BANGLADESH EPI

COVERAGE EVALUATION SURVEY 2016

Expanded Programme on Immunization (EPI)

Directorate General of Health Services (DGHS)

Mohakhali, Dhaka-1212, Bangladesh

স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রণালয়

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November 2017

MESSAGE OF HEALTH MINISTER

Mohammed Nasim, MP
Hon'ble Minister
Ministry of Health and Family Welfare
Govt. of the people's Republic of Bangladesh

মোহাম্মদ নাসিম, এমপি
মাননীয় মন্ত্রী
স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রনালয়
গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

It is my great pleasure to know that "EPI Coverage Evaluation Survey 2016" under Directorate General of Health Services has been completed and is going to publish the report.

EPI, one of the successful programs of Health sector in Bangladesh has enormously contributed in reduction vaccine preventable diseases and eventually reducing maternal & child mortality and morbidity.

Government of Bangladesh is committed to provide basic health services to all with special emphasis on children and women. The country started EPI activities with the support of UNICEF, WHO in 1979 with a view to reduce child and maternal mortality and morbidity from six dreadful vaccine preventable diseases. Introducing new vaccines, EPI is now protecting against ten fearsome vaccine preventable diseases reaching every door step of the community through its outreach sites.

Coverage Evaluation Survey (CES) is a very effective tool to monitor the progress and find out the weakness of the vaccination program. I am delighted knowing that the WHO new sampling methodology was followed in this study. As per CES, EPI has achieved 82.3 percent valid full vaccination coverage in 2016 among under one year age children which was only 2% in 1985. My heartfelt gratitude goes to the dedicated field workers and managers working tirelessly to achieve such a memorable task.

I acknowledge with sincere gratitude the support rendered by UNICEF, WHO, GAVI and other cooperating partners for the implementing EPI programme in Bangladesh protecting our children and mother.

Joy Bangla, Joy Bangabandhu

Long live Bangladesh

Mohammed Nasim

MESSAGE OF STATE HEALTH MINISTER

Zahid Maleque, MP
Hon'ble State Minister
Ministry of Health and Family Welfare
Govt. of the people's Republic of Bangladesh

জাহিদ মালেক, এমপি
মাননীয় প্রতিমন্ত্রী
স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রনালয়
গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

I am delighted knowing that 'EPI Coverage Evaluation Survey (CES) Report 2016' under Directorate General of Health Services is going to be published.

The immunization programme is considered as a success story in Bangladesh because of its contribution to the reduction in childhood mortality and morbidity.

Since the official launching of the programme in 1979, the vaccination coverage is steady upwards trend and reached 82.3% at present which was only 2% in 1985. For this extensive achievements, my gratitude goes to the field workers and managers whom continuous and sincere job made possible such a memorable task.

The immunization programme of Bangladesh is widely acclaimed nationally as well as internationally due to its remarkable progresses made in last few decades. It is one of the cornerstones of health and well-beings as well as a cost saving intervention of the health.

I would like to thank and express my gratitude to all experts who made their valuable contribution to the CES-2016. I hope findings of this survey will be useful to all concerned.

Joy Bangla, Joy Bangabandhu

Long live Bangladesh

Mr. Zahid Maleque

MESSAGE OF SECREATRY

Sirazul Haque Khan
Secretary
Health Service Division
Ministry of Health and Family Welfare
Govt. of the people's Republic of Bangladesh

The immunization programme is considered as a success story in Bangladesh because of its contribution to the reduction in childhood mortality and morbidity from vaccine preventable diseases.

The EPI Coverage Evaluation Survey (CES) is an important tool for estimation the level of vaccination status at national and sub-national levels. It indicates the the progress and achievement of the programme as well as the weakness of the vaccination programme. CES findings help the programme personnel for making good planning, developing strategies to ensure quality service delivery that can help to reach the objectives.

I request all officials to go through the survey report and help us to design the programme accordingly so as to achieve desired level of coverage.

Finally, I would like to express my gratitude to UNICEF and WHO for providing financial and technical support in conducting the survey.

Sirazul Haque Khan

PREFACE

Prof. Dr. Abul Kalam Azad
Director General
Directorate General of Health Services
Mohakhali, Dhaka.

With Government of Bangladesh started EPI activities with the support of UNICEF and WHO in 1979 with the objective to reduce infant and maternal mortality from vaccine preventable diseases. The programme has been saving thousand's of children's life from some vaccine preventable diseases since its introduction.

This year's survey shows that 82.3% children were fully vaccinated, which was only 2% in 1985. My heartfelt gratitude goes to the dedicated field forces working tirelessly to achieve this commendable result.

Coverage Evaluation Survey (CES) is a very effective tool to monitor the progress and find out the weakness of the vaccination program. I honestly hope that managers will use the findings and recommendations of this survey for making good plans and formulating effective strategies to reach every child under EPI targets.

I would like to express my sincere thanks to EPI, UNICEF and WHO for their generous support in conducting the EPI Coverage Evaluation Survey 2016. My sincere thanks to Center for Social and Market Research (CSMR) for carrying out this study maintaining high standard quality.

Prof. Dr. Abul Kalam Azad

FOREWORD

Dr. Jahangir Alam Sarkar
Line Director-MNC&AH
DGHS, Mohakhali, Dhaka

It's my great pleasure to write forwarding note for EPI Coverage Evaluation Survey (CES) 2016. Since 1991, Bangladesh has been conducting nationwide CES every year and now it has established itself as the most dependable monitoring tool to assess performance, achievements and progress of the Bangladesh Expanded Programme on Immunization (EPI).

EPI in Bangladesh has brought visible and tangible changes over the years in terms of childhood mortality and morbidity. 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 99% in 2016. However, the percentage of children under the age of one year receiving all doses of vaccines at the right time and right interval has been achieved 82.3%.

I would like to express my sincere thanks to EPI, UNICEF and WHO personnel whose sincere contributions help in revealing this CES 2016 report. My sincere thanks to Center for Social and Market Research (CSMR) who successfully conducted this survey throughout the country and prepared authentic report.

We look forward to all concern persons in the country for using the CES 2016 document.

Dr. Jahangir Alam Sarkar

ACKNOWLEDGMENT

As a part of child vaccination coverage evaluation, EPI of Bangladesh has been conducting nationwide coverage evaluation survey (CES) since 1991. In 2016, the survey was conducted in all 64 districts, 11 city corporations and 2 slums (in Dhaka and Chittagong City Corporations) using 57 cluster sampling methodology.

Coverage Evaluation Survey (CES) is a very effective tool to monitor the progress and find out the weakness of the vaccination programme. This year's survey shows that 82.3% children were fully vaccinated, which was only 2% in 1985. These achievements has enormously contributed in reduction vaccine preventable diseases and eventually reducing child mortality and morbidity. Acknowledging this tremendous success, Bangladesh has been recognized internationally through receiving awards from United Nations in 2010 from Gavi alliance in 2009 and 2012.

I must congratulate all EPI Head Quarter Personnel for supporting in planning, coordinating, and other aspects of this survey. I will express my gratitude and thanks to UNICEF and WHO for their technical support and contributions in this survey. My sincere thanks to 'Centre for Social and Market Research (CSMR)' for supporting EPI through conducting the survey and preparing this report.

Finally hope this report would be useful to all concern.

Dr. Md. Altaf Hossain
Program Manager, EPI.
Directorate General of Health services
Mohakhali, Dhaka-1212

EPI COVERAGE EVALUATION SURVEY 2016

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ACRONYMS

ANC	Antenatal Care
BBS	Bangladesh Bureau of Statistics
BCG	Bacillus Calmette Guerin
BCC	Barisal City Corporation
CC	City Corporation
CCC	Chittagong City Corporation
CES	Coverage Evaluation Survey
CI	Confidence Interval
Com CC	Comilla City Corporation
CSBA	Community Skilled Birth Attendant
DHIS	District Health Information System
DNCC	Dhaka North City Corporation
DSCC	Dhaka South City Corporation
DPT	Diphtheria, Pertussis and Tetanus
EA	Enumeration Area
EPI	Expanded Programme on Immunization
FGD	Focus Group Discussion
FWA	Family Welfare Assistant
FWV	Family Welfare Visitor
GCC	Gazipur City Corporation
HA	Health Assistant
ICC	Intra Cluster Correlation Coefficient
IDI	In-depth Interview
IPHN	Institute of Public Health Nutrition Bangladesh
IU	International Unit
KCC	Khulna City Corporation
MA	Medical Assistant
MDG	Millennium Development Goal
MNT	Maternal & Neonatal Tetanus
MOV	Missed Opportunity for Vaccination
MR	Measles and Rubella

MSD	Measles Second Dose
NCC	Narayanganj City Corporation
NGO	Non-Government Organization
NID	National Immunization Days
NT	Neonatal Tetanus
OPV	Oral Polio Vaccine
PAB	Protected at Birth
PNC	Post-natal Care
PPS	Probability Proportional-to- Size
RCC	Rajshahi City Corporation
Rang CC	Rangpur City Corporation
SCC	Sylhet City Corporation
SACMO	Sub-Assistant Community Medical Officer
SPSS	Statistical Package for Social Science
TT	Tetanus Toxoid
UNICEF	United Nations Children's Fund
VAC	Vitamin A Capsule
WHO	World Health Organization

GLOSSARY

Cluster	The cluster is defined as an enumeration area which constitutes of on average with 120 households
Crude	Crude vaccination coverage was defined as the vaccine given to the children where the exact age for starting vaccinations and/or interval between did not meet the EPI- recommended schedule
Confidence Interval	A range of interval of parameter values around a point estimate that is meant to be likely to contain the true population parameter. If the experiment were repeated without bias many times, with data collected and analysed in the same manner and **confidence intervals** constructed for each repetition, 100X(1-α)% of those intervals would contain the true population parameter
Fixed Sites	EPI outreach centers and hospitals from which vaccine are received (consider only for NID)
Fully Vaccinated child	A child is considered as fully vaccinated if the child has received one dose of BCG, 3 doses of Pentavalent (diphtheria, pertussis, tetanus, Hep-B and Hib), 3 doses of polio and one dose of MR(Measles and Rubella) vaccines
Fully Vaccinated child by 12 months of age	A child is considered as fully vaccinated if the child has received all recommended dose according to the national immunization schedule by 12 months of age
Hard-to-Reach Area	Hard-to-reach area means char, haor, enclaves and hilly areas which is geographically partly or fully difficult to access. An area will be considered as hard-to-reach only when the time required for vaccine transportation from the UHC to the distribution point or from distribution point to the vaccination site is more than 2 hours using existing transport facility
Invalid dose	A dose is considered invalid when it doesn't meet the immunization schedule criteria (dose given before a minimum age, or after a too short interval). For the multi-dose vaccine (Penta and OPV), if the document indicates that one of the earlier doses in a sequence was invalid but followed by valid doses then only the later dose will be considered as valid. Eg. **Invalid Penta1/OPV1:** If 1st dose of Penta or 1st dose of OPV is given before 6 weeks of age of child **Invalid Penta2/OPV2:** 2nd dose of Penta or 2nd dose of OPV is considered invalid If the interval between 1st dose and 2nd dose is less than 4 weeks given before 6 weeks of age of child If child receive Penta 2/OPV2 vaccine before 4 weeks **Invalid Penta3/OPV3:** 3rd dose of Penta or 3rd dose of OPV is considered invalid If the interval between 2nd dose and 3rd dose is less than 4 weeks

	Invalid MR 1st dose: If 1st dose of MR is given before 270 days or 9 months of age of child
	Invalid MR 2nd dose: If 2nd dose of MR is given before 450 days or 15 months of age of child
Minimum age and minimum interval	The minimum age and intervals are used to determine if a dose is valid (i.e. physiologically efficacious)
Missed Opportunity	Missed opportunity for vaccination (MOV) is the failure to administer all vaccines for which the child was eligible (according to the national vaccination schedule) on the date of a vaccination site visit
Mohallas	Smallest identifiable area of urban area (municipalities, city corporation) which is known to the inhabitants as mohallas
MCV1	MR (measles containing vaccine) replaced the measles dose since it was introduced in 2012
Mouza	A revenue village with a jurisdiction list number and defined area is called mouza
PAB	The newborn is protected if the mother received two valid doses of TT vaccine at least two weeks before delivery
Upazila	Lowest administrative unit (sub-district level)
Vaccination Coverage	The proportion of individual in the target population who are vaccinated
Valid dose	A dose that was administered when a child had reached the minimum age for the vaccine, and was administered with the proper interval between doses according to the national immunization schedule

EXECUTIVE SUMMARY

Since its inauguration in 1979, the Bangladesh Expanded Programme on Immunization (EPI) has been an integral part of Bangladesh's efforts to reduce child mortality. From a crude fully vaccinated rate of 76.0 percent in 1995, the rate today has reached 95.1 percent. The tremendous improvement in EPI contributes substantially to Bangladesh's efforts for achieving Millennium Development Goal 4: Reducing Child Mortality Rates. Despite this remarkable achievement, it is yet to meet the childhood vaccination coverage objective. EPI has fixed a target of full vaccination coverage of 90 percent nationally and 85 percent in all districts, and TT5 coverage was 80 percent nationally among women of child-bearing age and 75 percent at each district by 2018. At present, the valid vaccination coverage rate by the age of 23 months nationally is 86.8 percent and as low as 84.0 percent in Dhaka division. So, the Government of Bangladesh (GoB), in collaboration with UNICEF, World Health Organization (WHO), and other stakeholders, continues to identify obstacles and challenges for achieving the desired goals and seeks ways forward to overcome the barriers.

As one of its strategies to successfully implement EPI, the GoB periodically conducts EPI Coverage Evaluation Surveys (CES), which provide a scientific evaluation of the programme. This report of CES 2016 presents the findings obtained from the said household survey.

Both primary and the secondary stakeholders participated as survey respondents in this study. They were mothers/caregivers of children aged 0-11 months, 12-23 months, 18-29 months, 6-59 months, and women aged 18-49 years. The study was carried out between November 20, 2016 and April 2017.

The objectives of CES 2016 were to assess:

- Childhood vaccination coverage under routine EPI
- Measles Second Dose (MSD) vaccination coverage among 18-29-month-old children under routine EPI
- Status of TT Vaccination Coverage, protection at birth, ANC, micronutrient supplementation, delivery, PNC among the women having children less than one year old
- TT5 coverage among women 18-49 years of age to assess the progress of the TT5 programme
- Vitamin A Coverage during the Vitamin A Plus campaign held on April 14, 2016
- Drop-out rates and quality (percentage of invalid doses, vaccination card availability, post-vaccination abscesses, other AEFI, reasons for left-out and drop-out and equity
- Trends in the vaccination coverage and drop-out rates at the national, divisional, city corporation, and district levels
- Provide information as a basis for making concrete recommendations and planning for improving routine immunization activities

The findings are discussed in detail in Chapters 3 to 9 of this report.

METHODOLOGY

The WHO new sampling methodology was followed in this study. The study was mainly quantitative in nature, where data were collected through face-to-face interviews with Mothers/Caregivers of children & women by visiting community households. In addition, Focus Group Discussion (FGD) and In-depth Interview (IDI) were conducted in DNCC and DSCC to find out the causes of being drop out and left-out. There were five individual surveys targeting six different survey subjects. CES 2016 included 77 survey Units, and comprised of 64 districts, 11 city corporations, and 2 slums in Bangladesh: one in Dhaka and the other in Chittagong City Corporation. A total of 180,998 interviews were conducted in 4,389 randomly selected mouzas/mahallas across the country. Fifty-seven clusters from each survey unit were selected by following the systematic random sampling technique with Probability Proportion to Size (PPS). Respondents from each cluster were identified through a household listing operation and were selected randomly to administer the Questionnaire.

FINDINGS

Childhood Vaccination Coverage

National Coverage

Crude Full Vaccination Coverage by Age of 23 Months: Nationally, by age of 23 months 95.1 percent children had received all the eligible vaccines, irrespective of the whether the EPI-recommended age for administration and/or the interval between consecutive doses was met. BCG had the highest coverage (99.5 percent), with Penta1 close behind (99.3 percent), but with each subsequent dose, the rate progressively widened (Penta2 – 98.7 percent and Penta3 - 97.9 percent), with MR1 falling almost 3 percentage points to 95.3 percent (see Figure 1). A little variation was observed between rural (95.7 percent) and urban (93.0 percent) areas (see Figure 2).

Crude Full Vaccination Coverage by Age of 12 Months: Ninety percent of children received all the eligible vaccines by the age of 12 months, irrespective of the whether the EPI-recommended age for administration and/or the interval between consecutive doses was met. Again, BCG had the highest coverage (99.5 percent), being followed closely by the Pentavalent doses, but falling considerably for MR1 (90.5 percent) (see Figure 3). The urban-rural analysis shows a slight variation in the crude coverage between rural (91.3 percent) and urban (86.2 percent) areas (see Figure 4).

Valid Full Vaccination Coverage by Age of 23 Months: Valid coverage was defined as vaccines administered according to the EPI-recommended minimal age of the child and the recommended interval between doses. Nationally, 86.8 percent of the children received all doses of all antigens as scheduled, with the highest coverage for BCG (99.5 percent). Penta1 coverage was 97.9 percent, Penta2 97.2 percent, and Penta3 90.4 percent. The coverage for MR1, at 92.3 percent, was 7.2 percentage points lower than BCG (see Figure 5).

Valid Full Vaccination Coverage by Age of 12 Months: Overall, by age of 12 months 82.3 percent of children country-wide received all scheduled vaccines, following EPI-recommended minimal ages for administration and valid intervals between doses. Valid BCG coverage, at 99.5 percent, was the same as at 23 months, and the Pentavalent and OPV coverages were also almost exactly the same. Among all the antigens, valid MR1 coverage was the lowest (87.5 percent) (see Figure 7). The urban-rural analysis shows that rural children were more likely to receive valid doses (83.5 percent), compared to their urban counterparts (77.1 percent) (see Figure 8).

Coverage by Division

Crude Full Vaccination Coverage by Age of 23 Months: Crude full vaccination coverage was the highest in Barisal (97.8 percent) and the lowest in Sylhet (93.1 percent) divisions. Chittagong division achieved the second highest position with 96.7 percent coverage. The crude coverage was depicted as 95.7 percent in Khulna, 95.8 percent in Rajshahi, 93.2 percent in Dhaka, 95.5 percent in Rangpur and 94.2 percent in Mymensingh divisions (see Figure 9). The data indicate that the numbers of drop-outs from vaccination services attributed to the lower crude coverage.

Valid Full Vaccination Coverage by Age of 12 Months: Barisal division had the highest valid full vaccination coverage (87.5 percent), while Rajshahi division attained the second highest position, with 84.9 percent coverage. The valid vaccination coverage was 84.5 percent in Khulna, 83.5 percent in Chittagong, 82.5 percent each in Mymensingh and Rangpur, 79.2 percent in Sylhet, and 77.9 percent in Dhaka divisions (see Figure 9a). The coverage analysis and computation of valid coverage show that low drop-out rates, as well as the act of administering higher valid doses, contributed to the higher valid vaccination coverages.

Coverage by City Corporation

Crude Full Vaccination Coverage by Age of 23 Months: Nationally, urban coverage was observed to be 93.0 percent in CES 2016. Among the city corporations, crude vaccination was found to be the highest in Rajshahi City Corporation (RCC) (99.2 percent) and the lowest in Sylhet City Corporation (SCC) (86.9 percent). The crude vaccination coverage in other city corporations ranged between 88.3 percent in KCC and 97.5 percent in Com CC (see Figure 10).

Valid Full Vaccination Coverage by Age of 12 Months: Of the city corporations, Rajshahi City Corporation achieved the highest coverage, at 93.0 percent. The lowest coverage was observed in Dhaka North City Corporation (DNCC) (67.1 percent). The valid coverage in other city corporations was between 68.0 percent in DSCC and 82.3 percent in BCC (see Figure 10a).

Coverage by Hard-to Reach Areas and Ownership of Mobile Phones

Valid Full Vaccination Coverage by Hard-to Reach Areas: A hard-to-reach area was defined as an area where two or more hours were required to reach from the Upazila headquarters. Valid Full vaccination coverage was 0.5 percentage point higher in non-hard-to-reach areas than that in hard-to-reach areas (82.4 percent vs. 81.9 percent), which was true across all antigens (see Figure 11).

Valid Full Vaccination Coverage Age of 12 Months by the Ownership of Mobile Phones: In CES 2016, vaccination coverage was also analyzed by mobile phone ownership. A slight difference in coverage was noticed between those who owned mobile phones (82.5 percent) and those who did not (80.7 percent). As had been expected, the coverage of each antigen was also lower among those who did not have a mobile phone. The rate of difference varied from 0.3 percentage point for BCG coverage to 3.0 percentage points for MR1. Ownership of a mobile phone ensured higher vaccination coverage due to easy access to mothers/caregivers to follow up and ensure subsequent doses. Thus, it reduce drop-out rates as against those whose mothers/caregivers didn't own it (see Figure 12).

Programme Quality

Incidences of Invalid Doses: A dose or antigen is considered to be invalid when the vaccine is administered without complying with the exact EPI-recommended minimal age for starting the vaccine or with the minimum interval between the two consecutive doses. CES 2016 estimated the invalid doses for Penta1, Penta2, and Penta3, and MR vaccines. Invalid doses were found to be most prominent for Penta3 (6.4 percent) and the least prominent for Penta1 (3.0 percent) across the country. The invalid doses of MR1 vaccine administered to children were also found to be 3.2 percent. A slight variation of invalid doses was noticed between urban and rural areas, with those in urban areas being higher in comparison with those in rural areas for both Penta and MR1 vaccines: invalid Penta1 was 3.4 percent, Penta2 5.4 percent, Penta3 7.9 percent and invalid MR1 was 3.9 percent in urban areas, while invalid Penta1 was found to be 2.9 percent, Penta2 4.4 percent, Penta3 6.1 percent and MR1 3.0 percent in rural areas (see Figure 52).

The highest proportion of invalid Penta1 was administered in Dhaka and Chittagong divisions (3.5 percent each) and the lowest in Khulna division (1.9 percent). However, the highest invalid Penta2 (5.4 percent) and Penta3 (7.4 percent) were administered in Dhaka division and the lowest in Rangpur division (2.3 percent and 4.2 percent, respectively). Regarding invalid MR1, Sylhet division administered the highest invalid dose (3.8 percent); and it was the lowest in Khulna (2.8 percent) (Appendix Table 6).

Among the city corporations, overall the highest invalid doses were found in DNCC, with 8.2 percent invalid Penta1, 10.1 percent invalid Penta2, 12.7 percent invalid Penta3, and 6.0 percent invalid MR1. The lowest invalid doses were in RCC (see Figure 54).

Vaccination Drop-out Rate: CES 2016 estimated the drop-out rates for Penta1-Penta3 and Penta1-MR1. The drop-out rate from Penta1-Penta3 was defined as the proportion of children who received Penta1, but failed to receive Penta3. The drop-out rate from Penta1-MR was defined as the proportion of children who received Penta1, but failed to receive MR. Nationally, the Penta1-Penta3 drop-out rate was found to be 1.4 percent and the Penta1-MR1 drop-out rate 4.0 percent as a whole (see Figure 55). Among the eight divisions, the Penta1-Penta3 drop-out rate was the highest in Sylhet division (2.5 percent) and the lowest in Barisal division (0.5 percent). Similarly, the Penta1-MR drop-out rate was the highest in Dhaka division (5.9 percent) and the lowest in Barisal division (1.8 percent). In other divisions, Penta1-MR1 drop-out rate was between 4.8 percent and 2.7 percent (see Appendix Table 5).

Among the city corporations, the highest Penta1-Penta3 drop-out rate was observed in SCC (4.3 percent), which was followed by KCC (3.9 percent), Rang CC (3.3 percent), DSCC (2.8 percent), NCC (2.0 percent), CCC (1.9 percent), DNCC and GCC (1.8 percent each), BCC (1.4 percent), and Com CC (0.8 percent) . No drop-out from Penta1-Penta3 was observed in RCC. Similarly, the Penta1-MR1 drop-out rate was the highest in DNCC and KCC (9.2 percent each), the lowest (0.6 percent) in RCC. In other city corporations, Penta1-MR! drop-out rate was between 1.9 percent and 8.9 percent (see Figure 57).

Adverse Events Following Immunization: Nationally, 0.8 percent of the mothers/caregivers of vaccinated children reported that their children developed abscesses after receiving Penta or MR1 vaccine. There was very little difference on the occurrence of abscesses after Penta and MR1 vaccine between the children of urban (1.6 percent) and rural (0.6 percent) areas (see Figure 65).

Card Retention Rate: Card retention rate was defined as the proportion of cards available during the survey against the total number of cards issued at the time of first vaccination. Nationally, 99.2 percent of the children received vaccination cards. Of those, 83.8 percent of the mothers/caregivers retained the cards, with the retention

rate being higher in rural areas (86.7 percent) than in urban areas (72.7 percent). Among the rural divisions, card retention rate was the highest in Khulna (93.7 percent), followed by Rangpur (91.6 percent), Barisal (90.8 percent), Rajshahi (89.3 percent), Sylhet (89.2 percent), Dhaka (82.0 percent), and Chittagong (81.0 percent) divisions. In comparison, among the city corporations, card retention rate was the highest in RCC (99.2 percent) and the lowest in DSCC (48.0 percent). It was 90.9 percent in CCC, 88.4 percent in BCC, 84.8 percent in Rang CC, 80.5 percent in KCC, 68.6 percent in SCC, 63.9 percent in Com CC, 61.4 percent in NCC, 56.6 percent in GCC, 50.5 percent in DNCC, and 48.0 percent in DSCC (see Figure 49-51).

Reasons for Never Vaccination: Among the surveyed children, 0.5 percent did not receive any vaccine. Table 5 presents reasons for never vaccinating children, which were mentioned by the mothers/caregivers. The Table shows that about one in five (18.2 percent) mothers were scared of the side effects. By residence, rural mothers/caregivers were more scared of the side effects, compared to their urban counterparts (20.9 percent vs. 7.1 percent). Five percent of the mothers/caregivers reported that they were busy with household chores. Fourteen percent of them were unaware of the vaccination service. More than one in every ten mothers/caregivers (13.2 percent) reported that they didn't believe in vaccination followed by illness of child (10.4 percent), and unaware of vaccine site (5.1 percent) (see Table 5).

Reasons for Partial Vaccination: Five percent of the surveyed children received partial vaccinations. Involvement of mothers/ caregivers with household chores was the most common reason for partial vaccination, with one in every five mothers/caregivers. A little over one-fifth of the mothers/caregivers (21.7 percent) residing in rural areas reported about their involvement in household chores for being the reason for partial vaccination of their children, as compared to 17.2 percent in urban areas. Nationally, lack of awareness about schedule of MR1 doses was reported by 15.2 percent of the mothers/caregivers as a reason for partial vaccination, 16.2 percent in rural areas and 13.2 percent in urban areas. Another 4.2 percent of the mothers reported about their unawareness of 2nd or 3rd dose Penta/OPV as a reason for partial vaccination, 4.3 percent in urban areas and 4.1 percent in rural areas. Nationally, illness of the child was reported as a reason for partial vaccination by 11.6 percent of the mothers/caregivers- 15.9 percent in urban and 9.6 percent in rural areas. This was being followed by the facts that mothers/caregivers were scared and that they forgot to vaccinate their children (9.7 percent)- 14 percent in urban areas and 7.8 percent in rural areas, scared of side effects (9.0 percent): 10.2. percent in rural and 6.3 percent in urban areas) (see Table 8).

Knowledge about Common Side-effects of Vaccination

Vaccination can cause minimal undesirable side-effects, such as fever or local reaction at the injection site. CES 2016 assessed the knowledge of mothers/caregivers regarding minor side-effects after vaccination. Fever was found to be the most reported side-effect as a whole. Overall, 94.3 percent of the mothers/caregivers- 95.8 percent from urban and 93.9 percent from rural areas- reported about their knowledge about it (see Figure 68).

Measles Second Dose (MSD) Coverage

CES 2016 shows that 83.0 percent of the children received valid MSD by age of 23 months across the country in CES 2016. Children from rural areas were slightly more likely to receive MSD than those from urban areas (80.0 percent vs. 83.7 percent) (see Figure 83). In contrast, 86.4 percent of the children received crude MSD nationally, with a slight variation being noticed in the coverage between rural and urban areas (87.0 percent in rural and 83.7 percent in urban areas) (see Figure 80).

Drop-out Rate from MR1 to MR2

Drop-out from the subsequent dose(s) of the same antigen or different antigen was the most notable obstacle in achieving the desired coverage target. A child was considered as a drop-out from MR1, if s/ he had failed to receive MR2 after receiving MR1. Nationally, the MR1-MR2 drop-out rate was found to be 8.0 percent. The drop-out rate was slightly higher (10.4 percent) in urban areas than that in rural ones (7.5 percent) (see Figure 89). However, by gender, no marked variation was observed between males and females (see Figure 89).

Among the seven rural divisions, the MR-MSD drop-out rate was the highest (10.2 percent) in Dhaka and the lowest (3.3 percent) in Barisal divisions. The rate was between 8.6 percent and 4.8 percent in other divisions (see Figure 90). Among the city corporations, MR-MSD drop-out was the highest in SCC (16.4 percent) and the lowest in RCC (1.2 percent) (see Figure 91).

TT Vaccination Coverage Among Mothers With 0-11 Months Old Children

Crude Coverage

Sixty-three percent of the mothers having 0-11 month-old children received 5 doses of TT vaccine across the country. Ninety-eight percent of them received TT1, 96.9 percent TT2, 89.7 percent TT3, and 77.5 percent TT4, respectively (see Figure 92).

Valid Coverage

Nationally, valid TT1 and TT2 vaccination coverages were about 98.2 and 96.8 percent respectively. Valid TT3 vaccination coverage was 89.2 percent, TT4 73.2 percent and TT5 52.3 percent. Urban-rural analysis shows that TT1, TT2, TT3 and TT4 coverage were slightly higher in rural areas than those in urban areas. The coverage of TT5 was 3.7 percentage points higher in rural areas compared to urban areas (53.1 percent vs. 49.4 percent) (see Figure 95).

Protection at Birth (PAB)

CES 2016 data show that countrywide 91.0 percent of the children were protected against tetanus at birth, with urban children slightly ahead of rural children in this context (91.2 percent vs. 91.0 percent). Among the rural divisions, children from Chittagong (94.7 percent), Barisal (94.2 percent), Mymensingh (91.0 percent), Rangpur (90.3 percent), Rajshahi (89.9 percent), Khulna (89.7 percent), and Dhaka (89.0 percent) divisions were in higher position in terms of PAB than those in the other divisions. Children living in Sylhet division were found to be comparatively less protected (86.6 percent). The PAB was also quite good in BCC (98.7 percent), RCC (97.6 percent), CCC (95.8 percent),Com CC and DSCC (94.8 percent each), NCC (94.1 percent) , GCC (91.7 percent), and Rang CC (89.7 percent). However, the coverage was lower among the children in Sylhet City Corporation (85.0 percent), and Dhaka North City Corporation (85.9 percent). It was 83.4 percent in KCC (see Figures 115 to 117).

TT Vaccination Card Retention Rate

Nationally, 34.0 percent of the TT vaccination cards were found to be retained. Card retention rate was slightly higher in rural areas than that in urban areas (36.8 percent vs. 22.8 percent). Overall, in 94.2 percent of cases cards were issued at the time of TT vaccination. Only 32.0 percent cards were available during the period of data collection, while 62.2 percent of recipients reported that they had lost them (see Figure 106).

TT5 Vaccination Coverage

Crude TT5 Vaccination Coverage: Nationally, 56.6 percent of the women received all five doses of TT vaccines, with little variation in the coverage between rural and urban women (57.2 percent in rural and 54.7 percent in urban areas). On the way to TT5, there had been a steep downward trend in crude coverage between TT doses. Having started with TT1 at 93.0 percent nationally, the rate dropped at 82.8 percent for TT3 and 70.7 percent for TT4 dose. A similar picture was observed both in rural and urban areas. In rural areas, the crude coverage of TT1, TT2, TT3, TT4, and TT5 were 93.0 percent, 90.8 percent, 83.1 percent, 71.3 percent, and 57.2 percent, respectively. The corresponding figures were 93.0 percent, 91.0 percent, 81.7 percent, 68.5 percent, and 54.7 percent, respectively, in urban areas (see Figure 128).

Valid TT5 Coverage: More than one-third (38.0 percent) of the surveyed women received all five doses of valid TT vaccine - 36.5 percent in urban and 38.4 percent in rural areas. Like crude TT coverage, valid TT coverage for the subsequent doses were also found to have decreased substantially-from 93.0 percent for TT1 to 38.0 percent for TT5 (see Figure 129). By residence, valid TT coverage was higher in rural areas than that in urban areas for all TT doses, except TT2. The gap in the coverage between rural and urban areas was found high for TT4 dose (58.5 percent vs 53.9 percent).However, the gap was low for TT5 dose (38.4 percent vs 36.5 percent).

Maternal And Newborn Health

Pregnancy and child-birth related complications are important cause for maternal mortality. In Bangladesh, one in every three women do not receive any antenatal care during pregnancy, and about 50 percent women deliver their babies without the assistance of a skilled birth attendant.

Antenatal Care

Antenatal Care Coverage: CES 2016 observed that two-third of mothers (76.7 percent) received antenatal care (ANC) from medically-trained providers throughout the country. By residence, 85.5 percent women in urban areas and 74.5 percent women in rural areas received ANC from a medically-trained provider. According to the Bangladesh Demographic and Health Survey (BDHS) 2014, 64.0 percent of the women who gave birth within three years preceding the survey received ANC from a medically trained provider. However, Multiple Indicator Cluster Survey (MICS) 2012-2013 shows that 58.7 percent of the women who gave birth two years preceding the survey received ANC at least once from a medically trained provider.

Number of Antenatal Visits: The minimum number of antenatal care visits during pregnancy recommended by UNICEF and WHO is four. A little over one-third of the mothers (34.7 percent) made four or more ANC visits across the country, it is slightly more for urban mothers (45.1 percent) than their rural conuterparts (32.0 percent).

Iron and Calcium Supplementation: Nationally, 76.3 percent women took iron tablets and about two-thirds (74.3 percent) took calcium tablets during their last delivery.

Delivery Care

Place of Delivery: Nationally, 50.9 percent deliveries were conducted at a type of health facility, while the home delivery rate was recorded as 49.1 percent. A 21 percentage point's variation was observed in health facility deliveries between rural and urban areas (46.6 percent and 67.4 percent, respectively). A private hospital/clinic was the most common place for institutional deliveries (34.5 percent).

Delivery Assistant: Reducing maternal death from birth complications is possible by increasing the number of births attended by a medically-trained provider: a doctor, nurse, or trained midwife. CES 2016 findings show that a medically-trained provider attended 52.5 percent of total births nationally. The number of birth attended by medically-trained providers was remarkably higher in urban areas (68.8 percent) than that in rural areas (48.9 percent). Among the medically-trained providers, MBBS-qualified doctors were the main service provider in urban areas (54.9 percent), followed by nurses and midwives (36.9 percent).

Postnatal Checkup for Mother and Newborn

Nationally, 50.6 percent of women and 50.9 percent of newborns received a postnatal checkup (PNC) within two days of delivery from medically-trained providers. In contrast, 30.9 percent of mothers and 26.6 percent of newborns did not receive any postnatal care.

Vitamin A Coverage Among 6-59 Months Old Children

A Vitamin A Plus campaign was held in April 2016. Nationally, 86.1 percent of infants aged 6-11 months and 91.3 percent of children aged 12-59 months received Vitamin A capsules. No remarkable variation in the coverage was observed between urban and rural areas. However, 35.8 percent of the mothers with children aged 0-11 months – 41.2 percent in urban and 34.4 percent in rural areas – received Vitamin A capsules after delivering their last child (see Figure 154).

Findnings Of Qualitative Survey

EPI program is governed by the Ministry of Health and Family Welfare across the country. Health Assistant (HA) and Family Welfare Assistant (FWA) in the rural areas are responsible to conduct EPI sessions there. However, EPI program at urban settings is different. In the urban areas EPI activities are performed through different NGOs under the supervision of Ministry of Local Government. It is noticed that the EPI vaccination coverage at urban areas is lower than that of rural areas. To investigate the reasons for variance in coverage, CES 2016 conducted qualitative survey along with quantitative survey among service providers and service recipients in Dhaka North (DNCC) and South City Corporations (DSCC). Findings are separately presented below.

Findings Of In-Depth Interview (IDI)

CES 2016 collected information regarding coordination, dropout management and invalid dose monitoring system. Following facts were revealed in the discussion.

Coordination: EPI activities are coordinated by Health Officer of City Corporation who is responsible for one zone. Discussion with providers and recipients reveals that in urban settings, each Zone has several Wards. Almost each Ward has one EPI Wardroom. EPI Wardroom supplies vaccine & other EPI logistics and coordinate EPI activities of other NGOs/satellite sites and submits Report to Zone office. Zone office submits report to the City Corporation. In contrast, monthly meeting is held with all the EPI service recipients at the Zonal Office to discuss about the progress of EPI activities including drop-out, left-out and invalid dose.

Drop out management: A drop out list is maintained at the Zone and Ward level. Vaccinators follow up the drop out cases through mobile phone and record the outcome. However, exclusive management of dropout is not available at all NGO levels. We visited 4 NGOs but did not get any drop out list at outreach level. However,

drop out list was found at the Ward/Zone level. Drop out management initiatives were observed in 3 NGOs out of 4. One NGO prepares drop out list without mentioning any initiative as well as outcome of efforts to reduce the number of drop out. The qualitative finding reveals that out of 82 drop-outs of different antigens, 49 were corrected during data collection period and finally 33 remained dropped out.

Drop-out management will more effective if the number of static and satellite clinics are increased. While discussing with personnel in four Zones- 2 zones of DNCC; and 2 zones of DSCC it was found that number of satellite clinics largely varied from one Ward to another which didn't represent proportionate distribution (see Table 36). In one ward of DNCC some satellite clinics found to be closed. While asked for reasons, NGO focal person said, " *There was no required eligible children in those satellite sites. As per our official decision we don't operate any satellite site which consists of less than 10 eligible children*."

Another Ward had no satellite clinic. As reasons the NGO personnel said, "There are 3 static clinics surrounding the word. Three static sites are enough to cover the whole Ward, therefore, no need of satellite site in this Ward." However, while analyzed the catchment areas of this Ward the survey observed areas with disadvantaged group.

The quantitative finding shows that 1 out of 5 mothers of non-vaccinated children reported lack of awareness about vaccination as a cause of left out, and almost similar number of mothers with partially vaccinated children reported that they could not vaccinate their children due to household chores. This finding shows that demand side awareness and willingness is still too far as expected. Self-demand is not yet created among the recipients living in urban areas. Accessibility of EPI service like rural areas should ensure from EPI program in urban areas through collaboration with Ministry of Local Government.

Findings Of Focus Group Discussion

CES 2016 conducted FGDs with mothers/caregivers to understand their knowledge about vaccination center as well as reasons for drop out. The findings revealed that mobility of mothers from one place to another hampered administering the vaccine. This problem might have attributed to being drop-out from the subsequent doses. Due to mobility, drop out occurred from both supply and demand side.

> It was found that some mothers and caregivers fear of scolding for additional visit by vaccinator or health workers. One of the mothers said, *"I did not give MR1 Vaccine due to illness of my child. And, later I did not visit Vaccination Center fearing that Vaccinator might scold me."*
>
> The survey team found that usually women gave birth child at mothers' house predominantly at the villages where they stayed for long time. Though child's first vaccination was performed at that place, however the mothers do not have enough information about vaccination place when she back to Dhaka (capital city).

One of the mothers living in Dhaka North City Corporation (DNCC) said, *"I went to my in-laws' house situated in rural areas for delivery and stayed there for more than three months. My child's Vaccination started there. After coming back to Dhaka, the child was not given vaccine due to ignorance about the vaccination center.* When asked, "Did anyone come to you to know the status of child's vaccination?", she replied, *"No".* Similarly, one mother living in Dhaka South City Corporation (DSCC) said, *"I came to Dhaka after giving 7 Antigens. I was new in Dhaka and did not have information about vaccination Centers. So, rest two doses of MR were not given."*

Another mother said, *"Three vaccines were given at my village home, two were due. As we did not go to village, we could not receive vaccine. Here I don't know anything."*

One of the mothers said, ''After the due date, we didn't go for vaccine. We were not sure whether vaccine would be given after the due date.''

The survey also found that mothers visit to husband's house for longer time. By this time scheduled dates of subsequent doses expire. Though mothers feel that child should be vaccinated, they do not go to vaccination center. They think that as they have already missed the vaccination dates, the vaccinator will not administer vaccine. For example, majority of the FGD participants who dropped out due to migration responded as below:

"I went to my village and returned Dhaka after a long time. During this period, I missed the subsequent doses. Therefore, I did not visit vaccination center due to a confusion that the vaccinator would not vaccinate as the schedule date had expired."

Another mother expressed her bitter experience that refrained her from vaccinating child with MR2. The mother said, ''during the first visit, the vaccinator administered OPV1 and Penta1 but BCG was not given. After that I migrated to my in-laws' house. I went to the vaccination center near my in-laws house for the second dose. The vaccinator gave the 2nd dose of OPV and Penta but BCG remained uncorrected again. The vaccinator reasoned, ***"we can't break the vial for one child, come next month, we will give it." "***Again, I visited for the 3rd dose of OPV and Penta but similar cases repeated for BCG. This way I visited vaccination center three times but BCG remained missing. However, the vaccinator suggested vaccinating child with BCG from the first instance. Hearing all these, my husband suggested me to visit District Hospital. I went to the District Hospital for BCG but they told me that rural vaccination center would give it. But, rural outreach didn't give it. Finally, I went to my mother's house, my first vaccination point, and my child vaccinated with BCG though it was late".

When asked mother why she did not vaccinate her child with MR2.The mother replied, *"I went to my village home. By this time MR2 schedule date was over. My first bitter experience and uncertainty of getting vaccine prevented me from further visit for MR2."*

As to the issue of not breaking vial of BCG for one or two children, this was also found officially prohibited in DSCC. It requires at least 5 children for one vial to be broken. One of the vaccinators said,*" We don't break BCG vial for one or two children. It requires at least five children to open one."* He also mentioned that This was their official instruction

Demand of excessive money refrained Mothers/Caregivers to administer the missed subsequent dose/doses. Some mothers from DSCC said, *"Vaccination service requires Tk. 100. Therefore, I did not vaccinate my child with MR1 and MR2."*

It was found that sometimes family members such as husband create barrier for child's vaccination. They do not allow children to receive vaccination. For example- a child was sick while taking to the vaccination center. That time father of the child did not allow his wife to bring his child to vaccination center. The husband said, *"What will occur if we don't give vaccine? We did not give (ourselves) vaccine, what happened to us?"*

Finally, the Respondent's suggestions were sought for further improvement of EPI program so that all vaccines could be ensured. Most of the Participants did not give any suggestion. However, some of the participants opined that the EPI should inform about places where drop out children could be vaccinated.

Discussion And Recommendations

DISCUSSION

Nationally, by crude vaccination rates, 95.1 percent children received all the eligible vaccines, irrespective of age for starting the vaccination and/or minimum intervals between doses. However, In terms of valid coverage, which is the coverage for which Bangladesh is attempting to reach 90 percent at the national level, 82.3 percent of the children across the country received all the scheduled vaccines by the age of 12 months following EPI-recommended age and valid interval between the doses. The urban-rural analysis shows that rural children (83.5 percent) were more likely to receive valid doses compared to their urban counterparts (77.1 percent).

By both crude vaccination coverage by age of 23 months and valid vaccination coverage by age of 12 months, the division that had the highest rate was Barisal division (97.8 percent and 87.5 percent, respectively), and crude coverage was found to be the lowest in Sylhet division (93.1 percent). In contrast, the lowest valid coverage was in Dhaka division (77.9 percent). The second highest coverage division is Rajshahi (84.9 percent). Rajshahi and Barisal were the divisions to reach 85 percent target.

For the districts, the objective is that all reach 85 percent by 2016. In Bangladesh out of 64 districts, 18 districts have reached the target of full vaccination coverage- 85 percent. Thirteen districts having 85 percent coverage in 2015 are now below 85 percent in 2016.So, sustaining the high coverage rate is also a challenging task, which demands special attention from EPI.

The data show that those who left-out and who dropped out of the vaccination schedule contributed to the lower crude coverage. For BCG, the first dose of childhood vaccination schedule, coverage was 99.5 percent, which indicates that about <1.0 percent of the surveyed children still remained unvaccinated. However, crude fully vaccination coverage was 95.1 percent nationally, which means that 4.9 percent of the surveyed children dropped before receiving any subsequent dose of vaccination after receiving BCG. Since the national finding is the reflection of the divisional findings and the divisional findings point towards district coverage, the same interpretation can be applicable in general to the divisions and district. However, the left-out and drop-out rates do vary from one district to another. As an example of the impact the drop-out rate can have, it can be mentioned here that crude coverage was the lowest in Dhaka district (87.5 percent) among all the districts, with the Penta1-MR1 drop-out rate of 10.3 percent to be the second highest among all the districts and significantly limiting the district's crude coverage. Because of the impact it could have on the crude vaccination rate, reducing the drop-out rate should be given special attention by the EPI programme.

The discussion above indicates that both the administration of higher invalid doses and higher drop-out rates contribute to lower fully valid vaccination coverage.

RECOMMENDATIONS

Based on the detailed discussion of the findings on the various survey components of CES 2016 made above, the EPI authorities may consider the following recommendations for further betterment of the program:

- Listing of the drop-outs for every vaccination dose should be prepared on a regular basis; and default tracking system through domiciliary visits by assigned health workers or using new technology device should be introduced
- Reduction of invalid doses and drop-out rates would significantly improve vaccination coverage. To avoid invalid doses, children's vaccination cards and vaccination histories should be carefully reviewed. Additionally, effective supportive supervision, on-the-job training and needs-based refresher training for the service providers should be ensured.
- Biometric or mobile phone technology can be used to help avoid invalid doses and ensure timely vaccinations.
- To maintain equities while sustainably increasing EPI in the chronically and emerging low performing divisions, districts, and city corporations, special attention should be given to those areas.
- Based on the local context, experience regarding the implementation of evidence-based planning & budgeting to address the bottlenecks could be shared with the low performing areas to replicate the ideas or ways of working in the high performing areas.
- There should be regular monitoring of the online reporting on DHIS-2 and to ensuring data quality and timeliness of reporting
- EPI program could preserve vaccination card through digital scanning for future reference and monitoring
- Workers should be encouraged and a competitive mentality should be upheld to provide better services; within the framework of government rules, rewards may be given to better performers.
- Workers should maintain interpersonal communication with those in the target group until the completion of the last dose of scheduled vaccination. It is most important for MR, MSD, and TT3, TT4, and TT5, as the gap or interval is more important for these doses than others of the scheduled vaccines.
- EPI authorities should take appropriate measures to coordinate with the authorities of the local government ministries, city corporations, NGOs, and private health facilities, with an aim to ensure increased vaccination coverage in urban and slum areas.
- A TT campaign programme at schools, colleges, and garments factories could be established to ensure increased TT coverage, in particular TT2 coverage.

EPI authorities may set mechanisms to ensure a periodic review of the micro plan by upazilas through a bottle-neck analysis. Then, needs-based measures should be taken to address the weaknesses of the programme in the respective upazilas.

Table 1: Findings of Key Indicators

Indicators		BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Crude Vaccination Coverage by Age of 23 Months	National	99.5	99.3	99.3	98.7	98.7	97.9	97.9	95.3	95.1
	Urban	99.5	99.3	99.3	98.4	98.4	97.3	97.3	93.1	93.0
	Rural	99.5	99.3	99.3	98.8	98.8	98.1	98.1	95.9	95.7
	Male	99.6	99.4	99.4	98.8	98.8	98.0	98.0	95.5	95.3
	Female	99.4	99.2	99.2	98.6	98.6	97.8	97.8	95.1	95.0
By Division	Barisal	99.7	99.7	99.7	99.4	99.4	99.2	99.2	97.9	97.8
	Chittagong	99.6	99.5	99.5	99.2	99.2	98.7	98.7	96.8	96.7
	Dhaka	99.4	99.2	99.2	98.3	98.3	97.0	97.0	93.3	93.2
	Khulna	99.5	99.3	99.3	99.0	99.0	98.2	98.2	96.1	95.7
	Mymensingh	99.4	99.3	99.3	98.8	98.8	98.0	98.0	94.5	94.2
	Rajshahi	99.5	99.4	99.4	98.7	98.7	98.0	98.0	95.9	95.8
	Rangpur	99.9	99.6	99.6	99.2	99.2	98.6	98.6	95.6	95.5
	Sylhet	98.7	97.7	97.7	96.9	96.9	95.3	95.3	93.2	93.1
Valid Vaccination Coverage by Age 12 Months	National	99.5	97.8	97.8	97.0	97.0	90.1	90.1	87.5	82.3
	Urban	99.5	97.4	97.4	96.2	96.2	87.7	87.7	82.8	77.1
	Rural	99.5	97.9	97.9	97.2	97.2	90.6	90.6	88.5	83.5
	Male	99.6	97.8	97.8	97.1	97.1	90.0	90.0	87.5	82.2
	Female	99.4	97.7	97.7	96.9	96.9	90.2	90.2	87.5	82.5
By Division	Barisal	99.7	98.9	98.9	98.5	98.5	93.5	93.5	91.2	87.5
	Chittagong	99.6	97.8	97.8	97.1	97.1	90.2	90.2	89.1	83.5
	Dhaka	99.4	97.1	97.1	95.8	95.8	87.6	87.6	83.7	77.9
	Khulna	99.5	97.3	97.3	97.0	97.0	91.0	91.0	89.4	84.5
	Mymensingh	99.4	98.4	98.4	97.8	97.8	90.7	90.7	87.5	82.5
	Rajshahi	99.5	98.5	98.5	97.8	97.8	92.0	92.0	89.1	84.9
	Rangpur	99.9	98.1	98.1	97.5	97.5	90.5	90.5	88.0	82.5
	Sylhet	98.7	96.8	96.8	95.5	95.5	88.1	88.1	84.0	79.2

	National	Urban	Rural	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Mymensingh	Rangpur	Sylhet
Drop-out Rate											
Penta1-Penta3	1.4	2.0	1.3	0.5	0.9	2.2	1.2	1.3	1.4	1.0	2.5
Penta1-MR1	4.0	6.2	3.4	1.8	2.7	5.9	3.3	4.8	3.5	4.0	4.6
Incidence of Invalid Dose											
Invalid Penta1	3.0	3.4	2.9	2.2	3.5	3.5	1.9	3.3	2.6	3.4	2.6
Invalid Penta2	4.6	5.4	4.4	3.3	5.0	5.4	3.7	5.2	3.8	4.7	4.2
Invalid Penta3	6.4	7.9	6.1	4.7	6.8	7.4	5.5	6.6	5.3	6.9	6.3
Invalid MR1	3.2	3.9	3.0	3.0	3.1	3.3	2.8	3.5	3.2	2.9	3.8
Card Retention Rate	83.8	72.7	86.7	90.5	80.7	73.0	92.8	85.3	89.2	91.4	88.4
Measles Second Dose (MR2) Vaccination Coverage											
Crude MR2 Coverage	84.9	86.4	83.7	93.8	83.1	83.7	85.5	93.5	98.3	81.1	90.1
Valid MR2 Coverage by 23 Months	79.6	83.0	80.0	90.1	80.7	79.9	79.9	91.5	95.4	76.7	84.2

Indicators	National	Urban	Rural	Barisal	Chittagong	Dhaka	Khulna	Mymensingh	Rajshahi	Rangpur	Sylhet
TT5 Vaccination Coverage among Mothers with Children 0-11 Months Old											
Crude TT1	98.2	98.0	98.2	98.9	98.7	97.4	98.6	98.7	98.9	98.7	94.9
Crude TT2	96.9	96.5	97.0	98.3	97.9	95.9	97.1	95.9	97.3	97.8	93.8
Crude TT3	89.7	87.9	90.2	91.6	91.7	86.7	88.8	89.4	90.4	92.6	87.3
Crude TT4	77.5	75.3	78.0	76.4	80.3	74.3	75.2	77.5	78.9	79.9	76.4
Crude TT5	62.9	61.5	63.3	60.9	66.5	60.6	58.9	62.7	64.1	63.2	64.5
Valid TT1	98.2	98.0	98.2	98.9	98.7	97.4	98.6	98.7	98.9	98.7	94.9
Valid TT2	96.8	96.4	96.9	98.3	97.8	95.8	97.0	95.9	97.3	97.8	93.7
Valid TT3	89.2	87.6	89.6	91.1	91.1	86.3	88.5	89.1	89.6	91.4	86.9
Valid TT4	73.2	70.0	74.0	72.2	76.7	68.8	71.4	74.7	73.6	75.7	72.5
Valid TT5	52.3	49.4	53.1	50.4	58.0	48.7	46.9	50.9	51.5	53.6	56.3
Children Protected at Birth	91.0	91.2	91.0	94.3	94.8	89.3	89.4	90.8	90.1	90.5	86.6
TT5 Vaccination Coverage among Women aged 18-49 Years Old											
Crude TT1	93.0	93.0	93.0	94.0	94.7	92.7	92.4	91.8	93.0	91.9	91.3
Crude TT2	90.8	91.0	90.8	92.9	93.1	90.8	89.6	88.5	90.7	89.7	88.5
Crude TT3	82.8	81.7	83.1	85.3	86.9	81.4	80.1	81.0	81.5	83.1	81.6
Crude TT4	70.7	68.5	71.3	74.7	76.4	69.1	65.6	70.8	67.9	70.2	71.4
Crude TT5	56.6	54.7	57.2	60.6	63.1	54.8	51.2	56.2	52.4	56.0	60.9
Valid TT1	93.0	93.0	93.0	94.0	94.7	92.7	92.4	91.8	93.0	91.9	91.3
Valid TT2	90.8	90.9	90.7	92.9	93.0	90.7	89.5	88.5	90.8	89.5	88.5
Valid TT3	77.9	75.8	78.4	82.4	83.3	75.6	73.4	77.0	76.1	77.7	79.1
Valid TT4	57.5	53.9	58.5	62.9	66.1	54.6	49.0	58.3	53.6	55.5	65.3
Valid TT5	38.0	36.5	38.4	44.5	46.7	34.7	28.6	35.8	34.2	36.5	50.0

CHAPTER 1
INTRODUCTION

1.1 PROFILE OF BANGLADESH

History

Bangladesh has emerged as an independent sovereign country in the face of world atlas in 1971, after a nine-month war of liberation in which 3 million people sacrificed their lives.

Government

Bangladesh is governed by the constitution of 1972 as amended. The head of state is the President, a largely ceremonial position, and, the head of government is the Prime Minister. There is a 300-seat unicameral national parliament known as Jatiya Sangsad, whose members are popularly elected from respective constituencies for five-year terms.

Geographical location

Located in Southern Asia, Bangladesh is bordered by India to the north, west, and east, Myanmar to the south-east, and the Bay of Bengal to the south. The country has a total land of 147,570 square kilometers (56,977 square miles). Rather a low-lying country and occupying one of the largest river deltas in the world, Bangladesh comprised primarily floodplains, with scattered hills in its eastern and northern parts.

Religion and Culture

Approximately 89 percent of the population is Muslim, with the rest of the population comprising of Hindus (9.6 percent), Buddhists (0.6 percent), and Christians (0.3 percent). Although over 98 percent of the people speak Bangla, today English is widely spoken by the people. The country's rich cultural traditions are found in its archaeological sites, sculptures, terracotta, architecture, museums, archives, libraries, classical music, dance, paintings, dramas, folk arts, festivals, and ethnic diversities.

Population and Demography

As of 2014, the population of Bangladesh was 159.1 million. Bangladesh is one of the most densely-populated countries in the world, with 1,221.1 people living per square km at present. About 34 percent of the population lives in urban areas. Life expectancy at birth for both the sexes is 72 years.[1] The average household size is 4.35[2].

Localities

Bangladesh is divided into eight administrative divisions, in which there are 64 districts, with each district is subdivided into a number of upazilas (489), each of which, in turn, consists of several unions (4554). Under each union there are nine wards. Again, there are several villages in one ward. The city corporations and municipalities are denoted as urban areas. At present, there are 11 city corporations and 324 municipalities in the country[3]. The city corporations are divided into zones and wards. In each ward of the city corporation, there are several neighborhoods known as paras/mohallas. Similarly, each municipality is divided into different wards, each of which comprises several paras/mohallas.

1 World Bank

2 Socio-Economic and Demograpic Report 2011, BBS

3 Statistical Year Book 2014

1.2 BACKGROUND OF EPI

In Bangladesh, EPI was formally launched on 7th April 1979 as a pilot project in eight thanas. In 1985, the People's Republic of Bangladesh got committed to the Global Universal Child Immunization Initiative (UCI), and began a phase-wise process of EPI intensification from 1985-1990. During this time period, EPI was intensified throughout 476 upazilas, 92 major municipalities, and 6 city corporations. Finally, EPI was made available to all target groups (infants and pregnant mothers) by 1990.

In the year 1993, the Government of Bangladesh endorsed a TT5 dose schedule for women of child bearing-age, initially from 15 to 45 years of age, and, later extended to 15 to 49 years age. Polio eradication and Maternal & Neonatal tetanus elimination activities were initiated in 1995. As a part of this Acute Flaccid Paralysis (AFP), Measles and Neonatal tetanus surveillance was initiated in 1997. During the last few years, based on the data on disease burden, new vaccines for selected emerging diseases, such as Hepatitis B (2003) and Hib Disease (2009), have been incorporated into the EPI schedule with GAVI (Global Alliance for Vaccines and Immunization) support in pentavalent formulation (DPT+HepB+Hib) that has added advantage to the process of reducing shots for vaccination and minimizing concern of mothers for the use of injectable vaccines. In view of enhancing the injection safety AD (Auto Disable), syringes were introduced in the programme from 2004.Then, MR and MCV2 (Measles Containing Vaccine second dose) was introduced in September 2012, and, finally Pneumococcal Conjugate Vaccine (PCV) and Injectable Polio Vaccine (IPV) in March 2015. Moreover, Type 2 component of OPV was withdrawn on 23 April 2016 by switching from tOPV to bOPV.

Regarding the process of programme implementation, EPI programme is implemented by the Ministry of Health and Family Welfare (MoHFW), while in urban communities, it is implemented by the Ministry of Local Government, Rural Development and Cooperatives. However, MoHFW oversees vaccines and other logistics throughout the country. Overall, EPI is providing vaccines to children and child bearing age women through 134,000 EPI outreach sites across the country. Among rural communities, the existing immunization programme strategy is based on a model of eight outreach sites per ward (old), covering two vaccination sessions per week. At the village level, vaccinations are administered by health assistants with the help of Family Welfare Assistants appointed by MoHFW. Vaccination services in urban areas are provided through a public-private partnership. Although the city corporations (CCs) and the municipal governments are responsible for providing EPI services, 95 percent of the vaccinations are conducted by different national-level NGOs, with the remaining 5 percent being delivered by CCs and municipalities. The CCs assist NGOs in planning, monitoring, and evaluation activities.

The government-led programme of EPI is a noteworthy example of successful collaborative efforts made by the UNICEF, WHO, and other development partners. As a result of many interventions like Maternal and Neonatal Tetanus (MNT) elimination campaign, Measles catch up campaign, and NID for Polio eradication, commendable success has been achieved in immunization program. The country has achieved the threshold of NT validation from 2008. Bangladesh is again maintaining a polio free status from 22 November 2006 after experiencing importation in early part of that year. Finally, Bangladesh along with 10 other countries of WHO South-East-Asia Region, was certified as being polio free on March 27, 2014, by an independent commission under the WHO certification process.

Immunization has been one of Bangladesh's greatest public health success stories. As a result of outstanding performance in improving the child immunization status, Bangladesh achieved Global Alliance for Vaccines and Immunization (GAVI) Alliance Award in 2009 and 2012, which were given as recognition to achieving the Millennium Development Goals (MDG), particularly in reducing child mortality.

To uphold the status, the Government of Bangladesh, UNICEF, WHO, and other stakeholders are making continuous

efforts for identifying different obstacles or challenges and then ways to overcome the barriers with an aim to achieve the desired goals by meeting both the coverage and the disease reduction objectives. To meet the childhood vaccination coverage objectives, EPI has targeted full vaccination coverage at 90 percent nationally and 85 percent in all districts and TT5 coverage among women of child-bearing age at 80 percent nationally and 75 percent at each district by 2016. The establishment of an EPI micro plan (evidence-based strategic planning) is one of the most successful key strategies in this aspect. With an aim to make more targeted and equity focued immunization activities in the districts and sub-districts, annual district EPI micro-plann has been revised with introduction of Evidence Based Planning and Monitoring of effective fully vaccinated children. This resulted in a thorough analysis of different problems and barriers, understanding the bottlenecks in the health system which brings obstacles in achieving higher immunization rates and planning of activities accordingly. Additionally, EPI takes the initiative for conducting supplementary immunization activities, like measles catch-up campaigns, measles follow-up campaigns, MR campaign, etc., to supplement the routine immunization programme.

For the successful implementation of the different activities, EPI has incorporated various strategies, based on its past experiences, as well as on scientific evaluation of the programme periodically. The Coverage Evaluation Survey has proved to be the essential means for monitoring and evaluating the programme. Since 1991, EPI has conducted CES every year, with the exceptions of 1996, 2004, 2008, and 2012. The last CES (21st CES) was conducted in 2015.

1.3 OBJECTIVES OF EPI CES

The objectives of CES 2016 were to assess the following:

- Childhood vaccination coverage under routine EPI
- Measles Second Dose (MSD) vaccination coverage among 18-29-months-old children under routine EPI
- Status of TT Vaccination Coverage, protection at birth, ANC, micronutrient supplementation, delivery, PNC among the women having children less than one year old
- TT5 coverage among women 18-49 years of age to assess the progress of the TT5 programme
- Vitamin A Coverage during the Vitamin A Plus campaign held on April 5, 2015
- Drop-out rates and quality (percentage of invalid doses, vaccination card availability, post-vaccination abscesses, other AEFI, reasons for left-out and drop-out and equity)
- Trends in the vaccination coverage and drop-out rates at the national, divisional, city corporation, and district levels
- Provide information as a basis for making concrete recommendations and planning for improving routine immunization activities

As a routine EPI performance evaluation, CES 2016 was conducted by the Center for Social and Market Research (CSMR), Bangladesh, and was funded by UNICEF. Technical collaborative support was provided by UNICEF, WHO, and EPI.

1.4 ORGANIZATION OF THE REPORT

The CES 2016 report is organized in line with the objectives of the study, beginning with the Executive Summary as a stand-alone and relatively comprehensive write-up that contains all relevant key findings and a brief analysis of these. The report then consists of 10 chapters. Chapter 1 Introduction gives a brief overview of the report, Chapter 2 deals with the methodological aspects, which include data collection techniques, sample size determination, distribution of sample size, and sampling. Chapter 3 presents the findings of Childhood Vaccination Coverage survey. Chapter 4 describes the results gathered from the MSD Coverage survey. Chapter 5 describes the findings of TT vaccination coverage of mothers with children 0-11 months old. Chapter 6 presents the findings of the TT5 vaccination coverage survey of women aged 18-49 years. Chapter 7 describes the situation of maternal and newborn health obtained from the Maternal and Neonatal Health Survey. Chapter 8 shows the coverage of Vitamin A during the Vitamin A Plus Campaign. Chapter 9 presents the qualitative findings of the study. The major key findings and recommendations of the study are then presented in Chapter 10.

The text part of the report contains a total of 36 tables and 158 figures.

CHAPTER 2
METHODOLOGY

2.1 SURVEY DESIGN

CES 2016 intends to capture multiple Target Groups. And, its inferential goal is estimation of coverage of major indicators, which include Childhood Vaccination Coverage, Measles Second Dose Coverage (MSD), TT Vaccination Coverage among 18-49 years old women,TT Vaccination Coverage among mothers with children 0-11 month old, percentage of children protected at birth (PAB) during birth, Vitamin A Coverage during Vitamin A Plus Campaign held in April 2016. Since the Survey objectives of all Target Groups are an estimation of coverages, quantitative method was followed in CES 2016. In terms of operation, the survey estimated a feasible Sample size to capture all Target Groups from the same Cluster following the minimum Sample of WHO guidelines. However, regarding the level of Survey, it was conducted at District level with statistically representative sample size.

2.2 INDIVIDUAL SURVEYS

Under CES 2016, the following five individual surveys were conducted:

- Childhood Vaccination Coverage Survey
- Measles Second Dose Coverage Survey
- Tetanus Toxoid Vaccination Coverage Survey (TT Survey) among mothers with 0-11-months-old children
- Tetanus Toxoid Vaccination Coverage Survey among the women who were 18-49 years old (TT5 Survey)
- Vitamin A Coverage Survey among the 6-59 months- old children

2.3 SURVEY SUBJECT

CES 2016 included five individual surveys targeting six different survey subjects. The survey subjects are shown below by individual survey.

Childhood Vaccination Coverage Survey: According to EPI programme, a child should be vaccinated with all eligible antigens within 1 year after its birth. Therefore, children who were aged between 12 and 23 months and were born between 1 July 2014 and 30 June 2015 were the subjects of CES 2016.

Measles Second Dose (MSD) Coverage Survey: MSD should be received between 15 and 18 months after one's birth. Therefore, children who were aged between 18 and 29 months and were born between 01 January 2014 and 31 December 2014 were included in CES 2016.

TT Survey: Bangladesh achieved the neonatal tetanus (NT) elimination status in 2008. To uphold and sustain this elimination status, EPI monitored this status through assessing mothers' TT status. Therefore, mothers who had 0-11-month-old children and who delivered their children between 01 July 2015 and 30 June 2016 were the subjects of TT survey.

TT5 Coverage Survey: In the case of women, TT vaccination starts with the first dose after one attains the age of 15 years, and it takes 2 years and 7 months to complete all the 5 doses of TT vaccine. To estimate TT5 coverage, women aged between 18-49 years were included in TT5 Vaccination Coverage Survey.

Vitamin A Coverage Survey: Two types of survey subjects were included in CES 2016:

1. Children who were aged between 12 and 59 months, and
2. Children who were aged between 06 and 11 months

2.4 SAMPLE SIZE

Sample size of CES 2016 has been estimated by following the World Health Organization (WHO) latest guideline. Anticipated coverage, ICC (Intracluster Correlation Coefficient), design effect and non-response rate were considered to calculate the Sample size. EPI Program has separate coverage target objective for each Target Group. Anticipated coverage was not the same for all the Survey Groups. Sample size has been estimated with 95% confidence interval. WHO-suggested Table B-1[4] (Appendix D) was used to calculate the effective Sample size.

Using the above mentioned table, design effect and non-response rate 57 Clusters were estimated with eight eligible Households for Child, MSD, TT5, and Vitamin A coverage among 12-59 month old children. And, 57 Clusters with five eligible Households for Maternal and Neonatal Health (MNH) Survey and Vitamin A coverage Survey among 06-11 month old infants. Therefore, 57X8 = 456 Samples were estimated to produce District/City Corporation Survey Unit-wise result for Child, MSD, TT5, and Vitamin A (12-59 month old children) coverage Surveys. And, 57X5 = 185 Samples were estimated to produce District/City Corporation Survey Unit-wise result for MNH and Vitamin A (06-11 month old infants) coverage Surveys. Based on this calculation, a total of 184,338 Samples were estimated for 77 Survey Units in 6 different Target Groups in CES 2016.

Table 2: Summary Table of Estimated Sample Size

Divisions/City Corporations/ Municipalities/ Peri-urban/ slum areas	Number of Survey Units	Number of clusters	Number of 12-23 months old children (child sample)	Number of 18-29 months old children (MSD sample)	Number of mothers of 0-11 months old Children (TT sample)	Number of woman of 18- 49 yrs age (TT5)	Number of Children Aged 06-11 Months (Vitamin A Sample)	Number of Children Aged 12-59 Months (Vitamin A Sample)
			1	2	3	4	5	6
Barisal Division	6	342	2736	2736	1710	2736	1710	2736
Chittagong Division	11	627	5016	5016	3135	5016	3135	5016
Dhaka Division	13	741	5928	5928	3705	5928	3705	5928
Khulna Division	10	570	4560	4560	2850	4560	2850	4560
Mymensingh	4	228	1814	1814	1140	1814	1140	1814
Rajshahi Division	8	456	3648	3648	2280	3648	2280	3648
Rangpur Division	8	456	3648	3648	2280	3648	2280	3648
Sylhet Division	4	228	1824	1824	1140	1824	1140	1824
City Corporations	11	627	5016	5016	3135	5016	3135	5016
Slum of DCC	1	57	456	456	285	456	285	456
Slum of CCC	1	57	456	456	285	456	285	456
Total	**77**	**4389**	**35112**	**35112**	**21945**	**35112**	**21945**	**35112**

However, following WHO guideline, the survey did not replace randomly selected non-response households with another one. Therefore, the sample size reduced and the survey finally achieved 180998 samples that are shown in Table 2a.

4 Vaccination Coverage Survey Cluster Surveys Reference Manual, Version 3, Page B1-16

Table 2a: Summary Table of Actual Sample Size

Divisions/City Corporations/ Municipalities/ Peri-urban/ slum areas	Number of Survey Units	Number of clusters	Number of 12-23 months old children (child sample)	Number of 18-29 months old children (MSD sample)	Number of mothers of 0-11 months old Children (TT sample)	Number of woman of 18- 49 yrs age (TT5)	Number of Children Aged 06-11 Months (Vitamin A Sample)	Number of Children Aged 12-59 Months (Vitamin A Sample)
			1	2	3	4	5	6
Barisal Division	6	342	2670	1598	2661	2652	1680	2775
Chittagong Division	11	627	4849	3065	4913	4849	3062	5334
Dhaka Division	13	741	5779	3525	5670	5765	3649	6003
Khulna Division	10	570	4428	1059	1673	1754	1124	1855
Mymensingh	4	228	1752	2739	4544	4450	2802	4599
Rajshahi Division	8	456	3515	2188	3551	3545	2206	3606
Rangpur Division	8	456	3549	2172	3502	3567	2251	3742
Sylhet Division	4	228	1756	1091	1767	1750	1107	1899
City Corporations	11	627	4949	3096	5097	4965	3104	5120
Slum of DCC	1	57	443	277	443	450	282	454
Slum of CCC	1	57	431	277	427	420	275	446
Total	**77**	**4389**	**34121**	**34248**	**21087**	**34167**	**21542**	**35833**

2.5 SAMPLING

Selection of Primary Sampling Units and Survey Subjects

A Systematic Random Sampling technique was followed in CES 2016. The Bangladesh Bureau of Statistics (BBS) has developed the list of all mouzas and mohallas. By using this list, a sampling frame with all mouzas and mohallas in a district/city corporation was prepared. Then each mouza/mohallah was segmented with 120 households, which was denoted as Enumeration Area (EA) of CES 2016, from which 57 EAs were selected for each survey unit. In total, 4,389 clusters were selected country- wide. The detailed sampling technique is discussed below.

The following steps were followed for selecting the samples under CES 2016:

Step 1: Taking into consideration all the mouzas and mohallas available, a sampling frame was prepared.Following the segmentation method, a mouza/mohalla was divided into segments in such a way that each segment comprises 120 households. A total number of segment/EA in a district was prepared. Then 57 segments/EAs was selected using the systematic random sampling technique with Probability Proportion to Size (PPS) and was considered to be the final Primary Sampling Units of CES 2016.

Step 2: A list of all eligible households was prepared separately for each category of survey through a household listing exercise. Finally, eight households for Child, MSD, TT5 and Vitamin A Coverage surveys among 12-59 months old children and 5 households for Maternal and Neonatal Health Survey and Vitamin A Coverage surveys among 06-11 months old children were selected randomly from each category and the survey questionnaire was administered.

Step 3: Interviews were conducted with the pre-selected samples without replacement through a pre-designed questionnaire

2.6 QUESTIONNAIRE

Structured questionnaires were used to obtain data for CES 2016. Each questionnaire was pre-tested to check the consistency, language, time, and other difficulties that would be encountered during the interviews. Findings from pre-testing were incorporated into the questionnaire and were finalized with technical assistance from UNICEF, WHO, and EPI-DGHS. Five separate survey tools were prepared for five individual surveys: Child form; MSD form; Maternal and Neonatal Health form; TT5 form; and Vitamin A Plus Campaign form. In addition, the household listing form and sampling frame for each target group were prepared and used. All types of questionnaires are attached in the Appendix as ready reference.

2.7 IMPLEMENTATION OF THE SURVEY

2.7.1 Recruitment

Recruitment of quality control officers, supervisors, and interviewers took place in October 2016. One's educational attainment, previous experiences in conducting CES or similar kind of study, honesty and sincerity, team spirit and ability to work in any place for a long period, results of written test, mock test, and field test as well as his/her performance during the period of training were considered. The best performers were selected as Quality Control Officers and Supervisors.

2.7.2 Training

A seven-day exclusive participatory training programme was held for the field personnel from 6-12 November, 2016. The training programme included classroom lectures, by using multimedia, demonstration interviews, role-playing, field practices, and reviewing of problems. Present in the training programme as resource persons were Director, Primary Health Care and Line Director Maternal, Neonatal, Child & Adolescent Health; Programme Manager, EPI and Surveillance; Assistant Director, EPI and Surveillance; Deputy Programme Manager, EPI & Surveillance; Deputy Programme Manager, Field Services, EPI; Deputy Programme Manager, Training, EPI; and Training Officer, EPI. Additionally, the Immunization Specialist from UNICEF and National Professional Officer; and Data Manager from WHO also provided technical input as resource persons.

2.7.3 Fieldwork/Data Collection

The data collection for CES 2016 was carried out over a period of 120 days, starting from November 20, 2016 and ending on April 19 2017. Forty-two teams were involved in the data collection process, with each team comprising three members: one Supervisor and two Field Interviewers. Moreover, 20 interviewers and 10 supervisors worked as reserve field resources. In addition to the supervisors, 10 Quality Control Officers were involved in maintaining quality control, and one consultant was engaged to monitor and check data quality from time to time over the entire period of field activities. Field visits were also accompanied by personnel from EPI-Directorate General of Health Services, MOHFW, UNICEF, and WHO to monitor the field activities.

2.7.4 Data Management and Statistical Analysis

A Statistical Package for Social Science was used for analyzing the data. A series of activities were undertaken to manage and analyze the data, which included the following: data cleaning, processing, coding, data punching, quality control, and final analysis to obtain the required output. Data obtained from the field under CES 2016 were handled by using the database software FOXPRO version 2.6; and cleaning was done by using the software Clipper Version 5.3.

2.8 WEIGHTING

Weight was assigned for estimating the national, division, and district coverage for each indicator of every survey component.

2.9 LIMITATIONS OF THE SURVEY

The CES 2016 was conducted in compliance with the stipulations of the WHO New Guidelines. But, the whole attempt had to face many limitations.

Limitations affecting the Survey were of varied nature. Many Rules and Procedures, such as restriction regarding the replacement of sample households, pre-selection of households at the Central level, taking photographs of Vaccination Cards, obtaining information from the Health Register in case of unavailability of the Cards, were introduced in the New Guidelines. These were not in previous surveys.

The Survey required to visit on more than two occasions on different days, to conduct Interviews with Non-response Households. Overall, 84 percent of the Cards were found to have been retained. As per the Guidelines, the survey had to obtain information from the Health Register. All the information could not be obtained from the Health Register as the Register pertaining to the Reference Year was not available. It was required Registers which pertained to 1 to 2 years back.

The absence of Records relating to the surveyed children was another barrier. Here the child was an outsider; and, it was not under the jurisdictions of the selected Block. Besides, for want of time the Health Workers were busy with their routine work and were unable to meet Field Interviewers during the period of Data Collection.

Taking pictures and managing the Phone Book was another challenge for the Surveyors. Lack of electricity in the remote hilly areas prevented surveyors from taking clear pictures of some Clusters. Moreover, due to technical problems, some pictures were to be deleted from the Database. Incidents like loss of cell phone sets also affected availability of representative pictures of Vaccination Cards at some of the Clusters. The process had to progress with limitations of such types.

CHAPTER 3
CHILDHOOD VACCINATION COVERAGE

3.1 CHILDHOOD VACCINATION

Children may inherit some immunity against some specific infections from their mothers to protect themselves, with variant durability, against those diseases. In course of time, this type of immunity eventually comes to a point where it requires active or passive immunization to have the desired immunity to protect oneself from the specific disease. At present, EPI in Bangladesh deals with vaccines against a number of fatal diseases under the routine childhood vaccination schedule. These diseases are the following: Childhood Tuberculosis, Diphtheria, Pertussis, Tetanus, Hepatitis B, *Hemophilus Influenza type b*, Poliomyelitis, Measles, and Rubella.

The BCG vaccine provides protection against childhood tuberculosis; the Oral Polio Vaccine (OPV) provides protection against Poliomyelitis; the Pentavalent (DPT+Hep-B+Hib) vaccine provides protection against Diphtheria, Pertussis, Tetanus, Hepatitis B, and *Hemophilus Influenza type b*; and, the Measles and Rubella (MR1) vaccine provides protection against Measles and Rubella. For a quick understanding of the current childhood vaccination schedule under EPI in Bangladesh, the following table provides information about diseases protected by the vaccines, number of dose(s), minimum interval between the doses, and the starting time.

Table 3: EPI Childhood Vaccination Schedule

Name of Diseases	Name of vaccine	Number of doses	Minimum interval between doses	Starting time
Tuberculosis	BCG	1	-	At Birth
Diphtheria, Pertussis, Tetanus, Hepatitis-B, Haemophilus Influenza type b(Hib)	Pentavalent (DPT, Hep-B, Hib)	3	4 weeks	6 weeks
Poliomyelitis	OPV	3	4 weeks	6 weeks
	IPV	1	-	14 weeks
Pneumococcal pneumonia	PCV*	3	4 weeks	6 weeks
Measles and Rubella	MR	2	-	9 months and 15 months

*** PCV was not included in this survey**

3.2 CHILDHOOD VACCINATION COVERAGE

A child who has received all the doses of all antigens as recommended in the EPI programme under the childhood vaccination schedule is considered to be fully vaccinated. EPI has got a WHO-recommended vaccination schedule to administer and complete the required doses of all antigens. According to EPI childhood vaccination schedule, a child should receive all the eligible vaccines within one year of age, complying with the recommended minimal age for starting the vaccines and the intervals between the consecutive doses. Two types of coverage – crude and valid – were estimated and analyzed as per WHO guideline and presented in CES 2016.

Valid coverage refers that the first dose of a vaccine was given at the recommended age, and, the recommended minimum interval between doses was maintained. Therefore, any dose of a scheduled vaccine received by a recipient that was administered at the appropriate age and at the minimum time interval between the doses was considered to be a valid dose. If any child received all the valid doses within the age of 12 months, CES termed it as valid coverage by age of 12 months. And, if s/he received all the valid doses within the age of 23 months, CES termed it as valid coverage by the age of 23 months. Conversely, the coverage was defined as crude when a child received all the scheduled vaccines, whether or not the recommended starting age or intervals between the doses were complied with as recommended by EPI Bangladesh.

3.3 COVERAGE RATES FROM CARD, REGISTER AND HISTORY

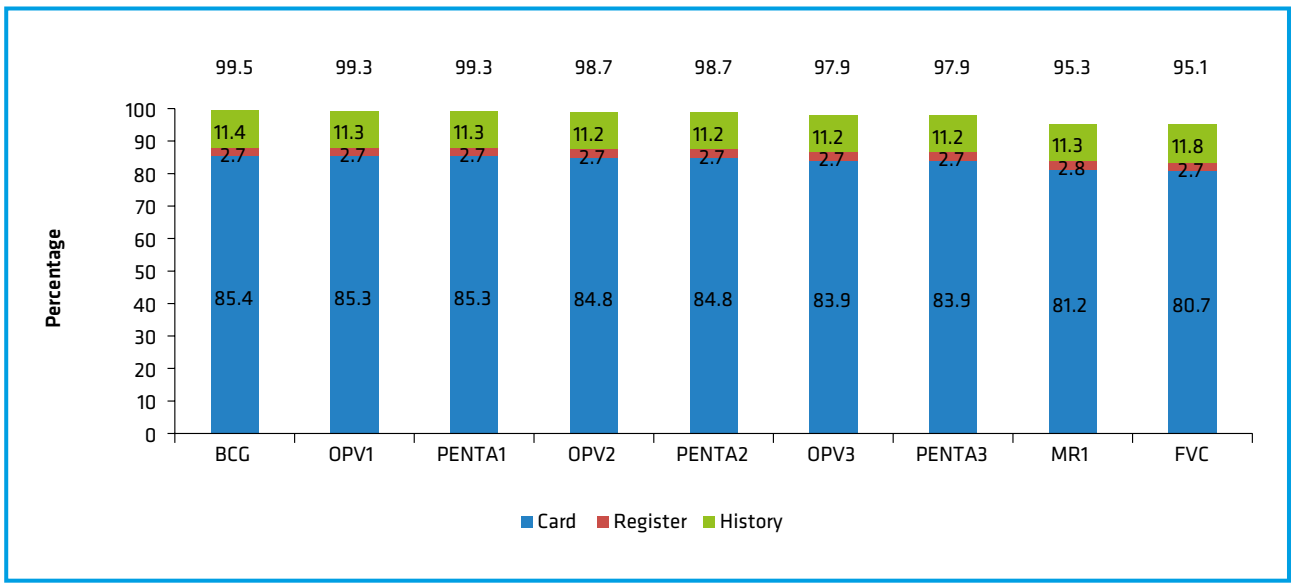
Total coverage is an aggregated result obtained from vaccination cards, register and history and history. Information about CES 2016 was gathered from the three sources: card, register and history. For the child who didn't have a vaccination card, his/her vaccination information was recorded either from register or by taking history from his/her mother/ caregiver. CES 2016 analyzed the coverage of both the sources separately. The findings are presented below.

3.3.1 Levels of Crude Vaccination Coverage by Age of 23 Months

Crude vaccination coverage was defined as the vaccines given to children when the exact age for starting the vaccination and/or the interval between the doses, as recommended in the EPI schedule, were or were not met. Information about the child's vaccinations was obtained from children aged 12-23 months, of whom 83.2 percent had vaccination cards. Figure 1 presents crude vaccination coverage separately obtained from three different sources: card, register, and history.

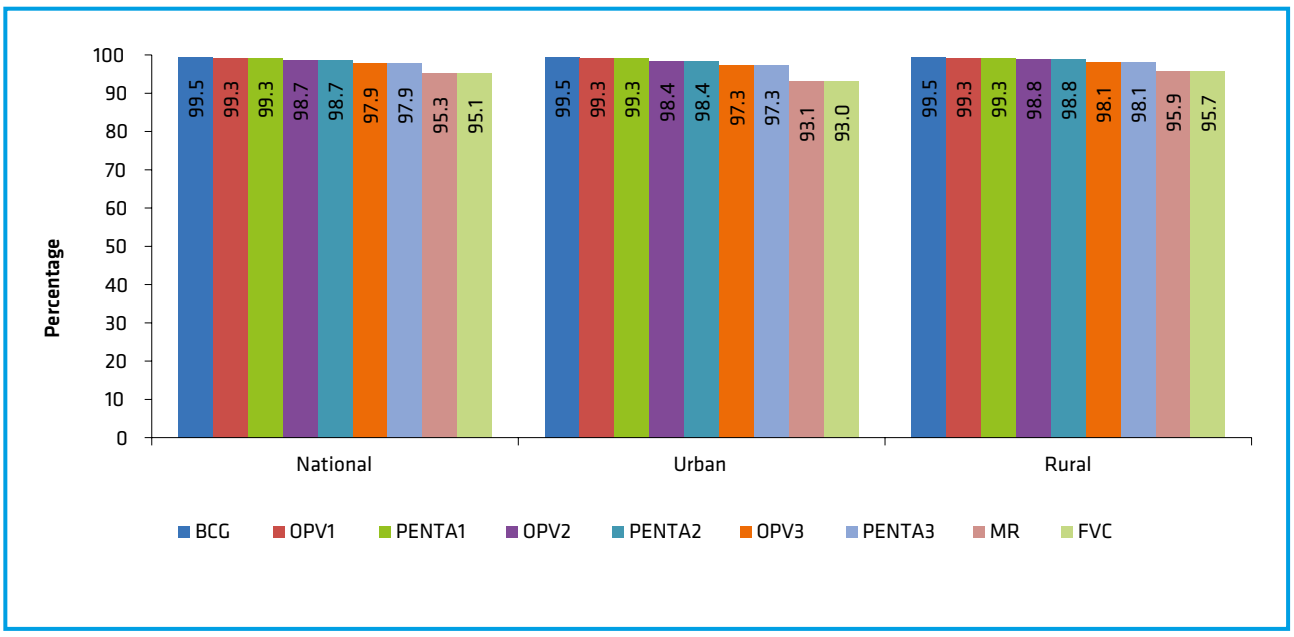
Nationally, 95.1 percent of the children received all the eligible vaccines, irrespective of the appropriate time for starting the antigen and/or the minimum interval between the two doses. Following the order by which the EPI schedule recommended doses, as shown in Figure 1, BCG had the highest coverage (99.5 percent), followed by Penta1, Penta2, Penta3, and MR1. The difference between BCG and MR1 was the most prominent (4.2 percentage points), while the difference was least prominent between BCG and Penta1 (0.2 percentage point)- a pattern common in all the variations of vaccination coverage. The difference gradually narrowed in the case of subsequent doses. The gap in coverage between the two antigens/doses might be caused by the drop-outs from subsequent doses.

Figure 1: Crude Vaccination Coverage by Age of 23 Months at National Level by Card, Register and History in 2016



By residence, a little variation was observed in crude vaccination coverage between rural and urban areas (95.7 percent vs. 93.0 percent) (see Figure 2).

Figure 2: Crude Vaccination Coverage by Age of 23 Months by National, Rural and Urban Areas in 2016



3.3.2 Levels of Crude Vaccination Coverage by Age of 12 Months

Crude Vaccination Coverage by Age of 12 Months: Ninety percent children received all the eligible vaccines by age of 12 months, irrespective of whether the age for starting the antigen and/or the minimum interval between the consecutive doses was as recommended. Following the order by which the EPI schedule recommended doses, as shown in Figure 3, coverage ranged from BCG at 99.5 percent, with a gradual decrease through to Penta3 at 97.5 percent, and then a 7.0 percentage points drop for MR1 (90.5 percent). The urban-rural analysis shows little variation between rural and urban areas, with rural children slightly more likely to receive the crude vaccine by age of 12 months than children residing in urban areas (91.3 percent vs. 86.2 percent, respectively) (see Figure 4).

Figure 3: Crude Vaccination Coverage by Age of 12 Months at National Level by Card and History in 2016

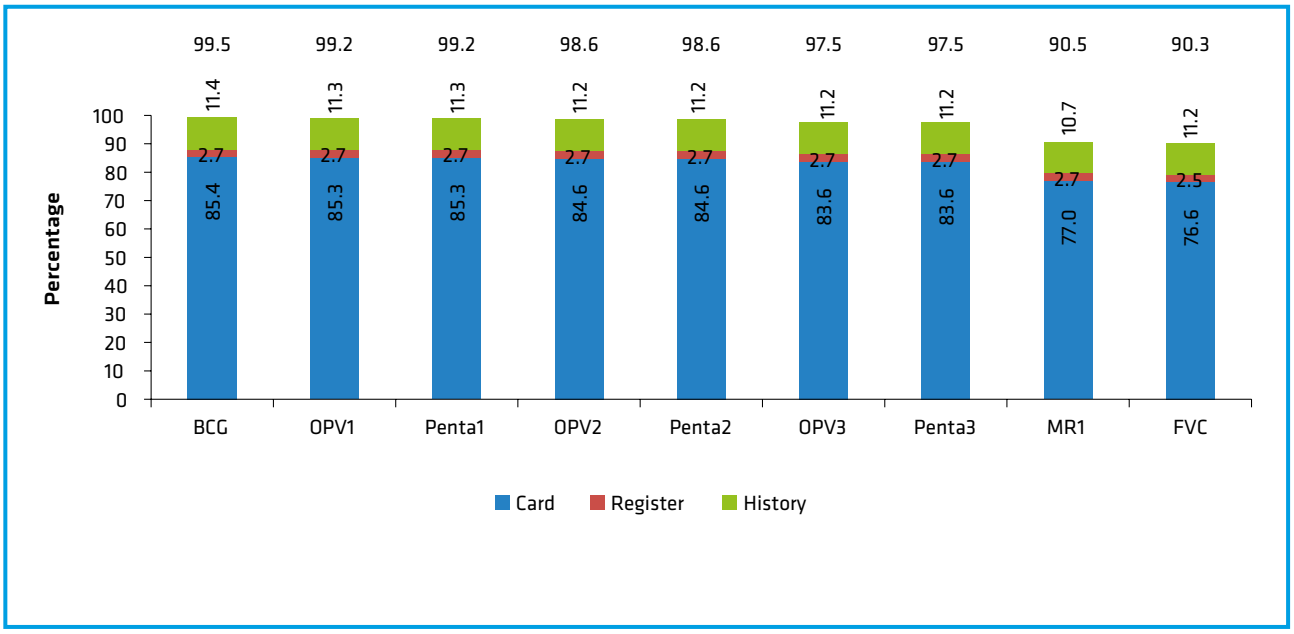
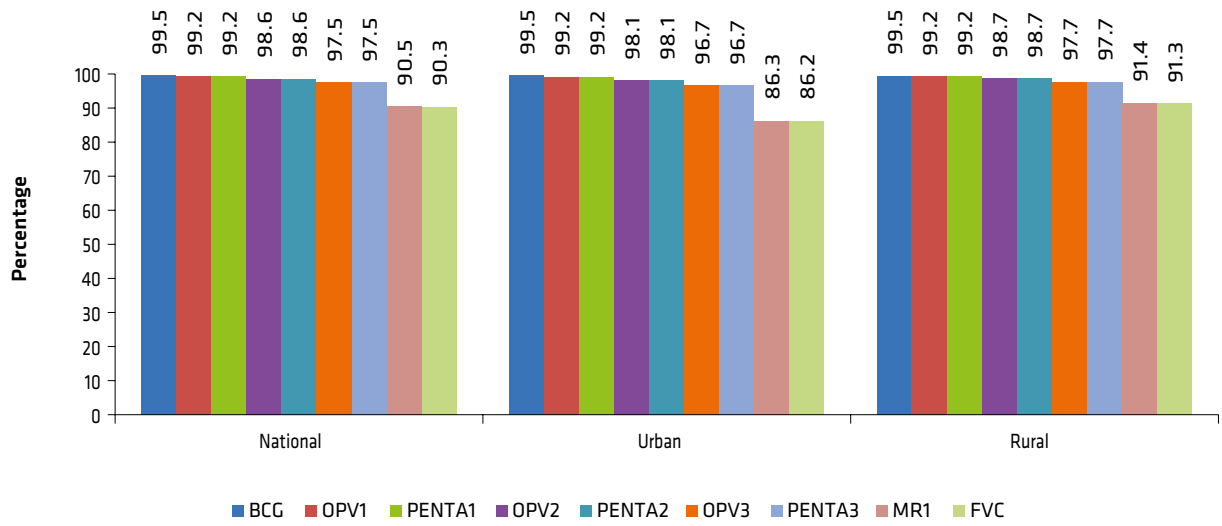


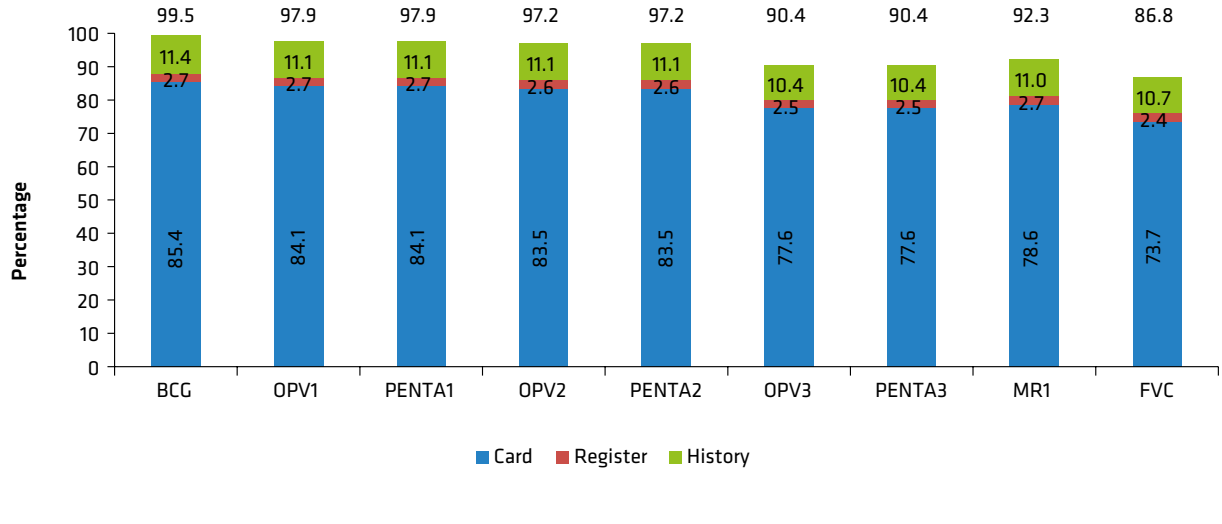
Figure 4: Crude Vaccination Coverage by Age of 12 Months by National, Rural and Urban Area in 2016



3.3.3 Levels of Valid Vaccination Coverage by Age of 23 Months

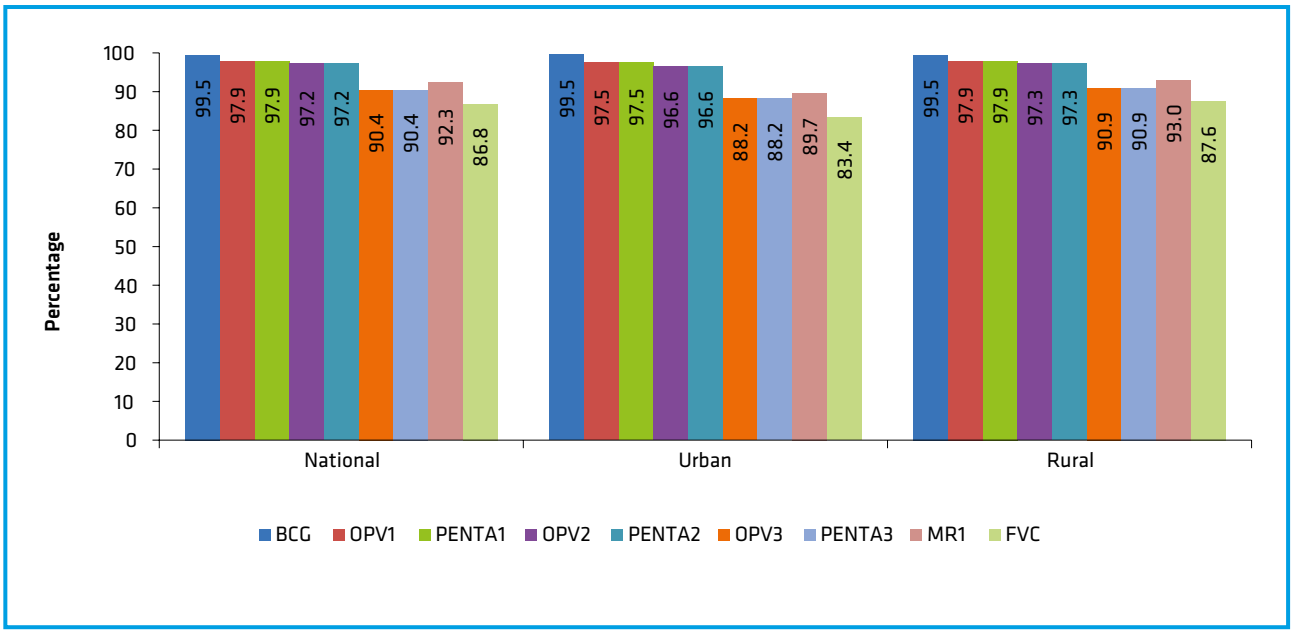
Figure 5 presents valid vaccination coverage by age of 23 months. Valid coverage was defined as vaccines received by following the EPI-recommended age and dose interval for each antigen. Nationally, 86.8 percent of the children received all the scheduled doses of all antigens with BCG coverage being at 99.5 percent. Penta1 coverage was 97.9 percent, Penta2 97.2 percent, and Penta3 90.4 percent. Moreover, MR1 coverage (92.3 percent) was revealed to be 7.2 percentage points lower than BCG (99.5 percent).

Figure 5: Valid Vaccination Coverage by Age of 23 Months at National Level by Card, Register and History in 2016



By residence, valid vaccination coverage was 4.2 percentage points higher in rural areas (87.6 percent), compared to those who resided in urban areas (83.4 percent) (see Figure 6).

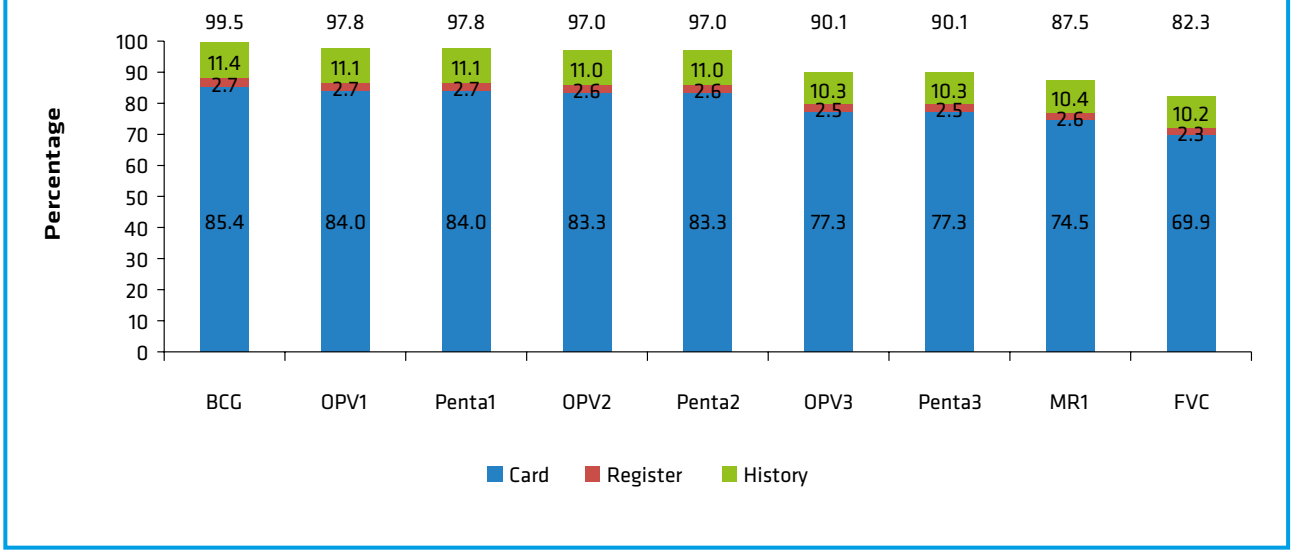
Figure 6: Crude Vaccination Coverage by Age of 23 Months by National, Rural and Urban Area in 2016



3.3.4 Valid Vaccination Coverage by Age of 12 Months

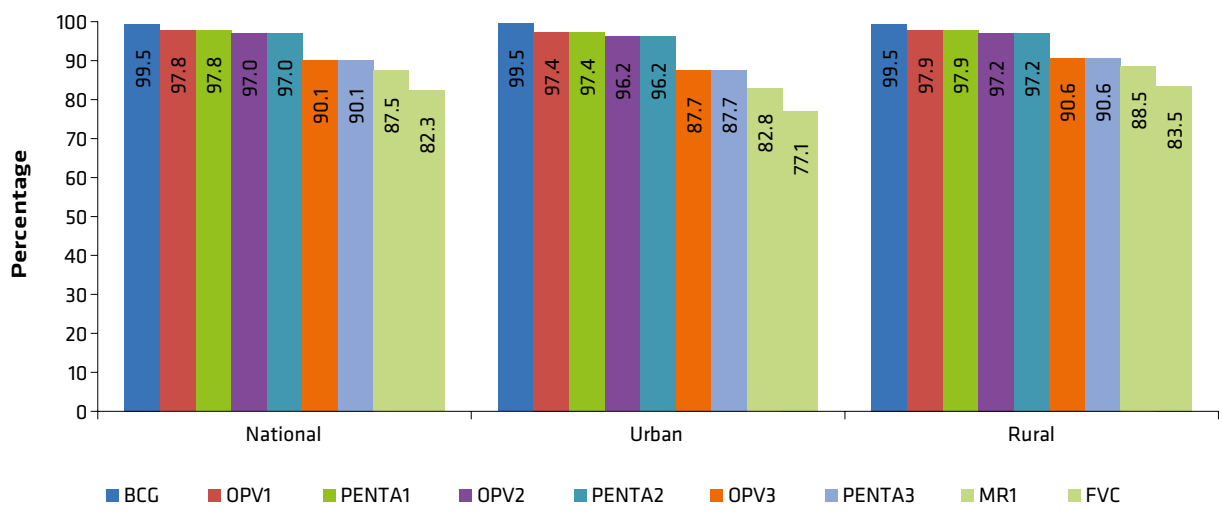
Figure 7 presents the valid vaccination coverage by age of 12 months. It is evident from the figure that nationally 82.3 percent of children received all the scheduled vaccines by age of 12 months, following EPI-recommended age and dose intervals for each antigen. The drop from BCG coverage (99.5 percent) to the 3rd dose of pentavalent administrations, Penta1 (97.8 percent), Penta2 (97.0 percent), and Penta3 (90.1 percent) was 9.4 percentage points. Valid MR1 coverage was 12 percentage points lower than for the BCG coverage. Administering vaccines without following the EPI-recommended minimum age and intervals caused invalid doses, as well as drop-outs from BCG; and the subsequent dose of OPV and Penta vaccines attributed to lower MR1 coverage.

Figure 7: Valid Vaccination Coverage by Age of 12 Months at National Level, by Card, Register and History



Similar to valid vaccination coverage by age of 23 months, valid full coverage by age of 12 months was higher among children in rural areas. Eighty-four percent of children in rural areas received all valid full vaccines by age of 12 months, as against 77.1 percent of those residing in urban areas (see Figure 8).

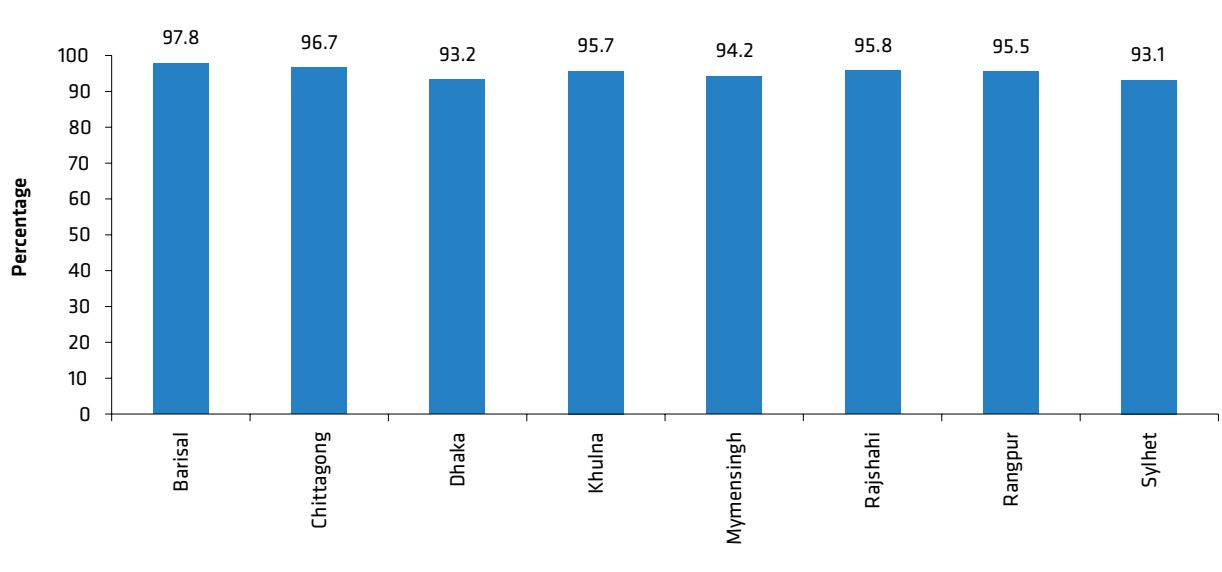
Figure 8: Valid Vaccination Coverage by Age of 12 Months by National, Rural and Urban Areas in 2016



3.3.5 Crude Full Vaccination Coverage by Age of 23 Months by Division

Figure 9 presents crude vaccination coverage by 23 months of age, by division. It shows that crude vaccination coverage was the highest in Barisal (97.8 percent) and the lowest in Sylhet (93.1 percent) divisions. Elsewhere, the coverage ranged from 96.7 percent in Chittagong to 93.2 percent, in Dhaka division.

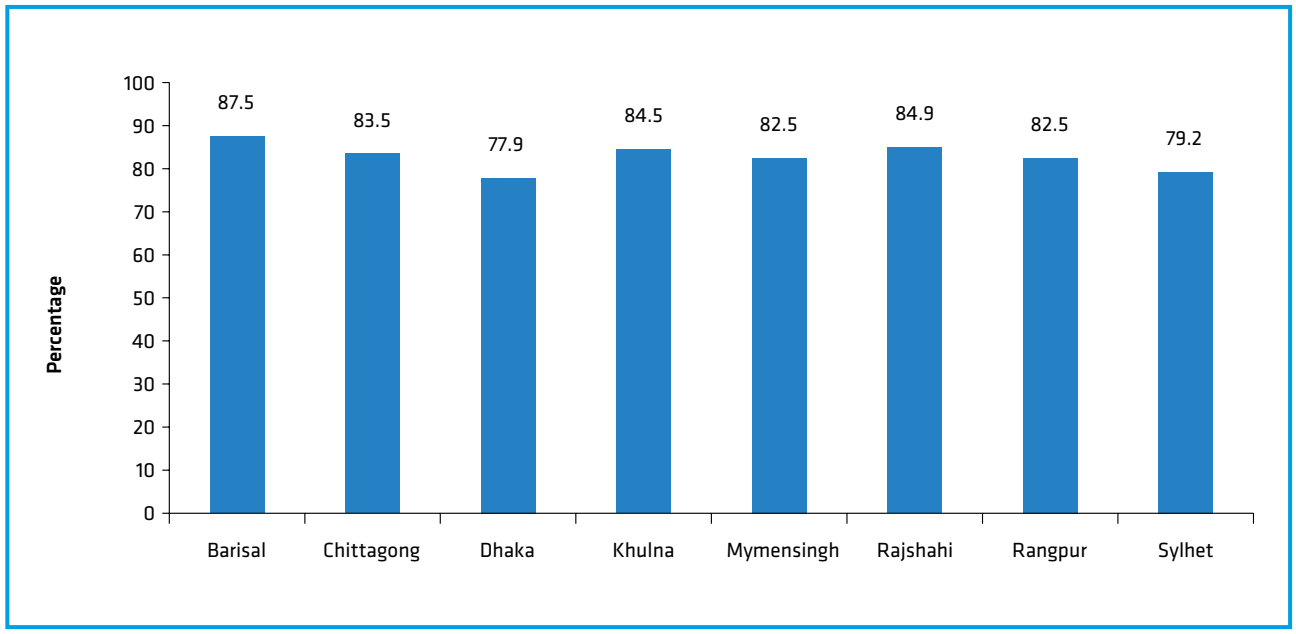
Figure 9: Crude Full Vaccination Coverage by Age of 23 Months by Divisions in 2016



3.3.6 Valid Full Vaccination Coverage by Age of 12 Months by Division

Valid full vaccination coverage by age of 12 months is displayed in Figure 9a. Barisal division had the highest valid vaccination coverage (87.5 percent) and Dhaka the lowest (77.9 percent). Conversely, higher drop-out rate and administering invalid dose contributed to lower valid vaccination coverage.

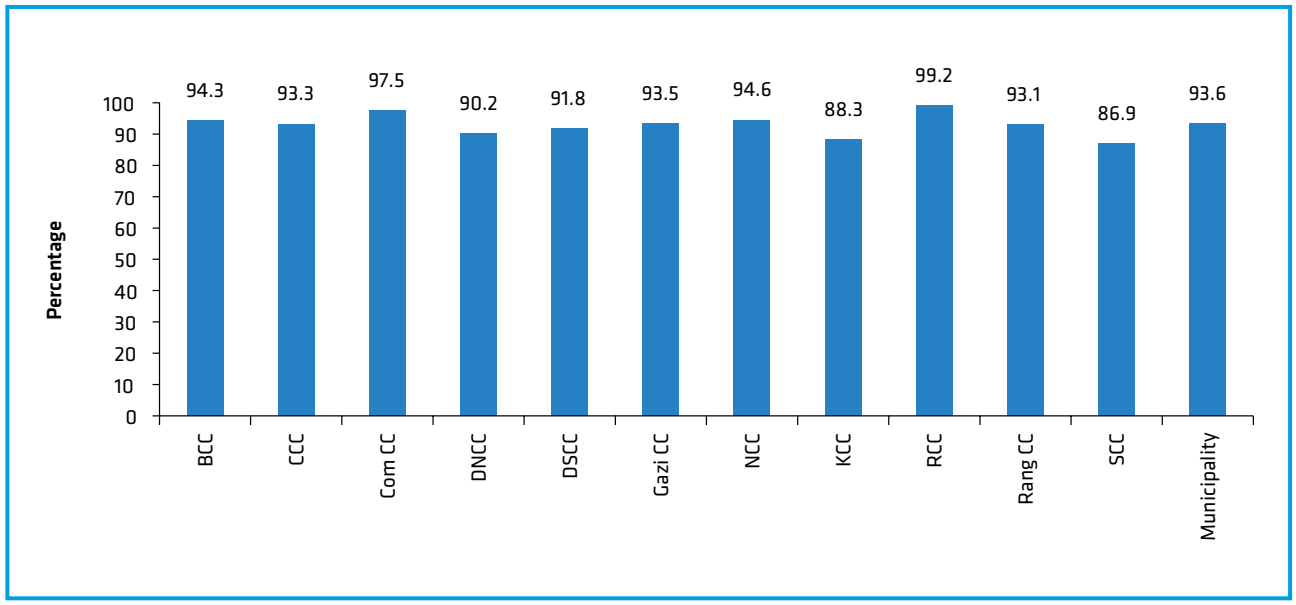
Figure 9a: Vlaid Full Vaccination Coverage by Age of 12 Months by Divisions in 2016



3.3.7 Crude Full Vaccination Coverage by Age of 23 Months in Urban Areas by City Corporation and Municipality

Figure 10 presents crude full vaccination coverage by 23 months of age, by city corporation and municipality. It shows that crude vaccination coverage was the highest in RCC (99.2 percent) and lowest in SCC (86.9 percent). Elsewhere, the coverage ranged from 97.5 percent in Com CC to 88.3 percent in KCC.

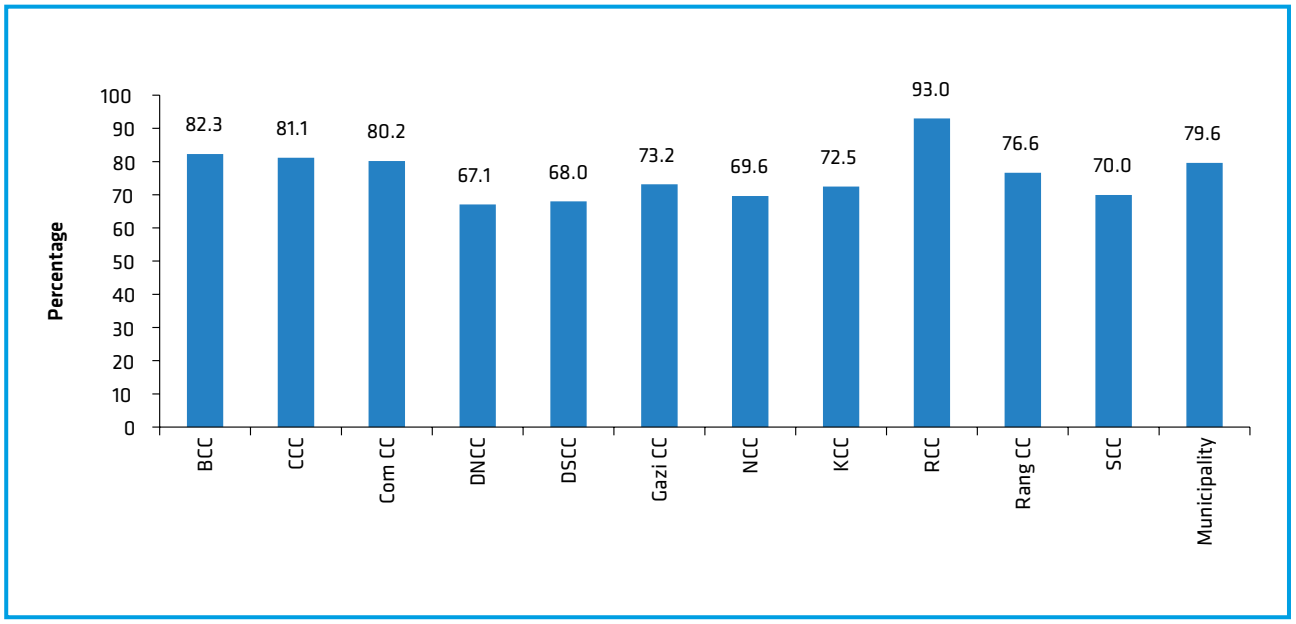
Figure 10: Crude Full Vaccination Coverage by Age of 23 Months in Urban Areas by City Corporation and Municipality in 2016



3.3.8 Valid Full Vaccination Coverage by Age of 12 Months in Urban Areas by City Corporation and Municipality

Valid full vaccination coverage by age of 12 months is displayed in Figure 10a. The figure shows that RCC had the highest valid vaccination coverage (93.0 percent) and DNCC the lowest (67.1 percent).

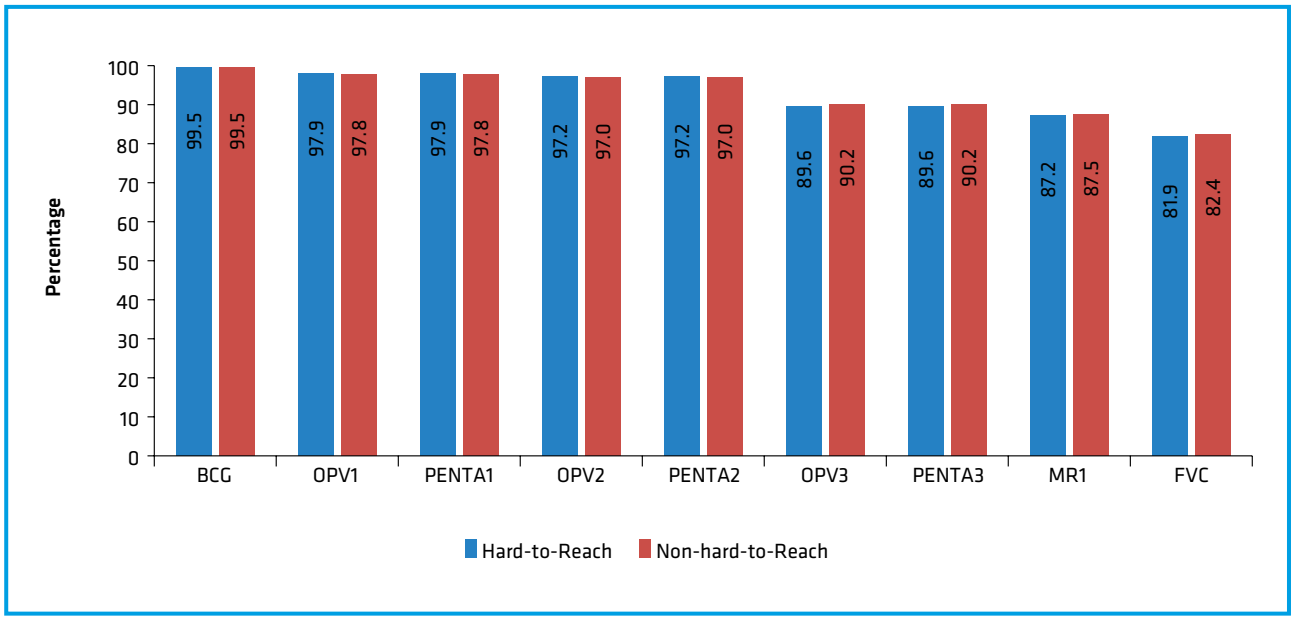
Figure 10a: Valid Full Vaccination Coverage by Age of 12 Months in Urban Areas by City Corporation and Municipality in 2016



3.3.9 Valid Vaccination Coverage by Hard-to Reach Areas

A hard-to-reach area was defined as an area where two or more hours is required to reach from the upazila headquarters. Figure 11 indicates that the vaccination coverage was 0.5 percentage point higher in non-hard-to-reach areas than that in hard-to-reach areas, which was true across all antigens except BCG.

Figure 11: Valid Vaccination Coverage by Age of 12 Months by Hard-to-Reach Area in 2016



3.3.10 Differential in Valid Vaccination Coverage by Age of 12 Months by Background Characteristics

Table 4 presents valid vaccination coverage by age of 12 months by background characteristics, such as gender and areas, which showed little variation, and the education of mothers and income of families, which had greater influences. There was a slight gender disparity, with valid vaccination coverage at 82.2 percent for males and 82.5 percent for females. As for residence, 6.4 percentage points difference was noticed between rural (83.5 percent) and urban (77.1 percent) areas.

However, regarding the educational attainment of mothers, valid vaccination coverage was higher among those children whose mothers had higher education. Coverage was considerably higher among children whose mothers had more than ten years of education (86.9 percent), as compared to those with five years (80.2 percent) and those with no education (76.0 percent). Beyond the graduate level, additional education actually resulted in a decrease in coverage 84.6 percent for a degree and 84.0 percent for a Masters.

In terms of income, a slight variation in valid full vaccination coverage was observed between the highest and the lowest income group. Valid full vaccination coverage was the highest in the highest income group (82.9 percent). And, the second lowest coverage (82.4 percent) was revealed in the middle income (income group of Tk. 5001-7000 per month). It gradually decreased as income decreased to 79.0 percent in the income group of Tk. 3001-5000 per month. The above findings suggest that lower income group people are almost parallel to the highest income group people as regards the vaccination of their children. It also refers to the efforts of Bangladesh EPI program to ensure equity.

Moreover, vaccination coverage was also assessed by wealth quintile, which was calculated by using a principal component analysis. Similar to the analysis by income, the vaccination coverage was slightly higher in the poorer wealth quintiles. The coverage was 80.4 percent in the richest wealth quintile, which was actually one percent lower than the fourth, 3.6 percentage points from middle, and 3.3 percentage points from second quintile. And, it was 1.2 percentage points lower from poorest quintile (81.6). Wealth analysis suggested that children belonged to poorer quintile was better off in terms full valid vaccination coverage compared to the richest quintile.

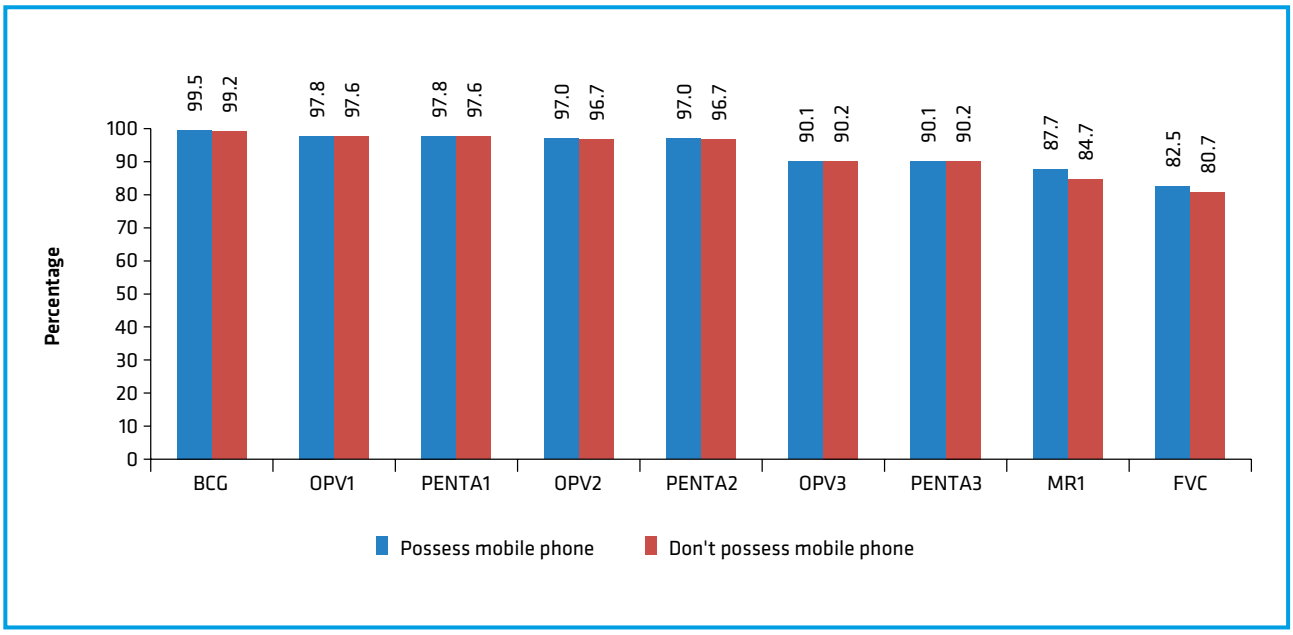
Table 4: Percentage Distribution of Children who received all Valid Vaccine by Age of 12 Months by Background Characteristics

	Valid Coverage									
Sex	**BCG**	**OPV1**	**PENTA1**	**OPV2**	**PENTA2**	**OPV3**	**PENTA3**	**MR1**	**FVC**	**Number**
Male	99.6	97.8	97.8	97.1	97.1	90.0	90.0	87.5	82.2	17039
Female	99.4	97.7	97.7	96.9	96.9	90.2	90.2	87.5	82.5	16208
Residence										
Urban	99.5	97.4	97.4	96.2	96.2	87.7	87.7	82.8	77.1	7940
Rural	99.5	97.9	97.9	97.2	97.2	90.6	90.6	88.5	83.5	25307
Education of mothers										
Illiterate	98.1	96.1	96.1	94.3	94.3	87.3	87.3	81.0	76.0	3152
Primary	99.4	97.4	97.4	96.3	96.3	89.0	89.0	85.3	80.2	9271
Secondary	99.7	98.1	98.1	97.5	97.5	91.2	91.2	89.0	84.2	14093
SSC/Dakhil/'O' Level	99.8	98.4	98.4	98.3	98.3	89.6	89.6	90.1	83.4	3362
HSC/Alim/'A' Level	99.9	98.7	98.7	98.5	98.5	92.5	92.5	91.8	86.9	2132
Degree/Fazil	100.0	98.4	98.4	98.2	98.2	90.8	90.8	91.1	84.6	703
Masters/Kamil	100.0	98.5	98.5	97.4	97.4	91.1	91.1	88.4	84.0	534
Monthly income										
Upto 3000	97.8	96.2	96.2	94.7	94.7	88.5	88.5	82.6	79.4	164
3001 – 5000	98.8	96.5	96.5	95.6	95.6	87.3	87.3	85.3	79.0	1009
5001 – 7000	99.1	97.7	97.7	97.1	97.1	89.6	89.6	87.3	82.4	2702
7001 - 10000	99.5	97.7	97.7	96.9	96.9	90.0	90.0	86.7	81.7	10711
10000+	99.6	97.9	97.9	97.1	97.1	90.3	90.3	88.1	82.9	18661
Wealth Quintiles										
Poorest	99.2	97.2	97.2	96.7	96.7	89.4	89.4	86.8	81.6	6820
Second	99.5	98.2	98.2	97.7	97.7	91.7	91.7	88.2	83.7	6802
Middle	99.6	97.7	97.7	96.7	96.7	90.5	90.5	89.1	84.0	6741
Fourth	99.6	97.9	97.9	96.9	96.9	90.0	90.0	86.6	81.6	6235
Richest	99.6	97.9	97.9	96.9	96.9	88.6	88.6	86.6	80.4	6649
Hard-to- Reach Area										
Yes	99.5	97.9	97.9	97.2	97.2	89.6	89.6	87.2	81.9	3834
No	99.5	97.8	97.8	97.0	97.0	90.2	90.2	87.5	82.4	29413
Ownership of Mobile Phone										
Yes	99.5	97.8	97.8	97.0	97.0	90.1	90.1	87.7	82.5	30851
No	99.2	97.6	97.6	96.7	96.7	90.2	90.2	84.7	80.7	2396
National	99.5	97.8	97.8	97.0	97.0	90.1	90.1	87.5	82.3	33247

3.3.11 Valid Vaccination Coverage by Age of 12 Months by the Ownership of Mobile Phones

In CES 2016, vaccination coverage was also analyzed by mobile phone ownership. A slight difference in coverage was noticed between those who owned mobile phones (82.5 percent) and those who did not (80.7 percent). As had been expected, the coverage of most of the antigens was also lower among those who did not have a mobile phone. The rate of difference varied from 0.3 percent for BCG coverage to 3.0 percent for MR1. Ownership of mobile ensures higher vaccination coverage due to easy access to mothers/caregivers to follow up and ensure subsequent doses. Thus, it reduced the rate of drop-outs as against those whose mothers/caregivers didn't own a mobile phone.

Figure 12: Valid Vaccination Coverage by Age of 12 Months by Ownership of Mobile Phone



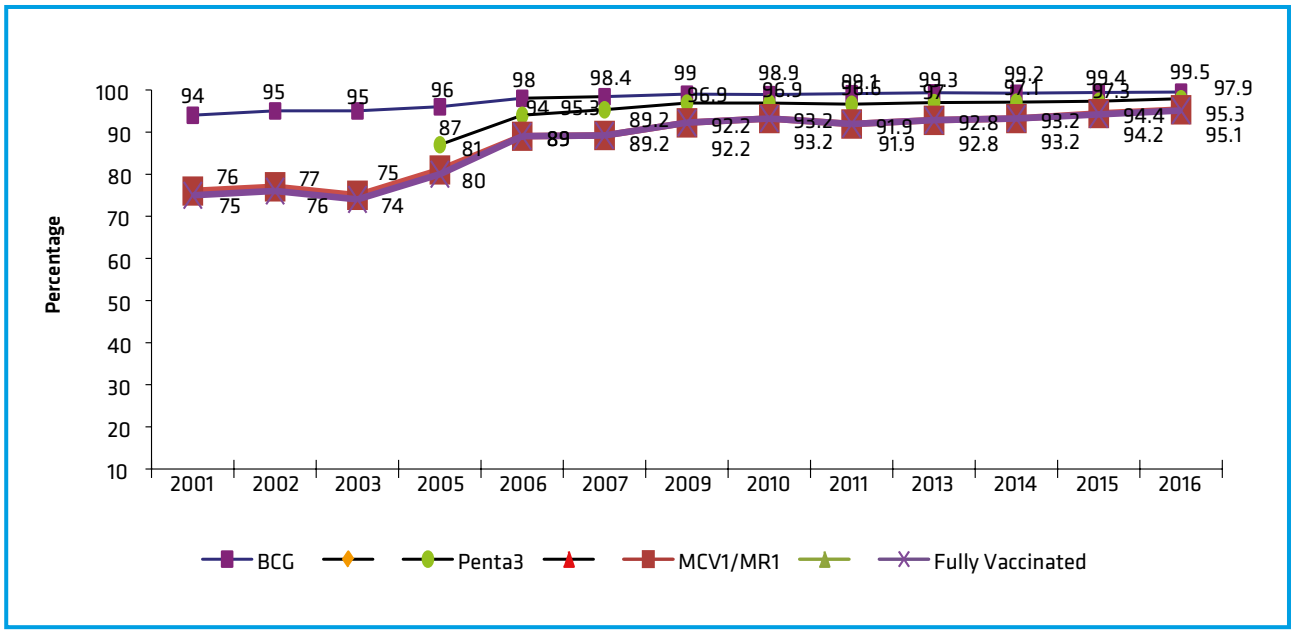
3.3.12 Trends in Coverage

Over the last two decades, enormous changes in terms of program implementation strategies and introduction of new vaccines have taken place in the EPI program. Those changes might act as an influencing factor to ascertain higher coverage. CES 2016 analyzed the trend in the coverage by using time series data produced in the previous CESs since 2001. A tremendous improvement in coverage with some fluctuations was observed over time. A detailed discussion of the trend in crude and valid coverages is given below.

Crude Coverage by Age of 23 Months

Figure 13 presents the trend in Crude Vaccination Coverage by age of 23 months over the last one and half decades-from 2001 to 2016. The figure indicates that crude coverage increased by 20 percentage points, beginning at 75.0 percent in 2001, with fluctuations as low as 74.0 percent in 2003. However, since 2003 the trend has been gradually increasing in coverage, with the exception of 2011, such that the rate had climbed to 94.2 percent in 2015 and 95.1 percent in 2016.

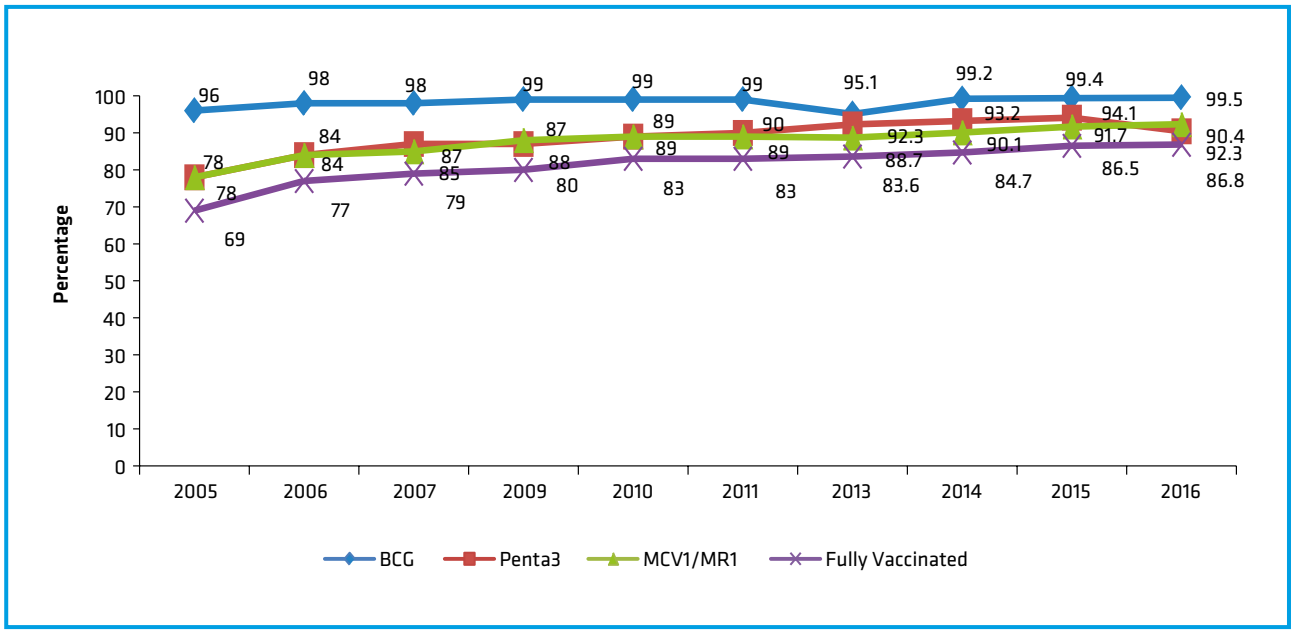
Figure 13: Annual Trend in National Crude Vaccination Coverage by Age of 23 Months from 2001 to 2016



Valid Coverage by Age of 23 Months

Figure 14 shows Valid Vaccination Coverage by age of 23 months since 2005, thus portraying a gradual improvement in valid vaccination coverage. Valid vaccination coverage increased by 17.8 percentage points- from 69.0 percent in 2005 to 86.8 percent in 2016.

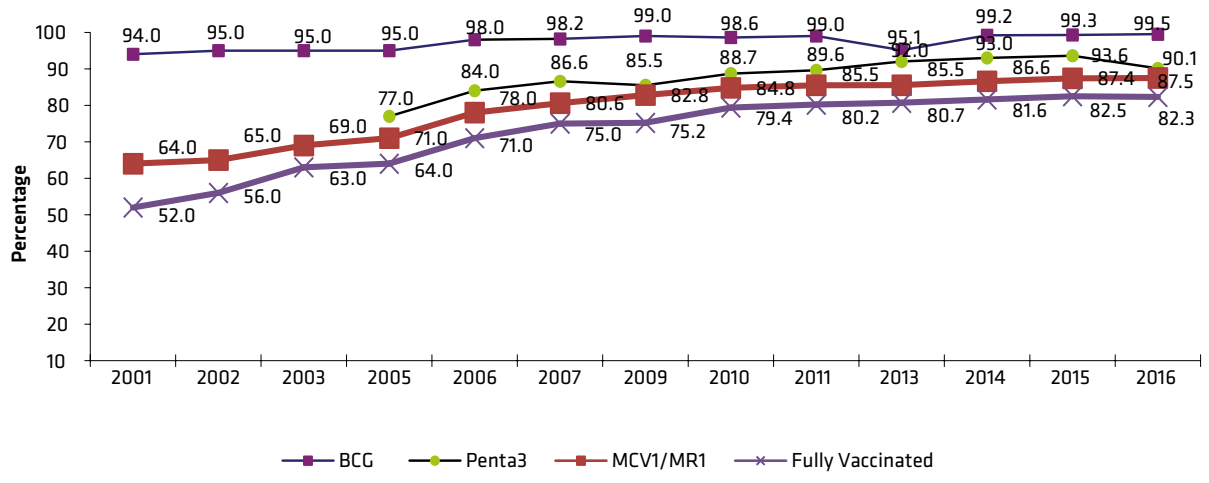
Figure 14: Annual Trend in National Valid Vaccination Coverage by Age of 23 Months from 2005 to 2016



Valid Coverage by Age of 12 Months

Improvement of valid coverage by age of 12 months is the ultimate goal of EPI. The programme has set a target of achieving 90.0 percent vaccination coverage nationally and at least 85.0 percent in each district Figure 15 indicates the increasing trend in the coverage from 2001 to 2016. A remarkable increase in vaccination coverage has occurred in the last 15 year. It increased upto 30.3 percentage points- from 52 percent in 2001 to 82.3 percent in 2016. The trend analysis indicates that gradual improvement in BCG, Penta3, and Measles/MR coverage attributed to the continuous improvement in the fully valid vaccination coverage.

Figure 15: Annual Trend in National Valid Vaccination Coverage by Age of 12 Months from 2001 to 2016



3.3.13 Trend in Vaccination Coverage by Division

An analysis of the divisional trends will help district and divisional health managers understand the performances in vaccination coverage over time in their respective divisions. Similar to the trends in the national coverage, trends in the divisional coverage are discussed below. For each division, three figures are presented: the first depicts crude coverage, the second valid coverage by age of 23 months, and the third shows valid coverage by age of 12 months.

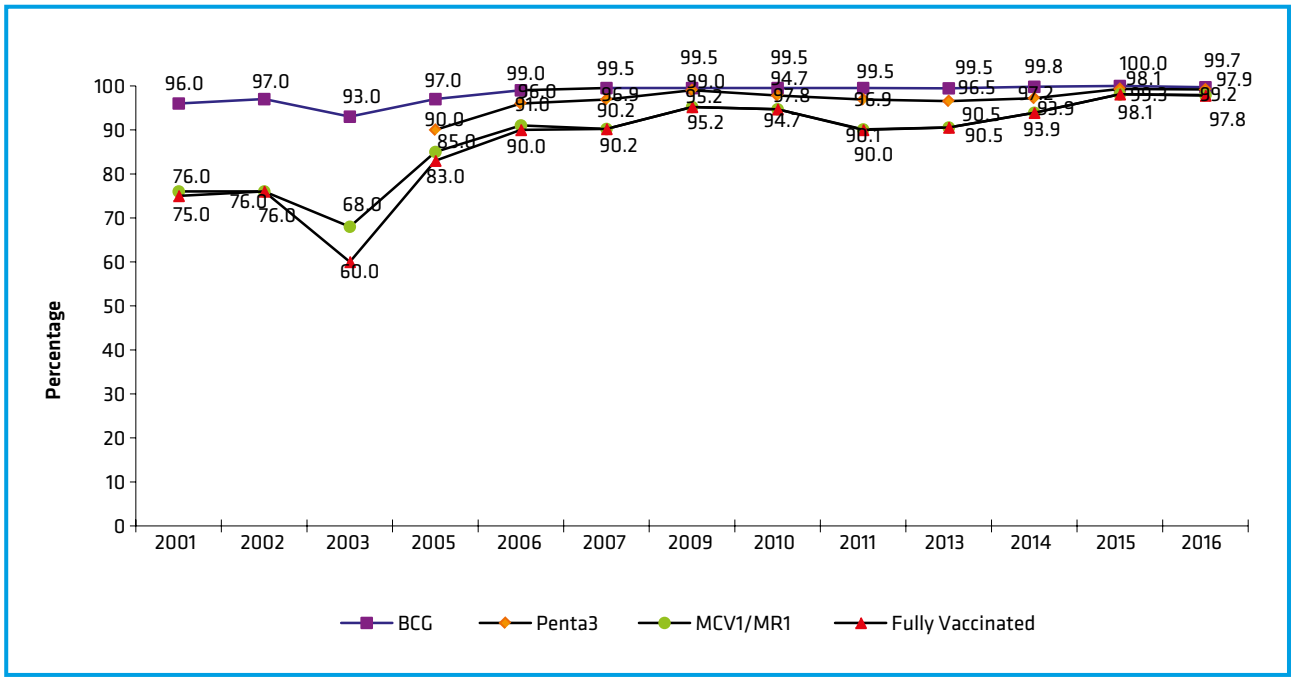
Barisal Division

Crude coverage in Barisal division was found to fluctuate widely between 2001 and 2003, as shown in Figure 16. Crude coverage declined from 75.0 percent in 2001 to 60.0 percent in 2003. A substantial improvement in crude coverage was noticed between 2003 and 2005, when it rose 23 percentage points to 83.0 percent. Since then, an uninterrupted increase with some fluctuation in the coverage resulted in a rate of 97.8 percent in 2016.

Valid coverage by age of 23 months, as shown in Figure 17, also had a significant increase, of 21 percent with some fluctuations, since 2005. In just the period between CES 2015 and CES 2016, valid coverage increased by 1.9 percentage points.

The trend in the valid coverage by age of 12 months, as is presented in Figure 18, was similar to that for crude vaccination coverage, in that it fluctuated considerably between 2001 and 2003, but has steadily increased since then. After a jump from 50.0 percent in 2003 to 67.0 percent in 2005, coverage steadily rose another 20.5 percentage points to 87.5 percent in 2016.

Figure 16: Annual Trend in Crude Vaccination Coverage by Age of 23 Months in Barisal Division from 2001 to 2016



MCV1 replaced with MR1 vaccination after introduction in 2012

Figure 17: Annual Trend in Valid Vaccination Coverage by Age of 23 Months in Barisal Division from 2005 to 2016

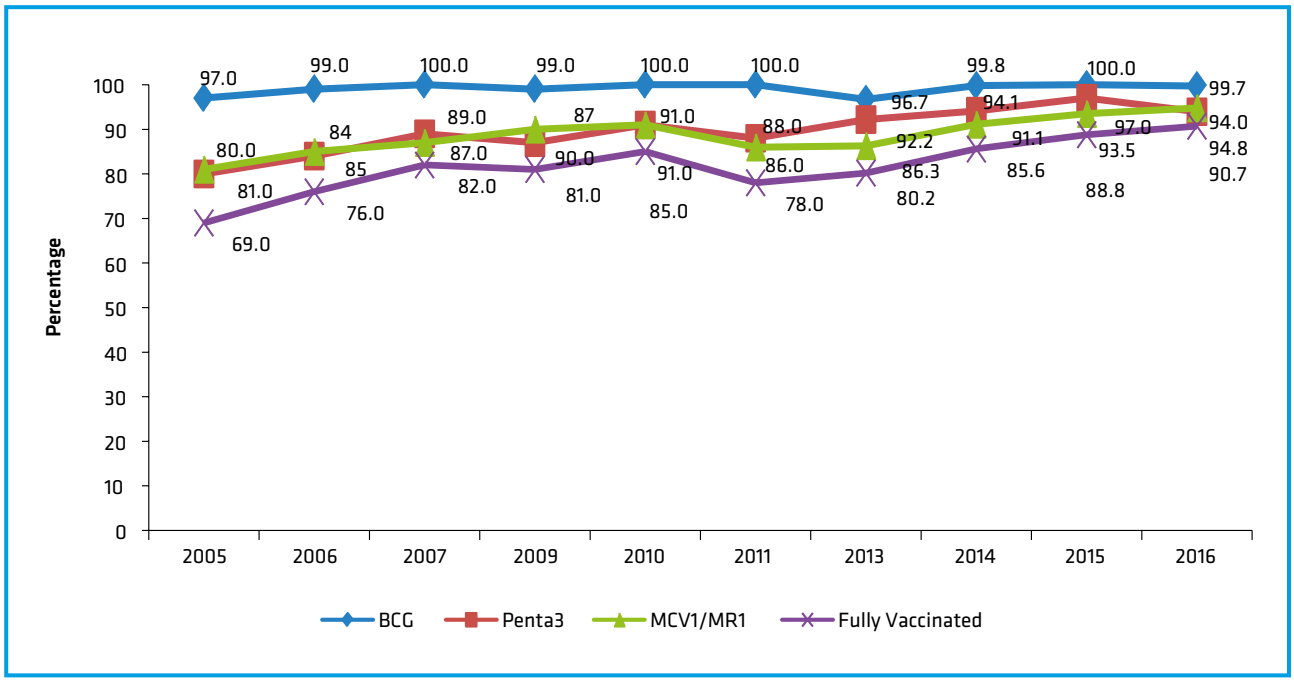
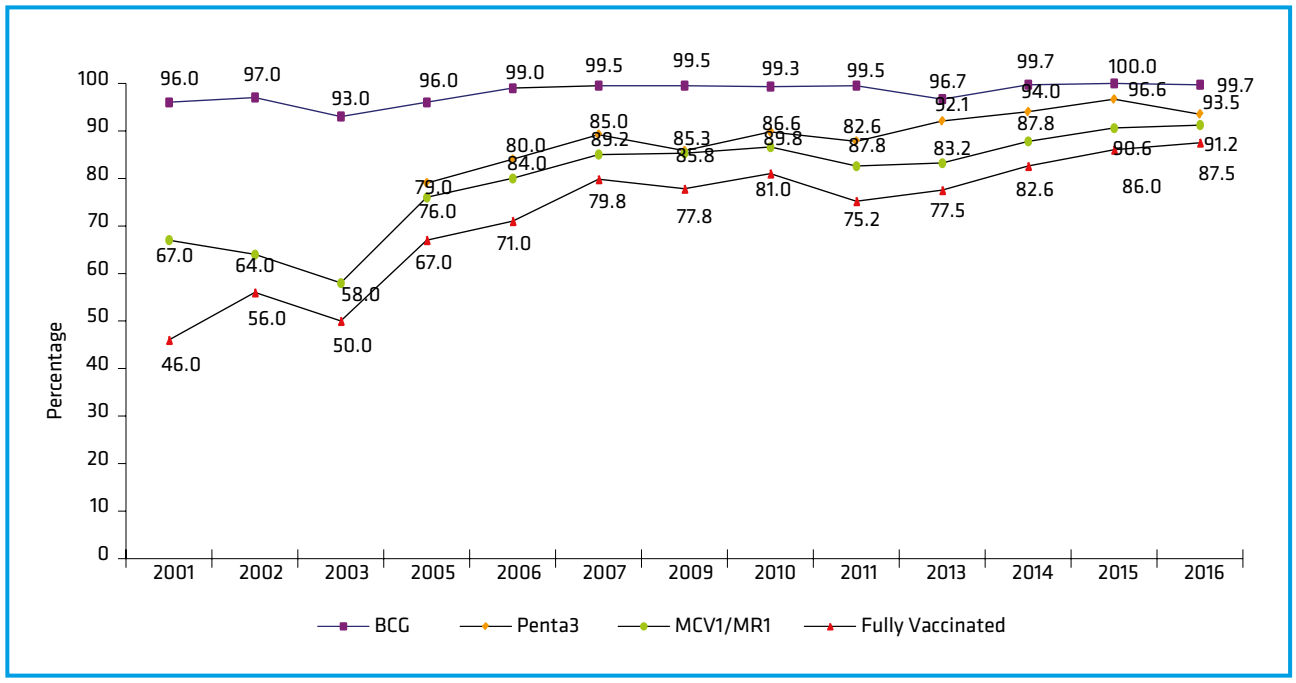


Figure 18: Annual Trend in Valid Vaccination Coverage by Age of 12 Months in Barisal Division from 2001 to 2016



Chittagong Division

The trend in crude vaccination coverage in Chittagong division is presented in Figure 19, which indicates a sharp 9 percentage point increase in coverage between the years 2001 and 2002- from 67.0 percent to 76.0 percent. After a considerable decline, it reached 71.0 percent in 2003. Since then, the trend has been towards a substantial, almost uninterrupted, improvement with crude coverage increasing another 25.7 percentage points to 96.7 percent in 2016; and, it increased by 3.1-percentage point between CES 2015 and CES 2016.

Figure 20 presents valid coverage by age of 23 months as having increased by 22.8 percentage points, with some fluctuations, in the last decade. Having started at 65.0 percent in 2005, the rate increased upto 87.8 percent in 2016, with a slight decrease just between CES 2009 and CES 2010.

While sharing the same 2001 to 2003 sharp increase that was seen in the 23 months crude vaccination coverage, valid coverage by age of 12 months has also increased considerably since then. Just between 2001 and 2016, it Increased by 36.5 percentage points- from 47.0 percent to 83.5 percent in 2016 (see Figure 21).

Figure 19: Annual Trend in Crude Vaccination Coverage by Age of 23 Months in Chittagong Division from 2001 to 2016

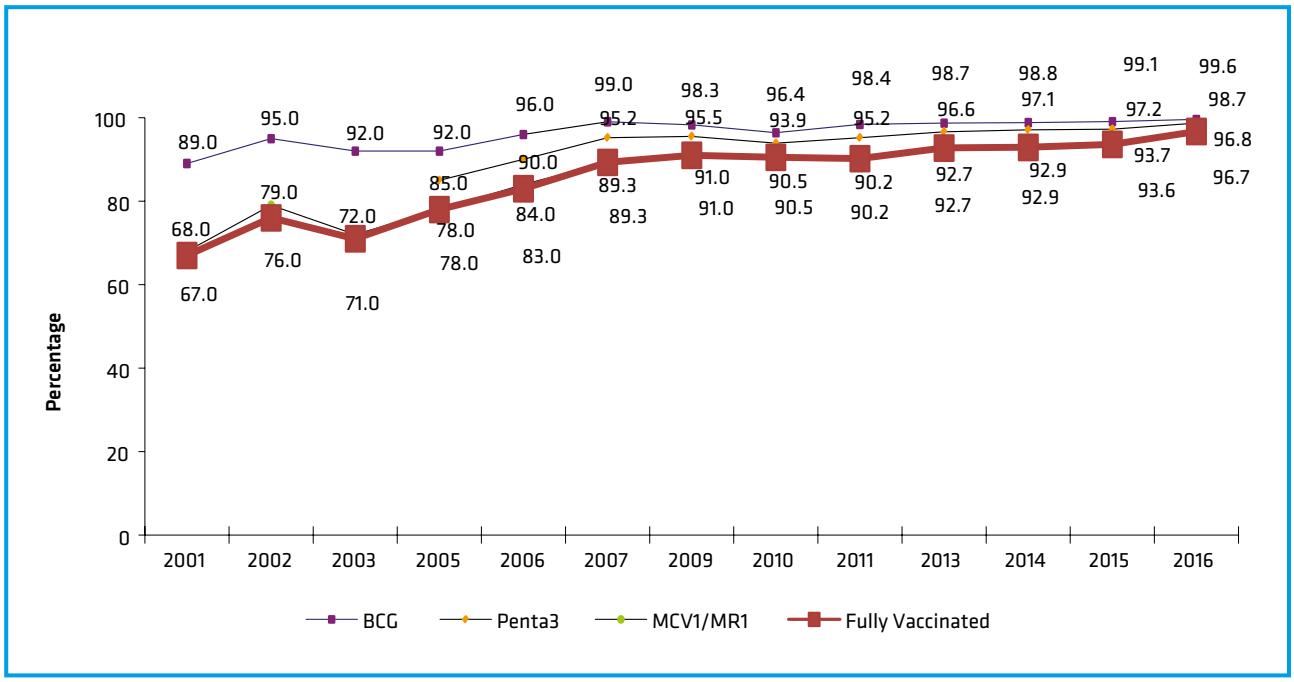


Figure 20: Annual Trend in Valid Vaccination Coverage by Age of 23 Months in Chittagong Division from 2005 to 2016

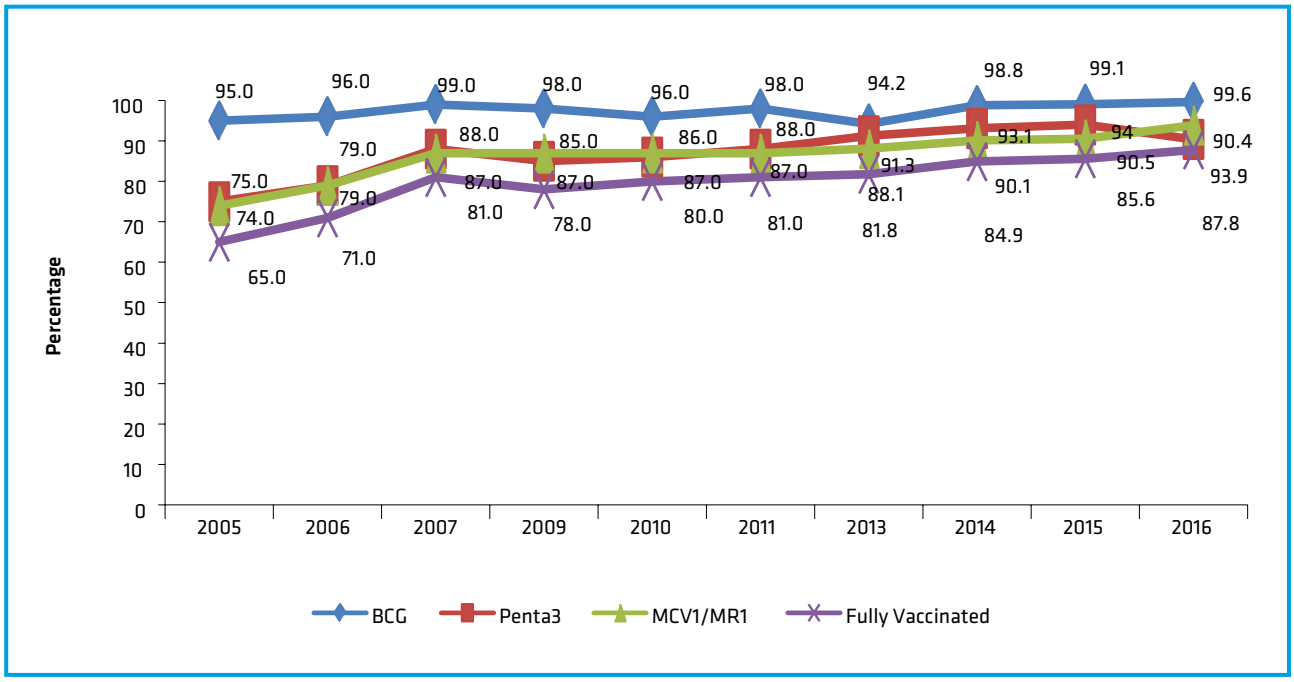
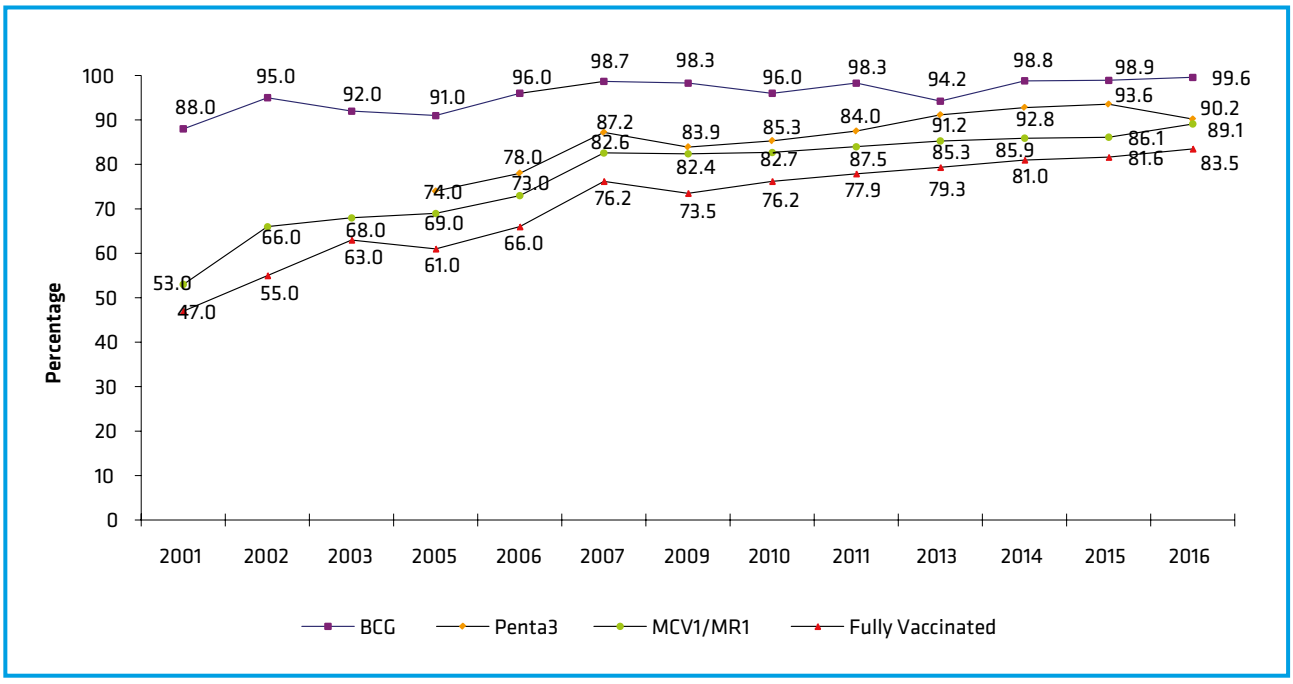


Figure 21: Annual Trend in Valid Vaccination Coverage by Age of 12 Months in Chittagong Division from 2001 to 2016



Dhaka Division

Dhaka division's fluctuations in crude vaccination coverage were not as wide as in the case in Barisal and Chittagong; but, in common with them, coverage began to climb after 2003. Dhaka experienced a steep 19.0 percent increase in the rate to 90.0 percent in 2006 (see Figure 22). From 2006 to 2016, coverage remained almost constant at 90.0 percent to 93.2 percent.

It is evident from Figure 23 that the valid coverage by age of 23 months substantially increased during the last decade – from 63.0 percent in 2005 to 82.9 percent in 2014 – and, it remained almost static between CES 2013 (82.7) and CES 2014 (82.9 percent). However, coverage increased upto 85.4 percent in 2015. And, again it decreased to 84.0 percent in 2016.

For valid vaccination coverage by age of 12 months, the rate has increased one-quarter since 2001, from 57.0 percent in 2001 to 81.1 percent in 2015 (see Figure 24). Following the greatest increase between 2002 and 2006, from 52.0 percent to 72.0 percent, the rate of increase slowed, with only a 1.7 percent rise between CES 2014 and CES 2015, and stayed on an upward path. However, it again decreased to 77.9 in CES 2016.

Figure 22: Annual Trend in Crude Full Vaccination Coverage by Age of 23 Months in Dhaka Division from 2001 to 2016

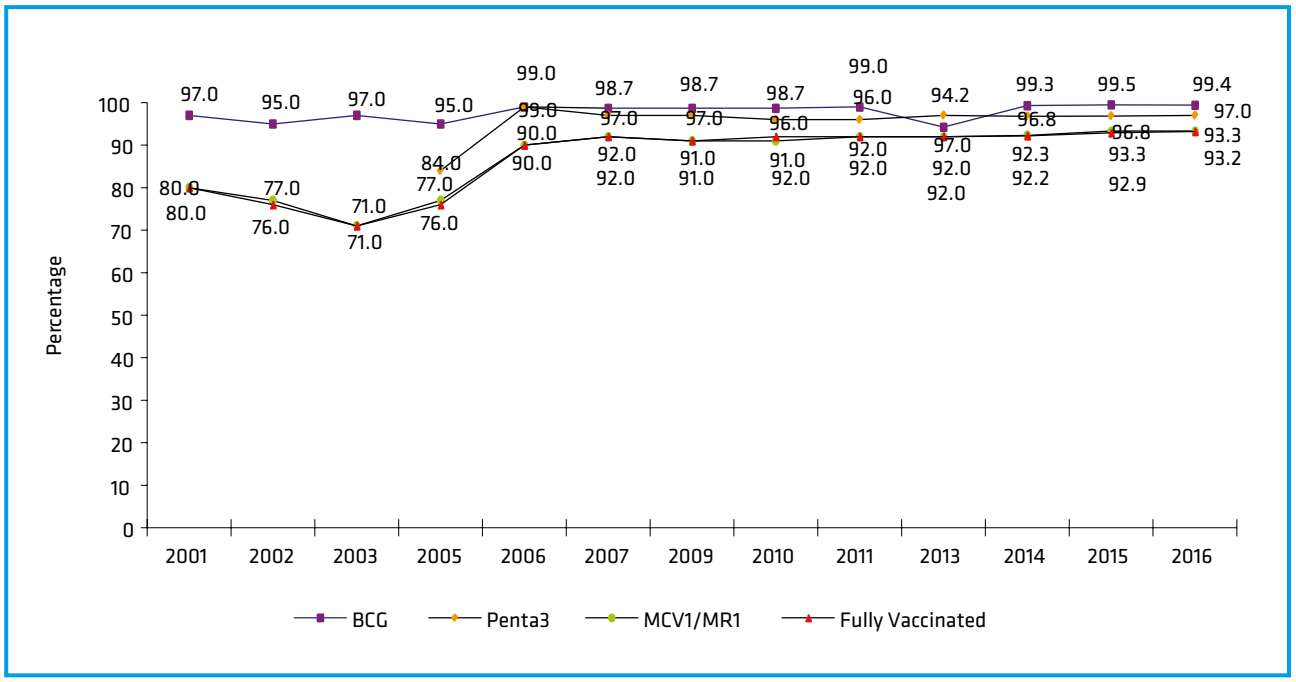


Figure 23: Annual Trend in Valid Vaccination Coverage by Age of 23 Months in Dhaka Division from 2005 to 2016

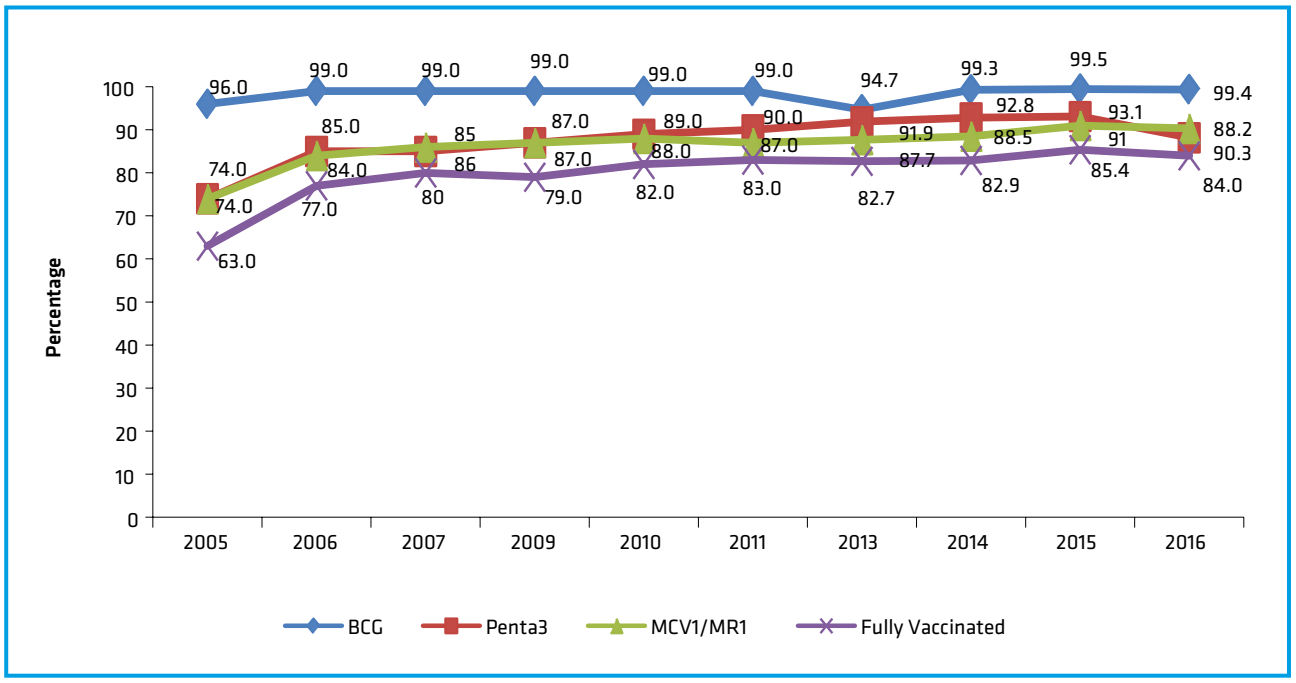
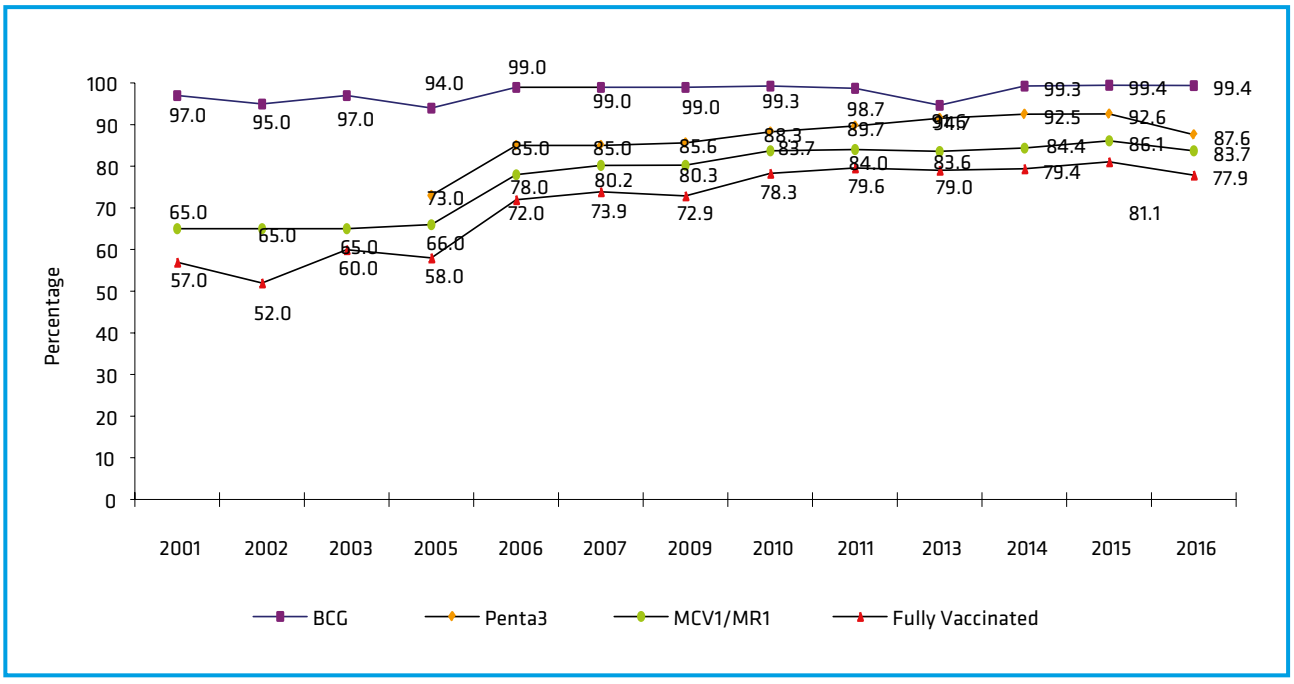


Figure 24: Annual Trend in Valid Vaccination Coverage by Age of 12 Months in Dhaka Division from 2001 to 2016



Khulna Division

Of the five divisions that have records upto 2001, Khulna division has had the flattest rise in coverage figures, having started at the highest percentage for crude vaccination coverage, 86.0 percent in 2001 (see Figure 25). While the division shared with others a drop and then fluctuations of the early years, it also stabilized earlier, in 2001, when the rate was 86.0 percent and then generally rose until 2011, when it reached 94.4 percent. Since then, it has declined slightly in CES 2013 and CES 2014, but increased upto 95.2 percent in 2015. And, again it increased to 95.7 percent in CES 2016.

Figure 26 presents valid vaccination coverage by age of 23 months since 2005. The figure indicates that it increased by 12 percentage points- from 75.0 percent in 2005 to 87.1 percent in 2013. Showing a similar trend as the crude coverage, the valid vaccination coverage decreased by about 2 percentage points between the CES 2013 and CES 2014- from 87.1 percent to 85.3 percent. It again increased to 87.2 percent in 2015. Between CES 2015 and 2016, coverage increased by 1 percentage point.

Figure 27 illustrates the trend in valid coverage by age of 12 months. It shows a slow increase in coverage between 2001 and 2006- from 65.0 percent to 77.0 percent. After some fluctuations, coverage rose to 72.2 percent in 2007 and since then there was a continuous improvement in coverage to 2013, when it was 84.8 percent. Coverage again dropped in 2014- to 81.9 percent-; and, further rose to 83.6 percent in 2015 and 84.5 percent in 2016.

Figure 25: Annual Trend in Crude Vaccination Coverage by Age of 23 Months in Khulna Division from 2001 to 2016

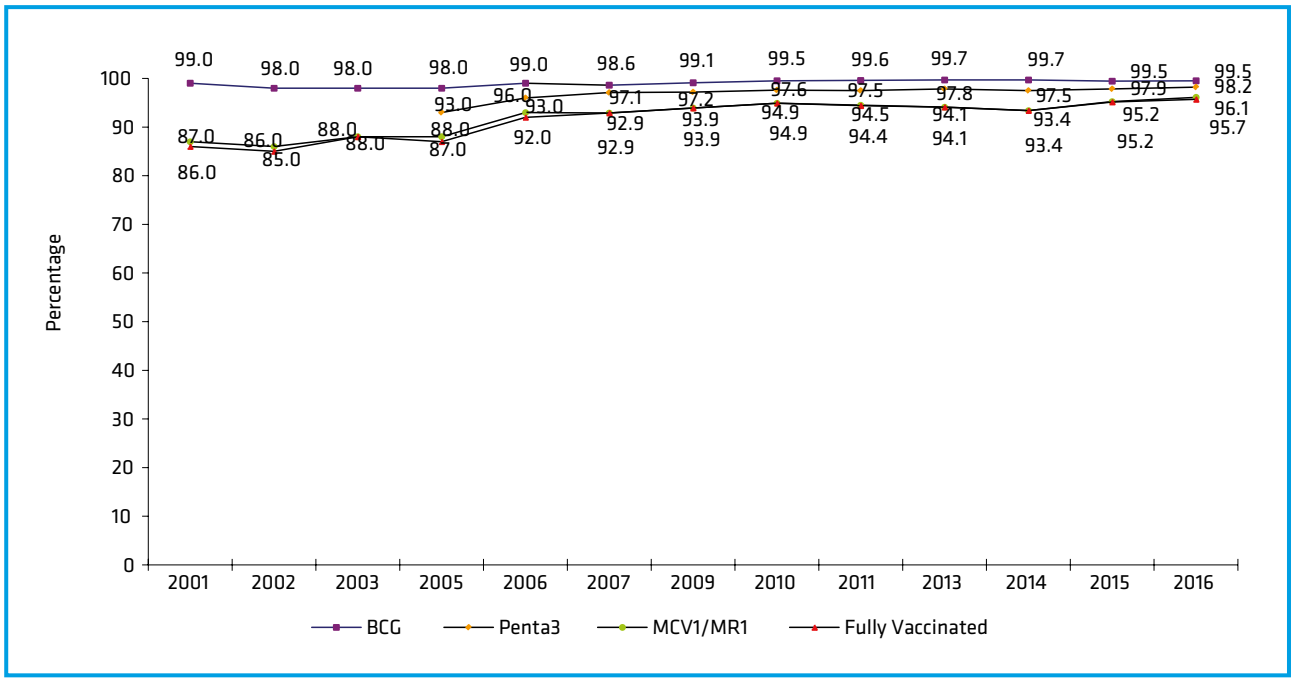


Figure26: Annual Trend in Valid Vaccination Coverage by Age of 23 Months in Khulna Division from 2005 to 2016

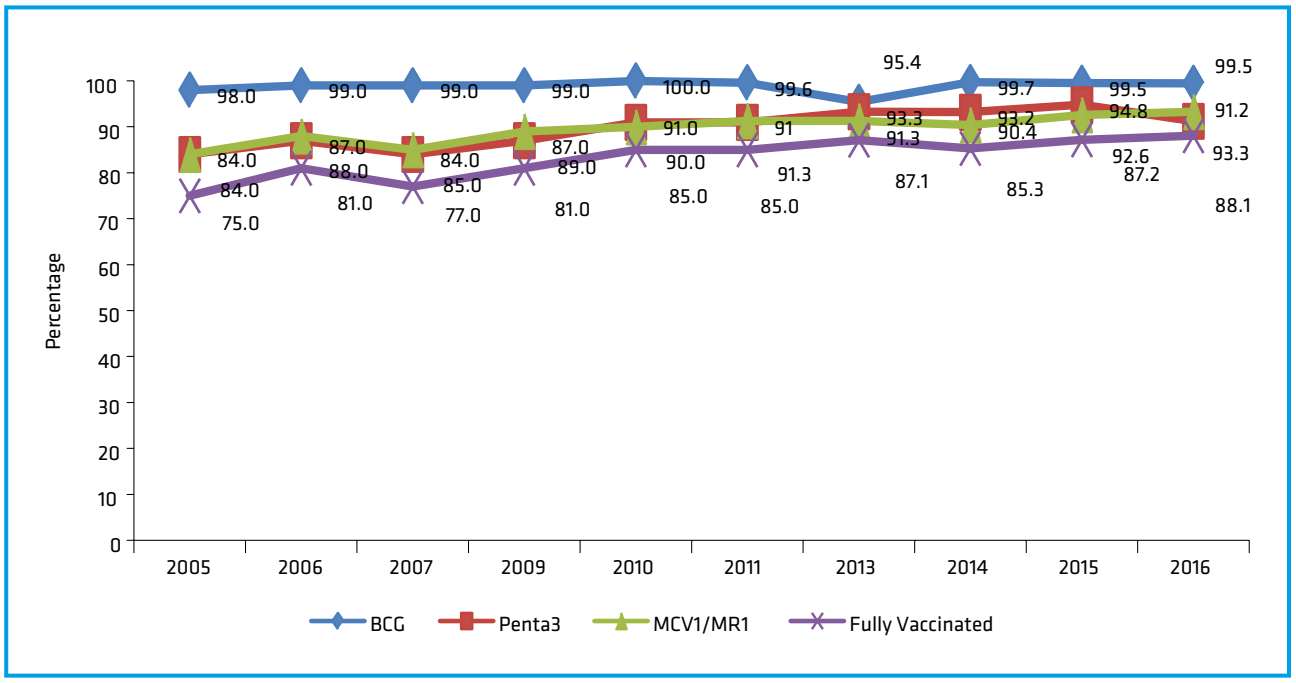
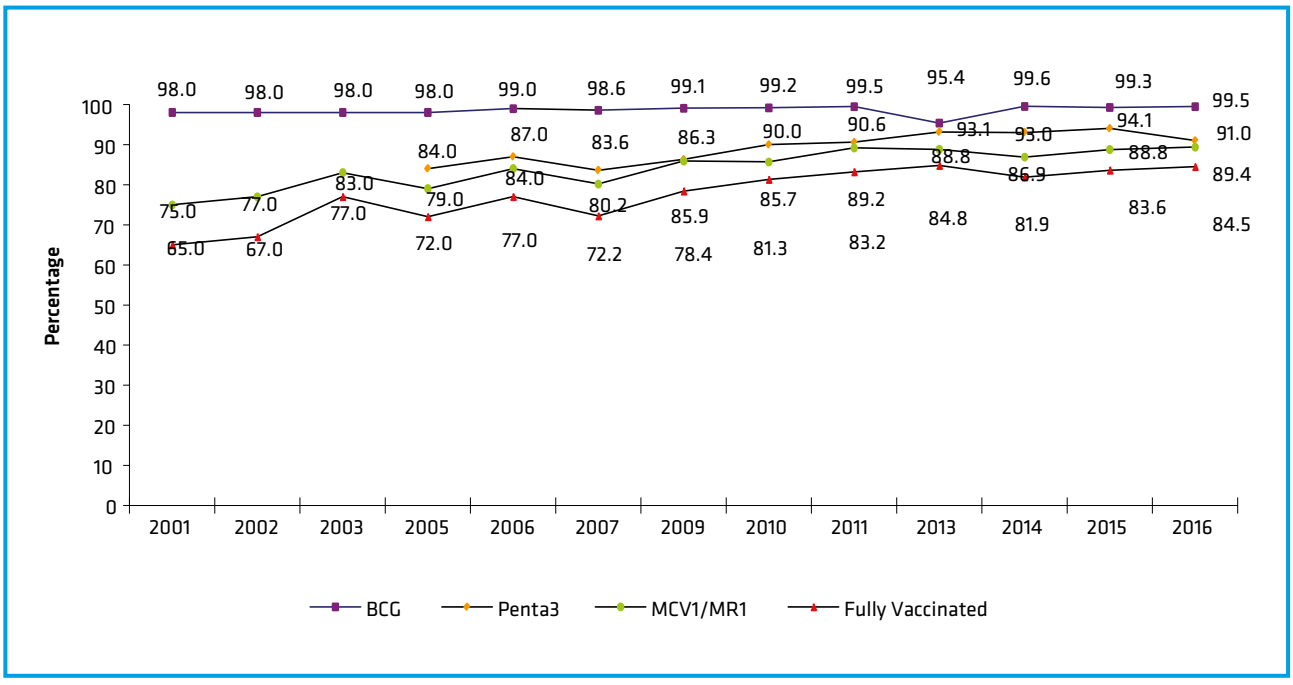


Figure 27: Annual Trend Valid Vaccination Coverage by Age 12 Months in Khulna Division from 2001 to 2016



Rajshahi Division

The trend in crude vaccination coverage by age of 23 months in Rajshahi division since 2001 follows much the same pattern as in other divisions. The coverage in Rajshahi division was fluctuating between 2001 and 2003 (see Figure 28). The most considerable jump was between 2003 and 2006, when the rate increased by 16 percentage points to 91.0 percent. This rapid jump contributed to Rajshahi's attainment of the status of the highest performing division in Bangladesh. Since 2007, crude coverage remained almost static, ranging from 93.9 percent to 96.1 percent; between 2013 and 2014, the rate increased by 1.6 percentage points to 96.8 percent. Further, drop in coverage was noticed in 2015 (96.8 percent in 2014 to 94.9 percent in 2015). However, it again rose to 95.8 percent in CES 2016.

The trend of valid vaccination coverage by age of 23 months, presented in Figure 29, shows that the rate fluctuated with almost each CES, beginning at 72.0 percent in 2005 and reaching a high of 88.8 percent in 2014. Although fluctuation from one CES to another CES, the overall trend has been up, including between 2013 and 2014, when the rate increased 2 percentage points. Coverage again climbed to 89.2 percent in 2015 and slightly decreased to 88.5 percent in 2016.

Figure 30 shows that valid coverage by age of 12 months quite steadily increased from 54.0 percent in 2001 to 64.0 percent in 2003 in Rajshahi division. Since then there was an almost continuous improvement, increasing by 32 percentage points to 87.0 percent in 2014. A sudden decreasing trend in valid coverage in Rajshahi division was observed since 2014. Among the latest three surveys (CES 2014, CES 2015, and CES 2016), valid vaccination coverage decreased by 2.1 percentage points (87.1 percent in 2014, 86.1 percent in 2015 and 84.9 percent in 2016).

Figure 28: Annual Trend in Crude Vaccination Coverage by Age of 23 Months in Rajshahi Division from 2001 to 2016

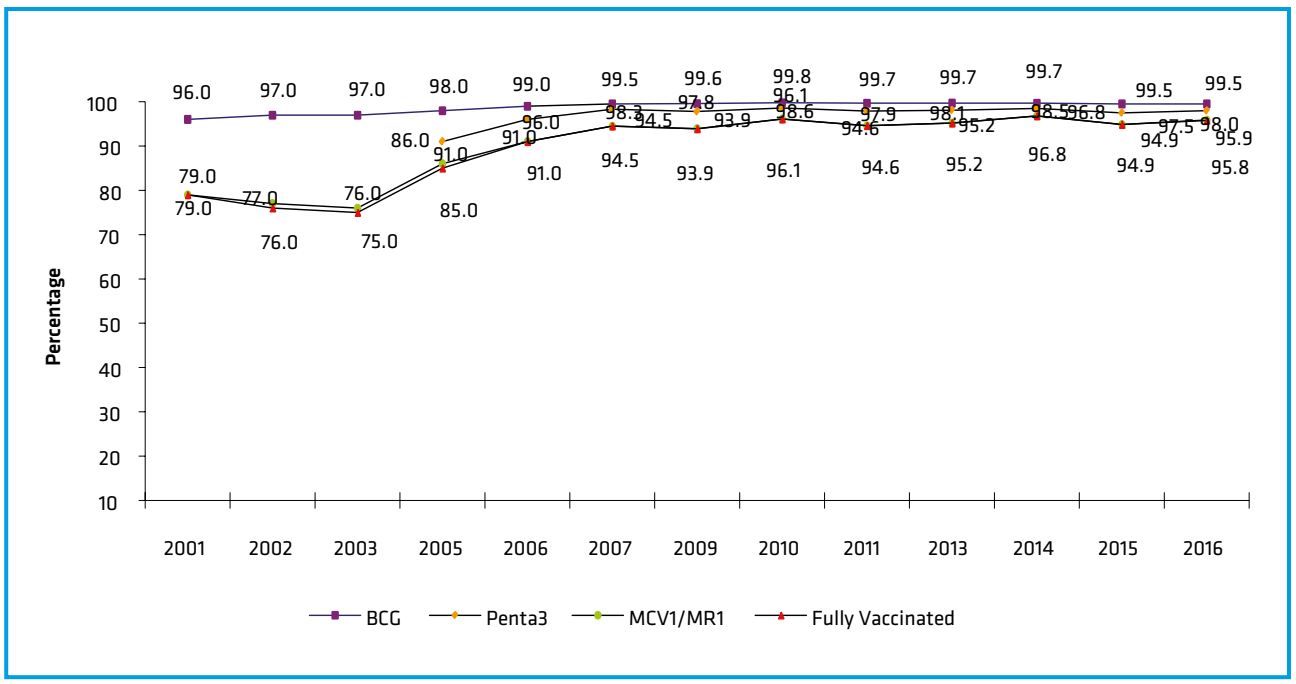


Figure 29: Annual Trend in Valid Vaccination Coverage by Age of 23 Months in Rajshahi Division from 2005 to 2016

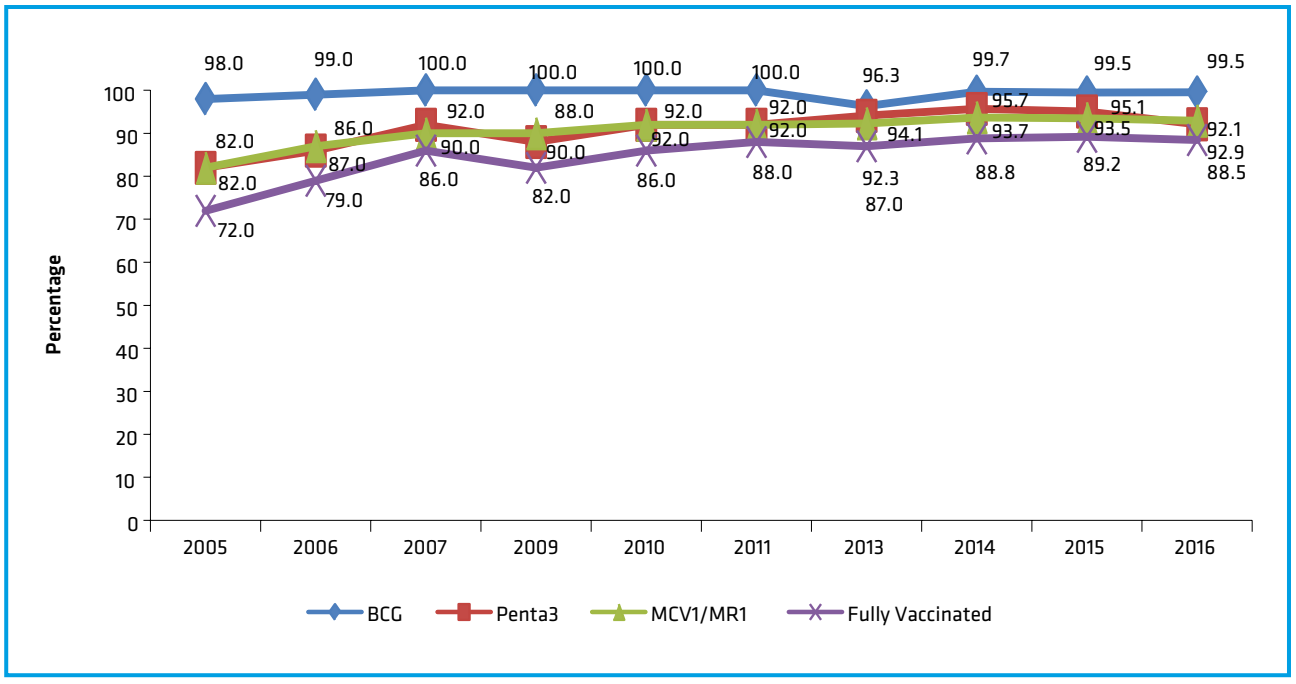
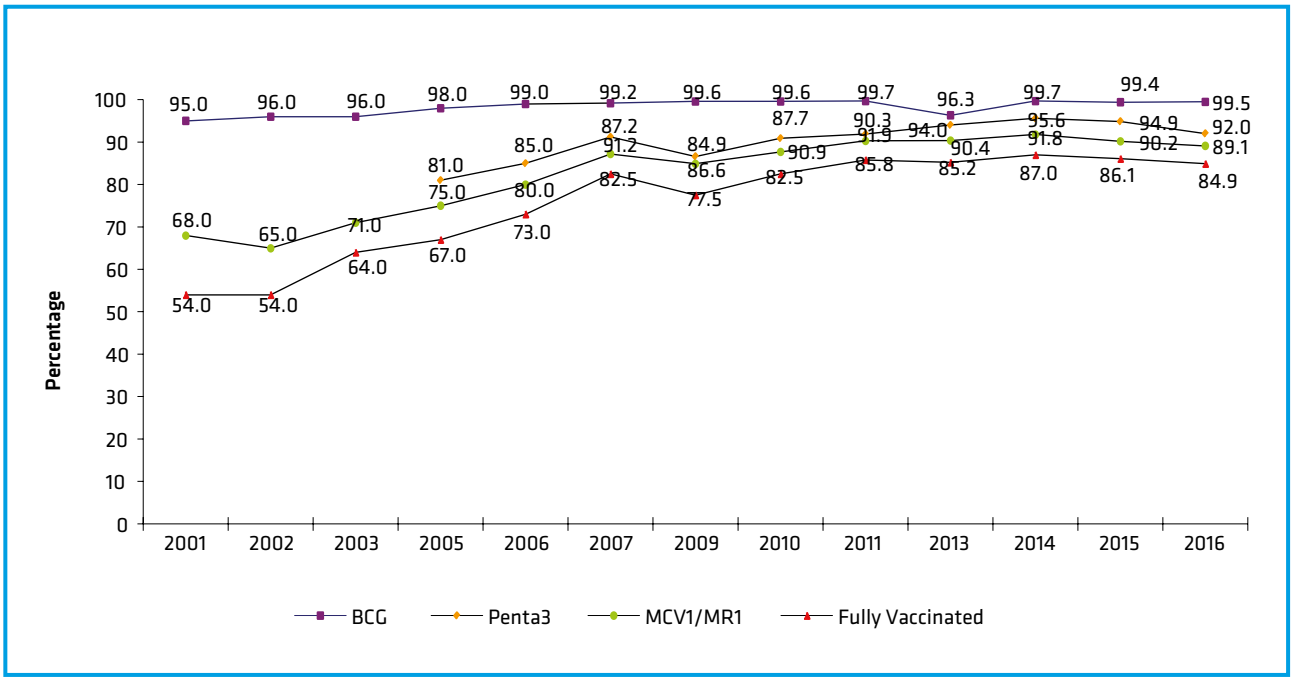


Figure 30: Annual Trend in Valid Vaccination Coverage by Age of 12 Months in Rajshahi Division from 2001 to 2016



Rangpur Division

As an independent administrative division, Rangpur emerged in 2010. Therefore, the trend in Rangpur division, as shown in Figure 31, describes vaccination coverage only since 2010. Crude vaccination coverage was 95.0 percent in 2010; it decreased to 92.0 percent in 2011, and rose again to 96.5 percent in 2015; and experienced slight decrease in 95.5 percent in 2016.

As regards valid vaccination coverage by age of 23 months, it was found to be almost static during the years 2010 to 2014. Valid vaccination coverage has risen slightly- from 86.0 percent in 2010 to 89.2 percent in 2015 (see Figure 32). And, again it fell down to 87.2 percent in 2016.

The valid coverage by age of 12 months trend was similar to the trend of valid coverage by age of 23 months. Both coverages were found to be increasing at a slow pace, with valid coverage up from 78.0 percent in 2010 to 81.5 percent in 2014; and, it remained unchanged between the 2013 and 2014 CESs (see Figure 33). However, it increased to 84.9 percent in 2015 and again decreased to 82.5 in CES 2016.

Figure 31: Annual Trend in Crude Vaccination Coverage by Age of 23 Months in Rangpur Division* from 2010 to 2016

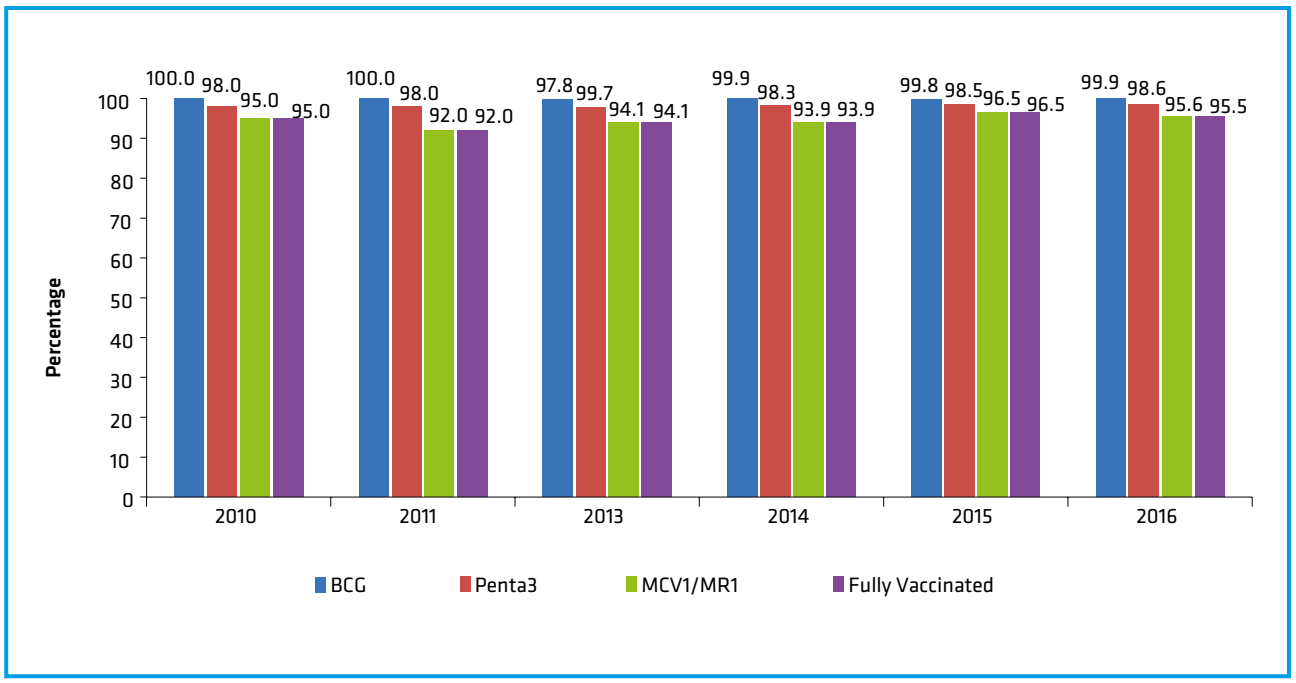


Figure 32: Annual Trend in Valid Vaccination Coverage by Age of 23 Months in Rangpur Division* from 2010 to 2016

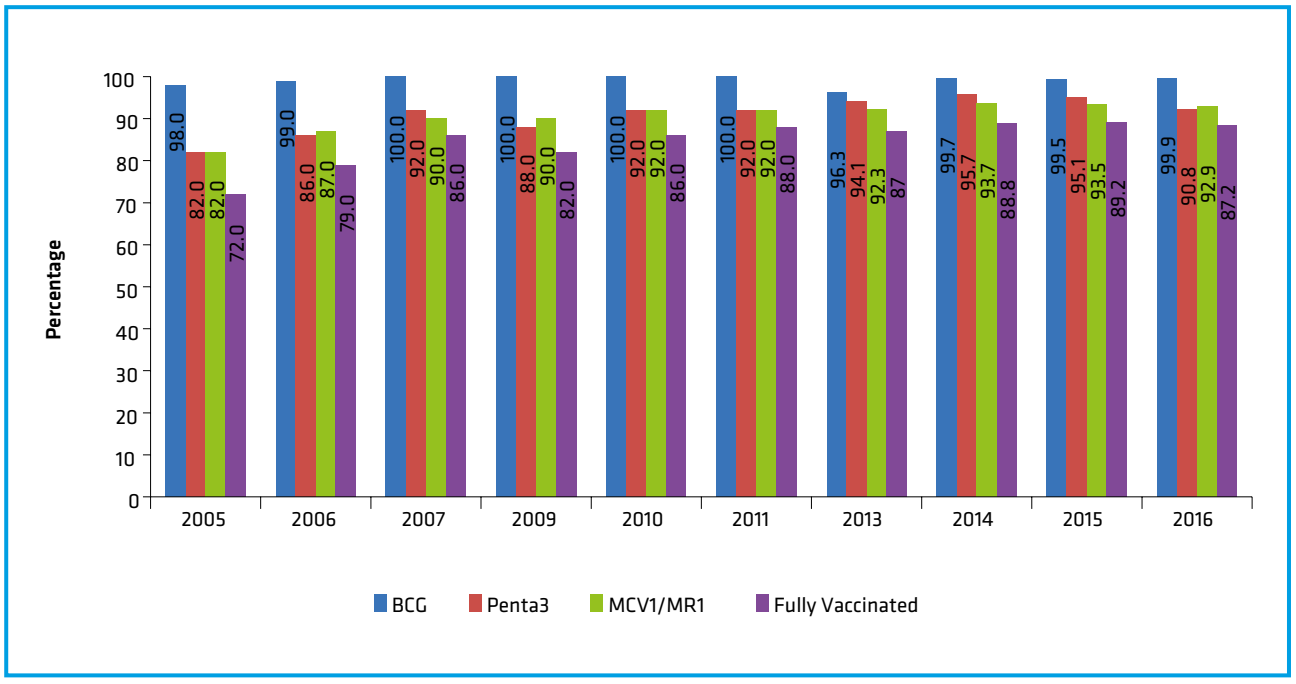
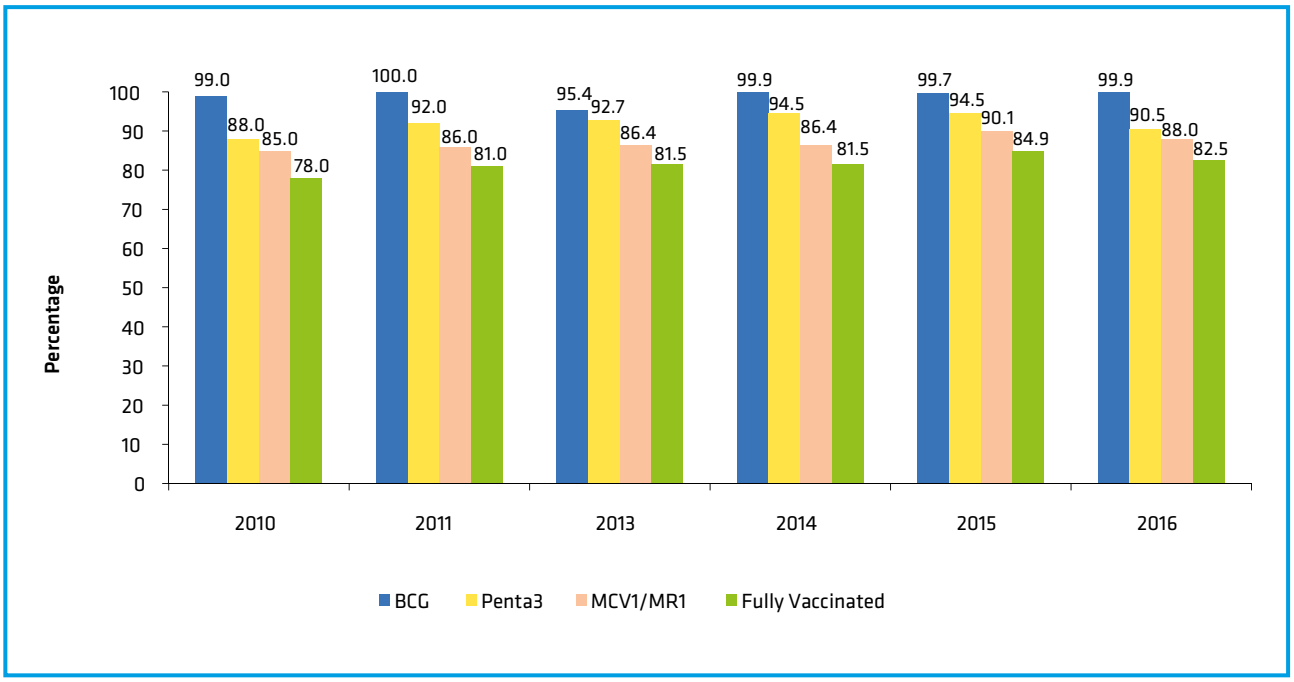


Figure 33: Annual trend in Valid Vaccination Coverage by Age of 12 Months in Rangpur Division* from 2010 to 2016



** Rangpur division was included in Rajshahi division till 2009*

Sylhet Division

Like Rangpur division, Sylhet division is rather a new division, having been part of Chittagong division until 1998. Consequently, Figure 34, illustrating crude coverage in Sylhet division by age of 23 months, presented since 2001, when the crude coverage rate was 42.0 percent. But after that, coverage has for the most part continually increased to 92.1 percent in 2013. Between 2013 and 2014, the rate dropped three and a half points, to 88.6 percent. And, again it increased to 92.1 percent in 2015 and 93.1 percent in 2016.

As for valid vaccination coverage by age of 23 months, this trend is similar to that of crude coverage: an uninterrupted but substantial increase in coverage from 2005 to 2013 (see Figure 35). Valid coverage increased by 24 percentage points- from 59.0 percent in 2005 to 83.4 percent in 2013. However, a slight decrease in coverage was observed in 2014. It again increased from 82.1 percent in 2014 to 82.5 percent in 2015 and 84.8 percent in 2016.

Similarly, Figure 36 shows that valid coverage by age of 12 months increased, following the same trend as valid coverage by age of 23 months, between the periods 2001-2003 and 2005-2014. Valid coverage by age of 12 months increased from 23.0 percent in 2001 to 42.0 percent in 2003, with fluctuations, followed by a continuous improvement during the years 2003-2013. Valid coverage increased by 39 percentage points, from 42.0 percent in 2003 to 80.7 percent in 2013. However, in 2014 it decreased by 2 percentage points- from 80.7 percent in 2013 to 78.6 percent. A similar decreasing trend was observed in 2015. Valid coverage decreased to 76.9 percent in 2015. After three years, continuous decreasing trend in valid coverage, it rose by 2.3 percentage points in CES 2016 (76.9 percent in 2015 and 79.2 percent in 2016).

Figure 34: Annual Trend in Crude Vaccination Coverage by Age of 23 Months in Sylhet Division from 2001 to 2016

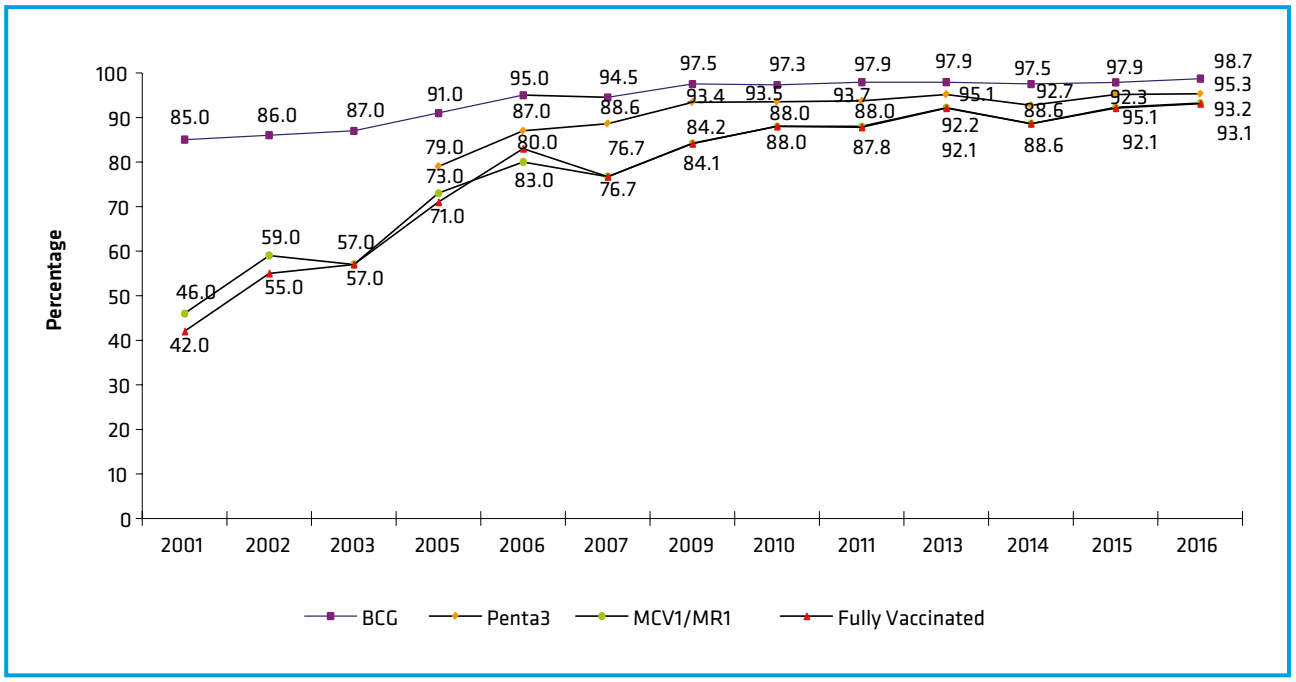


Figure 35: Annual Trend in Valid Vaccination Coverage by Age of 23 Months in Sylhet Division from 2005 to 2016

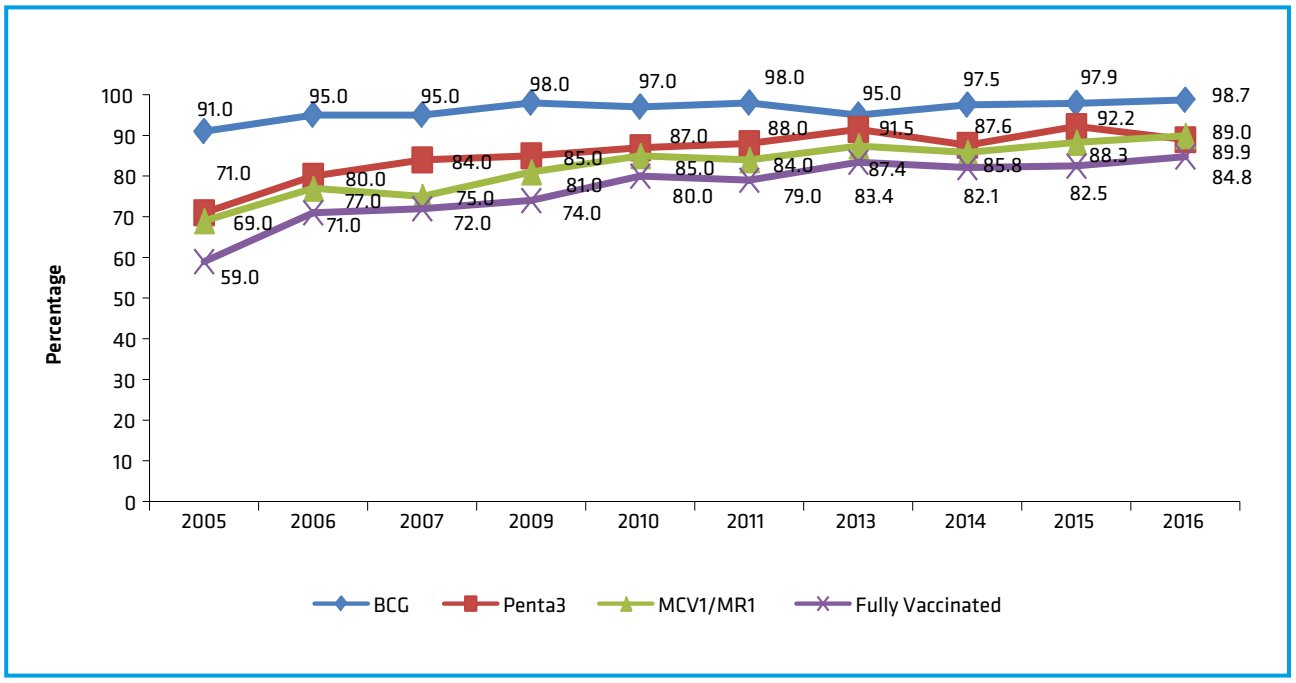
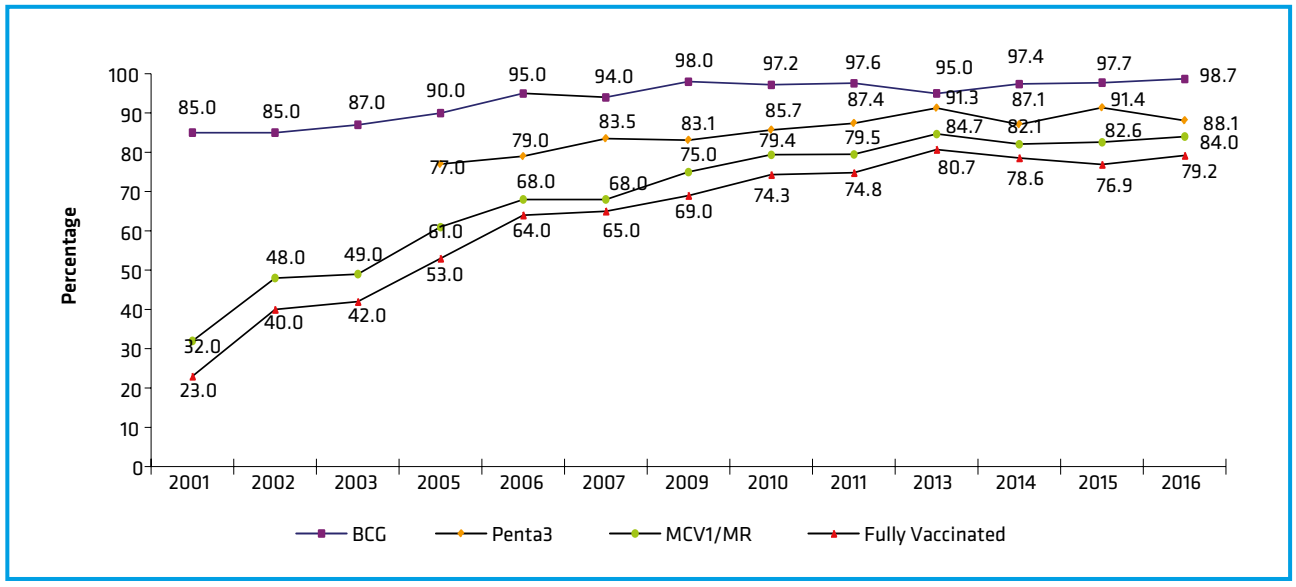


Figure 36: Annual Trend in Valid Vaccination Coverage by Age of 12 Months in Sylhet Division from 2001 to 2016



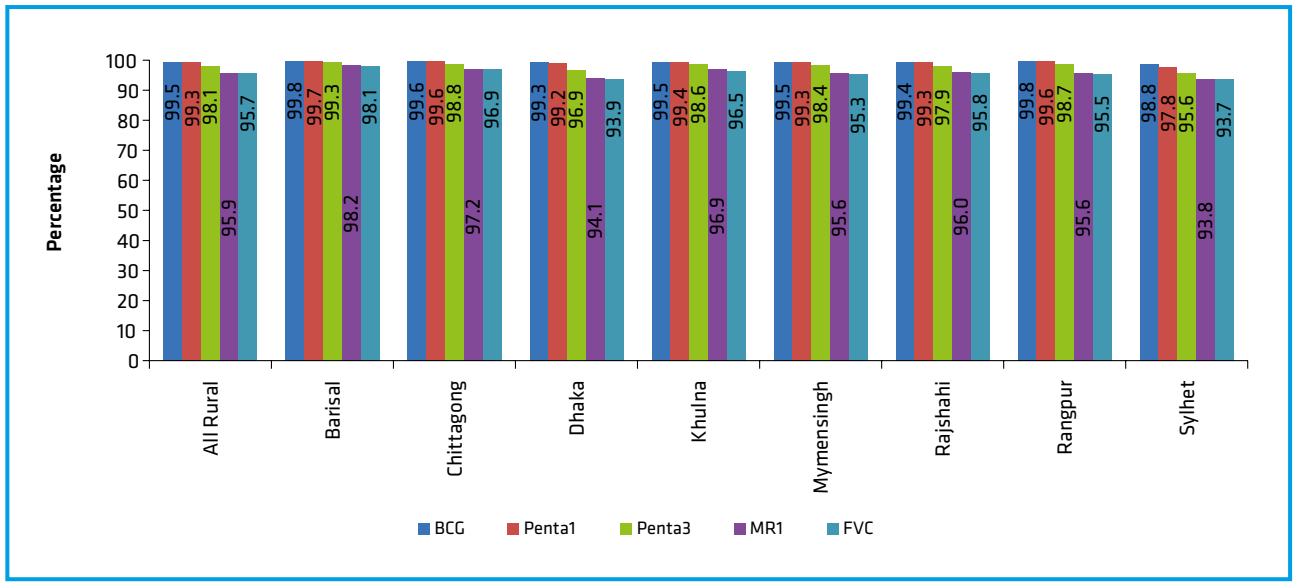
**** Sylhet division was included in Chittagong division until 1999***

3.3.14 Rural Coverage by Division

Crude Vaccination Coverage by Age of 23 Months

Crud vaccination coverage by age of 23 months varied slightly by rural division. As Figure 37 shows, all were within six percent of the national rural average of 95.7 percent. Crude vaccination coverage was highest in Barisal division (98.1 percent) and the lowest in Sylhet division (93.7 percent). Along with Sylhet, only Mymensingh, Rangpur, and Dhaka divisions were below the national average. By vaccine type, all achieved a BCG coverage rate of 99.3 percent or higher than that. The same general patterns were observed in the case of Penta1 and Penta3. The pattern remained same for MR1 coverage, in which case Barisal division had the highest coverage (98.2 percent) and Mymensingh was in the middle of the rates (95.6 percent), Sylhet again with the lowest rate (93.8 percent).

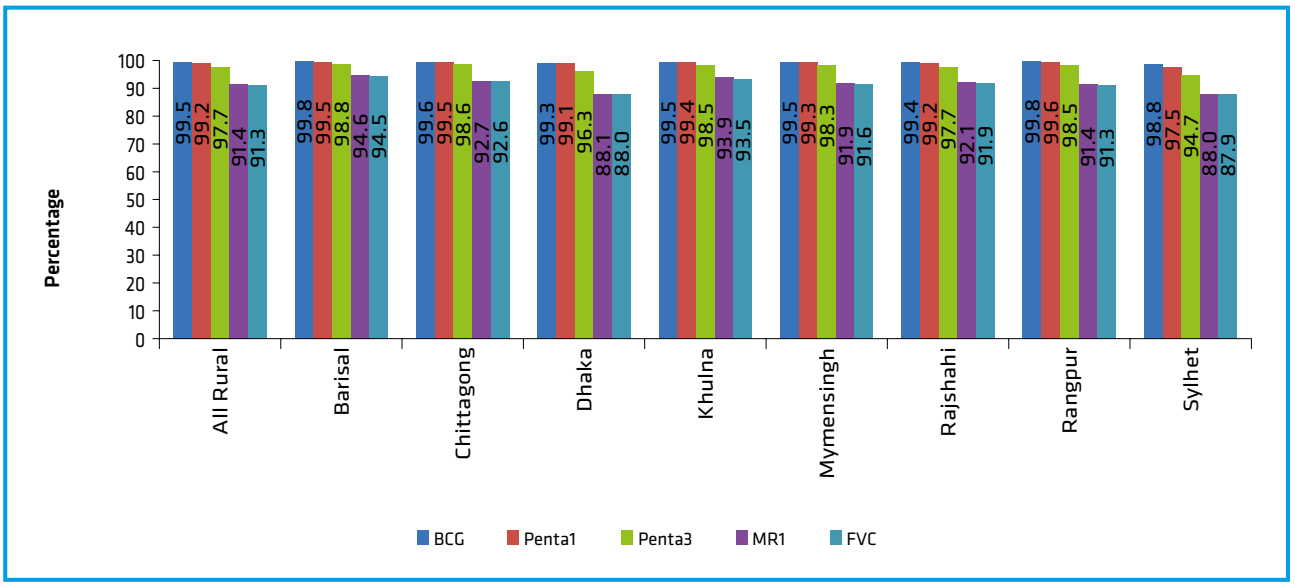
Figure 37: Crude Vaccination Coverage by Age of 23 Months in Rural Areas by Division in 2016



Crude Vaccination Coverage by Age of 12 Months

Similar to the crude coverage by age of 23 months, Barisal division achieved the highest crude vaccination coverage (94.5 percent) by age of 12 months. It was the lowest in Sylhet division (87.9 percent). Crude coverage was 93.5 percent in Khulna, 92.6 percent in Chittagong , 91.9 percent in Rajshahi, 91.6 percent in Mymensingh, 91.3 percent in Rangpur, and 88.0 percent in Dhaka divisions (see Figure 38).

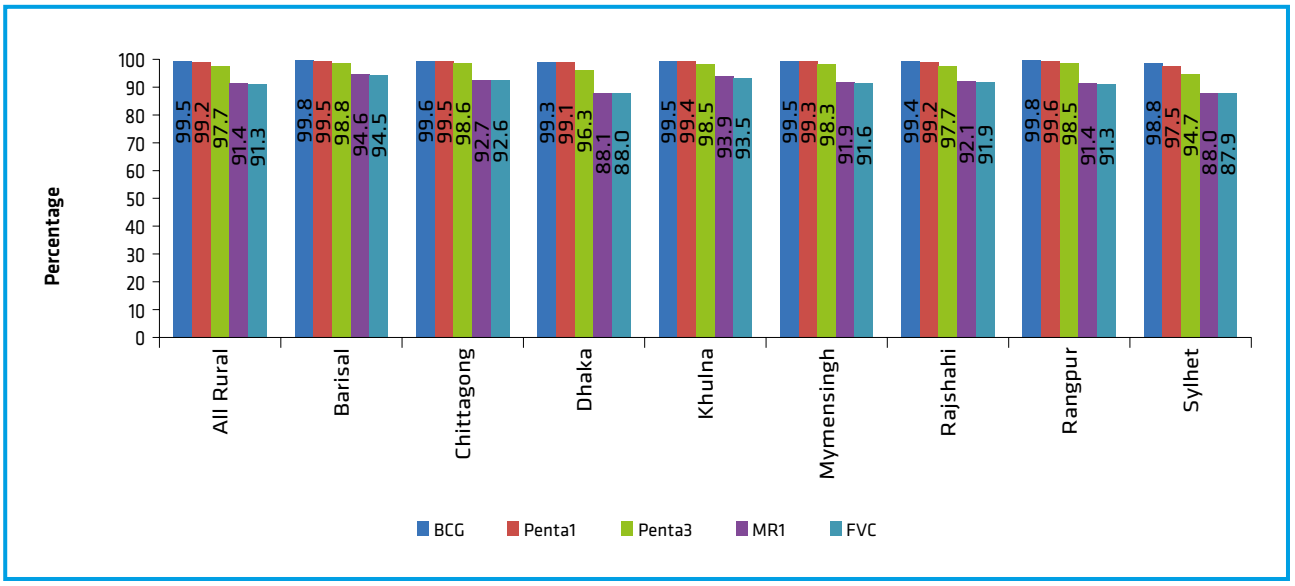
Figure 38: Crude Vaccination Coverage by Age of 12 Months in Rural Areas by Division in 2016



Valid Vaccination Coverage by Age of 23 Months

Nationally, 87.6 percent of rural children received all the vaccines by 23 months, following the EPI- recommended age and intervals between doses. Among the eight divisions, children from rural areas of Barisal division (91.2 percent) were more likely to receive all the valid vaccines than those from the other rural divisions.

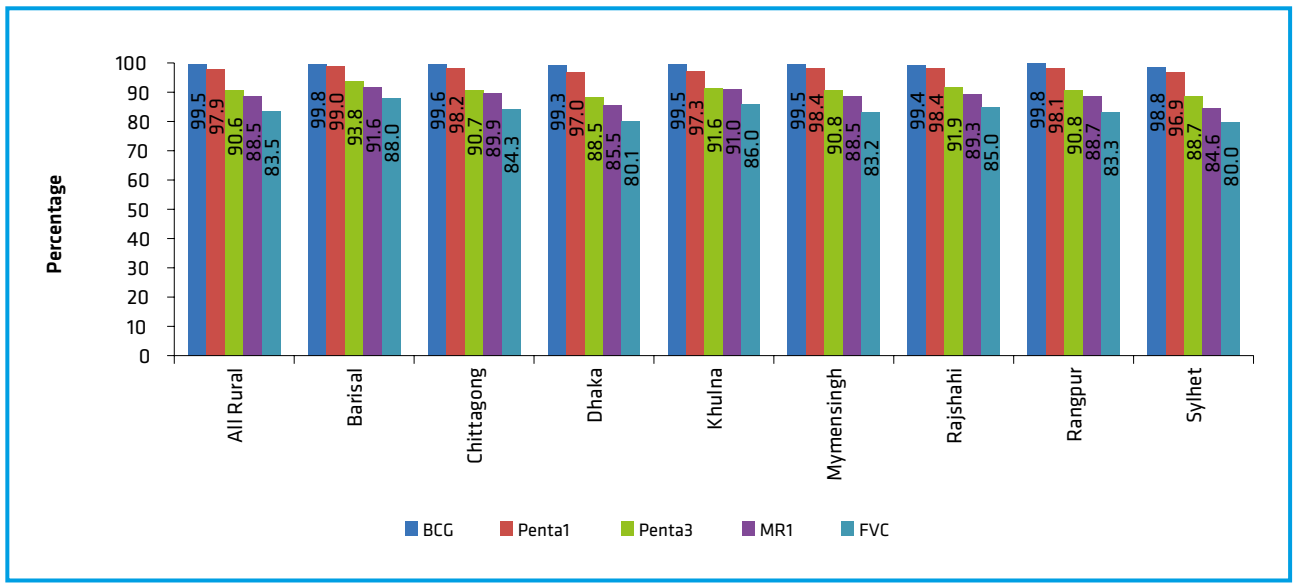
Figure 39: Valid Vaccination Coverage by Age of 23 Months in Rural Areas by Division in 2016



Valid Vaccination Coverage by age of 12 Months

Figure 40 presents the valid vaccination coverage by age of 12 months. Nationally, valid coverage in rural areas was 83.5 percent, with slight variation between divisions from the highest in Barisal (88.0 percent in Barisal) to the lowest in Sylhet (80.0 percent).

Figure 40: Valid Vaccination Coverage by Age of 12 Months in Rural Areas by Division in 2016

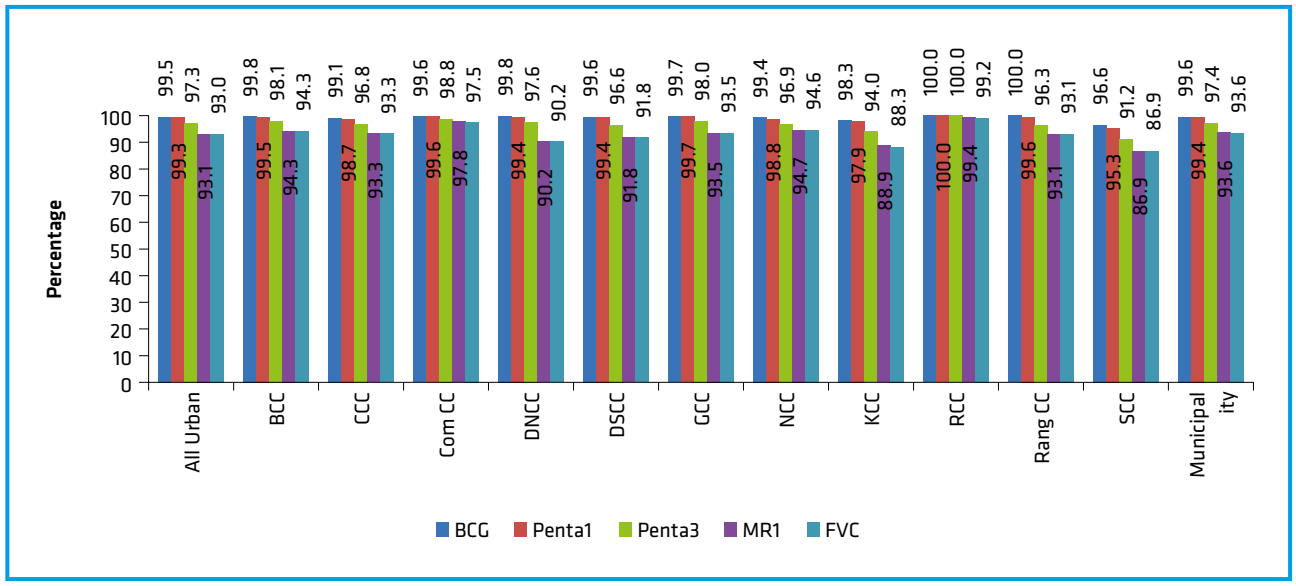


3.3.15 Coverage by City Corporation and Municipality

Figures 41 and 42 depict city corporation-wise vaccination coverage. For CES 2016, each of the 11 city corporations in Bangladesh was surveyed as separate survey strata.

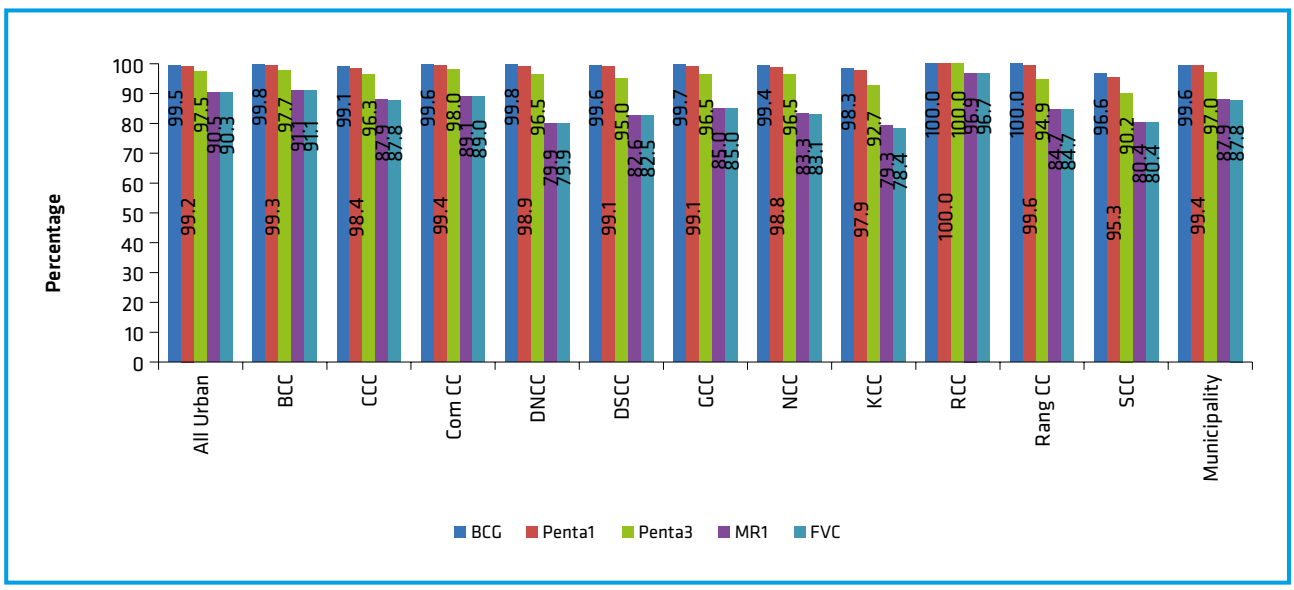
Crude Vaccination Coverage by age of 23 Months: Figure 40 shows urban vaccination coverage by city corporation. Nationally, urban coverage was depicted 93.0 percent in CES 2016. Among the city corporations, the highest crude vaccination coverage was in RCC and the lowest in SCC, with 99.2 percent and 86.9 percent coverage, respectively. Crude vaccination coverage in other city corporations ranged between 88.3 percent in KCC and 97.5 percent in Com CC.

Figure 41: Valid Vaccination Coverage by Age of 23 Months in Urban Areas by City Corporation and Municipality in 2016



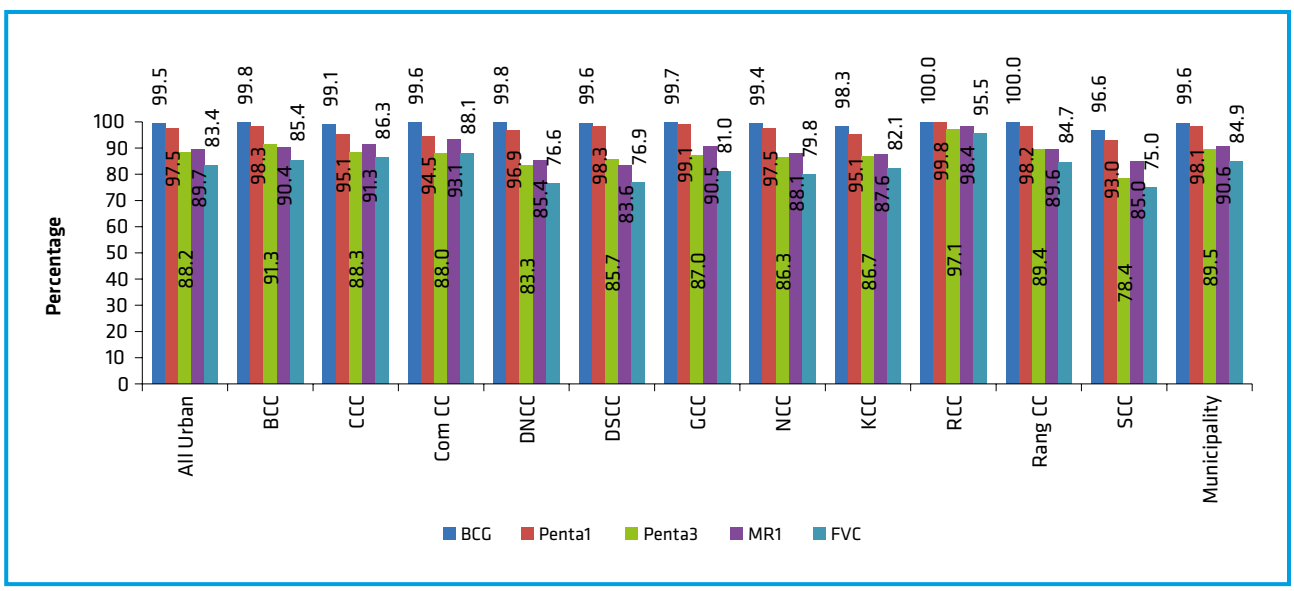
Crude Vaccination Coverage by Age of 12 Months: Figure 42 illustrates the crude vaccination coverage by age of 12 months. RCC attained the highest coverage (96.7 percent) and KCC the lowest (78.4 percent).

Figure 42: Crude Full Vaccination Coverage by Age of 12 Months in Urban Areas by City Corporation and Municipality in 2016



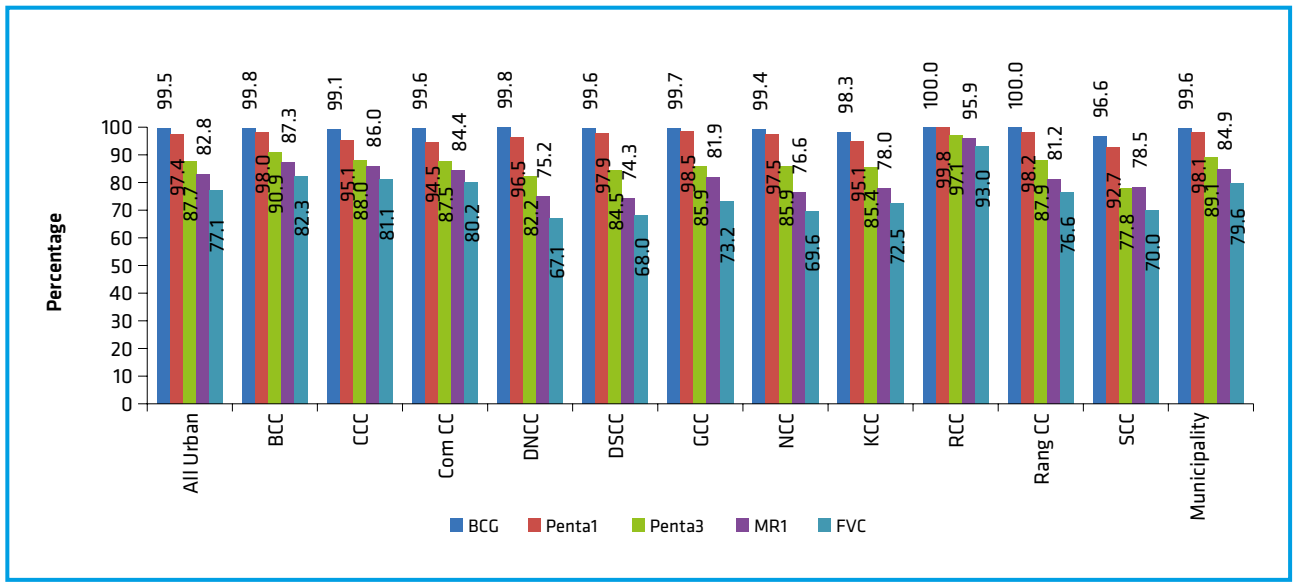
Valid Vaccination Coverage by Age of 23 Months: Figure 43 highlights the valid vaccination coverage by age of 23 months by CC. The figure shows that the valid coverage was the highest in RCC (95.5 percent). The next highest was Com CC at 88.1 percent, with the rest being between 86.3 percent and the lowest rate of 75.0 percent, in SCC.

Figure 43: Valid Vaccination Coverage by Age of 23 Months in Urban Areas by City Corporation and Municipality in 2016



Valid Vaccination Coverage by Age of 12 Months: The valid full vaccination coverage by age of 12 months is shown in Figure 44. Among all the city corporations, RCC achieved the highest position with 93.0 percent coverage. The lowest coverage was revealed in DNCC (67.1 percent). The valid coverage in other city corporations was between 68.0 percent in DSCC and 82.3 percent in BCC.

Figure 44: Valid Vaccination Coverage by Age of 12 Months in Urban Areas by City Corporation and Municipality in 2016



3.3.16 Sex Differentials in Coverage

Crude Vaccination Coverage by Age of 23 Months by Sex

Figures 45a-45c present crude vaccination coverage by age of 23 months. Nationally, 0.3 percentage point difference was noticed in the crude coverage between males and females. The crude full vaccination coverage was 95.3 percent among the males as against 95.0 percent of the females. Similarly, a slight difference was observed between males and females in both the urban and rural areas.

Figure 45a: National Crude Vaccination Coverage by Age of 23 Months by Sex in 2016

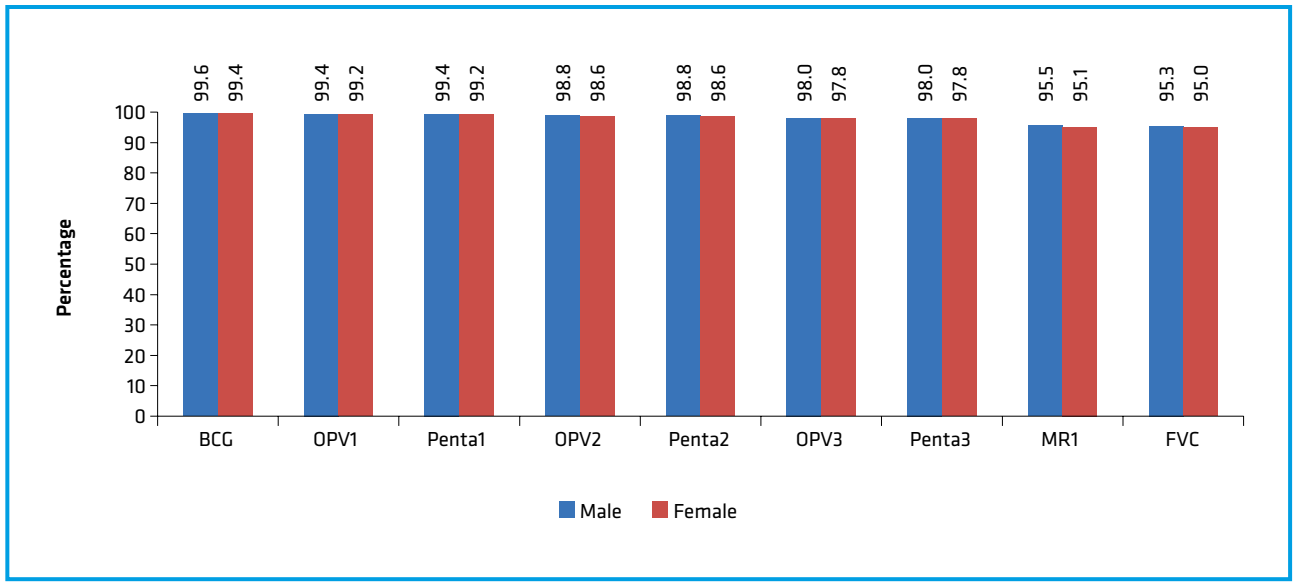


Figure 45b: Crude Vaccination Covearge by Age of 23 Months in Urban Areas by Sex in 2016

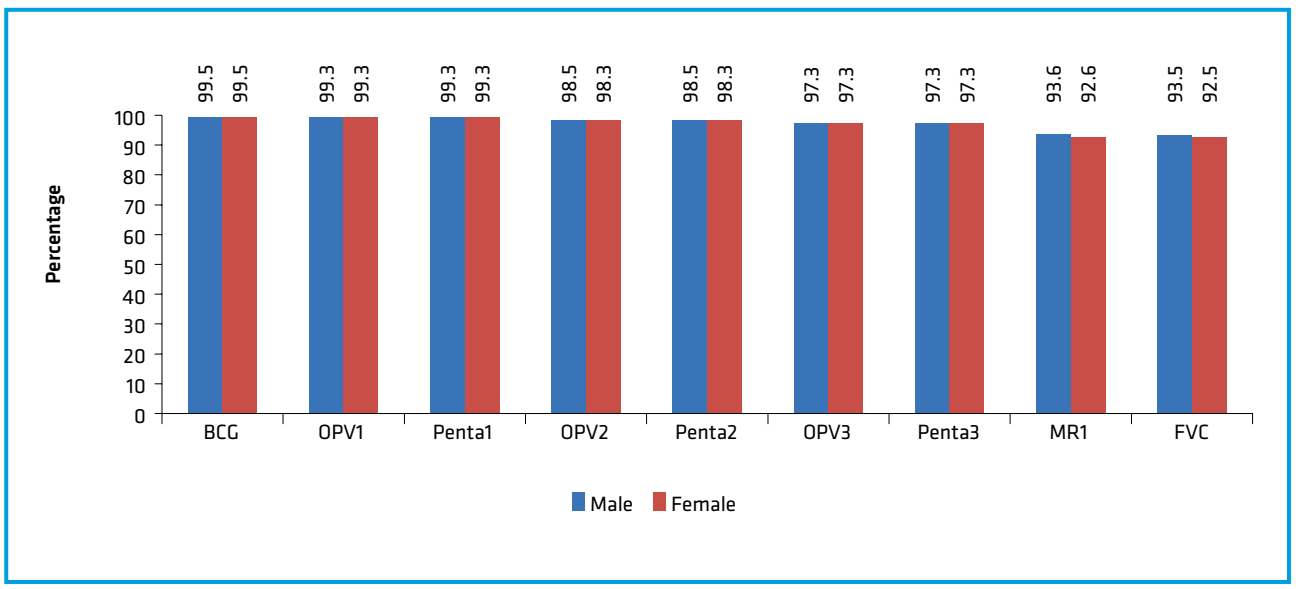
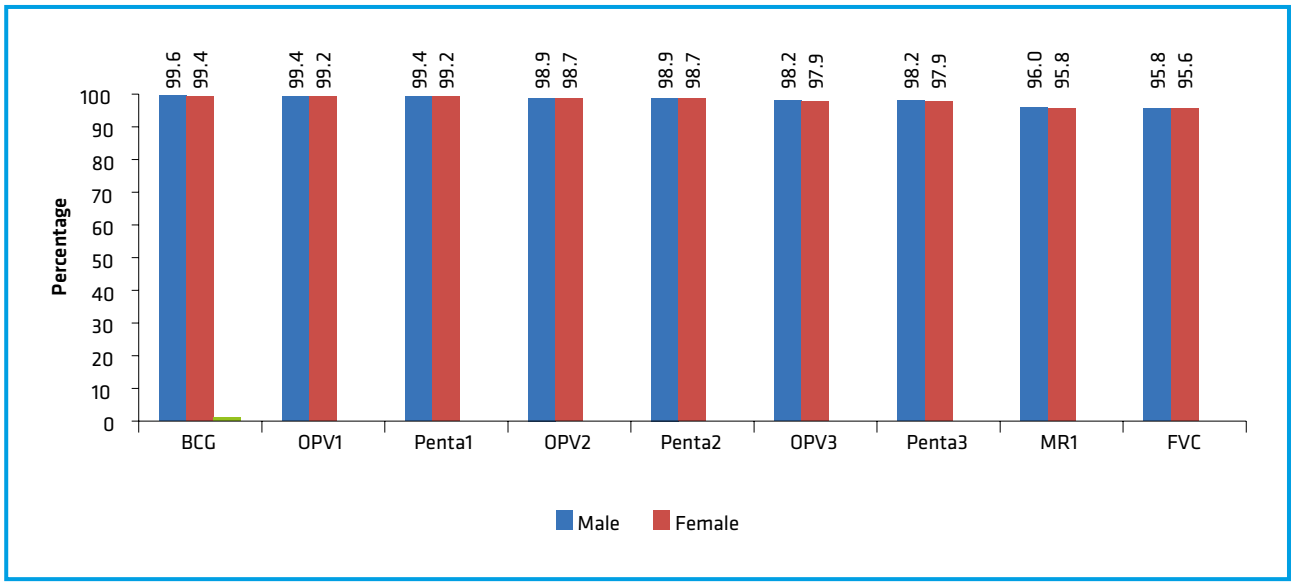


Figure 45C: Crude Vaccination Covearge by Age of 23 Months in Rural Areas by Sex in 2016



Crude Full Vaccination Coverage by Age of 12 Months by Sex

Figures 46a-46c present crude vaccination coverage by the age of 12 months. Nationally, 0.3 percentage point of difference was noticed in the crude coverage between males and females (90.5 percent vs.90.2 percent). Similarly, males were more likely to receive crude vaccine than females in both the urban (86.5 percent vs. 85.9 percent) and rural areas (91.4 percent vs. 91.1 percent).

Figure 46a: National Crude Full Vaccnation Coverage by Age of 12 Months by Sex in 2016

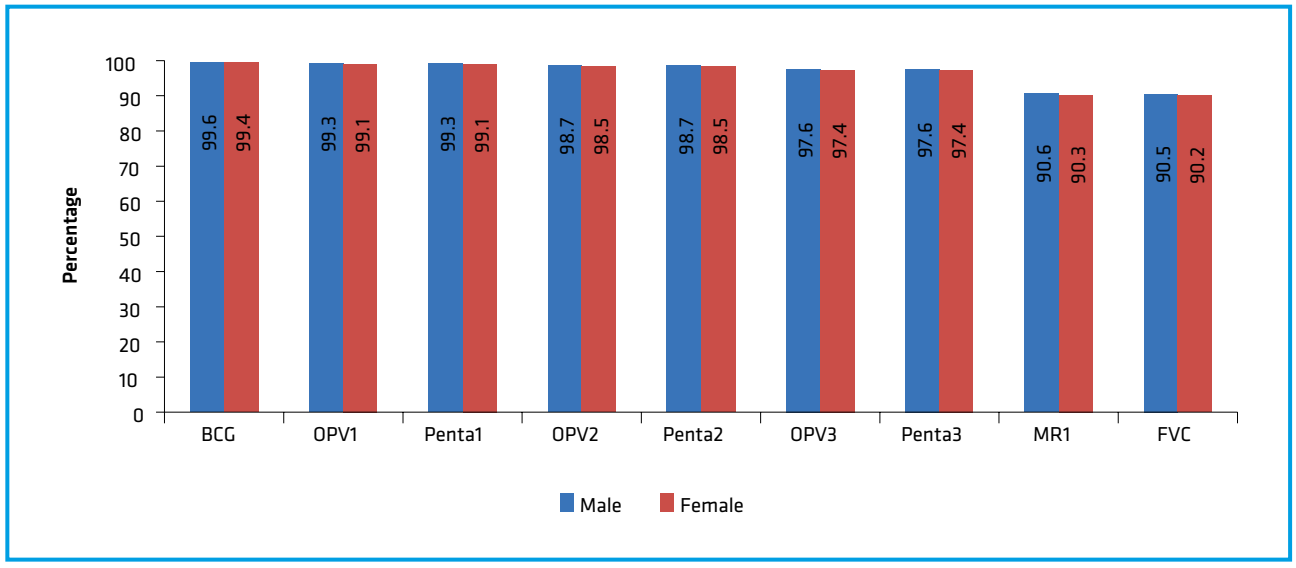


Figure 46b: Crude Full Vaccination Coveargе by Age of 12 Months in Urban Areas by Sex in 2016

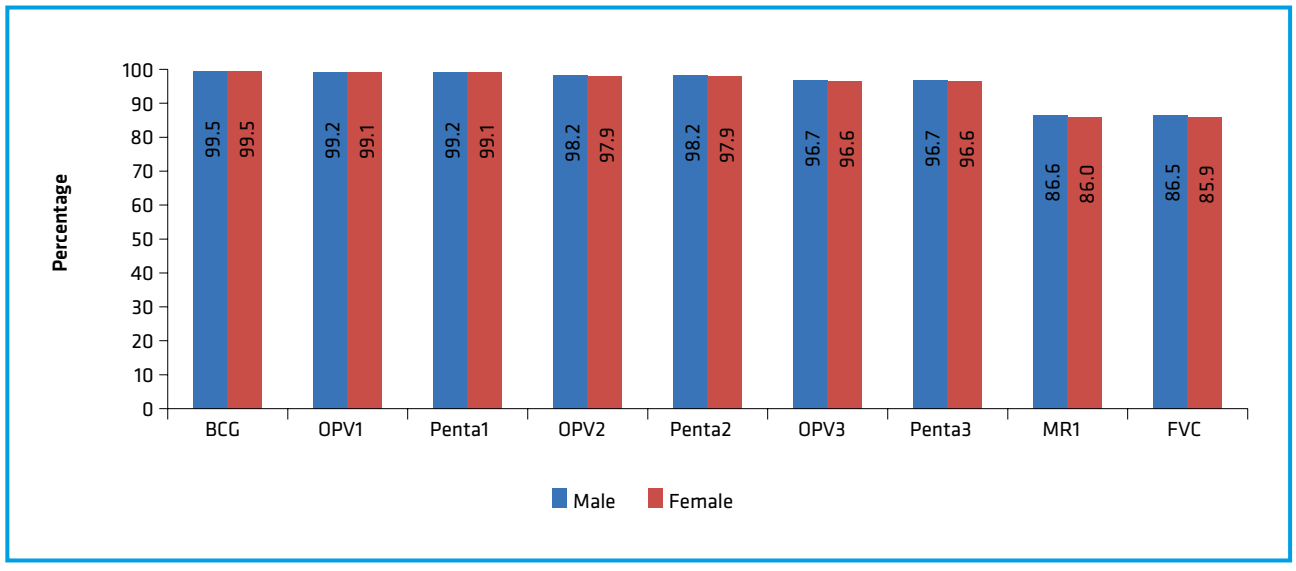
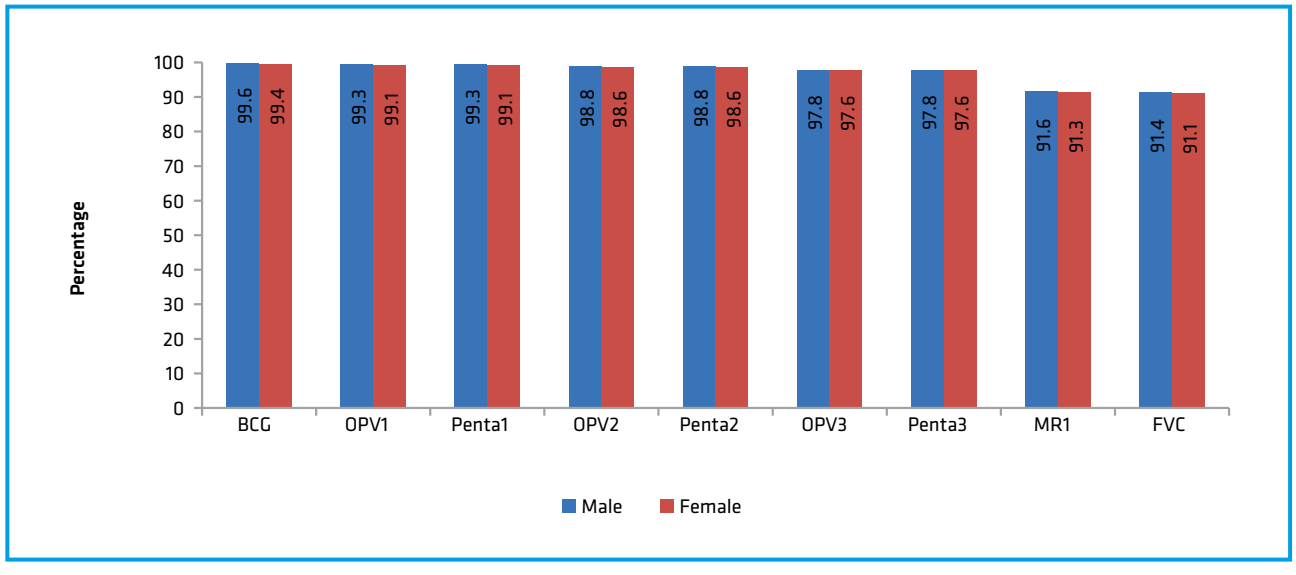


Figure 46c: Crude Full Vaccination Coveargе by Age of 12 Months in Rural Areas by Sex in 2016



Valid Vaccination Coverage by Age of 23 Months by Sex

Figures 47a-47c depict the valid vaccination coverage by age of 23 months. It shows that the valid coverage was 95.3 percent for males and 95.0 percent for females. As regards the residence, it was found almost similar among the males and the females both in rural and urban areas.

Figure 47a: National Valid Vaccination Covearge by Age of 23 Months by Sex in 2016

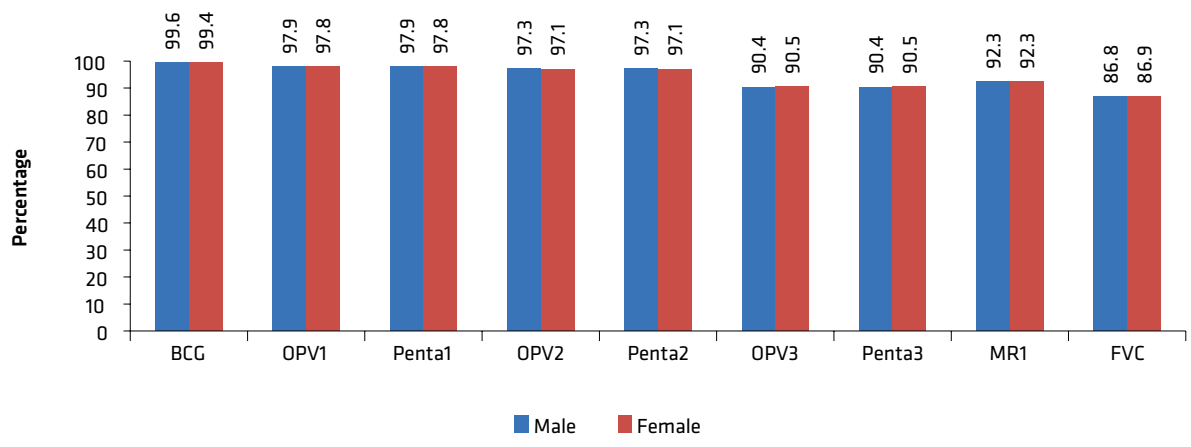


Figure 47b: Valid Vaccination Covearge by Age of 23 Months in Urban Areas by Sex in 2016

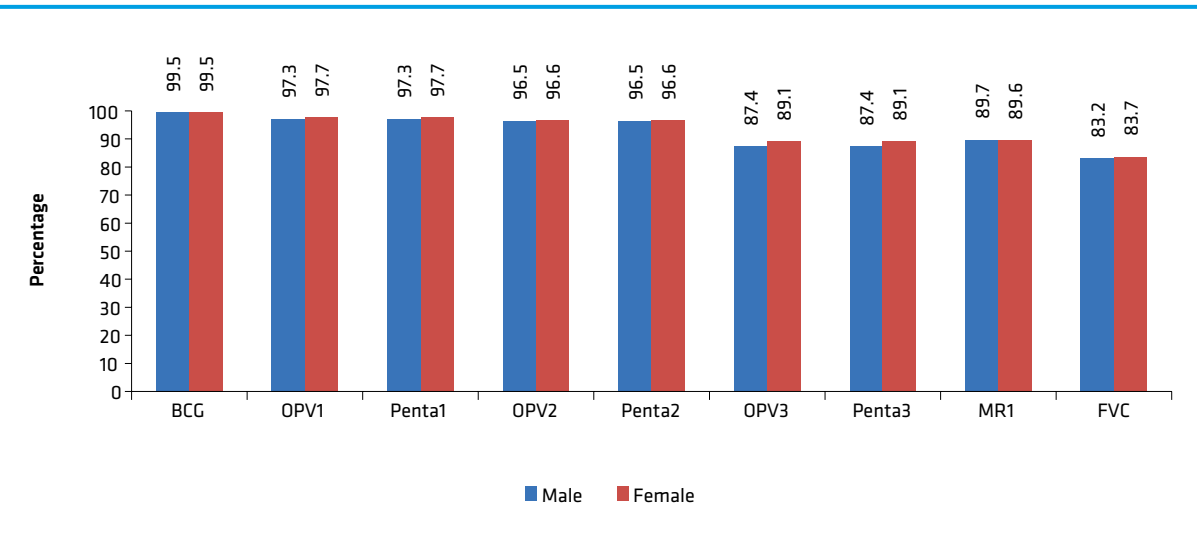
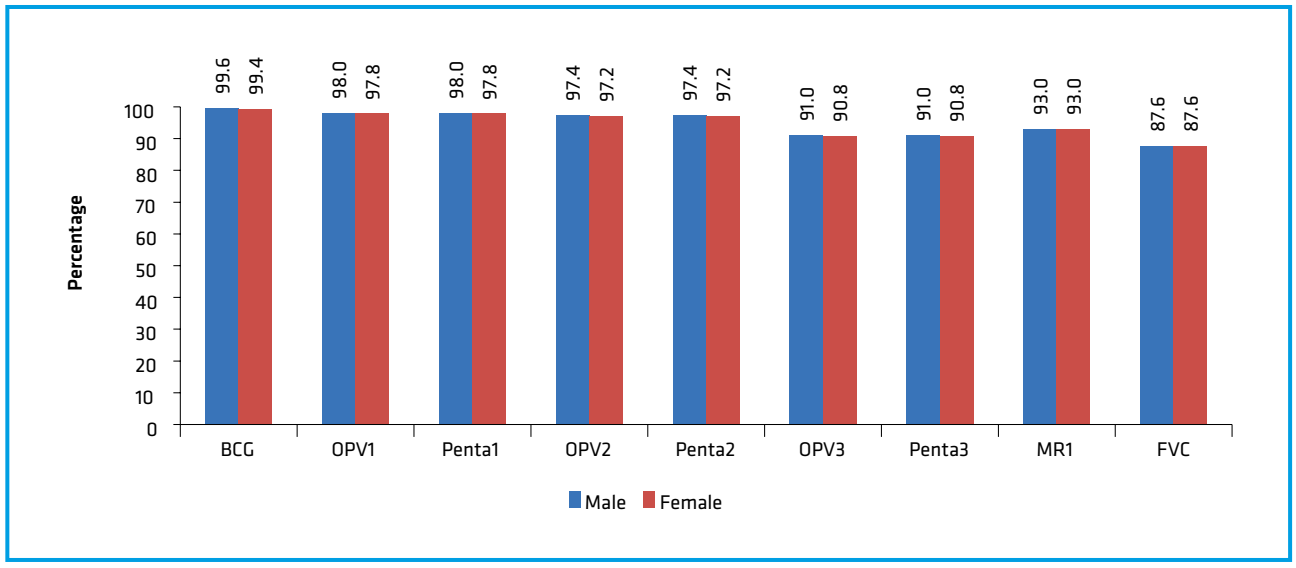


Figure 47c: Valid Vaccination Coveage by Age of 12 Months in Rural Areas by Sex in 2016



Valid Vaccination Coverage by Age of 12 Months by Sex

Sex differential in the valid vaccination coverage by age of 12 months is presented in Figures 48a-48c. The valid coverage was found 82.2 percent for males and 82.5 percent for females. By residence, a similar trend in difference was observed between males and females residing in the urban and rural areas.

Figure 48a: National Valid Vaccination Coveage by Age of 12 Months by Sex in 2016

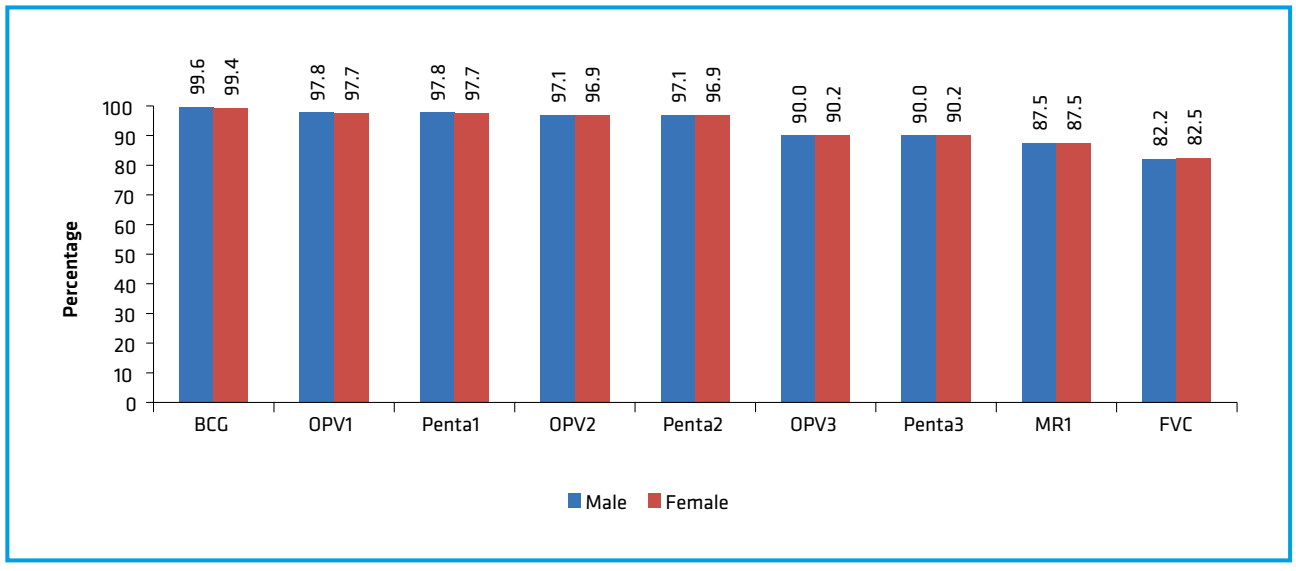


Figure 48b: Valid Vaccination Covearge by Age of 12 Months in Urban Areas by Sex in 2016

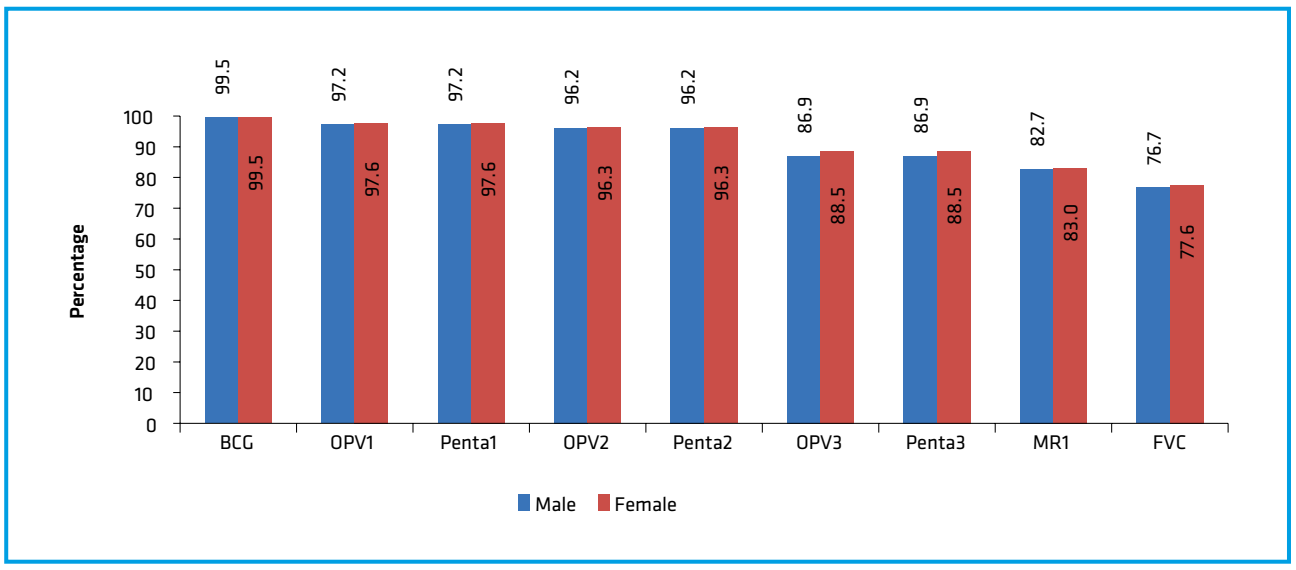
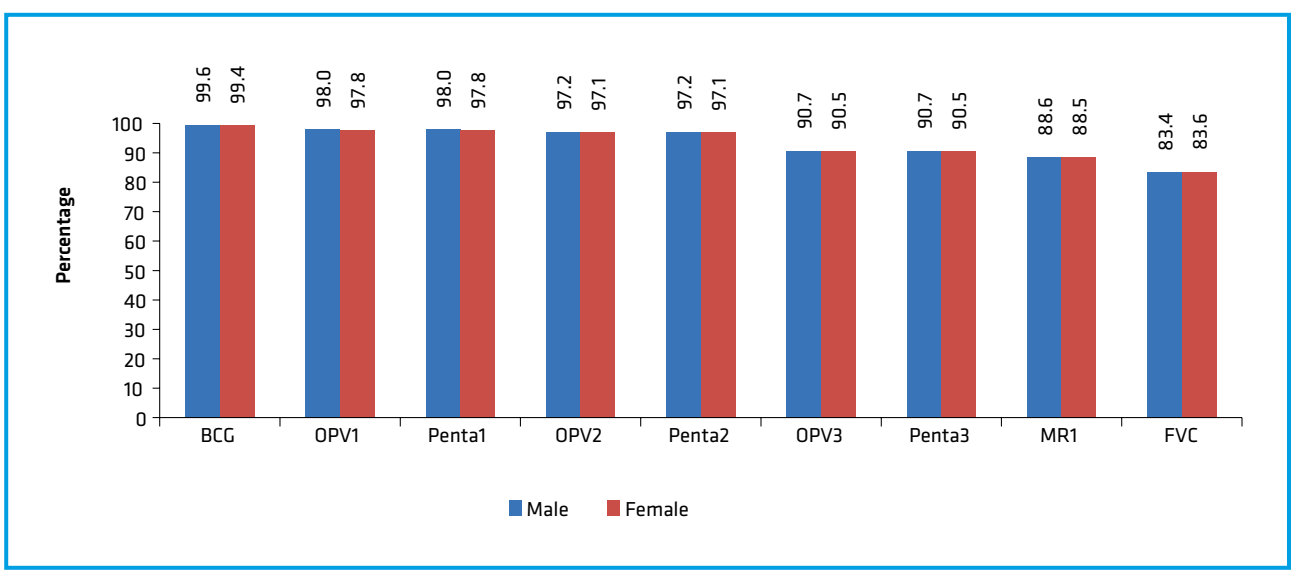
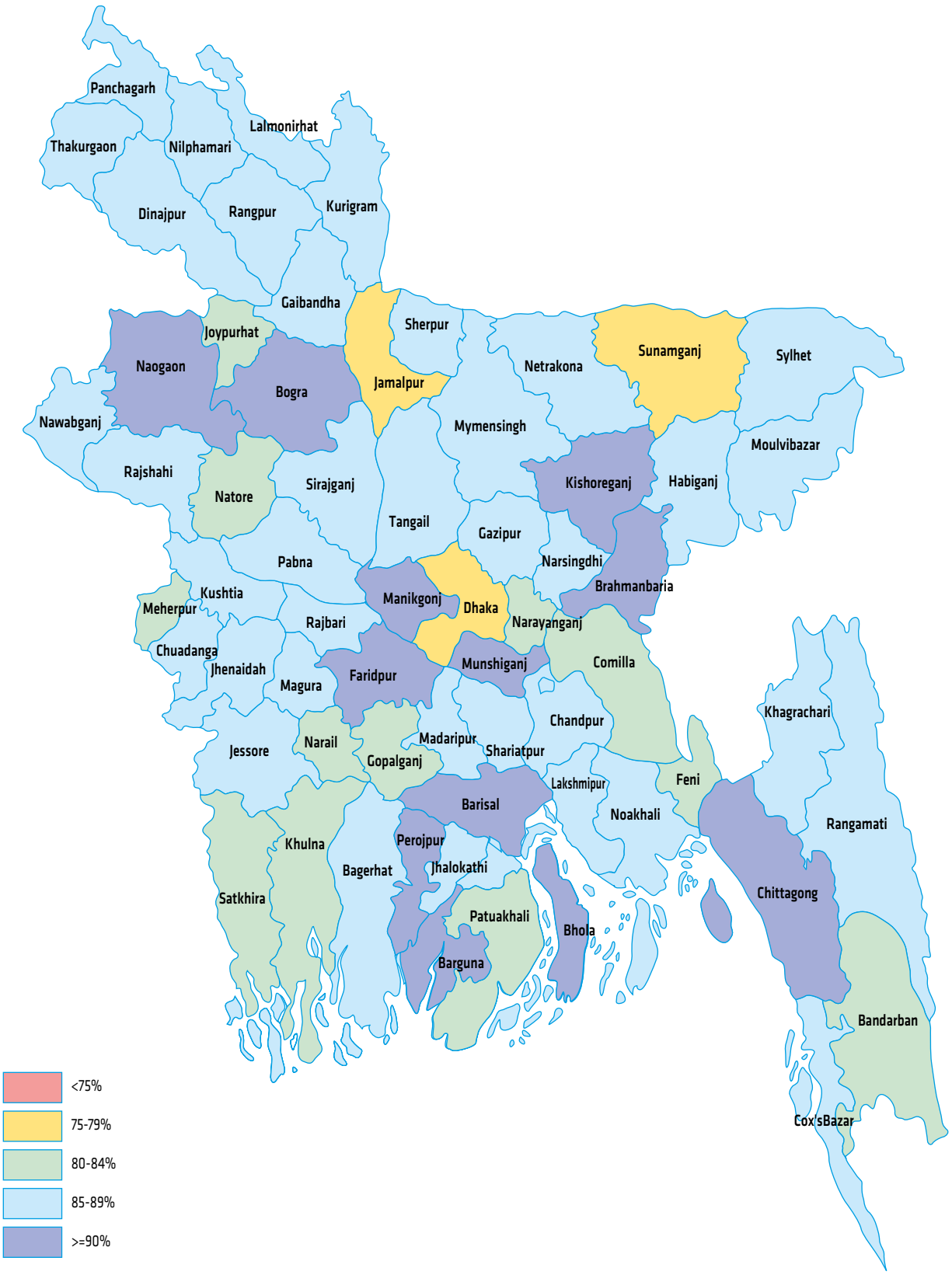


Figure 48c: Valid Vaccination Covearge by Age of 12 Months in Rural Areas by Sex in 2016



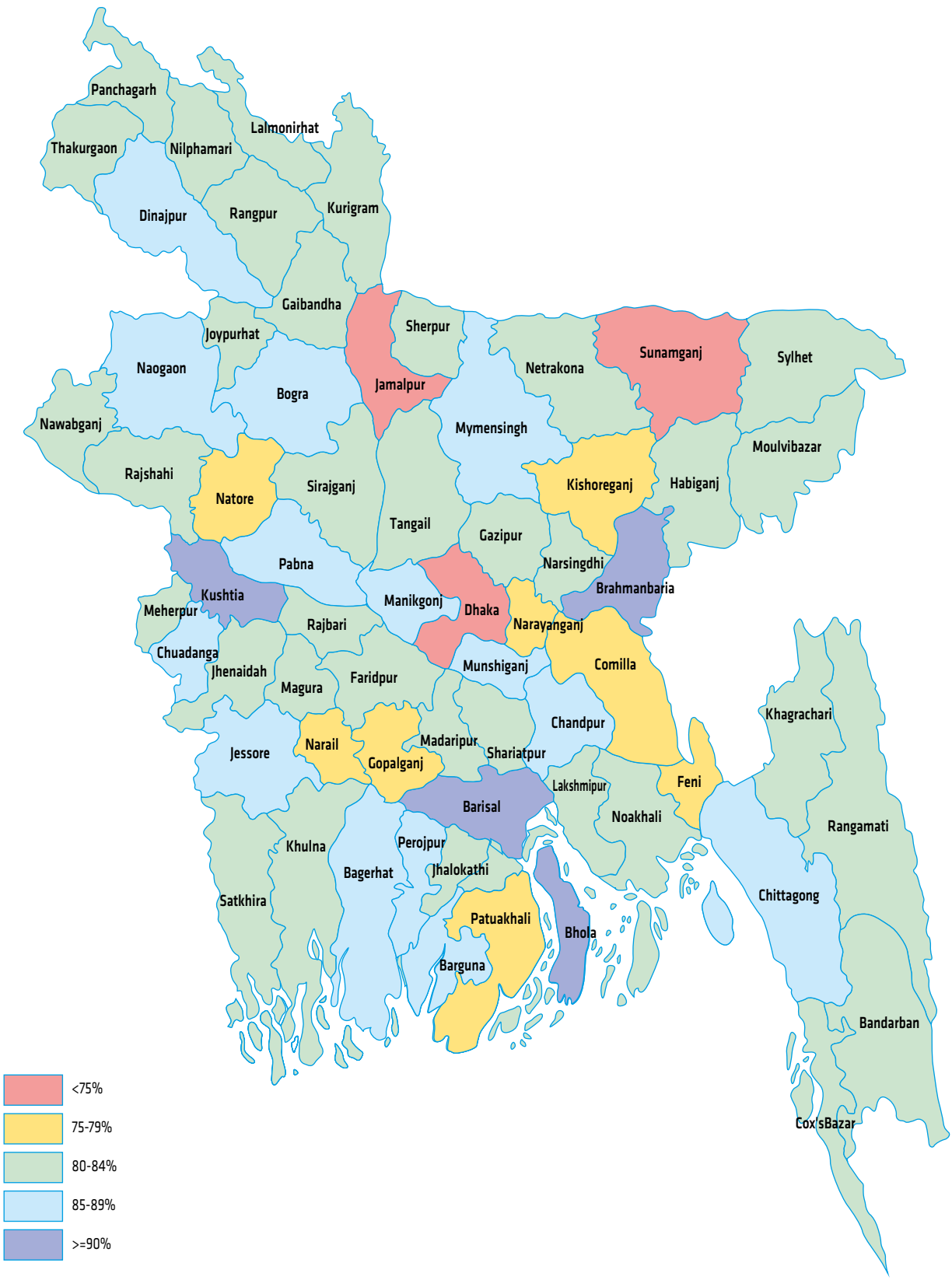
Map 1:

Valid Full Vaccination Coverage by Age of 23 Months by District



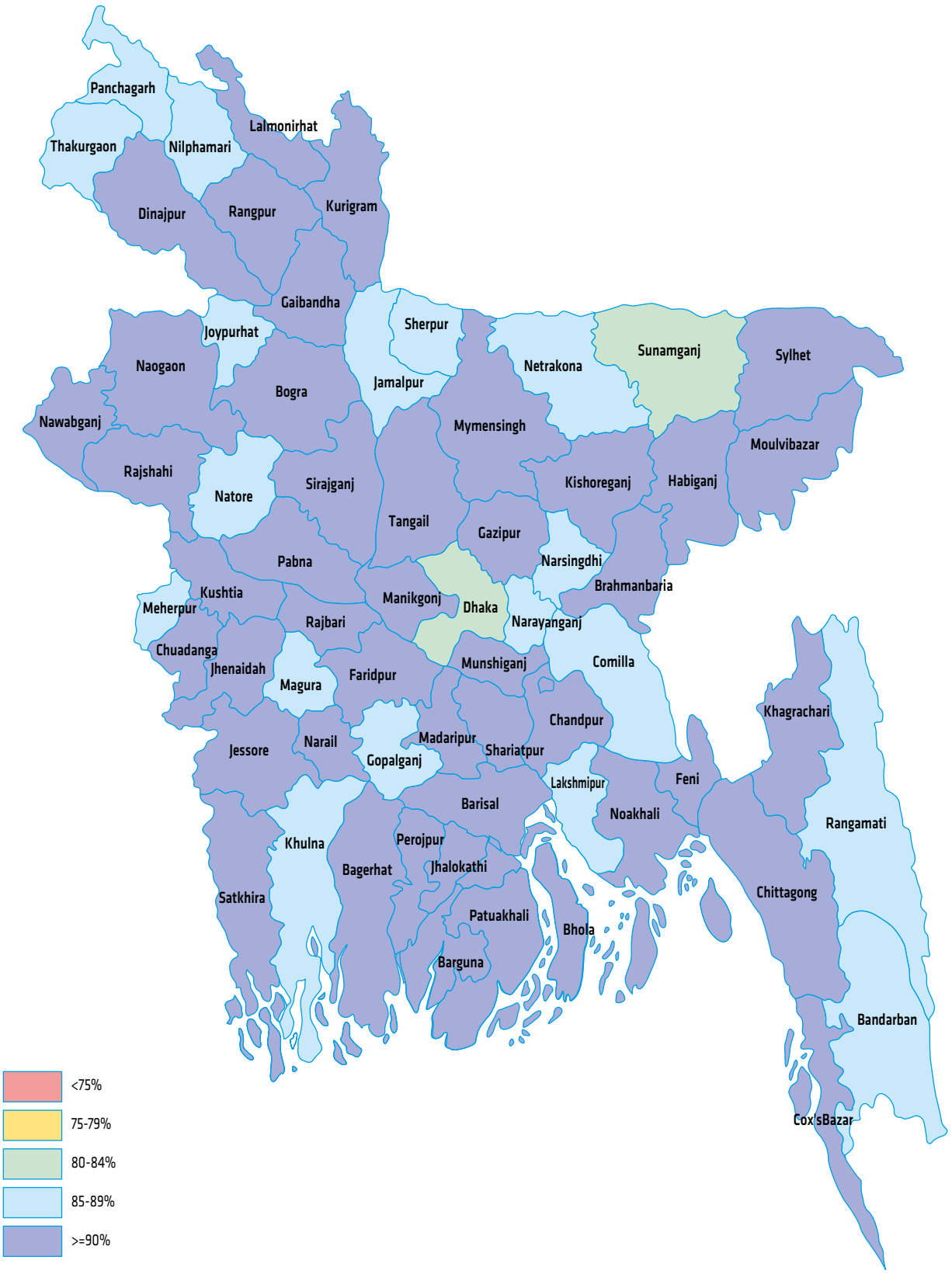
Map 2:

Valid Full Vaccination Coverage by Age of 12 Months by District



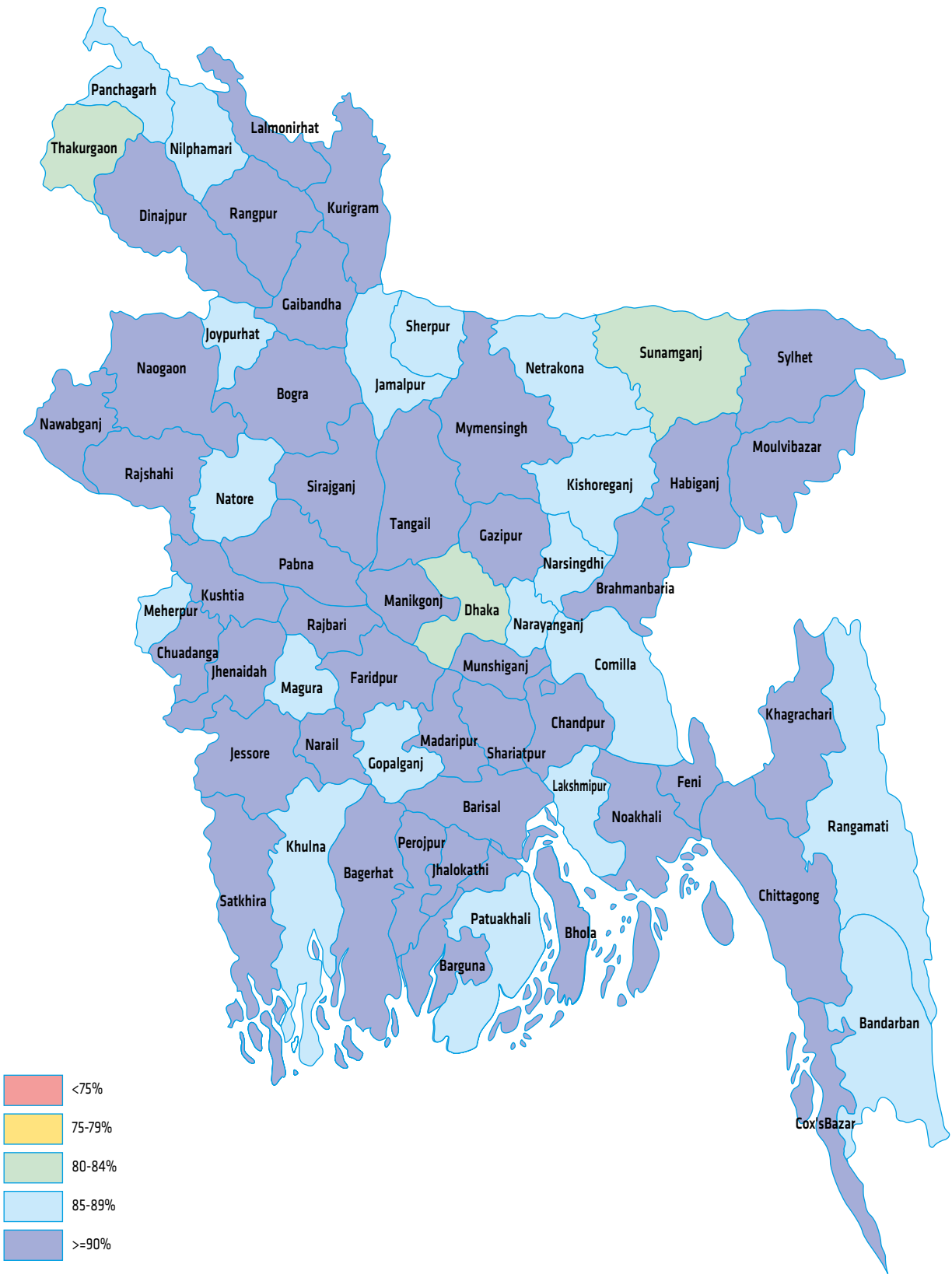
Map 3:

Valid Penta 3 Vaccination Coverage by Age of 23 Months by District



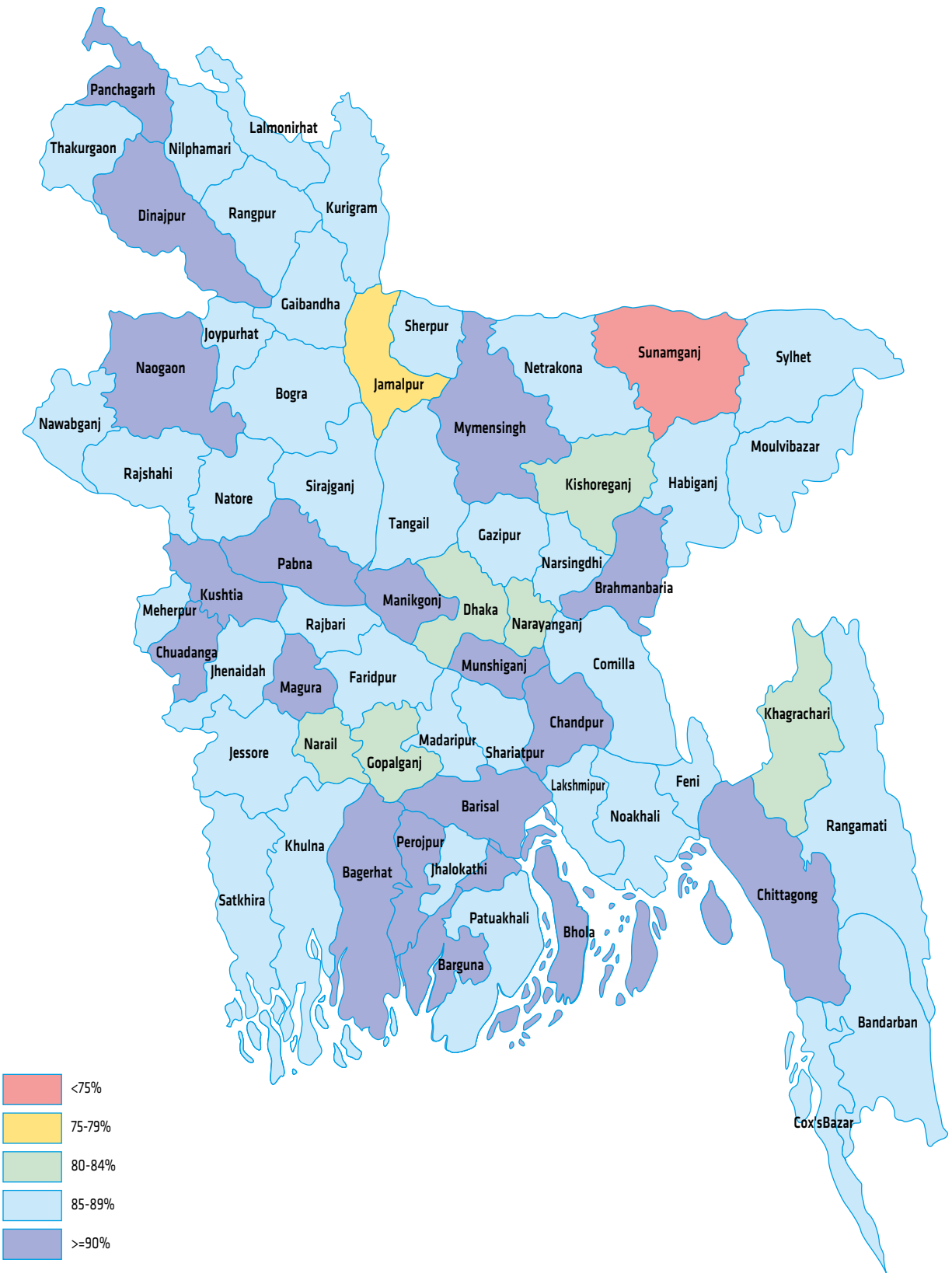
Map 4:

Valid Penta 3 Vaccination Coverage by Age of 12 Months by District



Map 5:

Valid MR1 Vaccination Coverage by Age of 12 Months by District

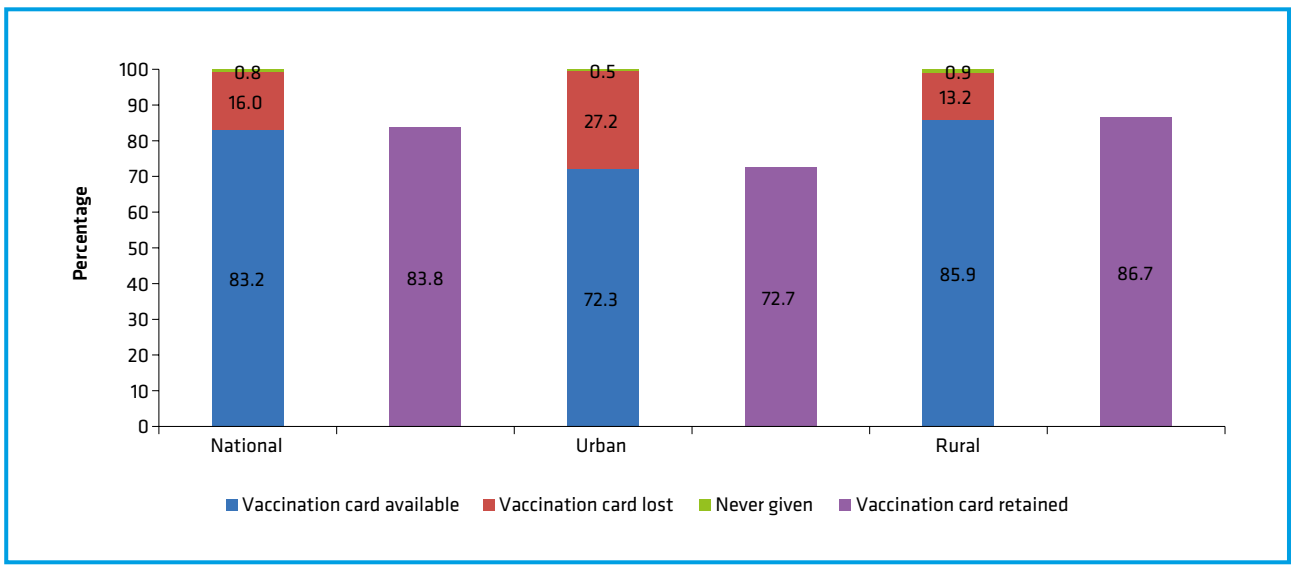


3.4 PROGRAMME QUALITY

3.4.1 Card Retention Rate

Vaccination cards were issued to all children at the time of their first vaccination. The card contains the dates of first vaccines given to the children, as well as the dates when they received the subsequent doses. The availability of the card was an important tool for the Coverage Evaluation Survey, as vaccination dates were obtained from the card to estimate the crude coverage and the valid coverage. Card retention rate was defined as the proportion of cards available during the survey from the number cards issued at the time of first vaccination. Nationally, 99.2 percent of children received the vaccination card and 83.8 percent of the mothers/caregivers retained it (see Figure 49). The retention rate was considerably higher in rural areas (86.7 percent) than in urban ones (72.7 percent).

Figure 49: Vaccination Card Status by National, Rural and Urban Areas in 2016



Among rural areas, card retention rate was the highest in Khulna division (93.7 percent) and the lowest in Chittagong (81.0 percent) division, with others being in the upper to mid-80's percentages (see Figure 50) except Barisal and Rangpur division (90.8 percent and 91.6 percent, respectively).

Figure 50: Vaccination Card Status in Rural Areas by Division in 2016

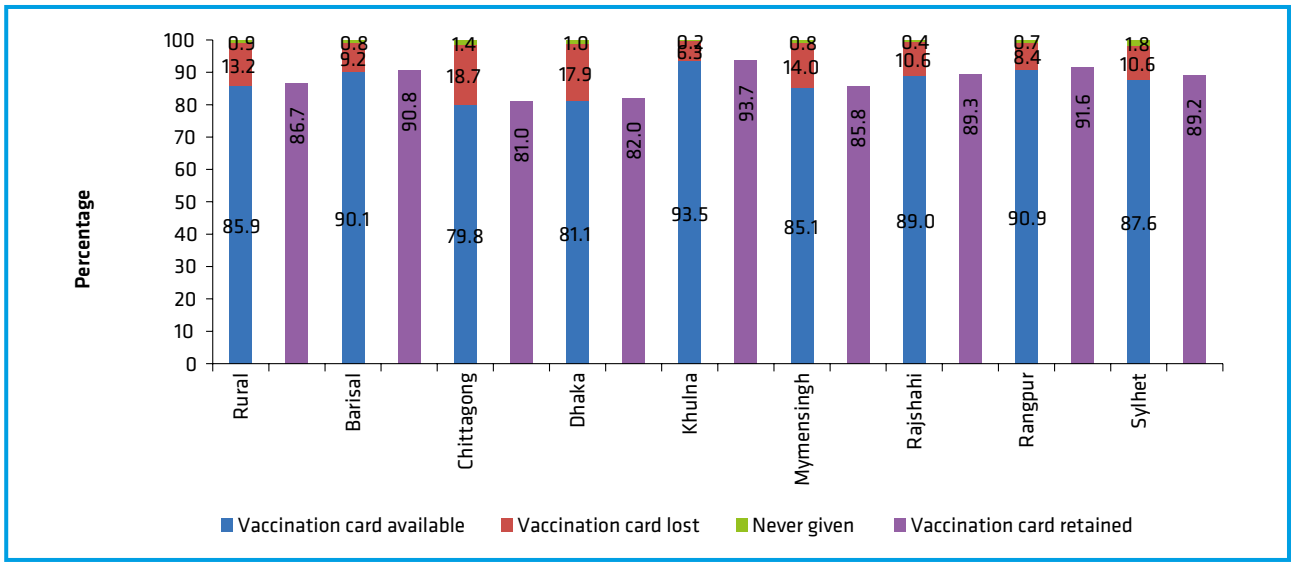
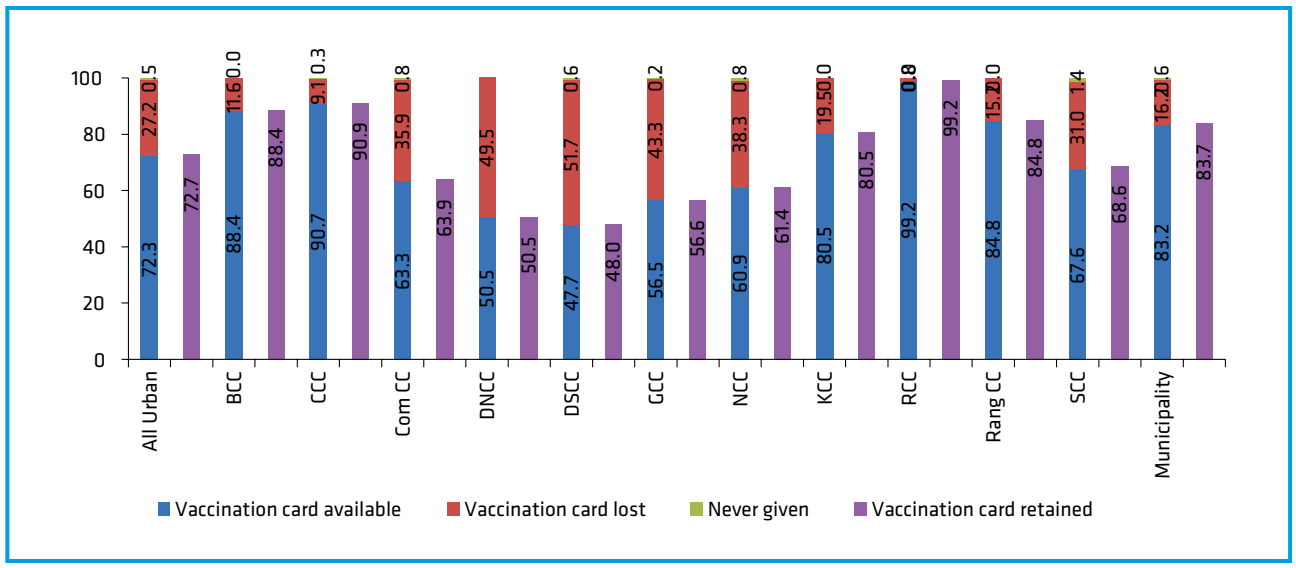


Figure 51 depicts the card retention rate in urban areas by city corporation. It shows that card retention rate was the highest in CCC (90.9 percent) and the lowest in DSCC (48.0 percent), with some variations among the others between those two numbers.

Figure 51: Vaccination Card Status in Urban Areas by City Corporation and Municipality in 2016



Map 6:

Card Retention Rate of Childhood Vaccination by District

3.4.2 Incidence of Invalid Doses

CES 2016 estimated invalid doses for Penta1, Penta2, Penta3, and MR1 vaccines are presented in Figure 52. As it has been discussed earlier, a dose was considered to be invalid when the vaccine was administered without following the EPI-recommended childhood vaccination schedule, as outlined in Table 3. When any dose of any antigen is administered before the recommended age and/or interval, it is treated as an "invalid" dose. The highest number of invalid doses were for Penta3 (6.4 percent) and the lowest numbers were for Penta1 and MR1 vaccines, at 3.0 percent and 3.2 percent respectively. There was a slight variation of invalid doses between urban and rural areas, with invalid doses found to be the higher in urban areas.

Figure 52: Incidence of Invalid Penta1, Penta2, Penta3, and MR by National, Rural and Urban Areas in 2016

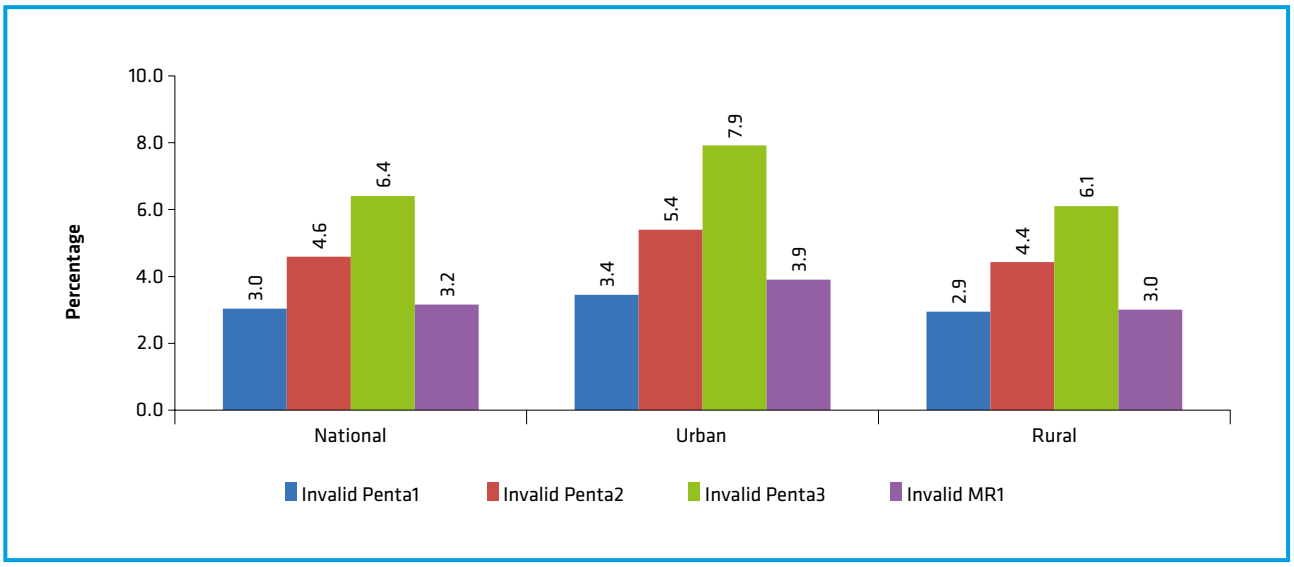
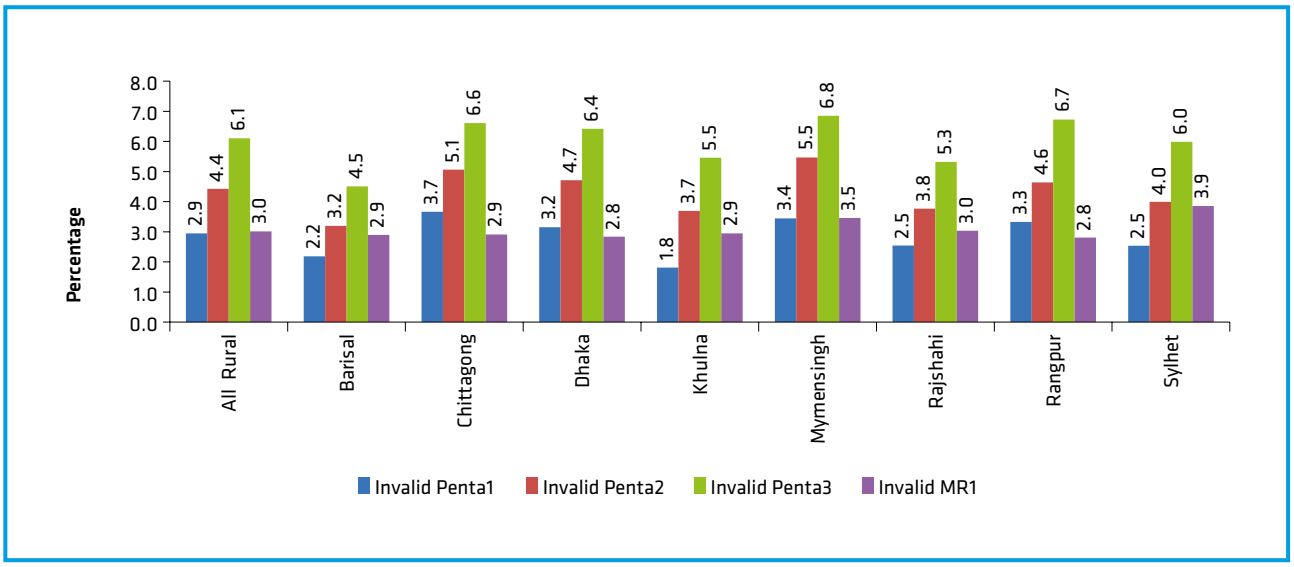


Figure 53 presents invalid doses of different antigens by rural division. It shows that the highest proportion of invalid Penta1 dose was administered in Chittagong division (3.7 percent) and the lowest in Khulna division (1.8 percent). Invalid Penta2 and Penta3 doses were the highest again in Mymensingh division (5.5 percent, and 6.8 percent) and lowest in Barisal division (3.2 percent and 4.5 percent, respectively). Regarding invalid MR1, Sylhet division administered the highest invalid dose (3.9 percent) and Dhaka and Rangpur divisions the lowest (2.8 percent each).

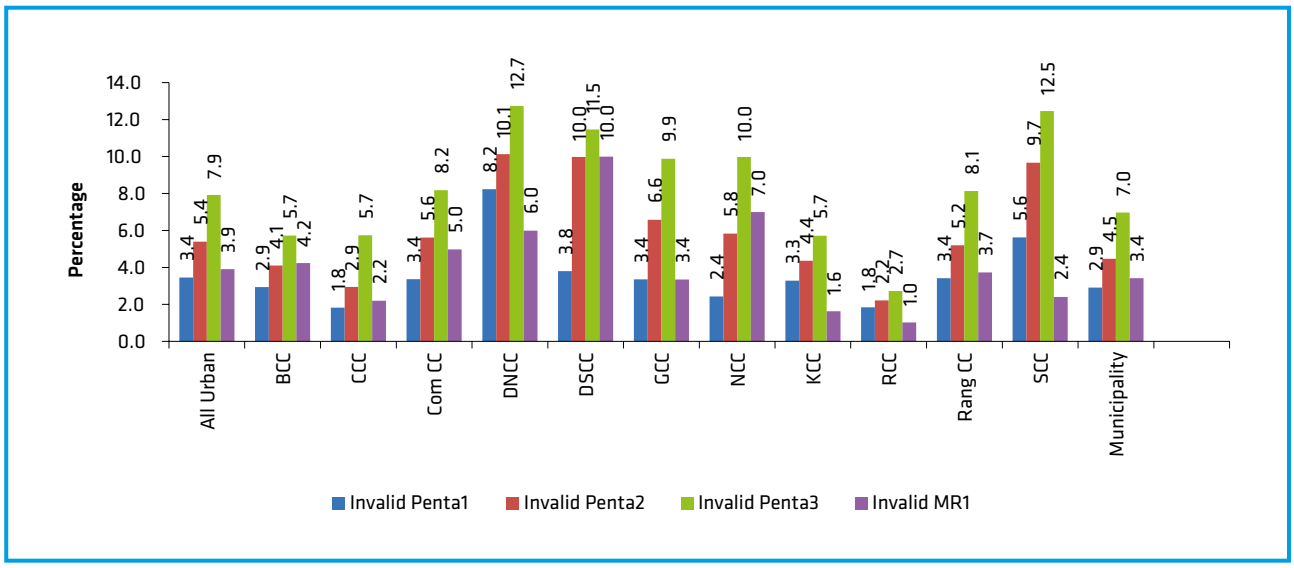
Figure 53: Incidence of Invalid Penta1, Penta2, Penta3 and MR in Rural Areas by Division in 2016



By antigen, as shown in Figure 54, the highest percentage of invalid doses was in DNCC, with the highest rate being for invalid Penta3 (12.7 percent), and Penta3 dropping to 12.5 percent in SCC. There was a wide range of percentages of invalid incidents, with the lowest rate being in RCC.

According to the EPI-recommended childhood vaccination schedule, MR1 should be received after 270 days of age, but not later than 365 days. In DSCC, 10.0 percent of children received a MR1 vaccination outside of that range, which was the highest percentage. The lowest percentage was 1.0 percent in RCC (see Figure 54).

Figure 54: Incidence of Invalid Penta1, Penta2, Penta3 and MR in Urban Areas by City Corporation and Municipality in 2016

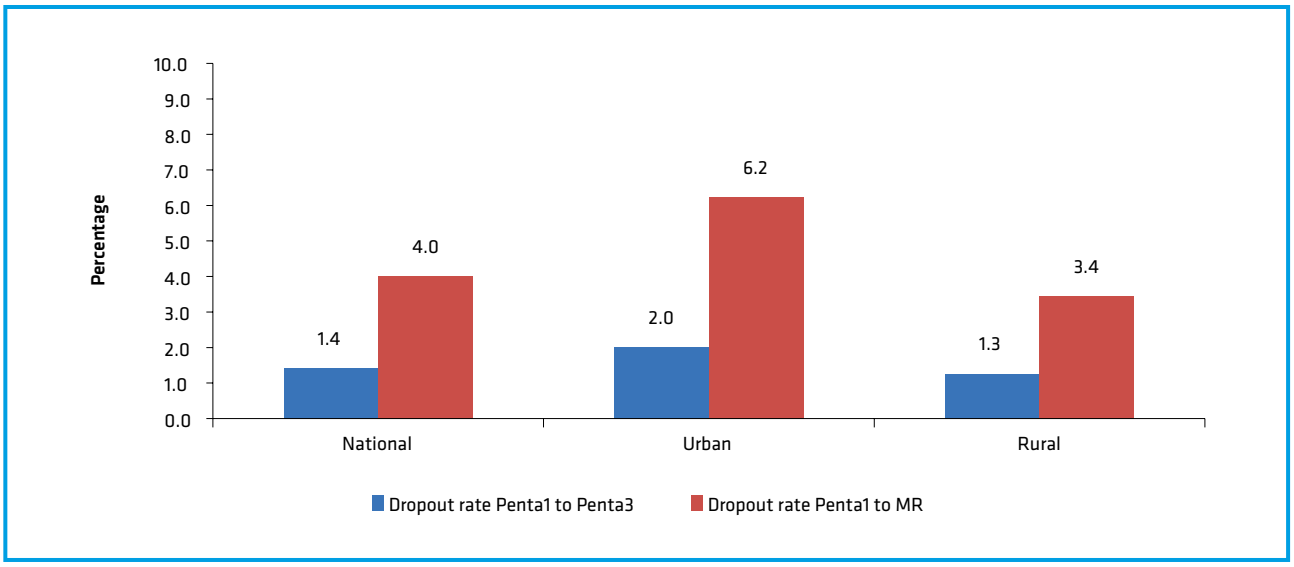


3.4.3 Vaccination Drop-out Rates

A low vaccination drop-out rate is crucial to achieving the desired coverage target. To be fully vaccinated, children should receive all the antigens as per the EPI-recommended vaccination schedule before their first birthday. When a child fails to receive the subsequent dose of any one of the same or different recommended vaccines (one dose of BCG, three doses each of Penta and OPV, and one dose of MR1 vaccine, it is interpreted as a drop-out case. In CES 2016, the drop-out rate from Penta1-Penta3 was defined as the proportion of children who received Penta1, but failed to receive Penta3. Similarly, the drop-out rate from Penta1-MR1 was defined as the proportion of children who received Penta1 but failed to receive MR1.

Figure 55 presents the drop-out rates from Penta1-Penta3 and Penta1-MR1. Nationally, the Penta1-Penta3 drop-out rate was 1.4 percent, with the rate being slightly lower in rural areas (1.3 percent) than that in urban areas (2.0 percent). In comparison, the Penta1-MR1 drop-out rate was 4.0 percent as a whole, and 2.8 percentage points higher in urban areas (6.2 percent) than that in rural ones (3.4 percent).

Figure 55: Vaccination Drop-out Rates from Penta1-Penta3 and Penta1-MR1 by National Rural and Urban Areas in 2016



By sex, the drop-out rate from Penta1-Penta3 was slightly higher among females than that among males (1.5 percent vs. 1.4 percent). Nationally, a slightly higher proportion of females (4.1 percent) failed to receive MR1, compared to their male counterparts (3.9 percent) (see Figures 55a and 55b).

Figure 55a: Vaccination Drop-out Rate from Penta1-Penta3 by Sex at National Level in 2016

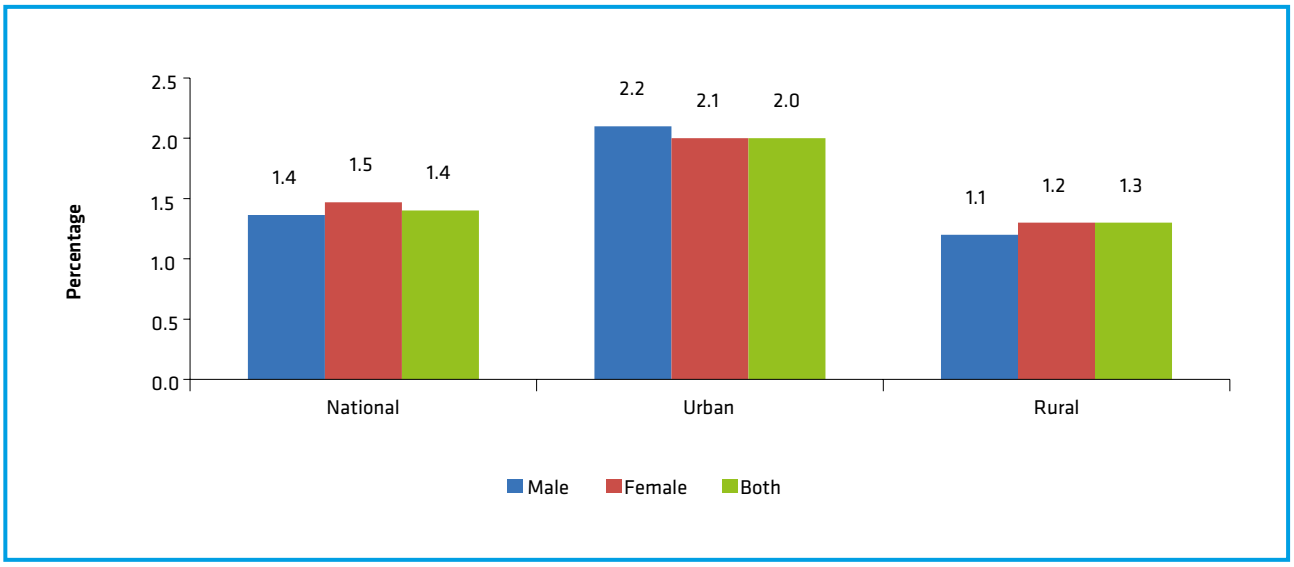


Figure 55b: Vaccination Drop-out Rate from Penta1-MR1 by Sex at National Level in 2016

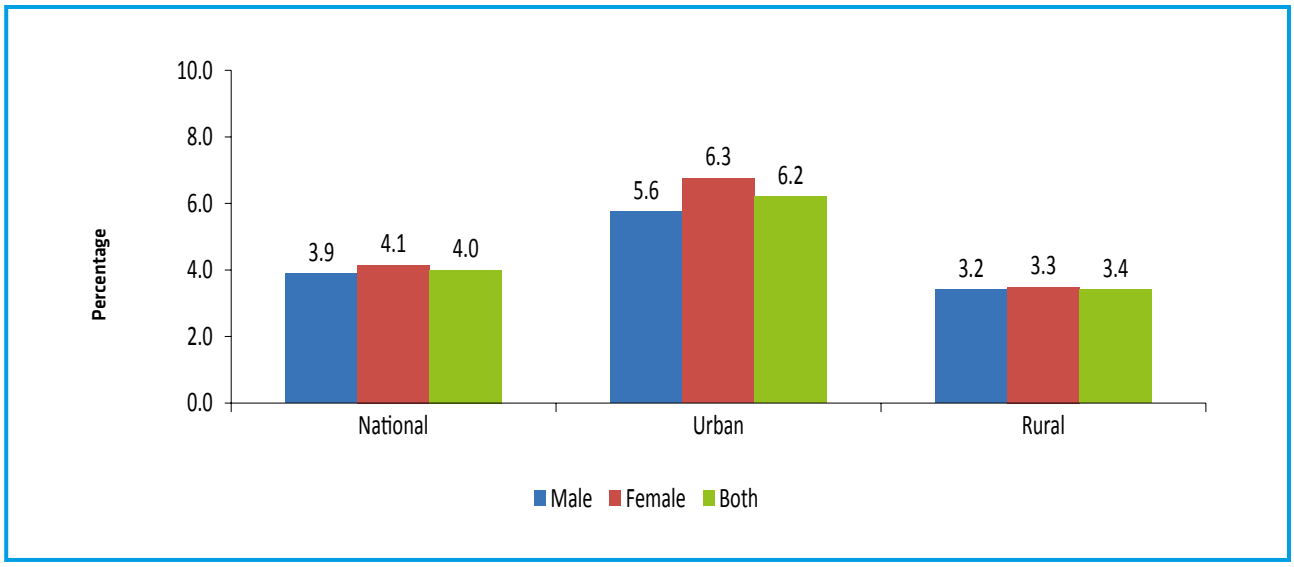


Figure 56 presents the drop-out rate by rural division. Among the eight divisions, the Penta1-Penta3 drop-out rate was found to be the highest in Dhaka division at 2.3 percent with the next highest considerably lower, at 2.2 percent, in Sylhet, and the lowest being 0.4 percent in Barisal division. However, Penta1-MR1 dropout rate was highest in Dhaka division at 5.1 percent and lowest in Barisal divisions (1.5 percent). The Penta1-MR1 drop-out rate ranged between 4.1 percent and 2.4 percent in other divisions.

Figure 56: Vaccination Drop-out Rates from Penta1-Penta3 and Penta1-MR1 in Rural Areas by Division in 2016

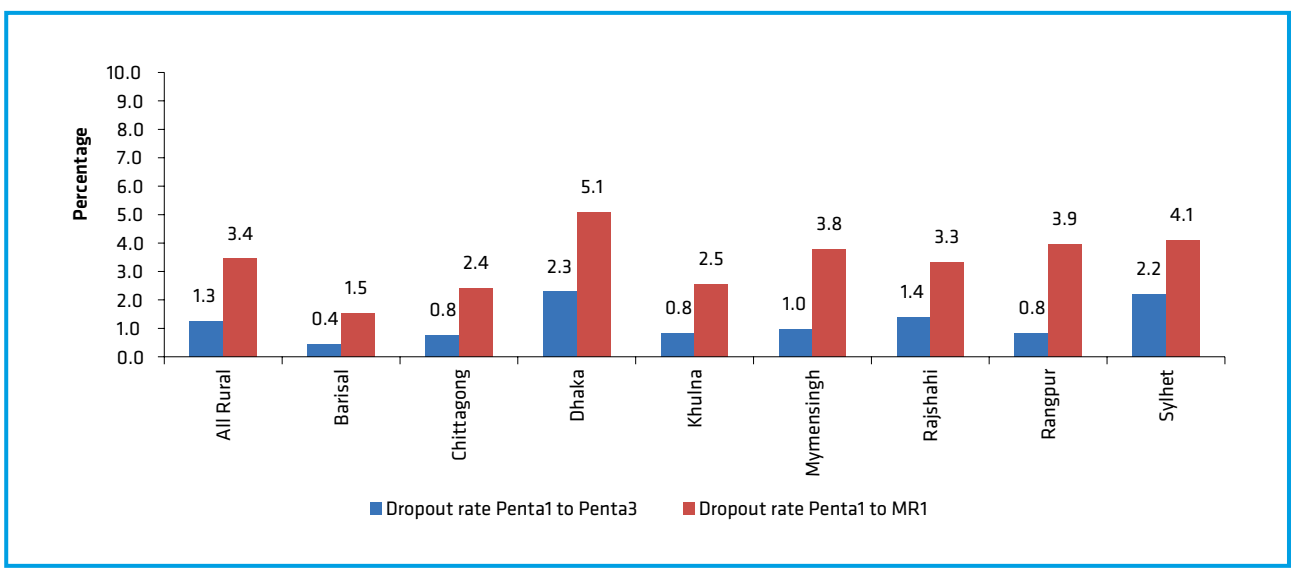
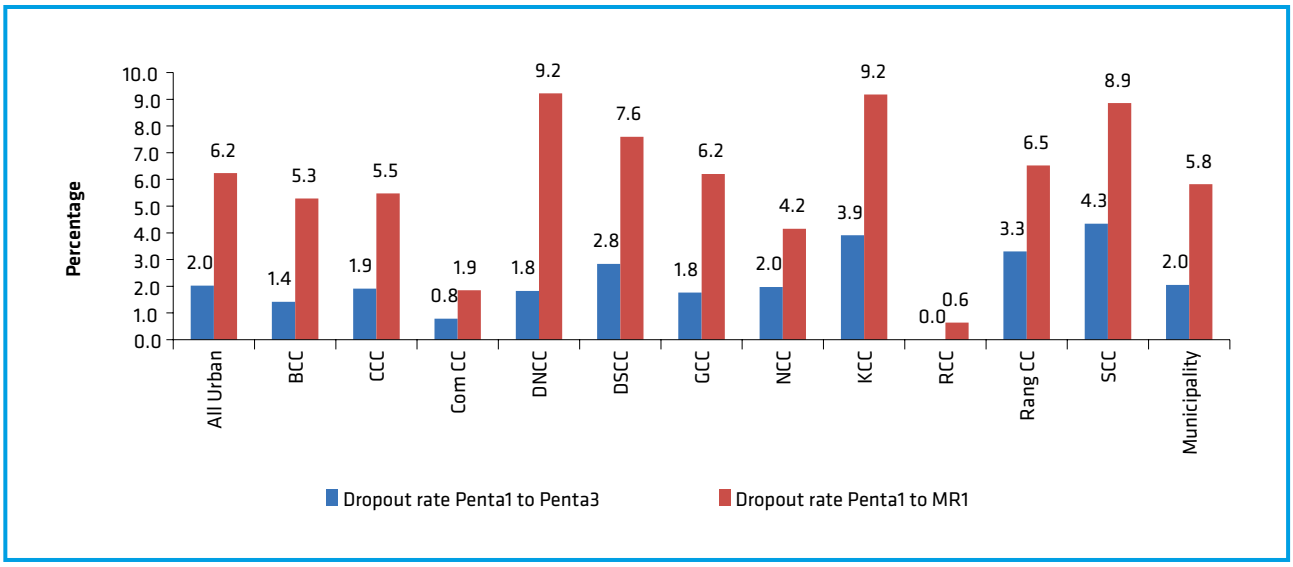


Figure 57 illustrates the drop-out rate in the urban context by city corporation. Among the city corporations, the highest Penta1-Penta3 drop-out rate ranged from 4.3 percent in SCC to 0.8 percent in Com CC, with no drop-out rate observed in RCC. Conversely, the Penta1-MR1 drop-out rate was highest in DNCC and KCC (9.2 percent each) and the lowest in Com CC (1.9 percent). In other city corporations, the Penta1-MR1 dropout rate was between 4.2 percent and 8.9 percent.

Figure 57: Vaccination Drop-out Rates from Penta1-Penta3 and Penta1-MR in Urban Areas by City Corporation and Municipality in 2016

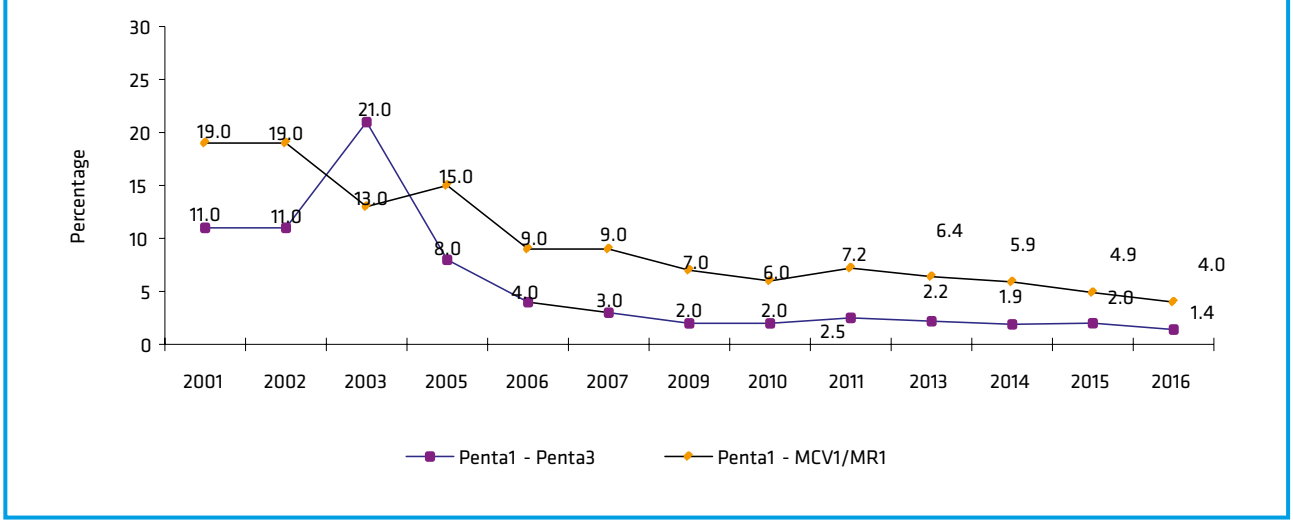


3.4.3.1 Trend in National Drop-out Rates

In analysis of the trend in national drop-out rates, considerable improvement can be seen in the rates of over a decade ago. The drop-out rate for Penta1-Penta3 vaccinations fluctuated from 2001 to 2005, when it rose from 11.0 percent to 21.0 percent (see Figure 58). After the high of 2003, it again dropped to 8.0 percent in 2005, and decreased down to 2.0 percent in 2009. Since then, it has ranged around 2.0 percent, including in 2016, when it was at 1.4 percent.

The declining trend was also observed for Penta1-MCV1/MR1 drop-out rate. Penta1-MCV1/MR1 drop-out rate decreased by 4 percentage points- from 19.0 percent in 2001 to 15.0 percent in 2005, when it, too, began a sharp decline by 11 percentage points to 4.0 percent in 2016. While not as stable as the Penta1-Penta3 rate, it has ranged between 7.0 percent and 4.0 percent since 2009.

Figure 58: Annual Trend in National Vaccination Drop-out Rates for Penta1-Penta3 and Penta1-MCV1/MR1 from 2001-2016



3.4.3.2 Trend in the Divisional Drop-out Rates

Figures 59-64 show the trend in the divisional drop-out rate from Penta1-Penta3 and Penta1-MCV1/MR1 (Rangpur divisions' figures are included in the Rajshahi divisions' figures before 2010, the year Rangpur became its own division). The figures suggest that the trend of both Penta1-Penta3 and Penta1-MCV1/MR1 drop-out rates are on a declining trend since 2005; but fluctuations still remained in some divisions. Barisal division reached 0.5 percent in 2016, which was the lowest level among all the divisions. The second lowest drop-out rate was observed in Chittagong division- at 0.9 percent.

During the period between 2001 and 2016, Penta1-MCV1/MR1 drop-out rate decreased at an even more rapid pace than Penta1-Penta3 for all divisions. After high in the 2001 that ranged from 11.1 percent in Khulna to 4.7 percent in Sylhet, most of the divisions experienced a very steep decline through the next decade. By 2010, Sylhet's rate was 37 percentage points lower, at 9.0 percent, and Barisal declined 17 percentage points to 5.0 percent, a trend that the other divisions shared. By 2010, the divisions had reached rates of 3.0 percent in Rajshahi to 9.0 percent in Sylhet. Since then, most of the divisions experienced an increase in 2011, but have again either stabilized or declined with the exception of 2014 when Khulna division had increased drop-out rates from 4.0 percent in 2010 to 6.1 percent in 2014. As of the CES 2016, the lowest Penta1-MCV1/MR1 dropout rate was in Barisal at 1.8 percent, and the highest in Dhaka, at 5.9 percent.

The trend analysis also suggests that compared to CES 2015, both Penta1-Penta3 and Penta1- MCV1/MR1 drop-out rates decreased in all divisions in CES 2016.

Figure 59: Annual Trend in Vaccination Drop-out Rates for Penta1-Penta3 and Penta1-MCV1/MR1 in Barisal Division from 2001 to 2016

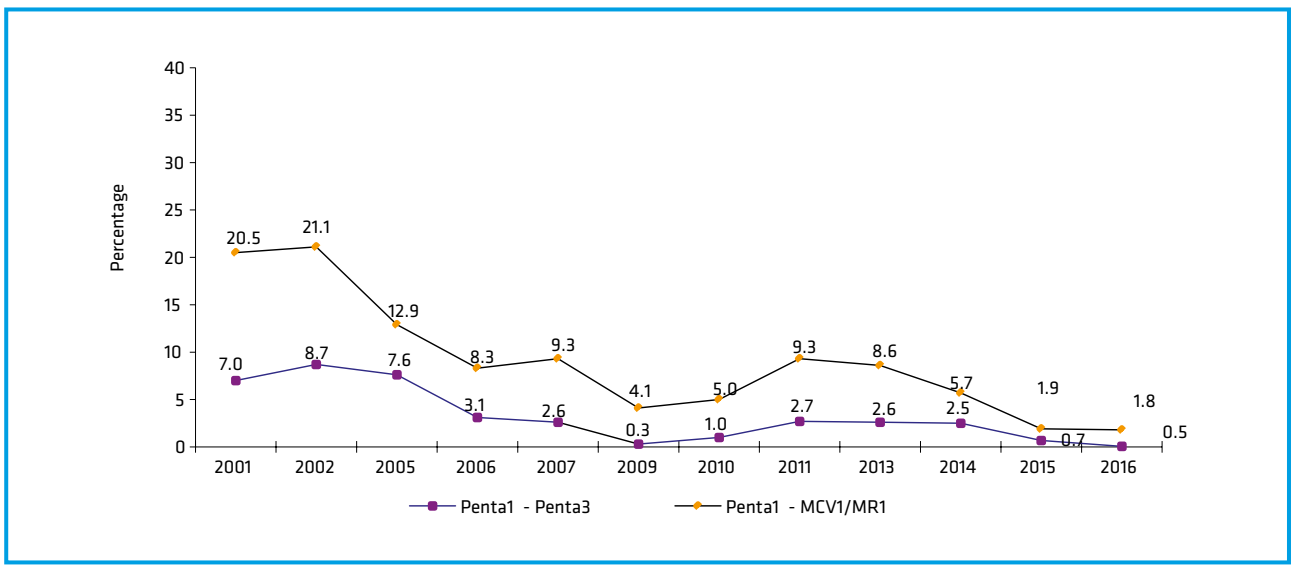


Figure 60: Annual Trend in Vaccination Drop-out Rates for Penta1-Penta3 and Penta1-MCV1 /MR1 in Chittagong Division from 2001 to 2016

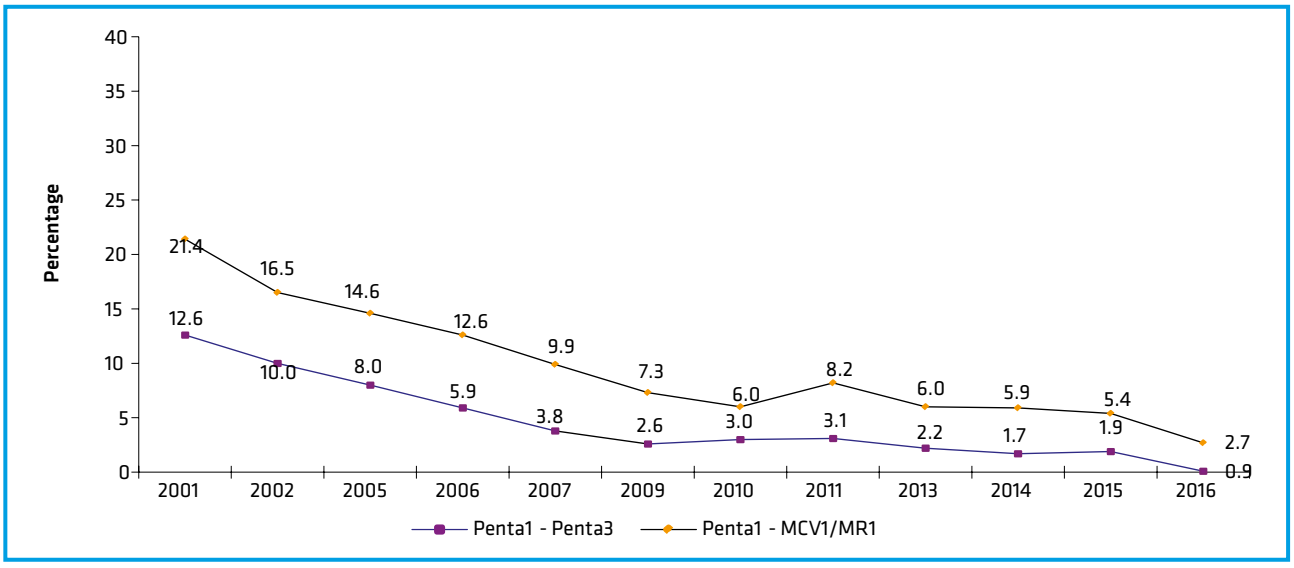


Figure 61: Annual Trend in Vaccination Drop-out Rates for Penta1-Penta 3 and Penta1-MCV1/MR1 in Dhaka Division from 2001 to 2016

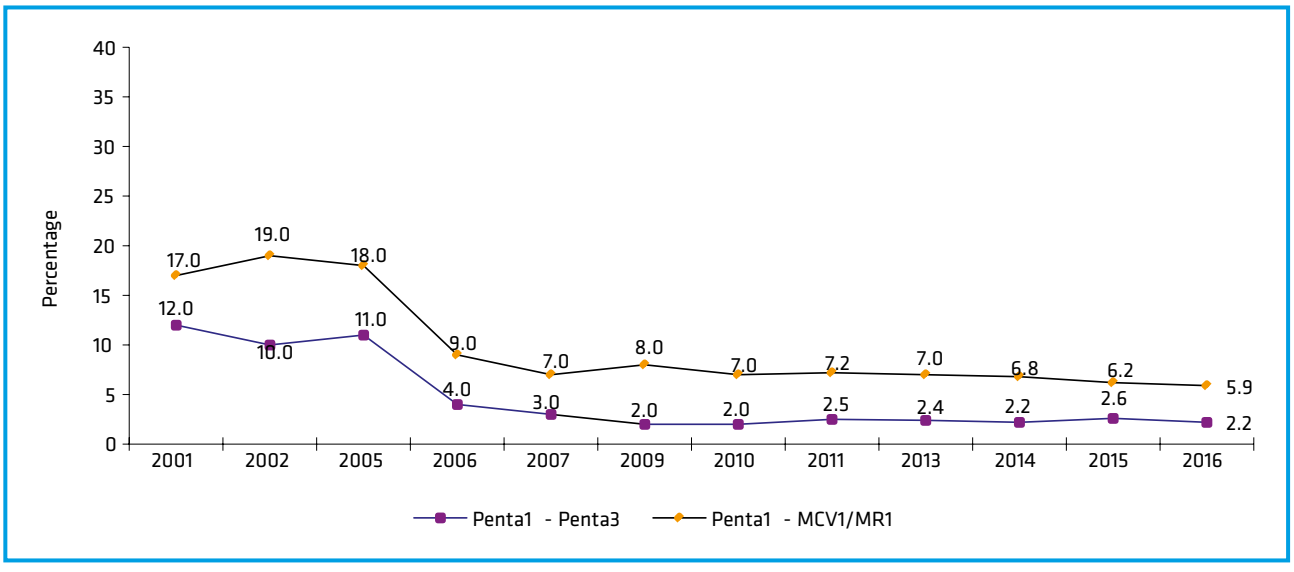


Figure 62: Annual Trend in Vaccination Drop-out Rates for Penta1-Penta3 and Penta1-MCV1/MR1 in Khulna Division from 2001 to 2016

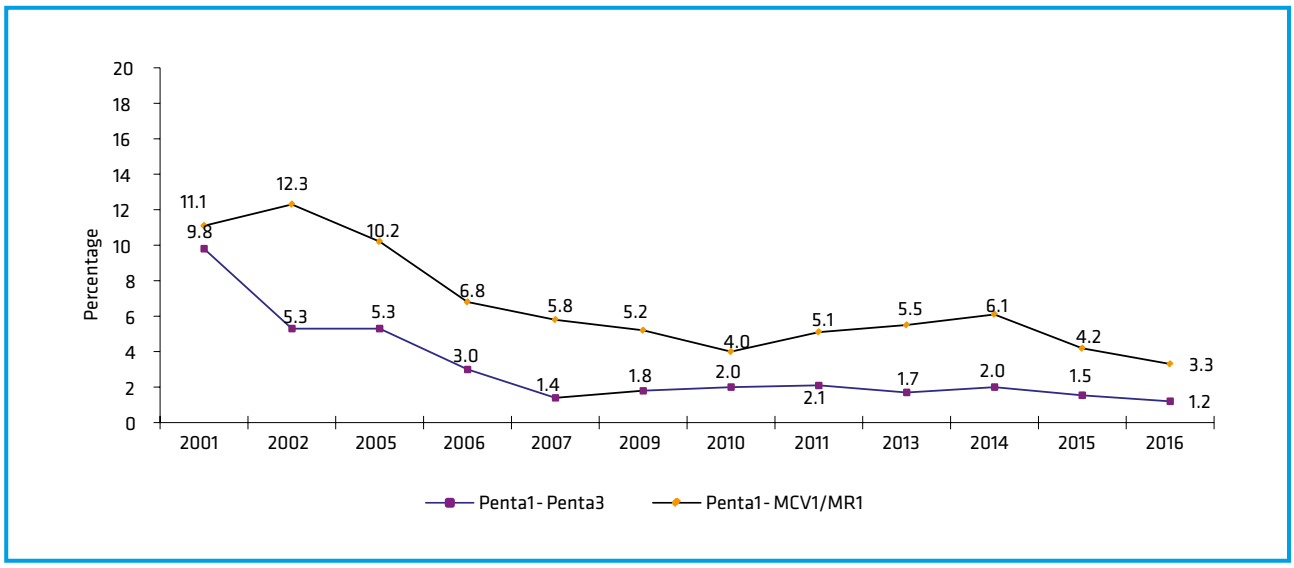
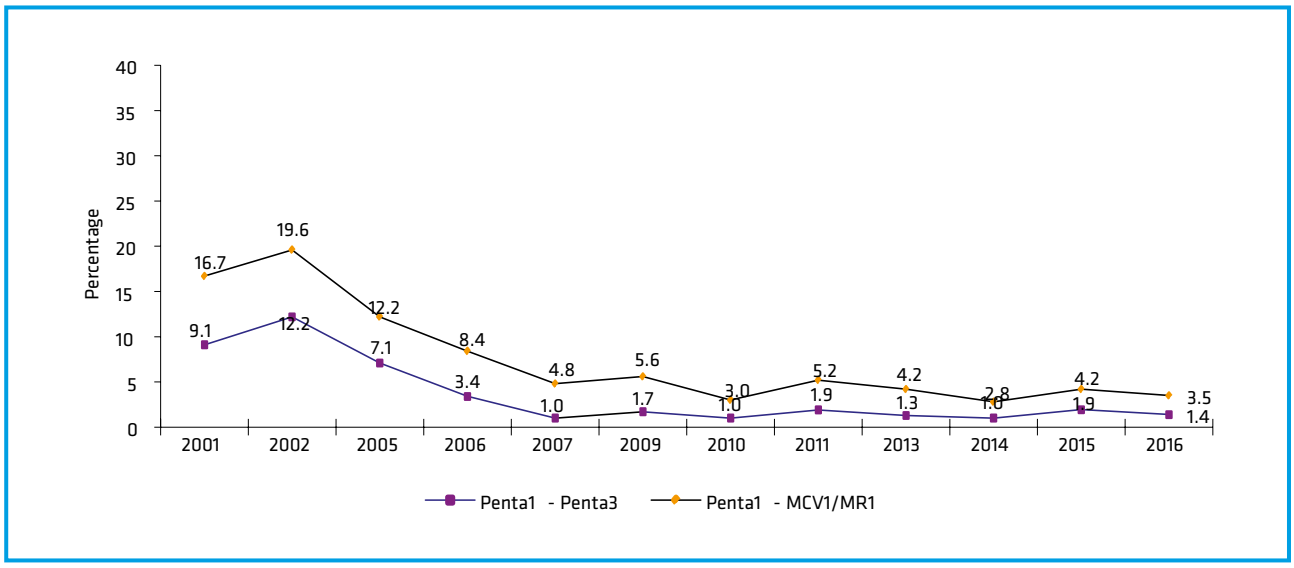
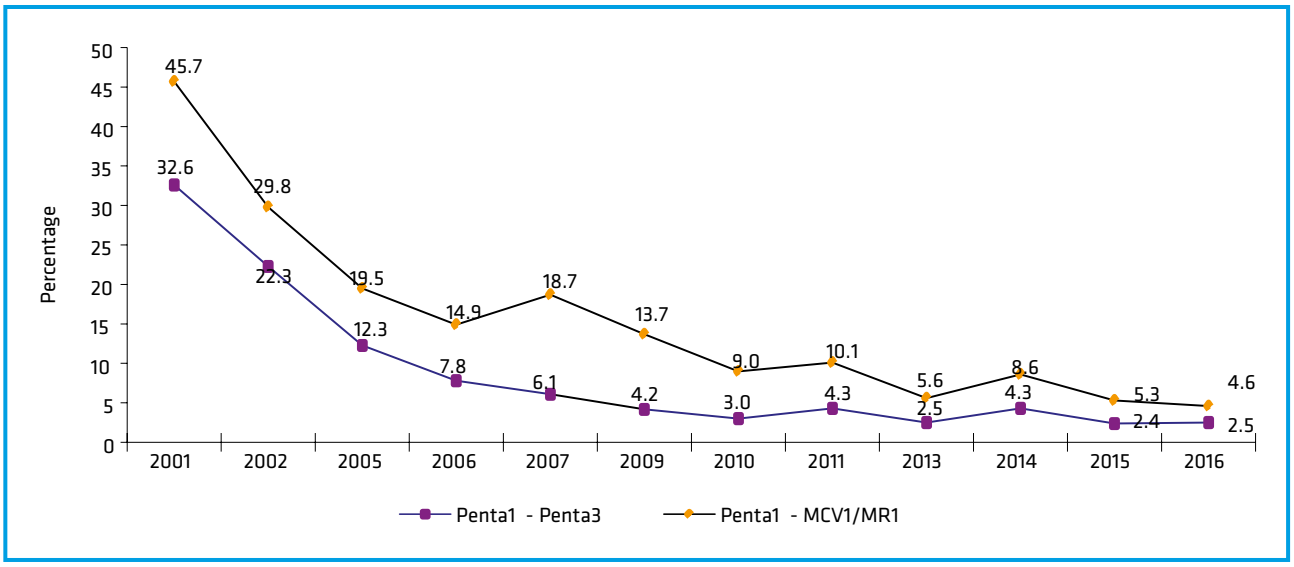


Figure 63: Annual Trend in Vaccination Drop-out Rates for Penata1-Penta3 and Penta1-MCV1/MR1 in Rajshahi Division* from 2001 to 2016



**** Before 2010 Rangpur division included in Rajshahi division***

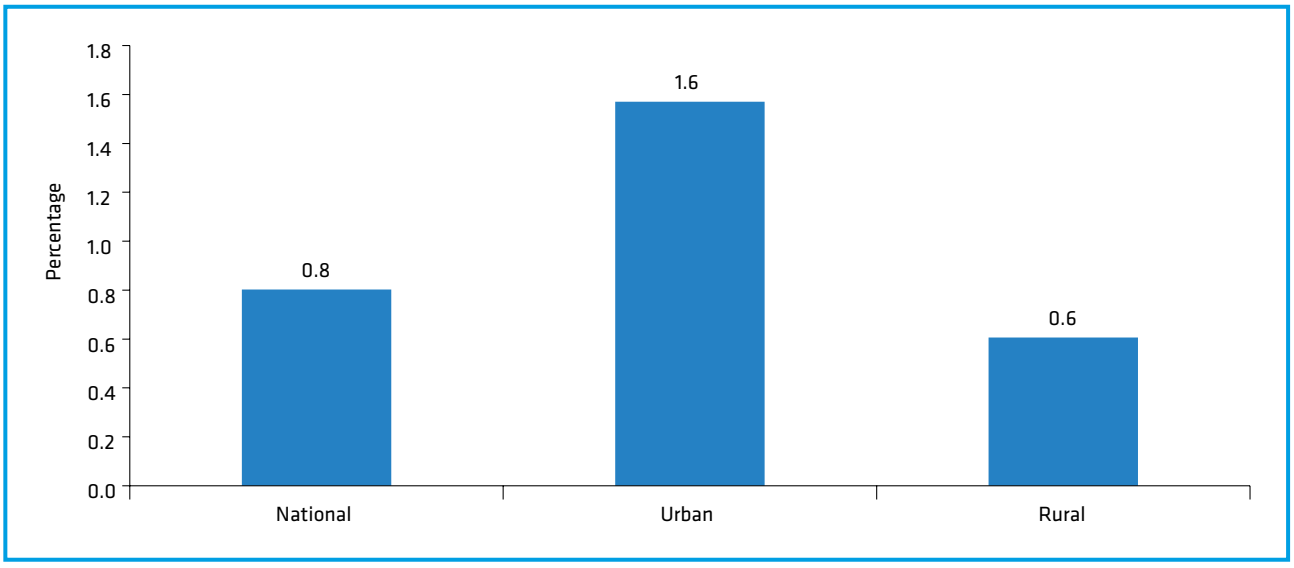
Figure 64: Annual Trend in Vaccination Drop-out Rates for Penta1-Penta3 and Penta1-MCV1/MR1 in Sylhet Division from 2001 to 2016



3.4.4 Adverse Events Following the Immunization

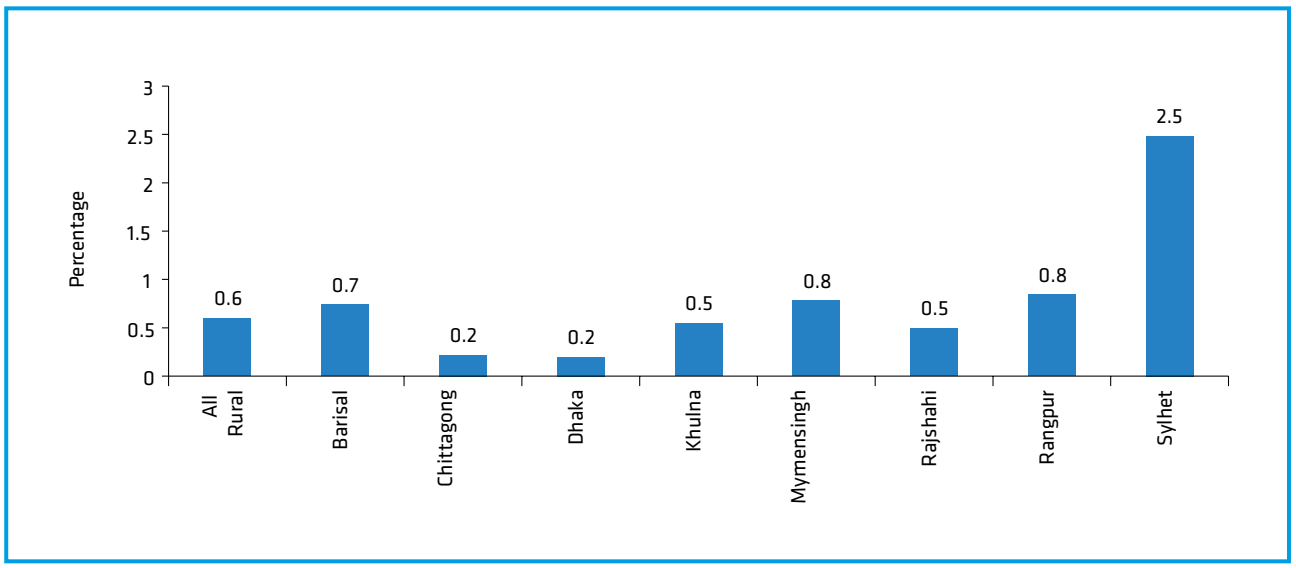
In rare cases, adverse events may occur following vaccination. In CES 2016, mothers/caregivers at Penta or MR1 vaccinations were asked about adverse events. Nationally, 0.8 percent of the mothers/caregivers of vaccinated children reported that their children developed abscesses as a form of AEFI after receiving Penta or MR1 vaccines, with very little difference between children in urban (1.6 percent) and rural (0.6 percent) areas (see Figure 65).

Figure 65: Incidence of Abscess Following Pentavalent or MR1 Vaccination in National, Rural and Urban Areas in 2016



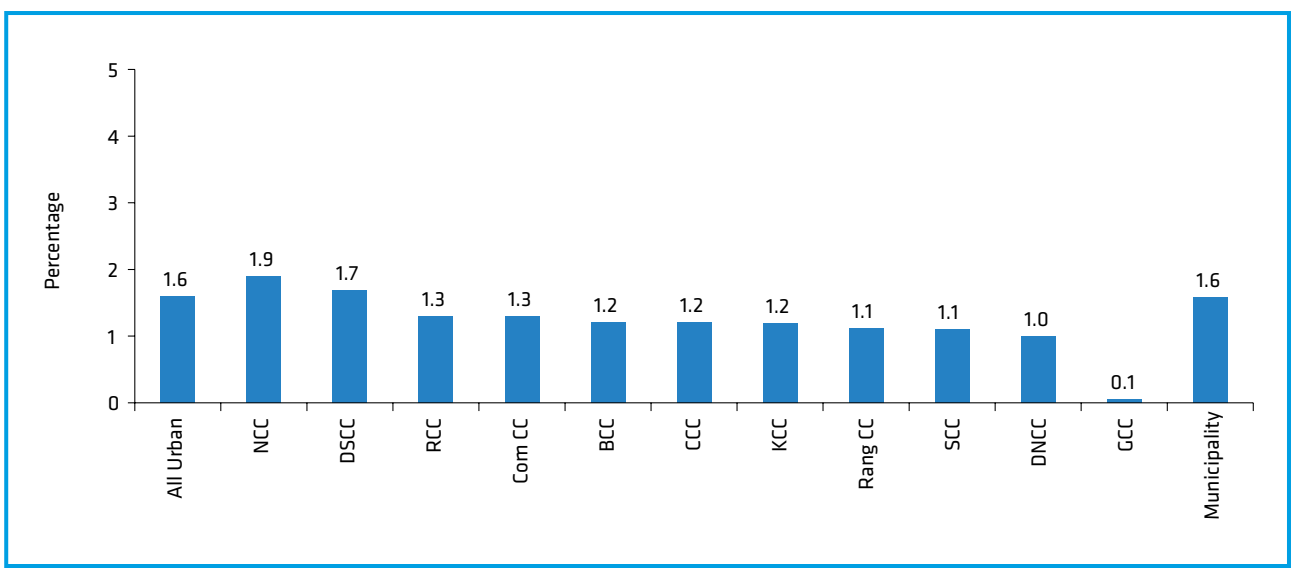
In rural areas, the division with the highest proportion of children who experienced abscesses was Sylhet (2.5 percent) and the lowest proportion was in Chittagong and Dhaka divisions (0.2 percent). In other divisions, the rate ranged between 0.5 percent and 0.8 percent.

Figure 66: Incidence of Abscess Following Pentavalent or MR1 Vaccination in Rural Areas by Division in 2016



Among the city corporations, the incidence of adverse events was the highest in NCC, (1.9 percent), followed by DSCC (1.7 percent), RCC and Com CC (1.3 percent each), BCC, CCC and KCC (1.2 percent each), Rang CC, SCC (1.1 percent each), DNCC (1.0 percent) and the lowest in GCC (0.1 percent).

Figure 67: Incidence of Abscess Following Pentavalent of MR1 Vaccine in Urban Areas by City Corporation and Municipality in 2016



3.4.5 Knowledge about the Common Side-Effects of Vaccination

CES 2016 assessed the knowledge of mothers/caregivers regarding the minor side-effects caused by vaccination. Overall, fever was the most reported known side-effect. Nationally, by 94.3 percent of the mothers/caregivers and by 95.8 percent in urban areas and 93.9 percent in rural reported it (see Figure 68). Among rural divisions, more than 95.0 percent of the mothers/caregivers from Rangpur, Dhaka, Sylhet and Barisal reported that they knew that fever could be a side-effect (see Figure 69). Ninety- nine percent of the mothers/caregivers from Barisal division reported about it, which was followed by Rangpur (98.1 percent), Sylhet (96.9 percent), and Dhaka divisions (96.1 percent) (see Figure 69). Similarly, except in NCC more than 90.0 percent of the mothers/ caregivers from Rang CC, RCC, KCC, BCC, CCC, GCC, DSCC, DNCC, SCC, and Com CC reported about their knowledge of the possibility of fever (see Figure 70).

Figure 68: Knowledge on Adverse Events Following Vaccination by National, Rural and Urban Areas in 2016

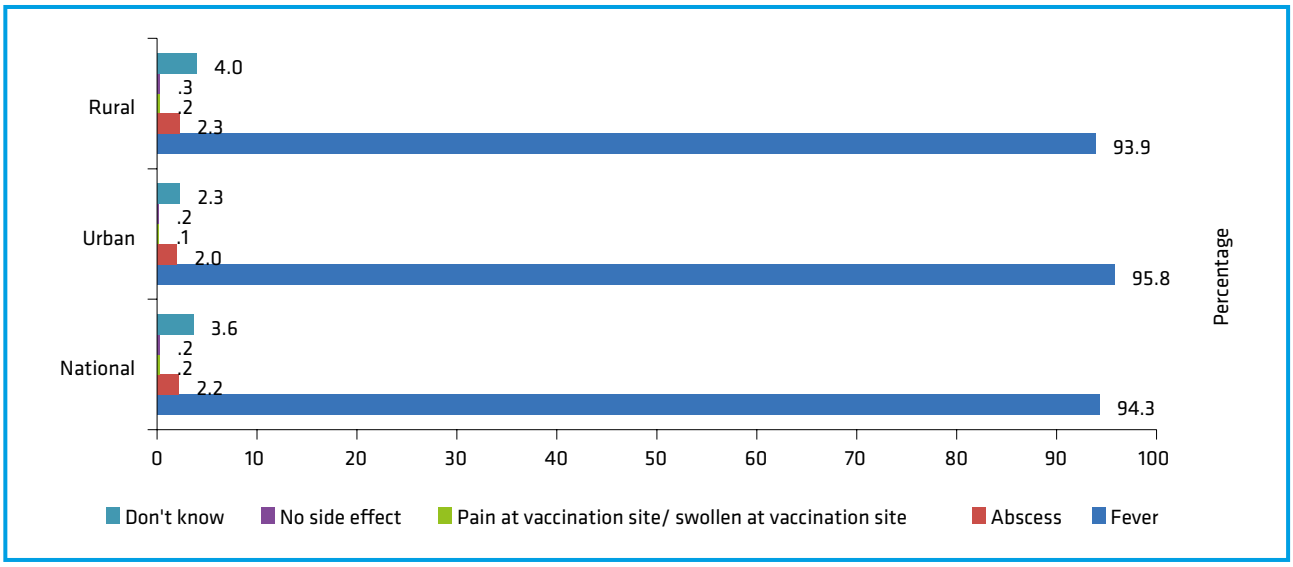


Figure 69: Knowledge on Adverse Events Following Vaccination in Rural Areas by Division in 2016

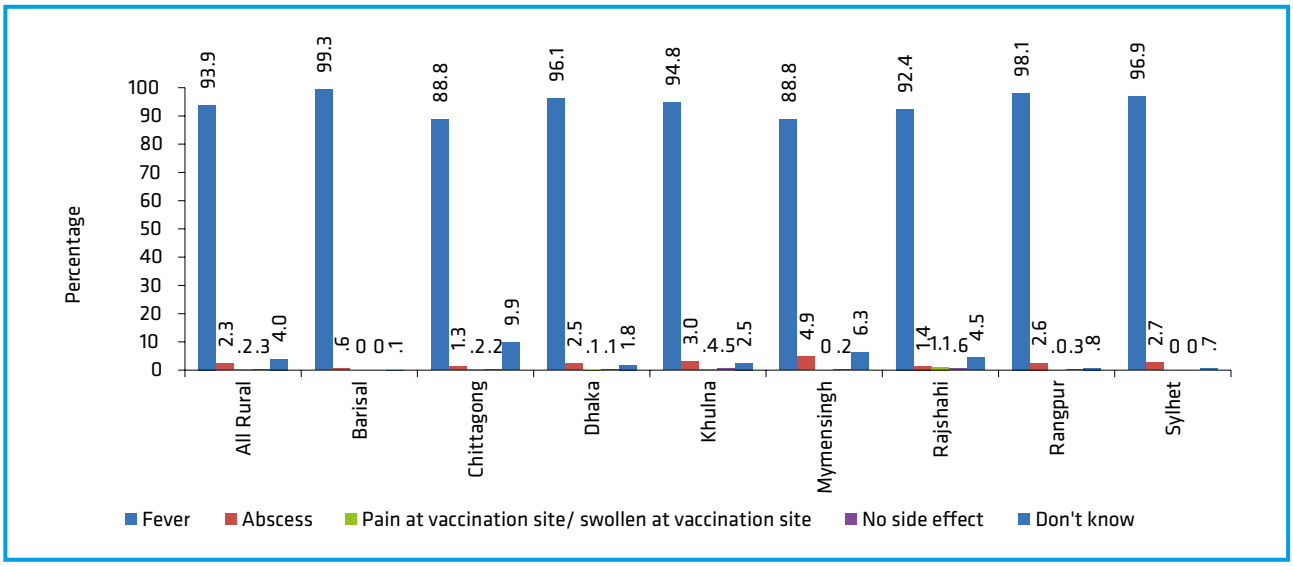
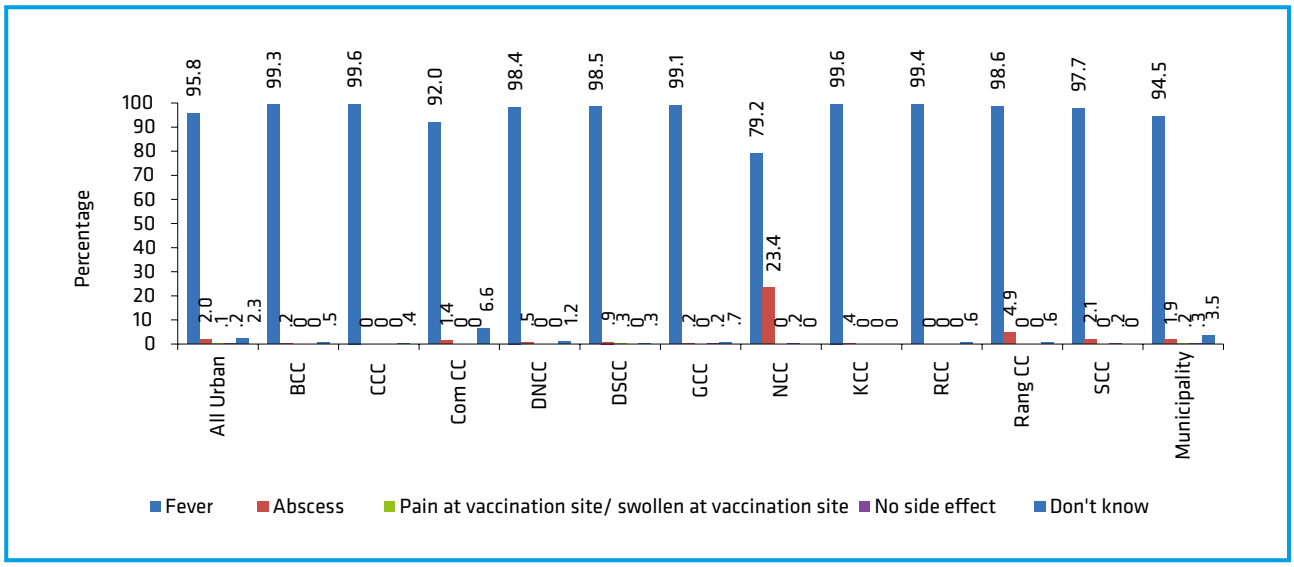


Figure 70: Knowledge on Adverse Events Following Vaccination in Urban Areas by City Corporation and Municipality in 2016



3.5 REASONS FOR NEVER VACCINATION OR PARTIAL VACCINATION

Left-outs, those who never received a vaccination, and drop-outs from subsequent doses result in low crude and valid vaccination coverage. CES 2016 addressed reasons for not receiving the vaccine. The findings are presented below.

3.5.1 Reasons for Never Vaccination

Among the surveyed children, less than 1 percent did not receive any vaccine. Table 5 presents reasons for never vaccinating the children, with reasons mentioned by the mothers/caregivers. The figure shows that about one in every twenty (18.2 percent) of the mothers were scared of side- effects. By residence, rural mothers/caregivers were more scared of the side-effects compared to their urban counterparts (20.9 percent vs. 7.1 percent). Fourteen percent of them were unaware of vaccination service. More than one in every ten mothers/caregivers reported that they do not believe in vaccination (13 percent) followed by the other cause- due to illness of child (10.4 percent), mothers/caregivers was at home (6.7 percent), unaware of vaccination sites, and time of vaccine (5.0 percent each), mothers and caregivers were busy with household chores (5.0 percent).

Reasons for never vaccination by rural divisions and city corporations are presented in Table 6 and Table 7, respectively.

Table 5: Reasons for Never Vaccination by National, Rural and Urban Areas in 2016

Reasons	National	Urban	Rural
Fearing side effects	18.2	7.1	20.9
Didn't know that my child should be given vaccine	13.7	19.1	12.7
Don't believe in vaccination	13.2	14.4	13.0
The child was sick, so was not taken to the vaccination center	10.4	6.4	11.3
Was not at home	6.7	22.1	3.1
Didn't know where to go for vaccine	5.1	4.3	6.3
Didn't know when to go for vaccine	5.0	1.0	5.9
Was busy and so couldn't give vaccine	5.0	2.6	5.5
The child was sick, so the vaccinator didn't give	4.1	0.0	5.0
The session time was inconvenient	1.8	1.2	1.9
Didn't give importance	1.9	1.2	2.1
Child's father forbade	1.8	3.3	1.5
Vaccinator was not friendly	1.0	1.0	1.0
They charge money to take vaccine	0.7	3.6	0.0
Vaccine centre was too far	0.5	0.0	0.6
Mother was sick	0.4	0.0	0.4
Rumor	0.3	0.0	0.3
Others	10.4	13.8	9.6
Number	172	49	123

Table 6: Reasons for Never Vaccination in Rural Areas by Division in 2016

Reasons	All Rural	Barisal	Chittagong	Dhaka	Khulna	Mymensingh	Rajshahi	Rang-pur	Sylhet
Fearing side effects	20.9	17.6	3.6	18.1	18.9	22.9	9.7	21.0	52.5
Don't believe in vaccination	13.0	6.6	39.5	6.6	22.6	0		31.3	6.5
Didn't know that my child should be	12.7	10.7	16.3	3.9	7.6	0	54.2	0	0
The child was sick, so was not taken to the vacci	11.3	0	5.3	22.6	5.7	0	15.2	0	7.7
Didn't know where to go for vaccine	5.2	28.9	2.3	4.9	15.2	15.1	0.0	0	0.0
Didn't know when to go for vaccine	5.9	0	9.0		7.2	0	5.6	34.9	9.4
Was busy and so couldn't give vaccine	5.5	36.1	18.4	4.1	3.8	0	0	0	0
The child was sick, so the vaccinator Didn't give	5.0	0	0	12.0	3.2	10.8	0	0	3.0
Was not at home	3.1	0	0	0	0	8.7	0	0	14.5
The session time was inconvenient	1.9	0	1.2	6.0	0	0	0	0	0
Vaccinator was not friendly	1.0	0	0	0	4.8	0	0	12.8	0
Vaccine centre was too far	0.6	0	3.6	0	0	0	0	0	0
Mother was sick	0.4	0	0	0	4.3	0	0	0	0
Rumor	0.3	0	0	0	3.2	0	0	0	0
Others	9.6	0	0.0	11.0	0.0	42.5	15.4	0	6.4
Number	123	7	25	23	22	8	12	4	22

Table 7: Reasons for Never Vaccination by City Corporation and Municipality in 2016

	All Urban	BCC	CCC	Com CC	DNCC	DSCC	G CC	NCC	KCC	RCC	Rang CC	SCC	Municipality
Was not at home	22.1	0.0	0.0	55.6	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.6
Didn't know that my child should be	18.1	0.0	0.0	0.0	0.0	47.8	0.0	0.0	12.0	0.0	0.0	27.8	25.5
Don't believe in vaccination	14.4	0.0	26.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.8	21.4
Others	10.2	0.0	0.0	44.4	0.0	0.0	100.0	0.0	48.0	0.0	0.0	0.0	0.0
Fearing side effects	7.1	100.0	0.0	0.0	0.0	0.0	0.0	70.6	0.0	0.0	0.0	5.7	7.5
The child was sick, so was not taken to the vacci	6.4	0.0	26.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	5.5
Didn't know where to go for vaccine	4.3	0.0	21.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.8	0.0
They charge money to take vaccine	3.6	0.0	0.0	0.0	0.0	52.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Didn't know when to go for the second/t	3.5	0.0	26.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Was busy and so couldn't give vaccine	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7	0.0	0.0	19.0	0.0
The session time was inconvenient	1.2	0.0	0.0	0.0	0.0	0.0	0.0	29.4	0.0	0.0	0.0		0.0
Didn't know when to go for vaccine of M	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0
Vaccinator was not friendly	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	0.0	0.0
Number	49	1	4	2	1	2	1	3	8	0.0	0.0	16	11

3.5.2 Reasons for Partial Vaccination

Five percent of the surveyed children received partial vaccinations. Involvement of mothers/ caregivers with household chores was the most common reason for partial vaccination, with one in every five mothers/caregivers. A little over one-fifth of the mothers/caregivers (21.7 percent) residing in rural areas reported about their involvement in household chores for being the reason for partial vaccination of their children, as compared to 17.2 percent in urban areas. Nationally, lack of awareness about schedule of MR1 doses was reported by 15.2 percent of the mothers/caregivers as a reason for partial vaccination, 16.2 percent in rural areas and 13.2 percent in urban areas. Another 4.2 percent of the mothers reported about their unawareness of 2nd or 3rd dose Penta/OPV as a reason for partial vaccination, 4.3 percent in urban areas and 4.1 percent in rural areas. Nationally, illness of the child was reported as a reason for partial vaccination by 11.6 percent of the mothers/caregivers- 15.9 percent in urban and 9.6 percent in rural areas. This was being followed by the facts that mothers/caregivers were scared and that they forgot to vaccinate their children (9.7 percent)- 14 percent in urban areas and 7.8 percent in rural areas, scared of side effects (9.0 percent): 10.2. percent in rural and 6.3 percent in urban areas). A detail description of reasons for partial vaccination by rural divisions and city corporations are presented in the Table 9 and Table 10.

Table 8: Reasons for Partial Vaccination by National, Rural and Urban Areas in 2016

Reasons	National	Urban	Rural
Was busy and so couldn't give vaccine	20.3	17.2	21.7
Did not know when to go for vaccine of MR	15.2	13.2	16.2
The child was sick, so was not taken to the vaccination center	11.6	15.9	9.6
Don't remember	9.7	14.0	7.8
Fearing side effects	9.0	6.3	10.2
The session time was inconvenient	5.2	4.4	5.5
Didn't know that my child should be given vaccine	4.8	4.8	4.8
Didn't know when to go for the second/third dose	4.2	4.3	4.1
The child was sick, so the vaccinator didn't give	3.9	4.6	3.5
Didn't know where to go for vaccine	2.6	4.3	1.8
Was not at home	2.3	1.2	2.8
Did not have vaccination card	1.5	1.0	1.7
Don't believe in vaccination	1.2	1.4	1.1
There was no vaccine in the center	1.2	0.5	1.5
They charge money to take vaccine	0.9	1.3	0.8
Mother was sick	0.9	0.9	0.8
Vaccinator was not friendly	0.8	0.5	1.0
Injection was too painful for the child	0.8	0.6	0.8
Vaccine centre was too far	0.6	0.7	0.6
Health worker did not give	0.5	0.8	0.4
Was abscess at the place of vaccine	0.3	0.6	0.2
I thought the vaccinator would come home	0.3	0	0.4
Due to migration	0.2	0	0.3
Rumor	0.2	0	0.2
There was no vaccinator in the center	0.2	0.2	0.1
There was a long queue in the vaccination	0.1	0.1	0.1
Others	1.6	1.2	1.8
Number	1348	490	858

Table 9: Reasons for Partial Vaccination in Rural Areas by Division in 2016

Reasons	All Rural	Barisal	Chittagong	Dhaka	Khulna	Mymensingh	Rajshahi	Rangpur	Sylhet
Was busy and so couldn't give vaccine	21.7	24.9	30.1	15.0	29.6	9.1	22.2	23.3	29.1
Did not know when to go for vaccine of MR	16.2	45.4	11.1	13.2	12.5	16.7	20.4	26.7	5.0
Fearing side effects	10.2	3.8	8.6	3.6	15.8		11.5	9.0	37.5
The child was sick, so was not taken to the vaccination center	9.6	6.8	7.0	15.0	13.0	1.1	14.0	2.6	8.4
Don't remember	7.8	2.4	7.8	5.6	7.3	9.4	4.5	14.3	8.5
The session time was inconvenient	5.5	1.0	4.4	15.7	0	1.1	0	2.1	0
Didn't know that my child should be	4.8	2.5	7.0	2.2	0	14.2	0	2.3	0
Didn't know when to go for the second/t	4.1	1.8	3.3	3.6	2.2	4.1	6.7	6.5	1.9
The child was sick, so the vaccinator Didn't give	3.5	0	5.2	4.3	0	12.4	1.5	1.6	0.6
Was not at home	2.8	0	4.5	1.9	0	8.2	1.6	1.9	2.7
Didn't know where to go for vaccine	1.8	4.7	1.8	2.8	2.1	3.8	0	0	1.2
Did not have vaccination card	1.7	0	0	5.5	0	0	0	0	1.2
There was no vaccine in the center	1.5	0	3.3	1.4	0	0	3.7	0.9	0
Don't believe in vaccination	1.1	0	0	2.2	0.5	3.2		1.0	0
Vaccinator was not friendly	1.0	0	0.5	0.2	0.7	3.8	2.0	1.4	0
Injection was too painful for the child	0.8	0	0	1.5		2.9	1.4		0
Mother was sick	0.8	0	0	0.6	0.4	2.9	0.9	1.7	0
They charge money to take vaccine	0.8	0	0	2.5	0	0	0	0.5	0
Vaccine centre was too far	0.6	0	1.3	0.2	0	1.2	0	0.8	1.2
I thought the vaccinator would come home	0.4	0	0.8		0	0	2.6	0	0
Health worker did not give	0.4	0	0	0.7	0	0	1.9	0	0
Due to migration	0.3	0	0	0.6	0	0	1.2	0	0
Rumor	0.2	0	0.4	0	0	0	0	1.1	0
Was abscess at the place of vaccine	0.2	0	0.1	0	0	2.0	0		0
There was no vaccinator in the center	0.1	0	0.2	0	0	0	0	0.6	0
There was a long queue in the vaccination center	0.1			0	0	0	0	0.8	0
Others	1.8	6.7	2.4	1.7	2.3	3.7	1.0	0	0
Number	858	43	134	205	109	68	96	119	84

Table 10: Reasons for Partial Vaccination by City Corporation and Municipality in 2016

Reasons	All Urban	BCC	CCC	Com CC	DNCC	DSCC	GCC	NCC	KCC	RCC	Rang CC	SCC	Municipality
Was busy and so couldn't give vaccine	17.2	30.3	8.6	48.3	6.6	30.7	18.6	18.3	4.2	71.4	36.1	13.7	19.8
The child was sick, so was not taken to the vaccination center	15.9	12.6	15.7	9.2	23.5	17.5	5.8		10.2	28.6	29.5	21.8	14.4
Don't remember	14.0	0.0	0.0	0.0	29.0	11.9	13.6	5.8	27.9	0.0	0.0	6.1	10.0
Didn't know when to go for vaccine of MR vaccine	13.2	7.5	11.5	0.0	8.2	0.0	36.3	22.7	13.4	0.0	1.7	9.0	15.1
Fearing side effects	6.3	21.1	8.2	42.5	0.0	0.0	3.7	5.5	0.0	0.0	5.6	4.6	10.0
Didn't know that my child should be given vaccine	4.8	0.0	25.7	0.0	0.0	3.6	9.8		2.2	0.0	0.0	14.6	4.0
The child was sick, so the vaccinator didn't give	4.6	0.0	4.1	0.0	5.5	8.1	0.0		5.2	0.0	3.5	2.3	4.9
The session time was inconvenient	4.4	0.0		0.0	7.5	2.0	0.0	27.0		0.0	0.0	3.6	4.2
Did not know when to go for the second/third dose	4.3	3.7	17.5	0.0	2.1	8.6	0.0	12.8	5.2	0.0	0.0	18.9	2.5
Didn't know where to go for vaccine	4.3	24.8	0.0	0.0	11.7	7.1	0.0	7.9	0.0	0.0	1.7	2.0	1.4
Don't believe in vaccination	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	1.7	0.0	3.0
They charge money to take vaccine	1.3	0.0	0.0	0.0	2.1	4.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1
Was not at home	1.2	0.0	0.0	0.0	0.0		0.0	0.0	3.0	0.0	0.0	3.4	2.3
Did not have vaccination card	1.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0		0.0	11.6	0.0	1.4
Mother was sick	0.9	0.0	0.0	0.0	0.0	0.0	3.7	0.0	4.7	0.0	0.0	0.0	1.0
Health worker did not give	0.8	0.0	4.5	0.0	0.0	0.0	5.4	0.0	2.2	0.0	0.0	0.0	0.0
Vaccine centre was too far	0.7	0.0	0.0	0.0	2.1	2.5	0.0	0.0	0.0	0.0	4.3	0.0	0.0
Was abscess at the place of vaccine	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Injection was too painful for the child	0.6	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
There was no vaccine in the center	0.5	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.6
Vaccinator was not friendly	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.9
There was no vaccinator in the center	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
There was a long queue in the vaccination center	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Will give vaccine in future	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		2.2	0.0	0.0
Others	1.2	0.0	0.0	0.0	0.0	3.8	0.0	0.0	15.9	0.0	0.0	0.0	0.8
Number	490	25	24	7	43	35	28	21	42	3	40	44	178

3.6 KNOWLEDGE ABOUT THE NUMBER OFVISITS REQUIRED FOR COMPLETE VACCINATION

As a mother/caregiver should make five visits to a vaccination centre to complete all the scheduled vaccines for her/ his children, CES 2016 appraised the knowledge of mothers/caregivers about the minimum number of visits required. About half of the mothers/caregivers (49.0 percent) reported that they knew about the required 5 visits to the vaccination center, with almost similar level of knowledge both in urban (52.5 percent) and rural (48.2 percent) areas (see Figure 71). Among the rural divisions, knowledge about the five visits was found to be the highest in Sylhet division (65.9 percent) and the lowest in Barisal division (29.0 percent) (see Figure 72). In the urban context, the proportion of the mothers/caregivers who had knowledge of the five required visits varied widely- from 90.5 percent to 20.9 percent (see Figure 73).

Figure 71: Knowledge of Number of Visits Required to Have Child Fully Vaccinated by National, Rural and Urban Areas in 2016

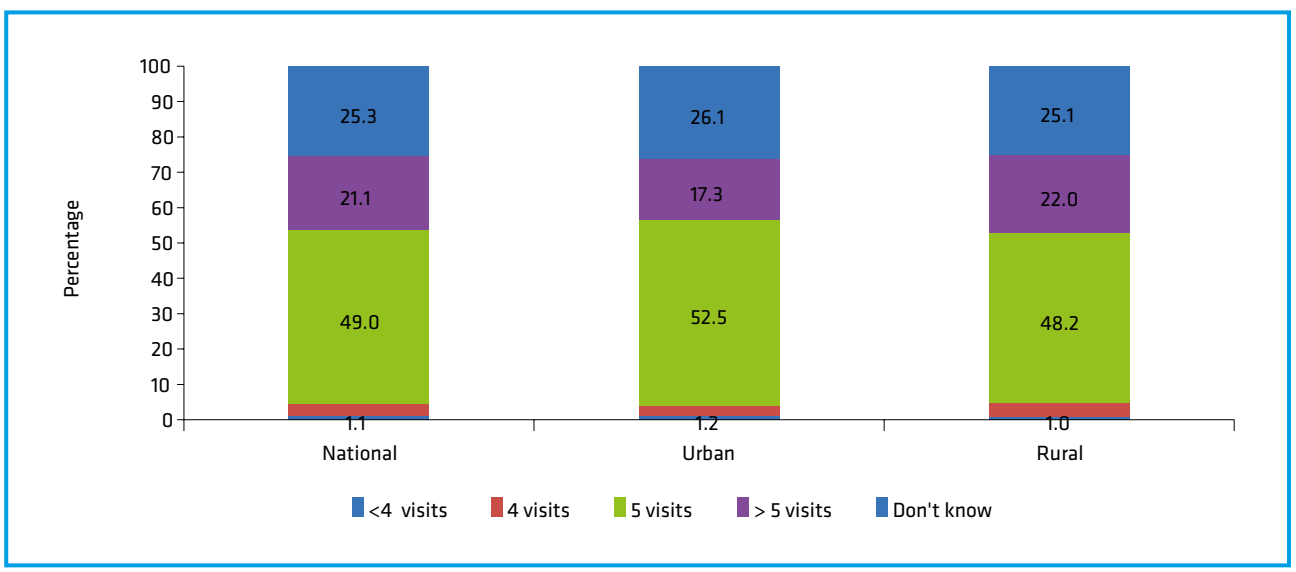


Figure 72: Knowledge on Number of Visits Required to Have a Child Fully Vaccinated in Rural Areas by Division in 2016

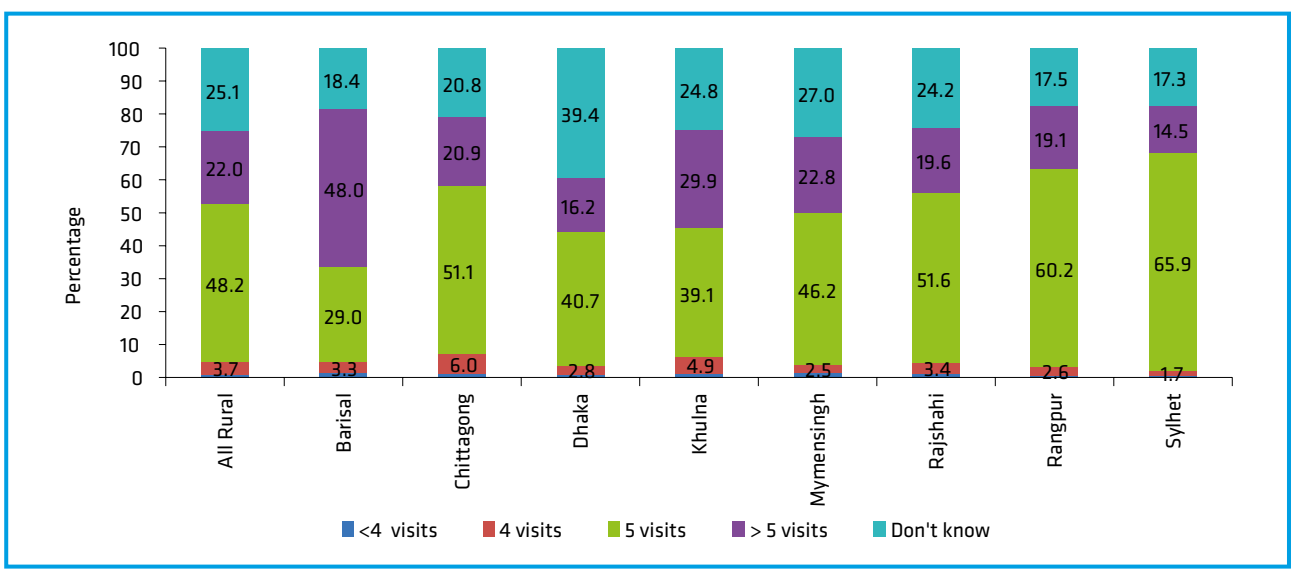
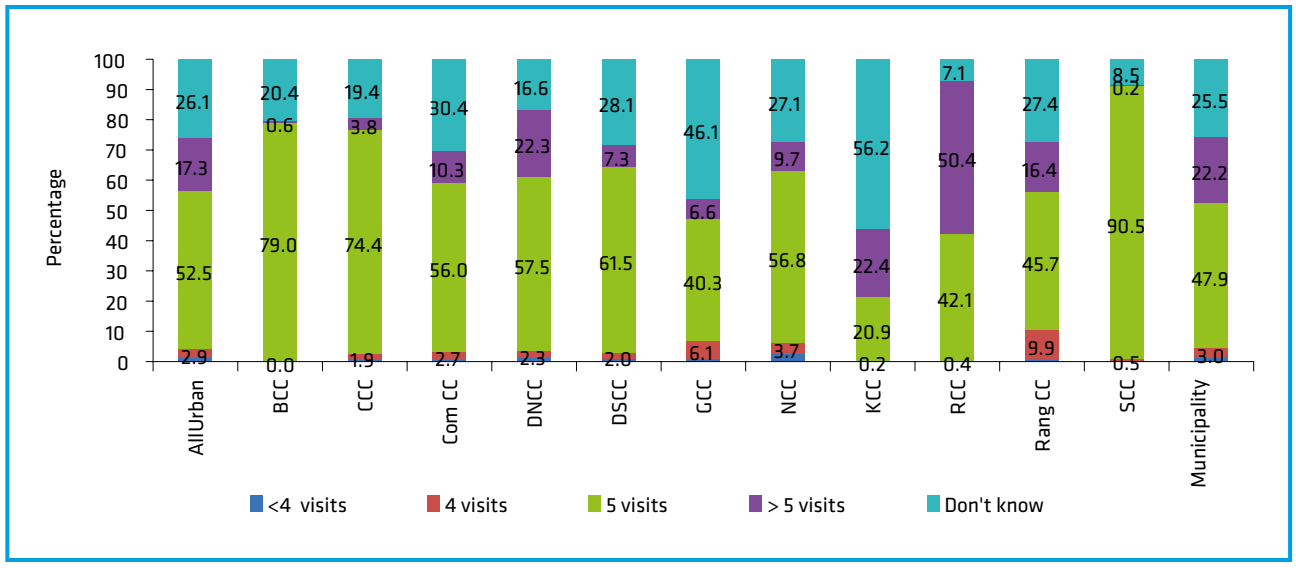


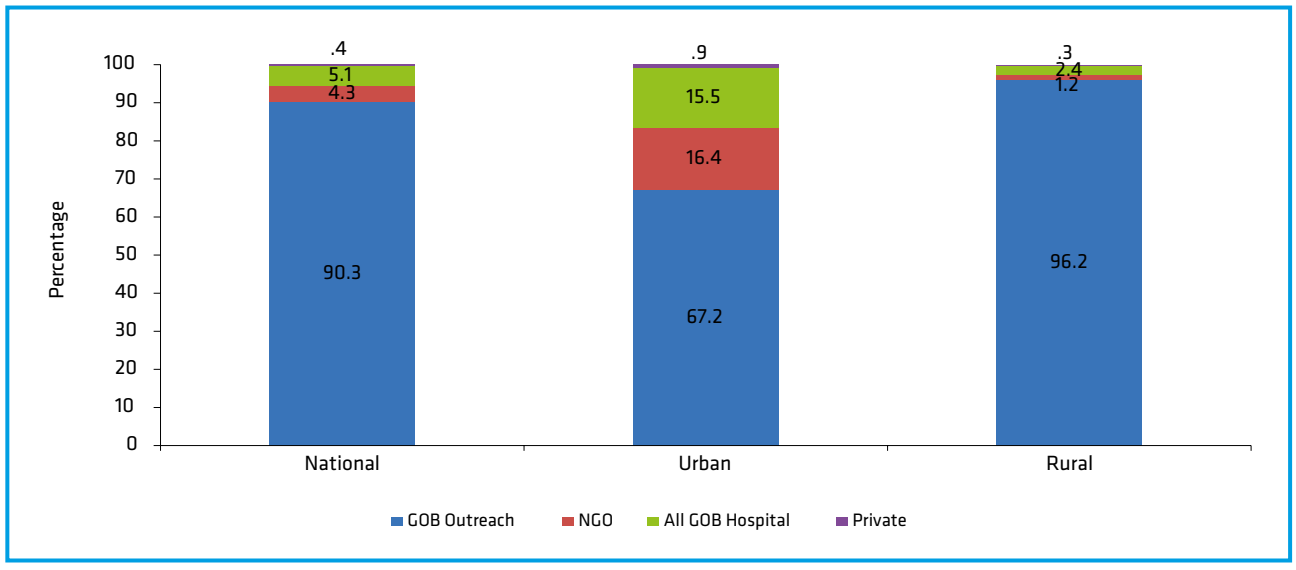
Figure 73: Knowledge on Number of Visits Required to Have a Child Fully Vaccinated in Urban Areas by City Corporation and Municipality in 2016



3.7 SOURCES OF CHILDHOOD VACCINATION

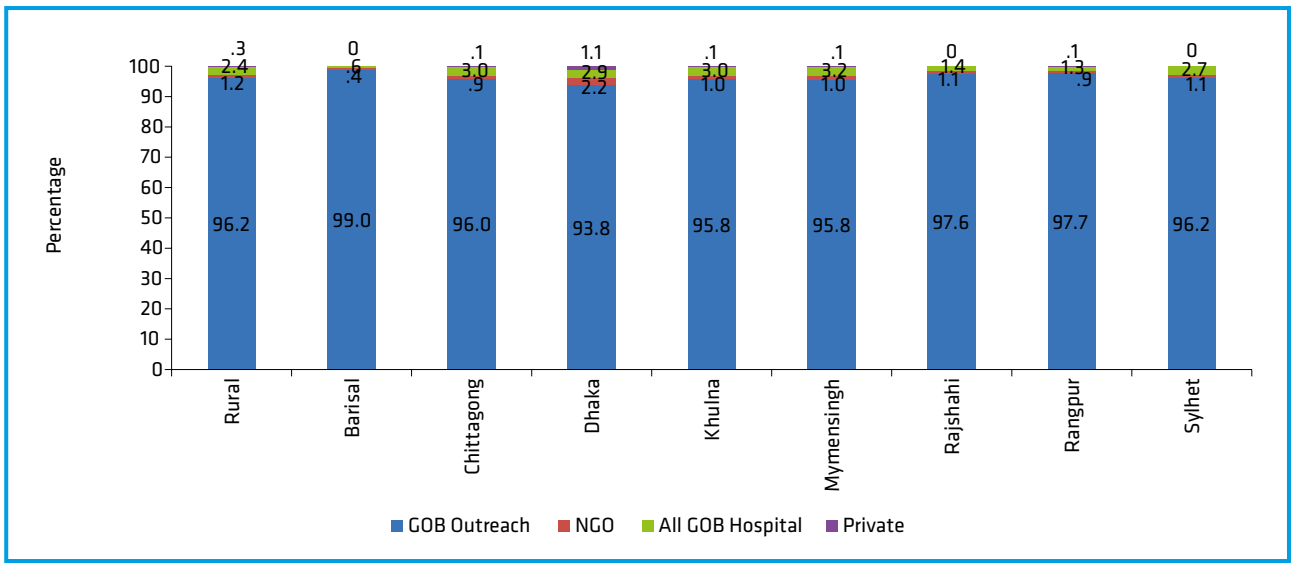
Children can receive vaccinations from a number of sources: GoB outreach centres or hospitals, NGO hospitals / clinics, or outreach centers, private hospitals, or clinics. These options for sources of Penta1 vaccine are presented in Figures 74-76. Overall, 90.3 percent of the children received Penta1 vaccine from the GoB outreach centers, in 96.2 percent of cases in rural areas and 67.2 percent of cases in urban areas. Nationally, the other sources included GoB hospitals (5.1 percent) and NGO or private hospitals (4.3 percent) (see Figure 74).

Figure 74: Source of Penta1 Vaccination by National, Rural and Urban Areas in 2016



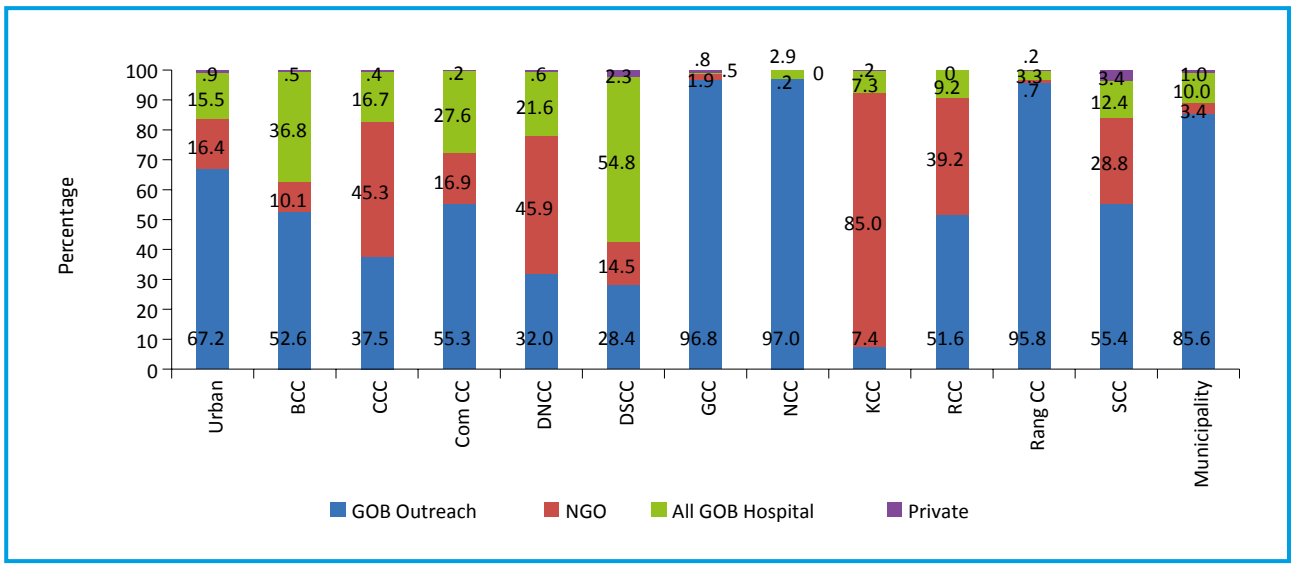
By rural division, the highest proportion of vaccine recipients who received Penta1 from GoB outreach centers ranged from 99.0 percent in Barisal division to 93.8 percent in Dhaka. In rural divisions, private and NGO hospitals and clinics were the source of Penta1 vaccine in less than 1.5 percent of cases (see Figure 75).

Figure 75: Source of Penta1 Vaccination in Rural Areas by Division in 2016



In city corporations, government facilities were again the prime source of Penta1 vaccination, except in DNCC and KCC, where 85.0 percent in KCC and 45.9 percent in DNCC received Penta1 from NGO clinics or hospitals. In other city corporations, the proportion of children who received Penta1 from NGO clinics or hospitals ranged between 45.3. percent and 0.2 percent. As for private sources, the highest proportion of the children who received Penta1 from private facilities was in SCC (3.4 percent), while in RCC and NCC, no child received Penta1 from private clinics or hospitals (see Figure 76).

Figure 76: Source of Penta1 Vaccination in Urban Areas by City Corporation and Municipality in 2016



3.8 RELATION BETWEEN SOURCE AND BCG VACCINATION GAP

Table 11 shows the gap between the date of child birth and the date of receiving BCG by the source of BCG vaccination. It shows that overall 3.2% of the children received BCG within 7 days of their birth. Among them, 0.3 percent received it from NGO clinic and 0.2 percent from government hospitals. The analysis shows that the percentage of children who received BCG within 7 days and 8-42 days and more than 42 days of birth was higher in number in outreach site than those who received it from different GO, NGOs, and private clinics/hospitals.

Table 11: Source of BCG by the Gap of BCG Vaccination after the Child Born

Gap of Vaccination from the date of Child born	Source of BCG in Percentage				
	National	GoB Outreach	NGO (Hospital, Clinic, Outreach)	All GoB Hospital	Private (Hospital, Clinic, Outreach)
Upto 7 days	3.2	2.7	0.3	0.2	0.0
8-42 days	35.2	32.8	1.2	1.1	0.1
More than 42 days	61.6	55.9	2.1	3.3	0.3
Number	29625	26638	1308	1587	92

3.9 AVAILABILITY OF BIRTH CERTIFICATE AMONG SURVEYED CHILDREN (12-23 MONTHS OLD CHILDREN)

Nationally, 15.3 percent of the children had their birth certificates available; urban children are more likely to have the certificates compared to their rural counterparts (17.4 percent vs. 14.8 percent) (see Figure 77). Among the rural divisions, availability of birth certificate was the highest in Sylhet (32.8 percent) and the lowest in Rajshahi (4.7 percent) divisions (see Figure78). Among the city corporations, availability of birth certificate was the highest in RCC (40.8 percent) and the lowest in DNCC (5.1 percent). Moreover, 17.7 percent of children residing in municipality areas had birth certificate (see Figure 79).

Figure 77: Percentage Distribution of Children by Availability of Birth Certificate by National, Rural and Urban Areas in 2016

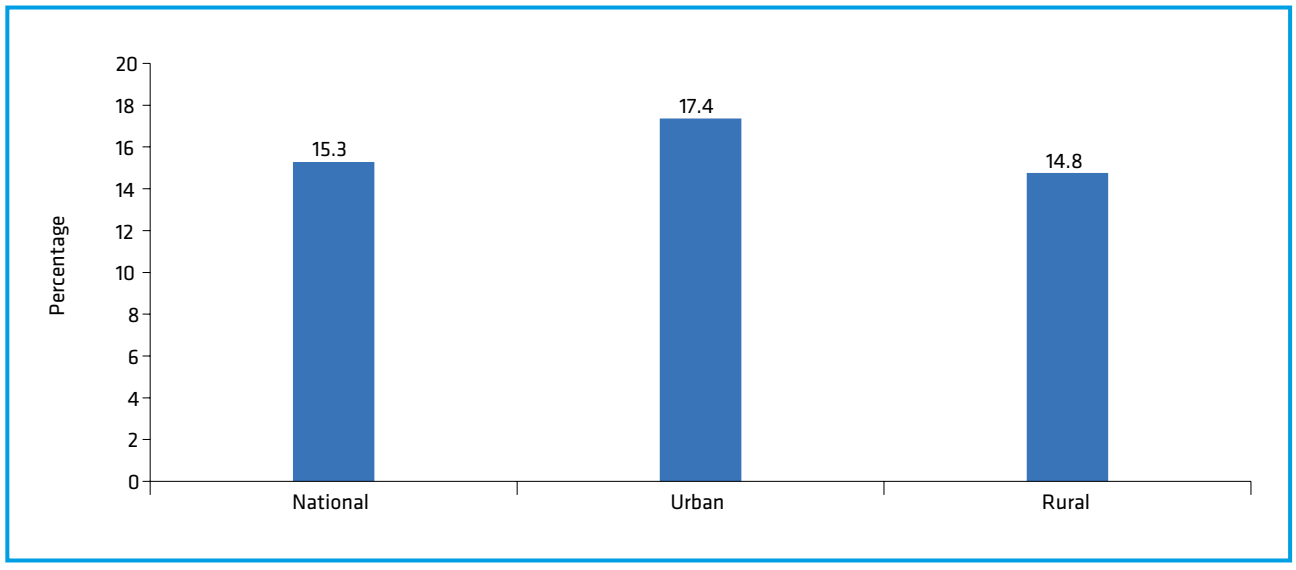


Figure 78: Percentage Distribution of Children by Availability of Birth Certificate in Rural Areas by Division in 2016

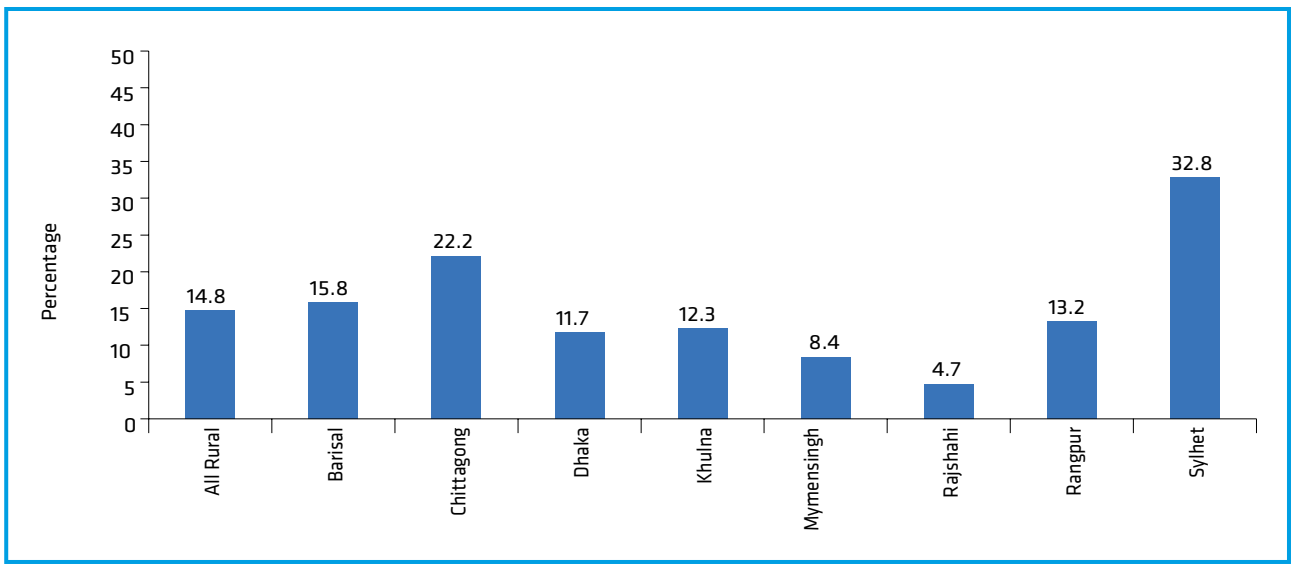
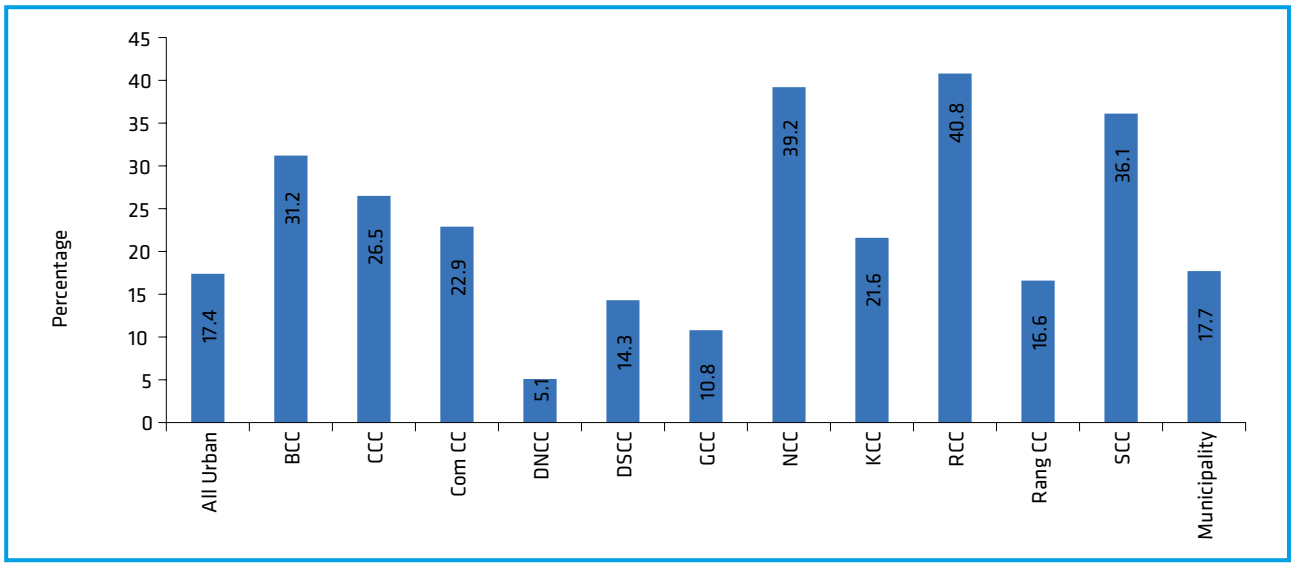


Figure 79: Percentage Distribution of Children by Availability of Birth Certificate in Urban Areas by City Corporation and Municipality by in 2016



3.10 CONFIDENCE INTERVAL BY SOURCE

In assessing the crude vaccination coverage by source among the children aged 12-23 months, it is observed (Table 12) that BCG documented from home based card coverage shows that a 95% confidence interval for the percentage of household possessing the vaccination card is obtained as 84.6 ± 0.80 percent. It indicates that there is a 95% chance that the true proportion of BCG documented from home based card coverage would lie somewhere between 84.6 percents to 86.2 percents. In case of documented from card or register, the interval is obtained to be 88.1 ± 0.80 percent which indicates with a 95% confidence that between 87.3 percent and 88.9 percent household possess the documented from card or register. The verval history (no card or register) coverage shows that around 11.4 percents of households posses no card or register, with a 95% confidence interval of ± 1.90 percentage point. It indicates that the true proportion of BCG documented from verbal history coverage lies somewhere between 9.50 percents to 13.30 percents. A 95% confidence interval for total BCG coverage is computed as 99.5 ± 0.10, giving a narrow width of the interval meaning there is only a 5% chance of the total coverage being outside the range of 99.4 to 99.6.

The width of the 95% confidence interval for OPV1 documented from home based card coverage is 1.4 percentage points around the estimated coverage 85.3 percent, resulting in a suggestion that this coverage would lie somewhere between 84.6 to 86.0 percent. The interval becomes 88 ± 0.70 percent for the OPV1 documented from card or register. A 95% confidence interval of 11 ± 1.90 percent indicates that the true proportion of OPV1 coverage documented from verbal history lies somewhere between 9.40 percents to 13.20 percent. While the total OPV1 coverage is 95% likely to be bounded by 99.1 to 99.5 percent.

For PENTA1, a 95% confidence interval for the coverage documented from home based card is 85.3 ± 0.70 and that for the coverage documented from card or register is 88 ± 0.70 percent. While the verbal history (no card or register) coverage shows 11 ± 1.90 percent as a 95% confidence interval. The total PENTA1 coverage has a 95% probability of lying between 99.1 to 99.5 percent. It can be observed that the OPV1 and PENTA1 have same coverage rate, however, the OPV2 coverage from home based card (84.8 ± 0.80 percent), card or register (87.5 ± 0.70 percent), verbal history (11.2 ± 0.60 percent) and total (98.7 ± 0.20 percent) are seen to be less than the coverage of OPV1. Similarly the 95% confidence interval for the coverage rates of OPV3 for all these categories are found to be less than that of OPV2. Similar trend also observed in PENTA coverage.

The crude vaccination coverage documented from no card or register according to verbal history is almost similar for the vaccines/doses. But it has noticeable variation among the crude coverage as well as 95% confidence interval (CI) between the vaccines/doses separately documented from home based card, card or register and total. In case of total coverage as well as 95% confidence interval the maximum coverage and CI interval belongs to BCG (99.5 and CI:99.4, 99.6) and minimum belongs to FVC (95.1, CI: 94.7, 95.7). It is observed from CES 2016 coverage evaluation survey that the variation among the vaccines/doses of total probably are due to incidences of invalid doses, vaccination drop-out, adverse events following immunization, card retention rate etc. The crude vaccination coverage documented from no card or register according to verbal history is almost similar for the vaccines/doses.

But there is noticeable variation among the crude coverage as well as 95% confidence interval (CI) between the vaccines/doses separately documented from home based card, card or register and total. In case of total coverage as well as 95% confidence interval the maximum coverage and CI interval belongs to BCG (99.5 and CI:99.4, 99.6) and minimum belongs to FVC (95.1, CI: 94.7, 95.7). It is observed from CES 2016 coverage evaluation survey that the variation among the vaccines/doses of total probably are due to incidences of invalid doses, vaccination drop-out, adverse events following immunization, card retention rate etc.

Table 12: Crude Vaccination Coverage by Source of Information, by age at the time of Survey among children aged 12-23 Months

Vaccine, Dose	Documented from home based card 95% CI	Documented from Card or Register 95% CI	If no card or register, according to verbal History95% CI	Total 95% CI
BCG	85.4 (84.6, 86.2)	88.1 (87.3, 88,9)	11.4 (9,5, 13.3)	99.5 (99.4, 99.6)
OPV1	85.3 (84.6, 86.0)	88.0 (87.3, 88.7)	11.3 (9.4- 13.2)	99.3 (99.1, 99.5)
PENTA1	85.3 (84.6, 86.0)	88.0 (87.3, 88.7)	11.3 (9.4, 13.2)	99.3 (99.1, 99.5)
OPV2	84.8 (84.0, 85.6)	87.5 (86.8, 88.2)	11.2 (10.6, 11.8)	98.7 (98.5, 98.9
PENTA2	84.8 (84.0, 85.6)	87.5 (86.8, 88.2)	11.2 (10.6-11.8)	98.7 (98.5, 98.9
OPV3	83.9 (83.2, 84.6)	86.7 86.1- 87.3)	11.2 (9.3, 13.1)	97.9 (97.6, 98.2)
PENTA3	83.9 (83.2, 84.6)	86.7 86.1, 87.3)	11.2 (9.3, 13.1)	97.9 (97.6, 98.2)
MR	81.2 (80.4, 82.0)	84.0 (83.2, 84.8)	11.3 (9.4, 13.2)	95.3 (94.9, 95.7)
FVC	80.7 (79.8, 81.6)	83.4 (82.7, 84.1)	11.8 (9.8, 13.8)	95.1 (94.7, 95.7)

3.11 CONFIDENCE INTERVAL OF CRUDE AND VALID COVERAGE BY AGE OF 12 MONTHS

For assessing the crude and valid vaccination coverage by age 12 months, it is observed (Table 13) that BCG crude coverage (99.5 $\pm$ 0.10 percent) is higher than valid coverage (98.1 $\pm$ 0.20 percent). It is also seen that both crude and valid percentage coverage of BCG are very high and they are close. Similar trend is also seen in case of OPV1, OPV2, OPV3, PENTA1, PENTA2, PENTA3 coverage. But in case of MR and FVC the crude coverage is much higher than valid coverage.

Table 13: Crude and Valid Vaccination Coverage by Age of 12 Months.

Vaccine, Dose	Crude Coverage-documented evidence or caretaker recall of vaccination95% CI, 95% LCB, 95% UCB	Valid Coverage- documented evidence of vaccination at correct ages and with correct intervals
BCG	99.5 (99.4, 99.6)	99.5 (99.4, 99.6)
OPV1	99.3 (99.1, 99.5)	97.8 (97.5, 98.1)
PENTA1	99.3 (99.1, 99.5)	97.8 (97.5, 98.1)
OPV2	98.7 (98.5, 98.9)	97.0 (96.7, 97.3)
PENTA2	98.7 (98.5, 98.9)	97.0
OPV3	97.9 (97.6, 98.2)	90.1 (89.5, 90.7)
PENTA3	97.9 (97.6, 98.2)	90.1
MR	95.3 (94.9, 95.7)	86.9 (89.5, 90.7)
FVC	**95.1 (94.7, 95.7)**	**82.3 (81.6, 83.0)**

3.12 MISSED OPPORTUNITY

In the context of a coverage survey, missed opportunity for vaccination (MOV) is the failure to administer all vaccines for which the child was eligible (according to the national vaccination schedule) on the date of a clinic visit. For example, a child who received the first dose of Penta at the age of 6 weeks but did not receive Pneumococcal conjugate vaccine (PCV) on the same date, when the national schedule recommended both at the age 6 weeks and no true contraindication existed, has a MOV for PCV. The most important causes behind the missed opportunities are the failure to administer simultaneously all the vaccines for which a child was eligible. CES 2016 calculated the missed opportunity by using Excel spreadsheet. The results are presented in Table 14. It shows that nationally 2.2 percent missed opportunities occurred for BCG, 0.2 percent for Penta1, 0.1 percent for Penta2 and Penta3 each, and 1.4 percent for MR1. Among all these, 1.5 percent missed opportunity for BCG and 1.2 percent for MR1 vaccine was corrected during the time of the survey. However, 0.7 percent missed opportunity for BCG, 0.2 percent for DPT1/OPV1, 0.1 percent for DPT3/OPV3, and o.2 percent for MR1 vaccines remained uncorrected across the country (see Table 14).

Table 14: Missed Opportunity

Vaccine, Dose	Number of children with at least 1+ vaccination record	Number of children with 1+ MOV	Percent of children with 1+ MOV	Number of children with an uncorrected MOV	Percent of children with an uncorrected MOV	Number of children with an corrected MOV	Percent of children with an Corrected MOV
	Denominator	Numerator		Numerator		Numerator	
BCG	29251	658	2.2	217.0	0.7	441	1.5
OPV 1	29251	64	0.2	63.0	0.2	1	0.0
PENTA 1	29251	64	0.2	63.0	0.2	1	0.0
OPV2	29251	27	0.1	27.0	0.1	0	0.0
PENTA 2	29251	27	0.1	27.0	0.1	0	0.0
OPV3	29251	29	0.1	27.0	0.1	2	0.0
PENTA 3	29251	29	0.1	27.0	0.1	2	0.0
MR1	29251	413	1.4	68.0	0.2	345	1.2

CHAPTER 4

MEASLES-RUBELA SECOND DOSE COVERAGE

This section details the facts and findings of Measles Second Dose (MSD) vaccination coverage of children between 18 and 23 months old. In Bangladesh, this component was included for the third time in EPI Coverage Evaluation Survey (CES) 2016 after its initiation in 2014 while the Government of Bangladesh introduced MSD in the routine childhood vaccination schedule under EPI in September 2012. As such, MR is scheduled for the children who are 9 months old and MSD is scheduled for children who are 15 months old.

4.1 OBJECTIVES OF MSD SURVEY

The MSD survey was carried out as a part of CES 2016 with a view to achieving the following targets:

- To assess the MSD coverage among 18-29 months old children
- To assess the drop-out rate from MR to MSD

4.2 SAMPLE SELECTION

The MSD survey was carried out among 18-29 months-old children drawn from the cluster samples of CES 2016 as applied in the other survey components. Interviewers listed all the eligible children (aged between 18-29 months) in every household of each cluster at the time of household visits in order to make the sampling frame eligible households. Afterwards, households with eligible children were selected randomly from the sampling frame to administer the questionnaires.

4.3 SECOND DOSE OF MEASLES VACCINE

Measles remains one of the leading causes of death of the young children. 164,000 children died of measles worldwide in 2008. Ninety-five percent of all measles-related death occurred in low-income countries with weak health infrastructures[5]. In accordance with the Global and Regional strategy to reduce measles mortality to 2000 estimates, the national EPI prepared a national plan for the reduction of measles mortality in Bangladesh for 2004-2010. In the light with this plan and to ensure a second opportunity for receiving the measles vaccines, a measles catch-up campaign was held in 2005-2006, targeting more than 35 million children aged between 9 months, and 10 years. Subsequently, another measles follow-up campaign was carried out in 2010 to vaccinate the children aged between 9 month and 5 years. The vaccination coverage was quite encouraging in both the campaigns. It is expected that more than 80 percent of the death related to measles could be averted through these supplementary activities.

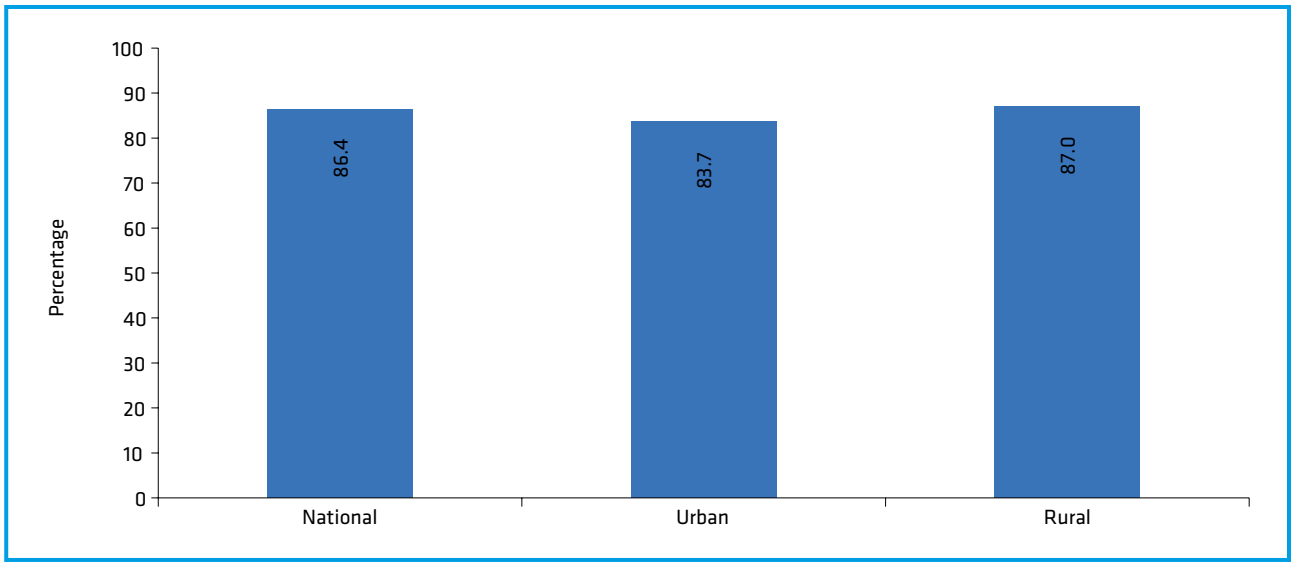
Additionally, the national EPI supported the recommendation of SEARO (South East Asian Regional Office of WHO) to eliminate measles by 2015. The National Committee on Immunization Practices, in a meeting in 2009 also supported the national EPI proposal to eliminate measles in Bangladesh by 2015. However, as per the recommendation of SEARO at present EPI targeted to eliminate measles by 2020.

4.4 CRUDE MSD VACCINATION COVERAGE BY AGE OF 29 MONTHS

Figure 80 presents the crude MSD coverage in detail. Overall, 86.4 percent of the children received MSD. Rural children were a bit ahead of the children from urban areas in the case of receiving MSD (87.0 percent vs. 83.7 percent).

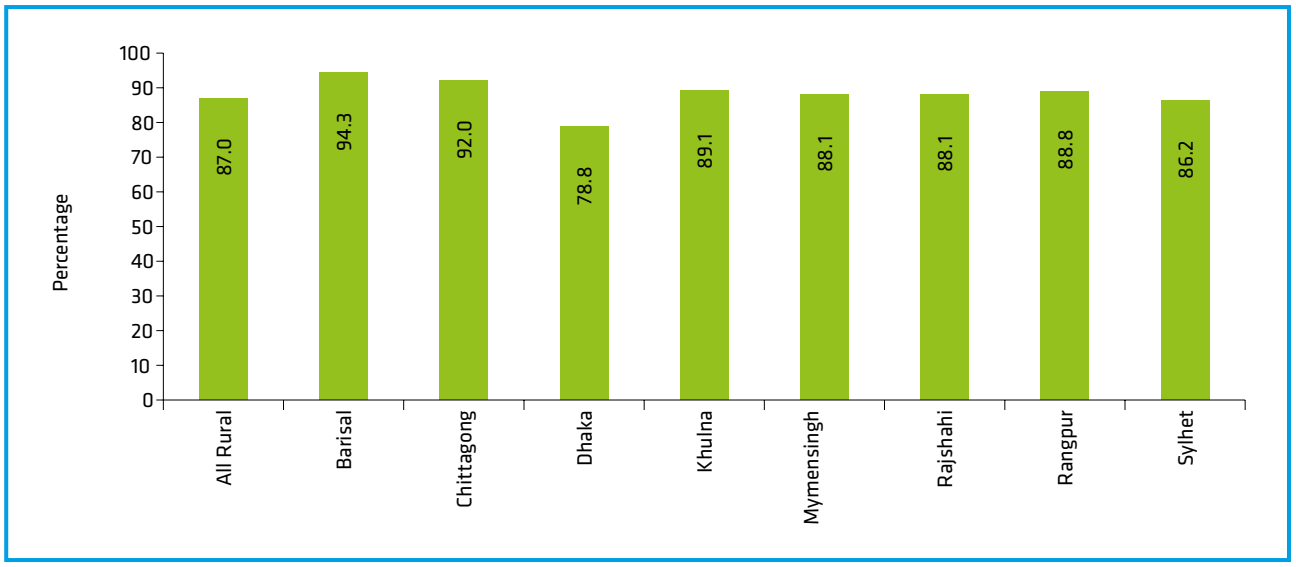
5 Koehlmoss, Tracey Perez, Jasim Uddin and Haribondu Sarma. "Imapct of Measles Eradication Activities on Routine Immunization Services and Health Systems in Bangladesh" in Journal of Infectious Diseases (2011) 204 (suppl 1): s90-s97.

Figure 80: Crude MSD Coverage by Age of 29 Months by National, Rural and Urban Areas in 2016



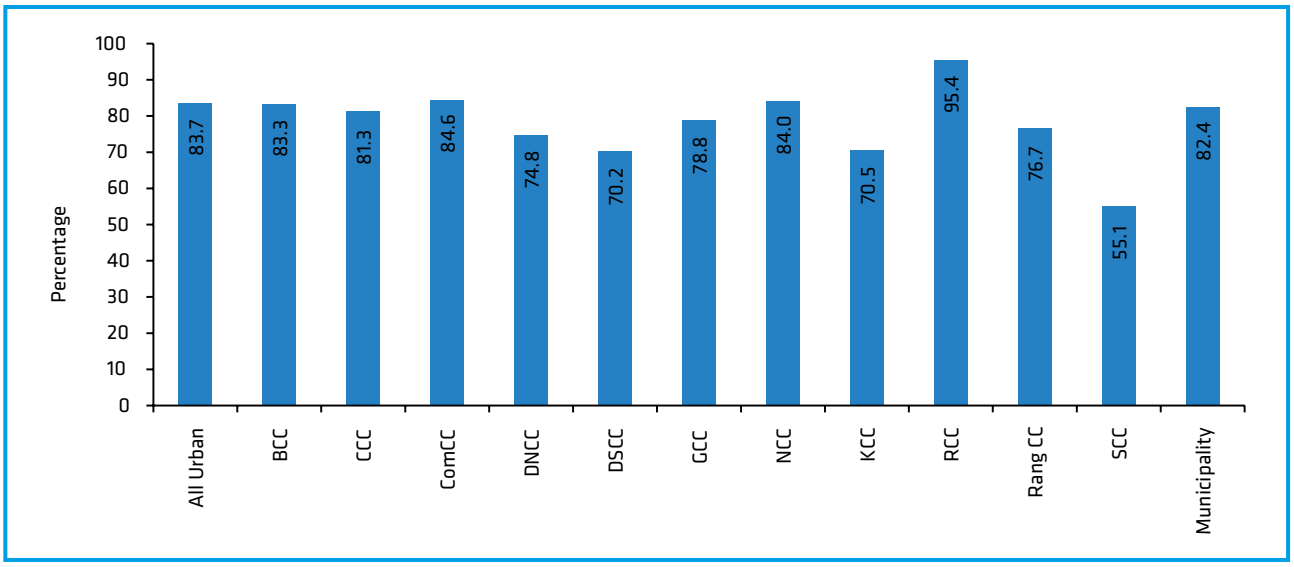
Among the rural areas by division, as shown in Figure 81, MSD coverage was rather evenly spaced from the second highest at 92.0 percent in Chittagong to the lowest at 78.8 percent in Dhaka division. Barisal division had the highest coverage of MSD at 94.3 percent, which indicates 15.5 percentage points difference from the MSD coverage of Dhaka division.

Figure 81: Crude MSD Coverage in Rural Areas by Division in 2016



For the city corporations, the crude MSD coverage had a wide range, from RCC at 95.4 percent to SCC at 55.1 percent. The smallest gap was 0.6 percentage points between the ComCC at 84.6 percent and NCC at 84.0 percent (see Figure 82).

Figure 82: Crude MSD Coverage in Urban Areas by City Corporation and Municipality in 2016



4.5 VALID MSD VACCINATION COVERAGE BY THE AGE OF 23 MONTHS

Figure 83a provides valid MSD coverage by the age of 23 months. It shows that 83.0 percent of the children received valid doses of MSD across the country, with children from rural areas more likely to receive the valid dose of MSD than those from urban areas (83.7 percent vs. 80.0 percent). By gender, no marked variation was observed between male and female at the national level.

Figure 83a: Valid MSD Coverage by Age of 23 Months by National, Rural and Urban Areas in 2016

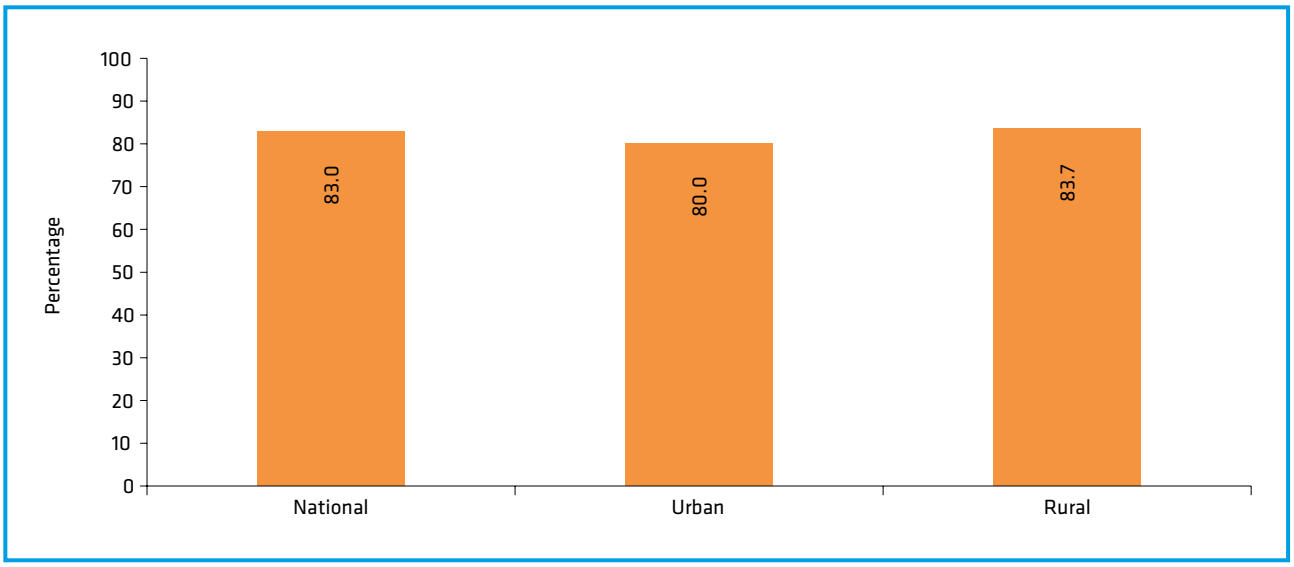


Figure 83b: Valid MSD Coverage by Age of 23 Months by Sex at National level in 2016

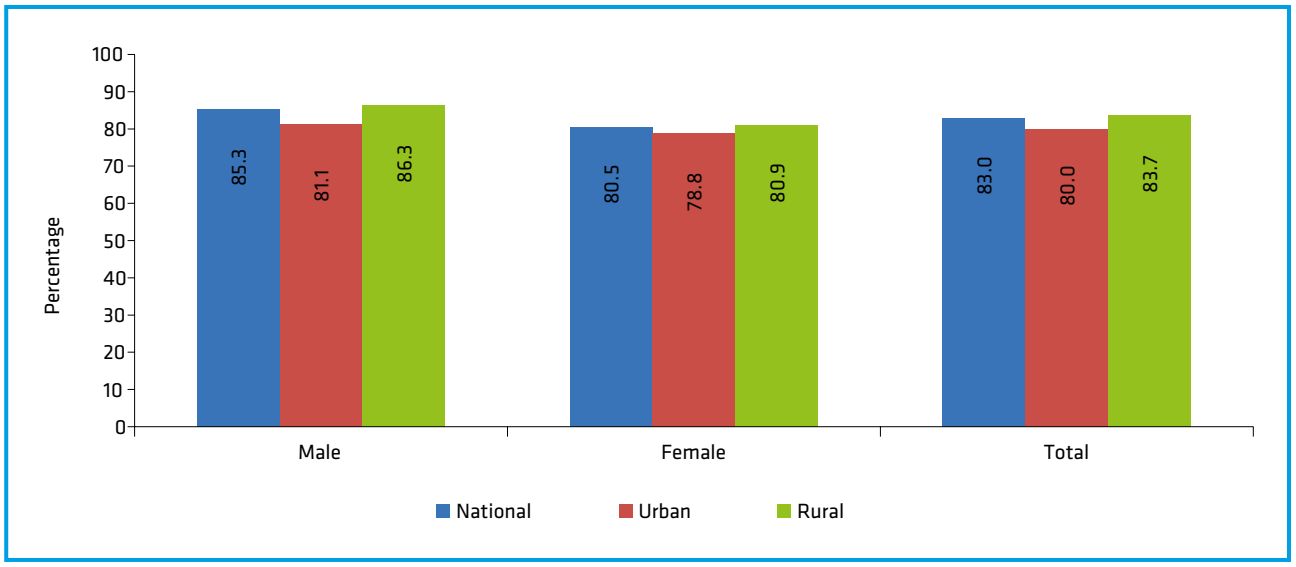
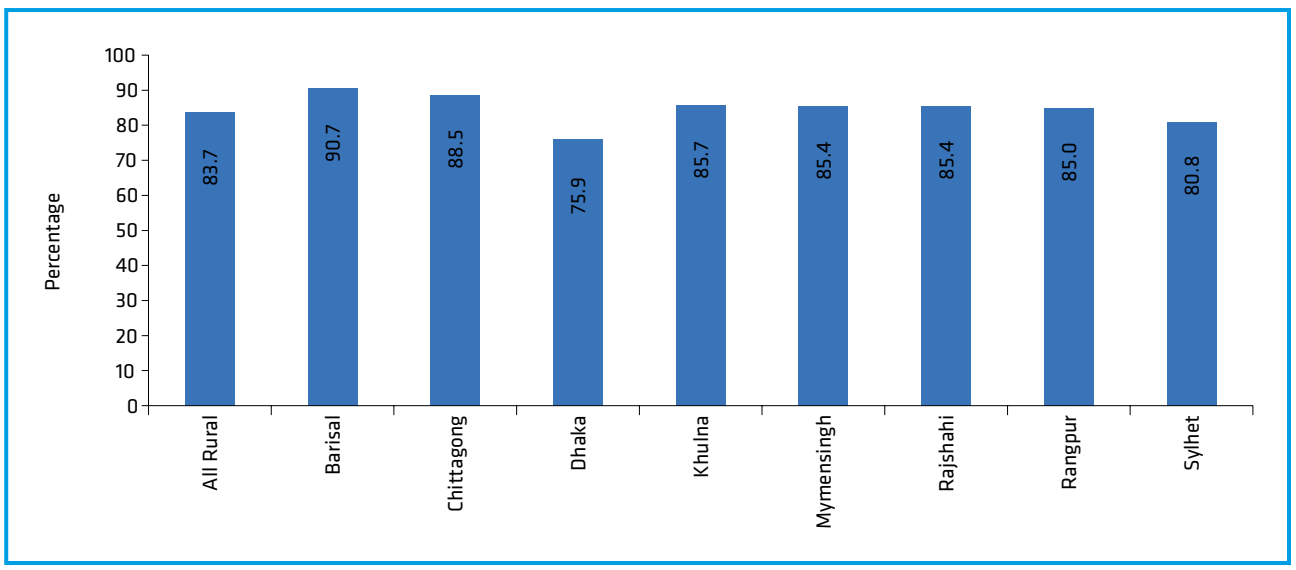


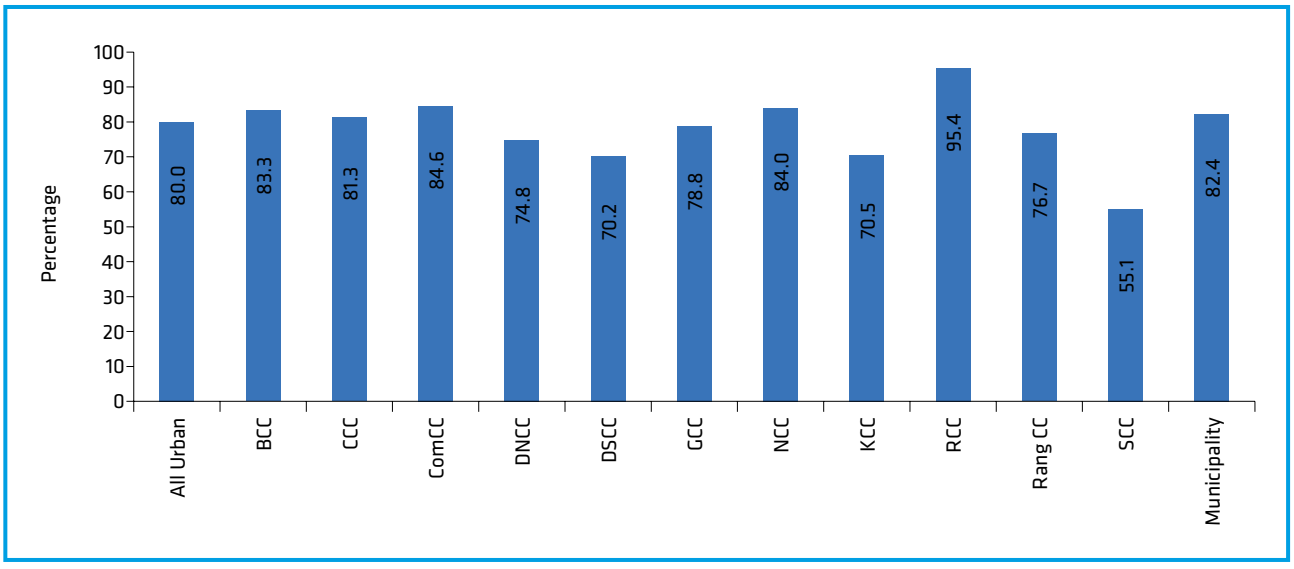
Figure 84a shows the valid MSD coverage by division. It depicts that the valid MSD coverage was the highest in Barisal (90.7 percent) and the lowest in Dhaka divisions (75.9 percent). Valid MSD coverage for the other divisions was in an intermediary level that ranged between 88.5 percent in Chittagong and 80.8 percent in Sylhet divisions.

Figure 84a: Valid MSD Coverage in Rural Areas by Division in 2016



Across the city corporations, valid MSD coverage was the highest in RCC (95.4 percent). There was 10.8 percentage points difference between RCC and the next highest of 84.6 percent in ComCC. Other than ComCC, others ranged between 84.0 percent in NCC and 55.1 percent in SCC (see Figure 84b).

Figure 84b: Valid MSD Coverage in Urban Areas by City Corporation and Municipality in 2016



4.6 VALID MSD VACCINATION COVERAGE BY THE AGE OF 18 MONTHS

Figure 85a depicts valid MSD coverage by the age of 18 months. It shows that 77.6 percent of the children received valid doses of MSD across the country, with children from rural areas more likely to receive the valid dose of MSD than those from urban areas (78.7 percent vs. 72.4 percent). By gender, 5 percentage point's difference was observed between male and female at the national level.

Figure 85a: Valid MSD Coverage by Age of 18 Months by National, Rural and Urban Areas in 2016

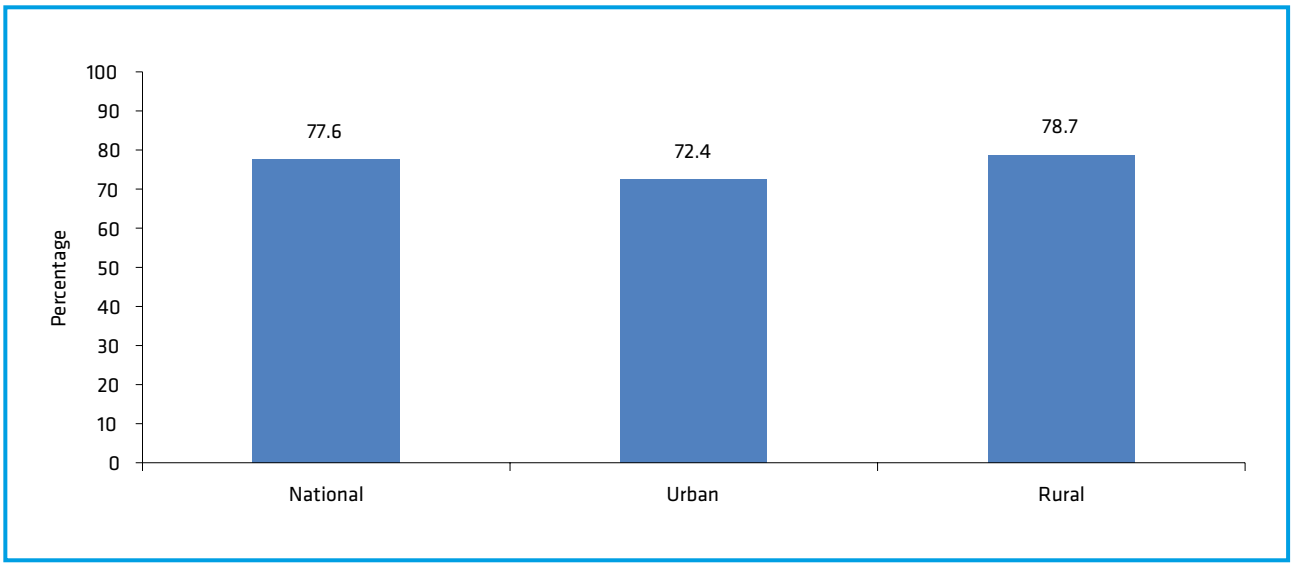


Figure 85b: Valid MSD Coverage by Age of 18 Months by Sex at National Level in 2016

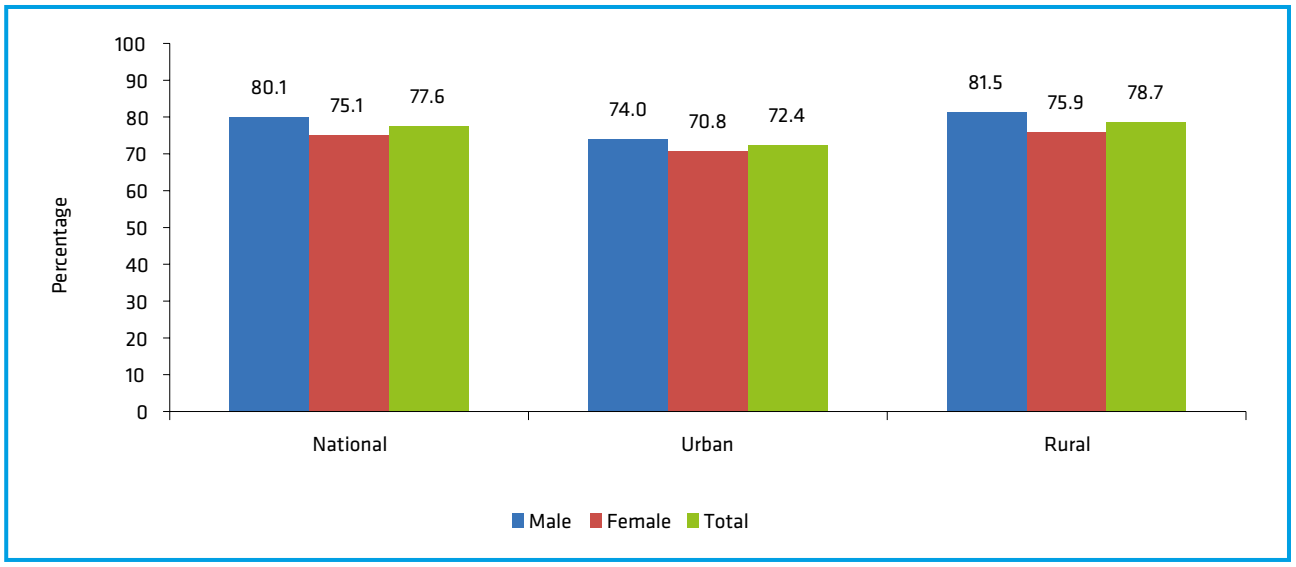
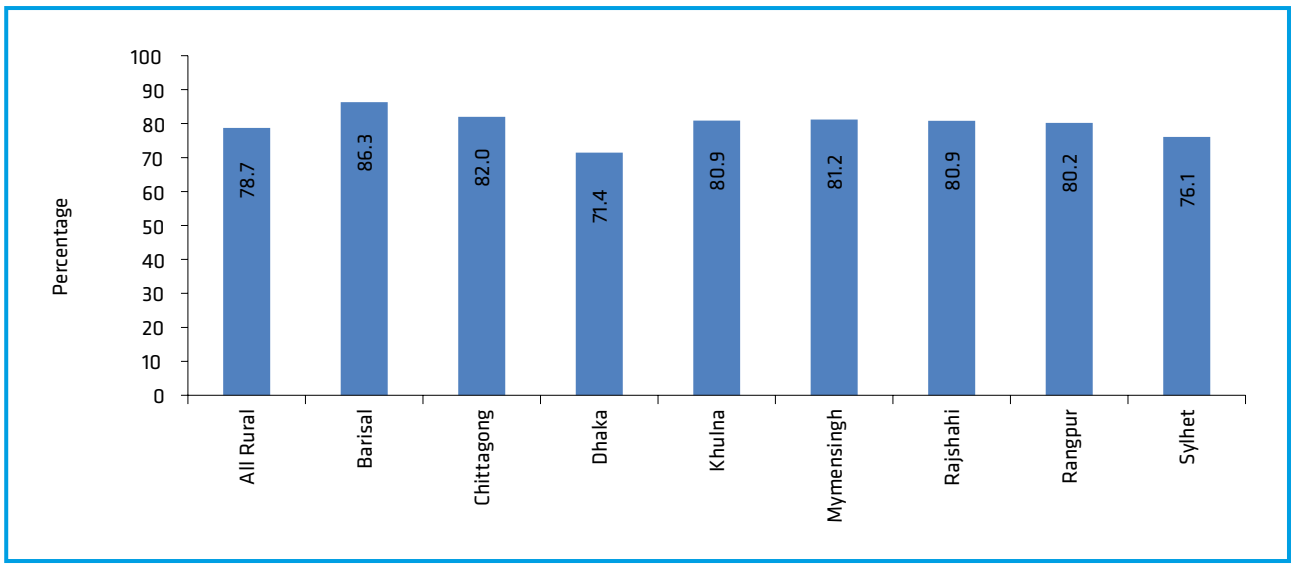


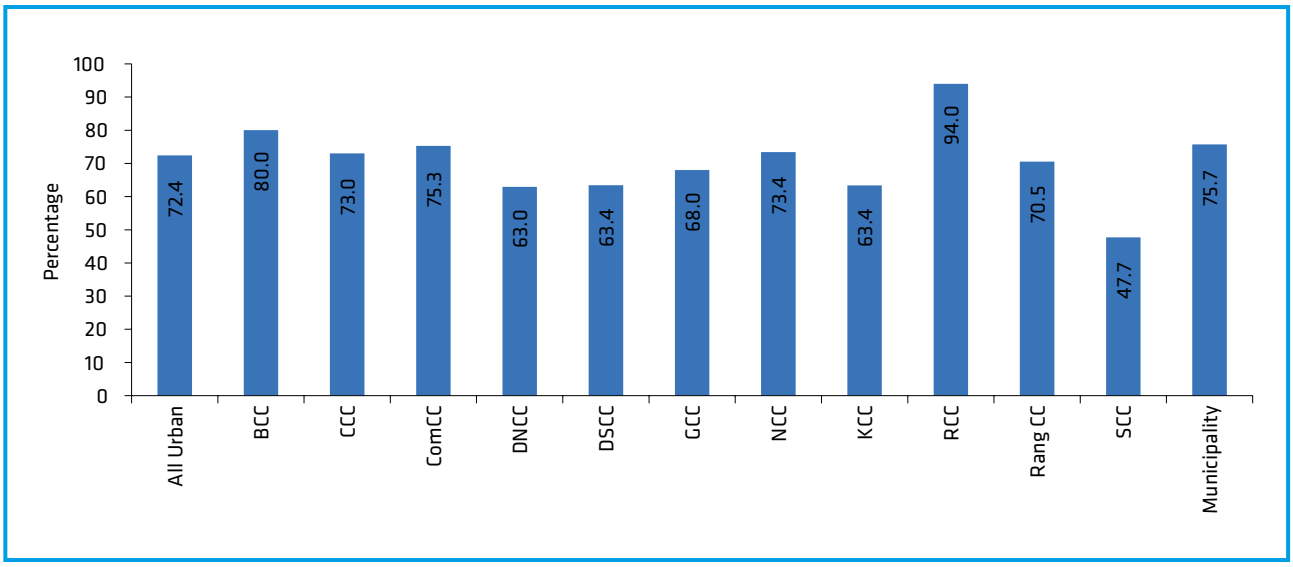
Figure 85c presents the valid MSD coverage by division. It depicts that the valid MSD coverage was highest in Barisal (86.3 percent) and the lowest in Dhaka divisions (71.4 percent). Valid MSD coverage for the other divisions was in an intermediary level that ranged between 82.0 percent in Chittagong and 76.1 percent in Sylhet divisions.

Figure 85c: Valid MSD Coverage in Rural Areas by Division in 2016



Across the city corporations, valid MSD coverage was the highest in RCC (94.0 percent). There was 14.0 percentage points difference between RCC and the next highest of 80.0 percent in BCC. Other than BCC, the others ranged within 7.5 percentage points difference at 75.3 percent in ComCC, with the lowest being SCC at 47.7 percent (see Figure 85d).

Figure 85d: Valid MSD Coverage in Urban Areas by City Corporation and Municipality in 2016



Map 7:

Valid MR2 Coverage by Age of 23 Months

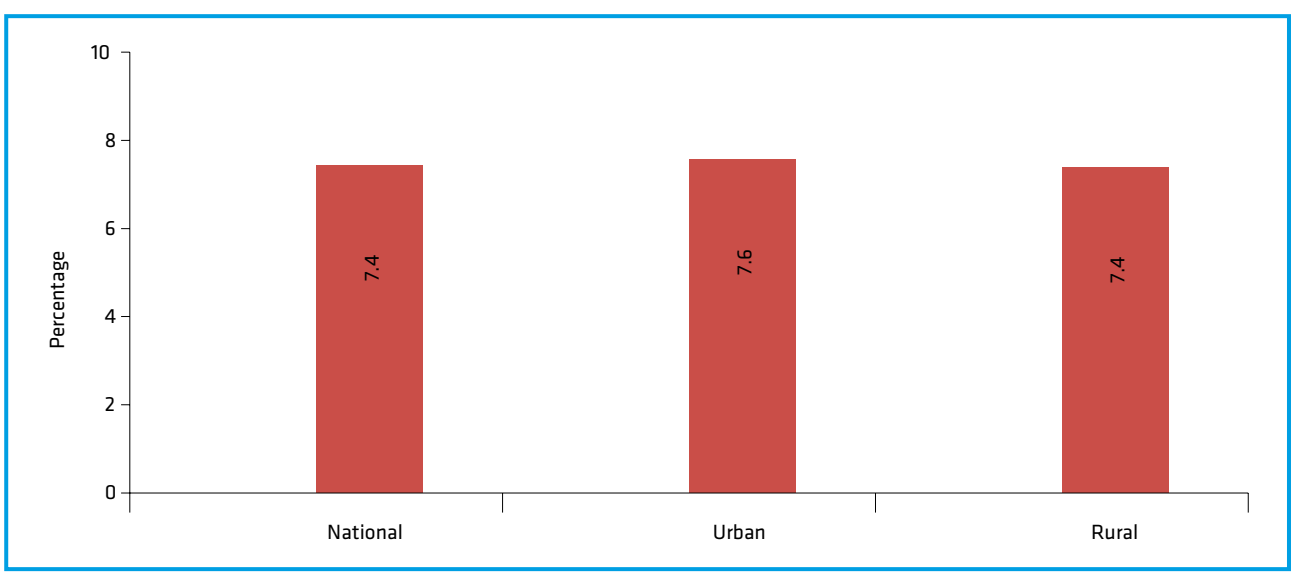
Map 8:

Valid MR2 Coverage by Age of 18 Months

4.7 IINCIDENCE OF INVALID MSD

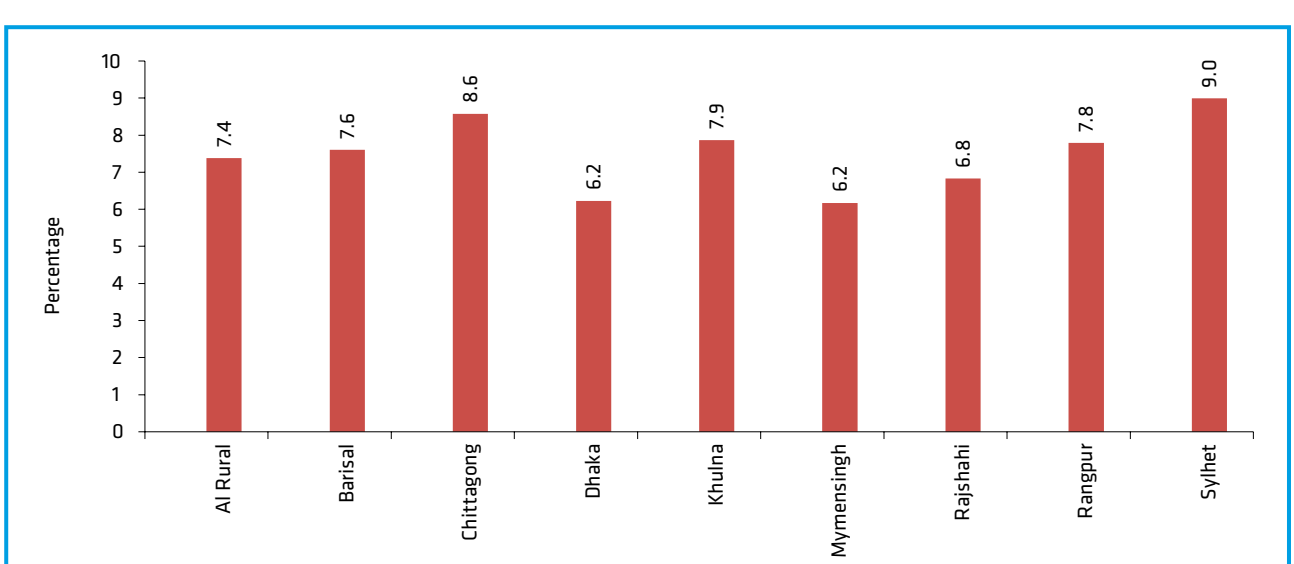
According to EPI vaccination schedule, a child should receive MSD between 15-18 months of age. Therefore, children who received MSD before the age of 15 months were considered recipients of invalid doses in CES 2016. Nationally, 7.4 percent of the children received invalid MSD. There was a little variation in invalid MSD rates between rural and urban inhabitants (see Figure 86).

Figure 86: Incidence of Invalid MSD by National, Rural and Urban Areas in 2016



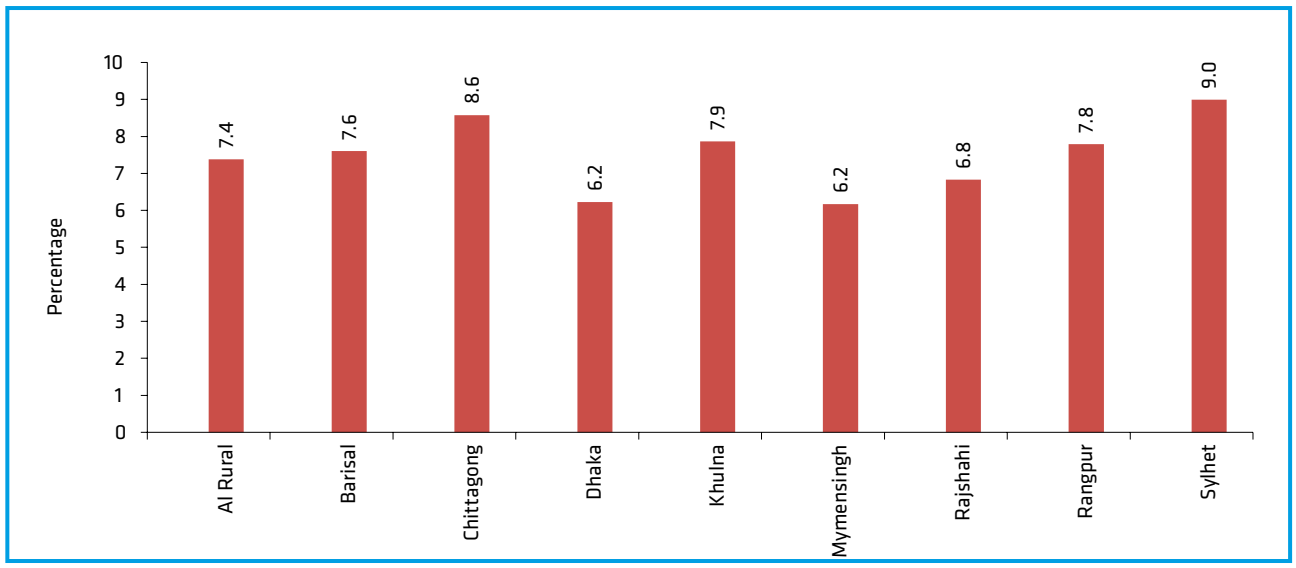
Within the divisions, invalid doses were found to be the highest in Sylhet (9.0 percent) and the lowest in Dhaka and Mymensingh divisions (6.2 percent). In other divisions, it was between 8.6 percent and 6.8 percent (see Figure 87).

Figure 87: Incidence of Invalid MSD in Rural Areas by Division in 2016



Among the city corporations, the highest invalid MSD coverage was found to be administered in CCC (9.5 percent) and the lowest in RCC (4.4 percent). The second highest invalid dose was noticed in KCC (9.0 percent). In other city corporations, it ranged between 7.7 percent in NCC and 4.5 percent in DSCC (see Figure 88).

Figure 88: Incidence of Invalid MSD in Urban Areas by City Corporation and Municipality in 2016



4.8 DROP-OUT RATE FROM MR1 TO MR2

Drop-outs from subsequent dose(s) of the same antigen or different antigen is the most notable obstacle to achieving the desired coverage target. A child was considered as a drop-out from MR2, if s/he failed to receive MR2 after receiving MR1. Nationally, the MR1-MR2 drop-out rate was 8.0 percent, with the lower rate in rural areas (7.5 percent) than in urban areas (10.4 percent) (see Figure 89). By sex, little variation was observed in the MR-MSD drop-out rate across the country (see Figure 89).

Figure 89: Vaccination Drop-out Rate from MR-MSD by Sex at National Level in 2016

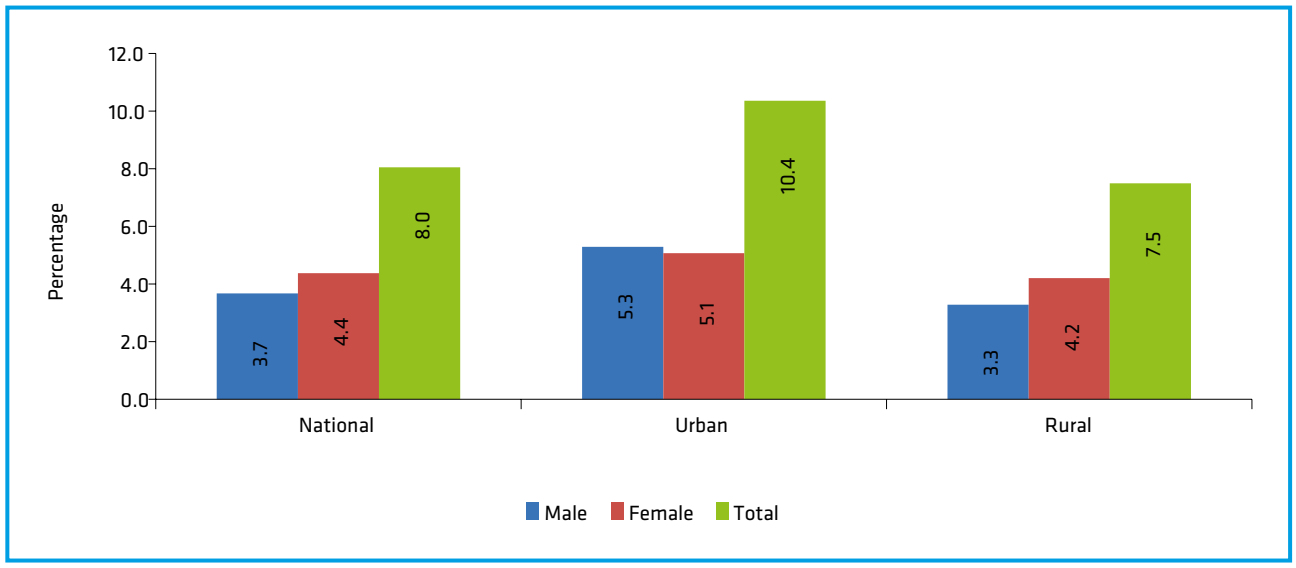


Figure 90 depicts the drop-out rate by rural division. Among the seven divisions, the MR-MSD drop-out rate was the highest in Dhaka (10.2 percent) and the lowest in Barisal (3.3 percent) divisions. The rates for the other divisions were in between 8.6 percent and 4.8 percent.

Figure 90: Drop-out Rate from MR to MSD in Rural Areas by Division in 2016

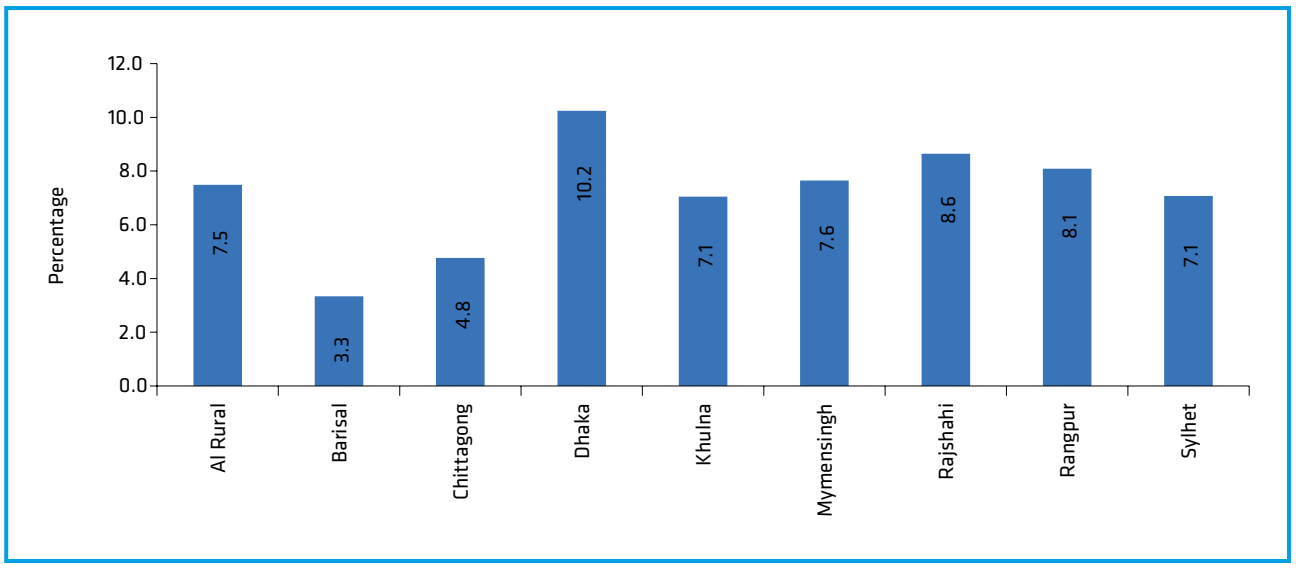
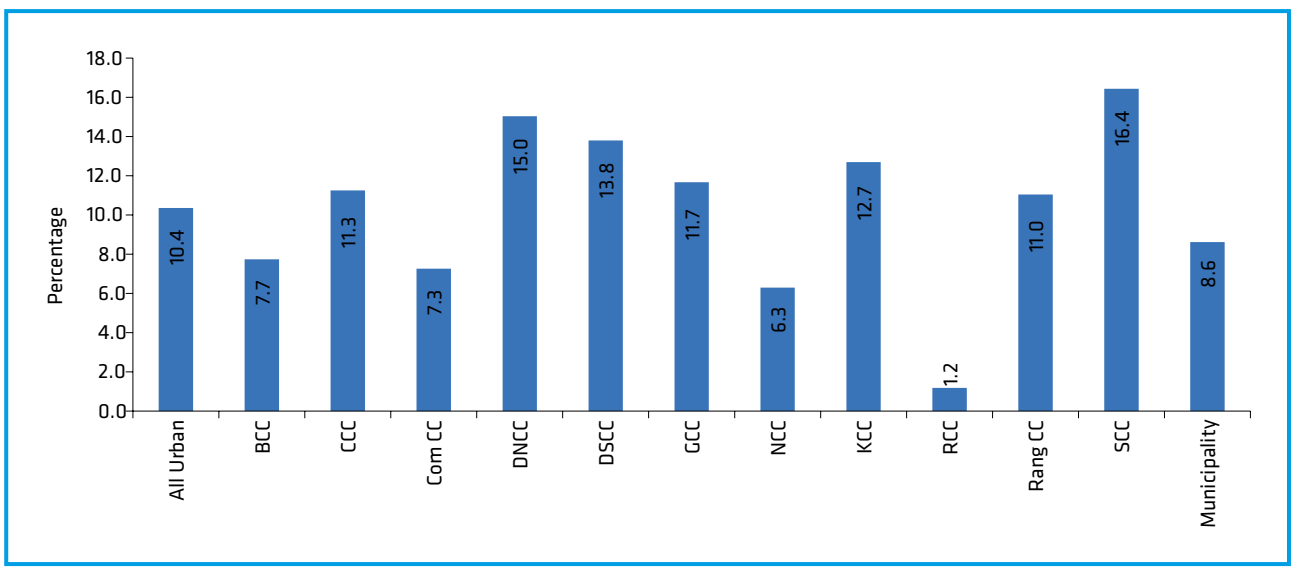


Figure 91 shows the drop-out rate by city corporation, which had a wider variation than in the rural divisions. Among the city corporations, the highest drop-out rate was observed in SCC (16.4 percent) and the lowest in RCC (1.2 percent). In other city corporations, it ranged between 15.0 percent in DNCC and 6.3 percent in NCC.

Figure 91: Drop-out Rate from MR to MSD in Urban Areas by City Corporation and Municipality in 2016



CHAPTER 5

TT VACCINATION COVERAGE AMONG THE MOTHERS WITH CHILDREN 0-11 MONTHS

Neonatal Tetanus (NT) has remained a public health problem in countries with low immunization coverage and unclean practices at childbirth. In Bangladesh, 62 percent of the deliveries take place at home, often in poor hygienic conditions, thus placing the lives of both mother and child at risk. Despite this risk factor for infection with "Clostridium tetani", Bangladesh achieved neonatal tetanus elimination status in 2008 by administering five doses of TT vaccine to women of childbearing age (15-49 years). UNICEF and WHO provided extensive financial and technical support to EPI to achieve this status. In order to maintain this NT elimination status, EPI in Bangladesh, in strong partnership with UNICEF and WHO, is continuing to strengthen its monitoring and supervision system. Although NT is included in the EPI disease surveillance system, it is important to identify the critical areas where the programme needs to give special attention or monitor the status of TT during the birth of the latest child. In this context, CES is an important avenue to provide strategic direction to the programme personnel. CES 2016 gathered information and provided an estimate of the children who were protected at birth (PAB) against NT. All the relevant information is presented in this chapter. Therefore, along with TT vaccination coverage status, this chapter provides information about the quality of programme, card retention rate, and invalid doses, as well as PAB of newborn.

5.1 OBJECTIVES OF TT SURVEY

The following survey objectives were set under the TT coverage survey among the mothers having 0-11 months old children:

- to estimate TT vaccination coverage
- to estimate TT card retention
- to estimate the incidence of invalid TT doses
- to know the sources of TT vaccination
- to estimate the proportion of the newborn babies who were protected at birth against neonatal tetanus
- to estimate post-partum Vitamin A coverage among the mothers having 0-11 months old children (results of this last point covered in Chapter 8)

5.2 SELECTION OF SAMPLES

In this survey component, mothers who delivered children between 01-07-2015 and 30-06-2016 were targeted for selecting the samples. The aforesaid samples were selected from the same clusters where the samples for other survey components in CES 2016 were selected. First, a list was made after identifying households with the mothers who delivered children between 01-07-2015 and 30-06-2016 while visiting every household of the selected cluster. After that, a sampling frame was constructed by including all the eligible households from the list. From all the eligible households, five households were randomly selected for interviews to gather the required information through the survey tool, which, in this case, was a questionnaire.

5.3 TT VACCINATION

With an aim to achieving its maternal and neonatal tetanus elimination objective, the Government of Bangladesh has provided TT vaccination services through its Expanded Programme on Immunization under the Directorate General of Health Services (DGHS) since 1979. The vaccine is given to women of child-bearing age (15-49 years) for

protecting them from tetanus and their newborn babies from neonatal tetanus during the whole reproductive period. A woman needs five TT doses to provide protection through her whole reproductive period. These should be administered by following the TT vaccination schedule recommended by WHO: TT1- the first dose- as soon as she reaches the age of 15 years; TT2 - four weeks after TT1 is given; TT3- six months after TT2; TT4 - one year after TT3; and, TT5 - one year after TT4. Since only one TT dose does not offer any protection, TT2 must be administered after TT1, thus providing a woman of reproductive age protection for a period of three years that begins after the administration of TT2. With the TT3 dose, the protection period is for five years after the administration of TT3, and with TT4 for 10 years after the administration of TT4. With TT5, the woman is protected for the rest of her reproductive period. Table 12 below shows the EPI-recommended TT vaccination schedule in Bangladesh.

Table 15: TT Vaccination Schedule

TT Doses	Minimum Interval between Doses	Years Protected
TT1	At 15 years age	No protection
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

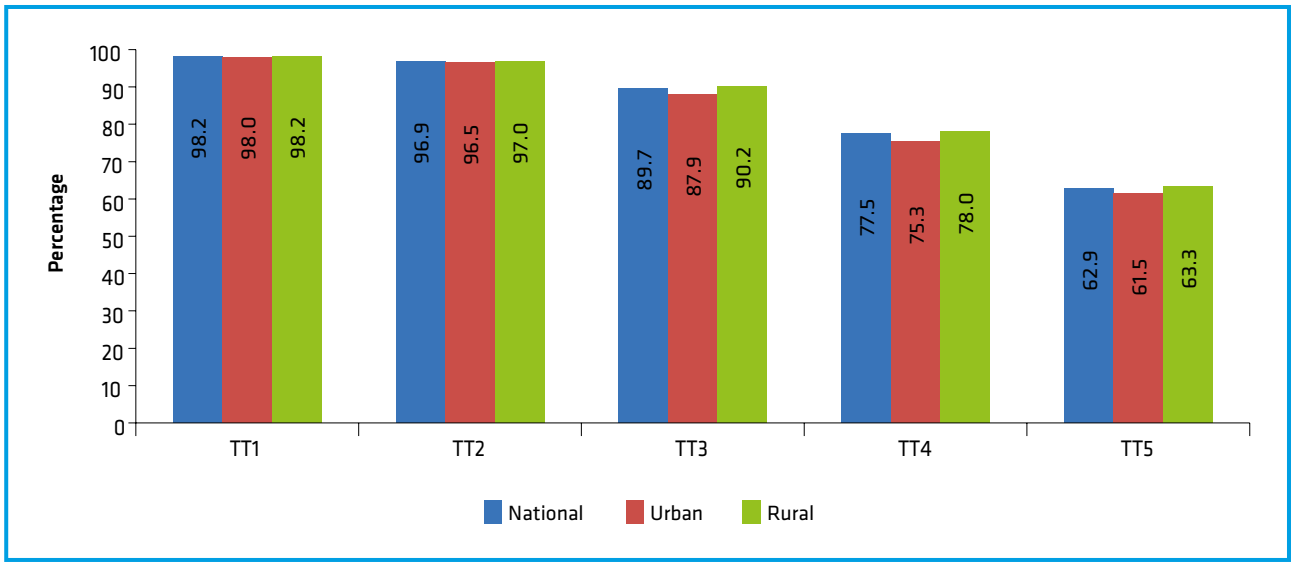
5.4 TT VACCINATION COVERAGE (CARD+ HISTORY)

Like the childhood vaccination coverage, TT vaccination coverage was assessed as crude and valid coverages. The valid TT coverage was assessed in terms of the valid doses that a woman received. And, the crude TT coverage was assessed in terms of all TT doses - both valid and invalid - that a woman received. A TT dose administered before the recommended interval was considered to be invalid. Thus, a TT3 dose given earlier than the recommended 6-month interval after a valid TT2 was enumerated as an invalid TT3 dose. The information of TT vaccination was obtained from a woman's TT card (if available). If it was not available, the information was collected from the woman's vaccination history reported by her.

5.4.1 Levels of the Crude TT Vaccination Coverage

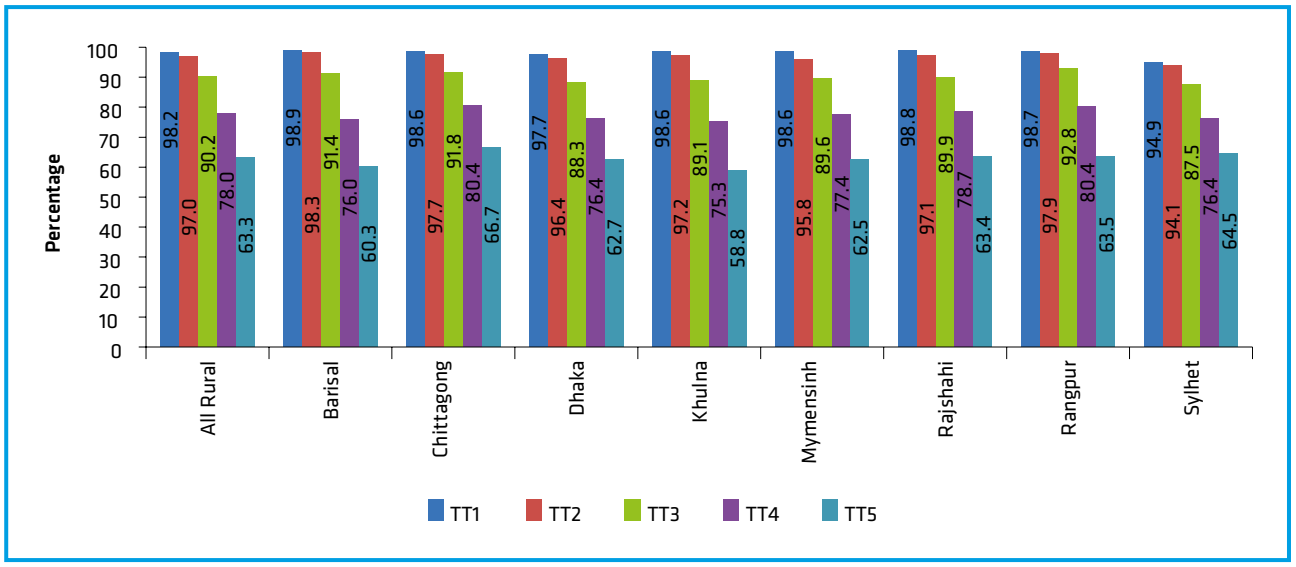
The distribution of crude TT vaccination coverage is presented in Figure 92 and Map 19. It shows that TT1 and TT2 vaccination coverage were 98.2 percent and 96.9 percent, respectively. Both TT1 and TT2 coverage were slightly higher among the rural mothers than their urban counterparts. However, TT3, TT4, and TT5 coverages were lower than TT1 and TT2 across the country. The national coverages of TT3, TT4, and TT5 were 89.7 percent, 77.5 percent and 62.9 percent, respectively. By residence, a little bit more than 2-percentage points difference was noticed in TT3, TT4, and TT5 coverage between rural and urban areas.

Figure 92: Crude TT Vaccination Covearge by National Rural and Urban Areas in 2016



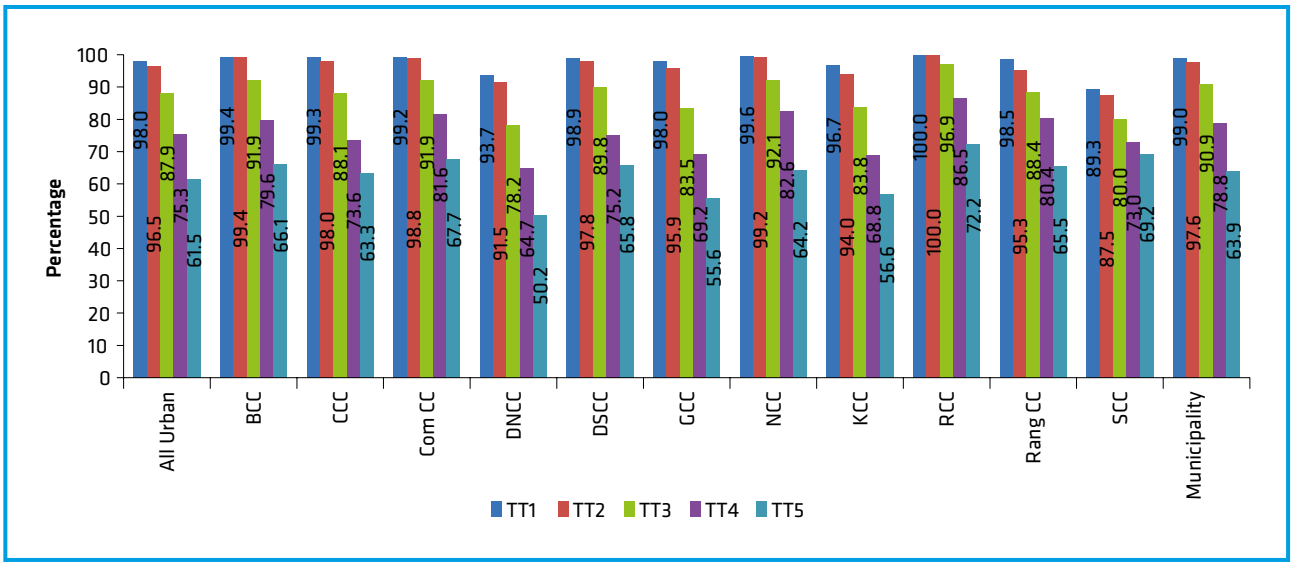
Among the divisions, no marked variation was noticed in crude TT1 and TT2 coverage, except in Sylhet division where both TT1 and TT2 coverage was almost 4 percentage points lower than the highest performing division. However, crude TT3 coverage was the highest in Rangpur (92.8 percent) and the lowest in Sylhet divisions (87.5 percent), which again being considerably less than the highest one. By TT4 coverage, the gap between the highest, 80.4 percent in Chittagong and Rangpur, the lowest, 75.3 percent in Khulna, had a little bit more than five percentage points difference, and the coverage gap was more wider by TT5, ranging from 66.7 percent in Chittagong to 58.8 percent in Khulna (see Figure 93).

Figure 93: Crude TT Vaccination coverage in Rural Areas by Division in 2016



Among the city corporations, crude TT1 and TT2 coverage was at or above 87 percent for all, where both TT1 and TT2 coverage was universal in RCC and the lowest in SCC (89.3 percent for TT1 and 87.5 percent for TT2). For TT3 coverage, the gap was more than 18 percentage points from the highest, RCC (96.9 percent) to the lowest, DNCC (78.2 percent). By TT4 coverage, the gap had widened substantially, with the highest in RCC (86.5 percent) and the lowest in DNCC (64.7 percent). Regarding crude TT5, three-quarters of the women in RCC (72.2 percent) received it. Most of the other city corporations ranged between 69.2 percent and 50.2 percent (see Figure 94).

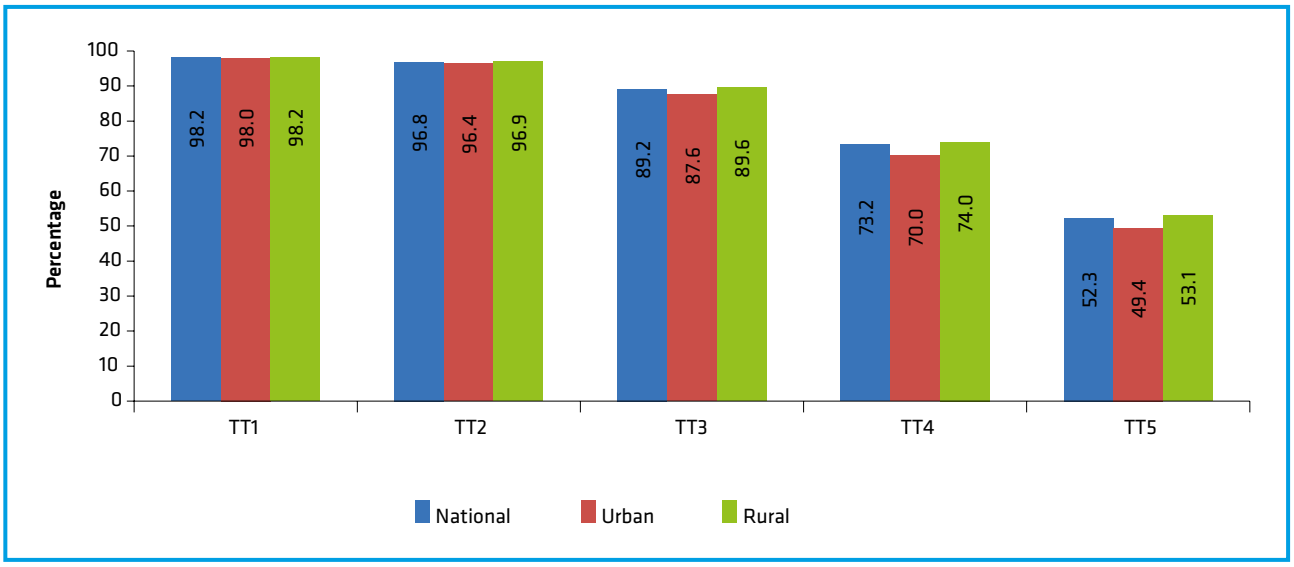
Figure 94: Crude TT Vaccination Coverage in Urban Areas by City Corporation and Municipality in 2016



5.4.2 Levels of Valid TT Vaccination Coverage

Valid TT coverage was defined as the coverage a woman received when the EPI-recommended TT vaccination schedule was followed. Nationally, valid TT2 vaccination coverage was 96.8 percent. However, the valid coverage rate was found to drop to 89.2 percent for TT3, 73.2 percent for TT4, and 52.3 percent for TT5. The urban-rural analysis shows that valid doses of TT2 to TT5 coverage were higher in rural areas than that in urban areas (see Figure 95 and Map 20).

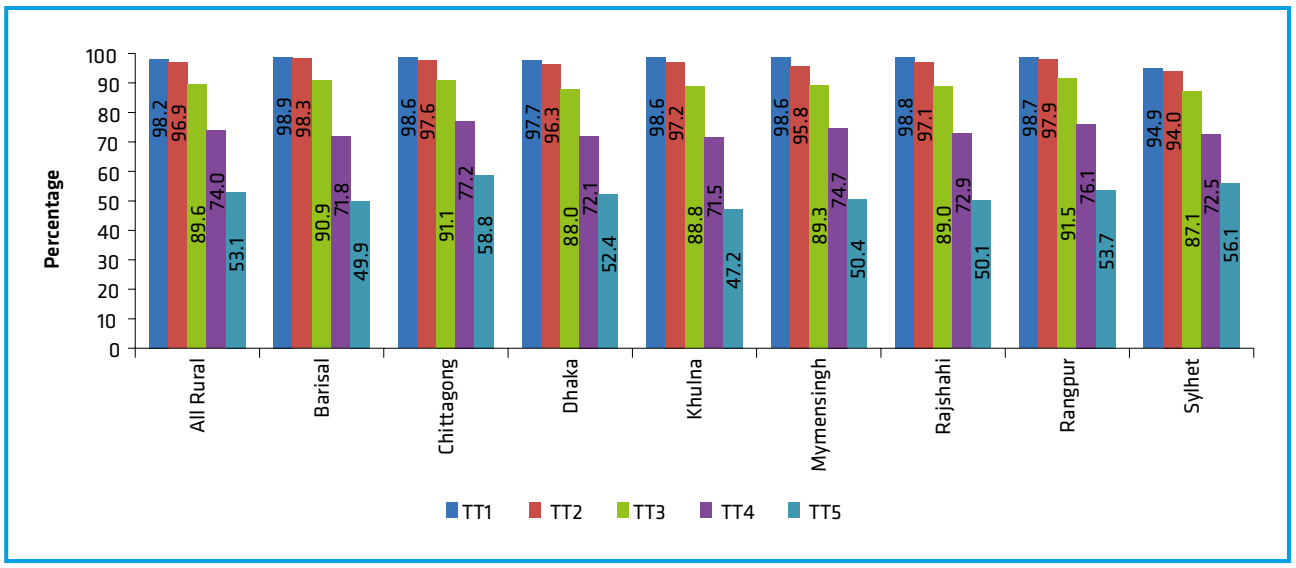
Figure 95: Valid TT Vaccination Covearge by National Rural and Urban Areas in 2016



Among the divisions, more than 96.0 percent of the women received two doses of valid TT vaccine in all the divisions, except Mymenshing, and Sylhet. Valid TT2 coverage was the highest in Barisal (98.3 percent) while for TT3 it was the highest in Rangpur (91.5 percent). The lowest coverage for both TT 2 and TT3 was observed in Sylhet (94.0 percent for TT2) and 87.1 percent for TT3, respectively. As regards valid TT3, the rate, ranged between 88.0 percent and 91.1 percent in other divisions. For TT4 and TT5, the gap between the highest and the lowest narrowed, although

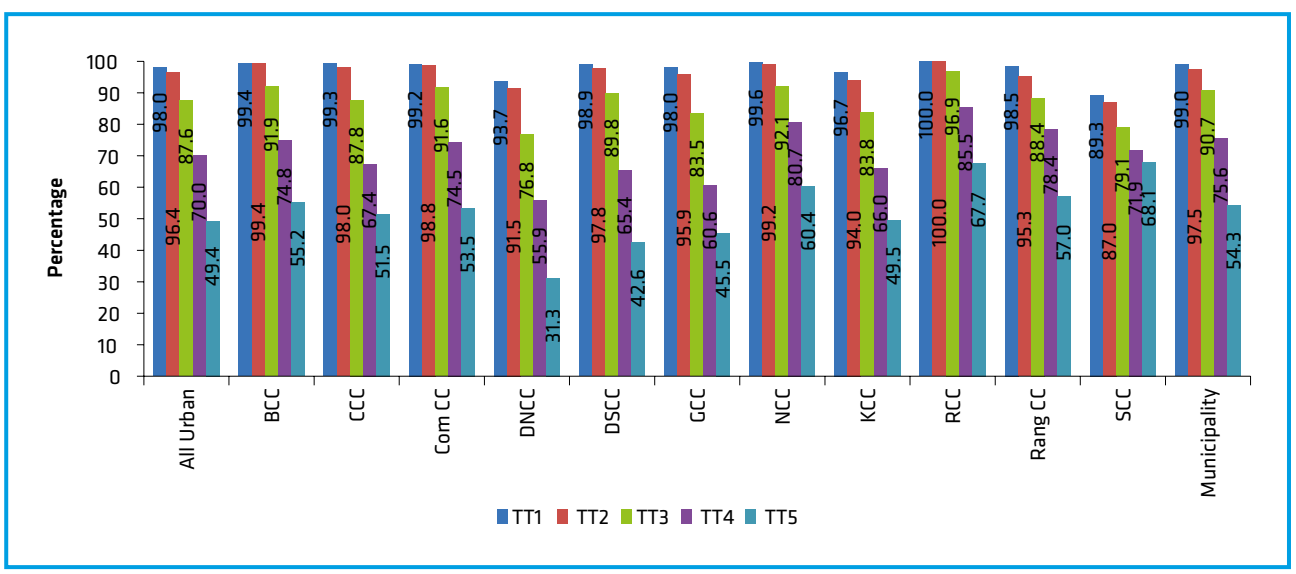
Chittagong had the highest rate (77.2 percent and 58.8 percent, respectively) and the lowest in Khulna (71.5 percent and 47.2 percent, respectively). Consequently, except Barisal and Khulna all the other divisions over half of women had protection against tetanus throughout their reproductive life (see Figure 96). Five doses of valid TT vaccine give protection to a woman against tetanus throughout her reproductive life. The findings suggest that more than half of the women in all divisions received 5 doses of valid TT vaccine.

Figure 96: Valid TT Vaccination Coverage in Rural Areas by Division in 2016

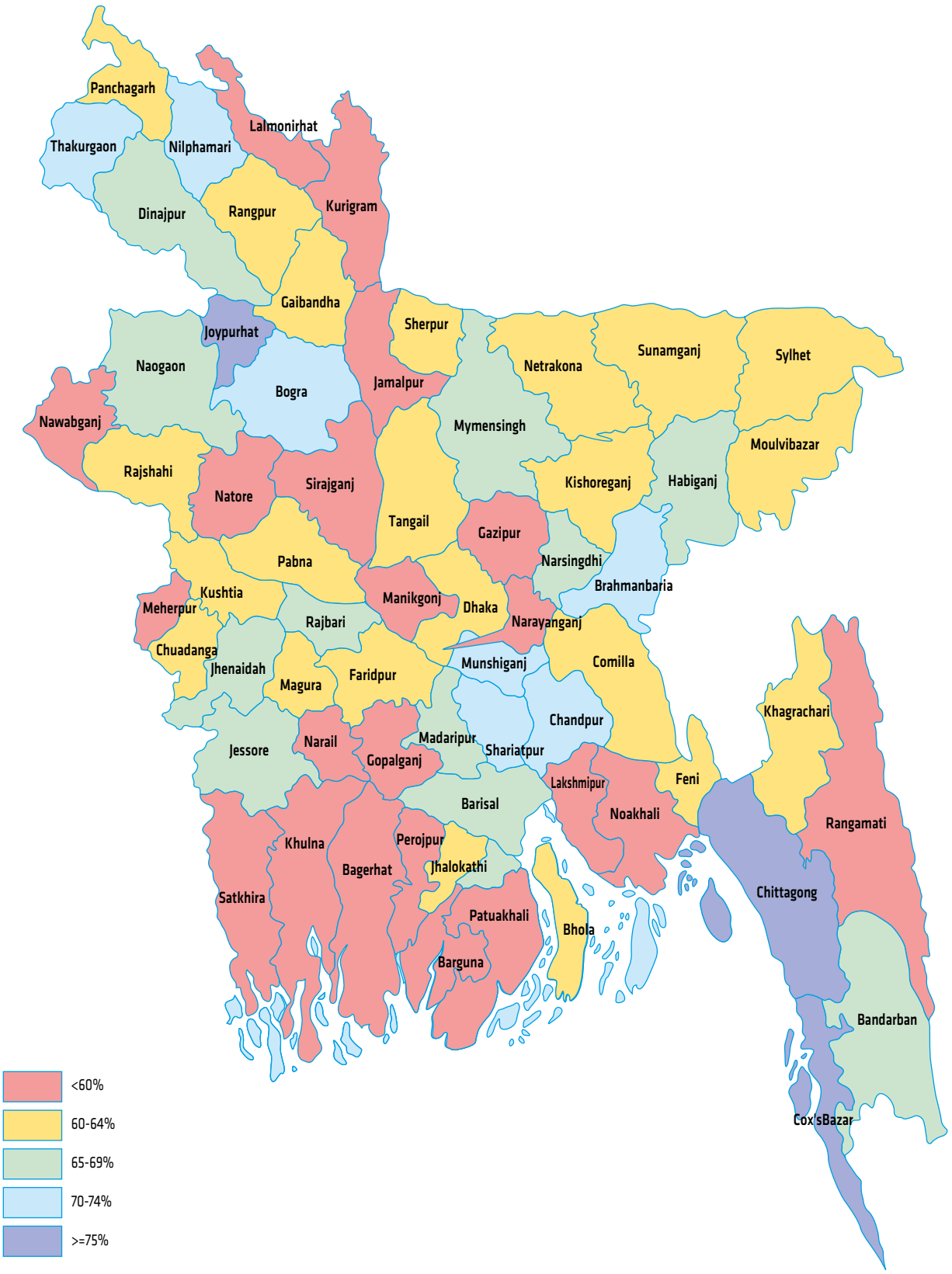


By city corporation, 90 percent or more of women in all the city corporations except SCC received valid TT2 vaccine. However, again, there was significant divergence for valid TT3 coverage, with the highest rate in RCC (96.9 percent) and the lowest in DNCC (76.8 percent). It ranged between 79.1 percent and 92.1 percent in other CCs. In terms of valid TT4, it was found to be the highest in RCC (85.5 percent) and the lowest in DNCC (55.9 percent). By valid TT5 coverage, the spread between the highest and the lowest was substantial, with SCC at 68.1 percent and DNCC at 31.3 percent (see Figure 97).

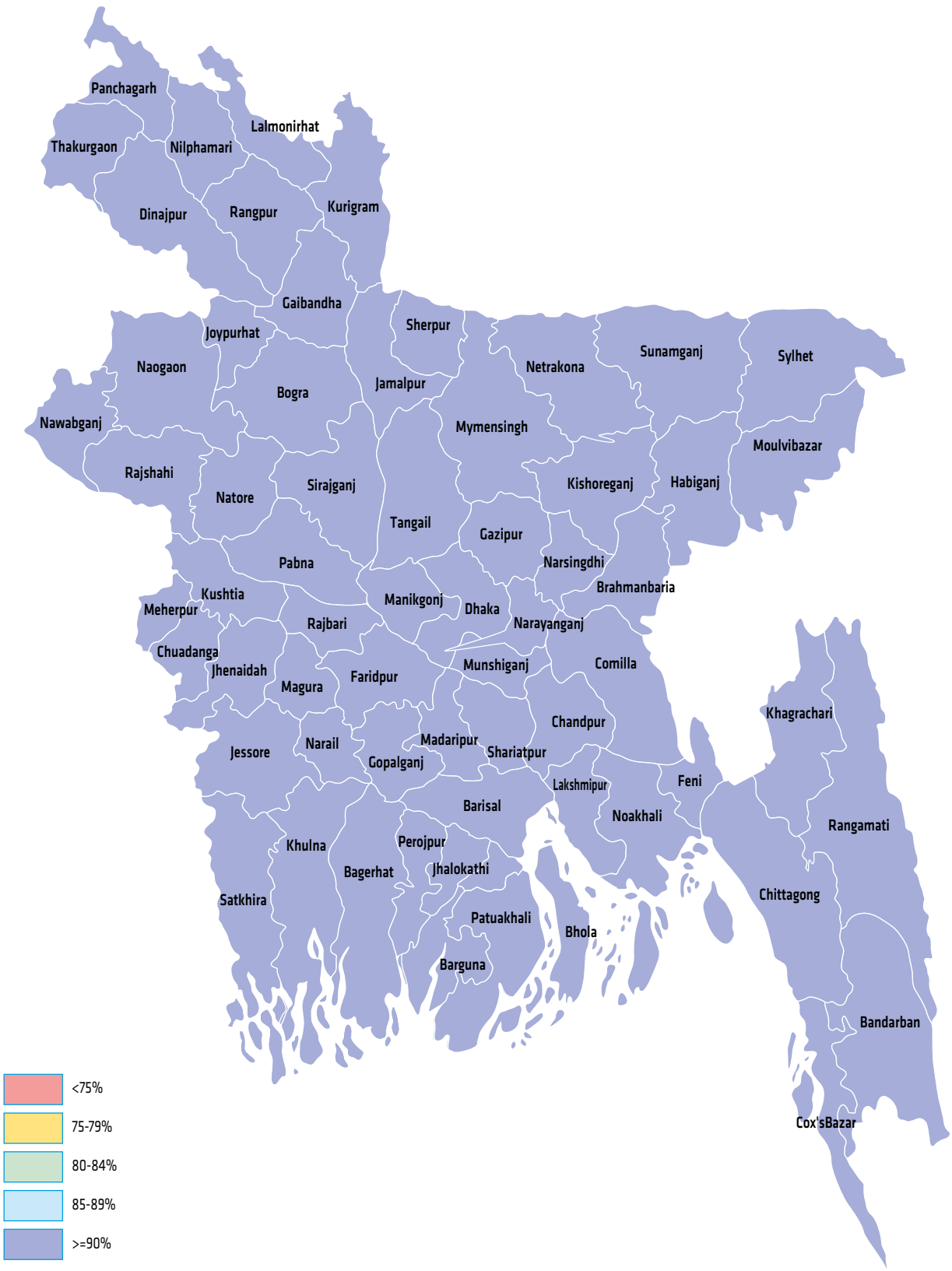
Figure 97: Valid TT Vaccination Coverage in Urban Areas by City Corporation and Municipality in 2016



Map 9: Crude TT5 Vaccination Coverage among Mothers of 0-11 Months Old Children by district



Map 10: Valid TT2 Vaccination Coverage among Mothers of 0-11 Month-Old by Children by District

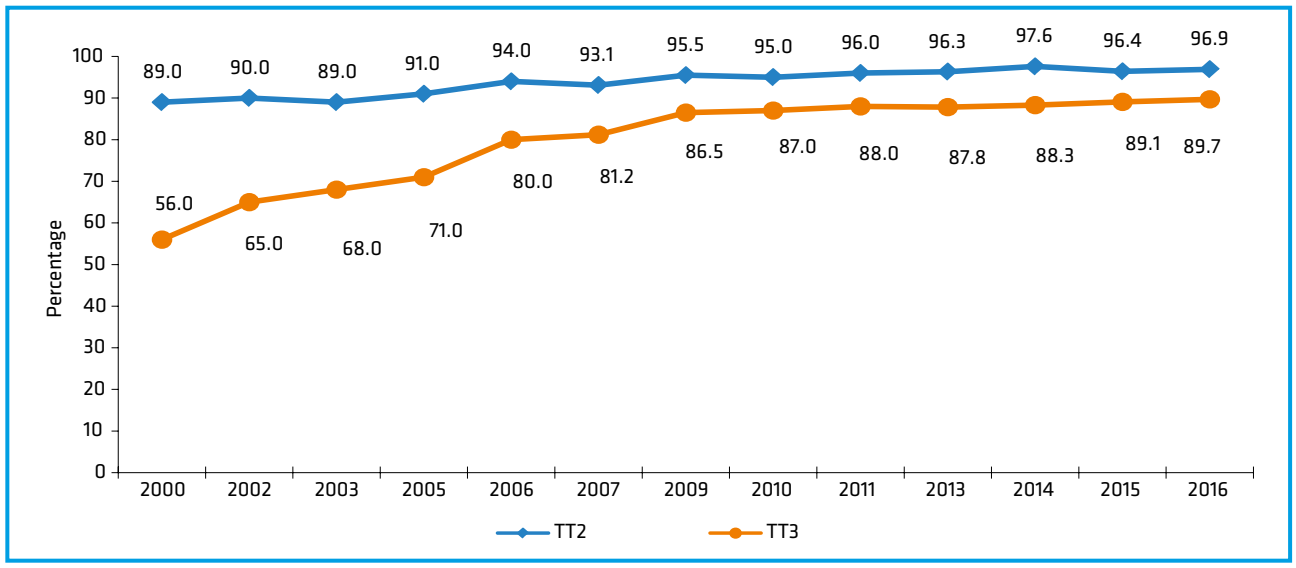


5.5 TRENDS IN THE CRUDE TT2 AND TT3 COVERAGE

Figure 98 shows the nation-wide trend in crude TT2 and TT3 vaccination coverage from 2000 to 2016. It indicates that crude TT3 coverage gradually increased from 56.0 percent in 2000 to 89.7 percent in 2016.

In contrast, TT2 coverage started higher and increased at a slower pace, with fluctuations, since 2003. Between 2003 and 2016, it increased by 7.9 percentage points to 96.9 percent in 2016.

Figure 98: Annual Trend in Crude TT2 and TT3 Vaccination Coverage at National Level from 2000 to 2016 (Card +History)



The trends in crude TT2 vaccination coverage by division is presented in Figures 99 to 105. While some divisions, such as Sylhet and Chittagong, started at lower levels in 2000 (77.0 percent and 81.0 percent, respectively), all the divisions now reach the coverage levels of 97 percent and above with exceptions in Dhaka, and Sylhet (see Figure 101-102 and 105). Improvement in TT2 coverage of Sylhet division is noteworthy, which began even lower in 1999 (72.0 percent), and later reached 93.8 percent in 2016.

Barisal division's crude TT vaccination coverage has generally increased with fluctuations since 2000. Barisal's crude TT2 coverage has experienced a continuous slow pace of improvement since then, increasing by 10.3 percentage points to 98.3 percent in 2016 (see Figure 99).

In Chittagong division, crude TT2 coverage has increased with frequent fluctuations between 2000 and 2016. It increased from 81.0 percent in 2000 to 95.0 percent in 2011, and, again increased to 99.2 percent in 2013. It again fluctuated the other way, with a 2.3 percentage points decrease in 2014 and 1 percentage point increase in 2016 (96.9 in 2014 and 97.9 percent in 2016) (see Figure 100).

In Dhaka division, crude TT2 coverage fluctuated considerably during the period between 2000 and 2005 and was then almost static from 2006 to 2011, ranging between 95.0 percent and 96.0 percent. After a decrease to 89.7 percent in 2013, the rate further increased to 97.6 percent In 2014 and, again, decreased to 95.9 percent in 2016 (see Figure 101).

In Khulna division, crude TT2 coverage began higher, at 90.0 percent in 2000, and, except in 2007, has steadily increased, with some slight fluctuations. By 2016, the rate was 97.1 percent, having increased by 1.8 percentage points over 2013 (see Figure 102).

Rajshahi division, like Barisal, has experienced slow and steady growth in the last decade, with crude TT2 coverage increasing by 4 percentage points from 2005 to 98.0 percent in 2010. After that, it considerably fluctuated in over the last six years (see Figure 103).

The crude TT2 coverage in Rangpur division was 97.0 percent in 2011 and 99.3 percent in 2013. However, it decreased down to 97.8 percent in 2016 (see Figure 104). It is to be noted here that before 2011 Rangpur division was a part of Rajshahi division. Therefore, the earlier findings about Rangpur division were presented under Rajshahi division.

In Sylhet division, a fluctuating but upward trend was observed in crude TT2 coverage. Crude TT2 coverage increased from 85.0 percent in 2005 to 94.3 percent in 2015, and, in 2016 it decreased to 93.8 percent. Conversely, it decreased by 7.9 percentage points in the past two surveys- from 98.9 percent in 2013 to 91.0 percent in 2014 (see Figure 105). And, again, it increased by 3.3 percentage points between CES 2014 and 2015; once again it decreased by 0.5 percentage point in 2016.

Figure 99: Crude TT2 Vaccination Coverage in Barisal Division from 2000 to 2016

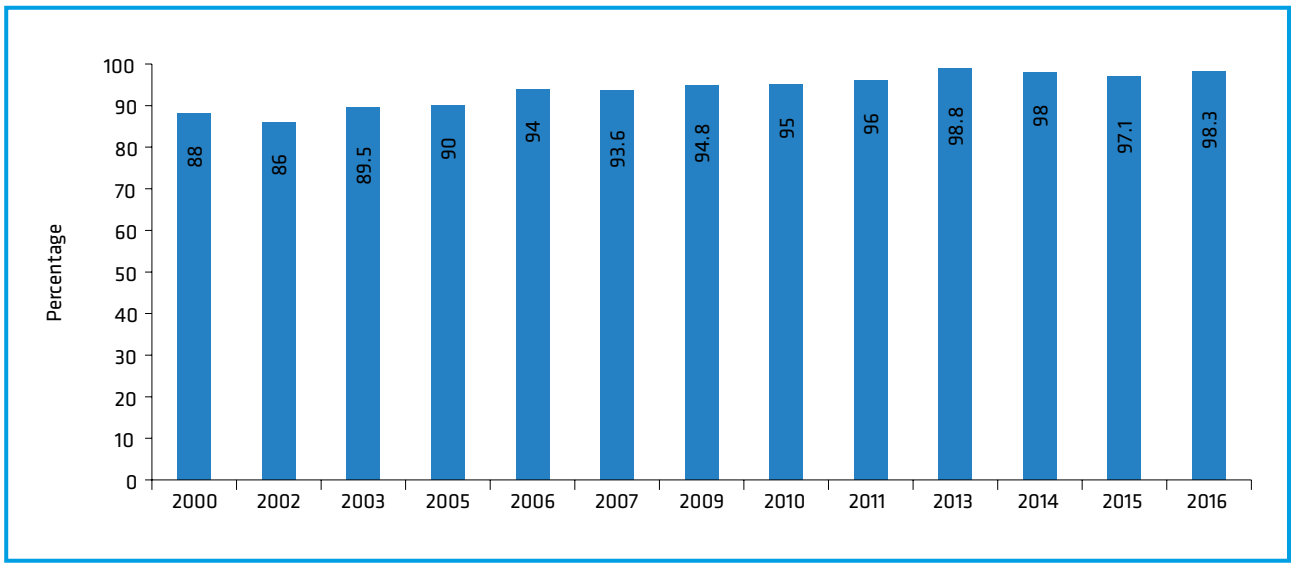


Figure 100: Crude TT2 Vaccination Coverage in Chittagong Division from 2000 to 2016

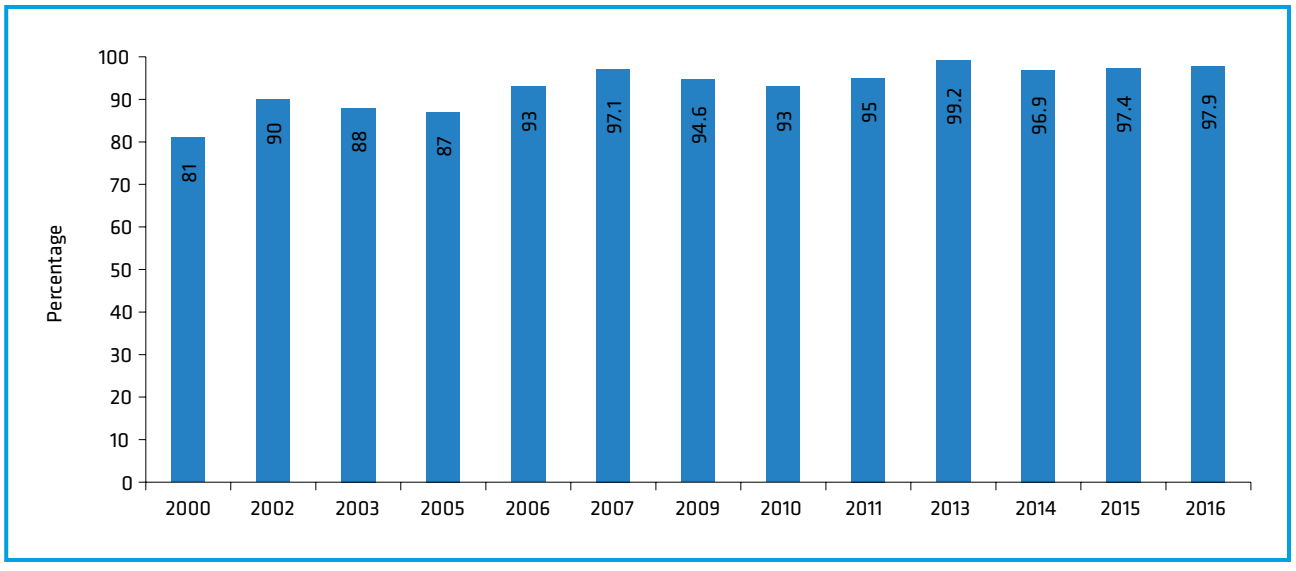


Figure 101: Crude TT2 Vaccination Coverage in Dhaka Division from 2000 to 2016

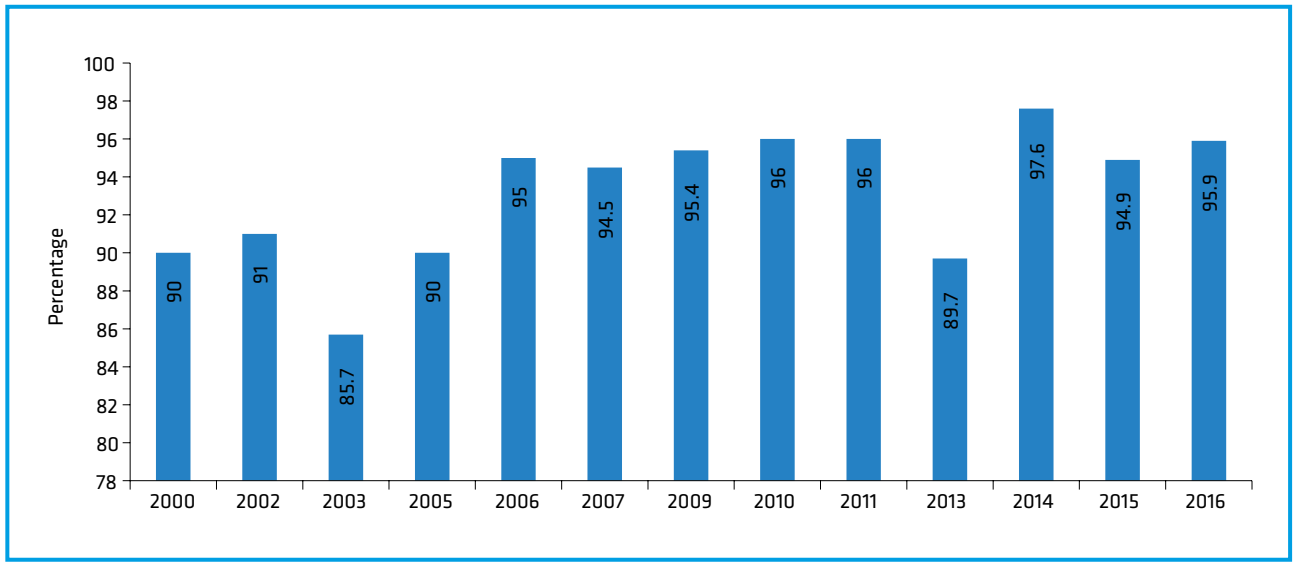


Figure 102: Crude TT2 Vaccination Coverage in Khulna Division from 2000 to 2016

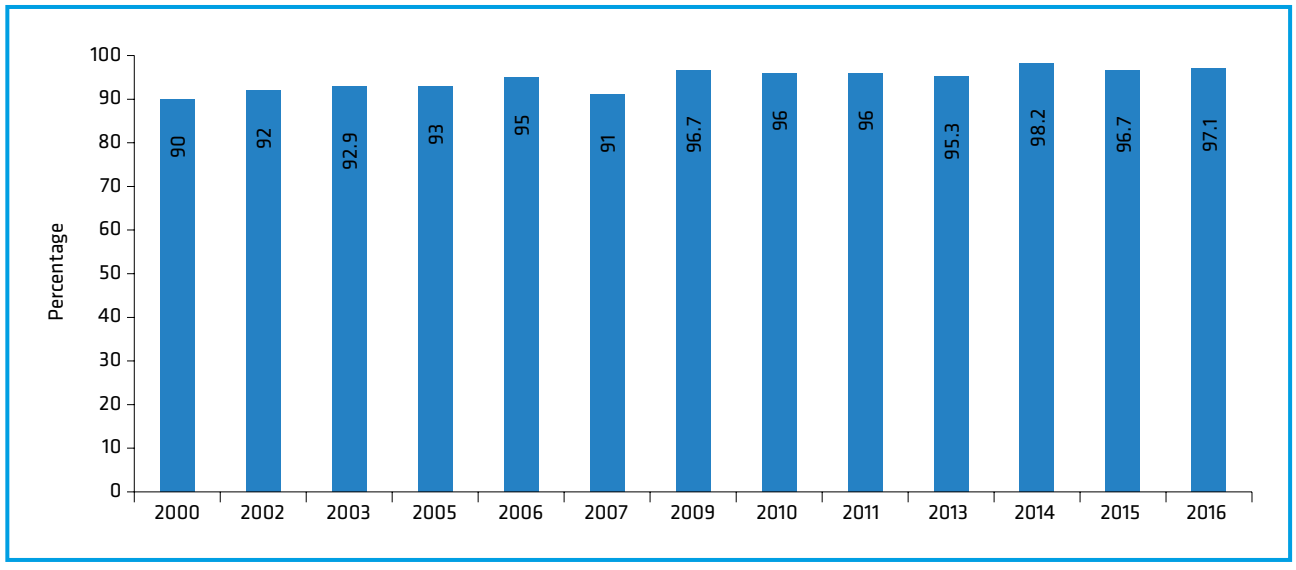


Figure 103: Crude TT2 Vaccination Coverage in Rajshahi Division from 2000 to 2016

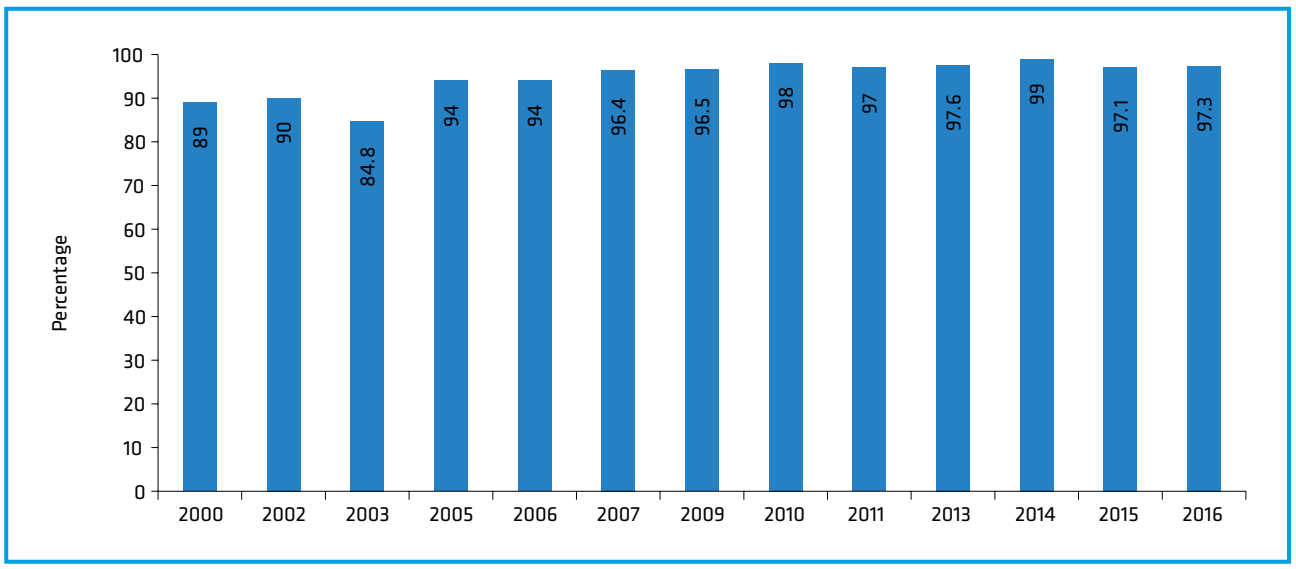


Figure 104: Crude TT2 Vaccination Coverage in Rangpur Division from 2011 to 2016

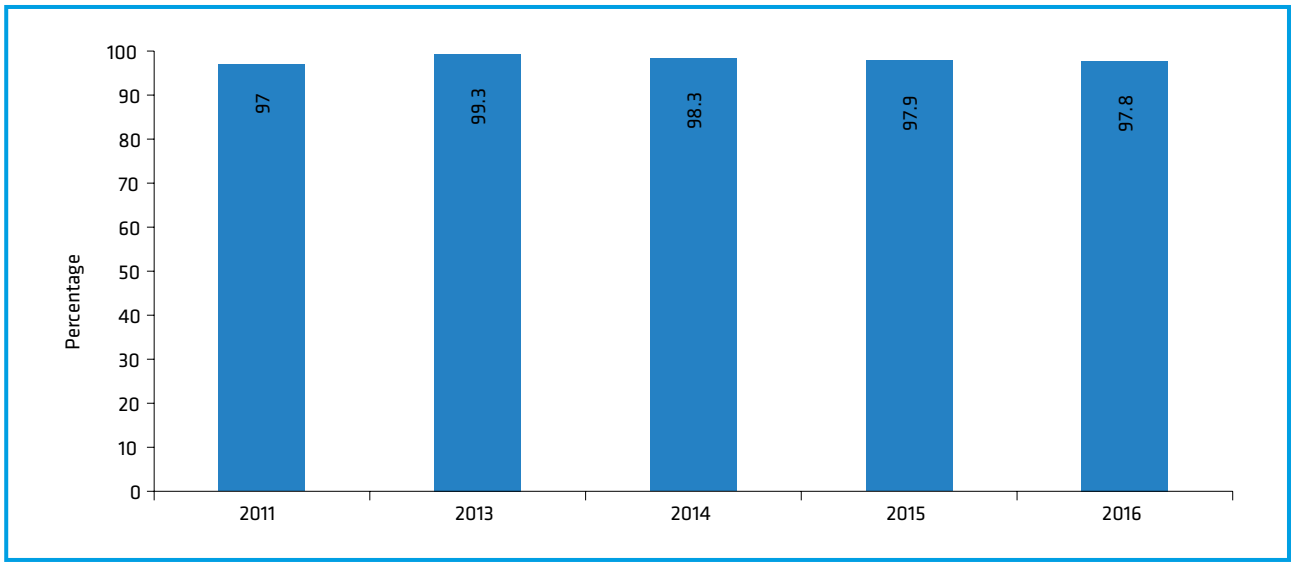
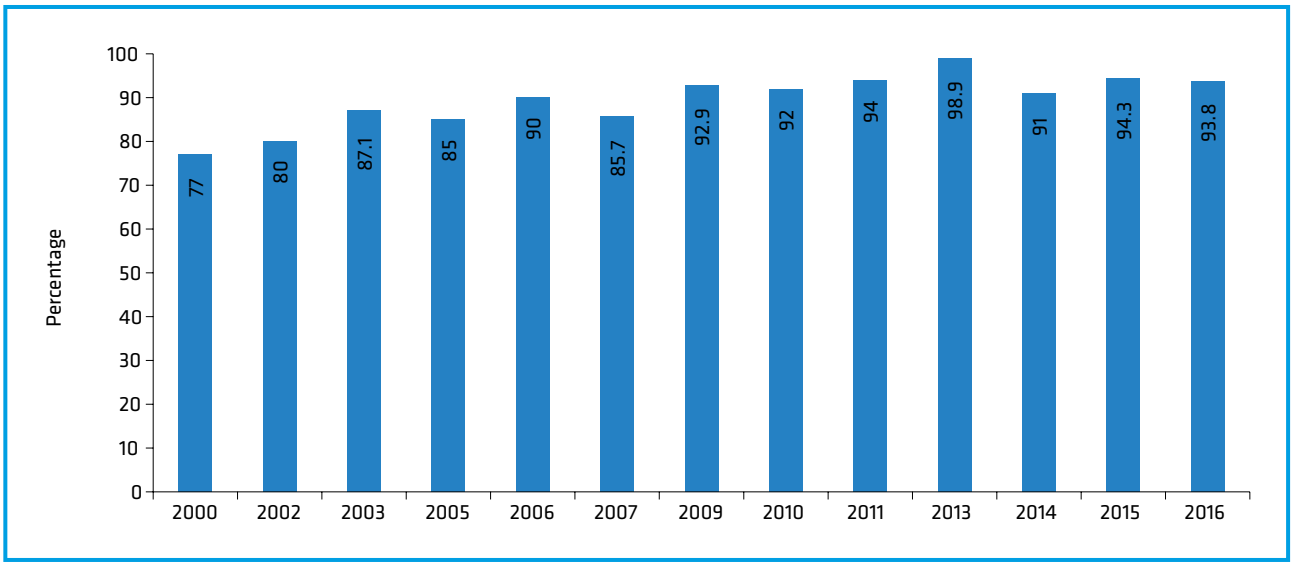


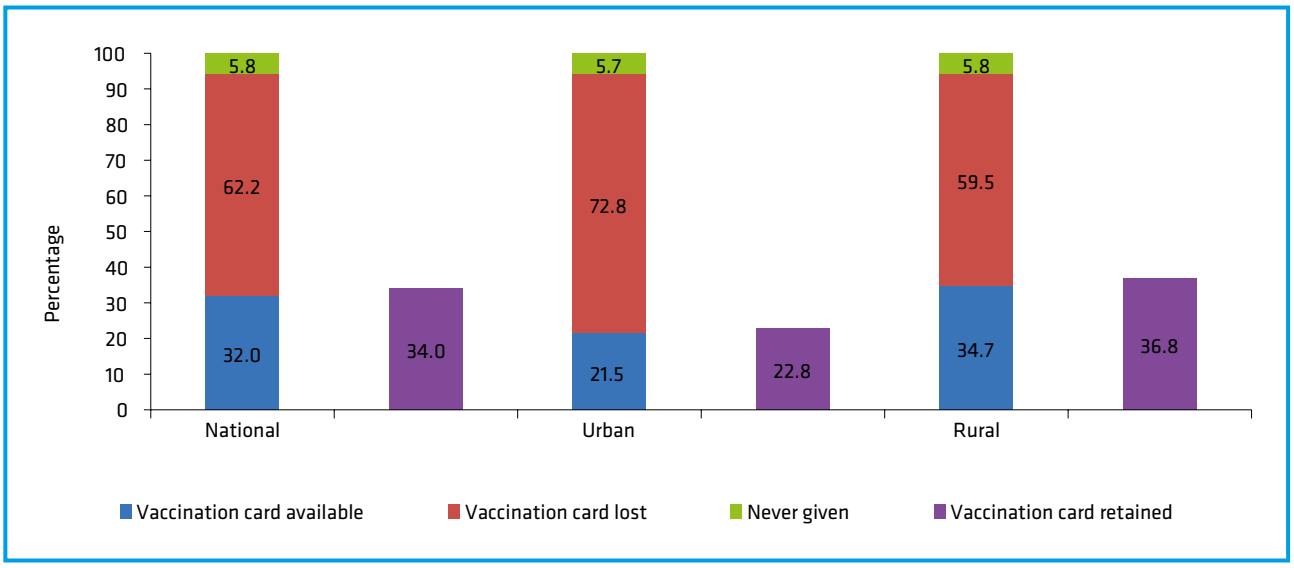
Figure 105: Crude TT2 Vaccination Coverage in Sylhet Division from 2000 to 2016



5.6 TT CARD STATUS AMONG MOTHERS

Nationally, 32.0 percent cards were available during the time of data collection and 62.2 percent appeared to be lost. In 94.2 percent cases, cards were issued at the time of vaccination and that the cards were not given to the rest 5.8 percent vaccine recipients. TT vaccination cards were found to be retained (percentage of cards available at the time of the survey against the total number available and lost, but not those never given) in 34.0 percent cases nationally (see Figure 106). Rural mothers were more likely to retain TT vaccination cards (36.8 percent), compared to their urban counterparts (22.8 percent).

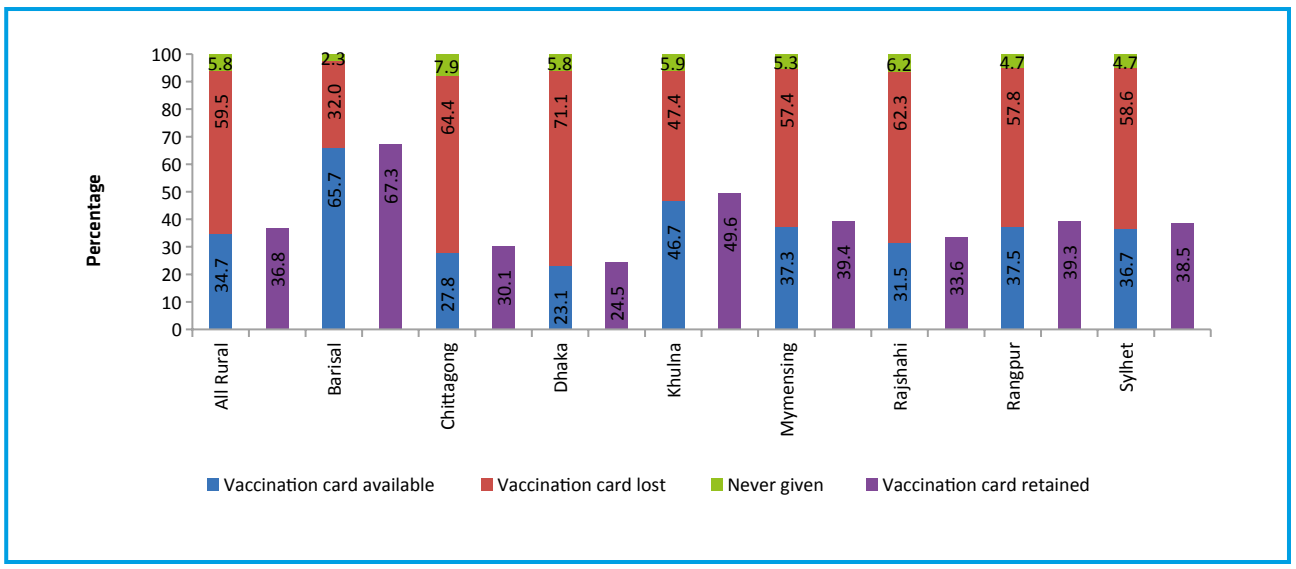
Figure 106: TT Vaccination Card Status by National, Rural and Urban Areas in 2016



Among the rural divisions, availability of TT vaccination cards during the period of data collection was found to be the highest in Barisal division (65.7 percent) and the lowest in Dhaka division (23.1 percent), which was found to be the same pattern for the card retention rate (67.3 percent and 24.5 percent, respectively) . The highest proportion of

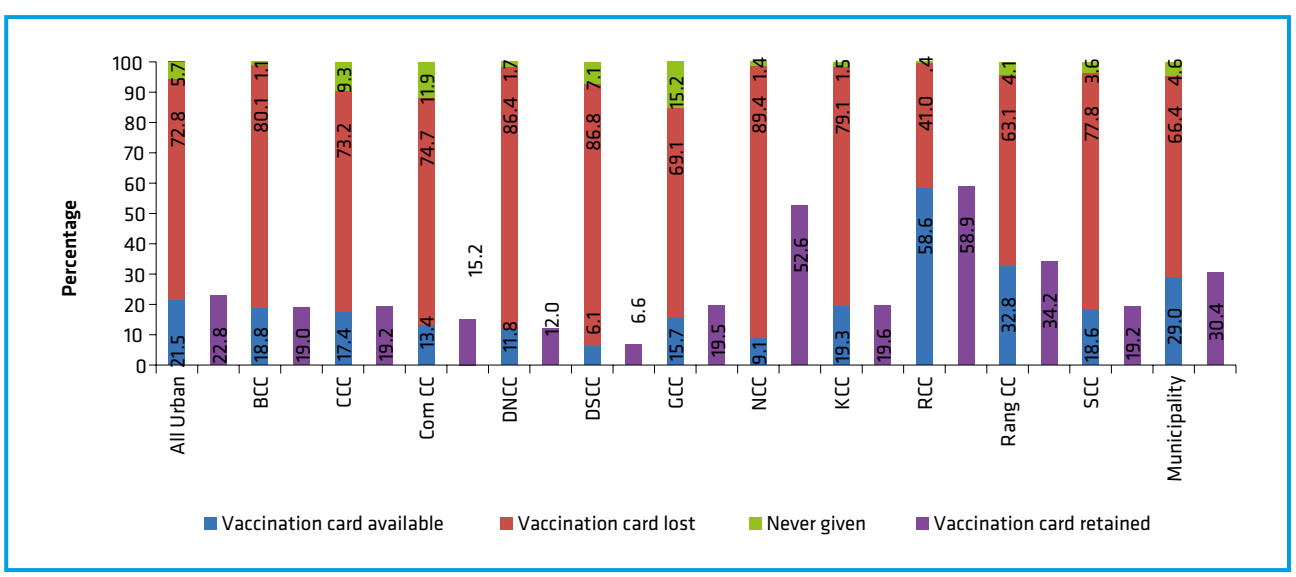
vaccination cards reported to be lost was the inverse, with Dhaka division the highest (71.1 percent) and Barisal division the lowest (32.0 percent) (see Figure 107).

Figure 107: TT Vaccination Card Status in Rural Areas by Division in 2016



The TT vaccination card status by city corporation reports that 58.6 percent cards were found to be retained during the time of data collection by mothers residing in RCC. The lowest percentage of retained cards was in DSCC, at 6.6 percent. While the lowest number of lost cards was in RCC (41.0 percent), the highest number in NCC (89.4 percent). The lowest rate of vaccination cards found to be retained was in DSCC (6.6 percent), which was being followed by DNCC (12.0 percent) (see Figure 108).

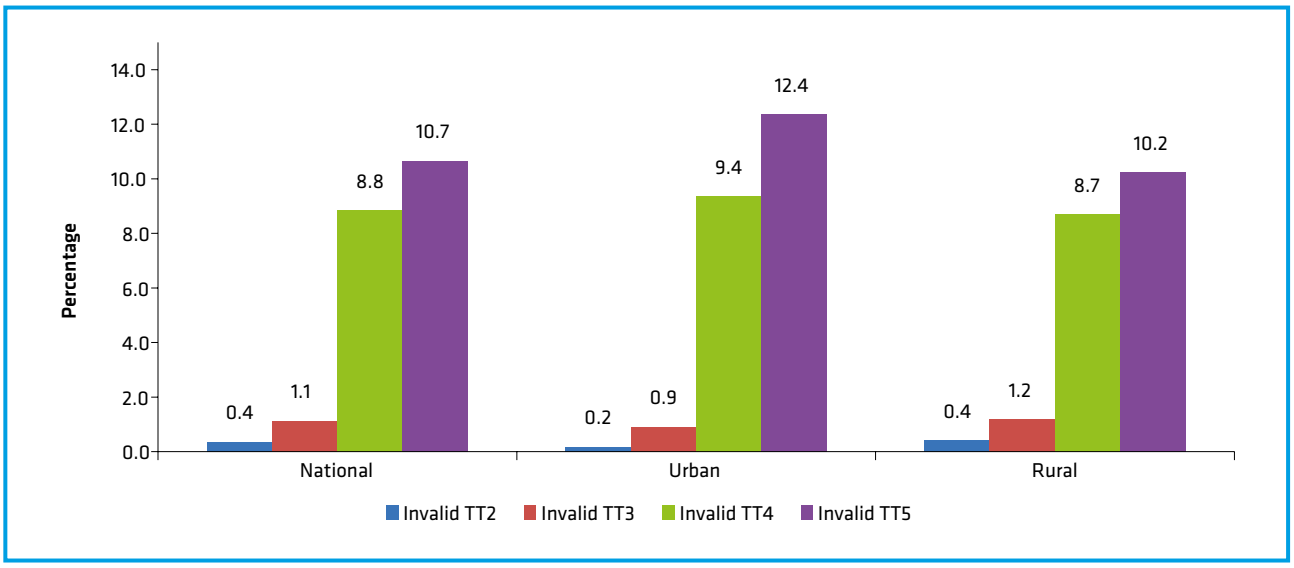
Figure 108: TT Vaccination Card Status in Urban Areas by City Corporation and Municipality in 2016



5.7 INCIDENCE OF INVALID DOSES

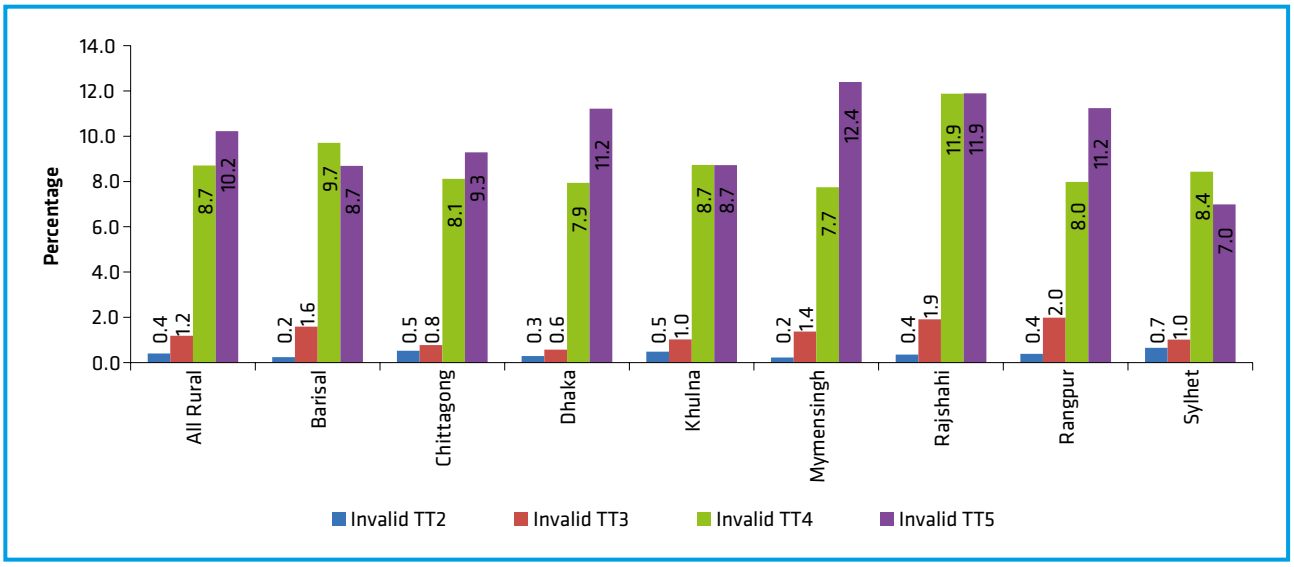
Nationally, the incidence of invalid doses was a little bit more than one percent for TT3, and about 9 percent for TT4, and roughly 11 percent for TT5. By residence, incidence of invalid TT3 was slightly higher in rural areas than in urban areas whereas TT4 and TT5 were slightly higher in urban areas than those in rural areas. In rural areas, incidence of invalid TT3 was 1.2 percent, TT4 8.7 percent, and TT5 10.2 percent, while the corresponding figures in urban areas were 0.9 percent, 9.4 percent, and 12.4 percent, respectively (see Figure 109).

Figure 109: Incidence of Invalid TT Doses by National, Rural and Urban Areas in 2016



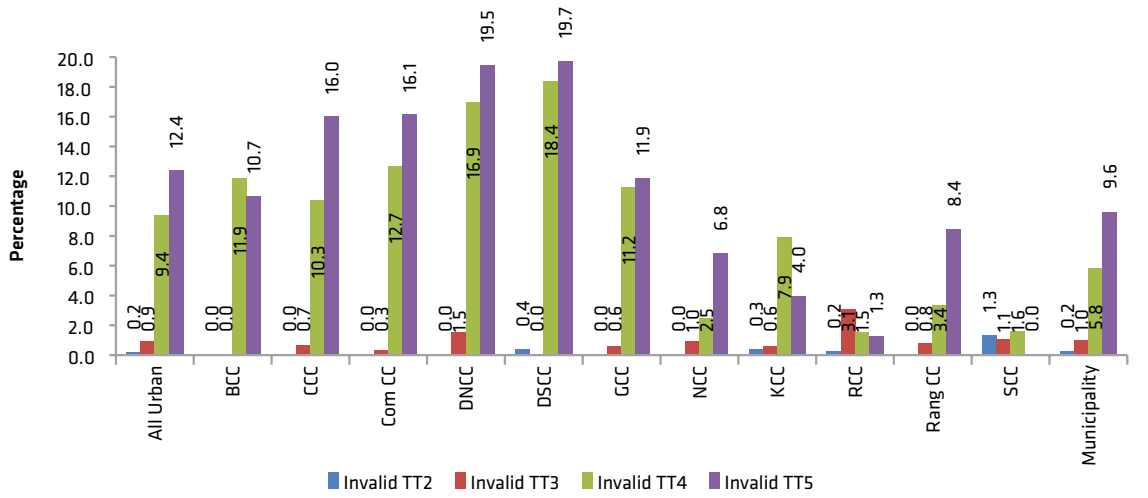
Incidence of invalid TT2 doses was 0.4 percent nationally, while it was 0.4 percent in rural areas, and 0.2 percent in urban areas. Among the rural divisions, there were some variations within the invalid doses of TT3, TT4, and TT5 among the divisions. Invalid TT3 ranged between 0.6 percent in Dhaka division and 2.0 percent in Rangpur division. Similarly, incidence of invalid TT4 ranged from 7.7 percent in Mymensingh division to 11.9 percent in Rajshahi division. The highest incidence of invalid TT5 was in Mymensingh (12.4 percent) whereas the lowest in Sylhet divisions (7.0 percent). Among the other divisions, incidence of invalid TT5 ranged between 11.9 percent in Rajshshi and 8.7 percent in Khulna and Barisal divisions (see Figure 110).

Figure 110: Incidence of Invalid TT Doses in Rural Areas by Division in 2016



Among the city corporations, the incidence of invalid TT2 was the highest in SCC (1.3 percent) followed by DSCC- 0.4 percent, KCC- 0.3 percent, and RCC- 0.2 percent. However, there was no invalid TT2 in the other city corporations. The highest and the lowest rates of invalid TT3 to TT4 doses varied greatly. For instance, incidence of invalid TT3 dose was the highest in RCC (3.1 percent) and the lowest in Com CC (0.3 percent), but there was no invalid TT3 in BCC and DSCC, while for invalid TT4, it was the highest in DSCC (18.4 percent) and the lowest in RCC (1.5 percent). However, invalid TT5 was again the highest in DSCC (19.7 percent) and the lowest in RCC (1.3 percent) although there was no invalid TT5 in SCC. Overall, DSCC had the highest incidence of TT4 and TT5 (see Figure 111).

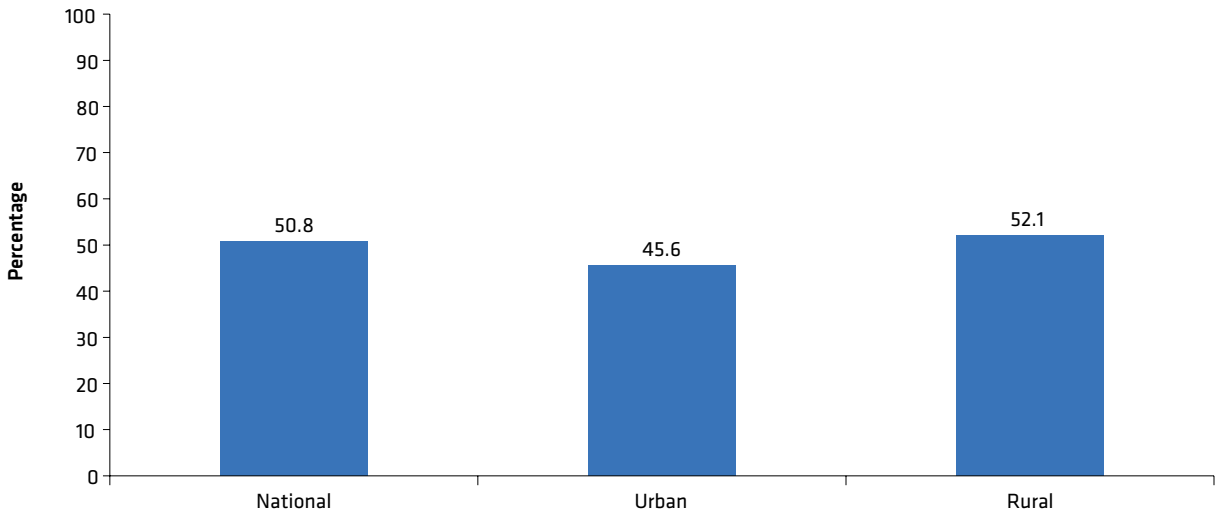
Figure 111: Incidence of Invalid TT Doses in Urban Areas by City Corporation and Municipality in 2016



5.8 SCREENING TT VACCINATION OF THE MOTHERS

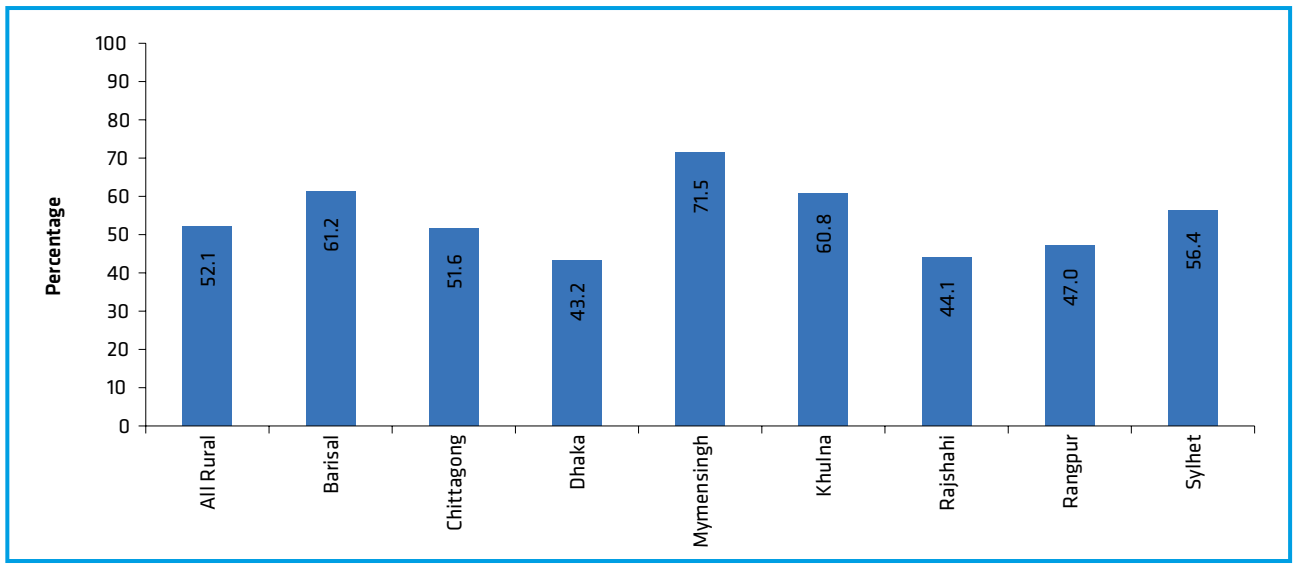
Screening the mothers' TT status is an important means for addressing the missed opportunity of subsequent TT doses. CES 2016 assessed the screening status by the vaccinator.Results are presented in from Figure 112 to Figure 114. Overall, 50.8 percent of the mothers across the country reported that their TT status was screened. Rural mothers (52.1 percent) were more likely to be screened, compared to those residing in urban areas (45.6 percent) (see Figure 112).

Figure 112: Percentage Distribution of Mothers Screened for TT Status by National, Rural and Urban Areas in 2016



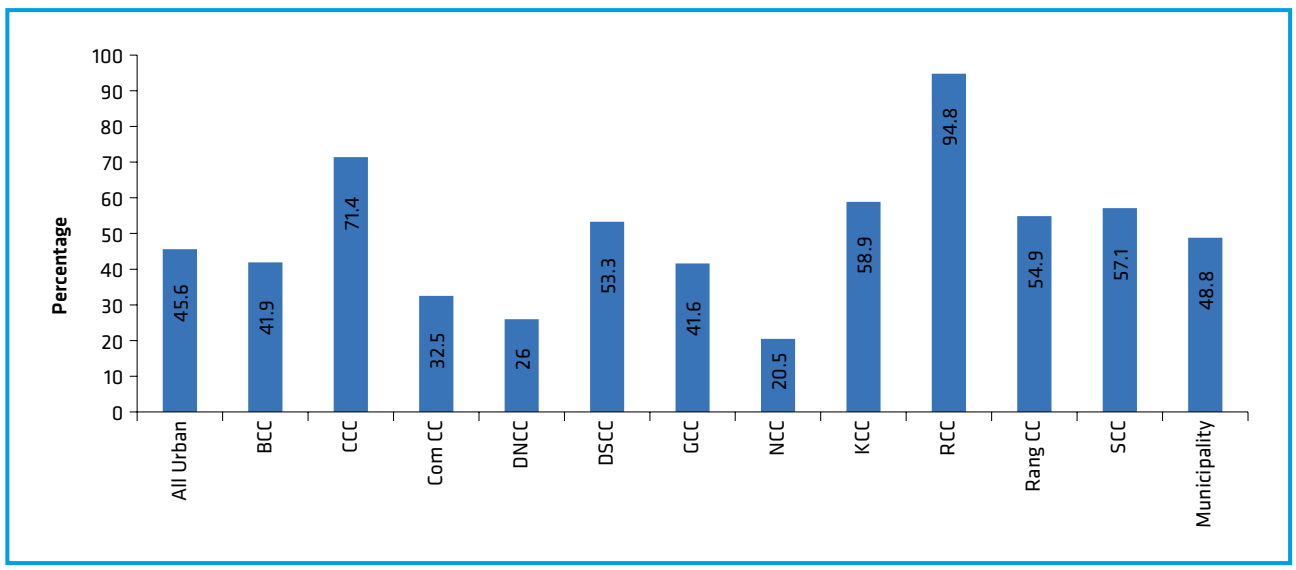
By rural division, the highest proportion of mothers who reported that their TT vaccination status was screened by the vaccinator (71.5 percent) were from Mymensingh division. The proportion of the screened mothers was the lowest in Dhaka division (43.2 percent). Others ranged between 44.1 percent and 61.2 percent in other divisions (see Figure 113).

Figure 113: Percentage Distribution of Mothers Screened for TT Status in Rural Areas by Division



Among the city corporations, the proportion of screened mothers was the highest by far in RCC (94.8 percent), followed by CCC (71.4 percent), KCC (58.9 percent), and, with a steady decline in the other city corporations to the lowest, held by NCC (20.5 percent) (see Figure114).

Figure 114: Percentage Distribution of Mothers Screened for TT in Urban Areas by City Corporation and Municipality in 2016



5.9 CHILDREN'S PROTECTION AT BIRTH (PAB) AGAINST TETANUS

The status of Protection at Birth against tetanus of the surveyed children is presented in Figures 115 to 117. Nationally, 91.0 percent of the children were protected at their birth against tetanus, with subtle difference between rural children and urban children in this context (91.2 percent urban children were protected whereas it was 91.0 percent for their urban counterpart). Among the divisions, also shown on Map 11, PAB against tetanus was the highest in Chittagong (94.7 percent), followed by Barisal (94.2 percent). Children living in Sylhet division were found to be comparatively less protected (86.6 percent) (see Figure 116).

Among the city corporations, PAB status was found to be almost universal in BCC (98.7 percent). Most of the city corporations were above 90.0 percent, but four ranged from 89.7 percent to 83.4 percent: Rang CC, DNCC, SCC and KCC (see Figure 117).

Figure 115: Percentage Distribution of Children Protected at Birth against Tetanus by National, Rural and Urban Areas in 2016

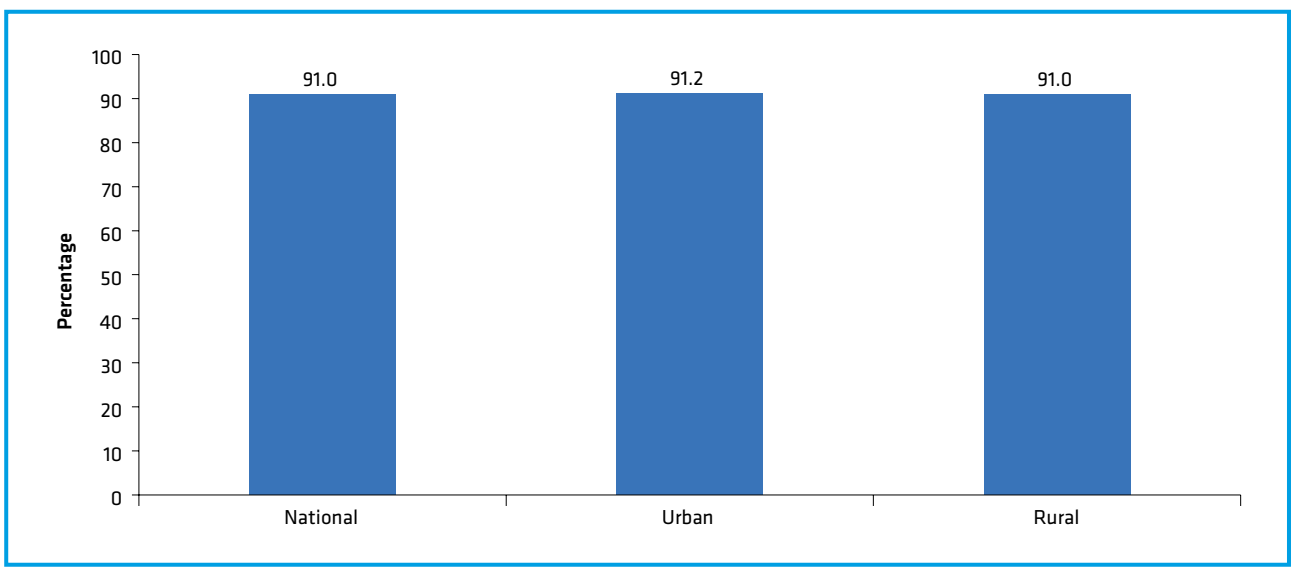


Figure 116: Percentage Distribution of Children Protected at Birth against Tetanus in Rural Areas by Division in 2016

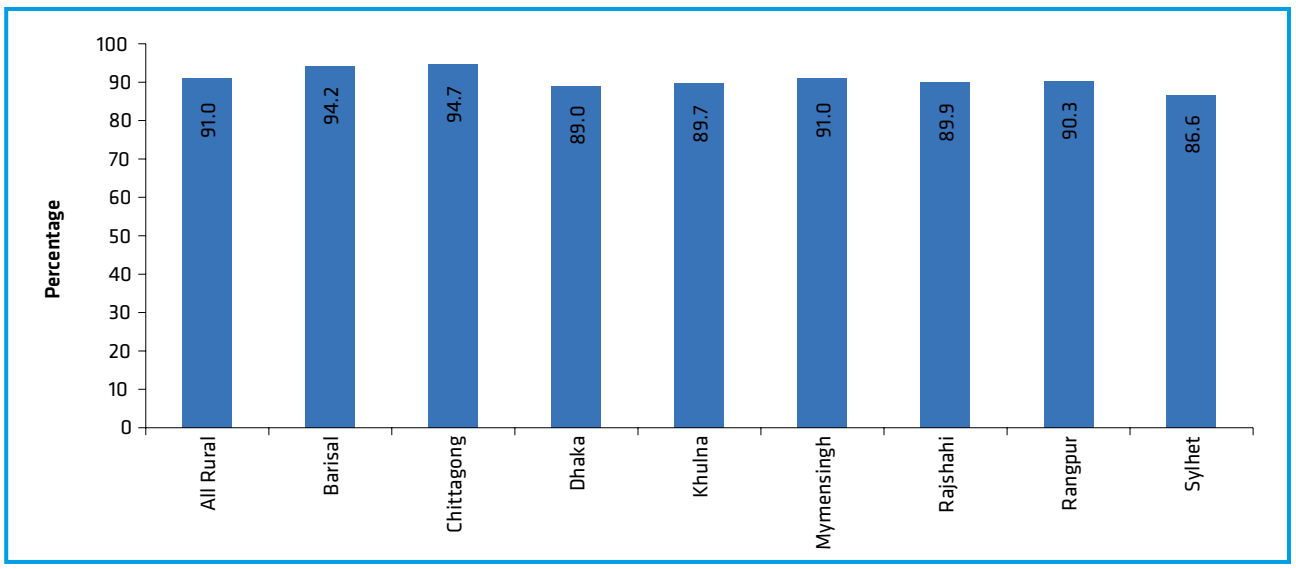
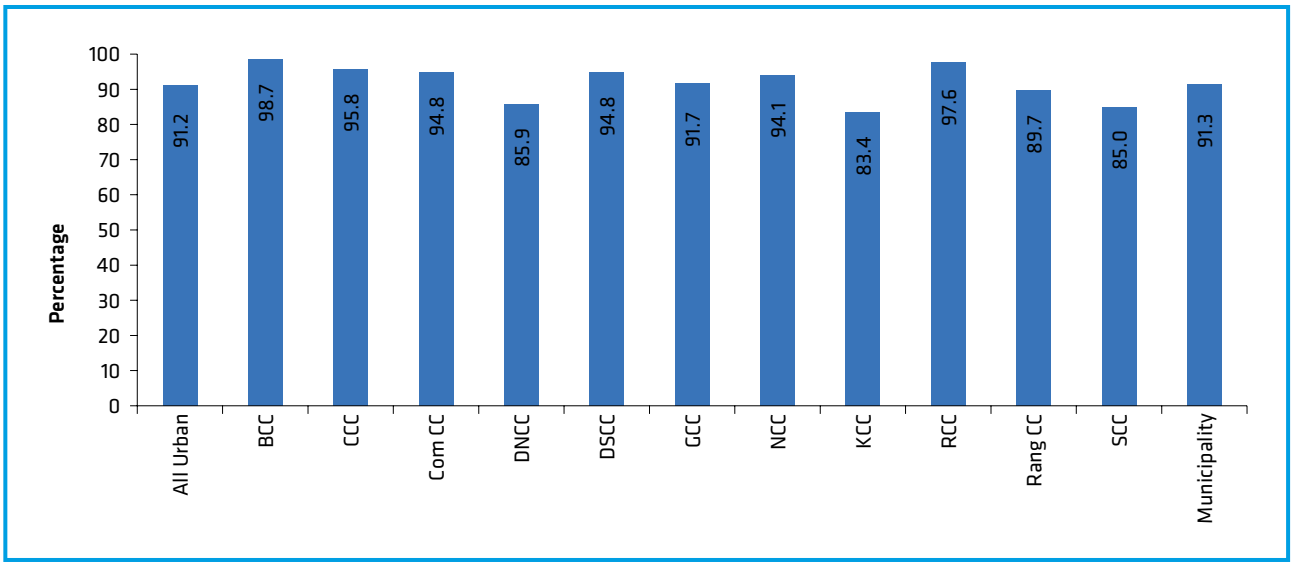


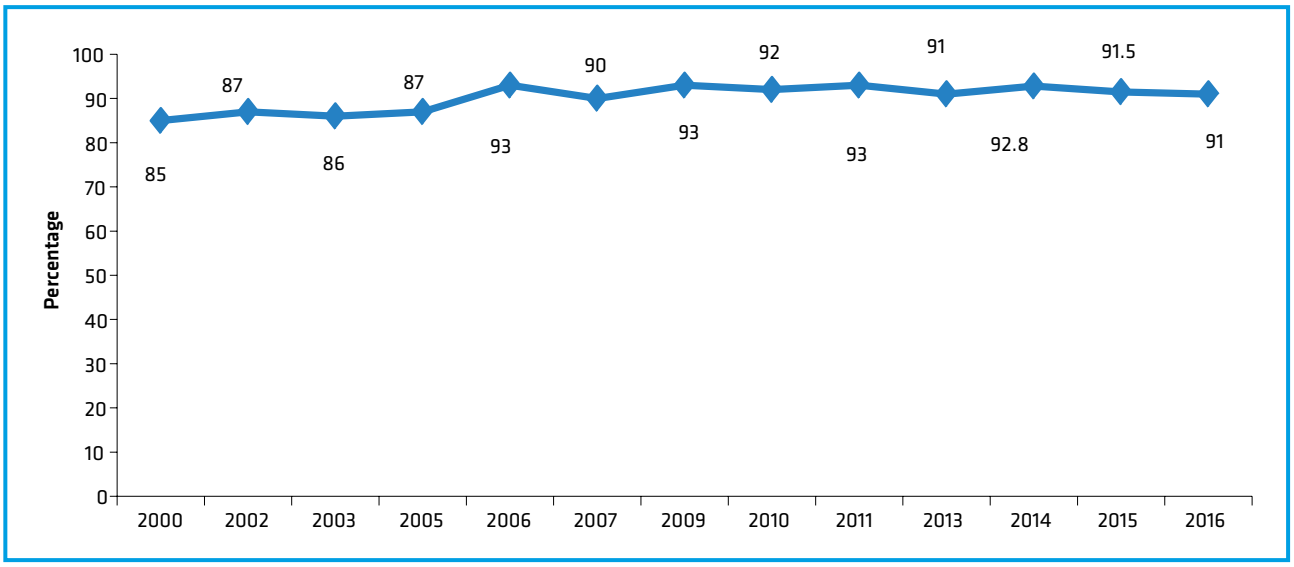
Figure 117: Percentage Distribution of Children Protected at Birth against Tetanus in Urban Areas by City Corporation and Municipality in 2016



5.10 TRENDS IN PROTECTION AT BIRTH (PAB) AGAINST TETANUS

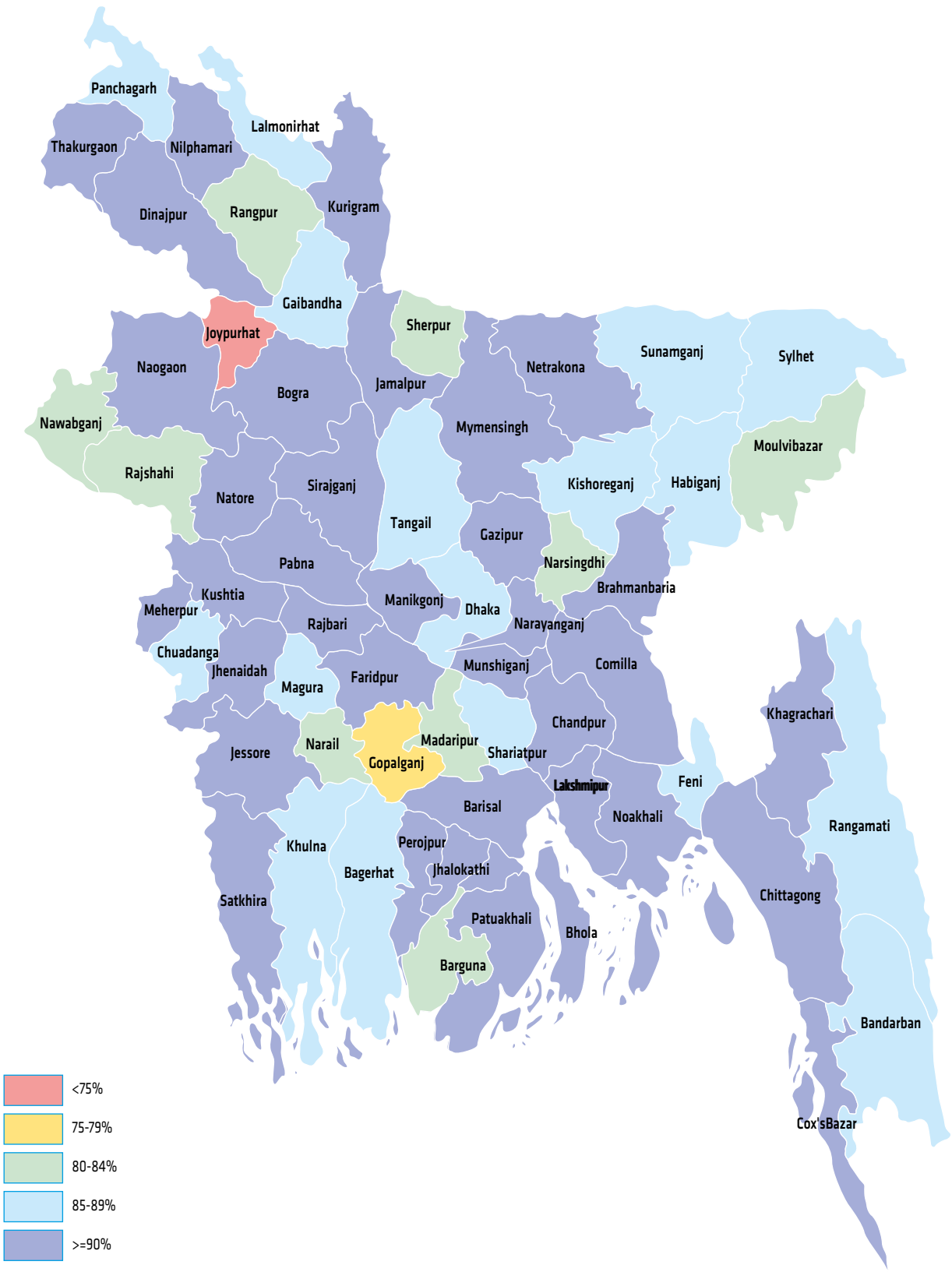
The trend of the nation in this regard is shown in Figure 118. It shows a slow but gradual increase with minor fluctuations in PAB since 2000. PAB against tetanus increased by 7 percentage points – from 85 percent in 2000 to 92 percent in 2010. PAB was almost stagnant for the last one decade and varied with some fluctuations between 93 percent and 91.5 percent. PAB was 91 percent in 2013 and increased to 92.8 percent in 2014. However, it again decreased down to 91.5 percent in 2015 and 91.0 percent in 2016.

Figure 118 . Percentage Distribution of Newborns Protected at Birth against Tetanus at National Level from 2000 to 2016



Map 11:

Newborn Protected at Birth against Tetanus by District



5.11 TT2 COVERAGE AND PAB STATUS

Figure 119 presents TT2 coverage by mothers' age and the status of PAB of newborn babies. It shows that 91.0 percent of the newborn babies were protected at their birth, as against all (96.8 percent) TT2 coverage. By the age of mothers, the gap between TT2 coverage and PAB was the highest among the mothers aged 40 years and above; it was 89.2 percent for TT2 coverage and 74.2 for PAB. For the other age groups, the gap between TT2 coverage and PAB had also some variations. In urban areas, the gap between TT2 coverage and PAB among mothers who were 40 years of age and above was 14.6 percentage points (see Figure 120). The gap among rural mothers who were 40 years old and above was 15.2 percent, which was 0.6 percentage points higher than the urban mothers of same age group.

The analysis of TT2 coverage and PAB indicates that TT2 coverage and PAB are not inter-related. In relation to TT2 coverage, PAB was not found the same even nationally. This might be due to giving birth to the child after 3 years of receiving TT2.

Figure 119: Percentage Distribution of Mothers Received TT2 and of Newborn Protected at Birth Against Tetanus by Age Group of Mothers at National Level in 2016

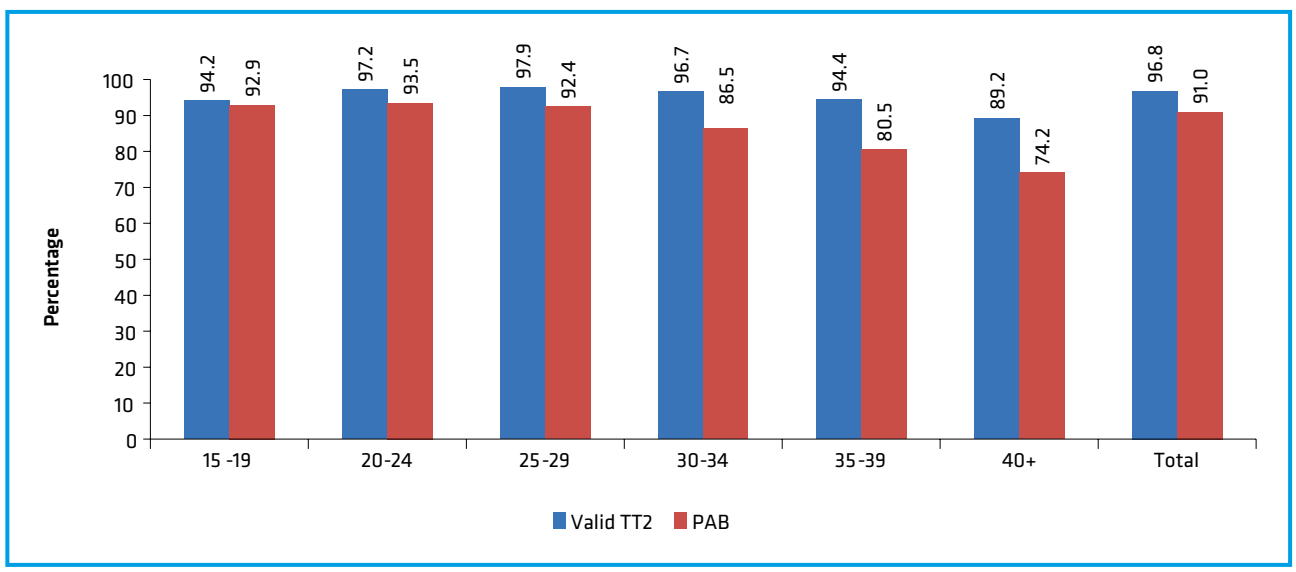


Figure 120: Percentage Distribution of Mothers Received TT2 and of Newborn Protected at Birth Against Tetanus by Age Group of Mothers by Urban Areas in 2016

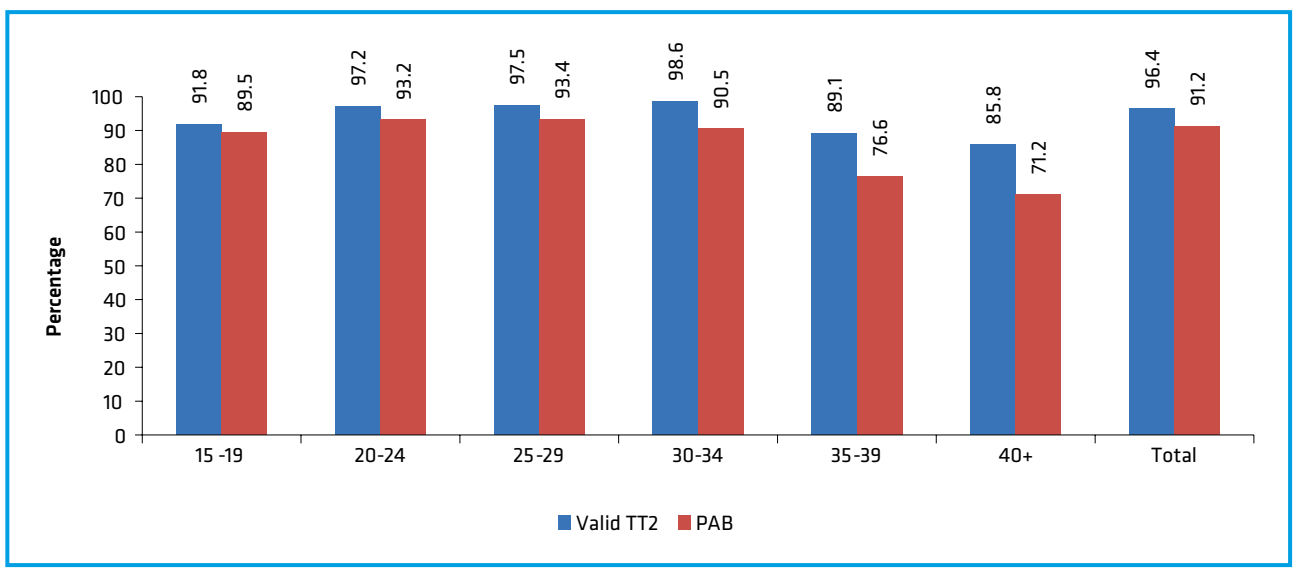
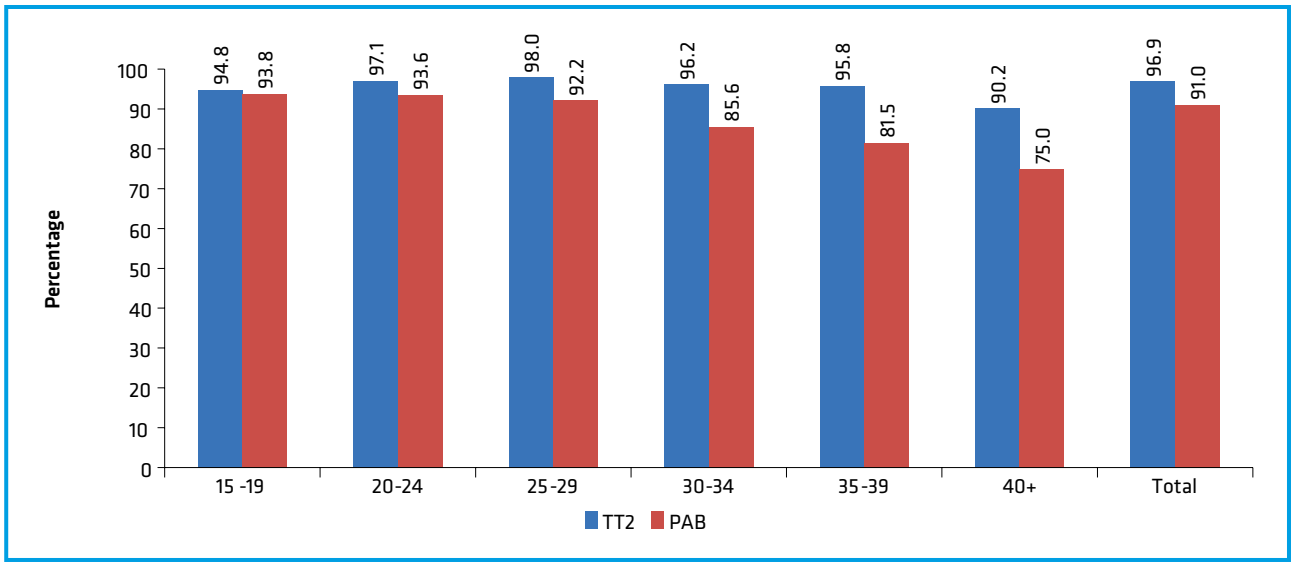


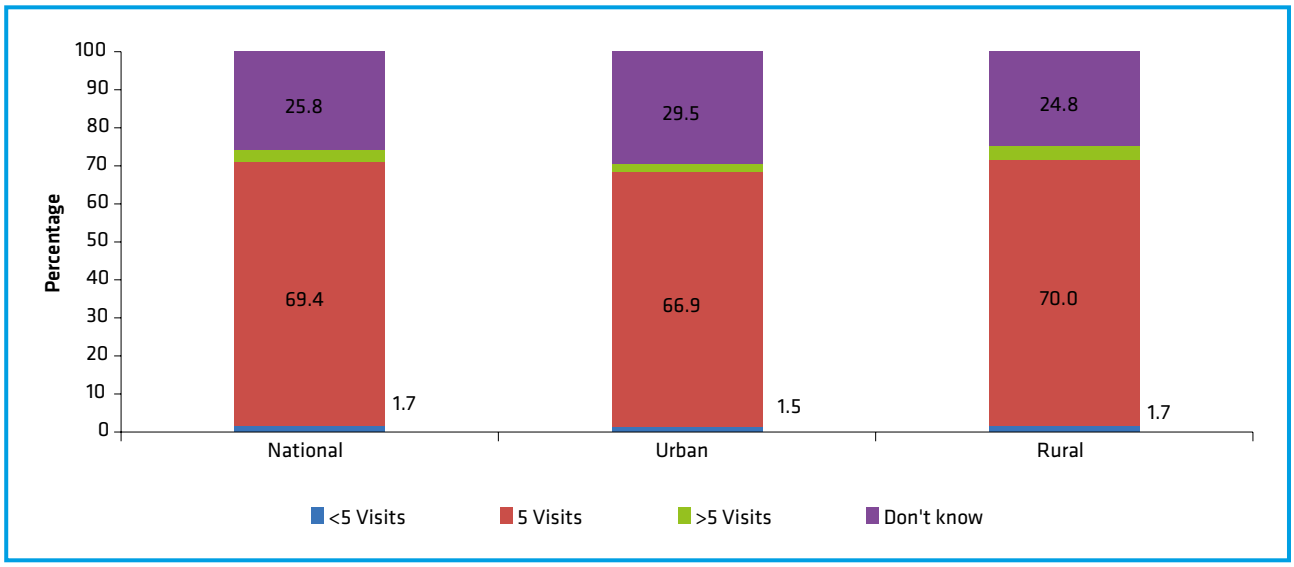
Figure 121: Percentage Distribution of Mothers Received TT2 and of Newborn Protected at Birth Against Tetanus by Age Group of Mothers by Rural Areas in 2016



5.12 MOTHERS' KNOWLEDGE ABOUT NUMBER OF TT DOSES

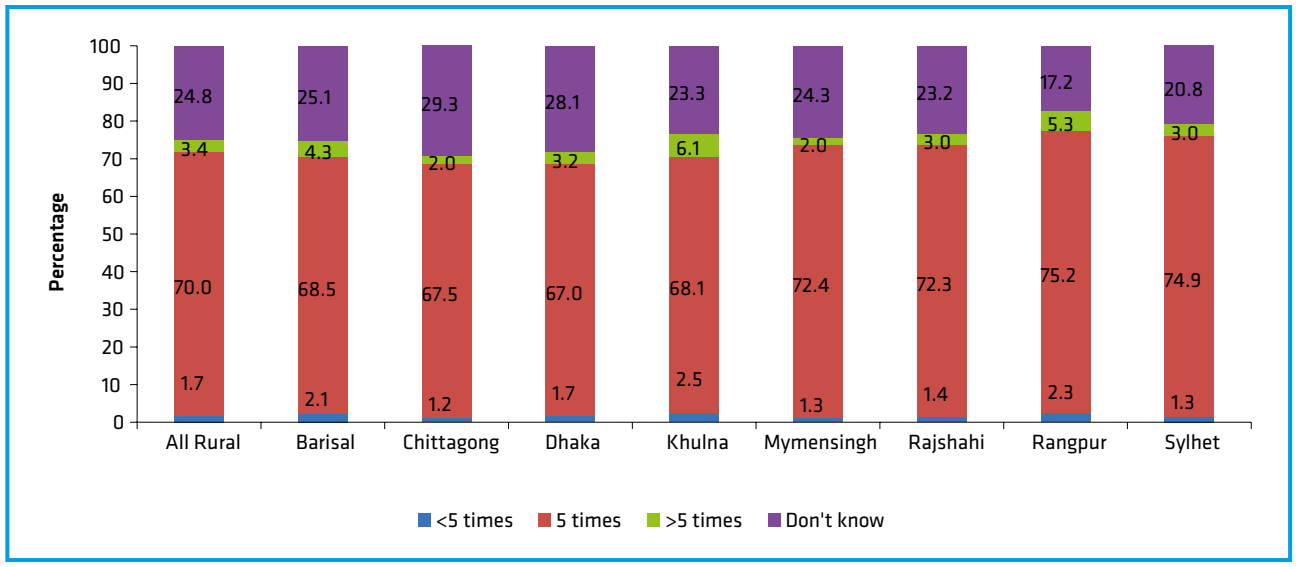
Figure 122 presents the mothers' knowledge about the number of TT doses required for their protection against tetanus throughout their reproductive age. Nationally, a little over two-thirds of the respondents (69.4 percent) reported about knowing five doses of TT vaccine. Respondents living in rural areas had better knowledge than those living in urban areas (70.0 percent vs. 66.9 percent). Overall, roughly one-fourth of the respondents reported that they did not know anything about the number of doses.

Figure 122: Knowledge about Number of TT Doses Required to Protect a Woman against Tetanus by National, Rural and Urban Areas in 2016



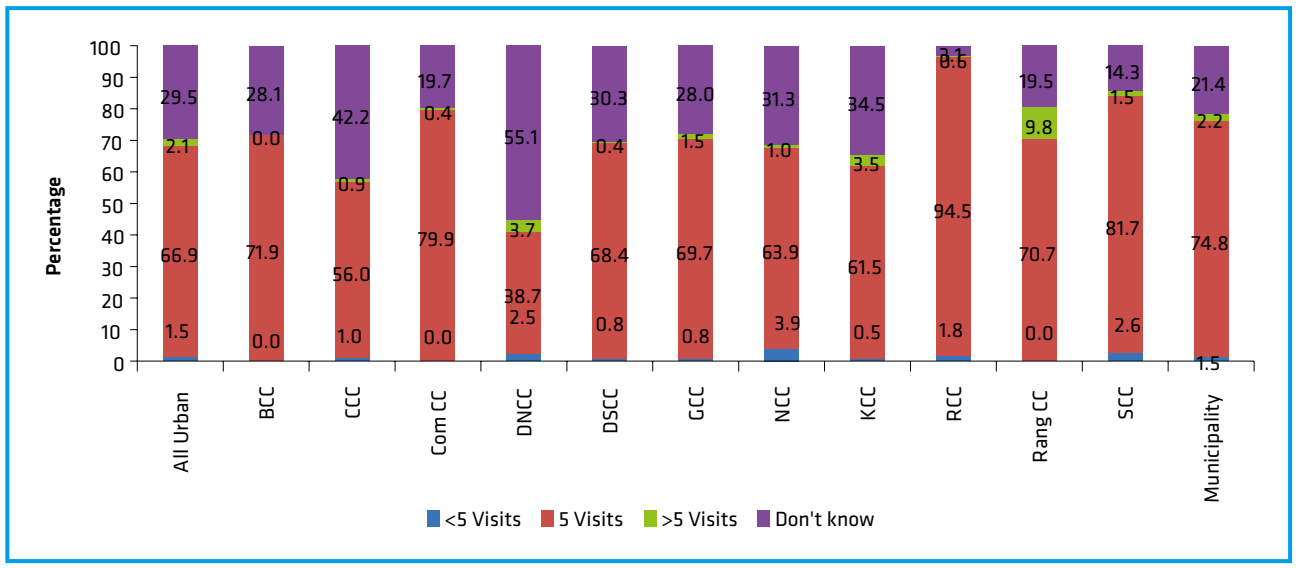
Among the divisions, awareness about the five required doses of TT vaccine was found to be the highest among mothers in Rangpur division (75.2 percent); mothers in Dhaka divisions (67.0 percent) had the least awareness about the recommended doses (see Figure 123).

Figure 123: Knowledge about Number of TT Doses Required to Protect a Woman against Tetanus in Rural Areas by Division in 2016



Respondents who were living in RCC (94.5 percent), SCC (81.7 percent), and Com CC (79.9 percent) possessed better knowledge about the required number of TT doses than those residing in other city corporations. It was found that 38.7 percent among those residing in DNCC knew about the correct required number of TT doses, while 55.1 percent could not mention the required number of TT dose (see Figure 124).

Figure 124: Knowledge about Number of TT Doses Required to Protect a Woman against Tetanusin Urban Areas by City Corporation and Municipality in 2016



5.13 SOURCES OF TT VACCINATION

The sources of TT1 vaccine are presented in Figure 125. Overall, in 95.7 percent cases, TT1 vaccine was received from GoB outreach centers. It was more so in rural areas (98.9 percent) than in urban areas (83.3 percent). Nationally, other sources included GoB hospitals (2.4 percent), and NGOs and private clinics/ hospitals (1.9 percent).

Figure 125: Sources of TT1 Vaccination by National, Rural and Urban Areas in 2016

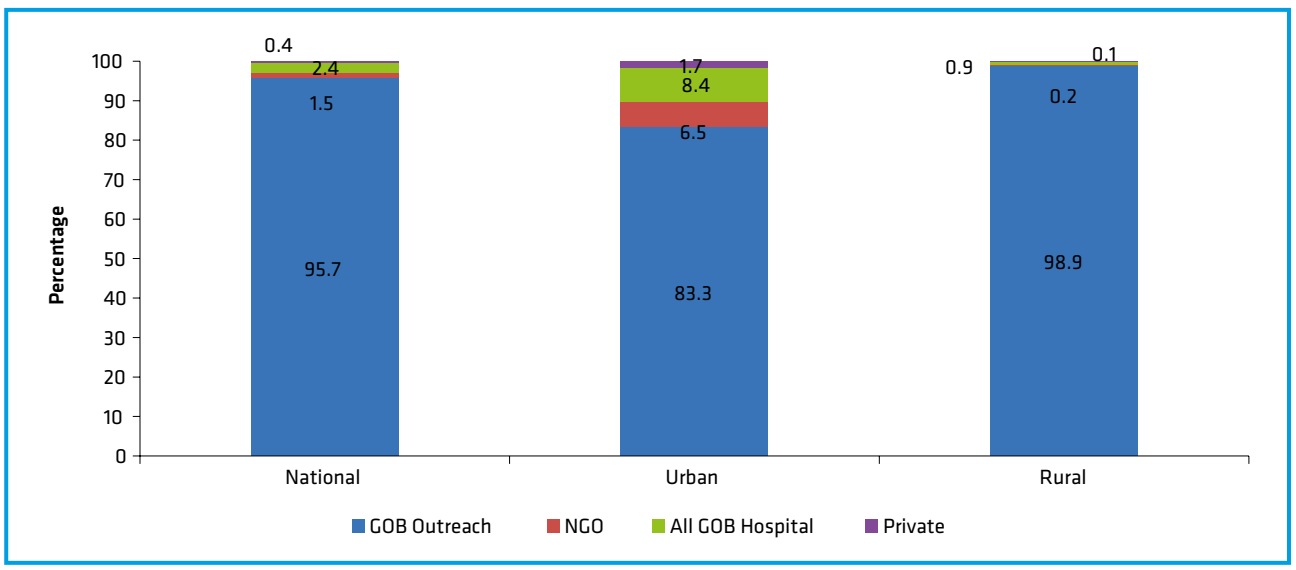
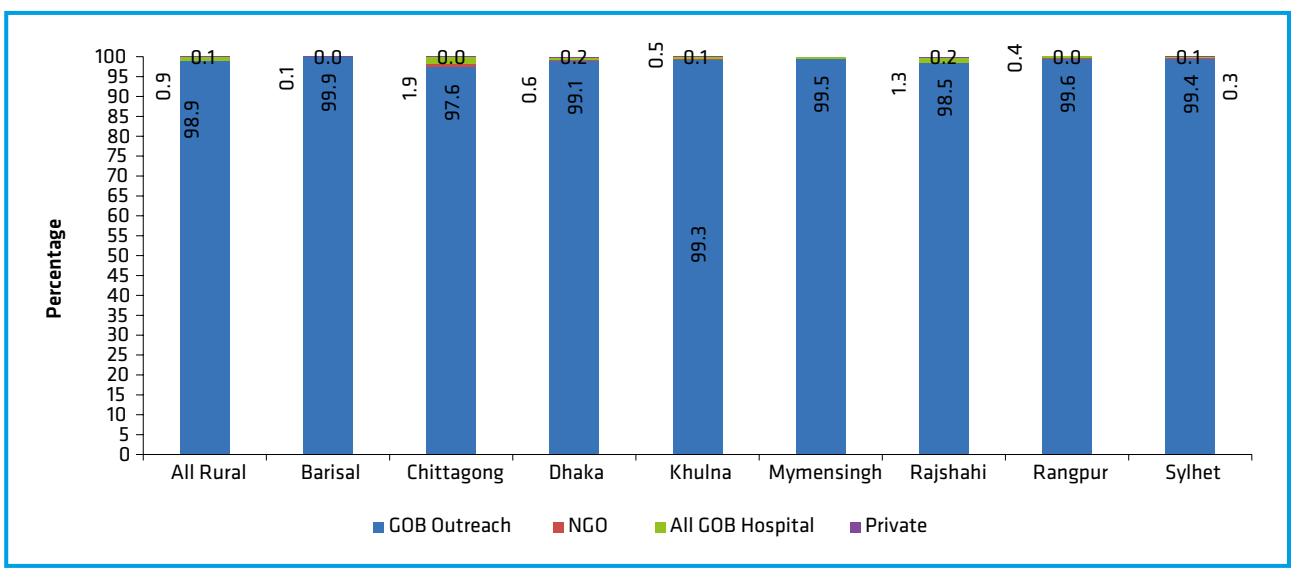


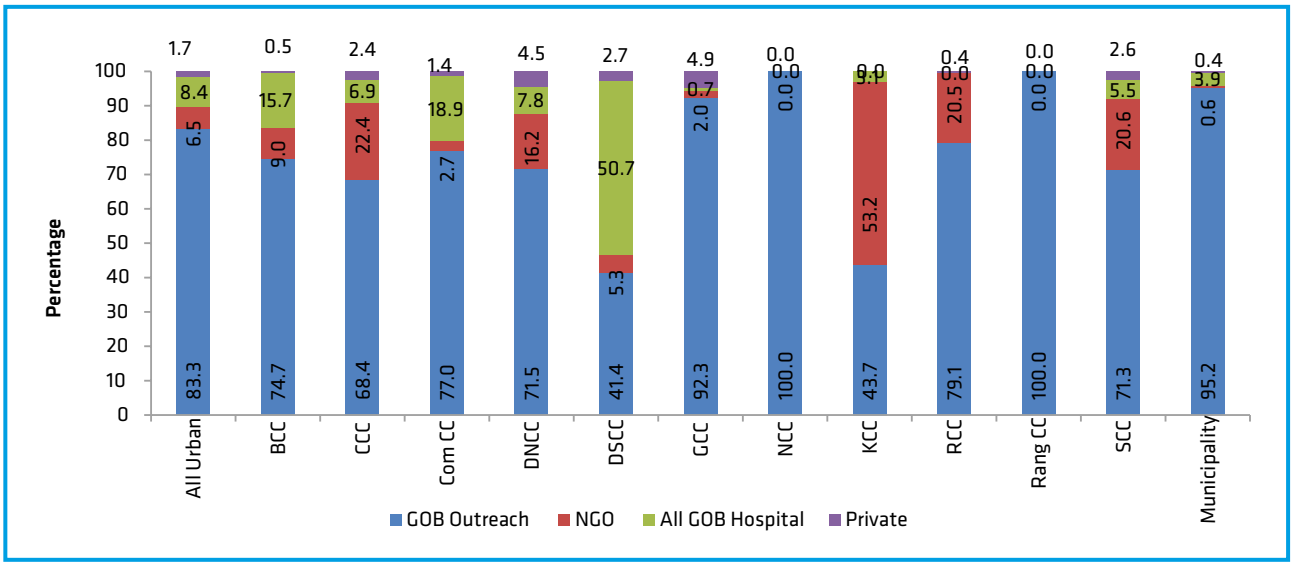
Figure 126 shows the distribution of sources of TT1 doses by rural division. Again, the vast majority received their TT1 doses from GoB outreach centres, with rates ranging from 99.9 percent in Barisal division to 97.6 percent in Chittagong division. NGO and private sources were found to be of a very low in all divisions.

Figure 126: Sources of TT1 Vaccination in Rural Areas by Division in 2016



By city corporation, the distribution of sources of TT1 dose was again for the most part GoB outreach centers; but, there was more variety than that in rural areas. The data show that all respondents in NCC and Ranpur City Corporations received TT1 from GoB outreach centers. At the other end of the scale, it was found that 41.4 percent went to GoB outreach centers in DSCC. A significant portion of respondents from KCC (53.2 percent) received TT1 from NGO health centers (see Figure 127).

Figure 127: Sources of TT1 Vaccination in Urban Areas by City Corporation and Municipality in 2016



CHAPTER 6

TT5 VACCINATION COVERAGE AMONG 18-49 YEAR-OLD WOMEN

EPI provides TT vaccines to all women of child bearing age (15-49 years) through its routine vaccination programme. To confirm adequate protection of newborn babies against neonatal tetanus, EPI aims to complete all the five doses of TT to all the target women at the shortest possible interval. Based on the vaccination schedule, the shortest possible interval would be at least two years and seven months. If a woman starts the TT vaccinations at the age of 15 and keeps to the exact scheduled intervals, she would be able to complete all the required doses before the age of her marriage, and she would be protected from tetanus through her reproductive years.

6.1 OBJECTIVES OF TT5 VACCINATION COVERAGE

The Tetanus Toxoid (TT) survey was undertaken to achieve the following objectives with relation to women aged between 18 to 49 years:

- the number who had completed all the five doses of TT
- rate of TT card retention
- sources of TT vaccination
- reasons for those not receiving TT

6.2 SELECTION OF SAMPLES

The survey samples for TT5 were selected from the same clusters as were the samples for Chapter 5, where the samples were selected by following WHO's new sampling technique. First, a list was compiled from women aged 18-49 years who were identified within each household. From that list, a sampling frame with all the eligible household with at least one woman was made. Finally, eight eligible households were selected randomly to examine their TT vaccination status through a pre-designed structured questionnaire.

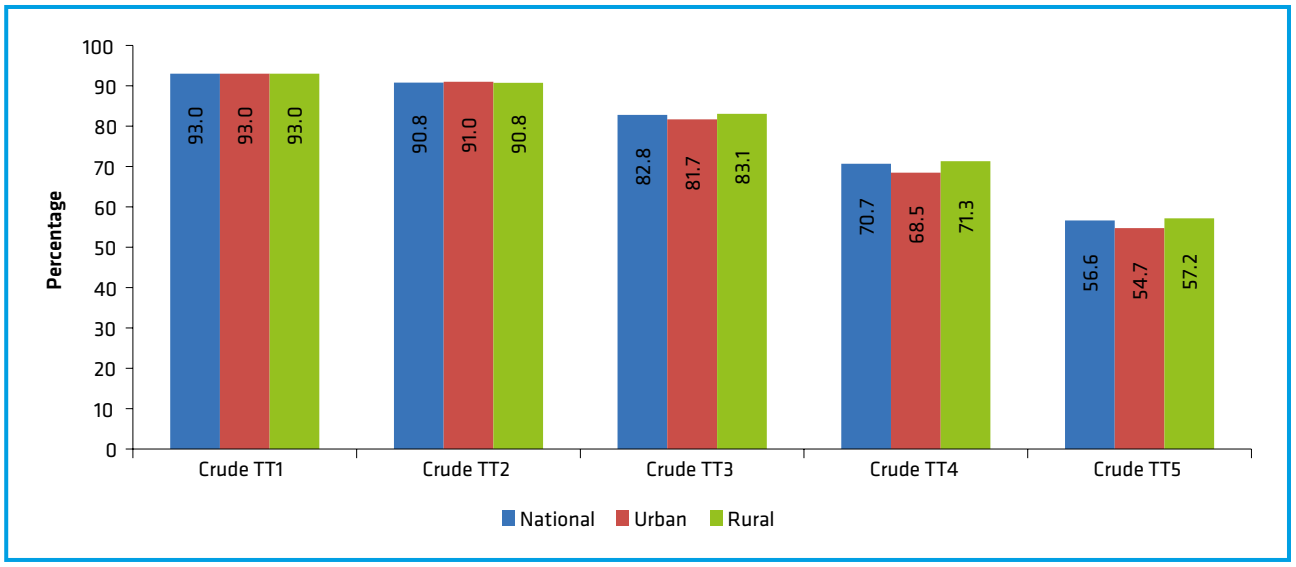
6.3 LEVELS OF TT VACCINATION COVERAGE

The Coverage Evaluation Survey 2016 estimated two types of TT vaccination coverage: crude and valid. Crude TT vaccination coverage includes all TT vaccines administered to a recipient, although the EPI recommended TT vaccination schedule may not have been followed. On the other hand, valid coverage is estimated from only those doses of vaccine, which were administered according to the EPI-recommended TT vaccination schedule. Both types of the coverage are discussed below.

Crude Vaccination Coverage

Figure 128 shows that nationally 56.6 percent of the women received all the 5 doses of TT vaccines with some variation in the coverage between rural (57.2 percent) and urban (54.7 percent) women. On the way to TT5, there had been a steep downward trend in crude coverage between TT doses. Having started with TT1 at 93.0 percent nationally, the rate had dropped at 82.8 percent for TT3 and 70.7 percent for TT4 dose. A similar picture was observed both in rural and urban areas.

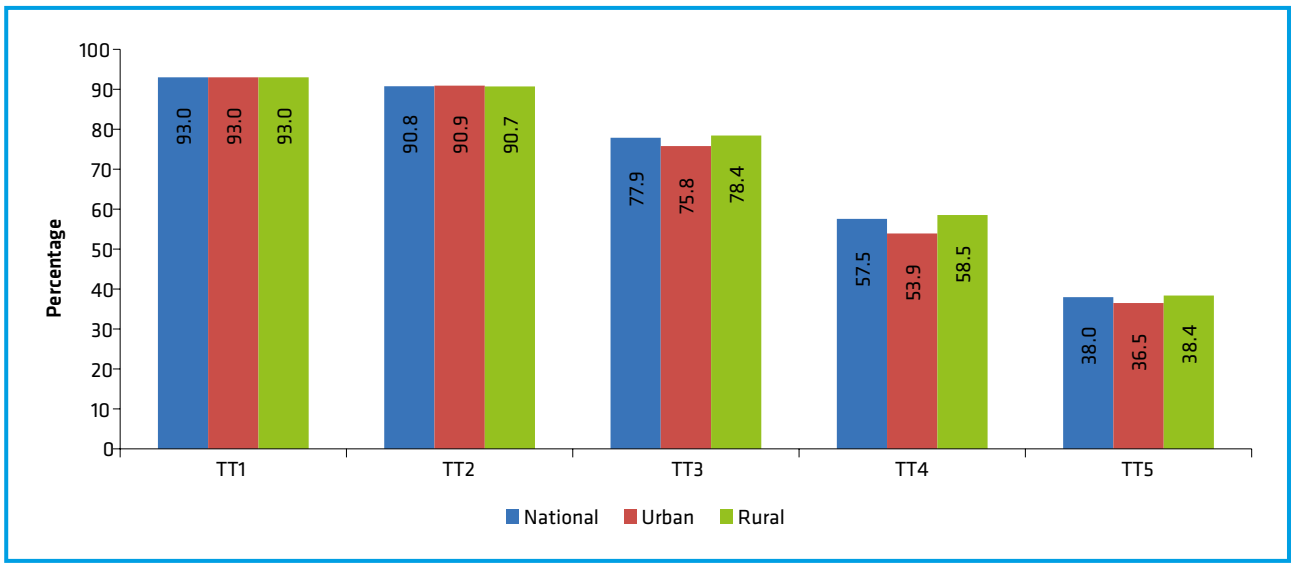
Figure 128: Crude TT5 Vaccination Coverage for Women 18-49 Years by National, Rural and Urban Areas in 2016



As regards valid TT vaccination coverage, less than half (38.0 percent) of the surveyed women received all the five doses of valid TT vaccine across the country - 38.4 percent in rural areas and 36.5 percent in urban areas. Like crude TT coverage, valid TT coverage for the subsequent doses was also found to have decreased substantially- from 93.0 percent for TT1 to 38.0 percent for TT5 (see Figure 129).

By residence, valid TT coverage was higher in rural areas than that in urban areas for all TT dose, except TT2. The gap in coverage between rural and urban areas was found to be high for TT4 dose (58.5 percent vs 53.9 percent).But, the gap was low in the case of TT5 dose (38.4 percent vs 36.5 percent).

Figure 129: Valid TT5 Vaccination Coverage for Women 18-49 Years by National, Rural and Urban Areas in 2016



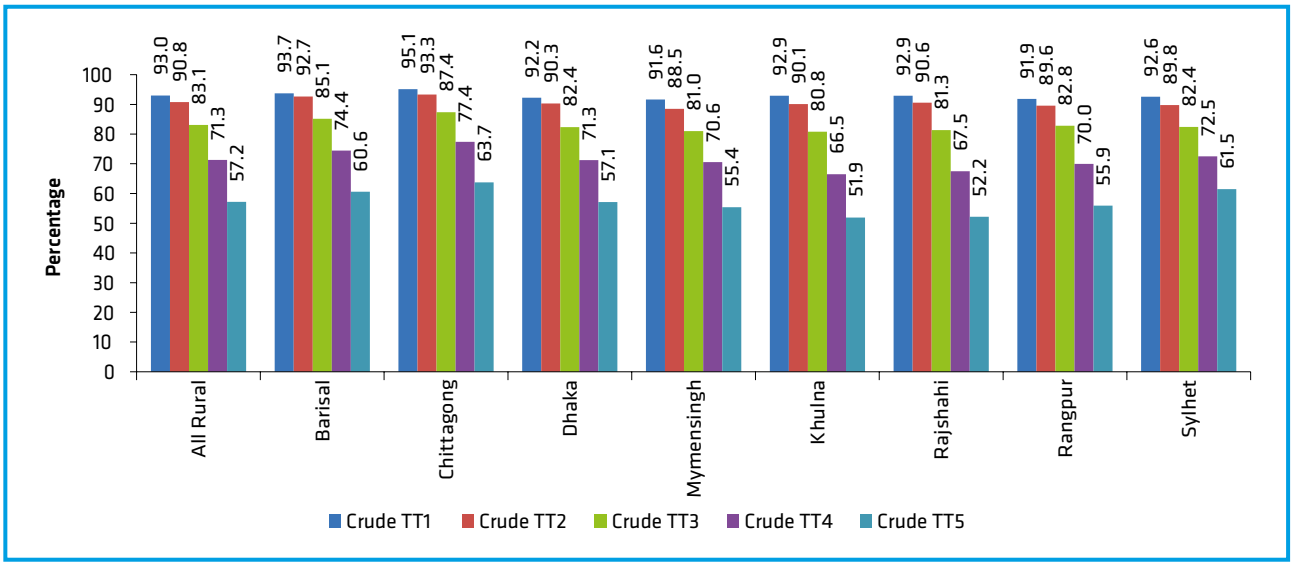
6.4 TT VACCINATION COVERAGE BY RURAL DIVISION

Crude TT Vaccination Coverage

Figure 130 shows crude TT5 vaccination coverage in rural areas by division. Crude TT5 coverage was the highest in Chittagong (63.7 percent) and the lowest in Khulna divisions (51.9 percent) and it ranged between 52.2 percent and 61.5 percent in other divisions.

As the initial dose, TT1 coverage was at or above 91.6 percent in all divisions. The pattern of decreasing coverage by subsequent dosage seen in other TT evaluations is repeated here. However, the highest decrease in TT coverage from the first dose (TT1) to the last (TT5) was observed in Khulna division- 41.0 percent.

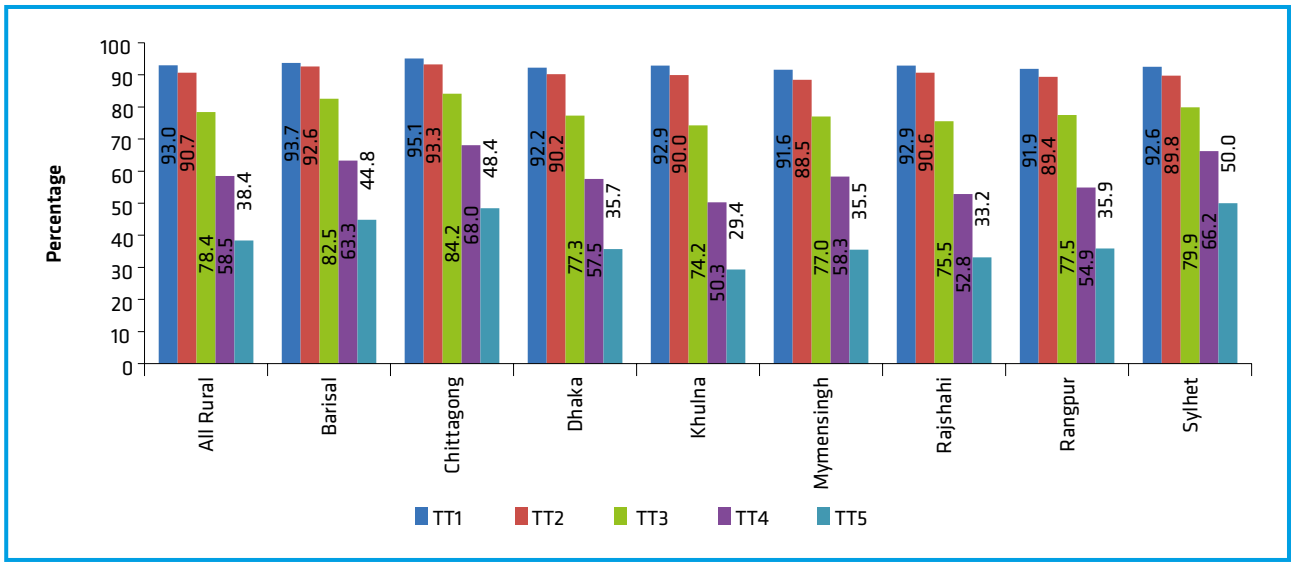
Figure 130: Crude TT5 Vaccination Coverage for Women 18-49 Years in Rural Areas by Division in 2016



Valid TT Vaccination Coverage

Valid TT vaccination coverage was defined as the vaccination coverage obtained by administering the TT vaccines as per the EPI-recommended TT vaccination schedule. Valid TT vaccination coverage for aged women 18-49 years in rural areas by division is presented in Figure 131 and Map 19. Five doses of valid TT vaccine ensure immunity against tetanus for the entire reproductive life of a woman. While first and second rounds of TT coverage was above 90.0 percent for all rural divisions, by TT5 it had dropped to no higher than 50.0 percent in Sylhet and as low as 29.4 percent in Khulna.

Figure 131: Valid TT5 Vaccination Coverage for Women 18-49 Years in Rural Areas by Division in 2016



6.5 LEVELS OF THE COVERAGE BY THE SURVEY UNIT

As a ready reference, rates of the valid TT coverage among the women aged between 18-49 years by the division / city corporation are given in the Appendix Tables.

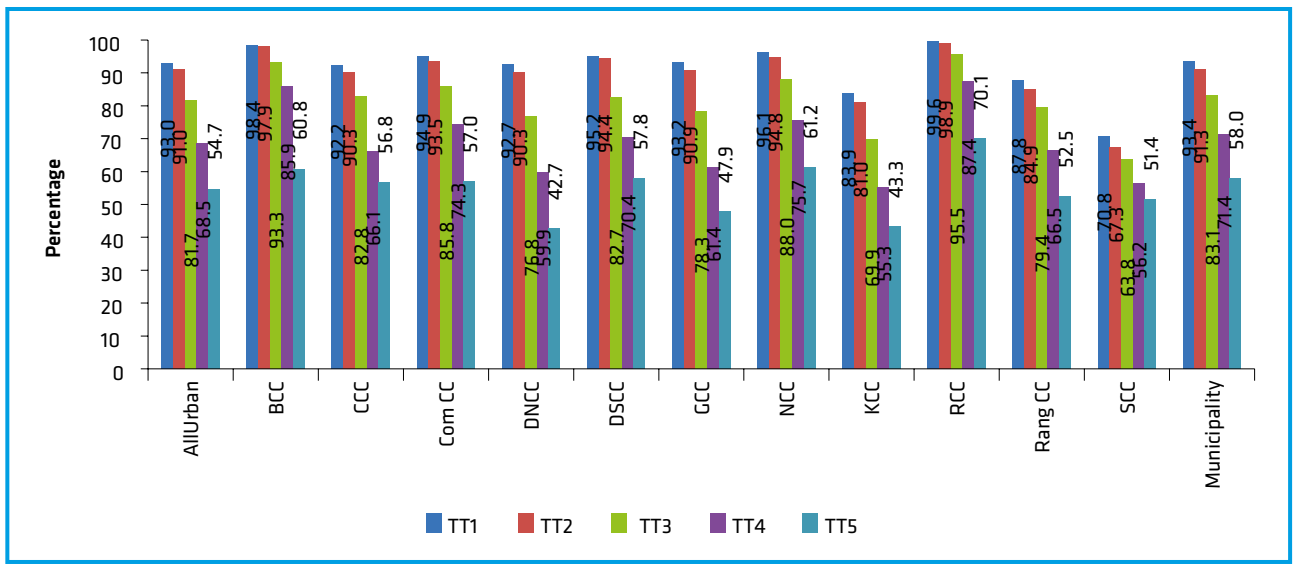
6.6 TT VACCINATION COVERAGE BY CITY CORPORATION

In CES 2016, similar to rural divisions, assessments of TT vaccination coverage were conducted in 11 city corporations. The TT vaccination coverage scenario across the city corporations is presented in Figures 132 and 133. Figure 132 presents the crude TT vaccination coverage, while Figure 133 shows the valid vaccination coverage.

Crude TT Vaccination Coverage

Figure 132 highlights crude TT vaccination coverage by city corporation. It shows that almost all women (99.6 percent) in RCC received TT1. The lowest TT1 coverage was in SCC (70.8 percent). TT1 coverage ranged between 83.9 percent and 98.4 percent in the other city corporations (see Figure 132). Similarly, crude TT5 coverage was the highest in RCC (70.1 percent) and the lowest in DNCC (42.7 percent)- a spread of 27.4 percentage points.

Figure 132: Crude TT5 Vaccination Coverage for Women 18-49 Years in Urban Areas by City Corporation and Municipality in 2016

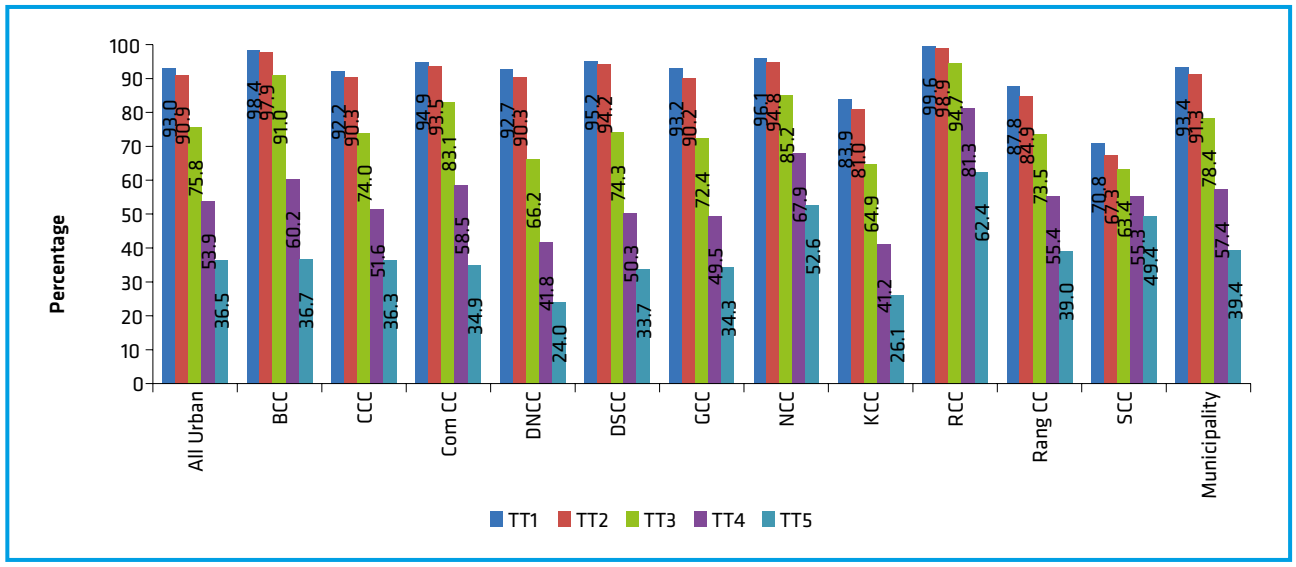


Valid TT Vaccination Coverage

Valid TT vaccination coverage by city corporation is presented in Figure 133. As TT1 is the gateway for receiving all the other doses of TT vaccine, discussion about valid TT1 dose is not necessary in this section. Valid TT2 coverage was almost universal in RCC (98.9 percent) and the lowest in SCC (67.3 percent); and it ranged between 97.9 percent and 81.0 percent in the other city corporations.

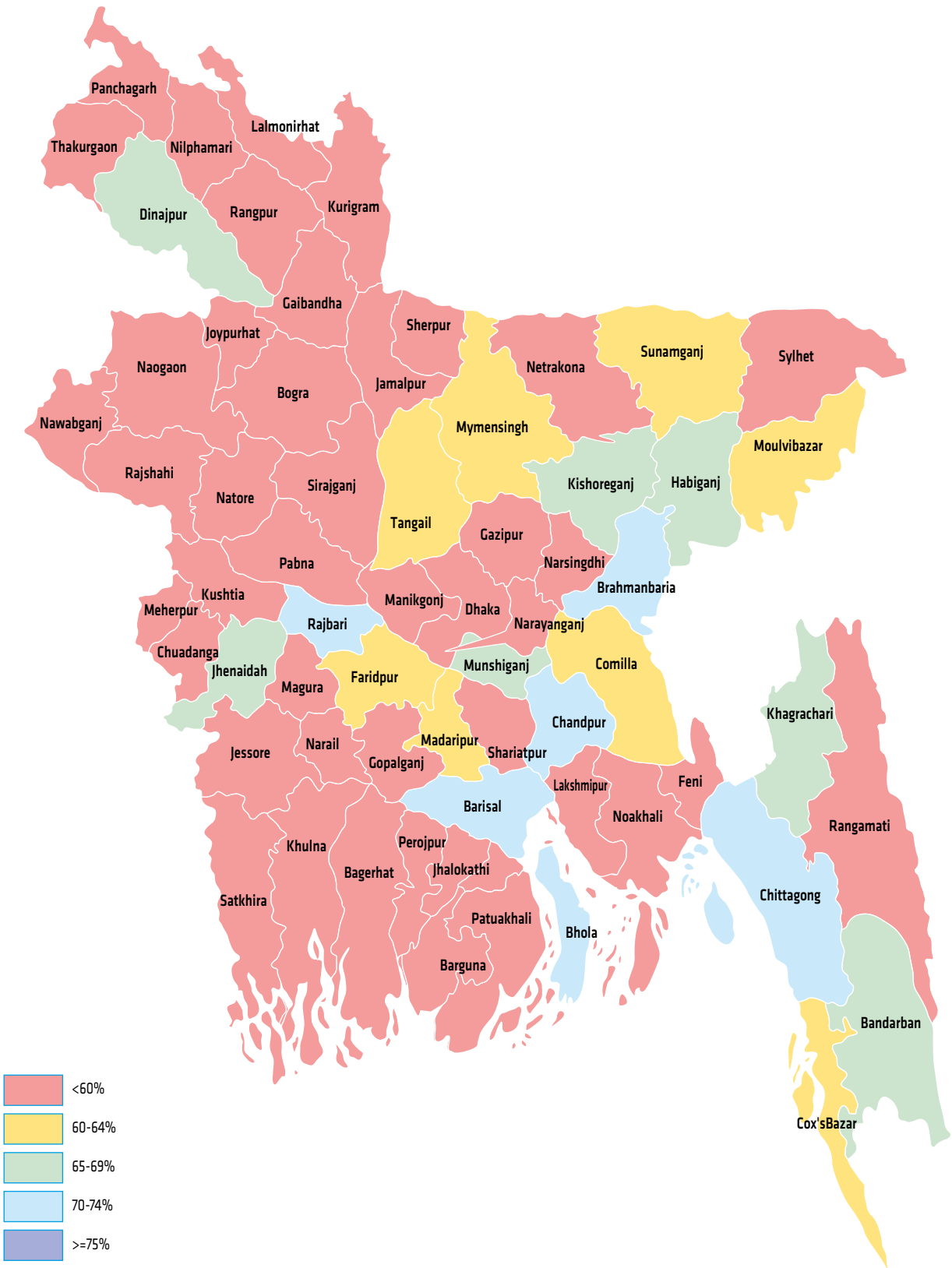
Figure 133 depicts reproductive life-time protection against tetanus with five valid TT doses. It shows that the highest proportion of women achieved this status in RCC (62.4. percent) and the lowest in DNCC (24.0 percent), with ranging between 52.6 percent in NCC and 26.1 percent in KCC.

Figure 133: Valid TT5 Vaccination Coverage for Women 18-49 Years in Urban Areas by City Corporation and Municipality in 2016



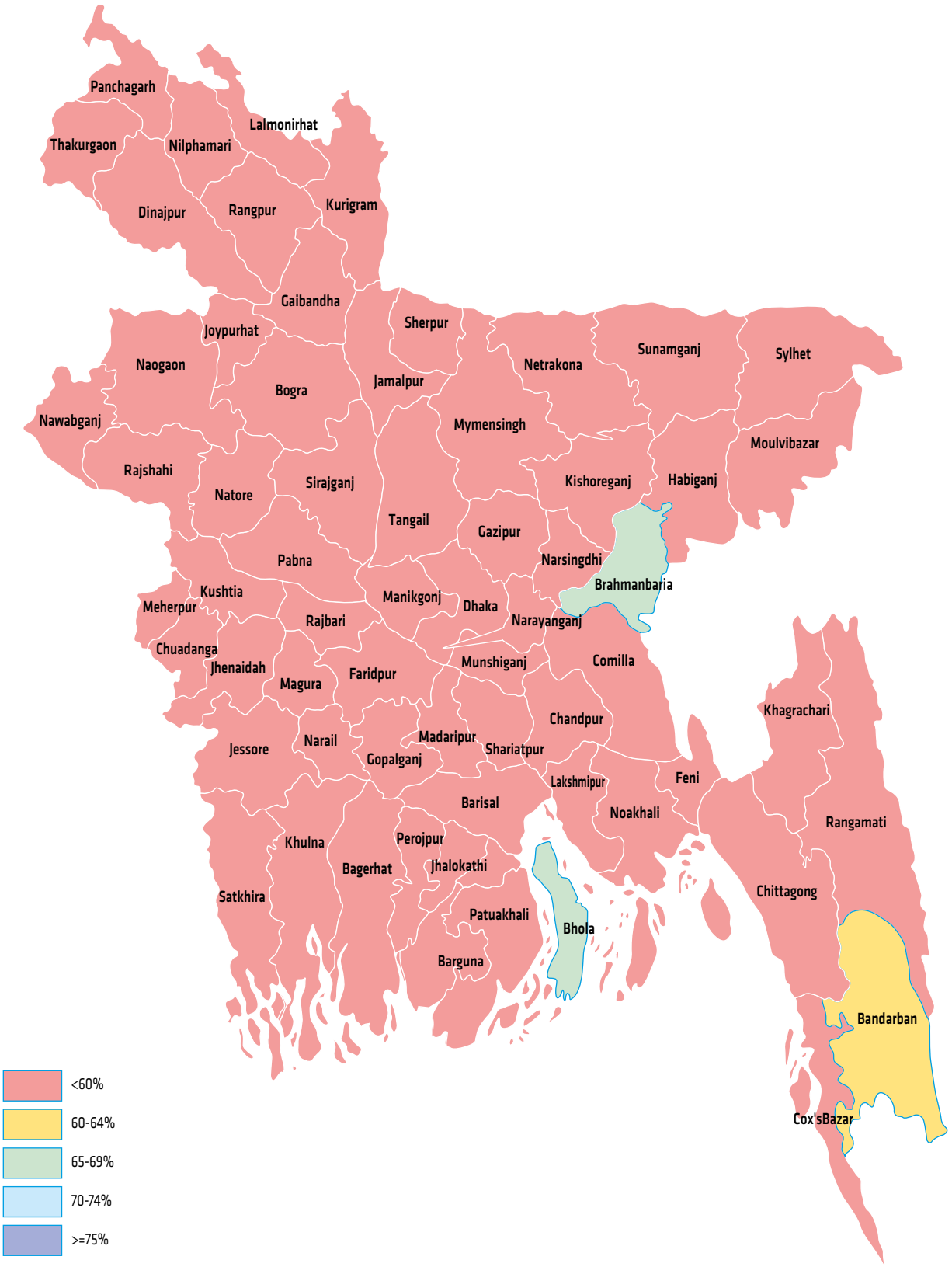
Map 12:

Crude TT5 Vaccination Coverage among Child Bearing Age Women by District



Map 13:

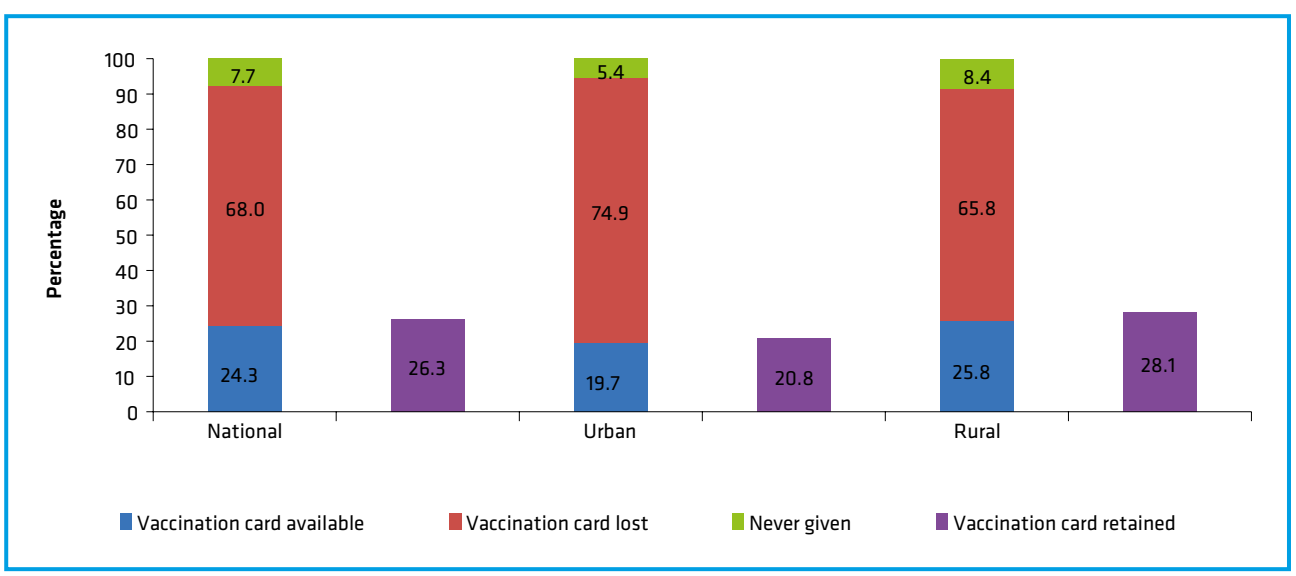
Valid TT5 Vaccination Coverage among Child Bearing Age Women by District



6.7 STATUS OF RETENTION OF TT CARD BY WOMEN

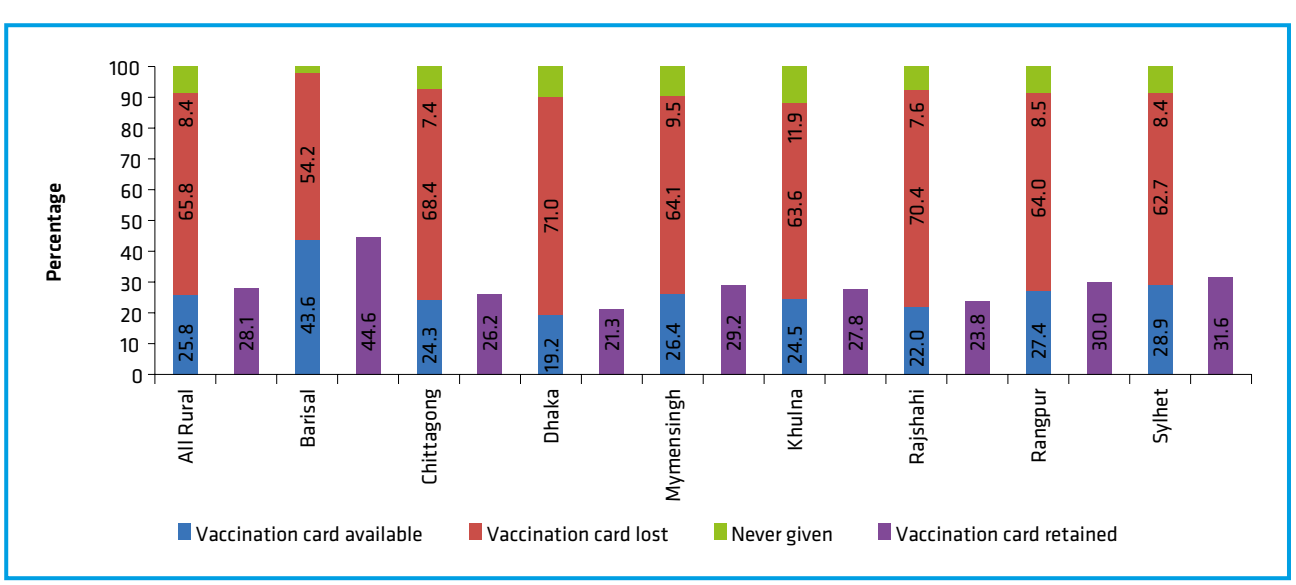
The TT vaccination card is an important document; its availability helps one avoid unnecessary administration of TT dose. It saves vaccines as well. Nationally, about one-quarter of the women reported to have vaccination card during the survey. Availability of TT vaccination card was higher (25.8 percent) in rural areas than that in urban areas (19.7 percent). CES 2016 calculated card retention rate through a separate analysis. It is presented in Figure 134. It shows that nationally, 26.3 percent of the women retained the TT vaccination card. Rural women were more likely to retain the vaccination card (28.1 percent), as opposed to 20.8 percent of those residing in urban areas (see Figure 134).

Figure 134: TT Vaccination Card Status for Women 18-49 Years by National, Rural and Urban Areas in 2016



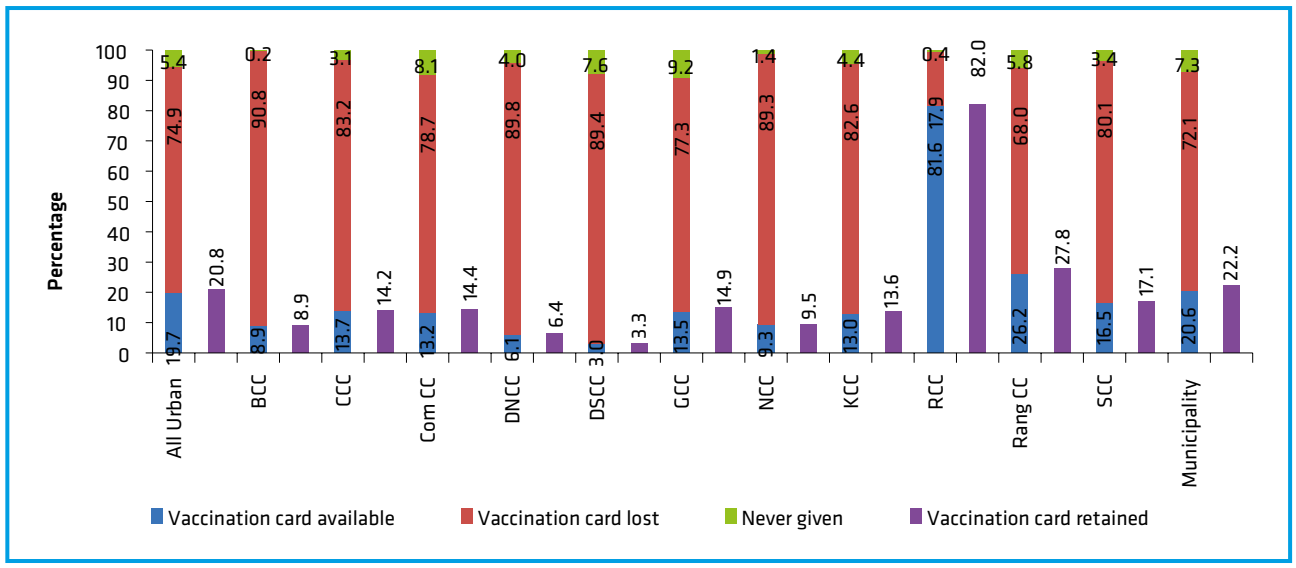
Among the rural divisions, card retention rate was the highest in Barisal (44.6 percent) and the lowest in Dhaka (21.3 percent).It ranged between 23.8 percent and 31.6 percent in the other divisions (Figure 135).

Figure 135: TT Vaccination Card Status for Women 18-49 Years in Rural Areas by Division in 2016



In the city corporations, card retention rate was found to be the highest in RCC (82.0 percent) and the lowest in DSCC (3.3 percent), with the other divisions covering a range from 27.8 percent in Rang CC to 6.4 percent in DNCC (see Figure 136).

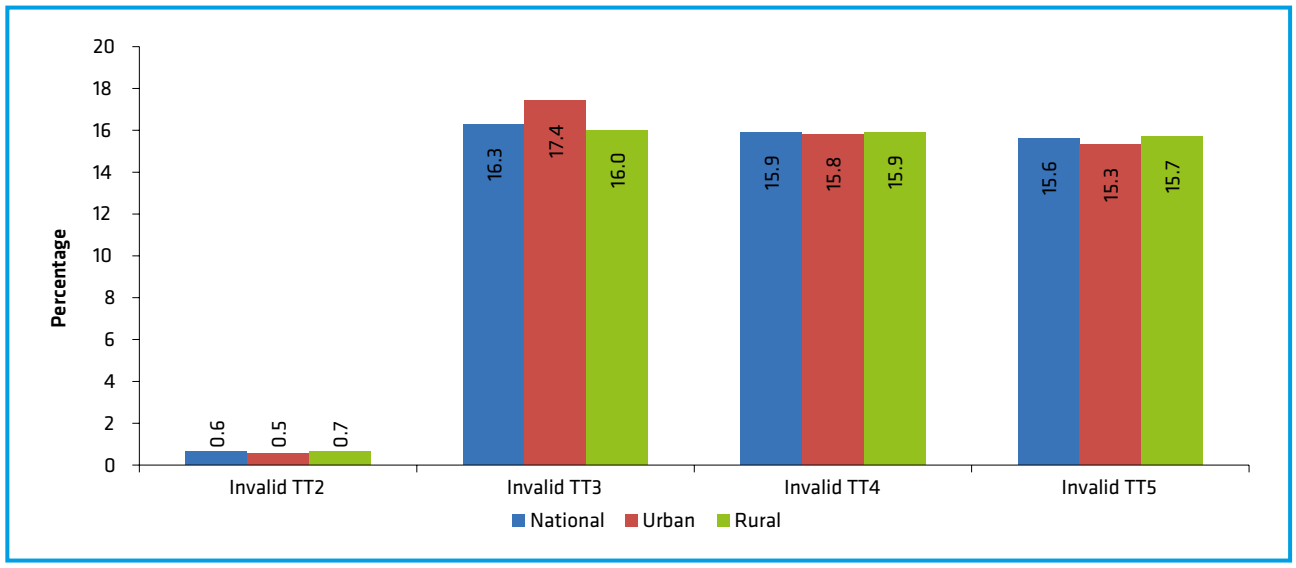
Figure 136: TT Vaccination Card Status in Urban Areas by City Corporation and Municipality in 2016



6.8 INCIDENCE OF INVALID DOSES

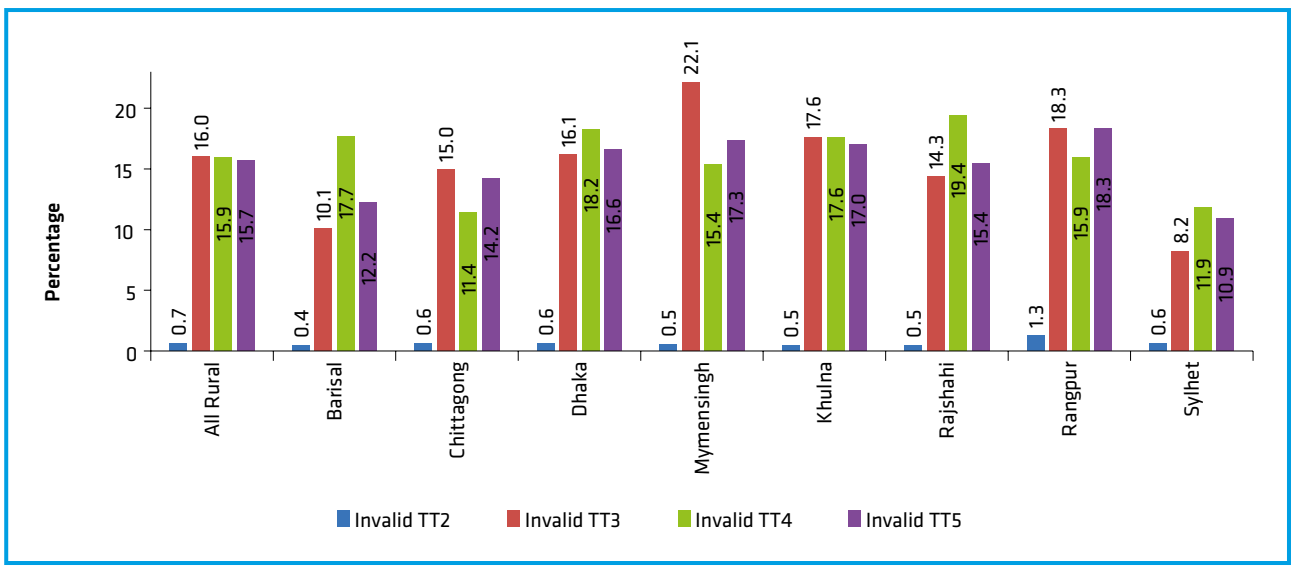
An invalid dose occurs if a woman receives any subsequent dose of TT vaccine before the minimum interval between two doses, as recommended by the EPI schedule. Invalid TT doses were estimated by analyzing the gap between the consecutive doses (see Figure 137). Nationally, incidence of invalid doses was most prevalent for TT3 (16.3 percent); but it also occurred for TT2 (0.6 percent), TT4 (15.9 percent), and TT5 (15.6 percent). The proportion of women who received invalid doses was higher in rural areas, compared to those living in urban areas as a whole and was most prevalent for TT3 (16.0 percent) in rural and 17.4 percent in urban areas.

Figure 137: Incidence of Invalid TT Doses for Women 18-49 Years by National, Rural and Urban Areas in 2016



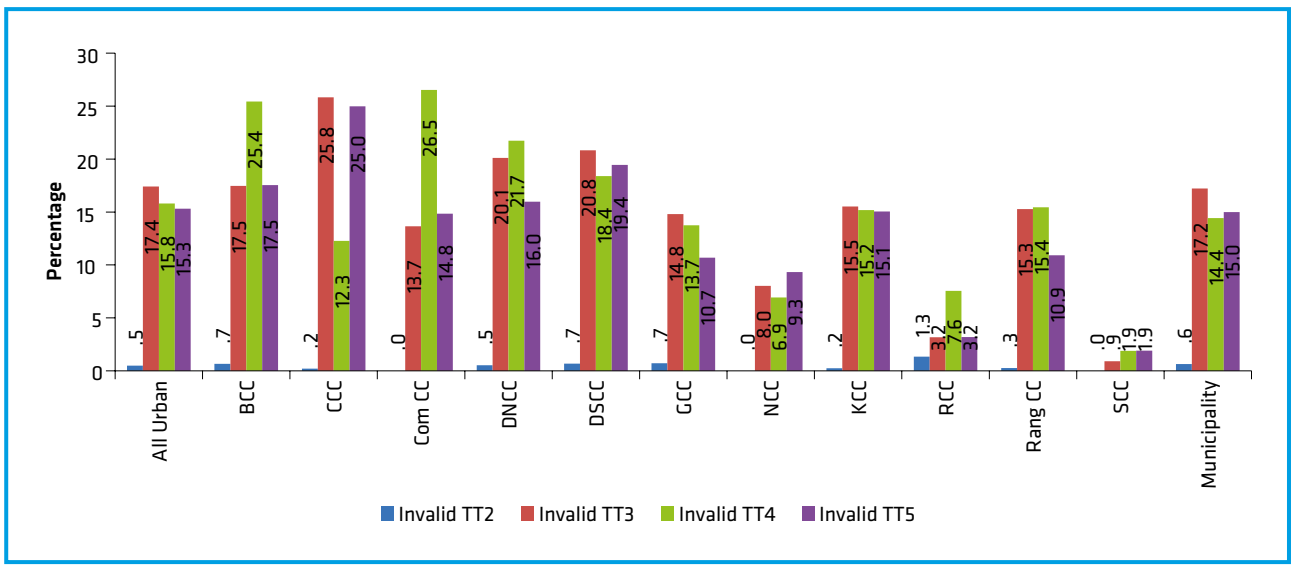
As with the national findings, incidence rate of invalid TT4 was higher than TT5 in all divisions, except in Chittagong, Mymensingh, and Rangpur. Invalid TT5 rate was the highest in Rangpur (18.3 percent) and the lowest in Sylhet (10.9 percent) (see Figure 138).

Figure 138: Incidence of Invalid TT Doses for Women 18-49 Years in Rural Areas by Divisions in 2016



Among the city corporations, invalid TT doses were generally lower than their rural counterparts, with some noticeable exceptions: TT4 rate for Com CC was as high as 26.5 percent and the lowest in NCC (6.9 percent) , all had rates just above 1.9 percent for invalid TT5. Otherwise, exceptions went the other ways, with SCC, NCC, RCC, and Rang CC having low rates. For TT5, RCC indicated that almost no woman received invalid doses (3.2 percent) (see Figure 139).

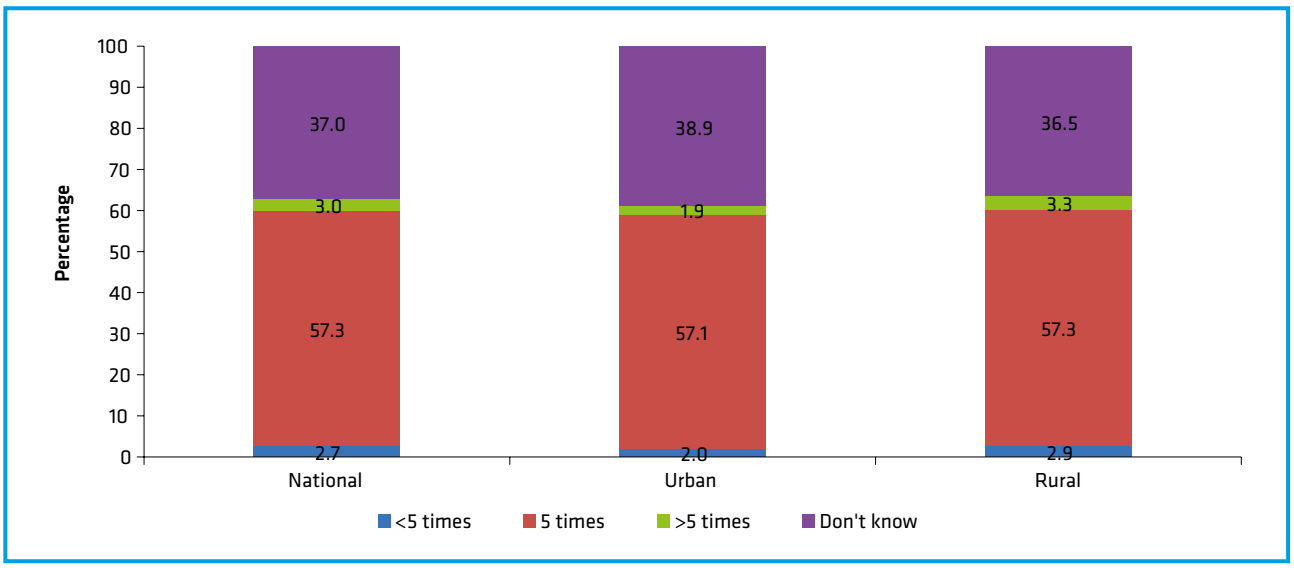
Figure 139: Incidence of Invalid TT Doses for Women 18-49 Years in Urban Areas by City Corporation and Municipality in 2016



6.9 WOMEN'S KNOWLEDGE OF TT DOSES

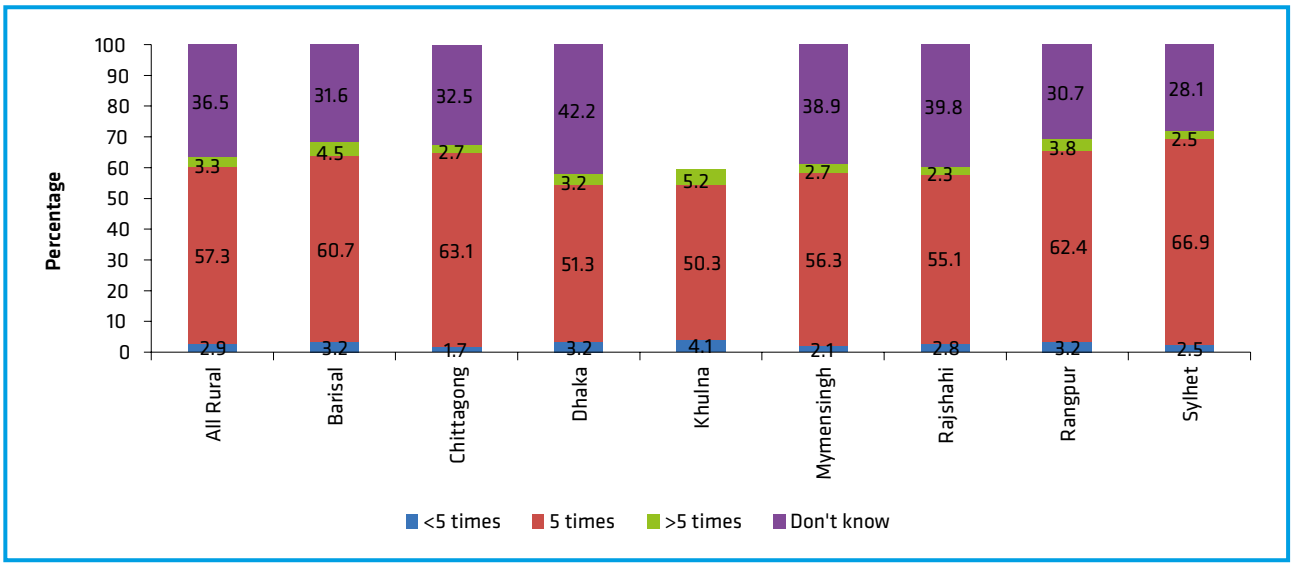
According to the EPI, to attain adequate lifetime protective antibody against tetanus, a woman should receive five doses of TT vaccine. On this point, women's knowledge of the required number of TT vaccines was assessed in CES 2016. Nationally, a little over half (57.0 percent) of the women reported that five doses of TT vaccine are needed to be administered for one's life-time protection. Both rural and urban women were found to almost equally aware of the requirement- women residing in urban areas (57.1 percent) and in rural areas (57.3 percent). However, a little over one-third of the women (37.0 percent) was unaware of the required number of TT doses, with little variation between urban (38.9 percent) and rural (36.5 percent) areas (see Figure 140).

Figure 140: Knowledge by Women 18-49 Years about Number of TT Doses Required during Reproductive Period to Protect against Tetanus by National, Rural and Urban Areas in 2016



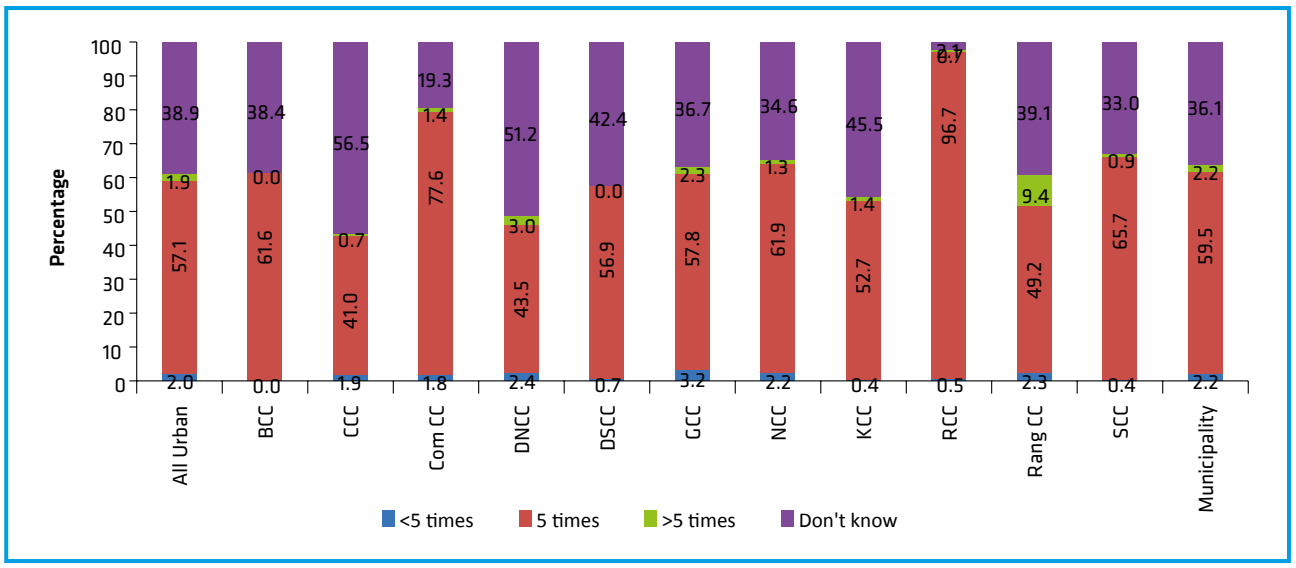
Among the rural divisions, the highest proportion of women to know about the required five doses of TT vaccine was in Sylhet division (66.9 percent) and the lowest in Khulna division (50.3 percent). Overall, 36.5 percent of women from rural areas were not aware that TT vaccines required a particular number of doses. This proportion was the highest in Chittagong division (32.6 percent) and the lowest in Barisal division (20.0 percent) (see Figure 141).

Figure 141: Knowledge by Women 18-49 Years about Number of TT Doses Required during Reproductive Period to Protect against Tetanus in Rural Areas by Division in 2016



In urban areas, overall, 57.1 percent of the women had knowledge about the five required doses of TT vaccination, while 38.9 percent of them had no knowledge about the required doses at all. Knowledge about the five doses was found to be the highest in RCC (96.7 percent) and the lowest in CCC (41.0 percent), with the intermediary levels ranging from 49.2 percent in RangCC to 52.7 percent in KCC (see Figure 142).

Figure 142: Knowledge by Women 18-49 Years about Number of TT Doses Required during Reproductive Period to Protect against Tetanus in Urban Areas by City Corporations and Municiplity in 2016



6.10 SOURCES OF TT VACCINATION

Nationwide, 95.7 percent of the women received TT1 vaccines from the government outreach centers, with a difference of 14.4 percentage points between rural (98.8 percent) and urban (84.4 percent) areas (see Figure 143). Some variations from this pattern were also observed between rural divisions (see Figure 144). GOB outreach centers were the most common source of TT1 vaccination in Barisal for the highest proportion (99.7 percent); the smallest proportion received their TT1 vaccines from GoB outreach centers in Rajshahi (98.3 percent). Among the city corporations, government outreach centers were also the most prominent source for TT1 vaccination, being most common in Rang CC and NCC (100 percent); and, it was the lowest in DSCC (38.5 percent) (see Figure 145).

Figure 143: Sources of TT1 Vaccination for Women 18-49 Years by National, Rural and Urban Areas in 2016

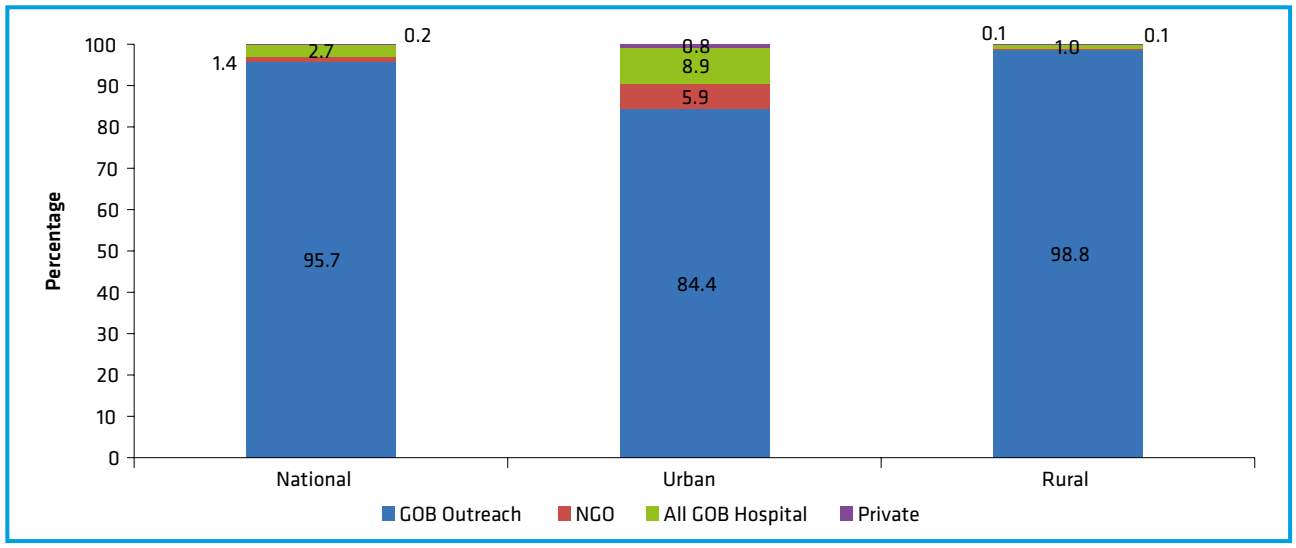


Figure 144: Sources of TT1 Vaccination for Women 18-49 Years in Rural Areas by Division in 2016

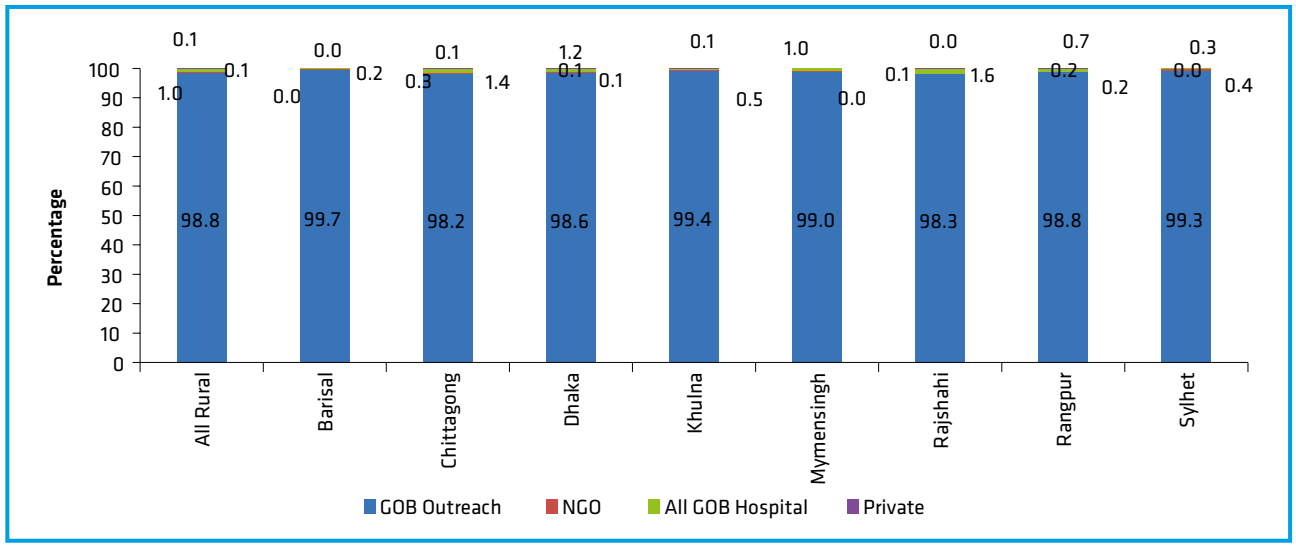
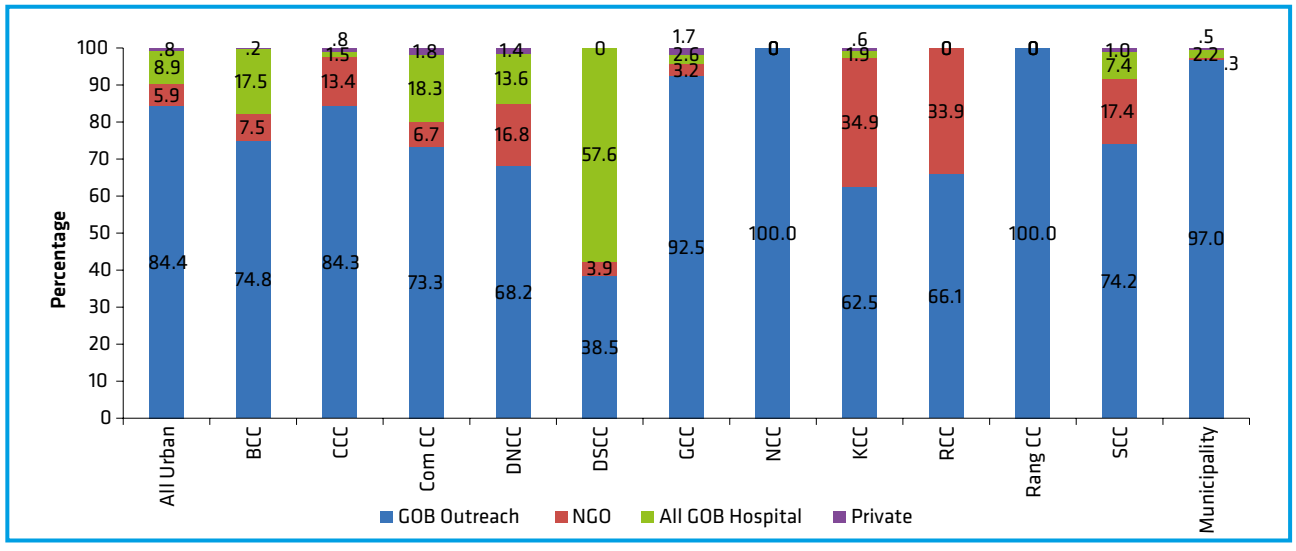


Figure 145: Sources of TT1 Vaccination for Women 18-49 Years in Urban Areas by City Corporation and Municipality in 2016



6.11 REASONS FOR NOT RECEIVING TT VACCINATION

Table 16 presents reasons for not receiving TT vaccination. About one-third of them (39.8 percent) mentioned that "feel fear" was a reason for non-vaccination. However, 31.3 percent of the women reported about their lack of awareness of TT vaccination service. And, less than one percent of the women reported that their family members forbade her to receive TT vaccination.

The data show no significant difference in the answers given by the stakeholders living in rural and urban areas. Reasons for non-vaccination of TT by rural division and city corporation are presented in the Table 17 and Table 18.

Table 16: Reasons Why Did Not Receive TT Vaccination by National, Rural and Urban Areas in 2016

Reasons	National	Urban	Rural
Will take TT vaccine in future	5.1	7.3	4.6
Did not know	31.3	30.6	31.5
Feel fear	39.8	37.9	40.3
Was busy	1.4	1.9	1.3
Don't believe in TT vaccination	1.9	2.4	1.8
Husband/in laws forbade	0.4	0.2	0.5
Vaccination center is too far	0.9	1.2	0.8
Did not give importance	10.7	14.5	9.6
Disable so could not go to the vaccination center	0.1	0.1	0.1
Others	8.6	4.4	9.7
Number	2537	658	1879

Table 17: Reasons Why Did Not Receive TT Vaccination in Rural Areas by Division in 2016

Reasons	All Rural	Barisal	Chittagong	Dhaka	Khulna	Mymensingh	Rajshahi	Rangpur	Sylhet
Will take TT vaccine in future	4.6	13.0	2.0	6.3	2.4	5.9	2.6	4.0	3.2
Did not know	31.5	27.0	30.3	30.9	26.0	32.7	43.0	34.9	12.8
Feel fear	40.3	35.8	50.4	42.4	39.7	30.7	35.7	31.2	68.0
Was busy	1.3	0.6	.9	1.6		.5	2.9	1.8	
Don't believe in TT vaccination	1.8	1.2	1.5	3.2	2.8	1.8	0.0	1.9	.6
Husband/in laws forbade	0.5	0.9	0.4	0.5	0.0	1.1	0.0	0.6	0.0
Vaccination center is too far	0.8	2.0	0.1	0.6	0.0	1.4	1.9	0.8	0.0
Did not give importance	9.6	10.4	9.5	11.6	7.5	12.2	6.3	11.6	3.2
Disable so could not go to the vaccination center	0.1		0.0	0.0	0.0	0.4	0.0	0.2	0.0
Others	9.7	9.5	5.1	3.5	21.6	13.2	7.6	13.1	12.2
Number	1879	158	295	360	303	118	227	290	128

Table 18: Reasons Why Did Not Receive TT Vaccination in Urban Areas by City Corporation in 2016

Reasons	All Urban	BCC	CCC	Com CC	DNCC	DSCC	GCC	NCC	KCC	RCC	Rang CC	SCC	Municipality
Will take TT vaccine in future	7.3	15.3	2.5		16.7	4.5	3.2	5.6		50.0	1.8	14.1	7.2
Did not know	30.6	41.5	54.6	17.1	20.9	18.9	25.3	20.9	33.4		26.6	45.6	30.4
Feel fear	37.9	43.2	29.9	61.0	48.4	52.6	45.9	44.3	34.6	50.0	21.2	26.2	33.3
Was busy	1.9		2.3		3.0		3.1	8.4	1.1	0.0	2.1	.7	1.8
Don't believe in TT vaccination	2.4	0.0	0.0	0.0	0.0	14.6		11.2	0.0	0.0	1.6	.7	3.2
Husband/in laws forbade	.2	0.0	0.0	0.0	0.0	0.0	0.0	5.6	1.2	0.0		.8	
Vaccination center is too far	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4		2.5
Did not give importance	14.5		10.7	21.9	11.1	9.4	19.2		19.0	0.0	20.3	10.4	15.6
Disable so could not go to the vaccination center	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	.8	0.0
Others	4.4	0.0	0.0	0.0	0.0	0.0	3.3	3.9	10.7	0.0	20.4	.7	7.0
Number	658	7	40	23	35	22	30	19	84	2	54	135	207

CHAPTER 7
MATERNAL HEALTH AND NEWBORN CARE

Pregnancy and child-birth related complications are responsible for the majority of maternal mortalities. In Bangladesh, one in every four women does not receive any antenatal care during pregnancy, and about three in every five women deliver their babies without the assistance of a skilled birth attendant. The enabling environment for safe motherhood and child birth depends on the care and attention provided to pregnant women and newborns by communities and families, the acumen of skilled health personnel, and the availability of adequate healthcare facilities, equipment, medicines, and emergency care when needed. CES 2016 examined the enabling environment for safe motherhood and child births. This chapter provides information on the issues related to maternal and new-born health, such as ANC, micronutrient supplementation, delivery, PNC, continuum of care, etc.

7.1 ANTENATAL CARE (ANC)

Antenatal care (ANC) from a medically-trained provider is important for monitoring the status of pregnancy, identify the complications associated with pregnancy, and prevent adverse pregnancy outcome. To be most effective, all pregnant women should receive at least four ANC check up by a medically trained provider. CES 2016 assessed the ANC status of mothers with children aged between 0-11 months

7.1.1 Antenatal Care Coverage

Figure 146 summarizes ANC coverage provided by medically-trained providers, as given in three surveys. It shows that three-fourth of the pregnant women received some ANC from a medically-trained provider/skilled health provider throughout the country. According to the Bangladesh Demographic and Health Survey (BDHS) 2014, 64.0 percent of the women who gave birth within three years preceding the survey received ANC from a medically-trained provider. However, the Multiple Indicator Cluster Survey (MICS) 2012-2013 shows that 58.7 percent of the women who gave birth two years preceding the survey received ANC at least once from skilled health personnel. It is worth mentioning here that CES 2016 included mothers who gave birth to children between July 2015 and June 2016. It indicates that 76.7 percent women received ANC from medically trained providers.

Figure 146: Any ANC Covearge by Medically Trained Providers in BDHS 2011, MICS 2012-2013, and CES 2014, 2015 and 2016

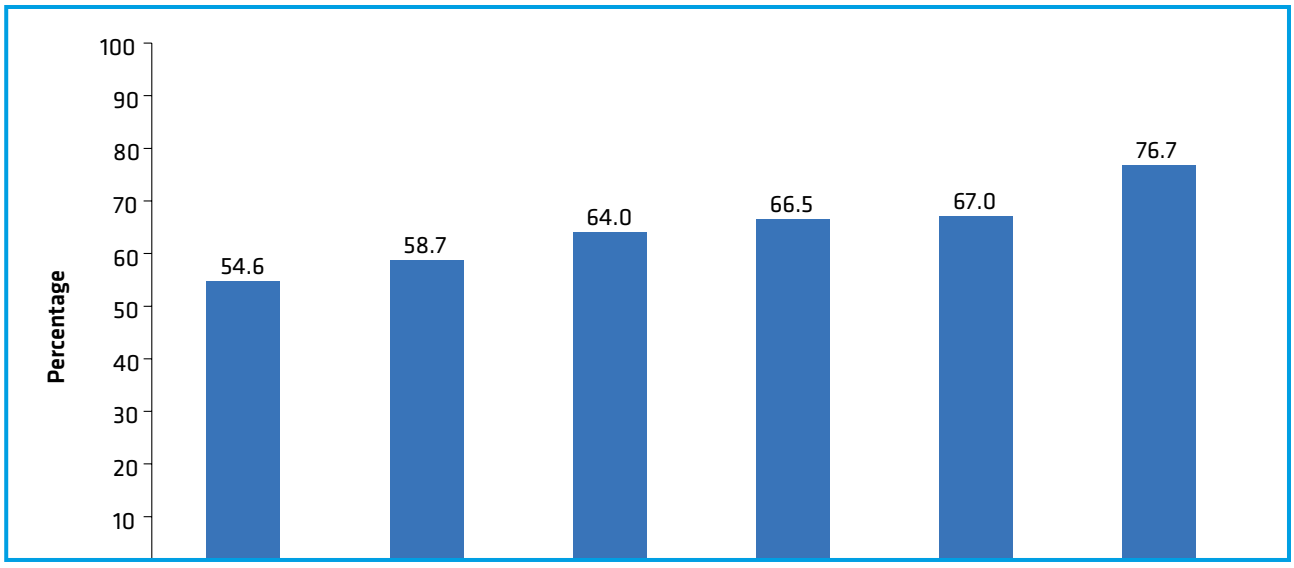


Table 19 shows ANC coverage provided by different service providers. It shows that nationally, 76.7 percent of the women received ANC from medically-trained providers. By residence, ANC by medically-trained providers was more prominent among the urban women than among the rural women (85.5 percent vs. 74.5 percent). Among the divisions, women from Khulna were more likely to receive ANC from medically-trained providers (86.7 percent), followed by Rajshahi (82.3 percent), Dhaka (80.1), Chittagong (76.5 percent), Barisal (75.5 percent), Rangpur (69.6 percent), Mymensingh (66.2), and Sylhet (63.5 percent) divisions. As regards the wealth quintile, marked variation was observed between the richest and the poorest quintile in this regard. Almost 92 percent of women from the richest wealth quintile received ANC from medically-trained providers, as opposed to 57.3 percent of those who belonged to the lowest wealth quintile. Similarly, large differences were also noticed between highly educated and illiterate mothers. Almost 55 percent of the mothers who had no education received ANC from a medically-trained provider, a proportion bit less than doubled among mothers who obtained postgraduation degrees (97.0 percent).

Table 19: Women Aged 15-49 with Children 0-11 Months Old during Survey by Antenatal Care Provider during Pregnancy and Received Antenatal Care from a Medically-trained Provider according to Background Characteristics, by Percent, Bangladesh, CES 2016

Background Characteristic	Did not check up	MBBS doctor	Nurse/ midwife/ Paramedic	FWV	CSBA	SACMO	HA/FWA/ CHCP	TTBA	TBA(Dai)	Unqualified Provider	NGO Health Worker	Medically trained	Number of Women
Mothers Age													
<20 yrs	9.1	75.8	3.8	3.6	0.2	0.4	3.3	0.2	0.0	0.5	3.0	83.9	1478
20-34 yrs	14.7	70.1	3.0	3.1	0.3	0.5	3.5	0.0	0.0	0.4	4.4	77.0	17563
35-49 yrs	24.3	61.7	1.6	2.9	0.5	0.6	4.1	0.0	0.0	0.4	3.9	67.3	1492
Number of Birth													
1	9.9	76.1	3.2	2.9	0.2	0.5	2.9	0.1	0.0	0.4	3.8	82.8	8286
2-3	15.9	69.1	2.9	3.1	0.4	0.5	3.5	0.0	0.0	0.4	4.1	76.1	10133
4-5	27.3	53.9	2.1	4.2	0.4	0.4	5.3	0.0	0.0	0.5	6.0	60.9	1758
6+	39.2	37.7	2.6	3.9	0.0	0.3	7.3	0.0	0.0	0.9	8.1	44.5	356
Residence													
Urban	8.6	79.4	3.2	2.3	0.4	0.1	1.0	0.1	0.0	0.4	4.6	85.5	4972
Rural	16.7	67.4	2.9	3.4	0.5	0.4	4.2	0.0	0.0	0.4	4.1	74.5	15561
Division													
Barisal	17.0	66.2	1.3	6.0	0.4	1.5	3.8	0.0	0.0	0.2	3.6	75.5	1883
Chittagong Division	15.2	70.6	3.2	2.4	0.2	0.1	4.3	0.0	0.0	0.4	3.6	76.5	3896
Dhaka Division	15.4	73.7	4.3	1.9	0.2	0.1	1.1	0.1	0.0	0.4	2.9	80.1	4931
Khulna Division	8.8	80.0	3.0	1.3	1.8	0.7	3.5	0.2	0.0	0.4	0.5	86.7	3032
Mymensingh	24.2	62.6	0.4	2.6	0.5	0.1	2.6	0.0	0.0	0.5	6.5	66.2	1059
Rajshahi Division	9.5	77.3	1.9	2.5	0.3	0.3	2.9	0.1	0.0	0.3	5.0	82.3	2473
Rangpur Division	13.9	59.8	2.6	5.4	1.3	0.6	6.9	0.1	0.0	0.2	9.4	69.6	2437
Sylhet Division	22.8	49.2	4.7	9.2	0.1	0.3	6.3	0.0	0.0	1.5	5.9	63.5	1376
Education													
Illiterate	32.4	46.4	4.0	4.3	0.3	0.4	4.4	0.1	0.0	0.4	7.3	55.3	1761
Primary	23.6	55.9	3.5	4.2	0.5	0.6	4.7	0.1	0.0	0.5	6.2	64.8	5309
Secondary	11.8	74.0	2.9	3.0	0.3	0.6	3.7	0.0	0.0	0.3	3.4	80.7	8825

Background Characteristic	Did not check up	MBBS doctor	Nurse/ midwife/ Paramedic	FWV	CSBA	SACMO	HA/FWA/ CHCP	TTBA	TBA(Dai)	Unqualified Provider	NGO Health Worker	Medically trained	Number of Women
SSC/Dhakil/O level	4.6	86.2	2.3	2.2	0.2	0.2	1.5	0.0	0.0	0.2	2.6	91.1	2266
HSC/Alim/ A leve	2.8	91.1	1.5	1.2	0.2	0.2	1.0	0.1	0.0	0.4	1.5	94.2	1613
Degree/Fazil	0.9	90.8	1.5	1.7	0.3	0.0	0.8	0.3	0.0	0.6	3.2	94.3	452
Masters/Kamil	1.4	95.6	0.9	0.5	0.0	0.0	0.9	0.0	0.0	0.0	0.7	97.0	307
Wealth Index(Quintiles													
Poorest	28.29	49.08	2.46	4.56	0.59	0.56	6.69	0.03	0.00	0.60	7.1	57.3	4164
Socond	20.20	61.74	3.22	4.04	0.52	0.30	4.92	0.00	0.00	0.39	4.7	69.8	4173
Middle	12.52	74.48	2.30	2.84	0.76	0.41	3.24	0.08	0.00	0.38	3.0	80.8	4148
Fourth	9.36	78.74	3.17	2.40	0.46	0.23	1.79	0.13	0.00	0.40	3.3	85.0	3889
Richest	4.24	86.09	3.54	1.88	0.17	0.07	0.70	0.02	0.00	0.34	3.0	91.7	4159
National	**15.0**	**69.8**	**2.9**	**3.2**	**0.5**	**0.3**	**3.5**	**0.1**	**0.0**	**0.4**	**4.2**	**76.7**	**20533**

7.1.2 Places for Antenatal Care

Table 20 shows the CES's findings as to the percentage of women who received ANC by the place where it was received. Both public and private sectors were found to be the main sources of ANC. Public sector venues include all GoB health facilities, such as medical college hospitals, district sadar hospitals, Maternal and Child Welfare Centres (MCWC), UHC, Union sub-centres, Family Welfare Centres (FWC), and Community Clinics. Private sector venues include private clinics and hospitals. And, NGO sector includes different static and satellite NGO clinics operated by national and international NGOs, with approval of GoB. It is evident from the table that about one-fifth of the mothers (19.1 percent) received ANC from the public sector, and 54.9 percent of them received ANC from the private sectors. Far fewer received ANC at home (3.6 percent) or at places in the NGO sector (5.4 percent). The likelihood of receiving ANC from the private sector was higher in all the divisions than from the public sector (see Table 20).

In contrast to the CES findings, BDHS 2014 shows that 58.0 percent of the women received ANC from the private sector, 41.0 percent from the public sector, 9.0 percent from NGO sector, and, 16.0 percent from home. However, BMMHS 2010 shows that 41.9 percent of the women received ANC from the public sector, 36.9 percent from the private sector, 13.2 percent from NGO sector, and 18.7 percent from home.

The findings shown above that ANC at home decreased over the time. By CES 2016, private sector emerged as a leading source of ANC. The decrease of ANC at home and the increasing use of the private sector may be the effect of the establishment of private hospitals and clinics, different private and non-government organization's health workers' work for increasing utilization of health facilities by pregnant mothers at the Upazila level. The percentage of public places used was similar across the surveys.

By residence, rural mothers were less likely to utilize private health facilities than the government (55.3 percent vs. 17.9 percent). In contrast, women who had the highest educational attainment tended to use private facilities more (83.8 percent private and 3.1 percent public), as did those who belonged to the richest wealth quintile (66.6 percent private vs. 18.8 percent public).

Table 20: Places ANC Conducted

Percentage Distribution of Women who Received ANC during Pregnancy by Place of ANC Care, according to Background Characteristics in CES 2016

Background Characteristic	Home	Public Sector	Private Sector	NGO Sector	Others	Did not check up	Number of Women
Mothers Age							
<20 yrs	19.2	61.0	5.5	2.0	9.1	3.2	1478
20-34 yrs	19.1	55.2	5.4	2.0	14.7	3.6	17563
35-49 yrs	19.5	45.7	4.8	2.2	24.3	3.4	1492
Number of Birth							
1	19.7	59.7	5.6	2.0	9.9	3.1	8286
2-3	18.9	54.4	5.4	2.0	15.9	3.4	10133
4-5	18.8	41.7	4.7	2.0	27.3	5.5	1758
6+	16.0	30.1	4.1	3.3	39.2	7.3	356
Residence							
Urban	1.5	23.9	53.3	10.6	2.2	8.6	4972
Rural	4.1	17.9	55.3	4.0	2.0	16.7	15561
Division							
Barisal Division	4.1	28.7	46.2	3.3	0.8	17.0	1883
Chittagong Division	3.3	14.6	58.0	5.0	3.9	15.2	3896
Dhaka Division	0.9	17.4	58.5	7.0	0.7	15.4	4931
Khulna Division	0.8	22.0	61.3	5.4	1.7	8.8	3032
Mymensingh	6.1	15.7	50.2	3.3	0.4	24.2	1059
Rajshahi Division	3.7	18.3	61.4	4.3	2.8	9.5	2473
Rangpur Division	9.6	25.6	42.4	5.8	2.7	13.9	2437
Sylhet Division	4.8	22.9	39.9	8.2	1.3	22.8	1376
Education of the respondent							
Illiterate	23.4	8.6	30.9	0.4	32.4	4.4	1761
Primary	20.6	5.9	44.1	0.4	23.6	5.4	5309
Secondary	19.2	4.8	60.6	0.2	11.8	3.3	8825
SSC/Dhakil/O level	15.9	4.5	73.5	0.2	4.6	1.3	2266
HSC/Alim/ A leve	16.1	4.2	75.0	0.2	2.8	1.6	1613
Degree/Fazil	12.2	6.1	78.7	1.0	0.9	1.2	452
Masters/Kamil	10.5	3.1	83.8	0.0	1.4	1.2	307
Wealth Index(Quintiles)							
Poorest	7.2	21.9	36.0	4.7	1.9	28.3	4164
Socond	4.6	19.5	50.2	3.6	1.9	20.2	4173
Middle	2.7	18.2	60.0	4.5	2.1	12.5	4148
Fourth	2.1	17.2	62.3	6.4	2.6	9.4	3889
Richest	1.0	18.8	66.6	7.7	1.6	4.2	4159
National	3.6	19.1	54.9	5.4	2.0	15.0	20533

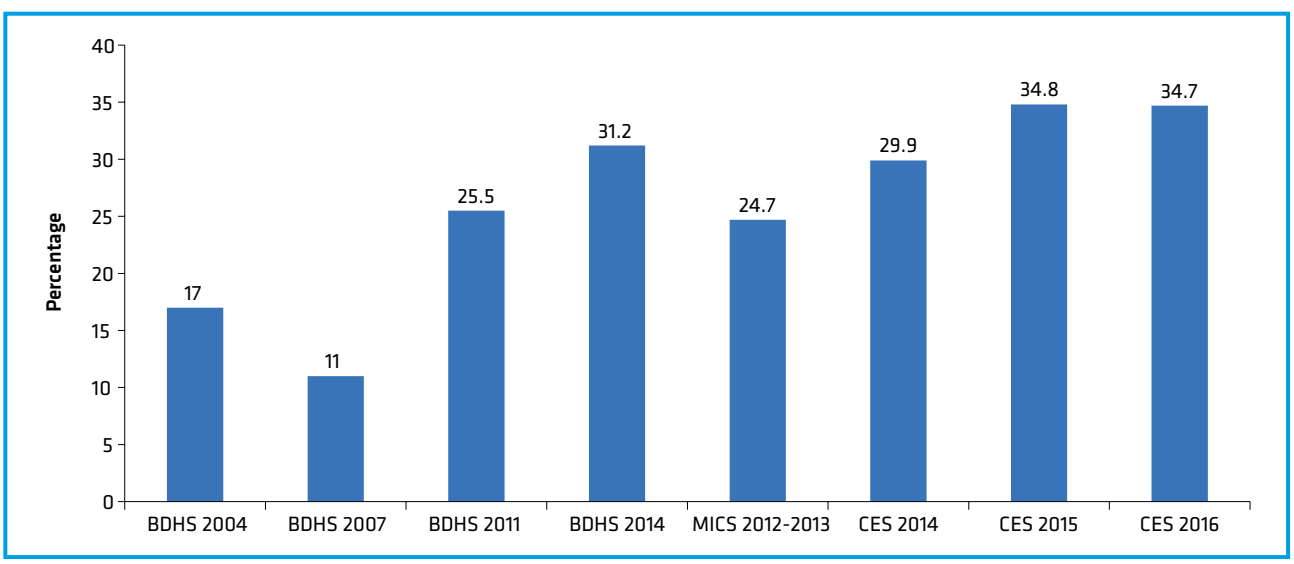
7.1.3 Number of Antenatal Visits

Antenatal care visits help in providing key service to pregnant women, including measures to detect and treat anemia, tetanus immunization, and provision for vital information to pregnant women on the danger sign during pregnancy, delivery, and postpartum period. The minimum number of antenatal care visits during the pregnancy as recommended by the government, is four, which has also been recommended by WHO and UNICEF. Table 21 presents the number of ANC visits made by women. It shows that about one-third of the mothers (34.7 percent) made four or more ANC visits across the country. Urban mothers were a little bit ahead than rural mothers regarding the question of four or more ANC visits (urban 45.1 percent and rural 32.0 percent). Figure 147 presents findings of four and more number of ANC obtained in BDHS 2004, 2007, 2014, MICS 2012-2013, and CES 2014- 2016. Between BDHS 2011 and MICS 2012-2013, no marked difference in the findings was observed. However, difference between CES 2016 and MICS 2012-2013 was 10.0 percentage points. And, the difference between BDHS 2014 and CES 2016 was 3.5 percentage points. The findings of CES 2016 matched with the trend in antenatal care visit (see Figure 147).

Table 21: Number of Antenatal Care Visits during Pregnancy, as Percentage Distribution of Women Aged 15-49 who had children 0-11 Months during Survey by according to Residence, in CES 2016

Number of ANC	National	Urban	Rural	Number of Women
None	15.0	8.6	16.7	3030
1 time	16.6	11.4	18.0	3349
2 times	18.3	17.3	18.6	3734
3 times	15.3	17.7	14.7	3252
4+	34.7	45.1	32.0	7168
Mean	3.9	4.1	3.8	

Figure 147: 4+ Antenatal Care Visits in BDHS 2004,2007,2011,2014, MICS 2012, CES 2014, CES 2015, CES 2016



By division, women from Rangpur were more likely to receive 4 and more ANC (47.6 percent), followed by Rajshahi (45.0), Khulna (39.8 percent), Chittagong (35.6), Barisal (29.1 percent), Dhaka (28.9), Sylhet (25.2 percent), and Mymensingh (21.5) percent) divisions.

As regards the wealth quintile, marked variation was observed between the richest and the poorest quintile. Fifty-one percent of the women from the richest wealth quintile received 4 and more ANC, as opposed to 21.1 percent of those belonging to the lowest wealth quintile. In contrast, 4 and more ANC was more prominent among women who had the highest educational attainment, compared to those who had no education (63.9 percent vs. 17.9 percent).

Table 22: Number of Antenatal Care Visits during Pregnancy as Percentage Distribution of Women Aged 15-49 who had Children 0-11 Months during Survey according to Background Characteristics in CES 2016

Background Characteristic	1 time	2 times	3 times	4 times and more	Never	Number of Women
Number of Birth						
1	17.0	19.2	16.4	37.5	9.9	8286
2-3	16.4	17.7	15.0	35.0	15.9	10133
4-5	16.3	18.5	13.2	24.7	27.3	1758
6+	16.8	14.4	13.4	16.2	39.2	356
Residence						
Rural	11.4	17.3	17.7	45.1	8.6	4972
Urban	18.0	18.6	14.7	32.0	16.7	15561
Division						
Barisal	20.3	17.7	15.9	29.1	17.0	1883
Chittagong	15.4	17.4	16.4	35.6	15.2	3896
Dhaka	17.2	21.4	17.1	28.9	15.4	4931
Khulna	14.2	20.4	16.8	39.8	8.8	3032
Mymensingh	25.1	18.6	10.6	21.5	24.2	1059
Rajshahi	15.5	17.9	12.1	45.0	9.5	2473
Rangpur	12.7	12.5	13.3	47.6	13.9	2437
Sylhet	17.7	17.5	16.8	25.2	22.8	1376
Education						
Illiterate	18.4	17.5	13.9	17.9	32.4	1761
Primary	20.0	18.3	13.9	24.2	23.6	5309
Secondary	17.0	19.3	15.4	36.4	11.8	8825
SSC/Dhakil/O level	11.7	18.4	18.0	47.4	4.6	2266
HSC/Alim/ A leve	12.3	14.7	17.9	52.3	2.8	1613
Degree/Fazil	6.4	15.0	15.3	62.5	0.9	452
Masters/Kamil	4.8	15.4	14.5	63.9	1.4	307
Wealth Quintile						
Poorest	20.1	18.0	12.4	21.1	28.3	4164
Second	21.4	18.5	13.1	26.7	20.2	4173
Middle	18.3	19.1	16.1	34.0	12.5	4148
Fourth	14.0	19.6	16.1	41.0	9.4	3889
Richest	9.1	16.2	19.1	51.3	4.2	4159
National	**16.6**	**18.3**	**15.3**	**34.7**	**15.0**	**20533**

7.1.4 Content of Antenatal Care

The components of ANC are presented in Table 23. Overall, 93.7 percent of the women surveyed measured their blood pressure, 79.3 percent gave urine samples for testing, 76.2 percent provided blood sample for testing, and 92.5 percent measured their weight during ANC. Compared to the Bangladesh Maternal Health Services and Maternal Mortality Survey (BMMS) 2010, these proportions were higher in CES 2016. BMMS 2010 showed that 90.5 percent of the women measured their blood pressure, 50.1 percent gave urine samples for testing, 37.4 percent provided blood sample for testing, and 83.5 percent measured their weight during ANC. CES 2016 findings show that urban women were slightly ahead of their rural counterparts in these practices. Ninety-seven percent of urban mothers measured blood pressure, 89.8 percent had their urine tested, 87.4 percent had their blood tested, and 96.1 percent had their weight measured, as compared to 92.7 percent, 76.3 percent, 73.1 percent, 91.5 percent, respectively, about the rural mothers. Similar to urban areas, disparity in the findings was observed between the highest and lowest wealth quintile, as well between the highest and the lowest educational attainment among the mothers. In all the components, the highest proportion of mothers who performed these procedures were those with higher educational attainment and in the richest wealth index, especially when compared to those who had no education or belonged to the lowest wealth index.

Among the divisions, the highest proportion of mothers who gave blood samples was in Dhaka (83.8 percent and urine 85.2 percent) while the highest proportion of mothers who gave urine samples to be tested was in Barisal (85.6 percent and for blood samples 80.6 percent). Chittagong, Khulna, and Sylhet divisions were quite alike regarding the proportions of mothers who gave sample (between 80.1 percent and 77.2 percent for blood and between 82.1 percent and 80.3 percent for urine). However, women from Mymensingh, Rajshahi, and Rangpur divisions were behind the national average (between 72.0 percent to 61.4 percent and 75.5 percent to 63.8 percent respectively).

The providers of ANC components are presented in Table 24. It shows that measuring blood pressure and weight was most commonly done by qualified doctors, nurses, and Community Skilled Birth Attendants (CSBA), SACMOs and community health workers. For the urine and blood tests, these were most frequently advised by qualified doctors.

Table 23: Women who Received Specific Antenatal Care Services by Background Characteristics, by percentage, CES 2016

Background Characteristic	Blood Pressure measured	Urine Sample Test	Blood Sample Test	Weight Measured	Number of Women
Mothers Age					
<20	93.7	79.7	78.1	91.9	1324
20-34 yrs	93.8	79.5	76.3	92.8	15033
35-49 yrs	91.8	75.4	72.6	90.3	1146
Number of Birth					
1	94.1	82.0	79.6	93.3	7471
2-3	93.8	78.6	75.3	92.4	8532
4-5	91.2	71.4	66.9	89.6	1280
6+	89.8	69.3	60.4	90.3	220
Residence					
Urban	97.2	89.8	87.4	96.1	4576
Rural	92.7	76.3	73.1	91.5	12927
Division					
Barisal Division	98.2	85.6	80.6	95.9	1585
Chittagong Division	91.9	82.1	79.3	93.2	2939
Dhaka Division	94.4	85.2	83.8	91.9	3965
Khulna Division	95.0	80.3	80.1	94.0	2765
Mymensingh	94.4	74.7	72.0	94.0	757
Rajshahi Division	87.4	63.8	61.4	86.2	2261
Rangpur Division	96.7	75.5	66.1	93.6	2138
Sylhet Division	97.7	81.3	77.2	96.3	1093
Education					
Illiterate	90.6	70.6	65.4	90.6	1190
Primary	91.6	70.3	65.7	89.8	4054
Secondary	93.6	79.7	76.7	92.1	7780
SSC/Dhakil/O level	96.2	87.8	86.6	95.7	2161
HSC/Alim/ A leve	97.4	91.2	89.8	97.4	1567
Degree/Fazil	95.5	91.8	91.1	96.6	448
Masters/Kamil	98.0	96.3	96.3	98.7	303
Wealth Quintile					
Poorest	89.1	63.5	56.8	86.5	2995
Socond	91.6	71.4	68.2	90.6	3350
Middle	93.6	78.8	76.3	92.6	3620
Fourth	95.6	86.0	83.8	94.8	3542
Richest	97.2	92.3	91.0	96.8	3996
National	**93.7**	**79.3**	**76.2**	**92.5**	**17503**

Table 24: Component of Antenatal Care by providers of ANC, by percentage of Women who received Antenatal Care, by ANC provider, CES 2016

ANC provider	Procedure Performed[6] and or Advised to be Performed during antenatal care			
	Blood Pressure Measured	Urine test done	Blood test done	Weight
MBBS doctor	82.5	87.8	90.0	82.3
Nurse/midwife/paramedic/FWA	7.1	5.8	5.3	7.1
SACMO	0.4	0.3	0.3	0.4
CSBA	0.6	0.5	0.3	0.6
HA/FWA/CHCP	3.9	1.9	1.4	4.0
NGO Health Worker	4.9	3.3	2.3	5.1
Others	0.6	0.3	0.3	0.4
National	**93.7**	**79.3**	**76.2**	**92.5**

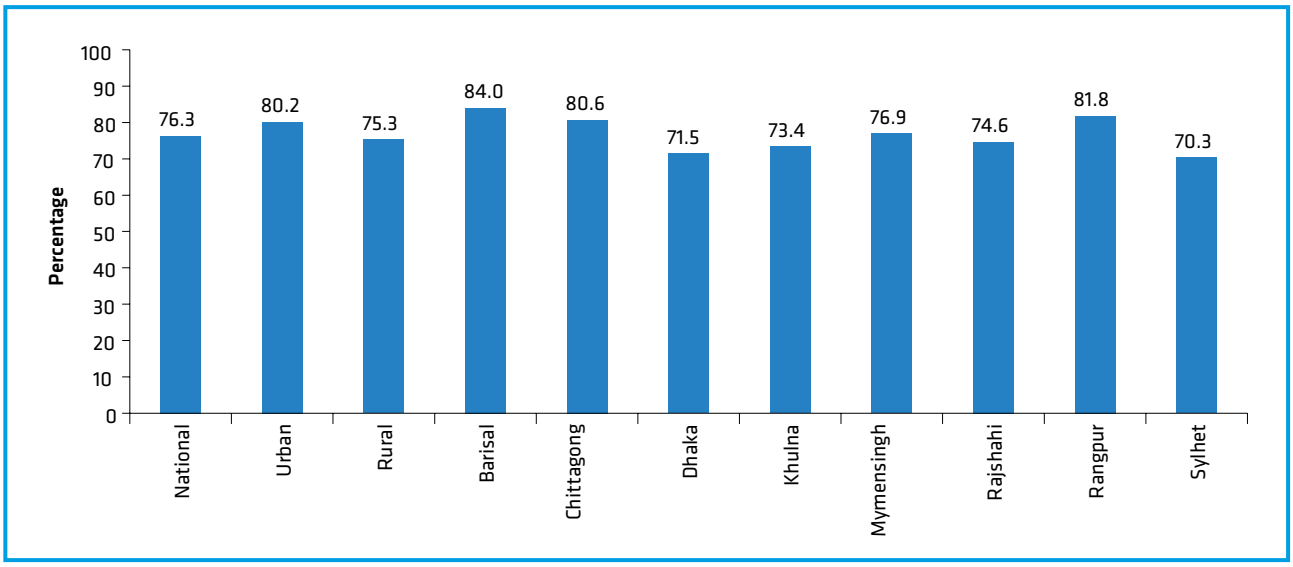
7.1.5 Iron and Calcium Supplementation

Adequate nutrition for pregnant women is critical for the health and survival prospects of both the mothers and the newborns. Malnutrition increases health risk of both mothers and children. A low body mass index for pregnant women increases the risk of both maternal and neonatal mortality; low body mass can also restrict the growth of the fetus, which is a risk factor for neonatal conditions, such as low birth weight. Nutritional supplements for calcium, folic acid, and iron provided by health workers can have beneficial effects against these risks. They can reduce the likelihood of malnutrition and anemia in the mother and low birth weight in the newborn. CES 2016 investigated the iron and calcium intake during pregnancy. The findings are presented below.

Iron Supplementation

Nationally, 76.3 percent women took iron tablets during their last pregnancy (see Figure 148). A little variation was observed between rural and urban areas (75.3 percent and 80.2 percent, respectively). The percentage of women who took iron table higher in Barisal (84.0 percent), Rangpur (81.8 percent) and Chittagong (80.6 percent) divisions than in other divisions and the lowest in Sylhet division (70.3 percent).

Figure 148: Percenatge of Mothers Who Took Iron Tablet during Pregnancy in 2016



6 Usually, BP and weight is measured by doctor/ provider but blood and urine test is advised by doctor and performed by lab technician

Number of Days Iron Tablets Taken

The government has recommended IFA supplements from confirmation of pregnancy preferably after 12 weeks of gestation until the end of pregnancy, which needs to be continued upto 3 months after delivery (1 tablet in each day). Nationally, on an average women took iron tablets for about 110 days as against the recommended 6 weeks before delivery and continued upto 12 weeks of delivery. Women living in urban areas took the tablets for longer than those living in rural areas (119 days and 109 days, respectively). It was also observed that nationally around one in every three women (35.0 percent) took iron tablets for 61-120 days, while only 9.9 percent of women took them for more than 180 days. Among the eight divisions, on an average women from Chittagong, Khulna, Barisal, and Rangpur divisions took more iron tablets. Women from Sylhet division took iron tablets comparatively for a shorter duration, on an average (97 days).

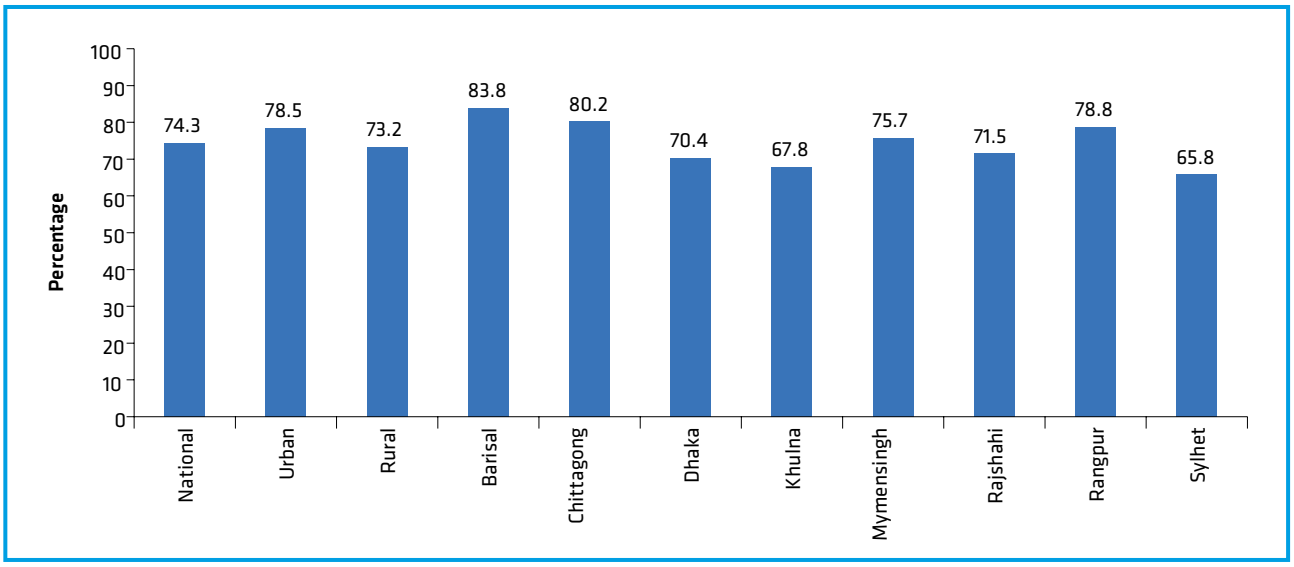
Table 25: Number of Days Mothers Took Iron Tablet, by percentage

	Upto 15 days	16 days to 1.0 month	1.1 - 2.0 months	2.1 - 4.0 months	4.1 - 6.0 months	6.0+ months	Don't know	Average	Number of Women
National	4.9	12.5	13.2	35.0	23.9	9.9	0.6	111	15654
Urban	4.3	11.8	12.8	32.0	25.2	13.6	0.3	119	4023
Rural	5.0	12.6	13.3	35.8	23.6	8.9	0.7	109	11631
Barisal Division	4.0	11.3	12.2	39.5	21.5	11.4	0.2	114	1575
Chittagong Division	1.1	8.3	11.1	36.6	29.7	12.8	0.4	128	3129
Dhaka Division	9.3	14.0	14.0	33.0	20.9	8.7	0.2	102	3492
Khulna Division	3.0	7.7	11.9	35.2	30.6	10.8	0.7	122	2236
Mymensingh	6.2	15.5	14.7	31.8	19.4	12.4	0.0	108	789
Rajshahi Division	7.1	15.0	14.6	36.2	19.5	7.6	0.0	100	1922
Rangpur Division	3.3	12.0	11.9	36.5	26.3	6.4	3.6	110	1963
Sylhet Division	2.9	21.9	18.9	30.8	17.7	7.5	0.3	97	982

Calcium Supplementation

The government of Bangladesh has recommended 1 tablet of calcium (500mg) twice daily- from 20 weeks of gestation until the end of pregnancy. Figure 149 shows that nationally about three-fourth of the women (74.3 percent) took calcium tablets during their last pregnancy. A five percentage points variation was observed between rural and urban women (78.5 percent and 73.2 percent, respectively). By division, the percentage of women who took calcium tablets was higher in Barisal (83.8 percent) and Chittagong (80.2 percent) than those living in other divisions; it was the lowest in Sylhet division (65.8 percent).

Figure 149: Mothers Who Took Calcium Tablet during Pregnancy by Percentage in 2016



Number of Days Calcium Tablets Taken

Calcium supplementation is recommended to women from 20 weeks of pregnancy to the end of the pregnancy. Table 26 shows that at the national level, on an average, women took calcium tablets for about 110 days. It was found to be higher among the women in urban areas than those living in rural areas (around 119 days and 108 days, respectively). It was seen that 35.1 percent of the women took calcium tablets for two to four months (61-120 days) while only 9.8 percent of those took it for more than six months (180 days) duration. Among the divisions, the majority of the women in Barisal (39.7 percent), Chittagong (37.0 percent), Rajshahi (36.1 percent), Rangpur (35.5 percent), Dhaka (33.7 percent), Sylhet (31.9 percent), and Khulna (31.8 percent) divisions took calcium tablet for longer durations (61-120 days).

Table 26: Number of Days Mothers Took Calcium Tablet, by percentage

	01-15 dys	16-30 ddays	31-60 days	61-120 days	121-180 days	180+ days	Dont know	Average	Number of Women
National	4.6	12.6	13.7	35.1	23.5	9.8	0.7	110	15208
Urban	3.6	11.4	13.5	32.8	24.7	13.6	0.5	119	3966
Rural	4.9	12.9	13.7	35.8	23.1	8.8	0.8	108	11242
Division									
Barisal Division	4.0	10.6	13.2	39.7	20.8	11.5	0.2	113	1569
Chittagong Division	1.0	8.6	10.9	37.0	29.3	12.7	0.5	125	3068
Dhaka Division	8.8	13.6	14.2	33.7	20.6	9.0	0.1	103	3456
Khulna Division	5.0	17.2	15.8	31.8	17.7	12.4	0.1	105	2080
Mymensingh	2.7	8.2	13.4	34.3	30.3	10.3	0.8	120	767
Rajshahi Division	6.4	14.6	15.8	36.1	19.7	7.3	0.0	100	1857
Rangpur Division	4.0	12.5	13.1	35.5	24.6	6.0	4.2	106	1916
Sylhet Division	3.0	22.1	17.8	31.9	18.0	7.0	0.1	96	932

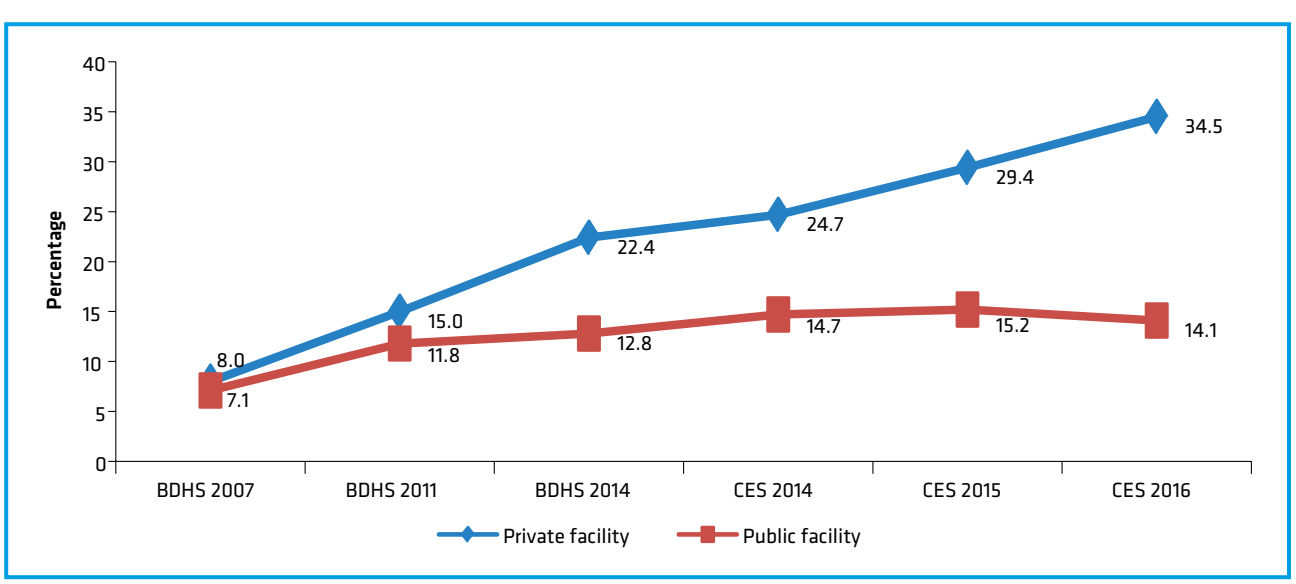
7.2 DELIVERY CARE

Child birth can be a time of risk for the both delivering mother as well as her newborns. The majority of maternal death occurs from complications either during the time of delivery or in the immediate postpartum period. These complications include the following: hemorrhage; infection; eclampsia; sepsis, and obstructed labour. Effective management of delivery complications is required to reduce risks of maternal as well as newborn death. Institutional delivery and/or delivery with a medically-trained provider at home can address and manage the complications associated with childbirth. CES 2016 investigated the delivery place and assistance provided during the time of delivery. The findings are presented below in this section.

7.2.1 Place of Delivery

The findings in Table 27 reveal that nationally 50.9 percent deliveries were made at a health facility, while 49.1 percent were at home. However, BDHS 2014 shows that 37.4 percent of the births in Bangladesh were delivered at a health facility and 62.2 percent at home. Among the health facility deliveries recorded by CES 2016, 14.1 percent were conducted at public health facilities, 34.5 percent at private hospital/ clinics, and 2.3 percent at NGO clinics. Increased use of public health facilities for delivery has been moderate, compared to that in private hospitals/clinics. According to BDHS 2007, 7.1 percent of the deliveries were conducted at a public health facility, but had increased to 11.8 percent in BDHS 2011 and 12.8 in BDHS 2014. In contrast, delivery in private facilities was 8 percent in BDHS 2007, 15 percent in 2011, and 22.4 percent in BDHS 2014. **T**he analysis shows that delivery in private facilities increased substantially, compared to public facilities. Utilization of public facility for delivery purpose should be given more emphasis through voucher scheme or other motivational programs.

Figure 150 : Trend in Utilization of Public and Private Health Facility According to BDHS 2007, 2011, 2014, CES 2014, 2015 and 2016



By residence, urban women were more likely than rural women to utilize the health facility for delivery (67.4 percent and 46.6 percent, respectively). Private hospitals/clinics were the main places for institutional delivery (34.5 percent). Among the divisions, women from Khulna, Dhaka, and Rajshahi, (65.1 percent, 58.7 percent, and 56.1 percent, respectively) conducted more deliveries at health facilities than those living in other divisions. The percentage of institutional delivery was lagging behind for women living in Mymensingh (34.3 percent), Sylhet (36.1 percent), Barisal (37.7 percent), Rangpur (47.4 percent) and Chittagong (48.2 percent) divisions.

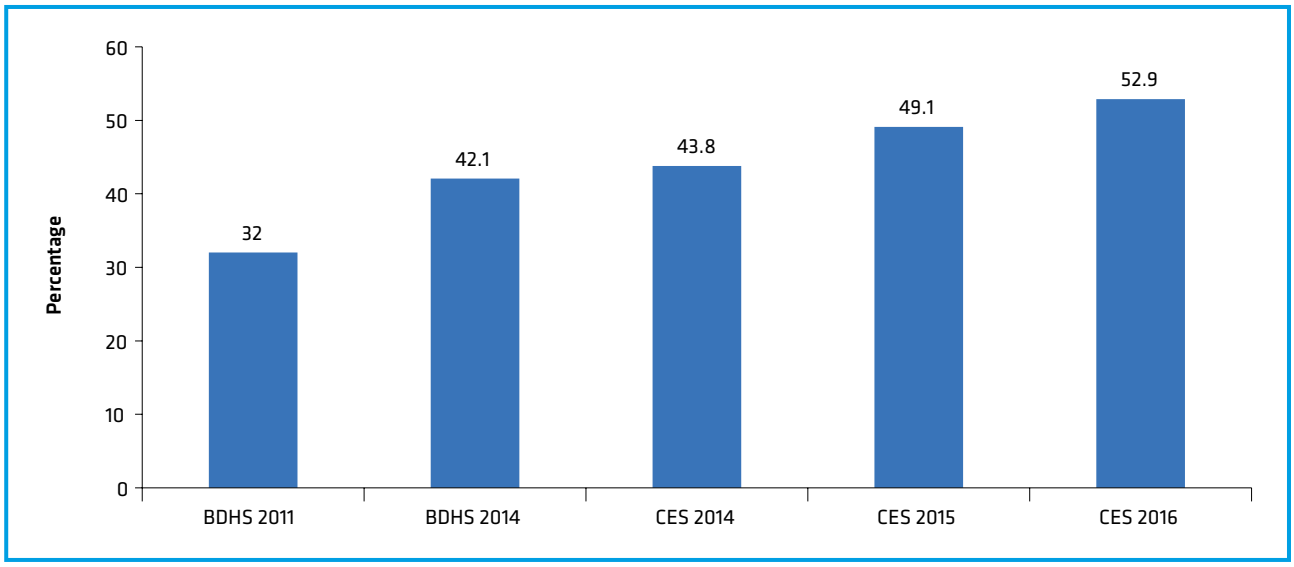
Table 27: Birth by Place of Delivery according to Background Characteristic, by percentage, in CES 2016

Background Characteristic	Public	Private Hospital/ Clinic	NGO Static Clinic	Home	Percentage de-livered in health facility	Number of Women
Mohers Age						
<20 yrs	14.9	36.3	2.4	46.4	53.6	1478
20-34 yrs	14.0	34.7	2.3	49.0	51.0	17563
35-49 yrs	14.6	30.3	2.0	53.0	47.0	1492
Number of Birth						
1	16.0	40.9	2.7	40.4	59.6	8286
2-3	13.4	32.9	2.2	51.5	48.5	10133
4-5	10.1	20.3	1.2	68.4	31.6	1758
6+	12.4	13.1	1.0	73.5	26.5	356
Residence						
Urban	20.9	41.0	5.6	32.6	67.4	4972
Rural	12.4	32.8	1.4	53.4	46.6	15561
Division						
Barisal Division	12.1	24.6	0.9	62.3	37.7	1883
Chittagong Division	10.9	34.7	2.5	51.8	48.2	3896
Dhaka Division	14.4	40.8	3.5	41.3	58.7	4931
Khulna Division	16.1	46.8	2.2	34.9	65.1	3032
Mymensingh	12.2	20.9	1.2	65.7	34.3	1059
Rajshahi Division	16.6	39.0	0.5	43.9	56.1	2473
Rangpur Division	16.8	27.8	2.9	52.6	47.4	2437
Sylhet Division	16.4	16.9	2.8	63.9	36.1	1376
Education						
Illiterate	14.0	16.2	3.8	66.0	34.0	1761
Primary	12.0	21.0	2.5	64.5	35.5	5309
Secondary	14.6	36.1	2.0	47.3	52.7	8825
SSC/Dhakil/O level	15.0	51.1	1.5	32.4	67.6	2266
HSC/Alim/ A leve	16.8	57.8	2.9	22.6	77.4	1613
Degree/Fazil	15.9	66.8	1.3	16.0	84.0	452
Masters/Kamil	13.7	68.0	1.4	16.9	83.1	307
Wealth Quintiles						
Poorest	10.2	16.1	1.0	72.7	27.3	4164
Socond	13.2	25.0	1.4	60.4	39.6	4173
Middle	13.6	34.8	1.9	49.8	50.2	4148
Fourth	16.4	42.9	3.3	37.4	62.6	3889
Richest	17.3	54.7	3.9	24.1	75.9	4159
National	**14.1**	**34.5**	**2.3**	**49.1**	**50.9**	**20533**

7.2.2 Delivery Assistance

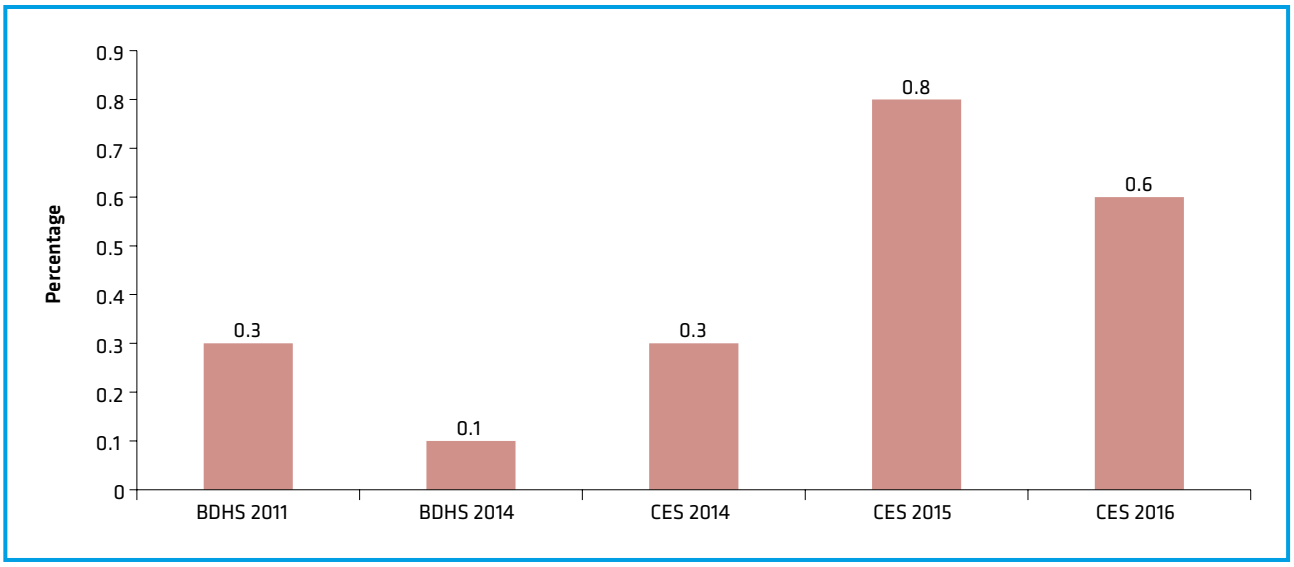
Reducing maternal death from birth complications is possible by increasing the number of births attended by a medically-trained provider – a doctor, nurse, or trained midwife. CES 2016 investigated those who assisted deliveries. The findings are shown in Table 28. The table shows that medically-trained providers attended 52.9 percent of the total number of births, which was nationally a number higher in urban areas (68.8 percent) than that in rural areas (48.9 percent). Among the medically-trained providers, MBBS doctors were the main service providers in both urban and rural areas (54.9 percent and 36.9 percent), followed by nurses/midwives (13.0 percent and 10.1 percent). The findings of CES 2016 were similar to the trend in delivery attendance by medically-trained providers shown in BDHS 2014. There has been a commendable increase in the number of deliveries attended by medically-trained providers, as was observed in BDHS 2014. It shows that the delivery attended by a medically-trained provider increased by 11 percentage points - from 21.0 percent in 2007 to 32.0 percent in 2011 and 42 percent in 2014. CES 2016 reveals that 52.9 percent of the deliveries were attended by medically trained providers.

Figure 151: Delivery Conducted by Skilled Attendance in BDHS 2011, BDHS 2014, CES 2014, CES 2015 and CES 2016 by Pecentage



It is worth mentioning here that so far 13000 CSBA has been trained on conducting safe delivery throughout the country. Compared to this large number, contribution of CSBA in conducting delivery was found to be poor. According to Coverage Evaluation Survey (CES), they contributed 0.3 percent of total deliveries in 2014, 0.8 percent in 2015, and 0.6 percent in 2016. According to BDHS, 0.3 percent deliveries were conducted by CSBA in 2011 and 0.1 percent in 2014. The program should identify the bottlenecks of poor contribution of CSBA in conducting deliveries and should take appropriate measure in this regard (see figure 152).

Figure 152: Delivery Conducted by CSBA in BDHS 2011, BDHS 2014, CES 2014, CES 2015 and CES 2016 by Pecentage



Of the unqualified health providers, traditional birth attendants, relatives/friends, NGO health workers played a major role in deliveries. In the divisions, the proportion of deliveries attended by medically-trained providers was the highest in Khulna division (67.1 percent), followed by Dhaka (59.5 percent) and Rajshahi divisions (57.1 percent); and, it was the lowest in Mymensingh division (37.0 percent).

However, disparities in attending the delivery by a medically-trained provider were again observed between the highly educated and the illiterate mothers, and between the richest and the poorest wealth quintile. For instance, 79.9 percent of the deliveries of postgraduate mothers were attended by a doctor, while in the case of mothers who were illiterate the figure was only 26.5 percent. In contrast, women from the poorest quintile of households were about one-fourth (19.2 percent) who were likely to be attended by a doctor, compared to those from the richest households (65.9 percent) (Table 28) .

Table 28: Assistance during Delivery

Percentage Distribution of Live Birth by Person Providing Assistance during Delivery by Background Characteristic in CES 2016

Background Characteristic	Qualified doctor	Nurse/mid wife/ paramedic	FWV	CSBA	SACMO	HA/FWA/ CHCP	TTBA	TBA	Unqualified Providers	Relatives/ friend	NGO Health Worker	Medically trained provider	Number of Women
Mother's Age													
<20 yrs	41.4	13.1	0.9	0.1	0.5	0.4	7.9	26.1	0.4	7.6	1.6	56.0	1478
20-34 yrs	40.8	10.7	1.0	0.1	0.5	0.3	9.4	28.1	0.7	7.2	1.2	53.1	17563
35-49 yrs	37.3	8.8	1.4	0.0	0.9	0.4	9.2	29.2	0.7	10.9	1.1	48.4	1492
Number of Birth													
1	47.9	11.8	1.0	0.1	0.5	0.3	8.1	22.3	0.6	6.0	1.3	61.3	8286
2-3	38.7	10.5	1.0	0.1	0.6	0.4	9.7	29.2	0.6	7.9	1.3	50.9	10133
4-5	24.1	7.8	0.8	0.0	0.5	0.2	12.2	42.3	1.0	10.5	0.6	33.2	1758
6+	17.8	9.4	1.1	0.0	0.2	0.7	7.8	47.6	0.6	14.0	0.6	28.6	356
Residence													
Rural	54.9	13.0	0.7	0.0	0.2	0.1	2.0	5.5	18.9	0.4	4.2	68.8	4972
Urban	36.9	10.1	1.1	0.1	0.6	0.4	1.0	10.2	30.4	0.7	8.4	48.9	15561
Division													
Barisal Division	33.1	8.8	1.0	0.2	1.0	0.2	0.9	5.6	36.8	0.4	12.1	44.0	1883
Chittagong	34.8	14.8	1.0	0.1	0.2	0.2	0.8	6.7	35.5	0.5	5.4	50.9	3896
Dhaka Division	52.1	6.7	0.5	0.0	0.2	0.2	1.3	10.1	25.4	1.0	2.5	59.5	4931
Khulna Division	57.4	9.1	0.1	0.2	0.2	0.4	0.4	7.4	17.8	1.5	5.5	67.1	3032
Mymensingh	27.6	7.7	0.1	0.2	1.4	0.3	1.4	15.5	32.9	0.2	12.7	37.0	1059
Rajshahi Division	41.5	13.9	0.8	0.1	0.7	0.6	0.4	4.2	21.4	0.6	15.8	57.1	2473
Rangpur Division	32.7	14.3	1.3	0.0	1.6	0.2	3.7	18.0	19.1	0.2	9.0	49.9	2437
Sylhet Division	22.9	8.6	5.4	0.1	0.2	1.0	1.1	8.0	42.8	0.5	9.3	37.2	1376
Education													
Illiterate	26.5	6.5	0.9	0.1	0.4	0.1	10.6	42.3	1.0	9.4	2.0	34.4	1761
Primary	25.7	9.3	1.1	0.2	0.7	0.3	10.9	39.0	0.6	10.7	1.5	37.0	5309
Secondary	40.9	12.5	1.0	0.1	0.5	0.4	9.4	25.9	0.8	7.3	1.2	55.0	8825
SSC/Dhakil/O level	57.5	12.2	1.0	0.0	0.8	0.3	7.3	15.8	0.6	4.1	0.5	71.5	2266
HSC/Alim/ A leve	68.2	10.0	0.8	0.0	0.5	0.2	5.9	10.5	0.3	2.9	0.9	79.4	1613
Degree/Fazil	74.7	9.3	0.9	0.0	1.1	0.4	5.0	6.5	0.0	1.5	0.5	86.2	452
Masters/Kamil	79.9	4.7	0.4	0.0	0.0	0.2	5.9	8.8	0.0	0.0	0.0	85.0	307
Wealt Quintile													
Poorest	19.2	7.9	1.0	0.1	0.9	0.5	1.7	11.6	42.9	0.4	13.7	29.2	4164
Socond	29.5	10.2	0.9	0.2	0.6	0.4	1.2	11.9	34.5	0.9	9.6	41.5	4173
Middle	39.3	11.9	1.1	0.1	0.7	0.4	1.0	8.7	28.7	0.6	7.5	53.1	4148
Fourth	50.1	12.7	0.9	0.0	0.3	0.2	1.2	8.2	20.9	0.9	4.6	64.0	3889
Richest	65.9	10.9	1.0	0.1	0.1	0.1	1.1	5.8	12.4	0.6	1.9	78.0	4159
National	**40.6**	**10.7**	**1.0**	**0.1**	**0.6**	**0.3**	**1.2**	**9.3**	**28.0**	**0.7**	**7.5**	**52.9**	**20533**

7.2.3 POSTNATAL CARE (PNC) FOR MOTHERS AND AND NEWBORNS

Postnatal checkups and care are recognized as an integral component of comprehensive maternity and newborn care.

Post-natal checkups provide an opportunity to assess and treat delivery complications and to counsel mothers on how to take care of themselves and their babies. Evidences indicate that the risks of maternal mortality and morbidity are high in the period of 48 hours immediately after the child's birth. Around three-quarters of neonatal death take place in the first week; with up to half of these occurring within 24 hours of birth.[7]

Therefore, there is an urgent need for taking care of both mothers and children in the immediate post-partum period. CES 2016 assessed the postnatal care for mothers and children. The findings are presented in the table below.

Postnatal Checkups for Mothers and Newborns

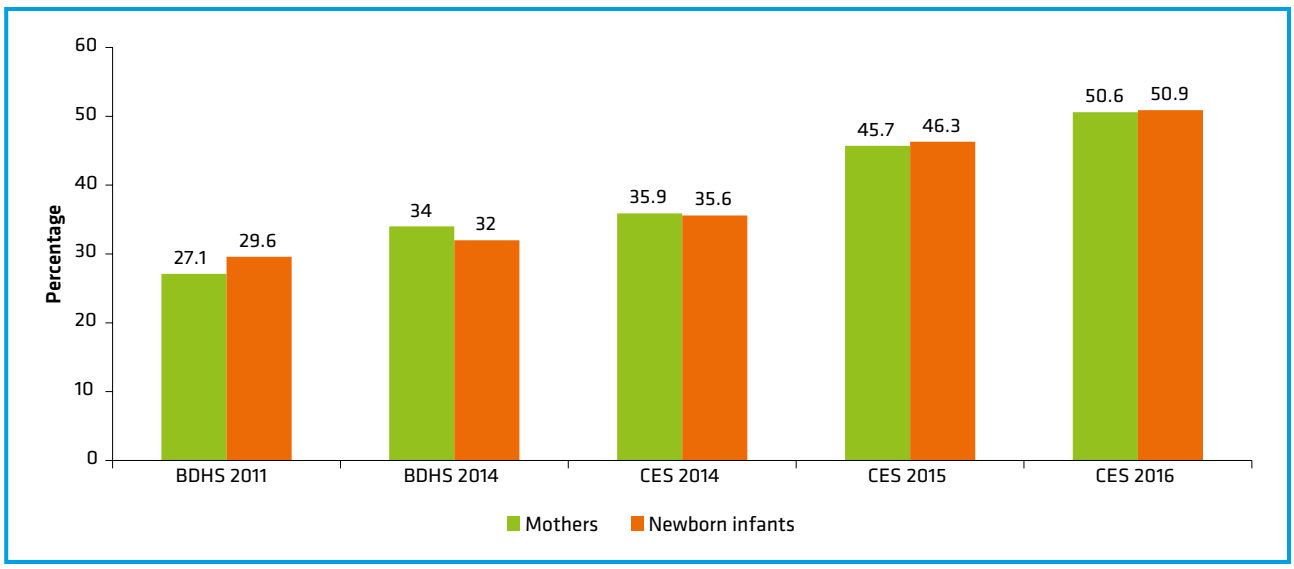
Table 29 illustrates the percent distribution of mothers and newborns who received PNC by providers. Nationally, 50.6 percent women and 50.9 percent newborns received PNC from medically-trained providers within two days after delivery. In contrast, 30.9 percent of the mothers and 26.6 percent of the newborns did not receive any postnatal care. Figure 153 shows a comparison between BDHS 2011 and CES 2016. It shows that compared to CES 2014, there were 9.8 percentage points increase in PNC for the mothers and 10.7 percentage points for the children in CES 2015. The 2014 BDHS data show that 34.0 percent of the mothers and 32.0 percent of the children received postnatal care from a medically-trained provider within the crucial first two days of the delivery. These were found to be 16.0 percent and 13.0 percent, respectively, in BDHS 2004; 20.0 percent for both mothers and newborn infants in BDHS 2007. Between BDHS 2011 and 2014, PNC for mothers increased by 6.9 percentage points and 2.4 percentage points for newborn. It is worth mentioning here that BDHS considered mothers who had delivered child three years back of the survey. However, CES considered mothers who delivered child between July 1, 2015 and June 30, 2016. This might cause differences in finding between BDHS 2014 and CES 2016. Moreover, hospital delivery increased from 41.2 percent in 2014 to 52.9 percent in 2016. This improvement in health facility delivery increased the PNC for both mothers and newborns.

Table 29: Postnatal Care for Mother and Newborn

Timing	Mother		Child	
	Any Provider	Medically trained provider	Any Provider	Medically trained provider
Within 2 days	63.3	50.6	63.8	50.9
3-6 days	2.3	1.1	2.9	1.3
7-41 days	2.7	1.6	5.2	2.5
41 days and Above	0.6	0.3	1.4	0.7
DK	0.2	0.2	0.2	0.2
Did not receive	30.9	46.3	26.6	44.4
Number	20533	20533	20533	20533

7 The State of Worlds Children 2009, Maternal and Newborn Health, Page 54, UNICEF

Figure 153: Postnatal Care for Women and Newborn from Medically-trained Provider within Two Days of Delivery in BDHS 2011, 2014, CES 2014, 2015 and 2016



Urban-rural difference in receiving PNC mother was found to be notable. PNC by medically trained providers was more prominent among urban women than among rural women (68.3 percent vs. 49.9 percent). By division, women from Khulna were more likely to receive ANC from medically-trained providers (67.6 percent), followed by Rajshahi (57.6 percent), Chittagong and Dhaka (52.4 percent), Rangpur (49.2 percent), Barisal (46.9 percent), Mymensingh (38.8 percent), and Sylhet (38.6. percent) divisions (see Table 30).

As regards the wealth quintile, marked variation was observed between the richest and the poorest quintile. Seventy-eight percent of the women from the richest wealth quintile received PNC from medically-trained providers, as opposed to 30.6 percent of those who belonged to the lowest wealth quintile (see Table 30).

Similarly, disparities in attending the delivery by a medically-trained provider were again observed between the highly educated and the illiterate mothers, and between the richest and the poorest wealth quintile. For instance, 87.6 percent of the PNC of postgraduate mothers were attended by a doctor, while in the case of mothers who were illiterate the figure was only 34.0 percent (see Table 30).

It is worth to mentioning here that like ANC components, PNC components such as blood pressure measure, blood test, urine test, and weighing information should be included in the survey to know about specific PNC services provided to mothers.

PNC for newborn given by providers is presented in Table 30a. Findings were found almost similar to PNC for mothers.

Table 30: Women Aged 15-49 with Children 0-11 Months Old Attended by Postnatal Care Providers after Delivery and Received from a Medically-trained Provider, according to Background Characteristics, by Percent, Bangladesh, CES 2016

Background Characteristic	MBBS doctor	Nurse/midwife /paramedic	FWV	CSBA	SACMO	HA/FWA/ CHCP	TBA	TTBA	Unqualified provider	NGO Health Worker	None	Any Provider	PNC from medically trained provider	Number of Women
Mothers Age														
<20 yrs	43.7	10.7	0.6	0.1	0.1	0.9	1.8	3.5	5.0	2.1	31.6	68.4	55.1	1478
20-34 yrs	45.5	6.9	0.9	0.1	0.4	0.5	2.2	4.9	4.9	2.8	30.8	69.2	53.9	17563
35-49 yrs	42.7	5.7	1.0	0.3	0.4	0.6	3.0	6.1	5.6	3.0	31.6	68.4	50.1	1492
Number of Birth														
1	52.1	8.3	0.9	0.2	0.3	0.5	1.8	3.9	4.4	2.5	25.1	74.9	61.8	8286
2-3	43.4	6.6	0.9	0.1	0.5	0.6	2.4	5.3	5.0	3.0	32.4	67.6	51.4	10133
4-5	29.3	5.1	1.0	0.4	0.3	0.6	3.4	7.1	6.9	3.1	42.7	57.3	36.1	1758
6+	23.7	4.7	1.0	0.5	0.0	0.2	1.3	5.3	8.4	1.5	53.3	46.7	29.9	356
Residence														
Rural	58.1	9.0	1.0	0.1	0.2	0.1	2.0	5.2	1.6	2.3	20.5	68.3	68.3	4972
Urban	41.8	6.6	0.9	0.2	0.4	0.6	2.3	4.8	5.9	2.9	33.5	49.9	49.9	15561
Division														
Barisal	39.4	4.9	1.5	0.5	0.8	2.1	1.9	5.1	7.3	2.8	33.9	46.9	46.9	1883
Chittagong	45.2	6.7	0.4	0.0	0.1	0.3	0.3	0.1	5.7	0.9	40.3	52.4	52.4	3896
Dhaka	45.2	6.7	0.4	0.0	0.1	0.3	0.3	0.1	5.7	0.9	40.3	52.4	52.4	4931
Khulna	55.8	11.4	0.2	0.1	0.1	0.4	1.6	2.0	7.7	0.3	20.3	67.6	67.6	3032
Mymensingh	31.2	6.1	0.4	0.2	1.0	0.3	3.9	4.8	6.0	1.7	44.5	38.8	38.8	1059
Rajshahi	48.6	7.8	0.6	0.1	0.6	0.8	0.4	13.9	7.1	0.7	19.4	57.6	57.6	2473
Rangpur	36.4	11.5	0.3	0.0	1.0	0.3	1.0	0.0	3.6	11.8	34.0	49.2	49.2	2437
Sylhet	26.1	5.6	5.9	0.9	0.1	1.3	1.3	2.0	4.6	3.5	48.8	38.6	38.6	1376
Education														
Illiterate	28.2	4.4	0.9	0.0	0.5	0.3	3.3	9.7	3.4	4.3	45.2	54.8	34.0	1761
Primary	30.5	6.0	1.3	0.2	0.4	0.6	2.8	6.9	7.5	3.5	40.3	59.7	38.4	5309
Secondary	45.9	8.3	0.8	0.2	0.3	0.7	2.1	4.2	5.2	2.8	29.6	70.4	55.5	8825
SSC/Dhakil/O level	62.6	7.9	0.8	0.0	0.4	0.4	1.4	2.4	2.9	1.3	19.6	80.4	71.8	2266
HSC/Alim/ A level	72.5	7.5	0.7	0.3	0.4	0.3	1.2	1.4	1.8	1.1	12.8	87.2	81.4	1613
Degree/Fazil	78.5	6.5	0.6	0.0	0.7	0.0	1.1	0.3	1.3	1.0	10.0	90.0	86.3	452
Masters/Kamil	83.7	2.9	0.7	0.0	0.3	0.0	1.4	1.7	2.4	0.0	6.9	93.1	87.6	307
Wealth Quintile														
Poorest	23.8	5.3	0.8	0.1	0.6	0.9	2.2	6.6	7.4	5.0	47.3	30.6	30.6	4164
Socond	33.5	7.4	0.8	0.1	0.5	0.6	2.0	4.8	6.1	3.0	41.0	42.3	42.3	4173
Middle	44.4	8.0	1.2	0.2	0.4	0.6	2.3	5.2	5.9	2.1	29.8	54.2	54.2	4148
Fourth	55.4	7.9	0.8	0.1	0.3	0.4	2.5	4.2	3.7	1.9	22.8	64.5	64.5	3889
Richest	69.7	7.1	1.0	0.1	0.1	0.1	2.1	3.6	1.7	1.7	12.7	78.0	78.0	4159
National	**45.1**	**7.1**	**0.9**	**0.1**	**0.4**	**0.5**	**2.2**	**4.9**	**5.0**	**2.8**	**30.9**	**53.7**	**53.7**	**20533**

Table 30a: Newborn Attended by Postnatal Care Providers after Delivery and Received from a Medically-trained Provider, according to Background Characteristics, by Percent, Bangladesh, CES 2016

Background Characteristic	MBBS doctor	Nurse/midwife/ Paramedic	FWV	CSBA	SACMO	HA/FWA/ CHCP	TTBA	TBA(Dai)	Unqualified Provider	NGO Health Worker	None	Any Provider	Qualified Provider	Number of Women
Mother's Age														
<20 yrs	47.0	9.6	0.7	0.1	0.1	1.0	1.6	3.2	7.1	2.8	26.8	73.2	57.4	1478
20-34 yrs	47.6	6.6	1.0	0.2	0.4	0.7	2.0	5.0	6.4	3.6	26.5	73.5	55.8	17563
35-49 yrs	43.7	5.4	1.4	0.3	0.4	0.6	2.8	5.6	8.6	3.9	27.3	72.7	51.2	1492
Number of Birth														
1	54.3	7.9	1.0	0.1	0.3	0.8	1.8	3.9	5.9	3.2	20.7	79.3	63.7	8286
2-3	45.5	6.2	0.9	0.1	0.4	0.6	2.1	5.3	6.7	3.8	28.2	71.8	53.2	10133
4-5	31.0	5.1	1.3	0.4	0.3	1.0	2.8	6.8	8.8	4.3	38.2	61.8	38.1	1758
6+	25.5	4.4	1.9	0.5	0.0	0.7	1.8	5.1	9.5	3.1	47.6	52.4	32.3	356
Residence														
Urban	60.2	8.3	1.2	0.0	0.2	0.3	2.0	5.2	2.1	2.8	17.8	69.9	69.9	4972
Rural	44.0	6.4	1.0	0.2	0.4	0.8	2.0	4.8	7.8	3.8	28.8	51.9	51.9	15561
Division														
Barisal	41.7	4.2	1.4	0.4	0.5	2.0	1.1	4.8	9.0	2.8	32.1	48.2	48.2	1883
Chittagong	48.8	6.7	0.3	0.1	0.2	0.5	0.3	0.3	7.7	1.0	34.1	56.1	56.1	3896
Dhaka	54.3	4.9	1.2	0.0	0.1	0.3	5.2	9.2	2.7	2.8	19.3	60.4	60.4	4931
Khulna	59.1	9.3	0.1	0.1	0.1	0.3	1.9	1.8	9.8	0.5	17.1	68.7	68.7	3032
Mymensingh	34.9	5.6	0.6	0.2	0.8	0.9	2.8	4.7	10.1	3.8	35.6	42.1	42.1	1059
Rajshahi	50.4	7.2	0.6	0.1	0.6	1.5	0.3	13.9	9.5	0.6	15.4	58.9	58.9	2473
Rangpur	36.7	11.5	0.5	0.0	1.0	0.3	1.0	0.0	4.6	16.9	27.3	49.8	49.8	2437
Sylhet	27.5	5.5	6.3	1.0	0.2	1.6	1.0	2.3	4.6	3.9	45.9	40.5	40.5	1376
Education of the respondent														
Illiterate	29.5	4.6	1.3	0.0	0.4	0.5	2.9	9.6	5.7	5.8	39.6	60.4	35.9	1761
Primary	32.6	5.8	1.4	0.2	0.3	1.1	2.6	6.8	9.9	4.3	35.0	65.0	40.3	5309
Secondary	48.4	7.9	0.8	0.2	0.4	0.8	1.8	4.1	6.6	3.7	25.4	74.6	57.6	8825
SSC/Dhakil/O level	65.1	7.0	1.0	0.1	0.4	0.5	1.4	2.6	3.6	1.9	16.2	83.8	73.7	2266
HSC/Alim/ A leve	73.6	7.2	0.6	0.2	0.3	0.1	1.3	1.6	3.2	1.4	10.4	89.6	82.0	1613
Degree/Fazil	79.9	5.5	0.1	0.0	0.4	0.6	1.2	0.6	1.1	1.8	8.9	91.1	85.8	452
Masters/Kamil	85.8	1.7	0.7	0.0	0.0	0.0	1.1	1.7	2.5	0.0	6.4	93.6	88.2	307
Wealth Index(Quintile														
Poorest	27.0	5.5	1.0	0.2	0.4	1.3	1.9	6.4	11.5	7.0	37.9	34.0	34.0	4164
Socond	35.6	7.1	0.9	0.2	0.7	0.8	1.8	5.0	7.8	4.1	35.9	44.4	44.4	4173
Middle	46.4	7.5	1.3	0.3	0.4	0.7	2.1	5.1	7.4	2.4	26.3	55.9	55.9	4148
Fourth	56.9	7.8	0.8	0.1	0.2	0.6	2.3	4.1	4.2	2.4	20.6	65.9	65.9	3889
Richest	71.4	6.0	1.1	0.1	0.0	0.2	2.0	3.7	1.9	1.9	11.6	78.6	78.6	4159
National	**47.3**	**6.8**	**1.0**	**0.2**	**0.4**	**0.7**	**2.0**	**4.9**	**6.6**	**3.6**	**26.6**	**55.6**	**55.6**	**20533**

CHAPTER 8

VITAMIN A COVERAGE DURING VITAMIN A PLUS CAMPAIGN IN APRIL 2016

Vitamin A deficiency poses a major threat to the health and survival of children and mothers. WHO recognizes it as the leading cause of preventable childhood blindness and a major public health concern.

It also increases the risk of child death from diseases such as measles and diarrhea. As sustained control of Vitamin A deficiency is essential for the reduction of child mortality, GoB has been conducting national Vitamin A Plus campaigns countrywide periodically on a regular basis. GoB conducted a national Vitamin A Plus Campaign in April 2016, with technical support from UNICEF, Micronutrient Initiative, and WHO. CES 2016 made an assessment of Vitamin A coverage during Vitamin A Plus campaign held in April 2016 among children aged 6-59 months.

8.1 OBJECTIVES OF VITAMIN A COVERAGE SURVEY

Vitamin A Coverage survey was carried out as one of the components of CES 2016 with a view to accomplishing the following objectives:

- to estimate Vitamin A coverage among children aged 6-11 months and 12-59 months
- to know the reasons for not taking Vitamin A

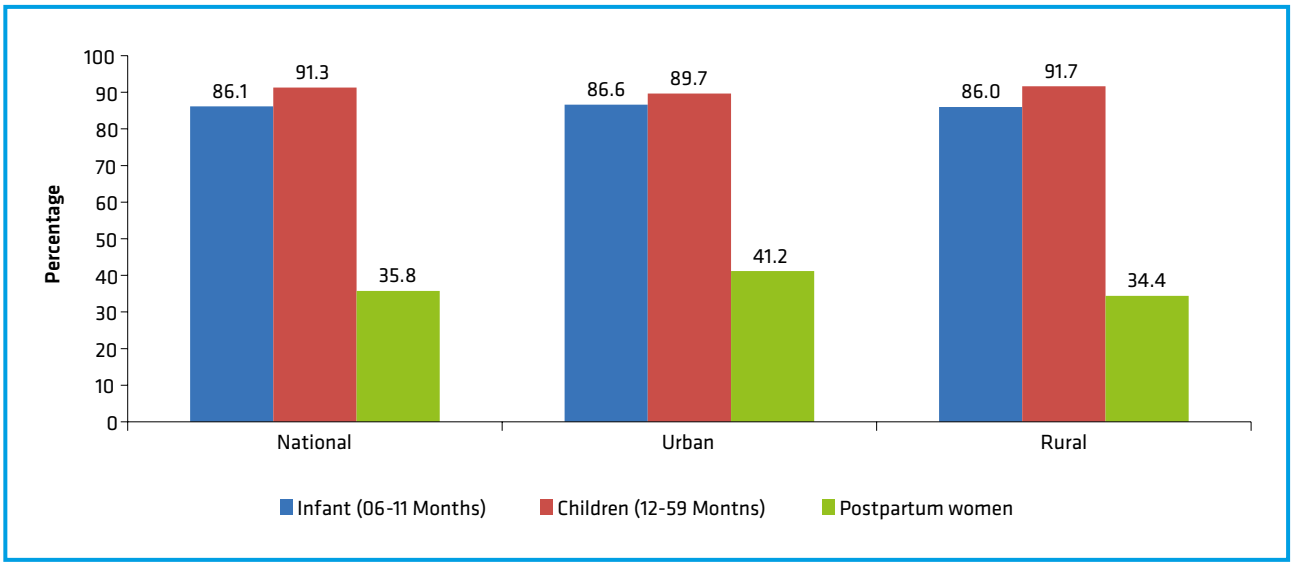
8.2 SAMPLE SELECTION

The Vitamin A coverage survey was carried out with representative samples among the 6-59 months old children drawn from the cluster samples of CES 2016. Interviewers listed all the eligible children (aged between 6-59 months) in every household of the selected cluster during household visit in order to make the sampling frame. Afterwards, 5 households with children aged 6-11 month and 8 households with children aged 12-59 months were selected randomly from the sampling frame to administer the questionnaire.

8.3 VITAMIN A SUPPLEMENTATION COVERAGE

CES 2016 found that nationally, 86.1 percent of infants aged 6-11 months and 91.3 percent of children aged 12-59 months received Vitamin A capsules, with slight variation in proportions between urban and rural areas. As for the mothers with 0-11 month-old children, nationally, 35.8 percent (41.2 percent urban and 34.4 percent rural) received VAC after delivering their latest child (see Figure 154).

Figure 154: Vitamin A Supplementation Coverage among 06-11 month-old Infants, 12-59 Month-old Children, and Postpartum Women, by National, Rural and Urban Area in 2016



8.4 VAC COVERAGE BY RURAL DIVISION

Infants Aged 6-11 Months

VAC coverage was found to be the highest in Rangpur (91.8 percent) and the lowest in Rajshahi (78.7 percent) divisions. In the other divisions, it ranged from 91.3 percent in Sylhet to 80.3 percent in Dhaka.

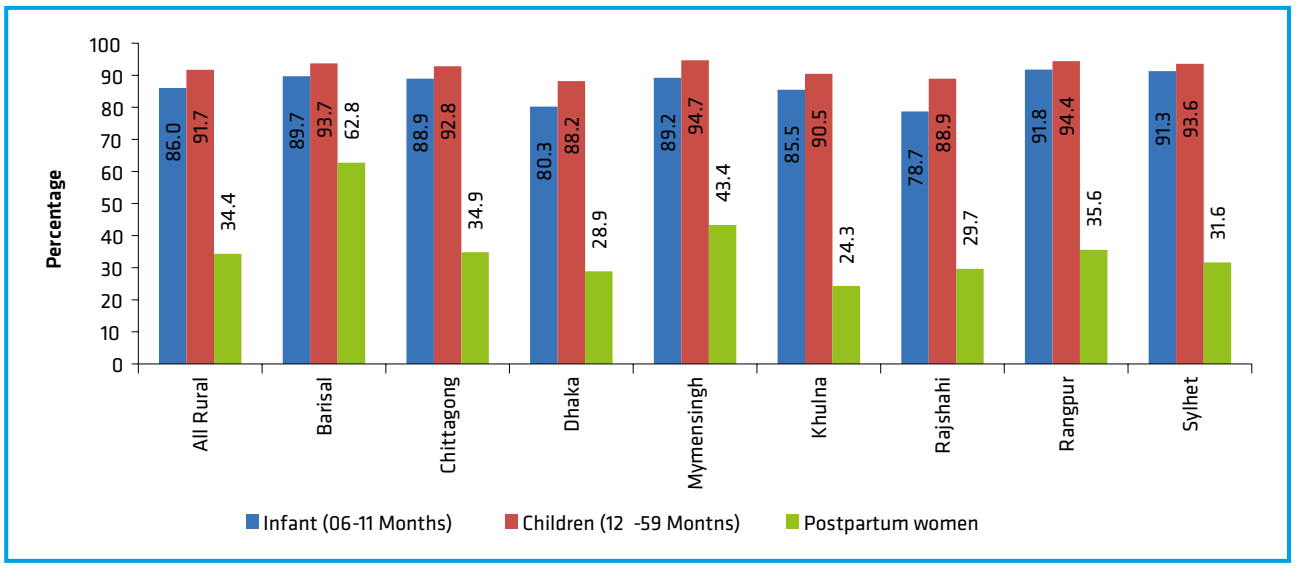
Children Aged 12-59 Months

Figure 155 presents VAC coverage by rural division. It shows that VAC coverage for children aged between 12 and 59 months were at or above 90.0 percent in all the divisions except in Rajshahi and Dhaka. It was the highest in Mymensingh (94.7 percent) and the lowest in Dhaka (88.2 percent); and, it ranged between 94.4 percent and 88.9 percent in other divisions.

Postpartum Women

In all the divisions postpartum VAC coverage was found to be lower, compared to VAC coverage, among the children during the vitamin A plus campaign. A little over two-thirds of the postpartum mothers (62.8 percent) in Barisal division received Vitamin A capsules after delivering their last child, while only about one-quarter (24.3 percent) in Khulna division.

Figure 155: Vitamin A Supplementtion Coverage among 06-11 month-old Infants, 12-59 Month-old Children, and Postpartum Women in Rural Areas by Division in 2016



8.5 VAC COVERAGE BY CITY CORPORATION

Infants Aged 6-11 Months

Among the city corporations, as presented in Figure 156, VAC coverage for 6-11 months old infants was found to be the highest in RCC (99.7 percent), and the lowest in CCC (68.7 percent). It ranged between 79.2 percent and 98.7 percent in other city corporations.

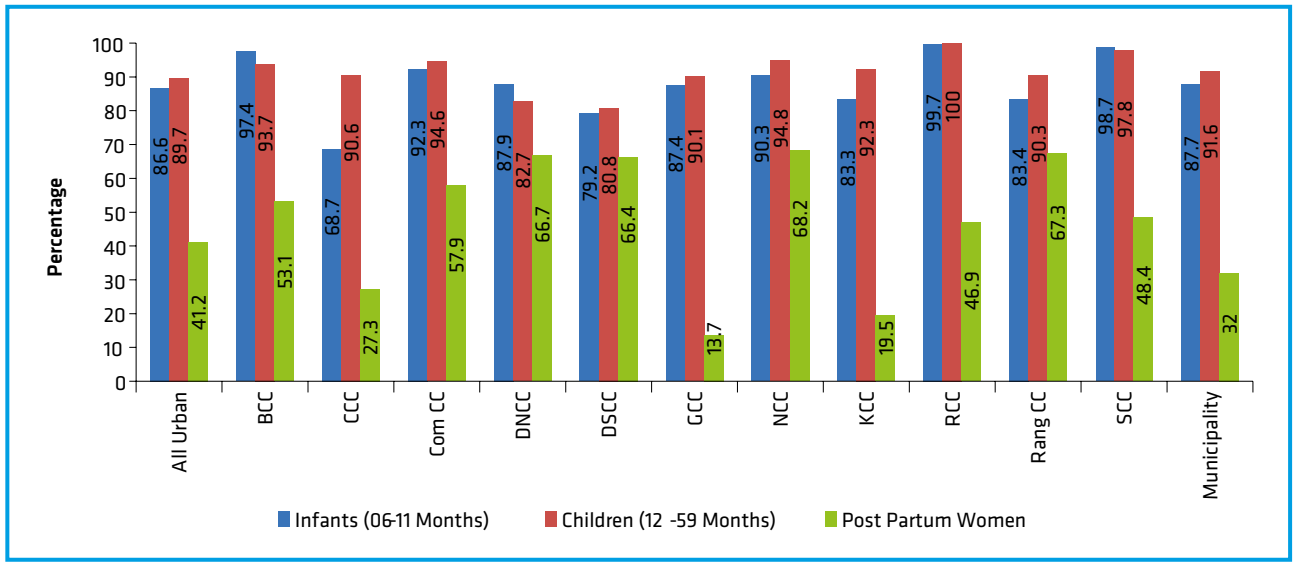
Children Aged 12-59 Months

VAC coverage for 12-59 months old children was the highest in RCC; and, it went as low as 80.8 percent in DSCC.

Postpartum Women

Postpartum Vitamin A coverage was found to have a great range. The highest in proportion was in NCC (68.2 percent), followed by DNCC (66.7 percent), Rang CC (67.3. percent)¸ DSCC (66.4 percent), RCC (46.9 percent), SCC (48.4 percent), CCC (27.3 percent), and KCC (19.5 percent). The percentage for the other divisions then fell considerably, until only 13.7 percent was covered in GCC (see Figure 156).

Figure 156: Vitamin A Supplementtion Coverage among 06-11 month-old Infants, 12-59 Month-old Children, and Postpartum Women in Urban Areas by City Corporation and Municipality in 2016

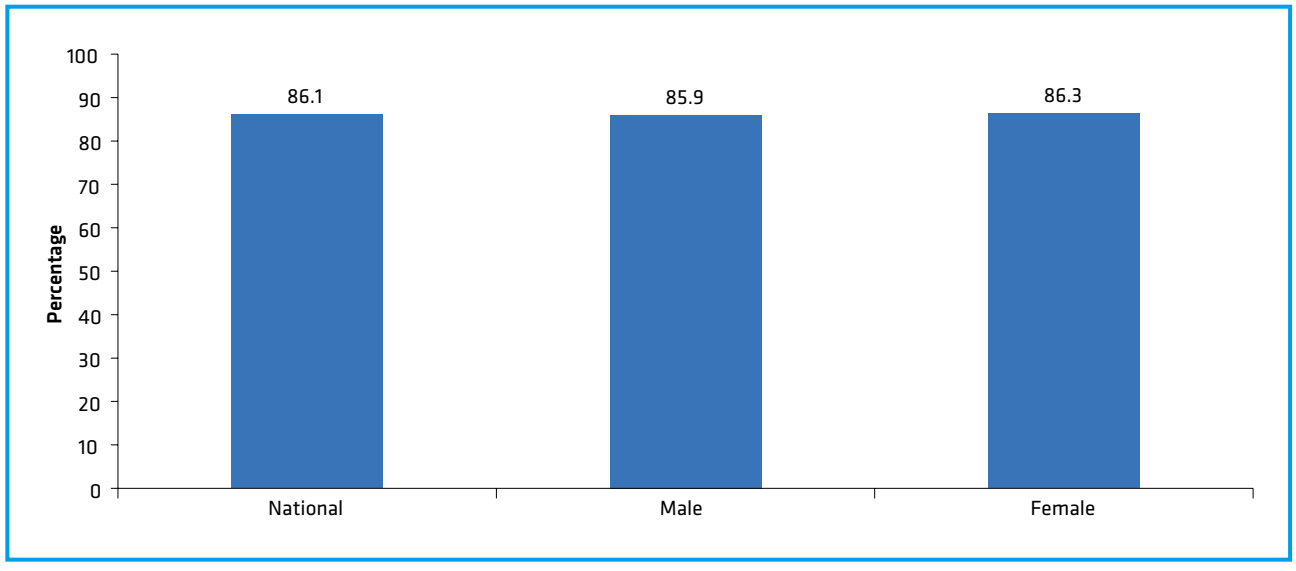


8.6 SEX DIFFERENTIALS IN VITAMIN A COVERAGE

Infants Aged 6-11 Months

By sex, it is evident in Figure 157 that slightly higher proportion of females (86.3 percent) received Vitamin A during the Vitamin A Plus Campaign than their male counterparts (85.9 percent).

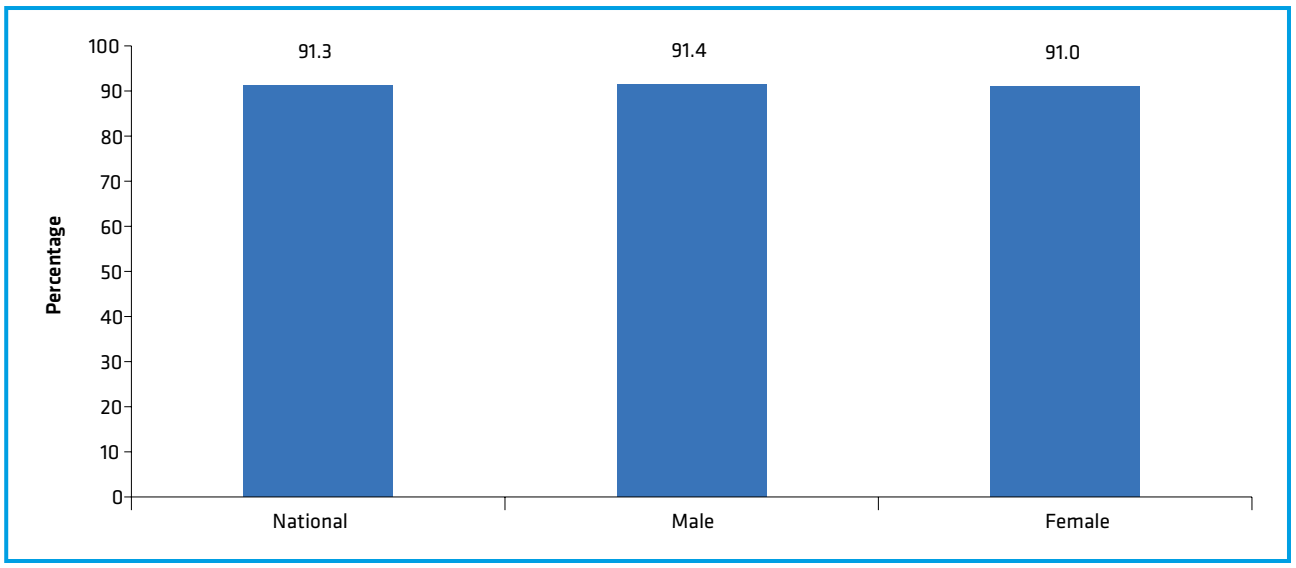
Figure 157: Vitamin A Supplementtion Coverage among 06-11 Month-old Infants by Sex in 2016



Children Aged 12-59 Months

Figure 158 presents VAC coverage among the 12-59 months old children by sex. It shows that 91.4 percent of the males received Vitamin A capsules during the Vitamin A plus Campaign as against 91.0 percent of the females.

Figure 158: Vitamin A Supplementtion Coverage among 12-59 Month-old Children by Sex in 2016



8.7 REASONS FOR CHILDREN NOT RECEIVING VAC DURING THE VITAMIN A PLUS CAMPAIGN

Reasons for not receiving Vitamin A during the Vitamin A Plus campaign was also investigated in CES 2016. The overall picture in this regard is presented in Table 31. It shows that about three-quarters of the mothers/caregivers (70.9 percent) were unaware of the Vitamin A Plus campaign. Less frequently given reasons are the following- they were not at home (8.8 percent), mothers/caregivers were busy with their household chores (10.2 percent), mothers/caregivers were scared of the side-effects (1.5 percent), and mothers/caregivers were travelling (1.7 percent).

Table 31: Reasons Why Children did not Receive Vitamin A Supplementation during Vitamin A Plus Campaign by National, Rural and Urban Areas in 2016

Reasons	National	Urban	Rural
Didn't know	70.9	75.7	69.4
Was very busy	10.2	9.1	10.5
Was not at home	8.8	4.5	10.1
Went on traveling	1.7	2.3	1.5
Was afraid of side effects	1.5	1.8	1.4
Vitamin A was not available	1.3	0.8	1.4
The centre was too far	0.9	1.3	0.8
Vaccinator did not fed	0.9	0.9	0.9
The child was sick, so didn't take him to the vaccination centre	0.9	0.8	0.9
The child was sick , so the health worker didn't give vaccine	0.6	0.6	0.6
Don't believe in Vitamin A	0.6	0.5	0.6
The session time was inconvenient	0.5	0.7	0.5
Health worker was not available	0.5	0.4	0.5
Was waiting to come back home with vitamin A	0.2	0.0	0.2
Did not think it is important	0.1	0.1	0.1
Child cries	0.1	0.2	0.1
Mother was ill	0.1	0.0	0.1
There was a long queue	0.1	0.0	0.1
The child was fed in the previous time	0.1	0.0	0.1
Religious/Social obstacles	0.1	0.1	0.1
Husband forbade	0.0	0.1	0.0
Others	0.0	0.0	0.1
Number	**6153**	**1354**	**4799**

Table 32: Reasons Why Children did not Receive Vitamin A Supplementation during Vitamin A Plus Campaign in Rural Areas by Division in 2016

Reasons	All Rural	Barisal	Chittagong	Dhaka	Khulna	Mymensingh	Rajshahi	Rangpur	Sylhet
Didn't know	69.4	79.5	62.0	82.0	65.8	67.5	57.1	73.8	66.7
Was very busy	10.5	5.4	4.6	3.7	16.5	6.9	27.6	6.0	7.5
Was not at home	10.1	9.0	22.1	6.6	5.2	14.9	6.7	8.8	10.5
Went on traveling	1.5	3.2	.8	1.3	3.4	1.7	.8	1.7	
Was afraid of side effects	1.4	.4	1.6	1.0	1.5	1.4	1.1	1.6	4.8
Vitamin A was not available	1.4	.1	1.7	0.8	1.5	1.7	1.2	3.2	2.0
The child was sick, so didn't take him to the vaccination centre	0.9	1.0	1.4	1.0	1.0		.5	.8	1.2
Vaccinator did not fed	0.9	0.1	.2	0.7	2.0	.6	1.5	1.0	.2
The centre was too far	0.8	0.1	1.9	0.4	.0		.9	.4	2.8
The child was sick , so the health worker didn't give vaccine	0.6	0.1	1.4	0.2	.5	.4		1.4	1.6
Don't believe in Vitamin A	0.6	0.3	0.9	0.1	1.1	1.6	.2	.1	1.9
Health worker was not available	0.5	0.0	0.3	0.8	.3	1.6	.4	.6	0.0
The session time was inconvenient	0.5	0.6	0.4	0.5	.3	.3	.8		.4
Was waiting to come back home with vitamin A	0.2	0.0	0.4	0.0		.6	.4	.4	.4
Did not think it is important	0.1	0.0	0.0	.1	.3	.7	.1	0.0	0.0
Mother was ill	0.1	0.0	0.0	.3	.2	0.0	0.0	0.0	0.0
There was a long queue	0.1	0.0	0.0	.2	.2	0.0		0.0	0.0
The child was fed in the previous time	0.1	0.0	0.0	0.0	.3	0.0	.2	0.0	0.0
Child cries	0.1	0.0	0.1	0.0	0.0	0.0	.3	0.0	0.0
Religious/Social obstacles	0.1	0.0	0.1	0.0	0.0	0.0	.2	0.0	0.0
Others	0.1	0.0	0.0	0.1	0.0	0.0	.1	0.0	0.0
Number	**4799**	**403**	**716**	**1345**	**828**	**232**	**738**	**343**	**194**

Table 33: Reasons Why Children did not Receive Vitamin A Supplementation during Vitamin A Plus Campaign in Urban Areas by City Corporation and Municipality in 2016

Reasons	All Urban	BCC	CCC	Com CC	DNCC	DSCC	GCC	NCC	KCC	RCC	Rang CC	SCC	Municipality
Was very busy	9.1	3.0	20.4	2.7	7.2	5.0	9.9	1.2	2.8	100.0	3.9	12.9	10.0
Went on traveling	2.3	1.3	.8		2.8	3.9	1.2	12.7	.8	0.0	2.1	0.0	1.8
Don't believe in Vitamin A	.5	0.0	0.0	2.8	0.0	0.0	3.9	0.0	1.4	0.0		5.6	0.1
The child was fed in the previous time	0.0	0.0	0.0		0.0	0.0	0.0	0.0	1.7	0.0	.5	0.0	0.0
The child was sick, so didn't take him to the vaccination centre	0.8	0.0	0.0	.9	1.0	.2	0.0	0.0	1.8	0.0	0.0	0.0	1.2
The child was sick , so the health worker didn't give vaccine	0.6	4.8	0.0	4.1	0.0	0.0	4.7	0.0	.6	0.0	3.9	0.0	0.2
Vitamin A was not available	0.8	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.7
Health worker was not available	0.4	0.0	0.0	0.0		.6	0.0	0.0	0.0	0.0	0.0	0.0	0.8
There was a long queue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	2.2	0.0	0.0
The centre was too far	1.3	0.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0.0	.5	0.0	0.3
The session time was inconvenient	0.7	0.0	0.0	0.0	0.0	1.1	1.1		2.9	0.0	1.6	0.0	1.0
Was afraid of side effects	1.8	3.7	1.3		.4	2.7	2.8	11.2	4.3	0.0	1.6	5.2	1.7
Was waiting to come back home with vitamin A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.9	0.0	0.0	0.0	0.0	0.1
Religious/Social obstacles	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Was not at home	4.5	10.3	4.0	5.9	1.8		7.6	11.8	1.0	0.0	8.1	0.0	6.6
Vaccinator did not fed	0.9	0.0	0.0	0.0	0.0	0.0	.6	1.6	13.0	0.0	.5	0.0	1.6
Did not think it is important	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.2
Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	8.1	0.0
Child cries	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.3
Husband forbade	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	2.5	0.0	0.0
Mother was ill	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Didn't know	75.7	76.9	73.5	83.6	79.3	86.4	68.1	60.6	58.1	0.0	68.0	68.2	73.3
Number	**1354**	**49**	**134**	**46**	**105**	**147**	**79**	**50**	**86**	**1**	**87**	**14**	**556**

8.8 SOURCES OF INFORMATION ABOUT VITAMIN A PLUS CAMPAIGN

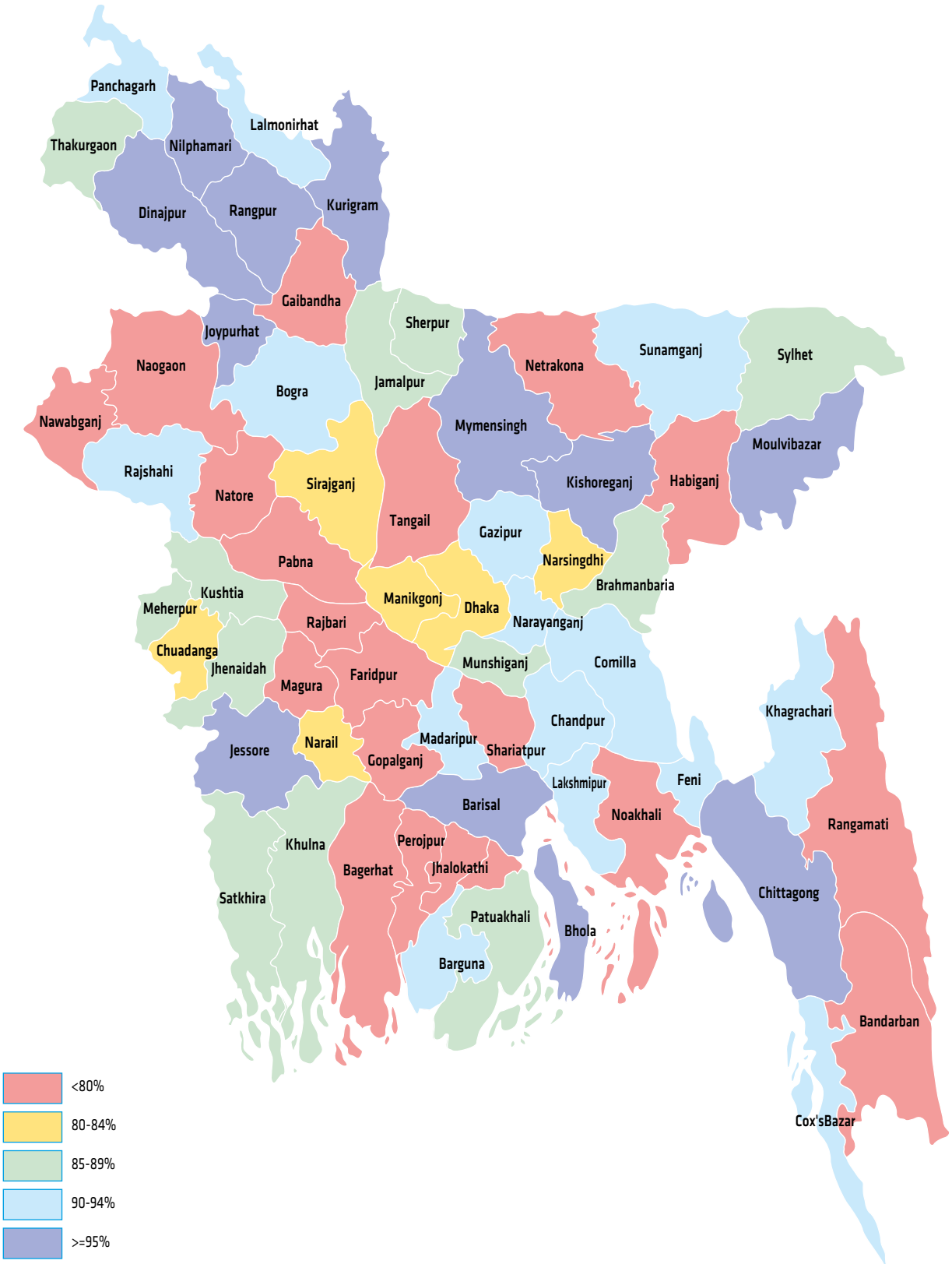
According to the results shown in Table 34, mosque miking was the most prominent source of information about the Vitamin A Plus Campaign. A little over thirty-six percent of mothers/caregivers mentioned about it. The other major sources were health worker's home visit (25.8 percent), family/neighbors/friends (23.7 percent), mobile miking (13.6 percent), GOB health worker's visit (11.1 percent), television (8.8 percent), and volunteers (3.4 percent).

Table 34: Sources of Information about Vitamin A Supplementation during Vitamin A Plus Campaign by National, Rural and Urban Areas in 2016

Sources	National	Urban	Rural
Mosque Miking	36.5	26.3	39
GOB/ City corporations FW visit	25.8	12.4	29.1
Family/neighbor/friends	23.7	34.9	20.9
Mobile Miking	13.6	18.5	12.3
Health Workers' home visit	11.1	5.2	12.6
Television	8.8	24.9	4.7
Other volunteers Visit	3.4	1.7	3.8
NGO worker Visit	2.3	2.8	2.2
Mobile SMS	1.5	2.3	1.3
City Corporation's Health Worker	1	2.3	0.7
Poster	0.3	0.5	0.2
Teacher visit	0.2	0.4	0.2
Newspaper	0.2	0.7	0.1
Radio	0.1	0.2	0.1
Number	**49765**	**11892**	**37873**

Map 14:

Vitamin A Coverage of 06-11 Month-Old Infants



Map 15:

Vitamin A Coverage of 12-59 Month-Old Children

CHAPTER 9
QUALITTATIVE FINDINGS

EPI program is governed by Ministry of Health and Family Welfare across the country. Health Assistant (HA) and Family Welfare Assistant (FWA) in the rural areas are responsible to conduct EPI sessions there. However, EPI program at urban settings is different. In the urban areas, usually EPI activities are performed through different NGOs under the supervision of Ministry of Local Government. In urban settings, each Zone of City Corporation is divided into several wards. Almost each Ward has one EPI room from where EPI Vaccines and other logistics are supplied to NGOs/private hospital. It is noticed that the EPI coverage at urban areas is lower than that of rural areas. To investigate the reasons for variance in coverage, CES 2016 conducted qualitative survey along with quantitative survey among service providers and service recipients in Dhaka North (DNCC) and South City Corporations (DSCC). CES 2016 conducted 4 Focus Group Discussions (FGD) and 10 in-depth interviews (IDI) with service recipients in DSCC and DNCC. Findings are separately presented below.

9.1 FINDINGS OF IN-DEPTH INTERVIEW (IDI)

CES 2016 collected information regarding coordination, dropout management and invalid dose monitoring system. Following facts were revealed in the discussion.

Coordination: EPI activities are coordinated by Health Officer of City Corporation who is responsible for one zone. Discussion with providers and recipients reveals that each Zone has several Wards. Almost each Ward has one EPI Wardroom. EPI Wardroom supplies vaccine and coordinate EPI activities of other NGOs/satellite sites and submits Report to Zone office. Zone office submits report to the City Corporation. In contrast, monthly meeting is held with all the EPI service recipients at the Zone Office to discuss about the progress of EPI activities including drop-out, left-out and invalid dose.

Drop out management: A drop out list is maintained at the Zone and Ward level. Vaccinators follow up the drop out cases through mobile phone and record the outcome. However, exclusive management of dropout is not available at all NGO levels. While visiting 4 NGOs during the survey, the survey teams did not get any drop out list at outreach level. However, drop out list was found at the Ward/Zone level. Drop out management initiatives were observed in 3 NGOs out of 4. One NGO prepares drop out list without mentioning any initiative as well as outcome of efforts to reduce the number of drop out. The table below shows the drop out monitoring system as well as outcome of dropout management. It revealed that out of 82 drop outs of different Antigens, 49 were corrected and finally 33 remained dropped out.

Table 35: Drop-out Management

Name NGO	Drop out			Drop out corrected			Drop out remained		
	P3	MR1	MR2	P3	MR1	MR2	P3	MR1	MR2
Radda	9	11	7	9	9	7	-	2	-
Marie Stopes	30	7	2	12	3		18	4	2
Marie Stopes P-2	-	-	-	-	-	-	-	-	-
WAPDA Building	1	1	-	1	-	-	-	1	-
Sabuj Bangla		1	-		-	-	-	1	-
PSTC	2	5	6	1	3	4	1	2	2
Total	**42**	**25**	**15**	**23**	**15**	**11**	**19**	**10**	**4**

Source: EPI Ward Room Zone 2 - DNCC

Drop-out management will be effective if the number of static and satellite clinics are increased.

While discussing with the personnel in 4 Zones: 2 zones of DNCC; and 2 zones of DSCC it was found that number of outreach sites largely varied from one Ward to another.

Table 36: Number of Static and Satellite Clinics by Ward of DNCC and DSCC in CES 2016

	Ward, Dhaka North City Corporation(DNCC)					Ward, Dhaka South City Corporation(DSCC)				
	31	33	3	6	30	22	27	26	14	24
Total Population[8]	58,500	129888	107147	185366	211,251	84519	28525	44540	128921	66470
No. of Static Clinic	3	1	1	1	1	1	1	1	1	1
No. of Satellite Clinic	-	7	6	27	13	5	1	3	15	1

It was observed that one Ward of Zone 5 had no outreach sites. As reasons, the focal person of concern NGO said,*" the total catchment area is small. There are 3 static clinics surrounding the word. The three static sites are enough to cover the whole Ward, therefore, no need of outreach site in this Ward."* However, while analyzed the catchment areas of this Ward the survey observed areas with disadvantaged group.

Moreover, five outreach sites found to be closed since 2015 in another Ward. While asked the reasons for closing, the focal person replied," *There was no required eligible children in those outreach site. As per our official decision we don't operate any outreach site less than 10 eligible children*."

The quantitative finding shows that 1 out of 5 mothers of non-vaccinated children reported lack of awareness about vaccination as a cause of left out, and almost similar number of mothers with partially vaccinated children reported that they could not vaccinate their children due to household chores. This finding indicates that demand side awareness and willingness is still far of our expectation. Self demand is not created largely in urban areas. Accessibility of EPI service like rural areas should ensure from EPI program in urban areas through collaboration with Ministry of Local Government.

In case of outsiders, most of the health workers put tick mark if the dose is administered to the children belongs to other than that vaccination Center. However, all the health workers are not practicing the same procedure. It was observed that the some boxes remained blank due to lack of awareness about specific rule. When asked about the reasons for blank information of previously administered Antigen, one of the health workers said, *"I don't know what record to be maintained for those Antigens. I Just put the date that I administered. What should I do in this case? I did not get any training".*

Vaccination Session Time

When asked the service providers about information on next visit, almost all of them stated that they informed mothers or caregivers of children about the next schedule visit while administering vaccine. A few of them replied that they visited the households during vaccination session and inform mother.

When mothers asked about the information of vaccination session date, almost all of them said that they knew it from previous session as well as seeing "Moni Logo".

Registration of new child

The survey also explored the initiative of new child registration. It was revealed that most of the NGOs do not ask about new children during household visit nor register their names in the child's vaccination register. They only

8 Population of DNCC collected from EPI Micro-plan and DSCC from Census 2011, BBS. Static and satellite clinics collected from EPI Micro-plan and discussion with concern personnel of Ward EPI room.

register the child's name when any (new) child visits the health or vaccination center. Otherwise, these children remained unregistered as well as out of the monitoring system.

9.2 FINDINGS OF FOCUS GROUP DISCUSSION (FGD)

CES 2016 conducted FGDs with mothers/caregivers to understand their knowledge about vaccination center as well as reasons for drop out. The findings revealed that mobility of mothers from one place to another hampered administering the vaccine. This problem might have attributed to being drop out from the subsequent doses. Due to mobility, drop out occurred from both supply and demand side.

> It was found that some mothers and caregivers fear of scolding for additional visit by vaccinator or health workers. One of the mothers said, *"I did not give MR1 Vaccine due to illness of my child. And, later I did not visit Vaccination Center fearing that Vaccinator might scold me."*
>
> It was also found that mothers and caregivers did not carry the child's vaccination card when they shifted from one place to another.
>
> The survey team found that usually women gave birth child at mothers' house predominantly at the villages where they stayed for long time. Though child's first vaccination was performed at that place, however the mothers do not have enough information about vaccination place when she back to Dhaka (capital city).

One of the mothers living in Dhaka North City Corporation (DNCC) said,*"I went to my in-laws' house situated in rural areas for delivery and stayed there for more than three months. My child's Vaccination started there. After coming back to Dhaka, the child was not given vaccine due to ignorance about the vaccination center.* When asked, "Did anyone come to you to know the status of child's vaccination?", she replied, *"No".* Similarly, one mother living in Dhaka South City Corporation (DSCC) said *,"I came to Dhaka after giving 7 Antigens. I was new in Dhaka and did not have information about vaccination Centers. So, rest two doses of MR were not given."*

Another mother said, *"Three vaccines were given at my village home, two were due. As we did not go to village, we could not receive vaccine. Here I don't know anything."*

One of the mothers said,''After the due date, we didn't go for vaccine. We were not sure whether vaccine would be given after the due date.''

The survey also found that mothers visit husband's house for longer time. By this time scheduled dates of subsequent doses expire. Though mothers feel that child should be vaccinated, they do not go to vaccination center. They think that as they have already missed the vaccination dates, the vaccinator will not administer vaccine. For example, majority of the FGD participants who dropped out due to migration responded as below:

"I went to my village and returned Dhaka after a long time. During this period, I missed the subsequent doses. Therefore, I did not visit vaccination center due to a confusion that the vaccinator would not vaccinate as the schedule date had expired."

Another Mother expressed her bitter experience that refrained her from vaccinating child with MR2. The mother said, during the first visit, the vaccinator administered OPV1 and Penta1 but BCG was not given. After that I migrated to my in-laws' house. I went to the vaccination center near my in-laws house for the second dose. The vaccinator gave the 2nd dose of OPV and Penta but BCG remained uncorrected again. The vaccinator reasoned, ***"we can't break the vial for one child, come next month, we will give it." "***Again, I visited for the 3rd dose of OPV

and Penta but similar case repeated for BCG. This way I visited vaccination center three times but BCG remained missing. However, the vaccinator suggested vaccinating child with BCG from the first instance. Hearing all these, my husband suggested me to visit District Hospital. I went to the District Hospital for BCG but they told me that rural vaccination center would give it. But, rural outreach didn't give it. Finally, I went to my mother's house, my first vaccination point, and my child vaccinated with BCG though it was late".

When asked a mother why she did not vaccinate her child with MR2. The mother replied, *"I went to my village home. By this time MR2 schedule date was over. My first bitter experience and uncertainty of getting vaccine prevented me from further visit for MR2."*

As to the issue of not breaking vial of BCG for one or two children, this was also found officially prohibited in DSCC. It requires at least 5 children for one vial to be broken. One of the vaccinators said,*" We don't break BCG vial for one or two children. It requires at least five children to open one."* He also mentioned that this was their official instruction.

Demand of excessive money refrained Mothers/Caregivers to administer the missed subsequent dose/doses.

Some mothers from DSCC said, *"Vaccination service requires Tk. 100. Therefore, I did not vaccinate my child with MR1 and MR2."*

It was found that sometimes family members such as husbands create barrier for child's vaccination. They do not allow to children to receive vaccination. For example- a child was sick while taking to the vaccination center. That time father of the child did not allow his wife to bring his child to vaccination center. The husband said, *"What will occur if we don't give vaccine? We did not give (ourselves) vaccine, what happened to us?"*

The survey findings revealed some other reasons for partial vaccination. Findings are mentioned follows:

Qualitative survey noticed lack of awareness among service recipients about MR2 vaccine.

One of the mother said, "The vaccinator told me after vaccinating the child with MR1 that your child's vaccination has completed, you don't need to administer vaccine anymore." – A mothers of DSCC.

Another mother said, "I didn't know about MR2 at all. After giving MR1, the service provider said, "Your child's vaccination has completed." "We do not know much like them".

It was found that service providers also lack of knowledge of MR2. One of the service providers said, *"We started to administer MSD from April 2015, after getting training on PCV. Before that we were not aware of it." However, it is worth mentioning that* MSD was introduced in the EPI program since September 2012.

Finally, the Respondent's suggestions were sought for further improvement of EPI program so that all vaccines could be ensured. Most of the Participants did not give any suggestion. However, some of the participants opined that the EPI should inform about places where drop out children could be vaccinated.

CHAPTER 10
DISCUSSION AND RECOMMENDATIONS

10.1 DISCUSSION

The Government of Bangladesh (GoB), in collaboration with its relevant partners, to meet its vaccination coverage objectives, should continue to build on the impressive progress it has made in EPI in the past decade. The Coverage Evaluation Survey 2016, carried out between November 20, 2016 and April 20, 2017, is an important component in meeting those objectives. This chapter presents a brief discussion of the key findings of the survey. And, it is followed a list of recommendation to improve the EPI program.

Nationally, by crude vaccination rates, 95.1 percent children received all the eligible vaccines, irrespective of age for starting the vaccination and/or minimum intervals between doses. However, In terms of valid coverage, which is the coverage for which Bangladesh is attempting to reach 90 percent at the national level, 82.3 percent of the children across the country received all the scheduled vaccines by the age of 12 months following EPI-recommended age and valid interval between the doses. The urban-rural analysis shows that rural children (83.5 percent) were more likely to receive valid doses compared to their urban counterparts (77.1 percent).

By both crude vaccination coverage by age of 23 months and valid vaccination coverage by age of 12 months, the division that had the highest rate was Barisal division (97.8 percent and 87.5 percent, respectively), and crude coverage was found to be the lowest in Sylhet division (93.1 percent). In contrast, the lowest valid coverage was in Dhaka division (77.9 percent). The second highest coverage division is Rajshahi (84.9 percent). Rajshahi and Barisal were the divisions to reach 85 percent target.

For the districts, the objective is that all reach 85 percent by 2016. In Bangladesh out of 64 districts, 18 districts have reached the target of full vaccination coverage- 85 percent. Thirteen districts having 85 percent coverage in 2015 are now below 85 percent in 2016.So, sustaining the high coverage rate is also a challenging task, which demands special attention from EPI.

The data show that those who left-out and who dropped out of the vaccination schedule contributed to the lower crude coverage. For BCG, the first dose of childhood vaccination schedule, coverage was 99.5 percent, which indicates that about <1.0 percent of the surveyed children still remained unvaccinated. However, crude fully vaccination coverage was 95.1 percent nationally, which means that 4.9 percent of the surveyed children dropped before receiving any subsequent dose of vaccination after receiving BCG. Since the national finding is the reflection of the divisional findings and the divisional findings point towards district coverage, the same interpretation can be applicable in general to the divisions and district. However, the left-out and drop-out rates do vary from one district to another. As an example of the impact the drop-rate can have, it can be mentioned here that crude coverage was the lowest in Dhaka district (87.5 percent) among all the districts, with the Penta1-MR1 drop-out rate of 10.3 percent to be the second highest among all the districts and significantly limiting the district's crude coverage. Because of the impact it could have on the crude vaccination rate, reducing the drop-out rate should be given special attention by the EPI programme.

Drop-outs from vaccinations are caused mostly from the demand side. However, qualitative survey revealed that supply side was also a cause of it. CES 2016 findings show that mother/caregiver was busy and so couldn't bring the child for vaccination (20.3 percent) was the most prevailing reason for partial vaccinations. The other most common reasons are the following: sick of child; the mother/caregiver was scared of side effects. All these reasons reflected that there was lack of right information about the vaccination service. So, the community-level health workers should visit households and monitor the drop-out cases during the vaccination session. As regards the supply side, it needs to be mentioned here that mothers/caregivers were scared of making further visits to receive the missed antigen. *One of the mothers said, ''After crossing the due date, we didn't go for vaccine. We were not sure whether vaccine would be given after the date, so we didn't give vaccine.'' – Mother of DSCC*

Another mother said, *"I did not give MR1 vaccine due to illness of my child. And, later I did not visit vaccination center apprehending that if vaccinator scolded me."- Mother of DNCC*

Further, the act of administering lower invalid doses accelerates the rise in vaccination coverage. Nationally, valid coverage was 12.8 percentage points lower than crude coverage (82.3 percent and 95.1 percent, respectively), with 3.0 percent of Penta1, 4.6 percent of Penta2, 6.4 percent of Penta3, and 3.2 percent of MR found to be invalid. The highest valid vaccination coverage was observed in Kushtia district (92.6 percent), where invalid rates by antigen were for Penta1 1.2 percent, Penta2 2.2 percent, Penta3 4.2 percent, and MR 1.6 percent. In contrast, among the districts, the lowest valid vaccination coverage was found in Sunamganj (68.5 percent). It was the district that also had the higher drop-out rate; its invalid Penta1 was 3.2 percent, Penta2 6.3 percent, Penta3 9.6 percent, and MR 5.4 percent. The analysis suggests that both the drop-out rate and the invalid dose contributed to the lower full vaccination coverage in Sunamganj- a combination common in districts where full valid vaccination coverage was poorer. Since the act of administering invalid doses was mainly caused on the supply side, EPI should identify the causes of administering invalid doses and counteract those causes accordingly.

MSD drop-out rates and invalid doses also play into the national figures. Overall, 86.4 percent of the children received crude MSD, with 83.0 percent children receiving the valid doses of MSD. However, the MR-MSD drop-out rate was found to be 8.0 percent nationally.

The discussion above indicates that both the administration of higher invalid doses and higher drop-out rates contribute to lower fully valid vaccination coverage.

Regarding TT coverage among the mothers with children aged 0-11 months old, nationally valid TT2 vaccination coverage was 96.8 percent of mothers having immunity status against tetanus. Nationally, 91.0 percent newborn was protected against tetanus. Children from Chittagong (94.8 percent), Barisal (94.3 percent), Mymensingh (90.8 percent), Rangpur (90.5 percent), Rajshahi (90.1 percent), Khulna (89.4 percent), and Dhaka (89.3 percent) divisions were in higher position in terms of PAB than those in the other divisions.

The TT vaccination card is an important tool to estimate valid and invalid doses, as well as PAB status of newborn babies. Nationally, 34.0 percent of TT vaccination cards were found to be retained. In 94.2 percent cases, cards had been issued at the time of the first TT vaccination. However, 62.2 percent of the recipients had lost their cards; so, only 32.0 percent of the cards were available during the time of data collection. The poor card retention rate may be the result of the mothers' lack of awareness about the importance of TT vaccination card.

Nationally, 86.1 percent of infants aged 6-11 months and 91.3 percent of children aged 12-59 months received Vitamin A capsules, with no significant variation in proportions between urban and rural areas. As for the mothers with 0-11 month-old children, nationally 35.8. percent (41.2 percent urban and 34.4 percent rural) received VAC after delivering their latest child.

10.2 RECOMMENDATIONS

Based on the detailed discussion of the findings on the various survey components of CES 2016 made above, the EPI authorities may consider the following recommendations for further betterment of the program:

- Listing of the drop-outs for every vaccination dose should be prepared on a regular basis; and default tracking system through domiciliary visits by assigned health workers or using new technology device should be introduced
- Reduction of invalid doses and drop-out rates would significantly improve vaccination coverage. To

avoid invalid doses, children's vaccination cards and vaccination histories should be carefully reviewed. Additionally, effective supportive supervision, on-the-job training and needs-based refresher training for the service providers should be ensured.

- Biometric or mobile phone technology can be used to help avoid invalid doses and ensure timely vaccinations.
- To maintain equities while sustainably increasing EPI in the chronically and emerging low performing divisions, districts, and city corporations, special attention should be given to those areas.
- Based on the local context, experience regarding the implementation of evidence-based planning & budgeting to address the bottlenecks could be shared with the low performing areas to replicate the ideas or ways of working in the high performing areas.
- There should be regular monitoring of the online reporting on DHIS-2 and to ensuring data quality and timeliness of reporting
- EPI program could preserve vaccination card through digital scanning for future reference and monitoring
- Workers should be encouraged and a competitive mentality should be upheld to provide better services; within the framework of government rules, rewards may be given to better performers.
- Workers should maintain interpersonal communication with those in the target group until the completion of the last dose of scheduled vaccination. It is most important for MR, MSD, and TT3, TT4, and TT5, as the gap or interval is more important for these doses than others of the scheduled vaccines.
- EPI authorities should take appropriate measures to coordinate with the authorities of the local government ministries, city corporations, NGOs, and private health facilities, with an aim to ensure increased vaccination coverage in urban and slum areas.
- A TT campaign programme at schools, colleges, and garments factories could be established to ensure increased TT coverage, in particular TT2 coverage.

EPI authorities may set mechanisms to ensure a periodic review of the micro plan by upazilas through a bottle-neck analysis. Then, needs-based measures should be taken to address the weaknesses of the programme in the respective upazilas.

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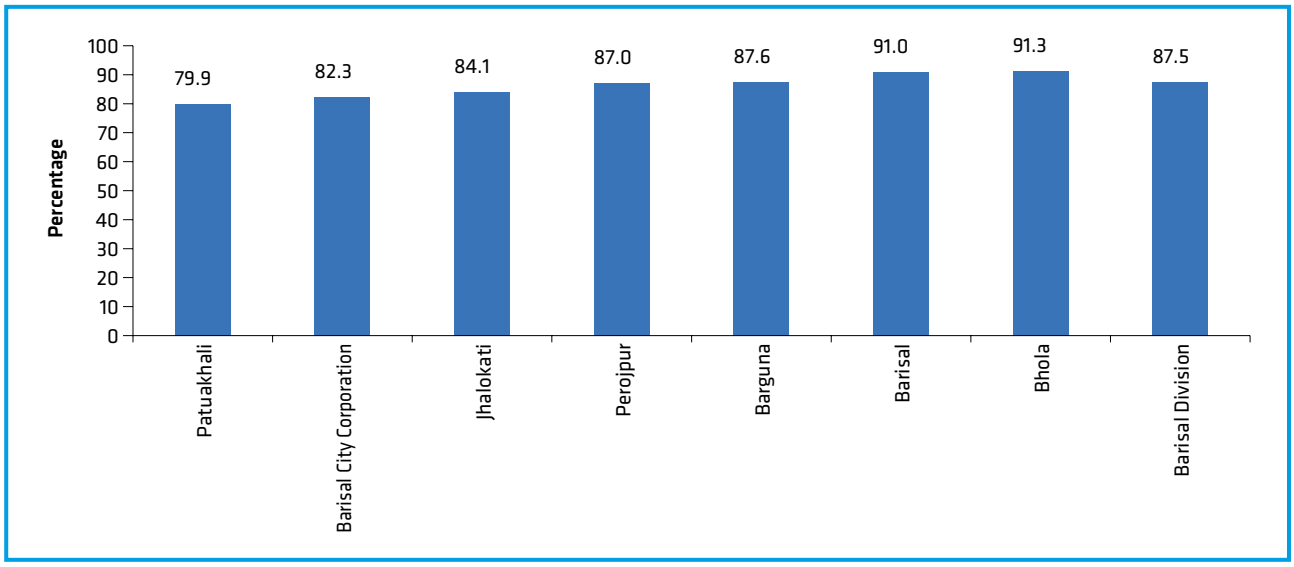

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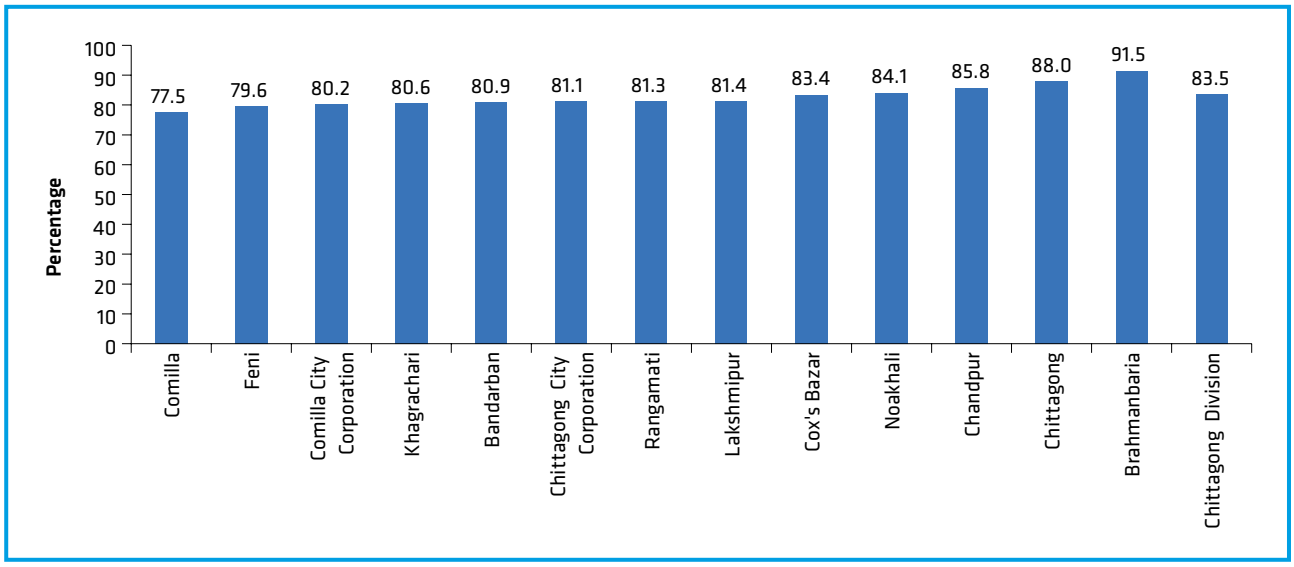


Figure 3. Valid Full Vaccination Coverage by Age 12 Months among 12-23 Months Old Children by Districts in Dhaka Division (Fully Immunized Arranged in ascending order by All Districts)

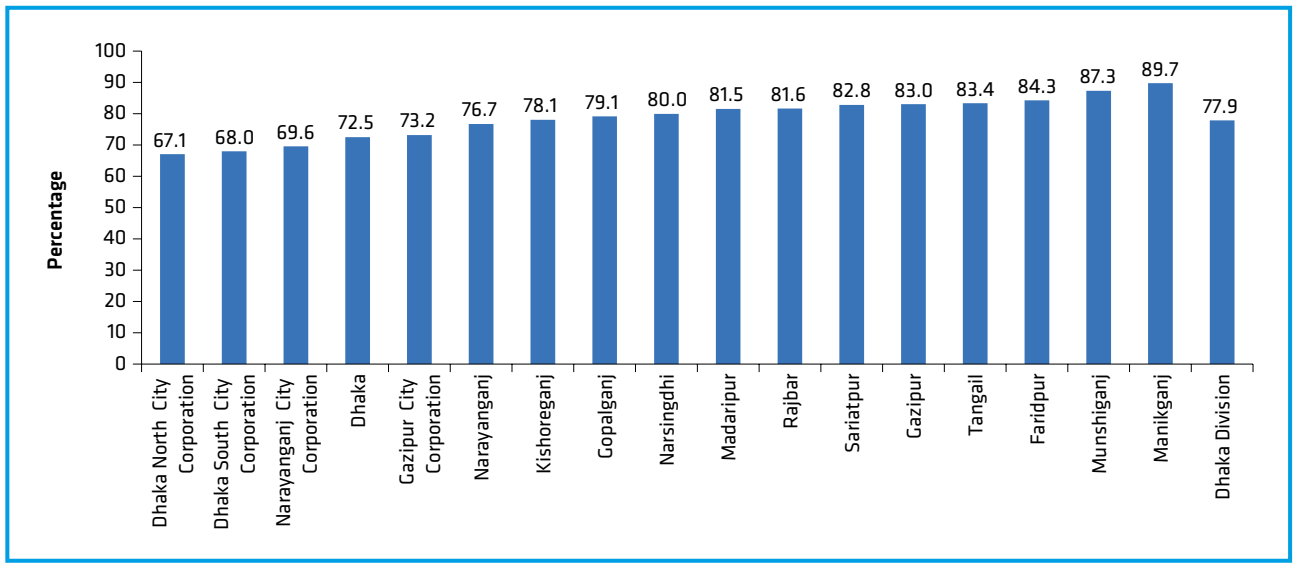
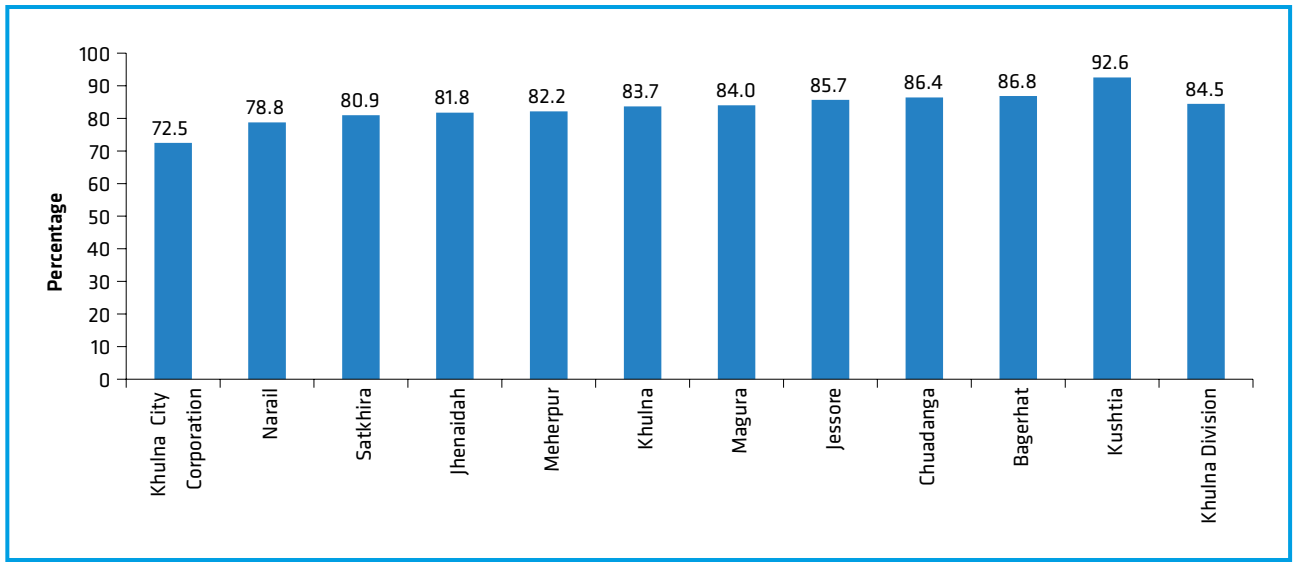


Figure 4. Valid Full Vaccination Coverage by Age 12 Months among 12-23 Months Old Children by Districts in Khulna Division (Fully Immunized Arranged in ascending order by All Districts)



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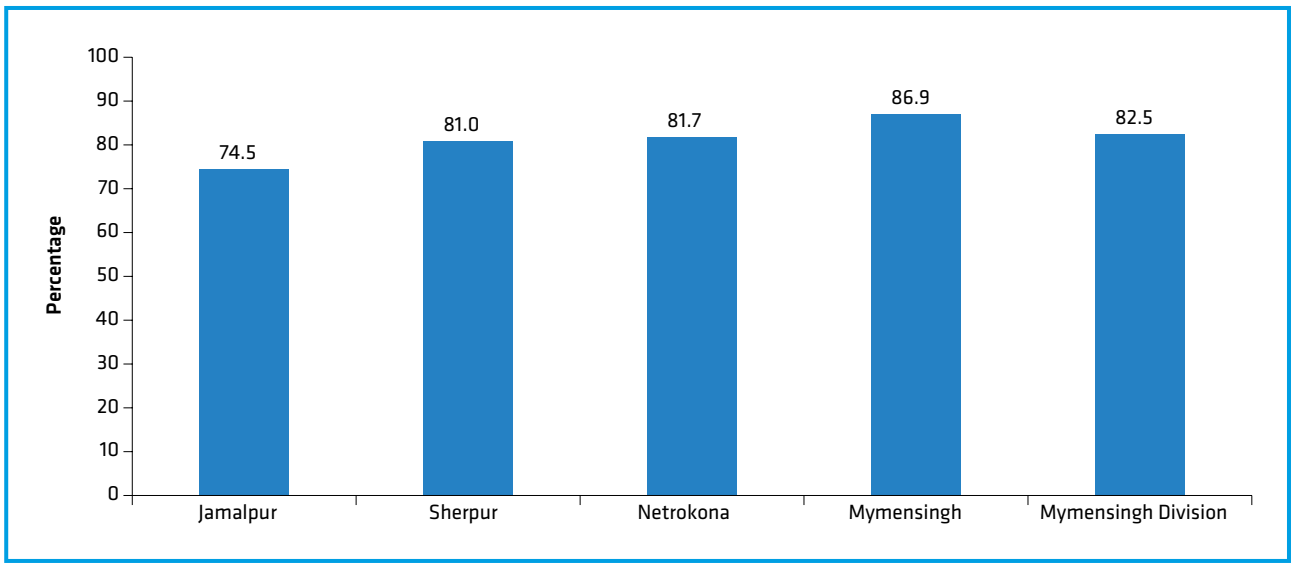

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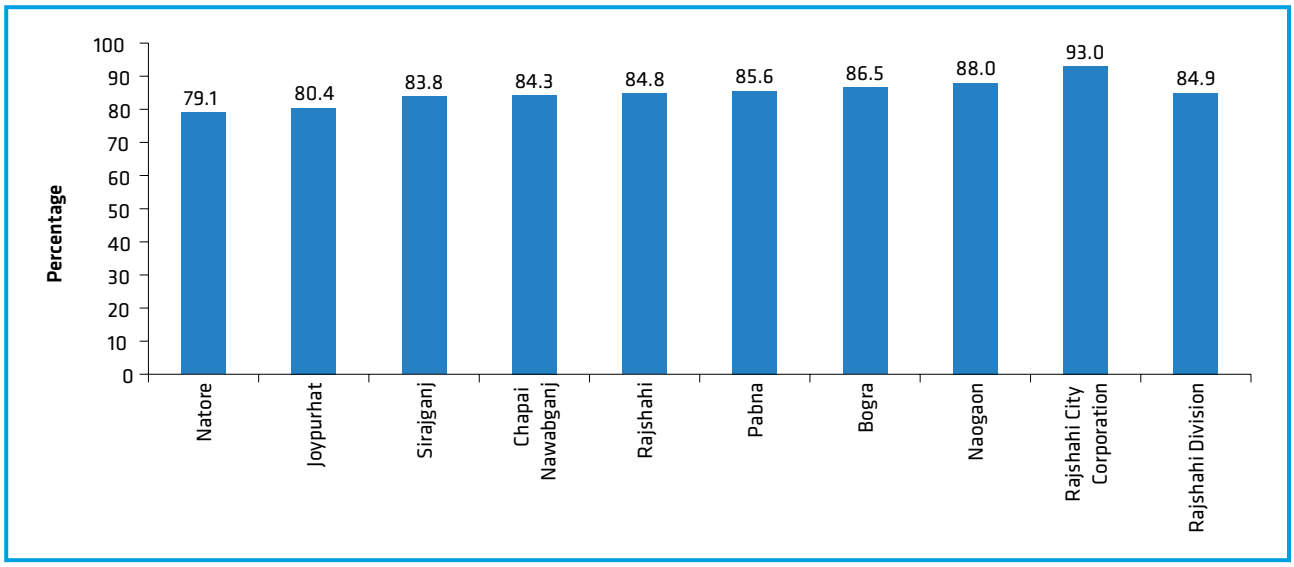

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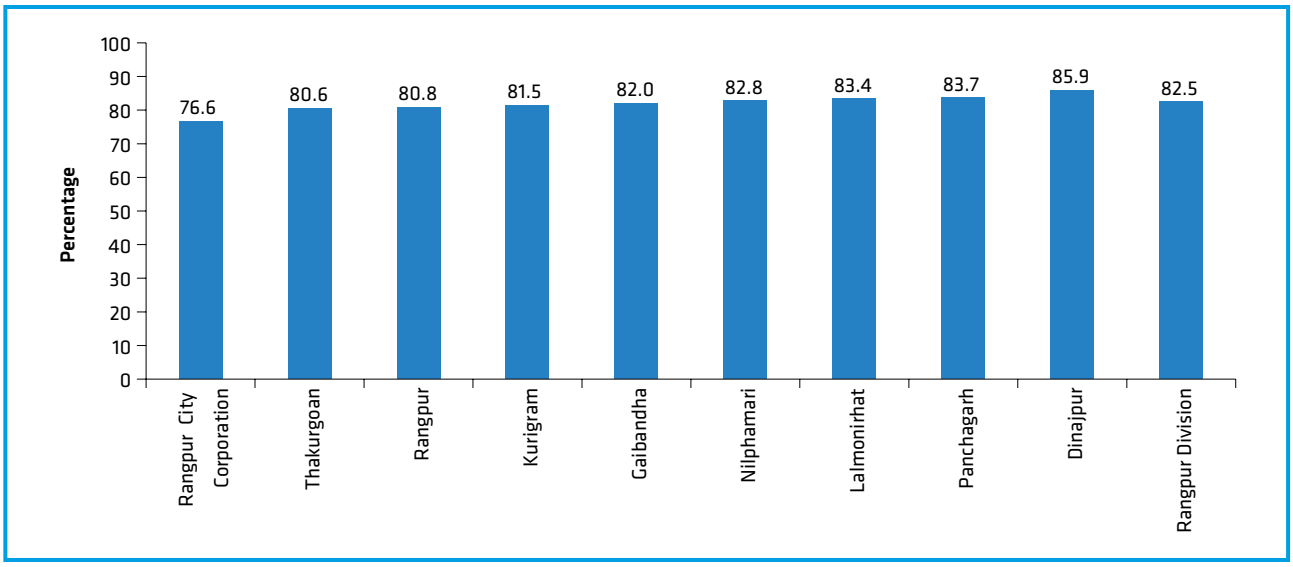

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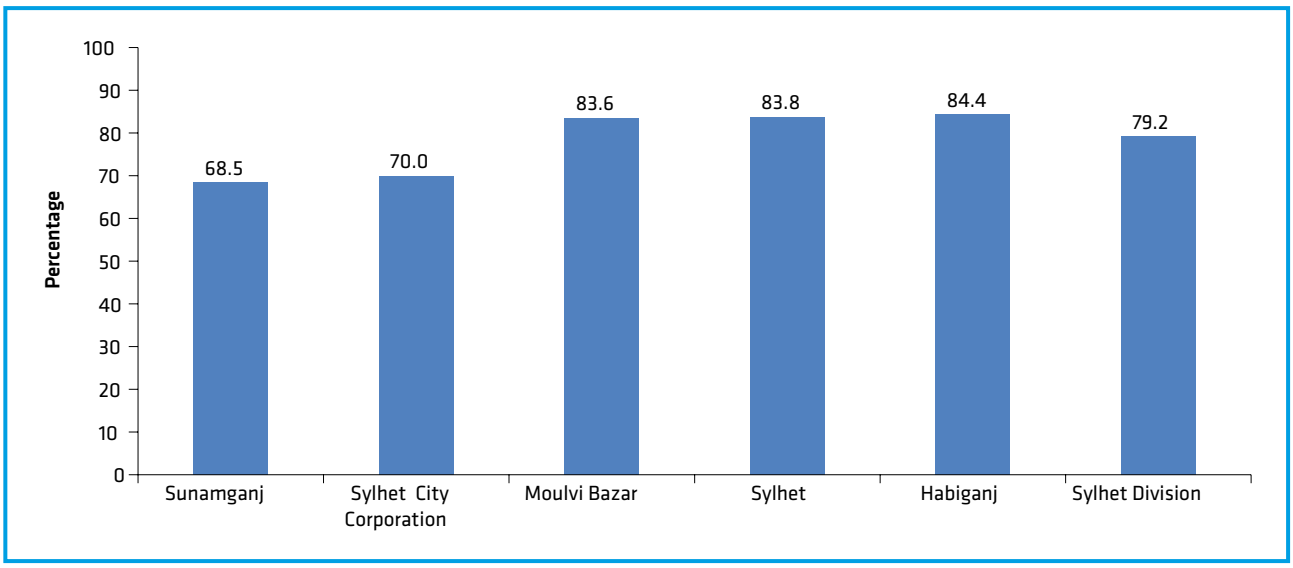

APPENDIX C: Vaccination Coverage by Survey Units (in Tables)

Table 1: Crude Vaccination Coverage by Age of 23 Months by District and City Corporation

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Barguna	99.7	99.7	99.7	99.5	99.5	99.5	99.5	97.7	97.5
Barisal	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.7	99.6
Barisal City Corporation	99.8	99.5	99.5	98.5	98.5	98.1	98.1	94.3	94.3
Bhola	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8	99.8
Jhalokati	99.8	99.5	99.5	99.3	99.3	98.8	98.8	97.0	97.0
Patuakhali	99.5	99.5	99.5	98.3	98.3	97.8	97.8	94.2	94.0
Perojpur	99.7	99.7	99.7	99.7	99.7	98.9	98.9	97.9	97.9
Barisal Division	**99.7**	**99.7**	**99.7**	**99.4**	**99.4**	**99.2**	**99.2**	**97.9**	**97.8**
Bandarban	99.0	98.7	98.7	97.7	97.7	97.3	97.3	94.1	94.1
Brahmanbaria	100.0	100.0	100.0	100.0	100.0	99.7	99.7	98.1	97.9
Chandpur	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	99.2
Chittagong	100.0	100.0	100.0	99.8	99.8	99.8	99.8	99.4	99.4
Chittagong City Corporation	99.1	98.7	98.7	97.9	97.9	96.8	96.8	93.3	93.3
Comilla	100.0	100.0	100.0	99.2	99.2	98.7	98.7	96.5	95.8
Comilla City Corporation	99.6	99.6	99.6	99.6	99.6	98.8	98.8	97.8	97.5
Cox's Bazar	100.0	99.8	99.8	99.8	99.8	99.1	99.1	97.2	96.7
Feni	100.0	100.0	100.0	99.8	99.8	99.1	99.1	95.6	95.6
Khagrachari	99.6	99.6	99.6	99.3	99.3	98.7	98.7	94.5	94.5
Lakshmipur	99.2	98.8	98.8	98.6	98.6	98.4	98.4	97.1	97.1
Noakhali	98.5	98.5	98.5	98.3	98.3	96.8	96.8	94.6	94.6
Rangamati	98.0	98.0	98.0	97.5	97.5	96.1	96.1	94.0	94.0
Chittagong Division	**99.6**	**99.5**	**99.5**	**99.2**	**99.2**	**98.7**	**98.7**	**96.8**	**96.7**
Dhaka	97.8	97.6	97.6	94.6	94.6	92.0	92.0	87.5	87.5
Dhaka North City Corporation	99.8	99.4	99.4	98.6	98.6	97.6	97.6	90.2	90.2
Dhaka South City Corporation	99.6	99.4	99.4	97.9	97.9	96.6	96.6	91.8	91.8
Faridpur	99.6	99.6	99.6	99.6	99.6	99.0	99.0	96.8	96.3
Gazipur	100.0	100.0	100.0	99.6	99.6	98.7	98.7	96.1	96.1
Gazipur City Corporation	99.7	99.7	99.7	99.0	99.0	98.0	98.0	93.5	93.5
Gopalganj	99.3	99.1	99.1	98.6	98.6	96.8	96.8	92.0	91.3
Kishoreganj	99.5	99.5	99.5	99.2	99.2	98.0	98.0	95.5	95.5
Madaripur	100.0	100.0	100.0	99.2	99.2	98.3	98.3	94.4	93.9
Manikganj	100.0	100.0	100.0	99.8	99.8	99.8	99.8	99.1	98.7
Munshiganj	100.0	100.0	100.0	100.0	100.0	99.5	99.5	98.1	97.9
Narayanganj	99.4	99.4	99.4	99.0	99.0	98.1	98.1	94.6	94.1
Narayanganj City Corporation	99.4	98.8	98.8	98.0	98.0	96.9	96.9	94.7	94.6
Narsingdhi	99.8	99.4	99.4	98.9	98.9	97.2	97.2	94.2	94.2
Rajbari	100.0	100.0	100.0	99.7	99.7	98.4	98.4	96.6	96.4
Sariatpur	99.8	99.8	99.8	99.8	99.8	99.8	99.8	98.8	98.8
Tangail	99.2	99.2	99.2	98.5	98.5	96.9	96.9	94.0	93.6
Dhaka Division	**99.4**	**99.2**	**99.2**	**98.3**	**98.3**	**97.0**	**97.0**	**93.3**	**93.2**
Bagerhat	98.2	98.2	98.2	97.9	97.9	96.3	96.3	94.8	94.8
Chuadanga	99.4	99.4	99.4	98.6	98.6	98.2	98.2	96.3	96.3
Jessore	100.0	99.4	99.4	99.1	99.1	98.0	98.0	94.9	94.9

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Jhenaidah	99.7	99.7	99.7	99.4	99.4	99.0	99.0	96.9	96.9
Khulna	99.6	99.3	99.3	99.3	99.3	98.6	98.6	96.2	95.6
Khulna City Corporation	98.3	97.9	97.9	95.6	95.6	94.0	94.0	88.9	88.3
Kushtia	100.0	100.0	100.0	100.0	100.0	99.8	99.8	99.8	99.6
Magura	98.9	98.9	98.9	98.8	98.8	98.3	98.3	97.2	97.0
Meherpur	100.0	99.8	99.8	99.1	99.1	98.5	98.5	96.4	96.0
Narail	99.2	99.0	99.0	98.4	98.4	96.5	96.5	91.5	91.5
Satkhira	99.6	99.6	99.6	99.6	99.6	98.6	98.6	97.2	95.0
Khulna Division	**99.5**	**99.3**	**99.3**	**99.0**	**99.0**	**98.2**	**98.2**	**96.1**	**95.7**
Jamalpur	99.3	99.3	99.3	98.1	98.1	96.9	96.9	89.0	88.8
Mymensingh	99.7	99.4	99.4	99.4	99.4	98.9	98.9	97.1	96.9
Netrokona	99.7	99.4	99.4	98.8	98.8	98.2	98.2	96.2	95.5
Sherpur	98.4	98.4	98.4	97.8	97.8	96.3	96.3	92.0	92.0
Mymensingh Division	**99.4**	**99.3**	**99.3**	**98.8**	**98.8**	**98.0**	**98.0**	**94.5**	**94.2**
Bogra	99.8	99.8	99.8	98.8	98.8	98.4	98.4	96.5	96.5
Joypurhat	100.0	100.0	100.0	100.0	100.0	99.6	99.6	98.6	98.3
Natore	99.0	99.0	99.0	97.7	97.7	96.7	96.7	93.5	93.5
Naogaon	99.6	99.4	99.4	99.2	99.2	98.8	98.8	96.7	96.7
Chapai Nawabganj	100.0	99.8	99.8	98.8	98.8	98.1	98.1	94.7	94.3
Pabna	100.0	100.0	100.0	99.7	99.7	98.8	98.8	97.3	96.6
Rajshahi	100.0	99.1	99.1	98.8	98.8	98.6	98.6	97.1	97.1
Rajshahi City Corporation	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	99.2
Sirajganj	98.3	98.3	98.3	97.1	97.1	96.1	96.1	93.5	93.5
Rajshahi Division	**99.5**	**99.4**	**99.4**	**98.7**	**98.7**	**98.0**	**98.0**	**95.9**	**95.8**
Dinajpur	100.0	99.7	99.7	99.5	99.5	98.9	98.9	96.8	96.8
Gaibandha	99.7	99.2	99.2	98.5	98.5	97.8	97.8	91.7	91.7
Kurigram	100.0	100.0	100.0	99.8	99.8	99.3	99.3	97.6	97.6
Lalmonirhat	100.0	99.2	99.2	98.7	98.7	98.7	98.7	95.4	95.4
Nilphamari	100.0	100.0	100.0	98.9	98.9	98.2	98.2	95.8	95.6
Panchagarh	100.0	100.0	100.0	100.0	100.0	99.8	99.8	99.1	97.3
Rangpur	99.5	99.3	99.3	99.3	99.3	98.4	98.4	94.1	94.1
Rangpur City Corporation	100.0	99.6	99.6	97.8	97.8	96.3	96.3	93.1	93.1
Thakurgoan	99.8	99.6	99.6	99.4	99.4	99.2	99.2	97.7	97.6
Rangpur Division	**99.9**	**99.6**	**99.6**	**99.2**	**99.2**	**98.6**	**98.6**	**95.6**	**95.5**
Habiganj	98.6	98.1	98.1	97.6	97.6	96.1	96.1	94.5	94.5
Moulvi Bazar	99.6	99.6	99.6	99.2	99.2	97.9	97.9	96.3	96.3
Sunamganj	97.7	94.7	94.7	93.4	93.4	91.7	91.7	88.9	88.9
Sylhet	99.5	99.5	99.5	98.4	98.4	96.9	96.9	95.1	94.9
Sylhet City Corporation	96.6	95.3	95.3	94.0	94.0	91.2	91.2	86.9	86.9
Sylhet Division	**98.7**	**97.7**	**97.7**	**96.9**	**96.9**	**95.3**	**95.3**	**93.2**	**93.1**
National	**99.5**	**99.3**	**99.3**	**98.7**	**98.7**	**97.9**	**97.9**	**95.3**	**95.1**
Urban	99.5	99.3	99.3	98.4	98.4	97.3	97.3	93.1	93.0
Rural	99.5	99.3	99.3	98.8	98.8	98.1	98.1	95.9	95.7
Dhaka City Corporation Slum	98.8	98.2	98.2	97.2	97.2	94.7	94.7	90.3	90.3
Chittagong City Corporation Slum	99.1	98.8	98.8	97.2	97.2	93.6	93.6	87.6	87.6

Table 2: Crude Vaccination Coverage by Age of 12 Months by District and City Corporation

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Barguna	99.7	99.7	99.7	99.3	99.3	98.7	98.7	93.7	93.7
Barisal	99.7	99.7	99.7	99.7	99.7	99.2	99.2	95.7	95.5
Barisal City Corporation	99.8	99.3	99.3	98.3	98.3	97.7	97.7	91.1	91.1
Bhola	99.8	99.8	99.8	99.8	99.8	99.8	99.8	98.7	98.7
Jhalokati	99.8	99.5	99.5	99.3	99.3	98.6	98.6	92.2	92.2
Patuakhali	99.5	98.4	98.4	97.1	97.1	96.7	96.7	89.3	89.1
Perojpur	99.7	99.3	99.3	99.1	99.1	98.4	98.4	93.3	93.3
Barisal Division	**99.7**	**99.4**	**99.4**	**99.1**	**99.1**	**98.6**	**98.6**	**94.3**	**94.2**
Bandarban	99.0	98.7	98.7	97.7	97.7	97.3	97.3	90.6	90.6
Brahmanbaria	100.0	100.0	100.0	100.0	100.0	99.7	99.7	95.5	95.2
Chandpur	100.0	100.0	100.0	99.8	99.8	99.0	99.0	94.8	94.8
Chittagong	100.0	99.8	99.8	99.6	99.6	99.6	99.6	96.5	96.5
Chittagong City Corporation	99.1	98.4	98.4	97.6	97.6	96.3	96.3	87.9	87.8
Comilla	100.0	100.0	100.0	99.2	99.2	98.7	98.7	88.8	88.4
Comilla City Corporation	99.6	99.4	99.4	98.8	98.8	98.0	98.0	89.1	89.0
Cox's Bazar	100.0	99.8	99.8	99.8	99.8	99.1	99.1	92.5	92.2
Feni	100.0	100.0	100.0	99.6	99.6	98.8	98.8	91.3	91.3
Khagrachari	99.6	99.6	99.6	98.6	98.6	98.0	98.0	88.7	88.7
Lakshmipur	99.2	98.8	98.8	98.6	98.6	98.1	98.1	92.8	92.8
Noakhali	98.5	98.5	98.5	98.3	98.3	96.8	96.8	90.8	90.8
Rangamati	98.0	98.0	98.0	97.5	97.5	95.9	95.9	87.7	87.9
Chittagong Division	**99.6**	**99.5**	**99.5**	**99.1**	**99.1**	**98.4**	**98.4**	**92.0**	**91.9**
Dhaka	97.8	97.6	97.6	94.6	94.6	91.1	91.1	81.8	81.8
Dhaka North City Corporation	99.8	98.9	98.9	98.2	98.2	96.5	96.5	79.9	79.9
Dhaka South City Corporation	99.6	99.1	99.1	97.6	97.6	95.0	95.0	82.6	82.5
Faridpur	99.6	99.3	99.3	98.9	98.9	98.1	98.1	89.2	89.0
Gazipur	100.0	100.0	100.0	99.6	99.6	98.5	98.5	89.5	90.1
Gazipur City Corporation	99.7	99.1	99.1	98.4	98.4	96.5	96.5	85.0	85.0
Gopalganj	99.3	99.1	99.1	98.6	98.6	96.1	96.1	85.6	85.3
Kishoreganj	99.5	99.5	99.5	98.2	98.2	96.9	96.9	86.9	86.8
Madaripur	100.0	100.0	100.0	99.2	99.2	97.6	97.6	88.6	88.3
Manikganj	100.0	99.8	99.8	99.6	99.6	99.4	99.4	97.0	96.6
Munshiganj	100.0	100.0	100.0	100.0	100.0	99.5	99.5	93.8	93.6
Narayanganj	99.4	99.4	99.4	99.0	99.0	97.5	97.5	88.5	87.9
Narayanganj City Corporation	99.4	98.8	98.8	98.0	98.0	96.5	96.5	83.3	83.1
Narsingdhi	99.8	99.4	99.4	98.9	98.9	97.2	97.2	88.9	88.8
Rajbari	100.0	100.0	100.0	99.5	99.5	98.2	98.2	91.3	91.3
Sariatpur	99.8	99.8	99.8	99.8	99.8	99.8	99.8	91.4	91.4
Tangail	99.2	99.2	99.2	98.5	98.5	96.5	96.5	89.3	88.9
Dhaka Division	**99.4**	**99.1**	**99.1**	**98.1**	**98.1**	**96.3**	**96.3**	**86.7**	**86.6**
Bagerhat	98.2	98.2	98.2	97.6	97.6	95.8	95.8	92.9	92.9
Chuadanga	99.4	99.4	99.4	98.6	98.6	98.0	98.0	93.2	93.2
Jessore	100.0	99.4	99.4	98.9	98.9	97.8	97.8	91.2	91.2
Jhenaidah	99.7	99.7	99.7	99.4	99.4	99.0	99.0	92.0	92.0

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Khulna	99.6	99.3	99.3	99.1	99.1	98.2	98.2	91.6	91.0
Khulna City Corporation	98.3	97.9	97.9	95.6	95.6	92.7	92.7	79.3	78.4
Kushtia	100.0	100.0	100.0	100.0	100.0	99.8	99.8	98.0	98.0
Magura	98.9	98.9	98.9	98.8	98.8	98.1	98.1	92.5	92.3
Meherpur	100.0	99.8	99.8	99.1	99.1	98.5	98.5	93.2	92.7
Narail	99.2	99.0	99.0	98.4	98.4	95.9	95.9	85.2	85.2
Satkhira	99.6	99.6	99.6	99.6	99.6	98.6	98.6	93.3	91.1
Khulna Division	**99.5**	**99.3**	**99.3**	**98.9**	**98.9**	**97.9**	**97.9**	**92.2**	**91.8**
Jamalpur	99.3	99.3	99.3	98.1	98.1	96.7	96.7	84.8	84.6
Mymensingh	99.7	99.4	99.4	99.4	99.4	98.9	98.9	94.6	94.4
Netrokona	99.7	99.4	99.4	98.8	98.8	98.2	98.2	91.2	90.5
Sherpur	98.4	98.4	98.4	97.8	97.8	96.3	96.3	87.0	87.3
Mymensingh Division	**99.4**	**99.3**	**99.3**	**98.8**	**98.8**	**97.9**	**97.9**	**90.8**	**90.6**
Bogra	99.8	99.8	99.8	98.8	98.8	98.4	98.4	91.7	91.7
Joypurhat	100.0	100.0	100.0	100.0	100.0	99.6	99.6	93.9	93.6
Natore	99.0	99.0	99.0	97.5	97.5	96.3	96.3	87.8	87.8
Naogaon	99.6	99.4	99.4	99.2	99.2	98.6	98.6	93.4	93.4
Chapai Nawabganj	100.0	99.8	99.8	98.8	98.8	97.9	97.9	91.8	91.4
Pabna	100.0	100.0	100.0	99.7	99.7	98.6	98.6	94.8	94.1
Rajshahi	100.0	99.1	99.1	98.3	98.3	98.1	98.1	92.6	92.6
Rajshahi City Corporation	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.9	96.7
Sirajganj	98.3	98.0	98.0	97.1	97.1	96.1	96.1	90.5	90.5
Rajshahi Division	**99.5**	**99.3**	**99.3**	**98.6**	**98.6**	**97.9**	**97.9**	**92.1**	**92.0**
Dinajpur	100.0	99.7	99.7	99.5	99.5	98.9	98.9	93.6	93.6
Gaibandha	99.7	99.2	99.2	98.3	98.3	97.6	97.6	86.8	86.7
Kurigram	100.0	100.0	100.0	99.8	99.8	99.1	99.1	90.7	90.7
Lalmonirhat	100.0	99.2	99.2	98.7	98.7	98.4	98.4	90.7	90.7
Nilphamari	100.0	99.8	99.8	98.4	98.4	98.1	98.1	92.5	92.3
Panchagarh	100.0	100.0	100.0	100.0	100.0	99.3	99.3	94.1	92.6
Rangpur	99.5	99.3	99.3	99.3	99.3	98.2	98.2	89.3	89.2
Rangpur City Corporation	100.0	99.6	99.6	96.4	96.4	94.9	94.9	84.7	84.7
Thakurgoan	99.8	99.6	99.6	98.2	98.2	97.6	97.6	91.6	91.8
Rangpur Division	**99.9**	**99.6**	**99.6**	**99.0**	**99.0**	**98.3**	**98.3**	**90.8**	**90.6**
Habiganj	98.6	97.8	97.8	97.4	97.4	95.6	95.6	90.8	90.8
Moulvi Bazar	99.6	98.8	98.8	98.3	98.3	97.0	97.0	90.1	90.1
Sunamganj	97.7	94.4	94.4	92.2	92.2	90.0	90.0	79.0	79.0
Sylhet	99.5	99.5	99.5	98.1	98.1	96.2	96.2	91.6	91.4
Sylhet City Corporation	96.6	95.3	95.3	93.6	93.6	90.2	90.2	80.4	80.4
Sylhet Division	**98.7**	**97.5**	**97.5**	**96.2**	**96.2**	**94.4**	**94.4**	**87.3**	**87.3**
National	**99.5**	**99.2**	**99.2**	**98.6**	**98.6**	**97.5**	**97.5**	**90.5**	**90.3**
Urban	99.5	99.2	99.2	98.1	98.1	96.7	96.7	86.3	86.2
Rural	99.5	99.2	99.2	98.7	98.7	97.7	97.7	91.4	91.3
Dhaka City Corporation Slum	98.8	98.2	98.2	96.3	96.3	93.6	93.6	78.6	78.6
Chittagong City Corporation Slum	99.1	98.0	98.0	95.1	95.1	90.3	90.3	73.5	74.6

Table 3: Valid Vaccination Coverage by Age of 23 Months by District and City Corporation

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Barguna	99.7	98.8	98.8	98.3	98.3	93.6	93.6	94.9	91.1
Barisal	99.7	99.1	99.1	99.3	99.3	96.0	96.0	97.1	94.6
Barisal City Corporation	99.8	98.3	98.3	97.7	97.7	91.3	91.3	90.4	85.4
Bhola	99.8	99.8	99.8	99.8	99.8	94.5	94.5	96.6	91.9
Jhalokati	99.8	99.0	99.0	98.5	98.5	92.3	92.3	93.1	88.3
Patuakhali	99.5	98.5	98.5	97.3	97.3	90.8	90.8	90.5	84.8
Perojpur	99.7	99.7	99.7	99.2	99.2	94.8	94.8	95.0	91.4
Barisal Division	**99.7**	**99.2**	**99.2**	**98.8**	**98.8**	**94.0**	**94.0**	**94.8**	**90.7**
Bandarban	99.0	96.3	96.3	94.8	94.8	87.8	87.8	89.8	83.9
Brahmanbaria	100.0	98.1	98.1	97.8	97.8	95.1	95.1	96.9	94.1
Chandpur	100.0	100.0	100.0	99.5	99.5	91.8	91.8	97.0	89.8
Chittagong	100.0	99.8	99.8	99.6	99.6	93.1	93.1	97.2	90.9
Chittagong City Corporation	99.1	95.1	95.1	93.6	93.6	88.3	88.3	91.3	86.3
Comilla	100.0	96.9	96.9	95.9	95.9	85.4	85.4	93.2	83.7
Comilla City Corporation	99.6	94.5	94.5	94.0	94.0	88.0	88.0	93.1	88.1
Cox's Bazar	100.0	98.1	98.1	98.4	98.4	92.3	92.3	92.2	87.4
Feni	100.0	99.4	99.4	99.2	99.2	90.5	90.5	90.2	83.5
Khagrachari	99.6	99.0	99.0	98.7	98.7	91.7	91.7	90.6	85.8
Lakshmipur	99.2	98.2	98.2	97.7	97.7	89.1	89.1	93.1	85.4
Noakhali	98.5	97.8	97.8	96.5	96.5	91.0	91.0	91.4	87.3
Rangamati	98.0	93.9	93.9	92.2	92.2	86.8	86.8	91.6	87.4
Chittagong Division	**99.6**	**97.9**	**97.9**	**97.2**	**97.2**	**90.4**	**90.4**	**93.9**	**87.8**
Dhaka	97.8	95.8	95.8	91.5	91.5	80.9	80.9	86.0	78.0
Dhaka North City Corporation	99.8	96.9	96.9	96.3	96.3	83.3	83.3	85.4	76.6
Dhaka South City Corporation	99.6	98.3	98.3	97.4	97.4	85.7	85.7	83.6	76.9
Faridpur	99.6	95.1	95.1	96.2	96.2	92.1	92.1	94.5	90.7
Gazipur	100.0	97.4	97.4	97.2	97.2	90.3	90.3	93.7	88.6
Gazipur City Corporation	99.7	99.1	99.1	98.7	98.7	87.0	87.0	90.5	81.0
Gopalganj	99.3	95.9	95.9	94.1	94.1	88.2	88.2	90.1	84.3
Kishoreganj	99.5	97.4	97.4	97.3	97.3	90.2	90.2	91.2	86.4
Madaripur	100.0	97.3	97.3	95.6	95.6	90.2	90.2	91.5	86.5
Manikganj	100.0	98.6	98.6	99.0	99.0	94.4	94.4	96.6	91.7
Munshiganj	100.0	99.5	99.5	99.3	99.3	95.1	95.1	95.5	91.6
Narayanganj	99.4	96.5	96.5	95.8	95.8	86.4	86.4	91.0	82.2
Narayanganj City Corporation	99.4	97.5	97.5	97.2	97.2	86.3	86.3	88.1	79.8
Narsingdhi	99.8	97.5	97.5	96.5	96.5	89.5	89.5	91.3	85.0
Rajbari	100.0	98.4	98.4	98.2	98.2	91.7	91.7	92.4	86.7
Sariatpur	99.8	97.8	97.8	98.3	98.3	92.6	92.6	94.7	89.3
Tangail	99.2	97.8	97.8	96.5	96.5	91.0	91.0	93.3	88.1
Dhaka Division	**99.4**	**97.2**	**97.2**	**96.1**	**96.1**	**88.2**	**88.2**	**90.3**	**84.0**
Bagerhat	98.2	97.4	97.4	97.1	97.1	91.0	91.0	92.2	88.3
Chuadanga	99.4	99.0	99.0	98.2	98.2	92.1	92.1	94.8	89.6
Jessore	100.0	98.0	98.0	97.8	97.8	91.8	91.8	93.4	89.1

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Jhenaidah	99.7	99.4	99.4	99.0	99.0	91.3	91.3	92.5	86.1
Khulna	99.6	93.4	93.4	94.4	94.4	89.5	89.5	93.2	88.3
Khulna City Corporation	98.3	95.1	95.1	92.6	92.6	86.7	86.7	87.6	82.1
Kushtia	100.0	99.4	99.4	99.6	99.6	95.2	95.2	98.3	94.1
Magura	98.9	94.3	94.3	95.1	95.1	89.1	89.1	94.9	88.4
Meherpur	100.0	97.9	97.9	97.0	97.0	88.4	88.4	92.4	84.9
Narail	99.2	97.7	97.7	96.9	96.9	90.8	90.8	89.3	84.8
Satkhira	99.6	96.2	96.2	95.7	95.7	90.7	90.7	91.5	84.7
Khulna Division	**99.5**	**97.3**	**97.3**	**97.1**	**97.1**	**91.2**	**91.2**	**93.3**	**88.1**
Jamalpur	99.3	98.9	98.9	97.2	97.2	88.4	88.4	84.0	78.7
Mymensingh	99.7	99.2	99.2	99.2	99.2	93.1	93.1	94.2	89.4
Netrokona	99.7	97.3	97.3	96.5	96.5	89.3	89.3	92.4	86.4
Sherpur	98.4	96.4	96.4	95.6	95.6	88.5	88.5	90.1	85.0
Mymensingh Division	**99.4**	**98.4**	**98.4**	**97.8**	**97.8**	**90.8**	**90.8**	**91.1**	**86.0**
Bogra	99.8	98.7	98.7	97.8	97.8	93.6	93.6	93.7	91.3
Joypurhat	100.0	99.5	99.5	99.2	99.2	88.6	88.6	94.3	84.6
Natore	99.0	99.0	99.0	97.5	97.5	88.5	88.5	91.6	84.1
Naogaon	99.6	98.8	98.8	98.8	98.8	94.1	94.1	94.8	91.0
Chapai Nawabganj	100.0	99.2	99.2	98.2	98.2	90.7	90.7	92.8	86.8
Pabna	100.0	98.2	98.2	98.2	98.2	92.2	92.2	93.3	88.1
Rajshahi	100.0	98.6	98.6	98.0	98.0	92.7	92.7	93.3	89.1
Rajshahi City Corporation	100.0	99.8	99.8	99.8	99.8	97.1	97.1	98.4	95.5
Sirajganj	98.3	97.8	97.8	96.4	96.4	91.4	91.4	89.9	86.3
Rajshahi Division	**99.5**	**98.6**	**98.6**	**97.9**	**97.9**	**92.1**	**92.1**	**92.9**	**88.5**
Dinajpur	100.0	97.9	97.9	97.7	97.7	91.4	91.4	95.1	88.9
Gaibandha	99.7	97.4	97.4	96.8	96.8	92.8	92.8	90.6	87.0
Kurigram	100.0	99.8	99.8	99.4	99.4	92.0	92.0	93.3	88.2
Lalmonirhat	100.0	98.5	98.5	98.2	98.2	92.0	92.0	93.5	87.9
Nilphamari	100.0	98.9	98.9	97.8	97.8	89.7	89.7	91.6	86.1
Panchagarh	100.0	96.3	96.3	96.9	96.9	89.4	89.4	96.3	88.4
Rangpur	99.5	98.3	98.3	98.2	98.2	90.4	90.4	91.0	85.5
Rangpur City Corporation	100.0	98.2	98.2	96.6	96.6	89.4	89.4	89.6	84.7
Thakurgoan	99.8	96.8	96.8	95.7	95.7	86.3	86.3	94.8	85.7
Rangpur Division	**99.9**	**98.2**	**98.2**	**97.7**	**97.7**	**90.8**	**90.8**	**92.9**	**87.2**
Habiganj	98.6	97.4	97.4	96.9	96.9	91.4	91.4	91.3	87.8
Moulvi Bazar	99.6	98.8	98.8	98.6	98.6	93.3	93.3	94.0	89.8
Sunamganj	97.7	94.3	94.3	92.9	92.9	83.3	83.3	84.6	77.9
Sylhet	99.5	98.8	98.8	97.7	97.7	90.8	90.8	91.9	86.7
Sylhet City Corporation	96.6	93.0	93.0	90.5	90.5	78.4	78.4	85.0	75.0
Sylhet Division	**98.7**	**97.1**	**97.1**	**96.1**	**96.1**	**89.0**	**89.0**	**89.9**	**84.8**
National	**99.5**	**97.9**	**97.9**	**97.2**	**97.2**	**90.4**	**90.4**	**92.3**	**86.8**
Urban	99.5	97.5	97.5	96.6	96.6	88.2	88.2	89.7	83.4
Rural	99.5	97.9	97.9	97.3	97.3	90.9	90.9	93.0	87.6
Dhaka City Corporation Slum	98.8	93.9	93.9	94.1	94.1	83.5	83.5	86.2	77.8
Chittagong City Corporation Slum	99.1	94.8	94.8	93.2	93.2	86.6	86.6	86.4	83.1

Table 4: Valid Vaccination Coverage by Age of 12 Months by District and City Corporation

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Barguna	99.7	98.8	98.8	97.9	97.9	93.0	93.0	91.0	87.6
Barisal	99.7	99.1	99.1	99.3	99.3	95.5	95.5	93.1	91.0
Barisal City Corporation	99.8	98.0	98.0	97.5	97.5	90.9	90.9	87.3	82.3
Bhola	99.8	99.8	99.8	99.8	99.8	94.5	94.5	95.4	91.3
Jhalokati	99.8	99.0	99.0	98.5	98.5	92.0	92.0	88.4	84.1
Patuakhali	99.5	97.4	97.4	96.2	96.2	89.7	89.7	85.6	79.9
Perojpur	99.7	99.3	99.3	98.6	98.6	94.3	94.3	90.4	87.0
Barisal Division	**99.7**	**98.9**	**98.9**	**98.5**	**98.5**	**93.5**	**93.5**	**91.2**	**87.5**
Bandarban	99.0	96.3	96.3	94.8	94.8	87.8	87.8	86.3	80.9
Brahmanbaria	100.0	98.1	98.1	97.8	97.8	95.1	95.1	94.2	91.5
Chandpur	100.0	99.8	99.8	99.2	99.2	91.0	91.0	92.5	85.8
Chittagong	100.0	99.5	99.5	99.4	99.4	92.9	92.9	94.3	88.0
Chittagong City Corporation	99.1	95.1	95.1	93.6	93.6	88.0	88.0	86.0	81.1
Comilla	100.0	96.9	96.9	95.9	95.9	85.4	85.4	85.6	77.5
Comilla City Corporation	99.6	94.5	94.5	93.4	93.4	87.5	87.5	84.4	80.2
Cox's Bazar	100.0	98.1	98.1	98.4	98.4	92.3	92.3	87.5	83.4
Feni	100.0	99.4	99.4	99.0	99.0	90.3	90.3	85.9	79.6
Khagrachari	99.6	99.0	99.0	98.0	98.0	90.9	90.9	84.7	80.6
Lakshmipur	99.2	98.2	98.2	97.7	97.7	88.9	88.9	88.8	81.4
Noakhali	98.5	97.8	97.8	96.5	96.5	91.0	91.0	87.7	84.1
Rangamati	98.0	93.9	93.9	92.2	92.2	86.6	86.6	85.3	81.3
Chittagong Division	**99.6**	**97.8**	**97.8**	**97.1**	**97.1**	**90.2**	**90.2**	**89.1**	**83.5**
Dhaka	97.8	95.8	95.8	91.5	91.5	80.1	80.1	80.3	72.5
Dhaka North City Corporation	99.8	96.5	96.5	95.8	95.8	82.2	82.2	75.2	67.1
Dhaka South City Corporation	99.6	97.9	97.9	96.7	96.7	84.5	84.5	74.3	68.0
Faridpur	99.6	94.8	94.8	95.3	95.3	91.4	91.4	86.9	84.3
Gazipur	100.0	97.4	97.4	97.2	97.2	90.1	90.1	87.1	83.0
Gazipur City Corporation	99.7	98.5	98.5	97.8	97.8	85.9	85.9	81.9	73.2
Gopalganj	99.3	95.9	95.9	93.9	93.9	87.8	87.8	83.8	79.1
Kishoreganj	99.5	97.4	97.4	96.6	96.6	89.1	89.1	82.6	78.1
Madaripur	100.0	97.3	97.3	95.6	95.6	90.0	90.0	85.7	81.5
Manikganj	100.0	98.3	98.3	98.8	98.8	93.9	93.9	94.4	89.7
Munshiganj	100.0	99.5	99.5	99.3	99.3	95.1	95.1	91.2	87.3
Narayanganj	99.4	96.5	96.5	95.5	95.5	86.1	86.1	84.9	76.7
Narayanganj City Corporation	99.4	97.5	97.5	97.2	97.2	85.9	85.9	76.6	69.6
Narsingdhi	99.8	97.5	97.5	96.5	96.5	89.5	89.5	86.0	80.0
Rajbari	100.0	98.4	98.4	98.0	98.0	91.5	91.5	87.2	81.6
Sariatpur	99.8	97.8	97.8	98.3	98.3	92.6	92.6	87.3	82.8
Tangail	99.2	97.8	97.8	96.5	96.5	90.6	90.6	88.6	83.4
Dhaka Division	**99.4**	**97.1**	**97.1**	**95.8**	**95.8**	**87.6**	**87.6**	**83.7**	**77.9**
Bagerhat	98.2	97.4	97.4	96.8	96.8	90.8	90.8	90.3	86.8
Chuadanga	99.4	99.0	99.0	98.2	98.2	91.9	91.9	91.7	86.4
Jessore	100.0	98.0	98.0	97.6	97.6	91.7	91.7	89.7	85.7
Jhenaidah	99.7	99.4	99.4	99.0	99.0	91.3	91.3	87.6	81.8
Khulna	99.6	93.4	93.4	94.2	94.2	89.3	89.3	88.6	83.7

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Khulna City Corporation	98.3	95.1	95.1	92.6	92.6	85.4	85.4	78.0	72.5
Kushtia	100.0	99.4	99.4	99.6	99.6	95.2	95.2	96.5	92.6
Magura	98.9	94.3	94.3	95.1	95.1	88.8	88.8	90.2	84.0
Meherpur	100.0	97.9	97.9	97.0	97.0	88.4	88.4	89.2	82.2
Narail	99.2	97.7	97.7	96.9	96.9	90.2	90.2	83.0	78.8
Satkhira	99.6	96.2	96.2	95.7	95.7	90.7	90.7	87.6	80.9
Khulna Division	**99.5**	**97.3**	**97.3**	**97.0**	**97.0**	**91.0**	**91.0**	**89.4**	**84.5**
Jamalpur	99.3	98.9	98.9	97.2	97.2	88.2	88.2	79.8	74.5
Mymensingh	99.7	99.2	99.2	99.2	99.2	93.1	93.1	91.8	86.9
Netrokona	99.7	97.3	97.3	96.5	96.5	89.3	89.3	87.4	81.7
Sherpur	98.4	96.4	96.4	95.6	95.6	88.5	88.5	85.1	81.0
Mymensingh Division	**99.4**	**98.4**	**98.4**	**97.8**	**97.8**	**90.7**	**90.7**	**87.5**	**82.5**
Bogra	99.8	98.7	98.7	97.8	97.8	93.6	93.6	89.0	86.5
Joypurhat	100.0	99.5	99.5	99.2	99.2	88.6	88.6	89.6	80.4
Natore	99.0	99.0	99.0	97.3	97.3	88.0	88.0	85.9	79.1
Naogaon	99.6	98.8	98.8	98.8	98.8	93.9	93.9	91.5	88.0
Chapai Nawabganj	100.0	99.2	99.2	98.2	98.2	90.5	90.5	89.9	84.3
Pabna	100.0	98.2	98.2	98.2	98.2	92.0	92.0	90.7	85.6
Rajshahi	100.0	98.4	98.4	97.6	97.6	92.5	92.5	88.7	84.8
Rajshahi City Corporation	100.0	99.8	99.8	99.8	99.8	97.1	97.1	95.9	93.0
Sirajganj	98.3	97.5	97.5	96.4	96.4	91.4	91.4	86.9	83.8
Rajshahi Division	**99.5**	**98.5**	**98.5**	**97.8**	**97.8**	**92.0**	**92.0**	**89.1**	**84.9**
Dinajpur	100.0	97.9	97.9	97.7	97.7	91.4	91.4	91.9	85.9
Gaibandha	99.7	97.4	97.4	96.6	96.6	92.6	92.6	85.7	82.0
Kurigram	100.0	99.8	99.8	99.4	99.4	91.9	91.9	86.3	81.5
Lalmonirhat	100.0	98.5	98.5	98.2	98.2	91.8	91.8	88.8	83.4
Nilphamari	100.0	98.7	98.7	97.3	97.3	89.5	89.5	88.3	82.8
Panchagarh	100.0	96.3	96.3	96.9	96.9	88.9	88.9	91.4	83.7
Rangpur	99.5	98.3	98.3	98.2	98.2	90.2	90.2	86.2	80.8
Rangpur City Corporation	100.0	98.2	98.2	95.2	95.2	87.9	87.9	81.2	76.6
Thakurgoan	99.8	96.8	96.8	94.3	94.3	84.9	84.9	88.7	80.6
Rangpur Division	**99.9**	**98.1**	**98.1**	**97.5**	**97.5**	**90.5**	**90.5**	**88.0**	**82.5**
Habiganj	98.6	97.1	97.1	96.6	96.6	91.0	91.0	87.6	84.4
Moulvi Bazar	99.6	98.0	98.0	97.8	97.8	92.4	92.4	87.7	83.6
Sunamganj	97.7	94.1	94.1	91.7	91.7	81.6	81.6	74.7	68.5
Sylhet	99.5	98.8	98.8	97.4	97.4	90.5	90.5	88.5	83.8
Sylhet City Corporation	96.6	92.7	92.7	90.1	90.1	77.8	77.8	78.5	70.0
Sylhet Division	**98.7**	**96.8**	**96.8**	**95.5**	**95.5**	**88.1**	**88.1**	**84.0**	**79.2**
National	**99.5**	**97.8**	**97.8**	**97.0**	**97.0**	**90.1**	**90.1**	**87.5**	**82.3**
Urban	99.5	97.4	97.4	96.2	96.2	87.7	87.7	82.8	77.1
Rural	99.5	97.9	97.9	97.2	97.2	90.6	90.6	88.5	83.5
Dhaka City Corporation Slum	98.8	93.9	93.9	93.2	93.2	82.3	82.3	74.5	67.5
Chittagong City Corporation Slum	99.1	94.3	94.3	91.9	91.9	85.0	85.0	72.4	70.8

Tale 4a: Valid Vaccination Coverage by Age of 12 Months by District and City Corporation (Fully Vaccinated Arranged in Ascending Order by All Districts)

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Dhaka North City Corporation	99.8	96.5	96.5	95.8	95.8	82.2	82.2	75.2	67.1
Dhaka South City Corporation	99.6	97.9	97.9	96.7	96.7	84.5	84.5	74.3	68.0
Sunamganj	97.7	94.1	94.1	91.7	91.7	81.6	81.6	74.7	68.5
Narayanganj City Corporation	99.4	97.5	97.5	97.2	97.2	85.9	85.9	76.6	69.6
Sylhet City Corporation	96.6	92.7	92.7	90.1	90.1	77.8	77.8	78.5	70.0
Khulna City Corporation	98.3	95.1	95.1	92.6	92.6	85.4	85.4	78.0	72.5
Dhaka	97.8	95.8	95.8	91.5	91.5	80.1	80.1	80.3	72.5
Gazipur City Corporation	99.7	98.5	98.5	97.8	97.8	85.9	85.9	81.9	73.2
Jamalpur	99.3	98.9	98.9	97.2	97.2	88.2	88.2	79.8	74.5
Rangpur City Corporation	100.0	98.2	98.2	95.2	95.2	87.9	87.9	81.2	76.6
Narayanganj	99.4	96.5	96.5	95.5	95.5	86.1	86.1	84.9	76.7
Comilla	100.0	96.9	96.9	95.9	95.9	85.4	85.4	85.6	77.5
Kishoreganj	99.5	97.4	97.4	96.6	96.6	89.1	89.1	82.6	78.1
Narail	99.2	97.7	97.7	96.9	96.9	90.2	90.2	83.0	78.8
Natore	99.0	99.0	99.0	97.3	97.3	88.0	88.0	85.9	79.1
Gopalganj	99.3	95.9	95.9	93.9	93.9	87.8	87.8	83.8	79.1
Feni	100.0	99.4	99.4	99.0	99.0	90.3	90.3	85.9	79.6
Patuakhali	99.5	97.4	97.4	96.2	96.2	89.7	89.7	85.6	79.9
Narsingdhi	99.8	97.5	97.5	96.5	96.5	89.5	89.5	86.0	80.0
Comilla City Corporation	99.6	94.5	94.5	93.4	93.4	87.5	87.5	84.4	80.2
Joypurhat	100.0	99.5	99.5	99.2	99.2	88.6	88.6	89.6	80.4
Thakurgoan	99.8	96.8	96.8	94.3	94.3	84.9	84.9	88.7	80.6
Khagrachari	99.6	99.0	99.0	98.0	98.0	90.9	90.9	84.7	80.6
Rangpur	99.5	98.3	98.3	98.2	98.2	90.2	90.2	86.2	80.8
Bandarban	99.0	96.3	96.3	94.8	94.8	87.8	87.8	86.3	80.9
Satkhira	99.6	96.2	96.2	95.7	95.7	90.7	90.7	87.6	80.9
Sherpur	98.4	96.4	96.4	95.6	95.6	88.5	88.5	85.1	81.0
Chittagong City Corporation	99.1	95.1	95.1	93.6	93.6	88.0	88.0	86.0	81.1
Rangamati	98.0	93.9	93.9	92.2	92.2	86.6	86.6	85.3	81.3
Lakshmipur	99.2	98.2	98.2	97.7	97.7	88.9	88.9	88.8	81.4
Kurigram	100.0	99.8	99.8	99.4	99.4	91.9	91.9	86.3	81.5
Madaripur	100.0	97.3	97.3	95.6	95.6	90.0	90.0	85.7	81.5
Rajbari	100.0	98.4	98.4	98.0	98.0	91.5	91.5	87.2	81.6
Netrokona	99.7	97.3	97.3	96.5	96.5	89.3	89.3	87.4	81.7
Jhenaidah	99.7	99.4	99.4	99.0	99.0	91.3	91.3	87.6	81.8
Gaibandha	99.7	97.4	97.4	96.6	96.6	92.6	92.6	85.7	82.0
Meherpur	100.0	97.9	97.9	97.0	97.0	88.4	88.4	89.2	82.2
Barisal City Corporation	99.8	98.0	98.0	97.5	97.5	90.9	90.9	87.3	82.3
Nilphamari	100.0	98.7	98.7	97.3	97.3	89.5	89.5	88.3	82.8
Sariatpur	99.8	97.8	97.8	98.3	98.3	92.6	92.6	87.3	82.8

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Gazipur	100.0	97.4	97.4	97.2	97.2	90.1	90.1	87.1	83.0
Tangail	99.2	97.8	97.8	96.5	96.5	90.6	90.6	88.6	83.4
Lalmonirhat	100.0	98.5	98.5	98.2	98.2	91.8	91.8	88.8	83.4
Cox's Bazar	100.0	98.1	98.1	98.4	98.4	92.3	92.3	87.5	83.4
Moulvi Bazar	99.6	98.0	98.0	97.8	97.8	92.4	92.4	87.7	83.6
Panchagarh	100.0	96.3	96.3	96.9	96.9	88.9	88.9	91.4	83.7
Khulna	99.6	93.4	93.4	94.2	94.2	89.3	89.3	88.6	83.7
Sylhet	99.5	98.8	98.8	97.4	97.4	90.5	90.5	88.5	83.8
Sirajganj	98.3	97.5	97.5	96.4	96.4	91.4	91.4	86.9	83.8
Magura	98.9	94.3	94.3	95.1	95.1	88.8	88.8	90.2	84.0
Jhalokati	99.8	99.0	99.0	98.5	98.5	92.0	92.0	88.4	84.1
Noakhali	98.5	97.8	97.8	96.5	96.5	91.0	91.0	87.7	84.1
Faridpur	99.6	94.8	94.8	95.3	95.3	91.4	91.4	86.9	84.3
Chapai Nawabganj	100.0	99.2	99.2	98.2	98.2	90.5	90.5	89.9	84.3
Habiganj	98.6	97.1	97.1	96.6	96.6	91.0	91.0	87.6	84.4
Rajshahi	100.0	98.4	98.4	97.6	97.6	92.5	92.5	88.7	84.8
Pabna	100.0	98.2	98.2	98.2	98.2	92.0	92.0	90.7	85.6
Jessore	100.0	98.0	98.0	97.6	97.6	91.7	91.7	89.7	85.7
Chandpur	100.0	99.8	99.8	99.2	99.2	91.0	91.0	92.5	85.8
Dinajpur	100.0	97.9	97.9	97.7	97.7	91.4	91.4	91.9	85.9
Chuadanga	99.4	99.0	99.0	98.2	98.2	91.9	91.9	91.7	86.4
Bogra	99.8	98.7	98.7	97.8	97.8	93.6	93.6	89.0	86.5
Bagerhat	98.2	97.4	97.4	96.8	96.8	90.8	90.8	90.3	86.8
Mymensingh	99.7	99.2	99.2	99.2	99.2	93.1	93.1	91.8	86.9
Perojpur	99.7	99.3	99.3	98.6	98.6	94.3	94.3	90.4	87.0
Munshiganj	100.0	99.5	99.5	99.3	99.3	95.1	95.1	91.2	87.3
Barguna	99.7	98.8	98.8	97.9	97.9	93.0	93.0	91.0	87.6
Naogaon	99.6	98.8	98.8	98.8	98.8	93.9	93.9	91.5	88.0
Chittagong	100.0	99.5	99.5	99.4	99.4	92.9	92.9	94.3	88.0
Manikganj	100.0	98.3	98.3	98.8	98.8	93.9	93.9	94.4	89.7
Barisal	99.7	99.1	99.1	99.3	99.3	95.5	95.5	93.1	91.0
Bhola	99.8	99.8	99.8	99.8	99.8	94.5	94.5	95.4	91.3
Brahmanbaria	100.0	98.1	98.1	97.8	97.8	95.1	95.1	94.2	91.5
Kushtia	100.0	99.4	99.4	99.6	99.6	95.2	95.2	96.5	92.6
Rajshahi City Corporation	100.0	99.8	99.8	99.8	99.8	97.1	97.1	95.9	93.0
National	**99.5**	**97.8**	**97.8**	**97.0**	**97.0**	**90.1**	**90.1**	**87.5**	**82.3**
Urban	99.5	97.4	97.4	96.2	96.2	87.7	87.7	82.8	77.1
Rural	99.5	97.9	97.9	97.2	97.2	90.6	90.6	88.5	83.5
Dhaka City Corporation Slum	98.8	93.9	93.9	93.2	93.2	82.3	82.3	74.5	67.5
Chittagong City Corporation Slum	99.1	94.3	94.3	91.9	91.9	85.0	85.0	72.4	70.8

Table 4b: Valid Vaccination Coverage by Age of 12 Months by District and City Corporation

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Patuakhali	99.5	97.4	97.4	96.2	96.2	89.7	89.7	85.6	79.9
Barisal City Corporation	99.8	98.0	98.0	97.5	97.5	90.9	90.9	87.3	82.3
Jhalokati	99.8	99.0	99.0	98.5	98.5	92.0	92.0	88.4	84.1
Perojpur	99.7	99.3	99.3	98.6	98.6	94.3	94.3	90.4	87.0
Barguna	99.7	98.8	98.8	97.9	97.9	93.0	93.0	91.0	87.6
Barisal	99.7	99.1	99.1	99.3	99.3	95.5	95.5	93.1	91.0
Bhola	99.8	99.8	99.8	99.8	99.8	94.5	94.5	95.4	91.3
Barisal Division	**99.7**	**98.9**	**98.9**	**98.5**	**98.5**	**93.5**	**93.5**	**91.2**	**87.5**
Comilla	100.0	96.9	96.9	95.9	95.9	85.4	85.4	85.6	77.5
Feni	100.0	99.4	99.4	99.0	99.0	90.3	90.3	85.9	79.6
Comilla City Corporation	99.6	94.5	94.5	93.4	93.4	87.5	87.5	84.4	80.2
Khagrachari	99.6	99.0	99.0	98.0	98.0	90.9	90.9	84.7	80.6
Bandarban	99.0	96.3	96.3	94.8	94.8	87.8	87.8	86.3	80.9
Chittagong City Corporation	99.1	95.1	95.1	93.6	93.6	88.0	88.0	86.0	81.1
Rangamati	98.0	93.9	93.9	92.2	92.2	86.6	86.6	85.3	81.3
Lakshmipur	99.2	98.2	98.2	97.7	97.7	88.9	88.9	88.8	81.4
Cox's Bazar	100.0	98.1	98.1	98.4	98.4	92.3	92.3	87.5	83.4
Noakhali	98.5	97.8	97.8	96.5	96.5	91.0	91.0	87.7	84.1
Chandpur	100.0	99.8	99.8	99.2	99.2	91.0	91.0	92.5	85.8
Chittagong	100.0	99.5	99.5	99.4	99.4	92.9	92.9	94.3	88.0
Brahmanbaria	100.0	98.1	98.1	97.8	97.8	95.1	95.1	94.2	91.5
Chittagong Division	**99.6**	**97.8**	**97.8**	**97.1**	**97.1**	**90.2**	**90.2**	**89.1**	**83.5**
Dhaka North City Corporation	99.8	96.5	96.5	95.8	95.8	82.2	82.2	75.2	67.1
Dhaka South City Corporation	99.6	97.9	97.9	96.7	96.7	84.5	84.5	74.3	68.0
Narayanganj City Corporation	99.4	97.5	97.5	97.2	97.2	85.9	85.9	76.6	69.6
Dhaka	97.8	95.8	95.8	91.5	91.5	80.1	80.1	80.3	72.5
Gazipur City Corporation	99.7	98.5	98.5	97.8	97.8	85.9	85.9	81.9	73.2
Narayanganj	99.4	96.5	96.5	95.5	95.5	86.1	86.1	84.9	76.7
Kishoreganj	99.5	97.4	97.4	96.6	96.6	89.1	89.1	82.6	78.1
Gopalganj	99.3	95.9	95.9	93.9	93.9	87.8	87.8	83.8	79.1
Narsingdhi	99.8	97.5	97.5	96.5	96.5	89.5	89.5	86.0	80.0
Madaripur	100.0	97.3	97.3	95.6	95.6	90.0	90.0	85.7	81.5
Rajbari	100.0	98.4	98.4	98.0	98.0	91.5	91.5	87.2	81.6
Sariatpur	99.8	97.8	97.8	98.3	98.3	92.6	92.6	87.3	82.8
Gazipur	100.0	97.4	97.4	97.2	97.2	90.1	90.1	87.1	83.0
Tangail	99.2	97.8	97.8	96.5	96.5	90.6	90.6	88.6	83.4
Faridpur	99.6	94.8	94.8	95.3	95.3	91.4	91.4	86.9	84.3
Munshiganj	100.0	99.5	99.5	99.3	99.3	95.1	95.1	91.2	87.3
Manikganj	100.0	98.3	98.3	98.8	98.8	93.9	93.9	94.4	89.7
Dhaka Division	**99.4**	**97.1**	**97.1**	**95.8**	**95.8**	**87.6**	**87.6**	**83.7**	**77.9**
Khulna City Corporation	98.3	95.1	95.1	92.6	92.6	85.4	85.4	78.0	72.5
Narail	99.2	97.7	97.7	96.9	96.9	90.2	90.2	83.0	78.8
Satkhira	99.6	96.2	96.2	95.7	95.7	90.7	90.7	87.6	80.9

District/City Corporation	BCG	OPV1	Penta1	OPV2	Penta2	OPV3	Penta3	MR1	FVC
Jhenaidah	99.7	99.4	99.4	99.0	99.0	91.3	91.3	87.6	81.8
Meherpur	100.0	97.9	97.9	97.0	97.0	88.4	88.4	89.2	82.2
Khulna	99.6	93.4	93.4	94.2	94.2	89.3	89.3	88.6	83.7
Magura	98.9	94.3	94.3	95.1	95.1	88.8	88.8	90.2	84.0
Jessore	100.0	98.0	98.0	97.6	97.6	91.7	91.7	89.7	85.7
Chuadanga	99.4	99.0	99.0	98.2	98.2	91.9	91.9	91.7	86.4
Bagerhat	98.2	97.4	97.4	96.8	96.8	90.8	90.8	90.3	86.8
Kushtia	100.0	99.4	99.4	99.6	99.6	95.2	95.2	96.5	92.6
Khulna Division	**99.5**	**97.3**	**97.3**	**97.0**	**97.0**	**91.0**	**91.0**	**89.4**	**84.5**
Jamalpur	99.3	98.9	98.9	97.2	97.2	88.2	88.2	79.8	74.5
Sherpur	98.4	96.4	96.4	95.6	95.6	88.5	88.5	85.1	81.0
Netrokona	99.7	97.3	97.3	96.5	96.5	89.3	89.3	87.4	81.7
Mymensingh	99.7	99.2	99.2	99.2	99.2	93.1	93.1	91.8	86.9
Mymensingh Division	**99.4**	**98.4**	**98.4**	**97.8**	**97.8**	**90.7**	**90.7**	**87.5**	**82.5**
Natore	99.0	99.0	99.0	97.3	97.3	88.0	88.0	85.9	79.1
Joypurhat	100.0	99.5	99.5	99.2	99.2	88.6	88.6	89.6	80.4
Sirajganj	98.3	97.5	97.5	96.4	96.4	91.4	91.4	86.9	83.8
Chapai Nawabganj	100.0	99.2	99.2	98.2	98.2	90.5	90.5	89.9	84.3
Rajshahi	100.0	98.4	98.4	97.6	97.6	92.5	92.5	88.7	84.8
Pabna	100.0	98.2	98.2	98.2	98.2	92.0	92.0	90.7	85.6
Bogra	99.8	98.7	98.7	97.8	97.8	93.6	93.6	89.0	86.5
Naogaon	99.6	98.8	98.8	98.8	98.8	93.9	93.9	91.5	88.0
Rajshahi City Corporation	100.0	99.8	99.8	99.8	99.8	97.1	97.1	95.9	93.0
Rajshahi Division	**99.5**	**98.5**	**98.5**	**97.8**	**97.8**	**92.0**	**92.0**	**89.1**	**84.9**
Rangpur City Corporation	100.0	98.2	98.2	95.2	95.2	87.9	87.9	81.2	76.6
Thakurgoan	99.8	96.8	96.8	94.3	94.3	84.9	84.9	88.7	80.6
Rangpur	99.5	98.3	98.3	98.2	98.2	90.2	90.2	86.2	80.8
Kurigram	100.0	99.8	99.8	99.4	99.4	91.9	91.9	86.3	81.5
Gaibandha	99.7	97.4	97.4	96.6	96.6	92.6	92.6	85.7	82.0
Nilphamari	100.0	98.7	98.7	97.3	97.3	89.5	89.5	88.3	82.8
Lalmonirhat	100.0	98.5	98.5	98.2	98.2	91.8	91.8	88.8	83.4
Panchagarh	100.0	96.3	96.3	96.9	96.9	88.9	88.9	91.4	83.7
Dinajpur	100.0	97.9	97.9	97.7	97.7	91.4	91.4	91.9	85.9
Rangpur Division	**99.9**	**98.1**	**98.1**	**97.5**	**97.5**	**90.5**	**90.5**	**88.0**	**82.5**
Sunamganj	97.7	94.1	94.1	91.7	91.7	81.6	81.6	74.7	68.5
Sylhet City Corporation	96.6	92.7	92.7	90.1	90.1	77.8	77.8	78.5	70.0
Moulvi Bazar	99.6	98.0	98.0	97.8	97.8	92.4	92.4	87.7	83.6
Sylhet	99.5	98.8	98.8	97.4	97.4	90.5	90.5	88.5	83.8
Habiganj	98.6	97.1	97.1	96.6	96.6	91.0	91.0	87.6	84.4
Sylhet Division	**98.7**	**96.8**	**96.8**	**95.5**	**95.5**	**88.1**	**88.1**	**84.0**	**79.2**
National	**99.5**	**97.8**	**97.8**	**97.0**	**97.0**	**90.1**	**90.1**	**87.5**	**82.3**
Urban	99.5	97.4	97.4	96.2	96.2	87.7	87.7	82.8	77.1
Rural	99.5	97.9	97.9	97.2	97.2	90.6	90.6	88.5	83.5
Dhaka City Corporation Slum	98.8	93.9	93.9	93.2	93.2	82.3	82.3	74.5	67.5
Chittagong City Corporation Slum	99.1	94.3	94.3	91.9	91.9	85.0	85.0	72.4	70.8

Table 5: Vaccination Drop-out Rate for Penta1-Penta3 and Penta1-MR by Age of 23 Months by District and City Corporation

District/City Corporation	Dropout rate Penta1 to Penta3			Dropout rate Penta1 to MR1		
	Male	Female	Both	Male	Female	Both
Barguna	0.4	0.0	0.3	2.6	1.4	2.1
Barisal		0.0	0.0	0.0	0.0	0.0
Barisal CC	0.4	2.7	1.4	4.1	6.8	5.3
Bhola	0.0	0.0	0.0	0.0	0.0	0.0
Jhalokati	0.9	0.6	0.7	2.5	2.6	2.6
Patuakhali	1.5	2.0	1.7	4.9	5.9	5.4
Perojpur	0.6	0.9	0.7	1.9	1.6	1.8
Barisal Division	**0.5**	**0.6**	**0.5**	**1.8**	**1.8**	**1.8**
Bandarban	1.4	1.6	1.5	4.3	5.0	4.7
Brahmanbaria	0.0	0.7	0.3	1.9	1.8	1.9
Chandpur	0.0	0.0	0.0	0.3	1.2	0.8
Chittagong	0.0	0.4	0.2	0.8	0.4	0.6
Chittagong City Corporation	2.5	1.3	1.9	5.6	5.3	5.5
Comilla	0.5	2.0	1.3	1.4	5.6	3.5
Comilla City Corporation	1.2	0.4	0.8	2.2	1.5	1.9
Cox's Bazar	0.4	0.9	0.7	1.8	3.6	2.7
Feni	1.3	0.4	0.9	4.6	4.1	4.4
Khagrachari	1.2	0.5	0.9	4.5	5.8	5.1
Lakshmipur	0.4	0.4	0.4	1.2	2.1	1.7
Noakhali	1.5	2.0	1.8	3.9	4.1	4.0
Rangamati	1.8	2.0	1.9	5.0	3.2	4.1
Chittagong Division	**0.7**	**1.1**	**0.9**	**2.2**	**3.2**	**2.7**
Dhaka	4.9	6.5	5.7	11.6	8.9	10.3
Dhaka North City Corporation	3.0	0.5	1.8	8.5	10.0	9.2
Dhaka South City Corporation	2.3	3.4	2.8	8.1	7.1	7.6
Faridpur	1.0	0.0	0.6	3.6	1.8	2.7
Gazipur	2.2	0.4	1.3	3.7	4.0	3.9
Gazipur City Corporation	2.5	1.0	1.8	7.1	5.3	6.2
Gopalganj	1.4	3.2	2.4	7.0	7.4	7.2
Kishoreganj	2.1	0.7	1.5	3.5	4.7	4.0
Madaripur	1.4	2.0	1.7	4.4	6.7	5.6
Manikganj	0.3	0.0	0.2	1.2	0.4	0.9
Munshiganj	1.0	0.0	0.5	1.7	2.2	1.9
Narayanganj	1.5	1.1	1.3	4.4	5.3	4.8
Narayanganj City Corporation	2.5	1.5	2.0	5.3	3.1	4.2
Narsingdhi	3.2	0.9	2.2	7.4	2.4	5.2
Rajbari	2.6	0.7	1.6	3.8	3.1	3.4
Sariatpur	0.0	0.0	0.0	1.4	0.4	1.0
Tangail	3.6	0.9	2.3	6.1	4.3	5.2
Dhaka Division	**2.6**	**1.8**	**2.2**	**6.3**	**5.6**	**5.9**
Bagerhat	3.1	0.8	1.9	4.9	1.8	3.4
Chuadanga	0.4	1.9	1.2	0.8	5.2	3.1
Jessore	1.6	1.2	1.4	6.0	3.1	4.5
Jhenaidah	0.7	0.7	0.7	2.5	3.1	2.8

District/City Corporation	Dropout rate Penta1 to Penta3			Dropout rate Penta1 to MR1		
	Male	Female	Both	Male	Female	Both
Khulna	0.5	0.8	0.7	3.6	2.7	3.1
Khulna City Corporation	3.3	4.5	3.9	7.0	11.2	9.2
Kushtia		0.4	0.2		0.4	0.2
Magura	1.2	0.0	0.6	3.6		1.8
Meherpur	2.3	0.4	1.3	4.2	2.7	3.4
Narail	3.4	1.7	2.5	5.9	9.3	7.6
Satkhira	0.9	0.9	0.9	2.3	2.5	2.4
Khulna Division	**1.3**	**1.0**	**1.2**	**3.4**	**3.1**	**3.3**
Jamalpur	1.3	3.5	2.4	10.9	9.8	10.4
Mymensingh	0.4	0.8	0.6	1.3	3.5	2.4
Netrokona	1.4	0.8	1.1	3.4	2.9	3.2
Sherpur	0.7	3.6	2.1	5.3	7.7	6.5
Mymensingh Division	**0.8**	**1.8**	**1.3**	**4.3**	**5.4**	**4.8**
Bogra	1.2	1.6	1.4	3.6	3.0	3.3
Joypurhat	0.0	0.9	0.4	0.4	2.4	1.4
Natore	1.3	3.4	2.3	5.1	6.2	5.6
Naogaon	0.4	0.8	0.6	2.6	2.8	2.7
Chapai Nawabganj	1.1	2.5	1.8	4.3	6.0	5.1
Pabna	0.9	1.4	1.2	2.9	2.4	2.7
Rajshahi	0.0	1.3	0.6	2.2	1.8	2.0
Rajshahi City Corporation	0.0	0.0	0.0	0.9	0.4	0.6
Sirajganj	3.2	1.4	2.3	4.4	5.5	4.9
Rajshahi Division	**1.2**	**1.6**	**1.4**	**3.3**	**3.7**	**3.5**
Dinajpur	0.3	1.2	0.8	3.3	2.4	2.9
Gaibandha	1.8	1.0	1.4	7.3	7.9	7.6
Kurigram	0.0	1.7	0.7	0.9	4.2	2.4
Lalmonirhat	0.6	0.5	0.6	3.7	3.9	3.8
Nilphamari	0.7	3.0	1.8	1.4	7.4	4.2
Panchagarh	0.3	0.0	0.2	1.4	0.4	0.9
Rangpur	0.7	1.2	0.9	6.1	4.0	5.2
Rangpur City Corporation	3.5	3.0	3.3	7.6	5.4	6.5
Thakurgoan	0.0	0.9	0.4	2.0	1.8	1.9
Rangpur Division	**0.7**	**1.3**	**1.0**	**3.6**	**4.4**	**4.0**
Habiganj	1.3	2.6	2.0	2.6	4.6	3.7
Moulvi Bazar	1.2	2.4	1.7	2.5	4.3	3.3
Sunamganj	2.8	3.4	3.1	5.3	7.1	6.1
Sylhet	2.4	2.7	2.6	4.4	4.6	4.5
Sylhet City Corporation	4.0	4.7	4.3	8.7	9.0	8.9
Sylhet Division	**2.1**	**2.9**	**2.5**	**4.0**	**5.3**	**4.6**
National	**1.4**	**1.5**	**1.4**	**3.9**	**4.1**	**4.0**
Urban	2.2	2.1	2.0	5.6	6.3	6.2
Rural	1.1	1.2	1.3	3.2	3.3	3.4
Dhaka City Corporation Slum	4.0	3.0	3.5	7.5	8.6	8.0
Chittagong City Corporation Slum	6.9	3.6	5.2	12.8	9.9	11.3

Table 6: Incidence of Invalid Penta 1, Penta 2, Penta 3, MR Doses by Age of 12 Months by District and City Corporation

District/ City Corporation	Invalid Penta1	Invalid Penta2	Invalid Penta3	Invalid MR1
Barguna	2.2	2.9	3.9	2.3
Barisal	1.9	2.3	3.3	2.8
Barisal CC	2.9	4.1	5.7	4.2
Bhola	2.5	3.6	5.2	3.3
Jhalokati	3.9	4.7	6.1	4.2
Patuakhali	1.7	3.7	6.1	3.0
Perojpur	2.1	3.5	4.6	2.9
Barisal Division	**2.2**	**3.3**	**4.7**	**3.0**
Bandarban	4.3	7.2	8.5	4.8
Brahmanbaria	0.7	1.5	2.4	1.1
Chandpur	5.1	6.9	8.3	2.4
Chittagong	3.0	4.4	6.4	1.8
Chittagong City Corporation	1.8	2.9	5.7	2.2
Comilla	5.9	8.0	10.6	3.6
Comilla City Corporation	3.4	5.6	8.2	5.0
Cox's Bazar	3.1	3.6	5.3	5.4
Feni	4.4	5.8	7.7	5.7
Khagrachari	2.5	3.9	7.0	4.5
Lakshmipur	3.1	5.2	8.6	4.3
Noakhali	3.6	4.9	5.0	3.2
Rangamati	1.8	3.3	4.6	2.7
Chittagong Division	**3.5**	**5.0**	**6.8**	**3.1**
Dhaka	5.3	7.0	10.2	1.8
Dhaka North City Corporation	8.2	10.1	12.7	6.0
Dhaka South City Corporation	3.8	10.0	11.5	10.0
Faridpur	1.5	2.3	3.4	2.2
Gazipur	3.5	5.4	6.5	2.4
Gazipur City Corporation	3.4	6.6	9.9	3.4
Gopalganj	2.5	4.4	5.6	1.8
Kishoreganj	2.4	4.6	5.5	4.9
Madaripur	3.4	4.6	5.3	2.4
Manikganj	2.8	3.5	4.7	2.6
Munshiganj	1.8	3.0	3.9	2.6
Narayanganj	4.9	6.6	8.9	3.7
Narayanganj City Corporation	2.4	5.8	10.0	7.0
Narsingdhi	2.9	5.1	7.1	3.3
Rajbari	2.3	4.5	5.7	4.5
Sariatpur	2.4	3.2	6.6	4.5
Tangail	2.1	3.2	4.9	0.7
Dhaka Division	**3.5**	**5.4**	**7.4**	**3.3**
Bagerhat	1.4	3.1	4.7	2.6
Chuadanga	2.3	4.2	5.9	1.6

District/ City Corporation	Invalid Penta1	Invalid Penta2	Invalid Penta3	Invalid MR1
Jessore	2.0	2.9	4.9	1.6
Jhenaidah	2.0	5.3	7.2	4.5
Khulna	1.9	3.6	5.4	3.0
Khulna City Corporation	3.3	4.4	5.7	1.6
Kushtia	1.2	2.2	4.2	1.6
Magura	1.3	3.8	6.5	2.3
Meherpur	2.8	5.7	8.7	4.3
Narail	2.8	4.1	5.4	2.4
Satkhira	1.4	4.0	5.3	5.6
Khulna Division	**1.9**	**3.7**	**5.5**	**2.8**
Jamalpur	4.0	6.3	8.3	5.9
Mymensingh	3.2	4.6	5.6	2.8
Netrokona	4.0	5.1	7.1	3.9
Sherpur	2.1	5.3	6.8	2.2
Mymensingh Division	**3.3**	**5.2**	**6.6**	**3.5**
Bogra	1.6	2.4	3.8	3.0
Joypurhat	4.2	7.1	10.3	4.6
Natore	5.5	6.3	8.5	2.2
Naogaon	2.4	3.3	4.4	1.9
Chapai Nawabganj	2.8	4.8	7.2	2.1
Pabna	2.1	3.1	5.0	4.1
Rajshahi	2.6	4.6	5.7	4.2
Rajshahi City Corporation	1.8	2.2	2.7	1.0
Sirajganj	2.3	3.1	4.3	4.0
Rajshahi Division	**2.6**	**3.8**	**5.3**	**3.2**
Dinajpur	3.1	4.4	6.4	1.8
Gaibandha	2.3	3.1	4.0	1.3
Kurigram	3.9	4.5	7.3	4.8
Lalmonirhat	1.6	3.7	6.5	2.1
Nilphamari	3.0	4.8	7.0	3.5
Panchagarh	2.9	4.4	7.4	2.7
Rangpur	4.8	5.6	7.6	3.5
Rangpur City Corporation	3.4	5.2	8.1	3.7
Thakurgoan	5.1	8.5	11.0	3.1
Rangpur Division	**1.5**	**2.3**	**4.2**	**3.5**
Habiganj	3.4	4.7	6.9	2.9
Moulvi Bazar	2.8	3.9	5.0	2.6
Sunamganj	3.2	6.3	9.6	5.4
Sylhet	2.4	3.4	5.1	3.4
Sylhet City Corporation	5.6	9.7	12.5	2.4
Sylhet Division	**2.6**	**4.2**	**6.3**	**3.8**
National	**3.0**	**4.6**	**6.4**	**3.2**
Urban	3.4	5.4	7.9	3.9
Rural	2.9	4.4	6.1	3.0
Dhaka City Corporation Slum	3.2	5.4	10.2	5.2
Chittagong City Corporation Slum	0.9	2.8	3.4	1.6

Table 7: Measles Second Dose (MSD) Vaccination Coverage among 18-29 Month-old Children by District and City Corporation

District/City Corporation	Crude MR2	Valid by 18 Months	Valid by 23 Months
Barguna	90.5	80.7	86.6
Barisal	98.7	92.1	96.6
Barisal CC	88.6	80.0	83.3
Bhola	99.0	91.4	94.3
Jhalokati	85.5	75.2	82.5
Patuakhali	88.1	77.8	82.6
Perojpur	93.4	87.1	90.6
Barisal Division	**93.8**	**85.7**	**90.1**
Bandarban	82.0	71.2	76.7
Brahmanbaria	96.0	92.6	95.2
Chandpur	94.9	84.8	90.8
Chittagong	96.8	85.9	92.1
Chittagong City Corporation	83.8	73.0	81.3
Comilla	67.4	53.3	64.1
Comilla City Corporation	92.1	79.5	88.5
Cox's Bazar	90.2	75.3	84.6
Feni	93.5	84.4	89.9
Khagrachari	84.8	74.2	80.3
Lakshmipur	87.5	77.8	85.4
Noakhali	87.1	77.4	82.9
Rangamati	86.0	74.3	83.5
Chittagong Division	**83.1**	**73.2**	**80.7**
Dhaka	91.0	80.7	87.5
Dhaka North City Corporation	70.4	66.5	68.9
Dhaka South City Corporation	74.9	56.2	67.3
Faridpur	79.9	63.0	74.8
Gazipur	76.7	63.4	70.2
Gazipur City Corporation	84.8	72.9	82.4
Gopalganj	87.9	79.1	84.0
Kishoreganj	84.2	68.0	78.8
Madaripur	83.5	73.9	80.1
Manikganj	85.3	74.1	79.9
Munshiganj	88.4	75.0	84.1
Narayanganj	94.8	87.9	91.7
Narayanganj City Corporation	93.9	85.3	91.2
Narsingdhi	82.1	71.7	78.5
Rajbari	90.5	73.4	84.0
Sariatpur	62.2	54.8	58.8
Tangail	89.9	77.2	84.7
Dhaka Division	**83.7**	**72.9**	**79.9**
Bagerhat	83.4	76.0	80.4
Chuadanga	79.3	70.5	76.0
Jessore	93.2	86.9	90.9
Jhenaidah	88.5	83.3	87.1

District/City Corporation	Crude MR2	Valid by 18 Months	Valid by 23 Months
Khulna	87.8	78.2	83.5
Khulna City Corporation	89.9	73.5	85.2
Kushtia	82.5	76.2	79.6
Magura	73.9	63.4	70.5
Meherpur	94.7	88.5	93.4
Narail	81.0	73.7	77.4
Satkhira	84.3	74.8	79.7
Khulna Division	**85.5**	**73.7**	**79.9**
Jamalpur	89.2	80.0	83.9
Mymensingh	87.7	79.0	84.3
Netrokona	79.1	68.4	75.2
Sherpur	90.9	85.1	88.1
Mymensingh Division	**93.5**	**85.7**	**91.5**
Bogra	83.3	75.4	80.5
Joypurhat	87.9	80.4	85.0
Natore	88.4	82.9	86.3
Naogaon	93.4	86.4	89.7
Chapai Nawabganj	87.9	77.3	83.5
Pabna	90.4	83.5	87.0
Rajshahi	90.2	84.8	88.0
Rajshahi City Corporation	85.0	78.8	83.7
Sirajganj	93.2	83.3	90.5
Rajshahi Division	**98.3**	**94.0**	**95.4**
Dinajpur	83.5	75.1	81.1
Gaibandha	88.5	81.3	85.9
Kurigram	92.8	85.4	90.1
Lalmonirhat	82.3	74.9	81.0
Nilphamari	92.8	83.5	87.7
Panchagarh	81.8	74.1	78.0
Rangpur	92.6	84.0	86.0
Rangpur City Corporation	93.4	83.2	88.7
Thakurgoan	83.6	76.2	80.9
Rangpur Division	**81.1**	**70.5**	**76.7**
Habiganj	93.7	79.6	87.4
Moulvi Bazar	88.8	80.1	84.9
Sunamganj	87.8	81.7	84.9
Sylhet	90.9	79.2	84.6
Sylhet City Corporation	76.0	64.6	69.7
Sylhet Division	**90.1**	**79.6**	**84.2**
National	**86.4**	**77.6**	**83.0**
Urban	83.7	72.4	80.0
Rural	87.0	78.7	83.7
Dhaka City Corporation Slum	74.9	56.2	67.3
Chittagong City Corporation Slum	67.4	53.3	64.1

Table 8: Crude TT Vaccination Coverage among Mothers with Children 0-11 Months Old Children by District and City Corporation

District/City Corporation	Crude TT1	Crude TT2	Crude TT3	Crude TT4	Crude TT5
Barguna	98.8	97.4	89.2	71.6	51.9
Barisal	100.0	100.0	97.0	79.9	67.3
Barisal CC	99.4	99.4	91.9	79.6	66.1
Bhola	100.0	100.0	94.3	82.1	64.9
Jhalokati	98.3	96.9	91.3	78.2	64.8
Patuakhali	95.9	94.9	82.7	68.3	53.9
Perojpur	99.0	97.9	90.2	71.7	53.2
Barisal Division	**98.9**	**98.3**	**91.6**	**76.4**	**60.9**
Bandarban	94.8	92.2	87.4	80.2	68.1
Brahmanbaria	99.7	99.1	97.3	86.8	70.8
Chandpur	99.0	99.0	94.4	82.5	71.9
Chittagong	100.0	98.8	93.8	86.8	75.8
Chittagong City Corporation	99.3	98.0	88.1	73.6	63.3
Comilla	99.3	99.3	92.4	78.6	63.9
Comilla City Corporation	99.2	98.8	91.9	81.6	67.7
Cox's Bazar	97.8	97.4	93.2	87.3	78.7
Feni	98.1	95.8	87.7	77.6	60.7
Khagrachari	99.6	99.0	93.3	78.0	61.8
Lakshmipur	97.1	95.1	83.0	69.2	47.6
Noakhali	96.7	95.6	89.3	75.4	58.6
Rangamati	96.8	94.3	84.9	66.3	57.8
Chittagong Division	**98.7**	**97.9**	**91.7**	**80.3**	**66.5**
Dhaka	96.6	94.2	84.7	71.2	60.1
Dhaka North City Corporation	93.7	91.5	78.2	64.7	50.2
Dhaka South City Corporation	98.9	97.8	89.8	75.2	65.8
Faridpur	97.6	95.5	88.0	78.9	63.4
Gazipur	98.5	97.5	89.6	74.7	55.0
Gazipur City Corporation	98.0	95.9	83.5	69.2	55.6
Gopalganj	94.2	90.6	81.7	66.4	53.8
Kishoreganj	99.5	99.5	86.9	76.5	64.8
Madaripur	97.6	97.4	91.2	78.5	65.1
Manikganj	98.9	96.8	88.9	72.9	54.8
Munshiganj	98.6	97.9	92.7	85.0	73.2
Narayanganj	97.5	97.3	86.9	76.6	59.3
Narayanganj City Corporation	99.6	99.2	92.1	82.6	64.2
Narsingdhi	97.3	96.7	92.2	83.1	67.2
Rajbari	99.3	98.6	94.2	79.2	66.3
Sariatpur	98.0	97.2	92.9	83.2	73.9
Tangail	98.1	97.0	89.2	76.2	61.4
Dhaka Division	**97.4**	**95.9**	**86.7**	**74.3**	**60.6**
Bagerhat	98.1	97.8	85.6	66.0	44.3
Chuadanga	100.0	99.2	93.8	81.1	63.4
Jessore	99.5	99.3	95.0	81.9	67.3

District/City Corporation	Crude TT1	Crude TT2	Crude TT3	Crude TT4	Crude TT5
Jhenaidah	99.5	99.2	91.9	83.2	65.1
Khulna	98.6	94.3	82.6	68.1	58.2
Khulna City Corporation	96.7	94.0	83.8	68.8	56.6
Kushtia	99.3	97.9	91.8	81.3	62.2
Magura	99.2	98.5	88.9	75.6	61.6
Meherpur	97.3	94.9	84.2	67.6	52.5
Narail	96.1	93.9	84.4	69.1	54.7
Satkhira	97.2	94.5	85.1	69.5	50.9
Khulna Division	**98.6**	**97.1**	**88.8**	**75.2**	**58.9**
Jamalpur	98.4	92.1	85.5	69.0	55.6
Mymensingh	99.2	96.7	89.8	80.0	66.1
Netrokona	97.7	96.6	91.4	81.5	62.1
Sherpur	98.9	98.1	90.6	76.0	63.0
Mymensingh Division	**98.7**	**95.9**	**89.4**	**77.5**	**62.7**
Bogra	100.0	98.2	92.2	81.9	70.0
Joypurhat	99.1	98.4	95.5	85.4	76.7
Natore	99.8	98.4	91.1	75.8	57.1
Naogaon	99.2	98.5	95.9	85.4	68.8
Chapai Nawabganj	98.4	96.5	90.4	75.6	58.6
Pabna	100.0	99.7	92.5	80.5	63.2
Rajshahi	96.0	92.0	87.7	76.9	62.7
Rajshahi City Corporation	100.0	100.0	96.9	86.5	72.2
Sirajganj	98.2	96.4	83.1	72.2	57.6
Rajshahi Division	**98.9**	**97.3**	**90.4**	**78.9**	**64.1**
Dinajpur	98.8	97.9	92.7	83.2	65.9
Gaibandha	97.6	96.2	89.8	75.4	60.3
Kurigram	99.4	98.8	89.4	71.1	55.2
Lalmonirhat	98.9	97.1	94.3	76.1	53.9
Nilphamari	100.0	100.0	96.7	89.1	74.6
Panchagarh	99.7	98.9	94.8	84.5	63.1
Rangpur	97.7	96.9	92.9	79.0	61.0
Rangpur City Corporation	98.5	95.3	88.4	80.4	65.5
Thakurgoan	98.8	98.3	93.8	84.9	70.9
Rangpur Division	**98.7**	**97.8**	**92.6**	**79.9**	**63.2**
Habiganj	97.3	95.9	91.1	78.9	69.0
Moulvi Bazar	95.7	94.9	89.8	78.0	64.8
Sunamganj	94.0	93.3	84.5	75.5	63.5
Sylhet	93.5	92.4	85.4	74.3	60.3
Sylhet City Corporation	89.3	87.5	80.0	73.0	69.2
Sylhet Division	**94.9**	**93.8**	**87.3**	**76.4**	**64.5**
National	**98.2**	**96.9**	**89.7**	**77.5**	**62.9**
Urban	98.0	96.5	87.9	75.3	61.5
Rural	98.2	97.0	90.2	78.0	63.3
Dhaka City Corporation Slum	98.4	93.2	79.3	64.0	50.2
Chittagong City Corporation Slum	95.6	94.9	84.9	65.3	51.5

Table 9: Valid TT Vaccination Coverage among Mothers with Children 0-11 Months Old Children by District and City Corporation

District/City Corporation	Valid TT1	Valid TT2	Valid TT3	Valid TT4	Valid TT5
Barguna	98.8	97.4	88.4	64.4	36.3
Barisal	100.0	100.0	96.7	79.3	60.0
Barisal CC	99.4	99.4	91.9	74.8	55.2
Bhola	100.0	100.0	94.1	79.0	56.1
Jhalokati	98.3	96.9	90.4	75.5	52.0
Patuakhali	95.9	94.9	82.0	58.7	38.1
Perojpur	99.0	97.9	89.9	67.6	47.0
Barisal Division	**98.9**	**98.3**	**91.1**	**72.2**	**50.4**
Bandarban	94.8	92.2	86.1	79.6	65.3
Brahmanbaria	99.7	99.1	96.9	85.9	67.9
Chandpur	99.0	99.0	93.7	79.5	63.6
Chittagong	100.0	98.5	93.8	85.9	68.9
Chittagong City Corporation	99.3	98.0	87.8	67.4	51.5
Comilla	99.3	99.0	91.1	76.0	57.7
Comilla City Corporation	99.2	98.8	91.6	74.5	53.5
Cox's Bazar	97.8	97.4	93.2	82.9	68.6
Feni	98.1	95.8	87.2	73.3	54.9
Khagrachari	99.6	99.0	91.4	74.7	53.4
Lakshmipur	97.1	95.1	82.7	63.5	38.5
Noakhali	96.7	95.6	88.2	69.1	42.9
Rangamati	96.8	94.3	84.5	63.6	53.2
Chittagong Division	**98.7**	**97.8**	**91.1**	**76.7**	**58.0**
Dhaka	96.6	94.2	84.3	65.8	48.4
Dhaka North City Corporation	93.7	91.5	76.8	55.9	31.3
Dhaka South City Corporation	98.9	97.8	89.8	65.4	42.6
Faridpur	97.6	95.2	87.5	74.9	49.9
Gazipur	98.5	97.5	88.8	69.6	49.0
Gazipur City Corporation	98.0	95.9	83.5	60.6	45.5
Gopalganj	94.2	90.6	81.7	63.9	44.7
Kishoreganj	99.5	99.5	86.9	73.0	54.5
Madaripur	97.6	97.4	90.2	71.5	53.4
Manikganj	98.9	96.8	88.1	69.7	48.8
Munshiganj	98.6	97.9	92.7	82.1	65.1
Narayanganj	97.5	97.3	86.9	71.8	49.6
Narayanganj City Corporation	99.6	99.2	92.1	80.7	60.4
Narsingdhi	97.3	96.7	92.0	77.5	56.6
Rajbari	99.3	98.6	93.8	75.9	53.7
Sariatpur	98.0	97.2	92.2	77.7	60.4
Tangail	98.1	96.6	89.2	74.3	55.3
Dhaka Division	**97.4**	**95.8**	**86.3**	**68.8**	**48.7**
Bagerhat	98.1	97.8	85.3	61.9	36.5
Chuadanga	100.0	99.2	92.8	74.4	44.7
Jessore	99.5	99.3	94.5	79.7	53.9

District/City Corporation	Valid TT1	Valid TT2	Valid TT3	Valid TT4	Valid TT5
Jhenaidah	99.5	99.2	91.9	79.8	57.0
Khulna	98.6	94.3	82.2	65.8	49.1
Khulna City Corporation	96.7	94.0	83.8	66.0	49.5
Kushtia	99.3	97.9	91.8	78.5	47.4
Magura	99.2	98.5	88.9	73.0	50.7
Meherpur	97.3	94.9	83.9	60.7	35.8
Narail	96.1	93.9	83.9	60.6	36.4
Satkhira	97.2	94.3	85.1	65.1	39.7
Khulna Division	**98.6**	**97.0**	**88.5**	**71.4**	**46.9**
Jamalpur	98.4	92.1	84.1	64.4	42.8
Mymensingh	99.2	96.7	89.8	77.6	53.1
Netrokona	97.7	96.6	91.4	79.0	55.6
Sherpur	98.9	98.1	90.6	74.1	49.2
Mymensingh Division	**98.7**	**95.9**	**89.1**	**74.7**	**50.9**
Bogra	100.0	98.2	91.4	75.3	58.0
Joypurhat	99.1	98.4	95.2	79.2	56.5
Natore	99.8	98.4	90.5	70.8	47.8
Naogaon	99.2	98.5	94.9	81.9	53.7
Chapai Nawabganj	98.4	96.2	90.4	72.1	47.8
Pabna	100.0	99.7	91.5	76.8	53.6
Rajshahi	96.0	92.0	87.7	75.2	52.4
Rajshahi City Corporation	100.0	100.0	96.9	85.5	67.7
Sirajganj	98.2	96.4	81.4	62.9	41.8
Rajshahi Division	**98.9**	**97.3**	**89.6**	**73.6**	**51.5**
Dinajpur	98.8	97.9	92.3	80.4	61.2
Gaibandha	97.6	96.2	88.2	70.4	51.9
Kurigram	99.4	98.8	86.3	66.4	48.4
Lalmonirhat	98.9	97.1	92.7	69.7	42.1
Nilphamari	100.0	100.0	96.3	85.0	61.0
Panchagarh	99.7	98.9	94.3	79.0	52.3
Rangpur	97.7	96.9	91.7	74.8	47.4
Rangpur City Corporation	98.5	95.3	88.4	78.4	57.0
Thakurgoan	98.8	98.3	93.4	81.3	59.9
Rangpur Division	**98.7**	**97.8**	**91.4**	**75.7**	**53.6**
Habiganj	**97.3**	**95.9**	**91.1**	**74.7**	**58.4**
Moulvi Bazar	95.7	94.9	89.3	75.4	57.9
Sunamganj	94.0	93.1	84.0	71.9	56.3
Sylhet	93.5	92.4	84.7	69.1	51.7
Sylhet City Corporation	89.3	87.0	79.1	71.9	68.1
Sylhet Division	**94.9**	**93.7**	**86.9**	**72.5**	**56.3**
National	**98.2**	**96.8**	**89.2**	**73.2**	**52.3**
Urban	98.0	96.4	87.6	70.0	49.4
Rural	98.2	96.9	89.6	74.0	53.1
Dhaka City Corporation Slum	98.4	93.2	78.8	52.7	32.4
Chittagong City Corporation Slum	95.6	94.9	84.5	58.0	39.7

Table 10: Protected of Birth against Tetanus among Mothers with Children 0-11 Months Old Children by District and City Corporation

District/City Corporation	Protected at birth
Barguna	80.2
Barisal	97.6
Barisal CC	98.7
Bhola	99.6
Jhalokati	91.7
Patuakhali	90.7
Perojpur	93.8
Barisal Division	**94.3**
Bandarban	89.2
Brahmanbaria	97.5
Chandpur	96.4
Chittagong	97.1
Chittagong City Corporation	95.8
Comilla	96.1
Comilla City Corporation	94.8
Cox's Bazar	94.0
Feni	87.2
Khagrachari	95.3
Lakshmipur	90.4
Noakhali	92.1
Rangamati	88.5
Chittagong Division	**94.8**
Dhaka	88.4
Dhaka North City Corporation	85.9
Dhaka South City Corporation	94.8
Faridpur	93.5
Gazipur	92.9
Gazipur City Corporation	91.7
Gopalganj	75.6
Kishoreganj	89.7
Madaripur	83.8
Manikganj	92.4
Munshiganj	92.4
Narayanganj	93.5
Narayanganj City Corporation	94.1
Narsingdhi	83.3
Rajbari	97.6
Sariatpur	87.9
Tangail	87.2
Dhaka Division	**89.3**
Bagerhat	89.1
Chuadanga	87.4
Jessore	91.2

District/City Corporation	Protected at birth
Jhenaidah	91.0
Khulna	86.8
Khulna City Corporation	83.4
Kushtia	93.5
Magura	89.0
Meherpur	91.7
Narail	80.9
Satkhira	90.0
Khulna Division	**89.4**
Jamalpur	91.2
Mymensingh	91.0
Netrokona	94.2
Sherpur	84.9
Mymensingh Division	**90.8**
Bogra	92.3
Joypurhat	62.6
Natore	92.8
Naogaon	95.2
Chapai Nawabganj	81.6
Pabna	98.0
Rajshahi	82.9
Rajshahi City Corporation	97.6
Sirajganj	92.5
Rajshahi Division	**90.1**
Dinajpur	95.6
Gaibandha	86.2
Kurigram	95.8
Lalmonirhat	86.0
Nilphamari	94.9
Panchagarh	86.0
Rangpur	83.4
Rangpur City Corporation	89.7
Thakurgoan	93.0
Rangpur Division	90.5
Habiganj	86.3
Moulvi Bazar	84.7
Sunamganj	86.6
Sylhet	88.3
Sylhet City Corporation	85.0
Sylhet Division	**86.6**
National	**91.0**
Urban	91.2
Rural	91.0
Dhaka City Corporation Slum	89.1
Chittagong City Corporation Slum	93.5

Table 11: Crude TT Vaccination Coverage among Women Aged 18-49 Years by District and City Corporation

District/City Corporation	Crude TT1	Crude TT2	Crude TT3	Crude TT4	Crude TT5
Barguna	95.4	93.6	83.7	67.7	52.2
Barisal	96.4	96.4	89.8	81.9	71.0
Barisal CC	98.4	97.9	93.3	85.9	60.8
Bhola	98.5	98.5	96.1	85.9	74.1
Jhalokati	90.1	85.7	77.5	62.2	48.4
Patuakhali	86.1	84.5	73.3	64.5	50.5
Perojpur	95.2	93.6	82.8	70.8	51.9
Barisal Division	**94.0**	**92.9**	**85.3**	**74.7**	**60.6**
Bandarban	93.4	92.3	85.7	77.6	66.2
Brahmanbaria	94.9	93.4	89.0	82.4	70.3
Chandpur	94.9	94.1	90.2	83.8	73.4
Chittagong	97.1	96.2	91.4	82.3	71.6
Chittagong City Corporation	92.2	90.3	82.8	66.1	56.8
Comilla	97.3	96.3	90.7	81.1	63.0
Comilla City Corporation	94.9	93.5	85.8	74.3	57.0
Cox's Bazar	95.7	92.2	87.1	75.9	63.7
Feni	95.9	93.1	85.2	77.0	58.5
Khagrachari	94.1	92.5	89.1	77.7	66.0
Lakshmipur	93.1	88.2	80.9	69.1	57.2
Noakhali	91.1	89.6	81.1	65.4	53.7
Rangamati	81.2	78.9	67.4	57.1	47.8
Chittagong Division	**94.7**	**93.1**	**86.9**	**76.4**	**63.1**
Dhaka	92.7	91.2	79.4	67.1	52.3
Dhaka North City Corporation	92.7	90.3	76.8	59.9	42.7
Dhaka South City Corporation	95.2	94.4	82.7	70.4	57.8
Faridpur	95.9	93.2	86.6	72.0	60.2
Gazipur	95.0	93.7	83.1	68.4	50.8
Gazipur City Corporation	93.2	90.9	78.3	61.4	47.9
Gopalganj	86.6	82.1	71.5	55.3	44.8
Kishoreganj	91.7	90.8	86.0	80.1	66.1
Madaripur	93.7	91.9	84.4	72.8	62.4
Manikganj	90.2	87.6	80.4	71.8	56.2
Munshiganj	97.2	95.9	88.5	80.4	67.3
Narayanganj	94.2	91.0	79.8	69.9	50.6
Narayanganj City Corporation	96.1	94.8	88.0	75.7	61.2
Narsingdhi	88.2	87.9	81.9	68.2	50.7
Rajbari	98.8	98.2	92.4	84.3	71.7
Sariatpur	93.9	92.2	85.0	73.8	59.6
Tangail	90.4	87.4	81.7	70.1	60.5
Dhaka Division	**92.7**	**90.8**	**81.4**	**69.1**	**54.8**
Bagerhat	88.6	87.6	74.9	57.6	37.8
Chuadanga	95.0	92.6	83.0	66.3	49.8
Jessore	94.5	93.8	85.0	68.5	54.1

District/City Corporation	Crude TT1	Crude TT2	Crude TT3	Crude TT4	Crude TT5
Jhenaidah	96.1	94.2	87.6	80.9	68.3
Khulna	90.6	88.3	78.8	67.6	54.7
Khulna City Corporation	83.9	81.0	69.9	55.3	43.3
Kushtia	94.8	91.7	84.0	66.2	54.8
Magura	94.8	89.1	82.0	69.8	57.7
Meherpur	90.3	86.1	73.7	60.1	42.5
Narail	87.3	84.1	77.7	64.5	53.1
Satkhira	92.9	87.1	74.4	56.8	40.4
Khulna Division	**92.4**	**89.6**	**80.1**	**65.6**	**51.2**
Jamalpur	87.9	80.9	71.2	59.8	48.8
Mymensingh	92.1	89.6	84.2	75.9	62.2
Netrokona	94.5	93.0	83.5	74.7	55.9
Sherpur	93.6	91.9	83.1	65.7	47.3
Mymensingh Division	**91.8**	**88.5**	**81.0**	**70.8**	**56.2**
Bogra	96.0	93.1	86.3	74.2	59.2
Joypurhat	91.9	90.4	82.8	69.4	55.5
Natore	94.8	91.7	80.6	66.7	48.8
Naogaon	93.1	91.2	84.5	73.2	55.1
Chapai Nawabganj	90.5	88.4	76.4	61.0	47.0
Pabna	94.4	91.9	83.1	66.0	49.3
Rajshahi	86.8	84.7	74.3	57.9	47.2
Rajshahi City Corporation	99.6	98.9	95.5	87.4	70.1
Sirajganj	92.0	89.7	76.7	64.8	49.8
Rajshahi Division	**93.0**	**90.7**	**81.5**	**67.9**	**52.4**
Dinajpur	94.4	93.4	87.5	78.0	66.8
Gaibandha	90.3	86.3	78.7	65.2	54.3
Kurigram	97.5	95.4	88.7	72.1	52.1
Lalmonirhat	94.6	92.4	84.7	65.4	50.1
Nilphamari	87.7	86.8	83.6	71.1	57.9
Panchagarh	82.1	80.7	76.0	67.1	54.2
Rangpur	91.8	88.4	79.6	65.7	47.6
Rangpur City Corporation	87.8	84.9	79.4	66.5	52.5
Thakurgoan	91.9	89.4	81.1	72.1	59.0
Rangpur Division	**91.9**	**89.7**	**83.1**	**70.2**	**56.0**
Habiganj	94.0	91.8	86.2	76.6	66.4
Moulvi Bazar	93.0	89.9	84.5	74.3	62.8
Sunamganj	90.1	88.5	81.0	72.6	62.8
Sylhet	93.2	89.4	79.9	67.2	55.2
Sylhet City Corporation	70.8	67.3	63.8	56.2	51.4
Sylhet Division	**91.3**	**88.5**	**81.6**	**71.4**	**60.9**
National	**93.0**	**90.8**	**82.8**	**70.7**	**56.6**
Urban	93.0	91.0	81.7	68.5	54.7
Rural	93.0	90.8	83.1	71.3	57.2
Dhaka City Corporation Slum	87.3	84.0	70.3	57.0	42.5
Chittagong City Corporation Slum	86.9	83.6	70.6	50.8	38.7

Table 12: Valid TT Vaccination Coverage among Women Aged 18-49 Years by District and City Corporation

District/City Corporation	Valid TT1	Valid TT2	Valid TT3	Valid TT4	Valid TT5
Barguna	95.4	93.7	74.5	49.2	30.1
Barisal	96.4	96.4	88.9	75.6	59.8
Barisal CC	98.4	97.9	91.0	60.2	36.7
Bhola	98.5	98.5	94.8	80.8	65.0
Jhalokati	90.1	85.7	71.2	50.9	31.8
Patuakhali	86.1	84.5	70.5	42.9	25.1
Perojpur	95.2	93.6	80.9	63.2	38.2
Barisal Division	**94.0**	**92.9**	**82.4**	**62.9**	**44.5**
Bandarban	93.4	92.6	85.0	74.6	61.2
Brahmanbaria	94.9	93.6	88.7	80.7	66.4
Chandpur	94.9	94.1	89.0	75.9	59.2
Chittagong	97.1	96.2	89.2	67.8	51.8
Chittagong City Corporation	92.2	90.3	74.0	51.6	36.3
Comilla	97.3	96.3	88.0	73.8	48.2
Comilla City Corporation	94.9	93.5	83.1	58.5	34.9
Cox's Bazar	95.7	92.0	81.5	66.1	46.8
Feni	95.9	93.1	82.9	63.3	40.2
Khagrachari	94.1	92.5	85.4	67.3	49.1
Lakshmipur	93.1	88.2	76.4	57.3	38.1
Noakhali	91.1	89.3	72.8	52.4	33.0
Rangamati	81.2	78.6	64.9	51.5	40.8
Chittagong Division	**94.7**	**93.0**	**83.3**	**66.1**	**46.7**
Dhaka	92.7	91.2	73.7	53.8	31.8
Dhaka North City Corporation	92.7	90.3	66.2	41.8	24.0
Dhaka South City Corporation	95.2	94.2	74.3	50.3	33.7
Faridpur	95.9	93.2	78.9	58.3	39.2
Gazipur	95.0	93.7	81.2	63.8	42.4
Gazipur City Corporation	93.2	90.2	72.4	49.5	34.3
Gopalganj	86.6	81.2	62.3	38.7	21.5
Kishoreganj	91.7	90.8	83.3	63.3	38.5
Madaripur	93.7	91.9	76.4	57.5	36.1
Manikganj	90.2	87.6	75.2	54.0	37.5
Munshiganj	97.2	95.5	86.6	72.8	52.6
Narayanganj	94.2	91.0	74.7	53.8	34.1
Narayanganj City Corporation	96.1	94.8	85.2	67.9	52.6
Narsingdhi	88.2	87.7	79.6	61.5	37.0
Rajbari	98.8	98.2	87.7	70.2	43.2
Sariatpur	93.9	92.2	81.2	65.2	45.0
Tangail	90.4	87.4	74.7	50.2	30.6
Dhaka Division	**92.7**	**90.7**	**75.6**	**54.6**	**34.7**
Bagerhat	88.6	87.6	74.9	50.2	29.7
Chuadanga	95.0	92.6	68.8	39.7	20.2
Jessore	94.5	93.4	72.4	42.0	21.1

District/City Corporation	Valid TT1	Valid TT2	Valid TT3	Valid TT4	Valid TT5
Jhenaidah	96.1	93.9	83.2	61.5	35.2
Khulna	90.6	88.3	74.4	54.1	39.0
Khulna City Corporation	83.9	81.0	64.9	41.2	26.1
Kushtia	94.8	91.5	75.5	54.2	31.7
Magura	94.8	88.9	75.3	55.6	34.1
Meherpur	90.3	86.3	67.1	38.7	17.5
Narail	87.3	83.9	69.1	46.8	29.2
Satkhira	92.9	87.1	70.5	43.9	22.8
Khulna Division	**92.4**	**89.5**	**73.4**	**49.0**	**28.6**
Jamalpur	87.9	80.9	62.8	40.8	24.2
Mymensingh	92.1	89.6	81.5	65.1	39.1
Netrokona	94.5	93.0	82.3	66.5	45.3
Sherpur	93.6	91.9	78.3	52.8	31.0
Mymensingh Division	**91.8**	**88.5**	**77.0**	**58.3**	**35.8**
Bogra	96.0	92.8	81.9	60.9	42.7
Joypurhat	91.9	90.6	74.2	52.3	32.8
Natore	94.8	91.7	80.3	57.4	32.6
Naogaon	93.1	90.9	80.0	57.8	38.5
Chapai Nawabganj	90.5	90.5	71.0	50.1	32.1
Pabna	94.4	91.9	72.8	47.3	27.3
Rajshahi	86.8	84.7	63.9	40.4	28.7
Rajshahi City Corporation	99.6	98.9	94.7	81.3	62.4
Sirajganj	92.0	89.7	74.8	51.6	28.1
Rajshahi Division	**93.0**	**90.8**	**76.1**	**53.6**	**34.2**
Dinajpur	94.4	93.4	83.2	66.2	50.6
Gaibandha	90.3	86.1	72.2	49.7	29.2
Kurigram	97.5	95.1	87.4	63.1	41.1
Lalmonirhat	94.6	92.4	77.8	46.3	26.9
Nilphamari	87.7	86.4	75.9	53.7	34.6
Panchagarh	82.1	80.5	70.4	52.4	34.1
Rangpur	91.8	88.2	72.7	49.3	29.8
Rangpur City Corporation	87.8	84.9	73.5	55.4	39.0
Thakurgoan	91.9	89.2	76.2	53.5	34.0
Rangpur Division	**91.9**	**89.5**	**77.7**	**55.5**	**36.5**
Habiganj	94.0	91.8	84.2	70.2	53.3
Moulvi Bazar	93.0	89.9	81.1	66.5	48.8
Sunamganj	90.1	88.5	79.2	67.1	52.5
Sylhet	93.2	89.4	76.8	60.8	45.7
Sylhet City Corporation	70.8	67.3	63.4	55.3	49.4
Sylhet Division	**91.3**	**88.5**	**79.1**	**65.3**	**50.0**
National	**93.0**	**90.8**	**77.9**	**57.5**	**38.0**
Urban	93.0	90.9	75.8	53.9	36.5
Rural	93.0	90.7	78.4	58.5	38.4
Dhaka City Corporation Slum	86.9	83.6	62.0	38.1	26.3
Chittagong City Corporation Slum	87.3	84.0	66.1	40.5	24.6

Table 13: Vitamin A Supplementation Coverage among Infants Aged 06-11 Months and Children 12-59 Months during National Vitamin A Plus Campaign, by Districts and City Corporations

District/City Corporation	Infants 06-11 Months	Children 12-59 Months
Barguna	92.6	96.8
Barisal	100.0	100.0
Barisal CC	97.4	93.7
Bhola	97.7	98.4
Jhalokati	70.4	75.1
Patuakhali	86.9	89.1
Perojpur	74.9	86.8
Barisal Division	90.3	93.6
Bandarban	78.4	84.1
Brahmanbaria	85.1	87.7
Chandpur	90.9	91.9
Chittagong	96.0	99.1
Chittagong City Corporation	68.7	90.6
Comilla	93.3	92.3
Comilla City Corporation	92.3	94.6
Cox's Bazar	92.9	93.7
Feni	94.2	95.4
Khagrachari	93.1	94.0
Lakshmipur	93.9	93.6
Noakhali	73.4	89.1
Rangamati	72.9	90.4
Chittagong Division	**88.1**	**92.7**
Dhaka	82.1	90.3
Dhaka North City Corporation	87.9	82.7
Dhaka South City Corporation	79.2	80.8
Faridpur	70.6	85.5
Gazipur	90.2	95.1
Gazipur City Corporation	87.4	90.1
Gopalganj	75.3	78.5
Kishoreganj	97.0	97.5
Madaripur	91.5	79.3
Manikganj	82.7	90.3
Munshiganj	86.5	90.0
Narayanganj	91.0	93.6
Narayanganj City Corporation	90.3	94.8
Narsingdhi	83.1	89.0
Rajbari	67.3	80.6
Sariatpur	65.1	75.4
Tangail	62.3	85.4
Dhaka Division	**82.2**	**87.6**
Bagerhat	75.7	82.0
Chuadanga	81.6	88.8

District/City Corporation	Infants 06-11 Months	Children 12-59 Months
Jessore	95.3	97.0
Jhenaidah	88.5	95.3
Khulna	86.9	97.2
Khulna City Corporation	83.3	92.3
Kushtia	89.1	89.2
Magura	70.1	83.9
Meherpur	87.6	90.6
Narail	82.5	84.0
Satkhira	85.3	86.8
Khulna Division	**85.8**	**90.4**
Jamalpur	89.2	95.8
Mymensingh	95.6	96.5
Netrokona	72.7	89.9
Sherpur	88.5	92.5
Mymensingh Division	**88.7**	**94.5**
Bogra	90.2	92.7
Joypurhat	99.6	99.5
Natore	75.8	89.9
Naogaon	79.8	91.8
Chapai Nawabganj	51.6	73.3
Pabna	50.3	79.0
Rajshahi	93.3	96.0
Rajshahi City Corporation	99.7	100.0
Sirajganj	84.0	88.3
Rajshahi Division	**79.5**	**89.0**
Dinajpur	99.2	99.4
Gaibandha	72.0	79.0
Kurigram	98.7	99.5
Lalmonirhat	91.7	96.2
Nilphamari	96.3	98.4
Panchagarh	92.7	91.7
Rangpur	95.8	97.5
Rangpur City Corporation	83.4	90.3
Thakurgoan	89.7	94.0
Rangpur Division	**91.9**	**94.3**
Habiganj	79.9	86.3
Moulvi Bazar	99.0	98.5
Sunamganj	93.2	95.6
Sylhet	94.8	97.3
Sylhet City Corporation	98.7	97.8
Sylhet Division	**91.8**	**93.9**
National	**86.1**	**91.3**
Urban	86.6	89.7
Rural	86.0	91.7
Dhaka City Corporation Slum	80.3	79.4
Chittagong City Corporation Slum	82.1	89.7

APPENDIX D:

Table B-1. Effective sample size (ESS) by expected coverage and desired precision for the 95% confidence interval (CI)

		Expected Coverage					
		50-70%	**0.75**	**0.8**	**0.85**	**0.9**	**0.95**
Precision for 95% CI	±3%	1097	892	788	663	518	354
	±4%	622	517	461	394	315	227
	±5%	401	340	306	265	216	162
	±6%	280	242	220	192	160	132
	±7%	207	182	167	147	125	110
	±8%	159	143	131	117	101	93
	±9%	126	115	106	96	83	81
	±10%	103	95	88	80	70	70

QUESTIONNAIRE

CHILD FORM

Applicable for those children who born in between *01-07-2014* and *30-06-2015* (Applicable for those children born in between 17 Ashar 1421 and 16 Ashar 1422)	
1. Cluster No	
2. Date	
3. Survey Area	

		Skip to	1	2	3	4	5	6	7	8
4. Sl no. of sample (to be filled in by office)										
5. Sl no. of children in this cluster										
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)										
11.1 Where was the child born?	Health care center : 1									
	Home : 2									
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-01, Government employee-02, Non-government employee-03, Household works/day labour-04, Small business-05, Large business-06, Teacher-07, Professional -08, others										
15. Occupation of the father: Agriculture-01, Government employee-02, Non-government employee-03, Day labor/rickshaw/van puller-04, Small business-05, Large business-06, Teacher-07, Professional -08, driver (truck/bus/ car)-09,others										
16. Number of family members										
17. Has the baby ever received vaccine?	Yes: 1	**17.1**								
	No: 2	**17.4**								
17.1 Does the child has card for vaccination?	Yes: 1	**17.4**								
	No: 2	**17.2**								
17.2. If s/he doesn't have card, then ask, Were you ever given a card?	Yes: 1	**17.3**								
	No: 2	**17.4**								
17.3. If the answer for the question 17.2 is yes, then ask Why didn't you preserve the card? (please mention)										
17.4. 17.1 Does the child has birth registration card?	Yes: 1									
	No: 2									
18. Would you please tell me, at least how many times the child should be taken to the vaccination center to complete all the vaccines? (write the number or 'don't know')										

			Skip to	1	2	3	4	5	6	7	8
19 BCG	(Date/+/0)										
19.1. BCG Scar (notice the upper side of the left arm)		Yes: 1									
		No: 2									
19.2. BCG -Source(from where BCG has taken)	GOB Outreach	1									
	NGO	2									
	All GOB Hospital	3									
	Private	4									
20. pentavalent 1	(Date/+/0)										
	NGO	2									
	All GOB Hospital	3									
	Private	4									
21. OPV 1	(Date/+/0)										
	+/0										
22. Pentavalent 2	(Date/+/0)										
	+/0										
23. OPV 2	(Date/+/0)										
	+/0										
24. Pentavalent 3	(Date/+/0)										
	+/0										
25. OPV 3	(Date/+/0)										
	+/0										
26. MR	Date										
	+/0										
27. How many times did the worker come to you to remind about completing vaccination?											
28. What are the side effects may occur if the child is vaccinated? [Multiple response possible]	Fever : 01										
	Abscess : 02										
	Don't know : 99										
	Others (specify):										
29. After giving vaccine to your child, has there been any abscess at the place of vaccine?		Yes: 1	**29.1**								
		No : 2	**30**								
29.1 If the answer is yes in Q 29, then ask, Where did he has the abscess? (multiple answers can be recorded) (please code)	Right thigh : 1										
	Left thigh : 2										
	Left arm : 3										
	Others (specify):										
29.2 Did you feel discourage to give his/her rest of the vaccines due to abscess or any other problem?		No : 2									
		Yes : 1									
30. Have you ever given money for vaccination of your child? (please code)		Yes : 1	**30.1**								
		No : 2	**31**								
30.1 If yes, how much money did you pay?											
30.2 (If yes, then ask) As you given money, did you abstain yourself from giving rest vaccine to your child?		Yes : 1									
		No : 2									
31. What is the monthly income of your family? (include all sources)											

Vaccination Code Date - Record date from vaccination card	Source codes:	
+ - History that the child was vaccinated	GOB Outreach = Community household, Satellite clinic, Community Clinic, Club	NGO = Hospital, Clinic, Outreach
0 - The child was not vaccinated	All GOB Hospital = District, UHC etc.	Private = Chamber, clinic and hospital

Reasons for Vaccination Failure

32. 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**	**8**
1. Lack of information								
i. Didn't know that my child should be given vaccine	1	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	2
iii. Didn't know when to go for vaccine of measles	3	3	3	3	3	3	3	3
iv. Didn't know where to go for vaccine	4	4	4	4	4	4	4	4
V. Fearing side effects	5	5	5	5	5	5	5	5
vi. Rumor (Please mention)	6	6	6	6	6	6	6	6
2. Lack of Motivation								
vii. Don't believe in vaccination	21	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	22
ix. Will give vaccine in future	23	23	23	23	23	23	23	23
x. There was a long queue in the vaccination centre	24	24	24	24	24	24	24	24
xi. Don't remember	25	25	25	25	25	25	25	25
3. Obstacles								
xii. There was no vaccine in the center	40	40	40	40	40	40	40	40
xiii. There was no vaccinator in the center	41	41	41	41	41	41	41	41
xiv. Vaccine centre was too far	42	42	42	42	42	42	42	42
xv. Injection was too painful for the child	43	43	43	43	43	43	43	43
xvi. Was abscess at the place of vaccine	44	44	44	44	44	44	44	44
xvii. Faced difficulty after receiving vaccine	45	45	45	45	45	45	45	45
xviii. Vaccinator was not friendly	46	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	47
xx. The child was sick, so the vaccinator didn't give vaccine	48	48	48	48	48	48	48	48
xxi. Mother was sick	49	49	49	49	49	49	49	49
xxii.I thought the vaccinator would come home	50	50	50	50	50	50	50	50
xxiii. They charge money to take vaccine	51	51	51	51	51	51	51	51
xxiv. The session time was inconvenient	52	52	52	52	52	52	52	52
4. Others (please specify)								

	Sl. no. of the baby in this cluster		Skip to	1	2	3	4	5	6	7	8
33.	Source of drinking water? Pipe water inside the house- 01 Pipe water outside the house -02, Tube well-03 Deep Tube well - 04, Sallow well - 05, Well-06, Pond/canal/lake -07, River/Fountain - 08, Tara Pump -09, Rain water -10										
34	Type of latrine? Sanitary latrine/ septic tank - 1, Water seal/ slub latrine- 2, Pit latrine - 3, Open latrine - 4, Hanging latrine - 5, No latrine/ open place – 6										
35	Household durables?										
35.1	Almirah	Yes-1 No – 2									
35.2	IPS/ Generator	Yes-1 No – 2									
35.3	Chair/bench	Yes-1 No- 2									
35.4	Air Conditioner	Yes-1 No- 2									
35.5	Computer/Laptop	Yes-1 No 2									
35.6	Radio	Yes-1 No- 2									
35.7	Television	Yes-1 No- 2									
35.8	DVD/VCR Player	Yes-1 No- 2									
35.9	Motor Cycle	Yes-1 No- 2									
35.10	Sewing Machine	Yes-1 No- 2									
35.11	Telephone	Yes-1 No- 2									
35.12	Mobile phone	Yes-1 No- 2									
35.13	Refrigerator	Yes-1 No- 2									
35.14	Water pump	Yes-1 No- 2									
35.15	Electric fan	Yes-1 No- 2									
35.16	Rickshaw/Van	Yes-1 No- 2									
35.17	Electricity	Yes-1 No- 2									
35.18	Solar	Yes-1 No- 2									
36	Observe materials of the floor concrete -1, soil-2, Bamboo-3, wood-4										
36.1	Observe materiasl of the wall concrete -1, soil-2, Bamboo-3, wood-4, Ply wood-5 Tin-6, Brick-7										
36.2	Observe materials of the roof Concrete-1, Tin-2, Bamboo/ wood-3, straw-4, Tally-5, No roof-6										
37	Is it take more tha half an hour to reach to the nearest vaccination center from your home on foot? Yes 1, No 2										

MSD FORM

Applicable for those children who born in between *01-01-2014* and *31-12-2014*	
1. Cluster No	
2. Date	
3. Survey Area	

		Skip to	1	2	3	4	5	6	7	8
4. Sl no. of sample (to be filled in by office)										
5. Sl no. of children in this cluster										
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)										
11.1 Where was the child born?	Health care center : 1									
	Home : 2									
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-01, Government employee-02, Non-government employee-03, Household works/day labour-04, Small business-05, Large business-06, Teacher-07, Professional -08, others										
15. Occupation of the father: Agriculture-01, Government employee-02, Non-government employee-03, Day labor/rickshaw/van puller-04, Small business-05, Large business-06, Teacher-07, professional -08, driver (truck/bus/car)-09,others										
16. Number of family members										
17. Has the baby ever received vaccine?	Yes: 1	**17.1**								
	No: 2	**18**								
17.1 Does the child have card for vaccination?	Yes: 1	**18**								
	No: 2	**17.2**								
17.2. If s/he doesn't have card, then ask, Were you ever given a card?	Yes: 1	**17.3**								
	No: 2	**18**								
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, at least how many times the child should be taken to the vaccination center to complete all the vaccines? (write the number or 'don't know')										

			Skip to	1	2	3	4	5	6	7	8
19 BCG	(Date/+/0)										
19.1. BCG Scar (notice the upper side of the left arm)	Yes: 1										
	No: 2										
19.2. BCG -Source(from where BCG has taken)	GOB Outreach	1									
	NGO	2									
	All GOB Hospital	3									
	Private	4									
20.1 Measles-Rubella	Date										
	+/0										
20.2 Measles 2nd Dose	Date										
	+/0										

Reasons for Vaccination Failure

21. 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**	**8**
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	
xxiv. The session time was inconvenient	52	52	52	52	52	52	52	
4. Others (please specify)								

22.	Source of drinking water? Pipe water inside the house- 01 Pipe water outside the house -02, Tube well-03 Deep Tube well - 04, Sallow well - 05, Well- 06, Pond/ canal/lake -07, River/Fountain - 08, Tara Pump -09, Rain water -10		**Skip to**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23	Type of latrine? Sanitary latrine- 1, Water seal/ slub latrine- 2, Pit latrine - 3, Open latrine - 4, Hanging latrine - 5, No latrine - 6									
24	Household durables?									
24.1	Almirah	Yes-1 No – 2								
24.2	IPS/ Generator	Yes-1 No – 2								
24.3	Chair/bench	Yes-1 No- 2								
24.4	Air Conditioner	Yes-1 No- 2								
24.5	Computer/Laptop	Yes-1 No 2								
24.6	Radio	Yes-1 No- 2								
24.7	Television	Yes-1 No- 2								
24.8	DVD/VCR Player	Yes-1 No- 2								
24.9	Motor Cycle	Yes-1 No- 2								
24.10	Sewing Machine	Yes-1 No- 2								
24.11	Telephone	Yes-1 No- 2								
24.12	Mobile phone	Yes-1 No- 2								
24.13	Refrigerator	Yes-1 No- 2								
24.14	Water pump	Yes-1 No- 2								
24.15	Electric fan	Yes-1 No- 2								
24.16	Rickshaw/Van	Yes-1 No- 2								
24.17	Electricity	Yes-1 No- 2								
24.18	Solar	Yes-1 No- 2								
25	Observe materials of the floor concrete -1, soil-2, Bamboo-3, wood-4									
25.1	Observe materiasl of the wall concrete -1, soil-2, Bamboo-3, wood-4, Ply wood-5 Tin-6, Brick-7									
25.2	Observe materials of the roof Concrete-1, Tin-2, Bamboo/wood-3, straw-4, Tally-5, No roof-6									
26	Is it take more tha half an hour to reach to the nearest vaccination center from your home on foot? Yes-1, No-2									
27	What is your monthly family income?									

Maternal and Neonatal Health Form

Applicable for those women who gave birth to live or dead child

between 01-07-2014 and 30-06-2015

1. Cluster no	
2. Date	
3. Survey area	

		Skip to	1	2	3	4	5
4. Sl number of sample (to be filled in by office)							
5. Sl number of woman in this cluster							
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 Was the last born baby alive or dead?	Alive : 1	**17**					
	Died : 2	**16.2**					
	Still birth : 3	**17**					
16.2. (If the child was dead) Within how many days after birth, did the child die?							

Antenatal Care (ANC)

		Skip to	1	2	3	4	5
17. Did you see any health worker for Antenatal Check-up when you were pregnant with (NAME) (during pregnancy)? Interviewer: make sure that you make the respondent understand that you mean all levels of health worker including doctors.		Yes 1 No: 2 >22a					
18. From where did you receive Antenatal Check-up during last pregnancy?	At home.....01 Government Medical College .....02 Government Hospital .....03 District Hospital.....04 MCWC.....05 UHC .....06 Sub Center .....07 UH&FWC.....08 Satellite clinic .....09 Community Clinic .....10 NGO Static Clinic.....11 NGO Satellite Clinic.....12 Private Hospital/ Clinic.....13 MBBS Doctor.....14 Village Doctor .....15 Pharmacy.....16 Don't know / can't remembers.....99 Others.....(Specify)						
19. To whom did you visit for Antenatal Check-up? Do not read out the answers. Circle & Write down all the answer ASK: Anything else?	MBBS doctor.....01 Nurse/midwife .....02 Paramedic.....03 FWV.....04 SACMO .....05 CSBA.....06 HA.....07 FWA.....08 CHCP.....09 NGO Health Worker .....10 TTBA.....11 TBA(Dai) .....12 Homeopath.....13 Village doctors.....14 Spiritual person .....15 Don't know/ can't say .....99 Others.....(Specify)						
20. How many times did you visit for Antenatal Check-up?							

			Skip to	1	2	3	4	5
21. As part of your antenatal care during last pregnancy, were any of the following done at least once? Ask about each item.	Were you weight?	Yes:1 No : 2						
	Was your blood pressure measured?	Yes:1 No : 2						
	Did you give a urine sample?	Yes:1 No : 2						
	Did you give a blood sample?	Yes:1 No : 2						
	Did you have an ultra sonogram?	Yes:1 No : 2						
	Did you have an abdominal examination?	Yes:1 No : 2						
	Were you given advise on danger sign of pregnancy	Yes:1 No : 2						

		Skip to	1	2	3	4	5
22. Were you given advice on danger sign of pregnancy during your last pregnancy?		Yes:1 No : 2					
22a. Did any health worker/field worker give you advice for medical checkup visiting your home?		Yes:1 No : 2 > 23					
22b. Who gave you advice?	HA.....1 FWA.....2 FWV.....3 CHCP .....4 NGO health worker 5						
22c. Did any of the following done while visit your home? Ask about each item.	Were you weight?	Yes:1 No : 2					
	Was your blood pressure measured?	Yes:1 No : 2					
	Did you give a urine sample?	Yes:1 No : 2					
	Did you give a blood sample?	Yes:1 No : 2					
	Were you given advise on danger sign of pregnancy	Yes:1 No : 2					
22d. How many times did the worker visit your home during your last pregnancy?							
23. Did you take iron tablet during last pregnancy?		Yes:1 No : 2 > 26					
24. How long did you take iron tablets during your last pregnancy?	Days Don't know /can't remember 99						

		Skip to	1	2	3	4	5
25. Where did you get iron tablets?	Satellite clinic .....01 Community clinic .....02 U&FWC .....03 UHC .....04 Doctor's chamber .....05 Clinic .....06 Hospital .....07 Pharmacy.....08 Union Sub-Center .....09 Don't know / can't remembers.....99 Others.....(Specify)						
26. Did you take Calcium supplement during last pregnancy?		Yes:1 No : 2 > 29					
27. How long did you take Calcium supplement during your last pregnancy?	Months Don't know /can't remember 99						
28. Where did you get Calcium supplement?	Satellite clinic .....01 Community clinic .....02 U&FWC .....03 UHC .....04 Doctor's chamber .....05 Clinic .....06 Hospital .....07 Pharmacy.....08 Union Sub-Center .....09 Don't know / can't remembers.....99 Others.....(Specify)						

Delivery

		Skip to	1	2	3	4	5
29. Where did you go for delivery?	At home.....01 Government Medical College .....02 Government Hospital .....03 District Hospital.....04 MCWC.....05 UHC.....06 Sub Center .....07 UH&FWC.....08 Community Clinic .....09 NGO Static Clinic.....10 Private Hospital/ Clinic..... 11 Others.....(Specify)						
30. Who assisted your delivery?	MBBS doctor.....01 Nurse/midwife .....02 Paramedic.....03 FWV.....04 CSBA.....05 SACMO .....06 HA..... 07 FWA.....08 CHCP.....10 NGO Health Worker .....11 TTBA.....12 TBA(Dai/Dhorni/Chauni) .....13 Village doctors.....14 Relatives.....15 Neighbor or friend.....16 None .....17 Don't know .....99 Others (specify)						
		Skip to	1	2	3	4	5

31 How long you stayed there after (Name) was delivered?	Hours Day Don't know 999						
32. Was (Name) delivered by caesarean operation?	Yes:1 No : 2						
33. If caesarean then ask, Why caesarean operation was required?	It was convenient ....01 To avoid labor pain..... ...02 Child was not in right position..... ...03 Premature child ....04 Cord problem ....05 More than one child..... ...06 In sufficient labor pain ....07 Pre-eclampsia..... ...08 Diabetic ....09 There is history of caesarean..... ...10 Low pressure on head..... .....11 Delivery complication ....12 Others (specify).....						
34. When (Name) was born, was he/she very large, larger than average, average, smaller than average, or very small?	Very large..... .....1 larger than average..... .....2 Average..... .....3 smaller than average ....4 very small ....5 Don't know 9						

If delivery conducted at home then ask the followings (35-39) else skip to 40

		Skip	1	2	3	4	5
35. Was a clean delivery kit used during the delivery of (NAME)?	Yes ..... 1 > 36 No .....2> 36 Don't know .....3> 38 Others----------						
36. What was used to cut the cord?	Blade from delivery kit .....1 Blade from other sources .....2 Bamboo strips .....3 Scissor .....4 Did not cut cord .....5 Don't know .....9 Others----------						
37. Was the ---------- (instrument) boiled before cutting the cord was cut??	Yes .....1 No .....2 Don't know 9						
38 Was anything applied to the cord immediately after cutting and tying it?	Yes .....1>39 No .....2>40 Don't know .....9>40						
39. What was applied to the cord after it was cut and tied?							
40. How many days after birth (Name) was given the first bath? If less than one day record in hour, if less than one week record in day	Day If less than one day write--00 Don't know 99						
41. When (Name) was washed after birth?	Less than 5 minutes .....1 5-9 minutes ..... 2 10* minutes ..... 3 Not dried.....4 Don't know 5						

Postnatal Care

		Skip	1	2	3	4	5
42. After the birth of your last child (NAME) did you visit any health worker for Postnatal Care?	Yes .....1>43 No ..... 2>46 Don't know----------9>46						
43. How many days after last delivery did you visit a health worker for the first Postnatal Care?	Days after ....|____| can't remember 999						
44. From where did you receive Postnatal Check-up during last pregnancy?	At home..... 01 Government Medical College .....02 Government Hospital .....03 District Hospital..... 04 MCWC.....05 UHC..... 06 Sub Center .....07 UH&FWC..... 08 Satellite clinic ..... 09 Community Clinic .....10 NGO Static Clinic.....11 NGO Satellite Clinic..... 12 Private Hospital/ Clinic..... 13 MBBS Doctor.....14 Village Doctor ..... 15 Pharmacy.....16 Don't know / can't remembers. 99 Others.....(Specify)						
45. To whom did you visit for Postnatal care?	MBBS doctor..... 01 Nurse/midwife .....02 Paramedic.....03 FWV..... 04 CSBA.....05 SACMO ..... 06 HA.....07 FWA..... 08 CHCP..... 09 NGO Health Worker .....10 TTBA.....11 TBA(Dai/Dhorni/Chauni) ..... 12 Village doctors..... 13 Don't know 99						

		Skip	1	2	3	4	5
46. Did your child receive postnatal check up within two days of birth?	Yes ..... 1 No ..... 2 Don't know---------- 3						
47. How many days after last birth did you visit a health worker for the first Postnatal Care for your child?	Hours after ....|____| Days after ....|____| can't remember 998						
48. Where did you visit at first for Postnatal Check-up of your child ?	At home ..... 01 Government Medical College ..... 02 Government Hospital ..... 03 District Hospital ..... 04 MCWC ..... 05 UHC ..... 06 Sub Center ..... 07 UH&FWC ..... 08 Satellite clinic ..... 09 Community Clinic ..... 10 NGO Static Clinic ..... 11 NGO Satellite Clinic ..... 12 Private Hospital/ Clinic ..... 13 MBBS Doctor ..... 14 Village Doctor ..... 15 Pharmacy ..... 16 Others ..... (Specify)						
49. To whom did you visit for Postnatal care for your child?	MBBS doctor ..... 01 Nurse/midwife ..... 02 Paramedic ..... 03 FWV ..... 04 CSBA ..... 05 SACMO ..... 06 HA ..... 07 FWA ..... 08 CHCP ..... 09 NGO Health Worker ..... 10 TTBA ..... 11 TBA(Dai/Dhorni/Chauni) ..... 12 Village doctors ..... 13 Don't know 99						
50. Was your child sick within one month of birth?	Yes ..... 1 > 51 No ..... 2> 54 Don't know ..... 3> 54						
51. Did you go anywhere for treatment?	Yes ..... 1>52 No ..... 2> 54 Don't know ..... 3> 54						

		Skip	1	2	3	4	5
52. Where did you go for treatment	Government Medical College ..... 02 Government Hospital ..... 03 District Hospital..... 04 MCWC..... 05 UHC ..... 06 Sub Center ..... 07 UH&FWC..... 08 Satellite clinic ..... 09 Community Clinic ..... 10 NGO Static Clinic..... 11 NGO Satellite Clinic..... 12 Private Hospital/ Clinic..... 13 MBBS Doctor..... 14 Village Doctor ..... 15 Pharmacy..... 16 Others.....(Specify)						
53. Who treated your child?	MBBS doctor..... 01 Nurse/midwife ..... 02 Paramedic..... 03 FWV..... 04 CSBA..... 05 SACMO ..... 06 HA..... 07 FWA..... 08 CHCP..... 09 NGO Health Worker ..... 10 TTBA..... 11 TBA(Dai/Dhorni/Chauni) ..... 12 Village doctors..... 13 Don't know ..... 99 Others.....(Specify)						
54. When did you start suckling (Name) first?	Immediately after birth.....000 minutes..... Don't know 999						
55. In the first three days after delivery was (name) given anything other than breast milk?	Yes.....1 No. .....2> 57 Don't know ..... 9>						

		Skip	1	2	3	4	5
56. What was given to drink? Anything else?	Milk (not breast milk) ..... 01 Only water ..... 02 Sweet and glucose water ..... 03 Water/salt water/solution ..... 04 Juice ..... 05 Infant formula ..... 06 Tea/Infusions ..... 07 Coffee ..... 08 Honey 09						
57. Are you still breast-feeding?	Yes ..... 1> 59 No .....2> 58						
58. How long did you breast-fed (Name)?	Months .....|____| Don't know 999						

Tetanus Toxoid Vaccination

		Skip	1	2	3	4	5
59. Have you ever received any TT vaccination?	Yes :1 : 1	60					
	No :2 : 2	75					
60. Do you have card for TT vaccination?	Yes :1 : 1						
	No :2 : 2	61					
61. (If the respondent does not have any card then ask) were you ever given a card for TT vaccination?	Yes :1 : 1						
	No :2 : 2						
61.1 If the answer for 61.1 is yes, then ask - Why didn't you preserve the card?							

Instruction: Record the answers for Q 62-72 from a card or history

	Skip		1	2	3	4	5
62. TT1	(Date/+/0)						
62.1 TT1 Source	GOB Outreach	1					
	NGO	2					
	All GOB Hospital	3					
	Private	4					
63. TT2	(Date/+/0)						
63.1 TT2 Source	GOB Outreach	1					
	NGO	2					
	All GOB Hospital	3					
	Private	4					
63.2 Interval between TT1 and TT2			..... Week	..... Week	..... Week	..... Week	..... Week
64. TT3	(Date/+/0)						
64.1. Interval between TT2 and TT3			------Month	.....Month	.....Month	.....Month	.....Month
65. TT4	(Date/+/0)						
65.1 Interval between TT3 and TT4	(write in month)		------Month	.....Month	.....Month	.....Month	.....Month
66. TT5	(Date/+/0)						
66.1 Interval between TT4 and TT5	(write in month)		------Month	.....Month	.....Month	.....Month	.....Month
67. TT6	(Date/+/0)						
67.1 Interval between TT5 and TT6	(write in month)		------Month	.....Month	.....Month	.....Month	.....Month
68. TT7	(Date/+/0)						
68.1 Interval between TT6 and TT7	(write in month)		------Month	.....Month	.....Month	.....Month	.....Month
69. TT8	(Date/+/0)						
69.1 Interval between TT7 and TT8	(write in month)		------Month	.....Month	.....Month	.....Month	.....Month
70. TT9	(Date/+/0)						
70.1 Interval between TT8 and TT9	(write in month)		------Month	.....Month	.....Month	.....Month	.....Month
71.TT10	(Date/+/0)						
71.1 Interval between TT9 and TT10	(write in month)		------Month	.....Month	.....Month	.....Month	.....Month
72. Last TT vaccination	(Date/+/0)						
72.1. Interval between TT10 and last TT injection	(write in month						
73. Interval between latest TT injection and date of birth of the last child	(write in week)		----- week	----- week	----- week	----- week	----- week
74. Question number of TT vaccination received in the last pregnancy							
74a. How many days before delivery TT was taken							
75 Was the child protected at birth?	Yes	1					
	No	2					

Vaccination Code:	Sources Code:
Date- Record date from vaccination card	Gob Outreach: Community Hospital, Community Clinic, Satellite clinic, club
+ History that the child was vaccinated	All GoB Hospital= District, UHC etc
0 Was not vaccinated	NGO= Hospital, Clinic, Outreach, Private= Chamber, Clinic and hospital

Adverse Effect Following Immunization

		Skip to	1	2	3	4	5
76. Have you ever had an abscess after receiving a TT vaccine?	Yes : 1						
	No : 2	77					
	Don't know/Can't remember :9						
76.1 Were you discouraged to take the next TT vaccine due to abscess or any other problem?	Yes :1						
	No :2						
77. Did the health worker ask you about TT vaccine? When did you take your child for vaccination?	Yes :1						
	No :2						
	Not applicable: 3						
	Don't know : 9						
78. (Check Q60: Those who did not receive TT injection ask them) Why didn't you receive TT vaccine? [single response]							
79. How many times a woman should receive TT vaccination to be protected against for the rest of her reproductive life? (write number or 'don't know')							
80. Did you take vitamin A capsule within six weeks/42 days of your last delivery?	Yes :1 : 1						
	No :2 : 2	81					
80.1. If yes, then tell us from where have you taken Vitamin A?	At home :1						
	Vaccination center : 2						
	Hospital : 3						

Water, Sanitation and Household Items

			Skip to	1	2	3	4	5
81	Source of drinking water? Pipe water inside the house- 01 Pipe water outside the house -02, Tube well-03 Deep Tube well - 04, Sallow well - 05, Well- 06, Pond/canal/lake -07, River/Fountain - 08, Tara Pump -09, Rain water -10							
82	Type of latrine? Sanitary latrine- 1, Water seal/ slub latrine- 2, Pit latrine - 3, Open latrine - 4, Hanging latrine - 5, No latrine - 6							
83	Household durables?							
83.1	Almirah	Yes-1 No - 2						
83.2	IPS/ Generator	Yes-1 No - 2						
83.3	Chair/bench	Yes-1 No- 2						
83.4	Air Conditioner	Yes-1 No- 2						
83.5	Computer/Laptop	Yes-1 No 2						
83.6	Radio	Yes-1 No- 2						
83.7	Television	Yes-1 No- 2						
83.8	DVD/VCR Player	Yes-1 No- 2						
83.9	Motor Cycle	Yes-1 No- 2						
83.10	Sewing Machine	Yes-1 No- 2						
83.11	Telephone	Yes-1 No- 2						
83.12	Mobile phone	Yes-1 No- 2						
83.13	Refrigerator	Yes-1 No- 2						
83.14	Water pump	Yes-1 No- 2						
83.15	Electric fan	Yes-1 No- 2						
83.16	Rickshaw/Van	Yes-1 No- 2						
83.17	Electricity	Yes-1 No- 2						
83.18	Solar							
84	Materials of the floor concrete -1, soil-2, Bamboo-3, wood-4							
84.1	Materials of the wall concrete -1, soil-2, Bamboo-3, wood-4, Ply wood-5 Tin-6, Brick-7							
84.2	Materials of the roof Concrete-1, Tin-2, Bamboo/wood-3, straw-4, Tally-5, No roof-6							
85	Is it take more than half an hour to reach to the nearest vaccination center from your home on foot? Yes-1, No-2							
86	What is your monthly family income?							

Thank You

TT 5 Form

Applicable for 18-49 years old women

1. Cluster No.										
2. Household Number/GR number and name of house head										
3. Date										
4. Survey Area										
5. Sl number of woman in this cluster		**Skip to**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
6. Name of Household head										
7. Name of respondent										
8. Father's Name/Husband's Name										
9. Age of the respondent? (in years)										
9marital. .Marital Status of respondent	Married/ divorce/ separated - 1									
	Unmarried - 2									
10. Educational Qualification of the respondents: Illiterate -1, Primary-2, Secondary-3, SSC/Dhakil/ O level-4, HSC/ Alim/ A level-5, Degree/Fazil-6, Masters/Kamil-7										
11. Occupation of the respondents: Housewife-1, Government employee-2, Non-government employee-3,Household works-4, Small business-5, Large business-6, Student-7 Teacher-8, Professional -9, Others										
12. Total family member										
13. Have you ever received TT vaccine?	Yes : 1	14								
	No : 2	27								
14. Do you have card for TT vaccination?	Yes : 1	16								
	No : 2	14.1								
14.1 (If the respondent does not have any card) were you ever given a card for TT vaccination?	Yes : 1	14.2								
	No : 2	15								
14.2 (if yes) Why did you not preserve the card?										

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

		Skip to	1	2	3	4	5	6	7	8
15. TT 1	(Date/+/0)									
15.1 Source of TT1?	(O/H/N/P)									
16. TT2	Date/+/0									
16.1 Source of TT2?	(O/H/N/P)									
16.2 Interval between TT-1 and TT-2?	(write in weeks)		..... months	..... months	..... months	..... months	..... months	..... months	..... months	
17. TT 3	(Date/+/0)									
17.1 Interval between TT2 and TT3	(Write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months	
18. TT4	(Date/+/0)									
18.1 Interval between TT3 and TT4	(Write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months	
19. TT5	(Date/+/0)									
19.1 Interval between TT 4 and TT5	(Write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months	
20.TT6	(Date/+/0)								.	
20.1 Interval between TT5 and TT6	(Write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months	
21. TT 7	(Date/+/0)									
21.1 Interval between TT 6 and TT7	(Write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months	
22. TT8	(Date/+/0)									
22.1 Interval between TT 7 and TT8	(Write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months	
23. TT9	(Date/+/0)									
23.1 Interval between T8 and T9	(write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months	
24. TT10	(Date/+/0)									
24.1 Interval between TT9 and TT10	(write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months	
25. Last TT vaccine	(Date/+/0)									
25.1 Interval between TT 10 and last TT injection	(write in months)		..... months	..... months	..... months	..... months	..... months	..... months	..... months	

		Skip to	1	2	3	4	5	6	7	8
26. Have you ever had an abscess after receiving a Tetanus vaccine?	Yes : 1	26.1								
	No : 2	27								
26.1 Are you discouraged to take the rest TT injection due to abscess or any other problem?	Yes : 1									
	No : 2									
27. How many times a woman should receive TT vaccine to be protected for the rest of her reproductive life? (write number or 'don't know')										
28. Why did you not take any TT vaccine? (ask those who have never taken any TT injection)										
29. What is your monthly family income?										

Vitamin A

(6 to 59 month children applicable)

1. Applicable for those children aged 6-11 Months who born in between 24/7/2015 and 19/01/2016

2. Applicable for those children aged 12-59 months who born in between 14/8/2011 and 23/07/2015

1.Cluster number																	
2. Date																	
3. Survey area																	
			6-11 months							**12-59 Months**							
4. Sl. no. of the child in this cluster		**Skip to**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
5. Name of the child																	
6.Name of the child's father																	
7. Name of the child's mother																	
8. Sex: Male –1 Female–2																	
9. Date of birth of the child (Day/ Month/Year)																	
9a. Age in Month																	
10. **Ask mother/guardian**: Was your child (6-59 months) fed vitamin A during the Vitamin A Plus Campaign held July 16, 2016	Yes:1	**11**															
	No:2	10.1															
			6-11 months							**12-59 Months**							
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
10.1 If the child (6-59 months) was not fed Vitamin A during the Vitamin A Plus Campaign held July, 2016 then ask, Why the child wasn't fed Vitamin A during the Vitamin A Plus Campaign held July 2016	Didn't know	**99**															
	Was very busy :01	**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	**08**															
	There was a long queue	**09**															
	The centre was too far	**10**															

(If there come multiple answers, ask which one is more important and code accordingly)	The session time was inconvenient	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)															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
111. How did you learn about the Vitamin A Plus Campaign held April 25 , 2014 (Multiple answer)	GOB/ City corporations FW visit	01														
	City Corporation's Health Worker:	02														
	NGO worker Visit	03														
	Teacher visit	04														
	Other volunteers Visit	05														
	Family/neighbor/ friends	06														
	Television	07														
	Radio	08														
	Poster	09														
	Newspaper	10														
	Mobile Miking	11														
	Mosque Miking	12														
	Health Workers' home visit	13														
	Told during first round	14														
	Mobile SMS	15														
	Others (specify)															

Thank you


World Health
Organization
Country Office for Bangladesh


unicef