. Appropriate measures should be taken to improve the EPI coverage. Only discussions with local management may not be of any help. The management may need to think talking with the EPI workers, mothers, and community members for finding out the reasons for losing immunization cards and failure to bring the child for the next vaccination. Reaching Every District (RED) strategy could be the best effort to achieve the vaccination target in EPI.

Appendix

VACCINATION COVERAGE BY SURVEY UNIT

TABLE 1

Valid Vaccination Coverage by Age 12 Months among 12-23 Months Old Children According to Division, Low Performing Districts and City Corporation

Centre Name	BCG	OPV1	DPT1	HB1	OPV2	DPT2	HB2	OPV3	DPT3	HB3	OPV4	MS	VITA	FVC_XHB	FVC_INHB
Dhaka Division	99.0	99.0	99.0	99.0	97.0	96.6	96.6	93.0	85.0	85.2	79.6	80.2	80.4	73.9	74.1
CTG Division	98.7	99.0	99.0	99.0	97.5	97.5	97.5	92.9	87.2	87.2	80.3	82.6	82.8	76.2	75.8
Rajshahi Division	99.2	99.3	99.3	99.3	99.3	99.3	99.3	97.0	91.2	91.5	86.2	87.2	86.3	82.5	82.5
Barisal Division	99.5	98.8	98.8	98.5	98.0	97.6	97.6	94.6	89.2	89.2	83.0	85.0	84.5	79.8	79.8
Khulna Division	98.6	98.6	97.9	97.9	97.4	95.6	95.6	93.2	83.6	83.4	77.6	80.2	79.8	72.2	72.1
Sylhet Division	94.1	93.9	93.9	93.9	91.8	91.8	91.8	87.8	83.5	83.0	71.0	67.9	67.4	64.7	64.7
DCC	98.6	98.6	98.6	98.6	97.3	97.3	97.3	92.4	87.4	87.2	79.6	77.9	77.0	73.3	72.9
CCC	98.4	99.0	99.0	99.0	97.0	97.0	97.0	91.1	86.4	87.1	80.5	78.5	78.3	73.6	73.6
RCC	99.3	100.0	100.0	100.0	100.0	100.0	100.0	99.3	91.4	92.1	87.4	89.4	88.1	82.6	82.6
BCC	100.0	99.2	99.2	99.2	97.8	97.1	97.1	93.6	87.5	87.5	79.4	85.7	84.7	79.4	79.4
KCC	97.6	97.6	96.9	96.9	96.0	94.5	94.5	92.8	83.3	82.8	76.3	80.2	79.6	71.5	71.4
SCC	91.0	90.1	90.1	90.1	86.3	86.3	86.3	79.3	78.5	78.1	63.6	57.0	55.9	57.0	57.0
National	**98.2**	**98.1**	**98.0**	**98.0**	**96.8**	**96.4**	**96.4**	**93.1**	**86.6**	**86.6**	**79.7**	**80.6**	**80.2**	**75.0**	**74.9**
All Urban	**97.7**	**97.6**	**97.5**	**97.5**	**96.0**	**95.6**	**95.6**	**91.6**	**86.1**	**86.1**	**78.3**	**78.8**	**78.0**	**73.7**	**73.6**
Rural	**98.8**	**98.7**	**98.6**	**98.5**	**97.8**	**97.4**	**97.4**	**94.8**	**87.3**	**87.3**	**81.3**	**82.7**	**82.8**	**76.5**	**76.5**

Valid Vaccination Coverage by Age 12 Months by 15 low Performing Districts

Centre Name	BCG	OPV1	DPT1	HB1	OPV2	DPT2	HB2	OPV3	DPT3	HB3	OPV4	MS	VITA	FVC_XHB	FVC_INHB
All District	**96.6**	**96.8**	**96.8**	**96.5**	**94.2**	**93.9**	**93.7**	**89.4**	**82.2**	**82.0**	**74.8**	**76.1**	**75.5**	**69.2**	**69.0**
Jamalpur	98.9	99.5	99.5	99.0	98.6	97.3	96.8	94.7	90.1	90.3	81.1	74.8	74.8	69.8	70.0
Mymensingh	96.9	97.1	97.1	96.7	95.2	95.2	94.8	92.0	83.8	83.4	78.9	78.9	78.7	71.5	71.5
Netrokona	95.9	96.7	96.7	96.2	91.9	90.4	90.4	87.3	84.3	85.0	73.8	65.1	64.9	62.0	62.0
Sherpur	99.3	99.5	99.5	99.5	97.4	97.4	97.4	94.0	91.1	90.6	84.8	82.5	81.8	78.6	78.6
B.Baria	97.8	97.8	97.8	97.3	96.2	96.2	95.7	87.4	77.5	77.5	72.3	79.4	78.9	69.7	69.7
Bandarban	90.2	90.2	90.2	90.2	86.0	85.3	85.3	74.6	55.4	55.4	52.2	68.2	68.2	48.3	48.3
Cox'sbazar	97.5	98.1	98.1	98.1	96.7	96.7	96.7	92.4	88.5	87.9	78.2	76.9	73.4	72.4	71.8
Khagrarachari	96.5	96.5	96.5	96.5	95.2	94.6	94.6	89.0	81.6	81.6	75.3	80.2	80.7	73.6	73.6
Noakhali	96.2	96.2	96.2	96.2	96.2	96.2	96.2	94.3	89.0	89.8	79.3	81.0	80.4	76.0	76.0
Rangamati	95.2	95.2	95.2	95.2	94.7	94.7	94.7	91.2	81.9	81.9	72.0	77.9	77.8	69.0	69.0
Lalmonirhat	99.0	99.0	99.0	99.0	98.1	98.1	98.1	93.5	86.2	85.2	79.8	80.7	78.9	74.4	73.7
Gaibandha	99.5	99.5	99.5	98.6	95.0	94.3	92.9	90.1	79.2	78.4	72.9	75.5	73.7	67.4	66.5
Sirajganj	99.0	98.6	98.6	98.1	96.2	95.5	95.5	92.6	85.9	85.9	78.8	78.9	78.2	73.6	73.6
Moulavibazar	98.1	97.6	97.6	97.1	93.1	93.1	93.1	87.6	83.1	83.4	75.5	70.8	70.1	66.2	66.2
Sunamganj	89.3	90.0	90.0	90.0	83.2	83.2	83.2	80.3	74.2	74.2	67.8	70.0	71.7	64.4	64.4

TABLE 2

Valid Vaccination Coverage by Age 23 Months among 12-23 Months Old Children According to Division, Low Performing Districts and City Corporation

Centre Name	BCG	OPV1	DPT1	HB1	OPV2	DPT2	HB2	OPV3	DPT3	HB3	OPV4	MS	VITA	FVC_ XHB	FVC_ INHB
Dhaka Division	99.0	99.0	99.0	99.0	97.0	96.6	96.6	93.8	85.3	85.6	80.8	86.2	86.0	79.7	79.5
CTG Division	99.0	99.0	99.0	99.0	97.5	97.5	97.5	93.6	87.6	87.6	81.8	87.2	87.4	80.8	80.4
Rajshahi Division	99.5	99.3	99.3	99.3	99.3	99.3	99.3	97.0	91.6	91.9	87.9	90.2	89.7	85.8	85.8
Barisal Division	99.5	98.8	98.8	98.5	98.0	97.6	97.6	94.6	89.2	89.2	83.4	87.4	86.9	82.2	82.2
Khulna Division	98.6	98.6	98.2	98.2	97.7	95.6	95.6	93.6	83.6	83.4	79.5	85.4	85.3	76.7	76.6
Sylhet Division	94.5	93.9	93.9	93.9	91.8	91.8	91.8	87.8	83.9	83.4	72.3	74.7	74.6	71.5	71.5
DCC	98.6	98.6	98.6	98.6	97.3	97.3	97.3	94.0	88.2	88.1	81.4	86.9	86.6	81.4	81.2
CCC	99.0	99.0	99.0	99.0	97.0	97.0	97.0	91.8	87.1	87.7	80.5	83.4	83.6	78.5	78.5
RCC	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	92.1	92.7	88.8	92.0	91.1	86.0	86.0
BCC	100.0	99.2	99.2	99.2	97.8	97.1	97.1	93.6	87.5	87.5	79.4	86.5	85.5	80.2	80.2
KCC	97.6	97.6	96.9	96.9	96.0	94.5	94.5	93.5	83.3	82.8	77.0	85.5	85.2	76.2	76.0
SCC	91.0	90.1	90.1	90.1	86.3	86.3	86.3	79.3	78.5	78.1	65.3	64.5	64.3	64.5	64.5
National	**98.4**	**98.1**	**98.1**	**98.0**	**96.9**	**96.4**	**96.4**	**93.4**	**86.9**	**86.8**	**81.0**	**85.2**	**85.0**	**79.5**	**79.4**
Urban	**97.9**	**97.6**	**97.5**	**97.5**	**96.0**	**95.6**	**95.6**	**92.1**	**86.4**	**86.4**	**79.6**	**83.8**	**83.4**	**78.6**	**78.5**
Rural	**99.0**	**98.7**	**98.7**	**98.7**	**97.9**	**97.4**	**97.4**	**95.0**	**87.4**	**87.4**	**82.7**	**86.9**	**86.9**	**80.5**	**80.5**

Valid Coverage by Age 23 Months by 15 Low Performing Districts

Centre Name	BCG	OPV1	DPT1	HB1	OPV2	DPT2	HB2	OPV3	DPT3	HB3	OPV4	MS	VITA	FVC_ XHB	FVC_ INHB
All District	**97.1**	**96.9**	**96.9**	**96.6**	**94.4**	**94.1**	**93.9**	**90.1**	**82.6**	**82.5**	**76.2**	**81.4**	**80.8**	**73.9**	**73.8**
Jamalpur	99.5	99.5	99.5	99.0	98.6	97.9	97.4	95.4	90.8	91.0	86.7	86.6	86.6	81.7	81.9
Mymensingh	97.6	97.1	97.1	96.7	95.2	95.2	94.8	93.3	85.2	84.7	79.6	86.9	86.8	78.8	78.8
Netrokona	96.7	96.7	96.7	96.2	91.9	91.2	91.2	88.8	85.1	85.8	77.7	74.5	74.2	69.8	69.8
Sherpur	100.0	99.5	99.5	99.5	98.1	98.1	98.1	94.7	91.9	91.4	84.8	87.3	86.7	83.3	83.3
Bandarban	91.0	90.2	90.2	90.2	86.0	85.3	85.3	75.3	56.1	56.1	52.2	68.2	68.2	48.3	48.3
Cox'bazar	98.1	98.1	98.1	98.1	96.7	96.7	96.7	93.0	88.5	87.9	78.2	79.5	76.2	75.0	74.4
Khagrarachari	97.1	97.1	97.1	97.1	95.2	94.6	94.6	89.0	81.6	81.6	75.9	82.8	82.7	75.6	75.6
Noakhali	96.2	96.2	96.2	96.2	96.2	96.2	96.2	94.3	89.0	89.8	80.2	83.6	83.0	78.5	78.5
Rangamati	95.2	95.2	95.2	95.2	94.7	94.7	94.7	91.2	81.9	81.9	75.6	83.8	83.8	74.9	74.9
Lalmonirhat	99.5	99.0	99.0	99.0	98.1	98.1	98.1	94.0	86.2	85.2	80.4	85.4	84.1	77.9	77.3
Gaibandha	99.5	99.5	99.5	98.6	96.2	95.6	94.1	92.0	79.8	79.1	73.5	83.4	80.0	73.4	72.5
Sirajganj	99.0	98.6	98.6	98.1	96.2	95.5	95.5	92.6	85.9	85.9	78.8	84.0	83.7	76.6	76.6
Moulavibazar	98.1	97.6	97.6	97.1	93.1	93.1	93.1	87.6	83.1	83.4	76.2	77.8	77.1	73.2	73.2
Sunamganj	90.0	90.0	90.0	90.0	83.2	83.2	83.2	80.3	74.9	74.9	69.3	73.4	74.7	67.9	67.9

TABLE 3

Crude Vaccination Coverage by Age 23 Months among 12-23 Months Old Children According to Division, Low Performing Districts and City Corporation

Centre Name	BCG	OPV1	DPT1	HB1	OPV2	DPT2	HB2	OPV3	DPT3	HB3	OPV4	MS	VITA	FVC_ XHB	FVC_ INHB
Dhaka Division	99.0	99.0	99.0	99.0	97.4	97.4	97.4	95.7	95.7	95.7	91.9	91.9	91.7	91.9	91.9
CTG Division	99.0	99.0	99.0	99.0	97.9	97.9	97.9	95.2	95.2	95.2	89.3	89.3	89.0	89.3	89.3
Rajshahi Division	99.5	99.3	99.3	99.3	99.3	99.3	99.3	98.3	98.3	98.3	94.5	94.5	94.3	94.5	94.5
Barisal Division	99.5	99.5	99.5	99.3	98.3	98.3	98.3	96.9	96.9	96.9	90.2	90.2	89.8	90.2	90.2
Khulna Division	98.6	98.6	98.6	98.6	98.1	98.1	98.1	97.1	97.1	96.9	92.9	92.9	92.4	92.9	92.9
Sylhet Division	94.5	94.3	94.3	94.3	92.1	92.1	92.1	88.6	88.6	88.1	76.7	76.7	76.7	76.7	76.7
DCC	98.6	98.6	98.6	98.6	98.1	98.1	98.1	95.7	95.7	95.7	90.5	90.5	90.5	90.5	90.5
CCC	99.0	99.0	99.0	99.0	97.6	97.6	97.6	93.8	93.8	93.8	86.2	86.2	86.2	86.2	86.2
RCC	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.1	98.1	97.6	98.1	98.1
BCC	100.0	100.0	100.0	100.0	98.6	98.6	98.6	96.7	96.7	96.7	88.1	88.1	87.1	88.1	88.1
KCC	97.6	97.6	97.6	97.6	96.7	96.7	96.7	95.7	95.7	95.2	90.0	X90.0	90.0	90.0	90.0
SCC	91.0	91.0	91.0	91.0	87.1	87.1	87.1	81.0	81.0	80.5	66.2	66.2	66.2	66.2	66.2
National	**98.4**	**98.3**	**98.3**	**98.3**	**97.2**	**97.2**	**97.2**	**95.3**	**95.3**	**95.2**	**89.2**	**89.2**	**89.0**	**89.2**	**89.2**
All Urban	**97.9**	**97.8**	**97.8**	**97.8**	**96.6**	**96.6**	**96.6**	**94.1**	**94.1**	**94.0**	**87.2**	**87.2**	**87.0**	**87.2**	**87.2**
Rural	**99.0**	**98.9**	**98.9**	**98.8**	**97.9**	**97.9**	**97.9**	**96.8**	**96.8**	**96.7**	**91.7**	**91.7**	**91.4**	**91.7**	**91.7**

Crude Vaccination Coverage by Age 23 Months in 15 Low Performing Districts

Centre Name	BCG	OPV1	DPT1	HB1	OPV2	DPT2	HB2	OPV3	DPT3	HB3	OPV4	MS	VITA	FVC_ XHB	FVC_ INHB
All District	**97.1**	**97.0**	**97.0**	**96.7**	**94.6**	**94.6**	**94.4**	**92.2**	**92.2**	**91.9**	**85.2**	**85.3**	**84.6**	**85.1**	**85.0**
Jamalpur	99.5	99.5	99.5	99.0	98.6	98.6	98.1	96.7	96.7	96.2	92.4	91.4	91.4	91.4	91.0
Mymensingh	97.6	97.1	97.1	96.7	95.2	95.2	94.8	93.3	93.3	92.9	89.0	89.0	89.0	89.0	89.0
Netrokona	96.7	96.7	96.7	96.2	91.9	91.9	91.9	89.5	89.5	89.5	82.4	82.4	81.0	82.4	82.4
Sherpur	100.0	99.5	99.5	99.5	98.1	98.1	98.1	96.2	96.2	95.7	90.5	90.5	90.0	90.5	90.5
B.Baria	98.6	98.6	98.6	98.1	96.2	96.2	95.7	92.4	92.4	92.4	87.1	87.1	86.7	87.1	87.1
Bandarban	91.0	91.0	91.0	91.0	88.1	88.1	88.1	86.7	86.7	86.7	74.8	75.2	75.2	74.8	74.8
Cox'bazar	98.1	98.1	98.1	98.1	96.7	96.7	96.7	94.3	94.3	94.3	83.3	83.3	80.5	83.3	83.3
Khagrarachari	97.1	97.1	97.1	97.1	95.2	95.2	95.2	93.3	93.3	93.3	84.8	84.8	84.8	84.8	84.8
Noakhali	96.2	96.2	96.2	96.2	96.2	96.2	96.2	94.3	94.3	94.3	85.2	85.2	84.8	85.2	85.2
Rangamati	95.2	95.2	95.2	95.2	95.2	95.2	95.2	92.4	92.4	92.4	86.2	86.2	86.2	86.2	86.2
Lalmonirhat	99.5	99.5	99.5	99.5	98.1	98.1	98.1	95.7	95.7	94.8	89.0	89.5	88.6	89.0	88.6
Gaibandha	99.5	99.5	99.5	98.6	96.2	96.2	94.8	93.3	93.3	91.9	88.1	90.0	85.7	88.6	87.6
Sirajganj	99.0	98.6	98.6	98.1	96.2	96.2	96.2	95.2	95.2	95.2	87.6	87.6	87.6	87.6	87.6
Moulavibazar	98.1	97.6	97.6	97.1	93.8	93.8	93.8	89.0	89.0	88.6	81.0	81.0	81.0	81.0	81.0
Sunamganj	90.0	90.0	90.0	90.0	83.8	83.8	83.8	81.0	81.0	81.0	76.2	76.2	76.2	76.2	76.2

TABLE 4

Crude TT Vaccination Coverage by Survey Units in 2007

Survey Units	TT1	TT2	TT3	TT4	TT5
Div Total	**96**	**93.1**	**81.2**	**64**	**46.7**
Dhaka Division	97.1	94.5	77.4	60	45.7
CTG Division	99	97.1	84.5	71	53.3
Rajshahi Division	98.6	96.4	87.6	69	50.7
Barisal Division	96.7	93.6	83.1	63.1	43.6
Khulna Division	94.3	91	80.5	65	45.7
Sylhet Division	90	85.7	73.8	55.7	41.2
CC Total	96.5	93.5	78.8	59.8	42.1
DCC	98.6	96.2	75.7	54.8	41
CCC	99.5	98.1	80.5	62.4	44.8
RCC	99	97.1	89	71	50
BCC	96.7	93.8	81	60	42.9
KCC	95.2	91.4	80.5	65.7	42.9
SCC	90	84.3	66.2	45.2	31.4
National	**96**	**93.1**	**81.2**	**64**	**46.7**
Urban	**96.6**	**93.7**	**79.4**	**60.4**	**43.1**
Rural	**95.2**	**92.2**	**83.3**	**68.2**	**51**

Crude TT Vaccination Coverage by 15 Low Performing Districts

Survey Units	TT1	TT2	TT3	TT4	TT5
Dist Total	**95.5**	**93.1**	**82.1**	**67.6**	**49.8**
Jamalpur	99	94.3	85.7	62.4	46.7
Mymensingh	96.7	95.7	84.8	69.5	46.7
Netrokona	97.1	93.8	82.9	64.8	49
Sherpur	95.7	92.4	80	56.7	41.9
B.Baria	98.6	96.2	82.9	70	48.1
Bandarban	88.6	87.6	82.9	71.9	63.3
Cox'bazar	98.1	95.7	90	81.9	71.9
Khagrachari	94.8	90.5	76.2	62.9	48.6
Noakhali	91.9	90.5	81.9	71	50.5
Rangamati	91	90	71	60.5	34.8
Lalmonirhat	100	99.5	84.8	70	54.8
Gaibandha	97.6	94.8	82.9	66.2	43.3
Sirajganj	99.5	97.6	90	74.3	50
Moulavibazar	87.1	85.7	76.7	65.2	48.1
Sunamganj	96.2	91.9	79.5	67.1	49

TABLE 5

TT Vaccination Coverage among Women Age 15-49 Years by Survey Units in 2007

Survey Units	TT1	TT2	TT3	TT4	TT5
Dhaka Division	97.1	94.5	70.5	45.5	22.9
CTG Division	99	97.1	79.8	55	32.1
Rajshahi Division	98.6	96.4	83.3	54.3	28.1
Barisal Division	96.7	93.6	77.4	43.6	18.8
Khulna Division	94.3	91	77.6	54.5	28.8
Sylhet Division	90	85.7	66.9	39.8	21.2
CC Total	96.5	93.5	73.4	43.7	22.4
DCC	98.6	96.2	68.1	37.6	18.1
CCC	99.5	98.1	76.2	45.7	25.2
RCC	99	97.1	85.2	55.7	31
BCC	96.7	93.8	76.2	39	16.2
KCC	95.2	91.4	77.6	54.3	28.1
SCC	90	84.3	57.1	29.5	15.7
National	**96**	**93.1**	**75.9**	**48.8**	**25.3**
Urban	**96.6**	**93.7**	**73.8**	**44.3**	**22.4**
Rural	**95.2**	**92.2**	**78.4**	**54.1**	**28.8**

TT Vaccination Coverage among Women Age 15-49 Years by Low Performing Districts

Survey Units	TT1	TT2	TT3	TT4	TT5
Dist Total	**95.5**	**93.1**	**76.6**	**50.7**	**27.6**
Jamalpur	99	94.3	77.1	45.7	30
Mymensingh	96.7	95.7	80.5	50	26.7
Netrokona	97.1	93.8	78.1	51.9	31
Sherpur	95.7	92.4	73.3	40.5	16.7
B.Baria	98.6	96.2	77.6	53.3	28.1
Bandarban	88.6	87.6	80	65.7	44.8
Cox'bazar	98.1	95.7	87.6	70.5	46.2
Khagrachari	94.8	90.5	73.3	48.6	24.3
Noakhali	91.9	90.5	75.2	51	26.7
Rangamati	91	90	67.6	37.6	19.5
Lalmonirhat	100	99.5	79.5	52.9	25.2
Gaibandha	97.6	94.8	74.3	46.7	21.4
Sirajganj	99.5	97.6	78.1	48.6	21.4
Moulavibazar	87.1	85.7	74.3	47.1	26.2
Sunamganj	96.2	91.9	72.4	51	25.7

TABLE 6

Crude TT Vaccination Coverage among Women Age 15-49 Years by Survey Units in 2007

Survey Units	TT1	TT2	TT3	TT4	TT5
Dhaka Division	86.9	83.1	72.4	53.8	37.1
CTG Division	87.9	84.3	73.1	56.9	40.7
Rajshahi Division	90.5	84.5	72.9	56.9	39
Barisal Division	88.1	84	72.1	55	36
Khulna Division	90.2	86.4	74	56	36.4
Sylhet Division	77.9	72.9	58.3	42.1	27.9
CC Total	85.1	80.9	69.1	51.2	34
DCC	86.2	83.3	72.4	52.9	35.2
CCC	84.3	80	68.1	48.6	36.2
RCC	87.1	81.9	71.9	57.1	39.5
BCC	86.2	82.4	72.4	54.8	34.3
KCC	90	86.2	73.8	53.8	33.3
SCC	76.7	71.4	56.2	40	25.2
Urban	**85.6**	**81.3**	**69.4**	**51.7**	**34.4**
Rural	**88.4**	**84.1**	**71.8**	**55.6**	**38.3**
National	**86.9**	**82.5**	**70.5**	**53.5**	**36.2**

Crude TT Vaccination Coverage by 15 Low Performing Districts

Survey Units	TT1	TT2	TT3	TT4	TT5
Dist Total	**89.7**	**85.5**	**72.1**	**52.6**	**35.2**
Jamalpur	95.2	89.5	73.3	53.3	37.1
Mymensingh	91	87.6	72.9	52.9	31.9
Netrokona	96.2	93.8	81.9	59	37.6
Sherpur	91.4	87.1	78.1	54.8	32.9
B.Baria	85.7	82.4	70	49.5	32.9
Bandarban	88.1	83.3	68.6	56.2	36.7
Cox'bazar	91.4	88.1	74.8	60	48.1
Khagrachari	91.9	86.2	72.9	51.4	33.8
Noakhali	80.5	77.1	62.9	47.1	31.9
Rangamati	86.2	85.2	65.2	41.9	24.8
Lalmonirhat	91.9	85.7	73.8	52.9	39.5
Gaibandha	92.4	89	78.1	54.3	39.5
Sirajganj	91.4	85.7	73.3	54.3	37.1
Moulavibazar	86.7	82.9	70.5	53.3	33.3
Sunamganj	84.8	79	64.8	48.6	30.5

TABLE 7

TT Coverage among Women Age 15-49 Years by Survey Units in 2007

Survey Units	TT1	TT2	TT3	TT4	TT5
Dhaka Division	86.9	83.1	65.5	36.9	16.9
CTG Division	87.9	83.8	68.8	43.8	21.4
Rajshahi Division	90.5	84.3	66.9	46.4	26.7
Barisal Division	88.1	83.8	65.7	35	14.8
Khulna Division	90.2	86.4	67.9	41	21.7
Sylhet Division	77.9	72.9	50.5	30.2	15.7
DCC	86.2	83.3	64.3	31.4	12.4
CCC	84.3	80	63.3	37.6	19
RCC	87.1	81.9	65.7	46.7	29.5
BCC	86.2	82.4	66.2	35.2	16.2
KCC	90	86.2	66.2	41.4	21.4
SCC	76.7	71.4	44.8	24.3	11.4
Urban	**85.6**	**81.3**	**62.1**	**36.8**	**18.4**
Rural	**88.4**	**83.7**	**66.7**	**41.4**	**20.8**
National	**86.9**	**82.4**	**64.2**	**38.9**	**19.5**

Valid Coverage of TT5 by 15 Low Performing Districts

Survey Units	TT1	TT2	TT3	TT4	TT5
Dist Total	89.7	85.5	66.2	40.7	21.3
Jamalpur	95.2	89.5	61	40.5	24.3
Mymensingh	91	87.1	70	43.3	21.9
Netrokona	96.2	93.8	75.2	48.1	25.7
Sherpur	91.4	87.1	67.1	37.1	17.1
B.Baria	85.7	82.4	64.8	35.7	22.4
Bandarban	88.1	83.3	66.7	51.4	32.4
Cox?bazar	91.4	88.1	71	50.5	32.4
Khagrachari	91.9	86.2	68.1	44.8	21.4
Noakhali	80.5	77.1	58.6	36.2	15.7
Rangamati	86.2	85.2	61.9	32.9	19
Lalmonirhat	91.9	85.7	66.2	35.2	14.8
Gaibandha	92.4	89	73.3	40.5	21.9
Sirajganj	91.4	85.7	66.7	36.7	13.8
Moulavibazar	86.7	82.4	64.8	40	18.6
Sunamganj	84.8	79	57.6	37.1	18.1

TABLE 8

OPV Coverage among 0-5 Months Children in the 16 th NIDS by Division and City Corporation

Survey Units	Ist Round	2nd Round	All Round
Dhaka Division	96.4	97.4	94.5
CTG Division	98.8	98.1	96.4
Rajshahi Division	98.6	96.9	95.5
Barisal Division	97.4	94.9	91.2
Khulna Division	99.5	99.3	98.8
Sylhet Division	97.9	90	86.7
DCC	96.2	95.7	93.8
CCC	97.6	98.1	95.7
RCC	99.5	96.6	95.2
BCC	97.1	95.5	90
KCC	99.5	99	98.6
SCC	98.6	91.5	86.2
National	**98.1**	**96.1**	**93.8**

TABLE 9

Vitamin A Supplementation Coverage among Postpartum Women, Infants 9-11 Months and Children 12-59 Months and Anthelmintic Coverage among Children 24-59 Months by Division, Low Performing Districts and City Corporation

Survey Units	Vitamin A			Anthelmintic
	Coverage during 16th NIDs	Infants	Post Partum Women	
Dhaka Division	95.2	65.4	37.6	87.2
CTG Division	96	92.1	29.8	88.7
Rajshahi Division	92.8	91.3	40.5	83.8
Barisal Division	94.8	91.4	36.2	77.4
Khulna Division	95.7	91.5	46.9	93.1
Sylhet Division	97.2	94.9	21	83
DCC	95.5	76.8	44.3	86
CCC	97.2	86.7	34.8	87.6
RCC	96.1	83.9	51.4	-
BCC	91.9	99.0	34.8	82.8
KCC	96.9	86.1	57.1	94.1
SCC	98.5	87.8	19	86
Dist Total	-	90.6	33.7	-
Jamalpur	-	83.5	61.4	-
Mymensingh	-	88.5	27.1	-
Netrokona	-	84.3	24.8	-
Sherpur	-	81.8	40	-
B.Baria	-	89.3	9	-
Bandarban	-	85.6	72.9	-
Cox'bazar	-	79.0	30	-
Khagrachari	-	76.6	52.9	-
Noakhali	-	89.6	11	-
Rangamati	-	85.7	36.7	-
Lalmonirhat	-	80.2	37.6	-
Gaibandha	-	88.4	21	-
Sirajganj	-	84.4	29	-
Moulavibazar	-	86.2	41	-
Sunamganj	-	80.4	11.9	-
National	**95.3**	**85.7**	**35.3**	**85.3**

FIGURE 1

Full Vaccination Coverage by Age 12 Months among 12-23 Months Old Children by Survey Units in the CES 2007

Source: CES 2007

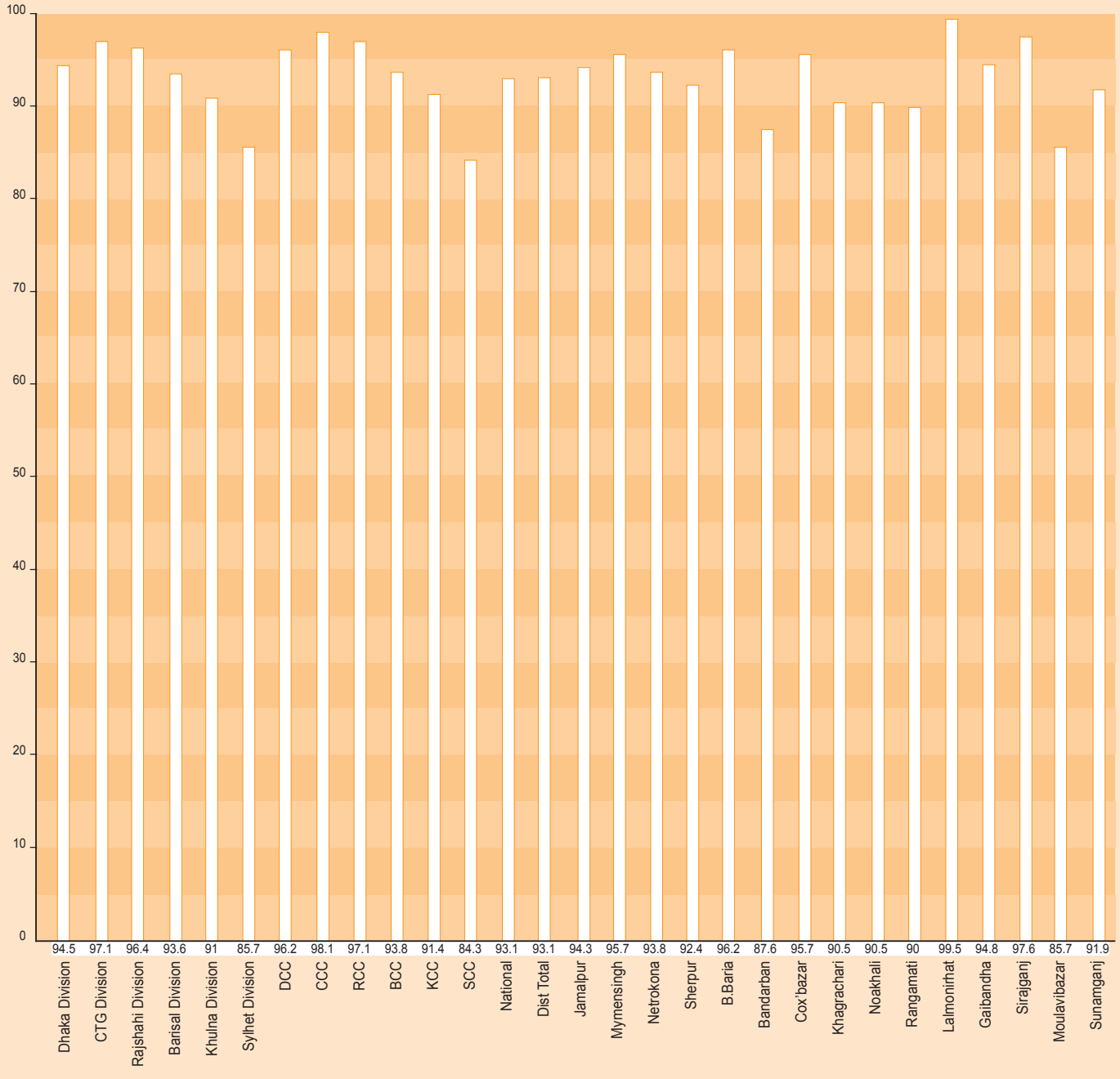
FIGURE 2

Vaccination Coverage by Age 23 Months among 12-23 Months Old Children by Survey Units in the CES 2007

Source: CES 2007

FIGURE 3

TT2 Vaccination Coverage among 15-49 Years Old Mothers of 0-11 Months Old Children by Survey Units in the CES 2007



Source: CES 2007

Questionnaire

People's Republic of Bangladesh
Expanded Programme on Immunization (EPI)
Coverage Evaluation Survey 2007

		CENTRE									
PROJECT	**EPI Coverage Evaluation Survey 2007**										
Cluster No	**Type: Urban = 1 Rural = 2**	**INTERVIEW TIME**									
Area		**START**			**END**						
LANDMARKS											
NAME OF INTERVIEWER		**Code**									
CHECK DETAILS	**Code**	**Accompany**			**Back Check**			**Scrutiny**			
		Codee	**Sign**	**Date**	**Codee**	**Sign**	**Date**	**Code**	**Sign**	**Date**
NAME OF FS		**1**			**2**			**3**		
NAME OF FC		**1**			**2**			**3**		
NAME OF OTHER OFFICIAL		**1**			**2**			**3**		

I hereby oath that all the information of the information of this interview true and correct. I followed the survey methodology and didn?t take any unfair means while collecting data of this questionnaire.

Signature of the Interviewer

Introduction

Salam/Adab. My name is ----. I am from ACNielsen Bangladesh a research firm of Bangladesh on behalf of EPI. Currently we are conducting a survey on mother and child vaccination. I would be grateful to you if you help me in this regard. Your information will be kept confidential and will be used for the development of EPI programme.

Child Form

Applicable for those babies born in between December 1, 2005 to November 30, 2006 (Applicable for those babies born in between 15 Agrahayun 1412 to 16 Agrahayun 1413)								
1. Cluster number								
2. Date								
3. Survey area								
4. Sl no. of sample (to be filled in by office)								
5. Sl no. of children in this cluster	Skip to	1	2	3	4	5	6	7
6. Household number/ G R number and name of house head								
7. Name of the child								
8. Sex of the child: Male - 1 Female - 2								
9. Name of the father of the child								
10. Name of the mother of the child								
11. Date of the birth of the child (Day/Month/Year)								
12. Academic qualification of the mother Illiterate -1, Primary-2, Secondary-3, SSC/Dhakil/ O level-4, HSC/Alim/ A level-5, Degree/Fazil-6, Masters/Kamil-7								
13. Academic qualification of the father of the child Illiterate -1, Primary-2, Secondary-3, SSC/Dhakil/ O level-4, HSC/Alim/ A level-5, Degree/Fazil-6, Masters/Kamil-7								
14. Occupation of the mother Housewife-1, Government employee-2, Non-government employee-3, Household works/day labour-4, Small business-5, Big business-6, Teacher-7, Professional -8, others								
15.Occupation of the father Agriculture-1, Government employee-2, Non-government employee-3, Day labor/rickshaw/van puller-4, Small business-5, Big business-6, Teacher-7, professional -8, driver (truck/bus/car)-9,others								
16. Number of family members								
		Skip to						
17. Has the baby ever received vaccine?	Yes: 1							
	No: 2	18						
17.1 Does the child have card for vaccination?	Yes: 1	18						
	No: 2							
17.2 If he doesn?t have card, then ask, Were you ever given a card?	Yes: 1							
	No: 2	18						

		Skip to	1	2	3	4	5	6	7
17.3 If the answer for the question 17.2 is yes, then ask Why didn?t you preserve the card?(please mention)									
18. Would you please tell me, how many times should the child be taken to the vaccination center to complete all the vaccines? (write the number or ?don?t know?)									
19. BCG	(Date/+/0)								
19.1. BCG Scar (notice the upper side of the left arm)	(Yes/No)								
19.2. BCG ~Source (from where BCG has taken)	(O/ H / N /P)								
20. DPT1	(Date/+/0)								
20.1 DPT1 Source	(O/ H / N /P)								
21. OPV1	Date/+/0)								
22. Hepatitis B1	Date/+/0)								
23. DPT 2	(Date/+/0)								
24. OPV2	Date/+/0)								
25. Hepatitis B2	Date/+/0)								
26. DPT 3	Date/+/0)								
27. OPV 3	(Date/+/0)								
28. Hepatitis B3	(Date/+/0)								
29. OPV 4	(Date/+/0)								
30. Measles	(Date/+/0)								
31. Vitamin A	(Date/+/0)								
32. Has the child received all the vaccinations	Received all the vaccination	32.1							
	Received partial vaccination	33							
	Didn't receive any vaccination	33							
32.1. Has the child received all the vaccination within the 12 months?	Yes								
	No								
33. What side effect may occur if the child is vaccinated?									
34. After giving vaccine to your child, has there been any abscess at the place of vaccine?	Yes: 1								
	No: 2	35							
	Don't know: 9								

		Skip to	1	2	3	4	5	6	7
34.1 if the answer is yes, then ask, Where did you have the abscess? (multiple answers can be recorded) (please code)	Right thigh: 1 Left thigh Left arm Others (specify)								
34.2 Did you feel discouraged to take the rest vaccine due to abscess or any other problem?	Yes: 1 No: 2								
35. Have you ever given money for vaccination of your child? (please code)	Yes: 1 No: 2 Not applicable: 3	36							
35.1 If yes, how much money did you pay?									
35.2 (If yes, then ask) As you given money, did you abstain yourself from giving rest vaccine to your child?	Yes No Don?t know								

Vaccination Code
Date-Record date from vaccination
\+ - history that the child was vaccinated.
0 - The child was not vaccinated

Source codes:
O = GOB Outreach, H = All GOB Hospital (e.g., District, UHC)
N = NGO (Hospital, Clinic, Outreach), P = Private (chamber, clinic and hospital)

Reasons for Vaccination Failure

36. The children who never/partially vaccinated ask the mothers or guardians? Why was the child not vaccinated or why the child was not fully vaccinated? (accept most important answer and circle the appropriate code)

Sl. no. of the baby in this cluster	1	2	3	4	5	6	7
1. Lack of information							
i. Didn't know that my child should be given vaccine	1	1	1	1	1	1	1
ii .Didn't know when to go for the second/third dose	2	2	2	2	2	2	2
iii. Didn't know when to go for vaccine of measles	3	3	3	3	3	3	3
iv. Didn't know where to go for vaccine	4	4	4	4	4	4	4
V. Fearing side effects	5	5	5	5	5	5	5
vi. rumor (Please mention)	6	6	6	6	6	6	6
2. Lack of Motivation							
vii. Don't believe in vaccination	21	21	21	21	21	21	21
viii. Was busy and so couldn't give vaccine to child	22	22	22	22	22	22	22
ix. Will give vaccine in future	23	23	23	23	23	23	23
x. There was a long queue in the vaccination centre	24	24	24	24	24	24	24
xi. Don't remember	25	25	25	25	25	25	25
3. Obstacles							
xii. There was no vaccine in the center	40	40	40	40	40	40	40
xiii. There was no vaccinator in the center	41	41	41	41	41	41	41
xiv. Vaccine centre was too far	42	42	42	42	42	42	42
xv. Injection was too painful for the child	43	43	43	43	43	43	43
xvi. Was abscess at the place of vaccine	44	44	44	44	44	44	44
xvii. Faced difficulty after receiving vaccine	45	45	45	45	45	45	45
xviii. Vaccinator was not friendly	46	46	46	46	46	46	46
xix. The child was sick, so was not taken to the vaccination center	47	47	47	47	47	47	47
xx. The child was sick, so the vaccinator didn't give vaccine	48	48	48	48	48	48	48
xxi. Mother was sick	49	49	49	49	49	49	49
xxii.I thought the vaccinator would come home	50	50	50	50	50	50	50
xxiii. They charge money to take vaccine	51	51	51	51	51	51	51
xxivi. The time period for the session was not comfortable	52	52	52	52	52	52	52x
4. Others (please specify)							
xxv.							
xxvi.							

Thank You

TT Form

Applicable for those women who gave birth to live or dead child between December 1, 2006 to November 30, 2007 (Who gave birth to live or dead child between 17 Agrahayun 1413 to 16 Agrahayn 1414)

1. Cluster number	
2. Date	
3. Survey area	

4.Sl number of sample (to be filled in by office)								
5. Sl number of woman in this cluster	Skip to	1	2	3	4	5	6	7
6. Household number/GR number/Name of the house head								
7. Name of the respondent								
8. Name of the husband								
9. Date of birth of the child born at the latest (still or live)								
10. Age of the respondent (write in year)								
11.Academic qualification of the respondent Illiterate -1, Primary-2, Secondary-3, SSC/Dhakil/ O level-4, HSC/Alim/ A level-5, Degree/Fazil-6, Masters/Kamil-7								
12. Academic qualification of the husband: Illiterate -1, Primary-2, Secondary-3, SSC/Dhakil/ O level-4, HSC/Alim/ A level-5, Degree/Fazil-6, Masters/Kamil-7								
13. Occupation of the respondent Housewife-1, Government employee-2, Non-government employee-3, Household works/day labour-4, Small business-5, Big business-6, Teacher-7, Professional -8, others								
14. Occupation of the husband Agriculture-1, Government employee-2, Non-government employee-3, Day labor/rickshaw/van puller-4, Small business-5, Big business-6, Teacher-7, professional -8, driver (truck/bus/car)-9, others								
15. Number of family members of the family								
16. How many times have you given birth to child? (live and dead) — Live:								
Dead:								
Total:								
16.1 The last born baby was alive or dead? — Live: 1	17							
Has died: 2	16.2							
Still birth: 3	17							
16.2 Within how many days since birth, did the child die?								
17. Delivery place of the last child? — in the health complex : 1	18							
at home : 2								
17.1 Who delivered the child? — SBA : 1								
USBA : 2								

SBA= Skilled Birth Attendant USBA = Un-Skilled Birth Attendant

18. Have you ever received any TT injection?	Yes : 1									
	No : 2	33								
18.1 Do you have card for TT injection?	Yes : 1	19								
	No : 2									
18.2 (If the respondent does not have any card) were you ever given a card for TT injection?	Yes : 1									
	No : 2	19								
18.3 If the answer for 18.2 is yes, Why didn?t you preserve the card?										

Instruction: Record the answers for Q 19-29 from a card or history										
19. TT 1	(Date/+/0)									
19.1 Source of TT1?	(O/H/N/P)									
20. TT2										
20.1 Source of TT2?	(O/H/N/P)									
20.2 Interval between TT-1 and TT-2	(write in weeks)	..... weeks	..... weeks	..... weeks	..... weeks	..... weeks	..... weeks	..... weeks	..... weeks	
21. TT 3	(Date/+/0)									
21.1 Interval between TT2 and TT3	(Write in months)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months	
22. TT4	(Date/+/0)									
22.1 Interval between TT3 and TT4	(Write in months)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months	
23. TT5	(Date/+/0)									
23.1 Interval between TT 4 and TT5	(Write in months)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months	
24.TT6	(Date/+/0)									
24.1 Interval between TT5 and TT6	(Write in months)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months	
25. TT 7	(Date/+/0)									
25.1 Interval between TT 6 and TT7	(Write in months)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months	
26. TT8	(Date/+/0)									
26.1 Interval between TT 7 and TT8	(Write in months)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months	
27. TT9	(Date/+/0)									
27.1 Interval between T8 and T9	(write in month)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months	
28. TT10	(Date/+/0)									
28.1 Interval between TT9 and TT10	(write in month)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months	

		Skip to	1	2	3	4	5	6	7
29. Last TT vaccination									
29.1 Interval between TT 10 and last TT injection	(write in month)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months
30. Interval between latest TT injection and birth date of the child	(write in Weeks)	..... weeks	..... weeks	..... .weeks	..... weeks	..... .weeks	..... weeks	..... weeks	..... weeks
31. Question number of TT vaccination received in the last preganancy									
		Skip to							
32. Have you ever had an abscess after receiving a Tetanus injection?	Yes : 1								
	No : 2	33							
	Don?t know/don't remember : 9								
32.1 Were you discouraged to take the following TT injection due to abscess or any other problem?	Yes : 1								
	No : 2								
33. Did the health worker ask about your TT injection When you took your child to be vaccinated?	Yes : 1								
	No : 2								
	Not applicable: 3								
	Don't know: 9								
34. (Those who did not receive TT injection, ask them) Why didn't you receive TT injection?									
35. How many times must a woman receive TT injection to be protected for the rest of her life? (write number or 'don't know')									
36. Did you take vitamin A within six weeks/ 42 days of child delivery?	Yes :1								
	No : 2	Stop							
36.1 If yes, then tell us from where have you taken Vitamin A?	At home : 1 At vaccination centre: 2								
	At hospital : 3								

Vaccination code:	**Source codes:**
Date - Record date from vaccination card.	O = GOB Outreach (Community household, Community Clinics. Satellite Clinic. Club) H = All GOB Hospital (e.g., District, UHC)
+ - history that the child was vaccinated. 0 - The child was not vaccinated	N = NGO (Hospital, Clinic, Outreach) P = Private (chamber, clinic and hospital)

Thank You

TT 5 Form

Applicable for 15-49 years old women

1. Cluster No.									
2. Household Number/GR number and name of house head									
3. Date									
4. Survey Area									
5. Name of the respondents									
6. Father's Name/Husband's Name									
7. Sl number of sample (to be filled in by office)									
8. Sl number of woman in this cluster		Skip to	1	2	3	4	5	6	7
9. Age of the respondents? (in years)									
10. Marital Status	Married/ divorce/ separated - 1 Unmarried - 2								
11. Educational Qualification: Illiterate -1, Primary-2, Secondary-3, SSC/Dhakil/ O level-4, HSC/Alim/ A level-5, Degree/Fazil-6, Masters/Kamil-7									
12. Occupation of the Respondents: Housewife-1, Government employee-2, Non-government employee-3,Household works-4, Small business-5, Big business-6, Teacher-7, Professional -8, Others									
13. Total family member									
14. Have you ever received TT Injection?	Yes : 1								
	No : 2	30							
15 Do your TT card available?	Yes : 1	16							
	No : 2	15.1							
15.1 If no, card ever given?	Yes : 1	15.1							
	No : 2	16							
15.2 (if yes) Why did you not preserve the card?									

Instruction: 16-26 record the answer from card or history

16. TT 1	(Date/+/0)								
16.1 Source of TT1?	(O/H/N/P)								
17. TT2	Date/+/0								
17.1 Source of TT2?	(O/H/N/P)								
17.2 Interval between TT-1 and TT-2?	(write in weeks)	---------- weeks	---------- weeks	---------- weeks	---------- weeks	---------- weeks	---------- weeks	---------- weeks	---------- weeks
18. TT 3	(Date/+/0)								
18.1 Interval between TT2 and TT3	(Write in months)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months
19. TT4	(Date/+/0)								
19.1 Interval between TT3 and TT4	(Write in months)	..... months	..... months	..... months	..... months	..... months	..... months	..... months	..... months
20. TT5	(Date/+/0)								

		Skip	1	2	3	4	5	6	7
20.1 Interval between TT 4 and TT5	(Write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months
21.TT6	(Date/+/0)								
21.1 Interval between TT5 and TT6	(Write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months
22. TT 7	(Date/+/0)								
22.1 Interval between TT 6 and TT7	(Write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months
23. TT8	(Date/+/0)								
23.1 Interval between TT 7 and TT8	(Write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months
24. TT9	(Date/+/0)								
24.1 Interval between T8 and T9	(write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months
25. TT10	(Date/+/0)								
25.1 Interval between TT9 and TT10	(write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months
26. Last TT vaccination	(Date/+/0)								
26.1 Interval between TT 10 and last TT injection	(write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months

		Skip	1	2	3	4	5	6	7
27. Have you ever had an abscess after receiving a Tetanus injection?	Yes : 1 No : 2 Don't know: 9	28							
27.1 Are you discouraged to take the rest TT injection due to abscess or any other problem?	Yes : 1 No : 2	31							
28. How many times must a woman receive TT injection to be protected for the rest of her life? (write number or 'don't know')									
29. Why did you not take any TT injection? (ask those who have never taken any TT injection)									

Vaccination Code: Date/+/0

Date - Record date from vaccination card.

\+ - History that the child was vaccinated.

0 - The child was not vaccinated

Source codes:

O = GOB Outreach (Community household, community clinic, Satelite clinic, Club)

H = All GOB Hospital (e.g., District, UHC)

N = NGO (Hospital, Clinic, Outreach), P = Private (chamber, clinic and hospital)

Thank you

NID Form

Applicable for those who were born in between 8-12-2002 to 7-12-2007 (24 Agrahayun 1409 to 23 Agrahayn 1414)

1. Cluster number										
2. Date										
3. Survey area										
4. Name of the child										
5. Name of the child?s father										
6. Name of the child?s mother										
7. Sl. no.of the child in this cluster			Skip to	1	2	3	4	5	6	7
8. Sex: Male -1 Female - 2										
9. Date of birth of the child (Day/Month/Year) Write down the age if date of birth not found (in month)										
10. **Ask mother/guardian**: Did your child receive polio drops during the first round of NID held on 27th October 2007 (12 Katrik 1414) or 4 days afterwards?	Yes	1	10.1							
	No	2	10.2							
10.1. **If yes, ask,** where was the child vaccinated?	At fixed site	1	11							
	Child to Child Search	2	10.2							
10.2. If the child (0-59 months) was not vaccinated at the fixed site held on 27th October 2007 (12 Katrik 1414), ask 'Why was not your child vaccinated at the fixed site?' If the response is more than one then ask 'which of those is the most important reason and code accordingly?'	Didn't know :99									
	Was very busy :01									
	Went in traveling :02									
	Doesn't believe in vaccine 03									
	The child was fed in the previous time :04									
	The child was sick , so /he was not taken : 05									
	The child was sick, so vaccine was not given : 06									
	No Vaccine :07									
	No Vaccinator :08									
	There was a long queue :09									
	The centre was too far :10									
	Time was inconvenient :11									
	Fear of side effect :12									
	Waited for home visit :13									
	Religious/Social obstacles :14									
	Was not at home									
	Others (specify)									

Vitamin A

Applicable for those children who born in between 27-10-2002 to 26-10-2006

			Skip to	1	2	3	4	5	6	7
11. **Ask mother/guardian**: Was your child (12-59 months) fed vitamin A during the 1st round of Jatiya Tika Dibosh held on 27th October 2007 (Bangla (12 Katrik 1414)	Yes	:1	12							
	No	: 2	11.1							
11.1 If the child (12-59 months) was not fed vitamin during Jatiya Tika Dibosh held on 27 October 2007 (Bangla (12 Katrik 1414)?, then ask, Why the child wasn't fed Vitamin A during Jatiya Tika Dibosh on held 27 October 2007 (Bangla (12 Katrik 1414) ? (If there come multiple answers, ask which one is more important and code accordingly)	Didn't know	:99								
	Was very busy	:01								
	Went on traveling	:02								
	Don't believe in Vitamin **A**	:03								
	The child was fed in the previous time	:04								
	The child was sick, so didn't take him to the vaccination centre	:05								
	The child was sick , so the health worker didn't give vaccine	:06								
	Vitamin A was not available	:07								
	Health worker was not available	:08								
	There was a long queue	:09								
	The centre was too far	:10								
	The time was not in favor	:11								
	Was afraid of side effects	:12								
	Was waiting to come back home with vitamin A	:13								
	Religious/Social obstacles	:14								
	Was not at home	:15								
	Others (specify)									
12. Ask mother/care taker, 'Did your child receive polio drops during the 2nd round of Jatiya Tika Dibosh held on 8th December 2007 (24th Agrahayun, 1414) or 4 days afterwards?'	Yes	:1	12.1							
	No	:2	12.2							

		Skip to	1	2	3	4	5	6	7
12.1. **If yes, then ask,** where was the child vaccinated? (Please code)	At fixed site : 1	13.1							
	Child to Child Search : 2	12.2							
12.2 If the child (0-59 months) was not vaccinated at the fixed site held on 8th December 2007 (24th Agrahayun, 1414), ask 'Why was not your child vaccinated at the fixed site?' (If the response is more than one then ask 'which of those is the most important reason and code accordingly)?'	Was very busy :01								
	Went in traveling :02								
	Doesn?t believe in vaccine :03								
	The child was fed in the previous time :04								
	The child was sick , so /he was not taken : 05								
	The child was sick, so vaccine was not given :06								
	No Vaccine :07								
	No Vaccinator :08								
	There was a long queue :09								
	The centre was too far :10								
	Time was inconvenient :11								
	Fear of side effect :12								
	Waited for home visit :13								
	Religious/Social obstacles :14								
	Was not at home :15								
	Others (specify)								

Q. 13.1 and 13.2 was not applicable for Panchagarh, Thakurgaon, Nilphamari, Lalmonirhat, Kurigram, Rangpur, Rajshahi, Chapai Nawabganj, Dinajpur, Pabna, Sirajganj, Gaibandha, Joypurhat, Bogra, Meherpur, Patuakhali, Barguna and Rajshahi city corporation

Anthelmintic Tablet

Applicable for those children who born in between 8-12-2002 to 7-12-2005

		Skip to	1	2	3	4	5	6	7
13.1 Ask mother/guardian Was your child (24-59 months) fed antihelmenthic tablet during Jatiya Tika Dibosh held on 8th December 2007 (Bangla 24 Agrahayun 1414)?	Yes :1	14							
	No :2	13.2							
13.2 If the child (24-59 months) was not fed Anthelmintic tablet during Jatiya Tika Dibosh held on 8th December 2007 (Bangla 24 Agrahayun 1414), then ask, 'Why the child wasn't fed Anthelmintic tablet during Jatiya Tika Dibosh held on 8th December 2007 (Bangla 24 Agrahayun 1414)?' (If there come multiple answers, ask which one is more important and code accordingly)	Didn't know :99								
	Was very busy :01								
	Went on traveling								
	Don't believe in Anthelmintic :03								
	The child was fed in the previous time :04								
	The child was sick, so didn't take him to the vaccination centre :05								
	The child was sick , so the health worker didn't give vaccine :06								
	Anthelmintic was not available :07								
	Health worker was not available :08								
	There was a long queue :09								
	The centre was too far :10								
	The time was not in favor :11								
	Was afraid of side effects :12								
	Was waiting to come back home with Anthelmintic :13								
	Religious/Social obstacles :14								
	Was not at home :15								
	Others (specify)								

14. Ask mother/guardian How did you learn about the 'Jatiya Tika Dibosh' held on 27 th Octoer 2007 (Bangla 12 Katrik 1414) and 8th December 2007, (Bangla 24 Agrahayun 1414)? (Please code)		1	2	3	4	5	6	7	
	GOB/ City corporations FW visit :01								
	NGO worker Visit :02								
	Teacher visit :03								
	Other volunteers Visit :04								
	Family/neighbor/friends :05								
	Television :06								
	Radio :07								
	Poster :08								
	Newspaper :09								
	Mobile Miking :10								
	Mosque Miking :11								
	Health Workers' home visit :12								
	Told during first round :13								
	Other (specify)								

Thank You

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World Health Organization
Country Office for Bangladesh

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EXPANDED PROGRAMME ON IMMUNIZATION
Directorate General of Health Services
Mohakhali, Dhaka-1212