Table of CONTENTS

Chapter 03
CHILDHOOD VACCINATION COVERAGE AMONG 12-23 MONTHS OLD CHILDREN

Chapter 04
ZERO DOSE AND UNDER IMMUNIZATION

Chapter 05
CHILDHOOD VACCINATION COVERAGEAMONG 24-35 MONTHS OLD CHILDREN

Chapter 06
Td VACCINATION COVERAGE AMONG MOTHERS WITH CHILDREN AGED 0-11 MONTHS

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPS

ACRONYMS

BBS	Bangladesh Bureau of Statistics
BCG	Bacillus Calmette Guerin
BCC	Barishal City Corporation
BeSD	Behavioral and Social Drivers of vaccination
bOPV	Bivalent Oral Polio Vaccine
CC	City Corporation
CCC	Chittagong City Corporation
CES	Coverage Evaluation Survey
CI	Confidence Interval
Cum CC	Cumilla City Corporation
DNCC	Dhaka North City Corporation
DSCC	Dhaka South City Corporation
DPT	Diphtheria, Pertussis and Tetanus
EA	Enumeration Area
EPI	Expanded Programme on Immunization
FVC	Full Vaccination Coverage
FWA	Family Welfare Assistant
GAVI	Global Alliance for Vaccine and Immunization
GCC	Gazipur City Corporation
HA	Health Assistant
ICC	Intra-cluster Correlation Coefficient
IDI	In-depth Interview
IPV	Inactivated Polio Vaccine
KCC	Khulna City Corporation
MCC	Mymensingh City Corporation
MCV	Measles Containing Vaccine
MNT	Maternal & Neonatal Tetanus
MR1	Measles and Rubella First Dose
MR2	Measles and Rubella 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
PCV	Pneumococcal Conjugate Vaccine
PPS	Probability Proportional-to- Size
RCC	Rajshahi City Corporation
Rang CC	Rangpur City Corporation
SAGE	Strategic Advisory Group of Experts
SCC	Sylhet City Corporation
SPSS	Statistical Package for the Social Sciences
tOPV	Trivalent Oral Polio Vaccine
Td	Tetanus, Diphtheria
UHC	Upazila Health Complex
UNICEF	United Nations Children's Fund
WHO	World Health Organization

GLOSSARY

(Not Arranged Alphabetically)

Estimation of Vaccination Coverage	**Estimation of Crude Coverage:** If a child receives 1 dose of BCG, 3 doses of Pentavalent, 3 doses of OPV, 3 doses of PCV, 2 doses of IPV, and 1 dose of MR irrespective of maintaining exact age of receiving the vaccine or minimum interval between the doses considered as Full Vaccination Crude Coverage. Both the sources; documented (card or register) and the mother's history were considered to calculate the crude coverage. If it is estimated within 12 months (all vaccines received within 12 months of age) then it was described as Full Crude Vaccination Coverage by the age of 12 months. In contrast, if coverage is estimated within 23 months (all vaccines received within 23 months of age) then it was described as Full Crude Vaccination Coverage by the age of 23 months. **Estimation of Valid Coverage:** If a child receives 1 dose of BCG, 3 doses of Pentavalent, 3 doses of OPV, 3 doses of PCV, 2 doses of IPV, and 1 dose of MR maintaining the exact age of receiving the vaccine and minimum interval between the doses considered as Full Valid Vaccination Coverage. Both the sources; documented, and history were considered to calculate the valid coverage. The history is valid, which was calculated as the proportion of valid cases calculated from the card or register. If it is estimated within 12 months (all vaccines received within 12 months of age maintaining exact age of receiving vaccine and minimum interval between 2 doses) then it is described as Full Valid Vaccination Coverage by the age of 12 months. In contrast, if coverage is estimated within 23 months (all vaccines received within 23 months of age maintaining the exact age of receiving the vaccine and minimum interval between 2 doses) then it is described as Full Valid Vaccination Coverage by the age of 23 months.
Fully Vaccinated	A child is considered as being Fully vaccinated if s/he has received one dose of BCG, 3 doses of Pentavalent (diphtheria, pertussis, tetanus, Hep-B and Hib), 3 doses of OPV, 3 doses of PCV, two doses of IPV and one dose of MR (Measles and Rubella) vaccines for childhood vaccination coverage by the age 12-23 months. However, for childhood vaccination coverage among children 24-35 months calculated considering one dose of BCG, 3 doses of Pentavalent (diphtheria, pertussis, tetanus, Hep-B and Hib), 3 doses of OPV, 3 doses of PCV, two doses of IPV and two doses of MR (Measles and Rubella 1st and 2nd doses)
Crude Coverage	Crude vaccination coverage is defined if a child received vaccines irrespective of maintaining EPI- recommended exact age for starting vaccinations and/or interval between dose(s) with or without documentation. Documented evidence (Card+Register) or caregiver recall of vaccination (History), (valid & invalid doses and verbal history).

Valid Coverage	A dose that is administered when a child reaches the minimum age for the vaccine, and it is administered maintaining the proper interval between doses, according to the national immunization schedule and is found recorded in the relevant documents (Card and/or register). Documented evidence of vaccination at correct ages and with correct intervals (includes only valid doses)
Crude Full Vaccination Coverage **(FVC) by age of 23 months**	**Crude FVC:** If a child receives **1 dose of BCG,** **3 doses of Pentavalent,** **3 doses of OPV,** **3 doses of PCV,** **2 doses of IPV, and** **1 dose of MR** • **Irrespective of maintaining exact age of receiving the vaccine or minimum interval between the doses considered** as Crude Full Vaccination Coverage. • Both the sources; documented (card or register) and the mother's history were considered to calculate the crude coverage.
CRUDE FVC BY 12 MONTHS: **CRUDE FVC BY 23 MONTHS:**	If it is estimated within 12 months (all vaccines received within 12 months of age) then it was described as Crude Full Vaccination Coverage by the age of 12 months. If coverage is estimated within 23 months (all vaccines mentioned above, received within 23 months of age) then it was described as Full Crude Vaccination Coverage by the age of 23 months.
CRUDE FVC among 24-35 MONTHS	For calculating Crude FVC among 24-35 months old children, MR second (MR2) doses included along with above-mentioned doses.
Confidence Interval (CI)	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 analyzed in the same manner and confidence intervals constructed for each repetition, 100X(1-α) % of those intervals would contain the true population parameter.
Drop-Out	The dropout rate (proportion) between the first and third doses of multi-dose vaccines and between BCG or first dose Penta and measles & rubella -containing vaccines. Dropout is often described with a weighted indicator and may be easily calculated from the table of crude coverage results. For example, if the weighted crude Penta1 coverage estimate is 80% and for Penta3 it is 65%, then the weighted estimate of crude dropout is (80-65)/80 = 18.8%. $Dropout\ \% = \frac{(weighted\ \%\ who\ received\ early\ dose) - (weighted\ \%\ who\ received\ later\ dose)}{(weighted\ \%\ who\ received\ early\ dose)}$

Drop-out From Penta1- Penta3 : **IF** a child received Penta1 but failed to receive Penta3
Drop-out From Penta1- MR1 : **IF** a child received Penta1 but failed to receive **MR1**
Drop-out From MR1-MR2 : **IF** a child received MR1 but failed to receive **MR2**

Fully Vaccinated	A child is considered as being Fully vaccinated if s/he has received one dose of BCG, 3 doses of Pentavalent (diphtheria, pertussis, tetanus, Hep-B and Hib), 3 doses of OPV, 3 doses of PCV, 2 doses of IPV and one dose of MR (Measles and Rubella) vaccines.
Fully Vaccinated Child by 12 months of age	A child is considered as being Fully vaccinated if s/he has received all the recommended doses by 12 months of age as per the national immunization schedule.
Minimum age and Minimum Interval	The minimum age and intervals are used to determine if a dose is valid (i.e., physiologically efficacious)
Vaccination Coverage	The proportion of the vaccinated individuals in the target population. One dose of BCG, three doses of Penta, three doses of OPV, three doses of PCV, two doses of IPV, and the first dose of MR vaccine.
Valid dose	A dose that is administered when a child reaches the minimum age for the vaccine, and it is administered maintaining the proper interval between doses, according to the national immunization schedule and is found recorded in the relevant documents (Card and/or register).
Valid Full Vaccination Coverage (FVC) by Age of 12 Months	The proportion of children who received valid doses of BCG, three doses of Penta, three doses of OPV, three doses of PCV, two doses of IPV, and the first dose of MR vaccine. When determining valid coverage, we consider children who received the doses at the recommended age and intervals according to the EPI schedule. If a child does not have a document, their vaccination history will be considered. If both the vaccination card and register data are available, we accept both sources as valid if they show that the dose was administered at the correct age and interval. The numerator for valid coverage only includes children who received the dose when they were age-eligible for it according to the vaccination schedule, or children who received all the vaccines following the EPI recommended vaccination schedule and received the vaccine within 12 months. The denominator includes all children who participated in the survey. The validity of the history is calculated based on the proportion of valid doses obtained from the card and/or register.
Valid Full Vaccination Coverage (FVC) by Age of 23 Months	The proportion of children who received valid doses of BCG, three doses of Penta, three doses of OPV, three doses of PCV, two doses of IPV, and the first dose of MR vaccine. When determining valid coverage, we consider children who received the doses at the recommended age and intervals according to the EPI schedule. If a child does not have a document, their vaccination history will be considered. If both the vaccination card and register data are available, we accept both sources as valid if they show that the dose was administered at the correct age and interval. The numerator for valid coverage only includes children who received the dose when they were age-eligible for it according to the vaccination schedule, or children who received all the vaccines following the EPI recommended vaccination schedule and received the vaccine within 23 months. The denominator includes all children who participated in the survey. The validity of the history is calculated based on the proportion of valid doses obtained from the card and/or register.

Hard-to-Reach Area	Hard-to-reach area means *char, haor,* enclaves, and hilly areas which are geographically partly or fully difficult to reach. 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 side is more than 2 hours while using the existing transport facilities.
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, OPV, PCV, IPV), 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. **INVALID PENTA1/OPV1/PCV1/IPV1:** If 1st dose of Penta or 1st dose of OPV, 1st dose of PCV is given before 6 weeks of age of child. **INVALID PENTA2/OPV2/PCV2:** 2nd dose of Penta or 2nd dose of OPV/PCV is considered invalid If the interval between 1st dose and 2nd dose is less than 4 weeks. **INVALID IPV2:** 2nd dose of IPV is considered invalid If the interval between 1st dose and 2nd dose is less than 28 days. **INVALID PENTA3/OPV3/PCV3:** 3rd dose of Penta or 3rd dose of OPV/PCV is considered invalid If the interval between 2nd dose and 3rd dose is less than 28 days. **INVALID MR 1ST DOSE:** If 1st dose of MR is given before 270 days of age of child. MR received between 270 days and 364 days is considered valid by 12 months and between 270 and 730 is considered valid by 23 months. **INVALID MR 2ND DOSE:** If 2nd dose of MR is given before 450 days 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)
Mohalla	Smallest identifiable neighborhood in the urban area (municipality/city corporation)
Mouza	Smallest identifiable neighborhood for revenue purposes in the rural area
PAB	The newborn child is protected if the mother receives two valid doses of Td vaccine at least two weeks before the delivery following the recommended Td protection period.
Replacement of invalid dose by the subsequent dose(s)	In the case of multi-dose vaccine **IF 1st** Dose is invalid and the child has valid 2nd dose. Then 1st dose will be replaced by 2nd dose and in that case 2nd dose will be considered as "0". **IF** the sum of gaps of 1st dose and 2nd dose (from birth date to 1st dose and from 1st dose to 2nd dose) lower than the minimum age of receiving **1st dose** then both the doses will be considered as invalid. And 1st dose would be **"0"**, also 2nd dose would be considered as **"0"**. E.g. a child received **penta1** at the age **7 days** and **penta2** after **28 days** of **penta1**. If we look the case the child received 2 doses at the age **35 days** (7 days+ 28 days) that does meet the **minimum age of 42 days of 1st dose**. Therefore, both the doses will be considered as invalid. In that case, if the child has 3rd dose, then 3rd dose will be examined and considered 1st dose.

Upazila	Lowest administrative unit (sub-district level)
Vaccination Coverage	The proportion of the vaccinated individuals in the target population
Valid Fully Vaccination	The proportion of the children (by the age of 23 months) who received valid BCG, 3 doses of Penta, 3 doses of OPV, 3 doses of PCV, 2 doses of IPV and 2 doses of MR (Maintaining minimum interval & age and received vaccine within 23 months).
Coverage (FVC) by Age of 23 Months with MR2	Valid coverage for each respective vaccine and of Fully vaccinated children by the time of the survey by 23 months, classifying children without a document as unvaccinated. If both the vaccination card and register data are available but each has a different date of vaccination, it is accepted in this analysis if either of the sources show that the dose was valid. The numerator for valid coverage includes only those children who received the dose when they were age-eligible for it according to the vaccination schedule or children who received all the vaccine following EPI recommended vaccination schedule (Maintaining minimum interval and age and received vaccine between 15 and 23 months).
Estimation of National Coverage	National coverage included data gathered from district and city corporations' survey unit. In CES 2023, 9 municipalities were included as separate survey units like a district. These 9 municipalities survey domains excluded from the national, district and divisional estimation. However, municipal areas were included in the district sampling frame and the survey was conducted in the municipality if any cluster selected under the municipal area.
Estimation of City Corporation Coverage	: A total of 55 survey units: 10 in DNCC, 10 in DSCC, 8 in GCC, 7 in CCC, 6 in RCC, 4 in KCC, 3 in NCC, and 3 in Rang CC were included in CES 2023. The aggregated results of all survey units of a city corporation were considered for estimation the coverage. However, Mymensingh, Barishal, Sylhet, Cumilla City Corporation have only 1 administrative unit each.
Estimation of Divisional Coverage	: Divisional coverage included aggregated result of the districts under each division excluding municipality survey unit (if any).
Estimation of District Coverage	: District coverage included aggregated results of the clusters under each district excluding municipality survey unit (if any).
Rural Division	: Aggregated findings of rural areas in a division excluding city corporation and municipality

EXECUTIVE SUMMARY

With a view to reduce child mortality and morbidity from the vaccine preventable diseases, EPI was officially launched on 7th April 1979 in Bangladesh. Although the vaccination coverage under EPI was pretty low till 1984, with the passing of time, EPI has the momentum and is now approaching towards obtaining its objectives and target as set at different times. Coverage Evaluation Survey (CES) 2023 indicates that in terms of vaccination coverage, valid Full vaccination coverage by the age of 12 months was 83.9 percent while it was only 2.0 percent in 1984. Similarly, crude Full vaccination rate has become 95.3 percent which was 76.0 percent in 1995. Despite its tremendous success, EPI could not achieve it's coverage target as set by its own. Considering the global, regional, and country contexts, EPI has fixed a target of full vaccination coverage among under one-year children with at least 95 percent nationally and at least 90 percent in each district; and Td5 coverage among women of child bearing age reached at least 80 percent nationally and at least 75 percent at each district level.

As one of the most important monitoring tools to oversee the program implementation status and for taking appropriate measures to reach the desired goals and objectives setby EPI, the GoB periodically conducts EPI Coverage Evaluation Surveys (CES), which provide an evidence-based scientific appraisal of the programme. This report of CES 2023 presents the findings obtained from the 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, 24-35 months, and women aged 18-49years. The study was carried out between April 2023 and September 2023.

The objectives of CES 2023 were to assess:

- Childhood vaccination coverage among12-23 months old childrenn under routine EPI
- Childhood vaccination coverage by the age of 23 months among 24-35-month-old children considering Measles Rubella Second Dose (MR2) under routine EPI.
- Status of Td Vaccination Coverage and one's protection at birth among the women having children aged less than one year.
- Td5 coverage among the women of 18-49 years of age to assess the progress of theTd5 programme
- Drop-out rates and quality (percentage of invalid doses, vaccination card availability, 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 seven different chapters from Chapter 3 to Chapter 9 of this report.

METHODOLOGY

The WHO new sampling methodology was implemented in this study, which primarily focused on quantitative research. Data were gathered through face-to-face interviews with mothers and caregivers of children and women during visits to community households. The study comprised four distinct surveys aimed at different subjects. CES 2023 encompassed 128 survey units, covering 64 districts, 55 zones within 12 city corporations, and 9 municipalities in Bangladesh. In total, 183,048 interviews were conducted across 7,168 randomly selected mouzas/mahallas throughout the country. For the childhood vaccination coverage survey, 56 clusters were selected from each survey unit using a systematic random sampling technique with Probability Proportional to Size (PPS), while 44 clusters were utilized for the Td3 and Td5 surveys. Respondents from each cluster were identified through a household listing process and were selected randomly to complete the questionnaire.

FINDINGS

Childhood Vaccination Coverage among 12-23 months old children Nationa Coverage

Crude Full Vaccination Coverage by Age 23 Months:

Nationwide, 95.2 percent of children received all eligible vaccines by the age of 23 months, regardless of whether the EPI recommended age for administration and the intervals between doses were adhered to BCG, the first antigen administered, had the highest coverage at 98.8 percent, with Penta1 matching this rate at 98.8 percent as well. However, coverage for subsequent doses declined progressively: Penta2 was at 98.4 percent and Penta3 dropped to 97.7 percent, with MR1 at 95.5 percent, reflecting a decrease of 2.2 percentage points. Notably, coverage varied between rural (97.5 percent) and urban (93.4 percent) areas.

Valid Full Vaccination Coverage by Age of 23 Months:

Valid coverage, defined as vaccines administered according to the EPI-recommended minimal age and intervals between doses, showed that **87.2** percent of children nationally received all doses as scheduled. The highest coverage was for BCG **98.8** percent and Penta1 **98.5** percent, followed by Penta2 at 98.0 percent and Penta3 at **91.7** percent. MR1 coverage stood at 92.2 percent, which is 6.6 percentage points lower than BCG.

Valid Full Vaccination Coverage by Age of 12 Months:

By 12 months of age, **81.6** percent of children received all scheduled vaccines, adhering to the EPI-recommended minimal ages and valid intervals. BCG coverage remained consistent at 98.8 percent. Valid coverage for Penta1 and OPV1 was almost identical to that at 23 months. Among all antigens, MR1 coverage was the lowest at **86.1** percent. An analysis of urban versus rural areas revealed MR1 coverage was lower in urban areas (83.8 percent) compared to rural areas (88.8 percent). Overall, rural children were more likely to receive valid doses (**84.6** percent) than their urban counterparts (**79.0** percent)

Coverage by Division

Crude Full Vaccination Coverage for Children by Age 23 Months:

The highest crude full vaccination coverage was observed in Rajshahi, reaching **98.9** percent, while Dhaka had the lowest coverage at **92.3** percent. Barishal division closely followed with a coverage rate of 98.3 percent. The other divisions reported the following coverage rates: Rangpur at 97.4 percent, Mymensingh at 97.3 percent, Chattogram at 96.2 percent, and Khulna at 96.0 percent. The overall data suggests that the number of dropouts from vaccination services contributed to the lower coverage in some areas.

Valid Full Vaccination Coverage for Children by Age 12 Months:

Barishal division achieved the highest valid full vaccination coverage with **89.0** percent, slightly ahead of Rajshahi, which had 88.4 percent. Other valid vaccination coverage rates included Mymensingh at 85.5 percent and Sylhet at 85.0 percent. Chattogram reported a valid coverage of 82.9 percent, while both Khulna and Rangpur divisions had **82.8** percent. The analysis indicates that lower drop-out rates and the administration of more valid doses played significant roles in achieving these higher vaccination coverage rates.

Coverage by City Corporation

Crude Full Vaccination Coverage by the Age of 23 Months:

Nationally, urban coverage was reported at **93.4** percent in CES 2023. Among city corporations, Rajshahi City Corporation (RCC) had the highest crude vaccination coverage at 99.8 percent, while Dhaka South City Corporation (DSCC) recorded the lowest at **87.7** percent. The coverage in other city corporations varied between 97.7 percent and 88.5 percent (see Figure 10).

Valid Full Vaccination Coverage by the Age of 12 Months:

Nationally, urban coverage for valid full vaccination was noted at **79.0** percent in CES 2023. Among the city corporations, the highest valid vaccination coverage was again in Rajshahi City Corporation (RCC) at **93.4** percent, contrasted by the lowest in Cumilla City Corporation (COCC) at 74.5 percent. Valid vaccination coverage in other city corporations ranged from 86.2 percent to 75.4 percent (see Figure 10a).

Programme Quality

Invalid Dose: A vaccine dose or antigen is considered invalid when it is administered without adhering to the exact EPI-recommended minimum age for starting the vaccine or the required minimum interval between consecutive doses. CES 2023 estimated the invalid doses for Penta1, Penta2, Penta3, and MR vaccines. Among the Pentavalent doses, invalid doses were most prominent for **Penta1 (3.6 percent)** and least prominent for Penta2 and Penta3 (**1.4 percent and 0.7 percent**, respectively) across the country.

A slight variation in invalid doses was observed between urban and rural areas, with urban areas showing higher rates compared to rural areas for both Penta and MR1 vaccines. Specifically, the invalid rates for rural areas were as follows: Penta1 was 3.2 percent, Penta2 was 1.4 percent, and Penta3 was 0.7 percent. The invalid MR1 rate was 8.1 percent in rural areas and 9.8 percent nationwide (see Figure 52).

The highest proportion of invalid Penta1 doses was administered in the Dhaka division (4.9 percent), while the lowest was in Rajshahi divisions (2.4 percent). For Penta2, the highest invalid rate (1.7 percent) was also found in both Dhaka and Khulna division, whereas the lowest rates were observed in Barishal (0.7 percent) for Penta2 and Rangpur (0.5 percent) for Penta3.

It is important to note that the Dhaka division had the highest rate of invalid MR1 doses at 15.1 percent, while Barishal had the lowest at 6.0 percent (see Appendix Table 9).

Among city corporations, the highest invalid doses were recorded in Cumilla City Corporation, with 13.0 percent invalid Penta1, 1.1 percent invalid Penta2, 1.3 percent invalid Penta3, and 22.7 percent invalid MR1. The lowest invalid doses were reported in SCC (see Figure 54).

Vaccination Drop-out Rate:

The text outlines the estimated drop-out rates for Penta1-Penta3 and Penta1-MR1 vaccinations in the country. The Penta1-Penta3 drop-out rate, which is the proportion of children who received Penta1 but did not receive Penta3, is 1.1 percent overall. In contrast, the Penta1-MR1 drop-out rate, defined as the proportion of children who received Penta1 but failed to receive MR1, stands at 3.2 percent.

Looking at the divisions, Dhaka has the highest Penta1-Penta3 drop-out rate at 1.6 percent, while Barishal has the lowest at 0.3 percent. For the Penta1-MR1 drop-out rates, Dhaka again records the highest at 4.0 percent, and Rajshahi shows the lowest at 1.1 percent. Other divisions show Penta1-MR1 drop-out rates between 3.8 percent and 1.7 percent.

In terms of city corporations, DSCC has the highest Penta1-Penta3 drop-out rate at 3.5 percent, and RCC reports the lowest at 0.0 percent. Sylhet and Rangpur follow with drop-out rates of 0.3 and 0.4 percent, respectively. Conversely, KCC has the highest Penta1-MR1 drop-out rate at 7.4 percent, with RCC again having the lowest at 0.2 percent. Other city corporations show rates ranging from 6.8 percent to 1.1 percent.

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, 96.5 percent of the children received the vaccination card and **56.7** percent of the mothers/caregivers retained it (see Figure 49). Card availability was considerably higher in the rural areas (76.7 percent) than in the urban areas (39.1 percent). The card retention rate in urban areas by city corporation, shows that it was the highest in Rajshahi CC (84.7 percent) and the lowest in SCC (9.2 percent), with some variations among others between those two figures (See figure 49-51).

Reasons for Never and Partial Vaccination

Reasons for Never Vaccination

Among the surveyed children, less than 1.2 percent did not receive any vaccine. Table 5 presents the reasons for never vaccinating, as reported by the mothers or caregivers. Approximately one-third (30.0 percent) stated that they didn't know where to go for vaccination. A similar percentage (29.9 percent) mentioned that their children were sick at the time. About one in ten of the mothers or caregivers (8.5 percent) also cited Mother/Caregiver was busy. Additionally, about 8.0 percent noted that no one had contacted them to remind them to vaccinate their children. Vaccine hesitancy was evident in 5.5 percent of the responses, following reasons such as the child being unwell, which prevented vaccination (3.1 percent), fears about side effects (2.3 percent), family members forbidding vaccinations (2.2 percent), misconceptions (1.5 percent), forgetting to vaccinate (1.4 percent), the child being absent during the vaccination session (2.6 percent), and the vaccinator charging a fee (1.2 percent) (see Table 6). The reasons for not vaccinating, according to rural divisions and city corporations, are detailed in Tables 6 and 7, respectively.

Reasons for Partial Vaccination

Across the country, 4 percent of the surveyed children received partial vaccinations. Table 8 presents reasons for never vaccinating the children, with reasons mentioned by the mothers/caregivers. The figure shows that about one-third of the mothers reported that they were busy (28.9 percent). One-fifth of the mothers/ caregivers reported vaccine hesitancy which was being followed by other major causes of partial vaccination such as mothers/caregivers didn't know when to go for subsequent doses or next vaccine (12.8 percent), the child was sick (9.3 percent), mothers/caregivers forgot to vaccinate (8.5 percent), and the child was sick, so vaccinator didn't give (3.3 percent) (see Table 8). Reasons for Partial vaccination by the rural division and city corporation are presented in Table 9 and Table 10, respectively.

Vaccination Coverage by the age of 23 months among 24-35 Months Old Children Considering Measles Rubella Second Dose (MR2)

Measles elimination by 2020 is a global partnership initiative which was formed in 2001. WHO targeted to accelerate Measles-Rubella coverage among the countries of 5 regions through EPI routine immunization programme. Strengthening surveillance system is one the ways to assess the incidence as well as prevalence rate of both Measles and Rubella which is being currently practiced in Bangladesh. However, proportion of children got immunity against Measles and Rubella is crucial to know to identify bottlenecks and design micro-plan accordingly. EPI CES is an important means in this aspect. Therefore, MR2 coverage among 24-35 months old children was added in CES 2023 similar to childhood vaccination coverage survey among 12-23 months old to assess the Measles-Rubella second dose coverage among 24-35 months old children. The children who born between October 1, 2020, and September 30, 2021, was the target audience of MR2 coverage evaluation Survey. The methodology was similar to childhood vaccination survey among 24-35 months old children. And the sample was drawn to the same cluster where childhood vaccination survey was conducted.

Vaccination Coverage among by the age of 23 months among 24-35 Months Old Children

Crude Full Vaccination Coverage among 24-35months old children

About **93.0** percent of the children received all the vaccines including MR2 by the age of 23 months across the country. As individual antigen, crude MR2 coverage was found 93.1 percent with slight variation between the urban and the rural areas (94.3 percent in rural and 91.9 percent in the urban areas). However, no variation was observed between the male and the female across the country regarding MR2 coverage. While looked at Crude Full Vaccination Coverage including MR2 by residence children from rural areas were more likely to receive all the recommended vaccines than those from urban areas (94.3 percent vs. 91.9 percent)

Valid Full Vaccination Coverage among 24-35 months old children

Across the country, **76.8** percent of the children received MR2. Seventy nine percent of the children who resided in rural areas received valid MR2 as against 75.0 percent who were from urban areas. By division valid MR2 coverage was found to be the highest in Rajshahi division (88.2%), and the lowest is Dhaka division (77.1%). Among the city corporations the highest MR2 coverage revealed in RCC (92.2 percent) the lowest in Chattogram City Corporation (79.3%).

MR1-MR2 Drop-out.

Across the country 3.4 percent of the children received MR1 but failed to receive MR2. A slight variation between urban and rural areas noticed (3.4 percent in the rural and 3.3 percent in the urban areas). Among the divisions, the highest drop-out noticed in Khulna and Chattogram divisions (3.9 percent each), and it was the lowest in Barishal and Rajshahi divisions (1.9 percent). Similar to the division the lowest drop-out observed in RCC (0.4 percent), and the highest in NCC (7.3 percent).

Td Vaccination Coverage among the mothers with 0-11 Months Old Children

Crude Coverage

CrudeTd5 Vaccination Coverage illustrates that nationwide, **62.9** percent of women received all five doses of Td vaccines. There is a small difference of 0.6 percentage point between rural and urban women, with coverage at 63.2 percent in rural areas compared to 62.6 percent in urban areas. Notably, there has been a significant decline in the crude coverage of Td doses. Starting at 95.6 percent for Td1 nationally, it has decreased to 85.6 percent for Td3 and 75.4 percent for Td4 doses. This decline is consistent in both rural and urban settings. In rural areas, the coverage rates for Td1, Td2, Td3, Td4, and Td are 97.3 percent, 95.7 percent, 87.9 percent, 75.8 percent, and 63.2 percent, respectively. For urban areas, the figures stand at 94.3 percent, 90.1 percent, 83.8 percent, 74.5 percent, and 62.6 percent, respectively.

Valid Coverage

In terms of Valid Td5 Coverage, over three-fifth (**61.3** percent) of surveyed women received all five doses of the valid Td vaccine, with 61.0 percent in urban areas and 61.7 percent in rural areas. Similar to crude Td coverage, valid Td coverage for subsequent doses has also seen a notable decrease—from 95.6 percent for Td1 down to 61.3 percent for Td5. Valid coverages are slightly higher in rural areas compared to urban areas for all Td doses.

Protected At Birth (PAB): About ninety percent (89.8%) of the children were found to be protected at birth in CES 2023. The children of urban areas were less protected against tetanus (89.3 percent) than the children resided in rural areas (90.3 percent).

Td Vaccination Coverage among Childbearing Age Women

Crude Vaccination Coverage

TT vaccine was converted to Td in 2019. Approximately sixty percent (58.0%) of women received all five doses of the Td vaccine, with some variation in coverage between rural (60.8 percent) and urban (59.1 percent) populations. There was a significant downward trend in crude coverage between the Td doses. Starting with Td1, which had a nationwide coverage rate of 92.9 percent, the rate decreased to 84.1 percent for Td3 and 74.3 percent for Td4. This trend was consistent in both rural and urban areas.

Valid Vaccination Coverage

More than half of the surveyed women (58.0 percent) received all five doses of the Td vaccine according to the recommended vaccination schedule set by the Expanded Programme on Immunization (EPI). Coverage was slightly higher in rural areas, at 58.3 percent, than in urban areas (57.8 percent). Similar to crude Td coverage, valid Td coverage for the subsequent doses also decreased significantly, dropping from 92.9 percent for Td1 to 58.0 percent for Td5.

By residence, it was higher in rural areas than in urban areas for all Td doses. The coverage gap between rural and urban areas was especially pronounced for the Td3 dose (85.1 percent in rural areas versus 80.3 percent in urban areas). However, the gap was narrower for the Td4 dose (71.1 percent in rural areas compared to 68.7 percent in urban areas).

Table 1: Findings of Key Indicators

Indicators		BCG	Penta1	OPV1	PCV1	Penta2	OPV2	PCV2	Penta3	OPV3	PCV3	IPV1	IPV2	MR1	FVC
Crude Vaccination Coverage by Age of 23 Months	National	98.8	98.8	98.8	98.8	98.4	98.7	98.4	97.7	97.7	97.7	98.8	97.7	95.5	95.2
	Urban	97.9	97.8	97.8	97.8	97.3	97.8	97.3	96.3	96.3	96.3	97.8	96.3	93.9	93.4
	Rural	99.9	99.9	99.9	99.9	99.6	99.9	99.7	99.2	99.2	99.2	99.9	99.2	97.5	97.5
	Male	98.8	98.8	98.8	98.8	98.5	98.7	98.5	97.6	97.6	97.6	98.8	97.6	95.8	95.4
	Female	98.8	98.8	98.8	98.8	98.3	98.8	98.3	97.7	97.7	97.7	98.8	97.7	95.3	95.0
By Division	Barishal	100.0	100.0	100.0	100.0	99.9	100.0	99.9	99.7	99.7	99.7	100	99.7	98.3	98.3
	Chattogram	99.7	99.7	99.7	99.7	99.2	99.7	99.2	98.7	98.7	98.7	99.7	98.7	96.3	96.2
	Dhaka	97.1	97.0	97.0	97.0	96.6	97.0	96.6	95.4	95.4	95.4	97.0	95.4	93.0	92.3
	Khulna	99.8	99.8	99.8	99.8	99.4	99.8	99.4	98.6	98.6	98.6	99.8	98.6	96.1	96.0
	Mymensingh	99.9	99.8	99.8	99.8	99.5	99.8	99.5	99.3	99.3	99.3	99.8	99.3	97.3	97.3
	Rajshahi	0	0	0	0	99.8	.0	99.8	99.6	99.6	99.6	100	99.6	98.9	98.9
	Rangpur	99.9	99.9	99.9	99.9	99.6	99.9	99.6	99.4	99.4	99.4	99.9	99.4	97.5	97.4
	Sylhet	99.7	99.7	99.7	99.7	99.2	99.7	99.2	98.5	98.5	98.5	99.7	98.5	95.9	95.9
Valid Vaccination Coverage by Age of 12 Months	National	98.8	98.5	98.8	98.5	98	98.4	98	91.6	91.6	91.6	98.5	93.6	86.1	81.6
	Urban	97.9	97.6	97.8	97.6	97.0	97.5	97	90.2	90.2	90.2	97.5	92.3	83.8	79.0
	Rural	99.9	99.6	99.9	99.6	99.2	99.5	99.3	93.2	93.2	93.2	99.6	95.1	88.8	84.6
	Male	98.8	98.5	98.8	98.5	98.1	98.4	98.2	91.5	91.5	91.5	98.5	93.5	86.2	81.8
	Female	98.8	98.5	98.8	98.5	97.9	98.3	97.9	91.7	91.7	91.6	98.4	93.6	85.9	81.4
By Division	Barishal	100.0	99.7	100.0	99.7	99.6	99.6	99.5	99.4	99.4	99.3	99.2	99.2	99.1	89.0
	Chattogram	99.7	99.4	99.7	99.4	98.7	98.8	98.6	98.4	98.2	98.0	97.8	97.6	97.4	82.9
	Dhaka	97.1	96.8	97	96.8	96.3	96.3	96.1	96.0	95.8	95.6	95.4	95.3	95.1	76.5
	Khulna	99.8	99.5	99.8	99.5	99.0	99.0	98.9	98.7	98.6	98.4	98.3	98.1	98	82.8
	Mymensingh	99.9	99.5	99.8	99.5	99.2	99.5	99.2	94.3	94.3	94.3	99.5	95.7	88.8	85.5
	Rajshahi	100	99.7	100	99.7	99.5	99.6	99.5	95.5	95.5	95.5	99.7	96.6	91.5	88.4
	Rangpur	99.9	99.6	99.9	99.6	99.1	99.4	99.1	91.6	91.6	91.6	99.6	94.1	88.2	82.8
	Sylhet	99.7	99.4	99.7	99.4	98.8	99.3	98.8	93.1	93.1	93.1	99.3	94.9	88.8	85.0

	National	Urban	Rural	Barishal	Chittagong	Dhaka	Khulna	Mymensingh	Rajshahi	Rangpur	Sylhet
Drop-out Rate											
Penta1-Penta3	1.1	1.4	0.6	0.3	1.0	1.6	1.2	0.5	0.3	0.5	1.2
Penta1-MR1	3.2	3.9	2.4	1.7	3.4	4.0	3.7	2.5	1.1	2.4	3.8
P3-MR1	2.1	2.5	1.7	1.4	2.3	2.4	2.5	2.0	0.7	1.9	2.6
Incidence of Invalid Dose											
Invalid Penta1	3.6	4.3	3.2	2.5	4.2	4.9	3.2	2.8	2.4	4.7	2.5
Invalid Penta2	1.4	1.5	1.4	0.7	1.5	1.7	1.7	0.9	0.8	2	1.5
Invalid Penta3	0.7	0.6	0.7	0.6	0.7	0.8	0.7	0.6	0.6	0.5	0.7
Invalid IPV2	0.6	0.7	0.5	0.1	0.6	0.8	0.9	0.3	0.4	0.7	0.7
Invalid MR by 12 Months	3.5	4.2	3.0	2.5	3.8	5.0	3.4	2.4	2.2	3.7	2.6
Invalid MR by 23 Months	6.3	8.6	4.9	3.3	6.2	10.1	6.6	5.4	4.8	4.5	3.3
Card Retention Rate among 12-23 Months Old Children	56.7	39.1	76.7	85.2	58.2	33.6	74.9	68.9	86.0	56.6	67.9
Card Retention Rate among 24-35 Months	52.0	33.9	72.4	84.3	50.6	28.6	73.5	60.6	81.2	52.2	63.7

MR Vaccination Coverage among 24-35 Months Old Children											
Indicators	**National**	**Urban**	**Rural**	**Barishal**	**Chittagong**	**Dhaka**	**Khulna**	**Mymensingh**	**Rajshahi**	**Rangpur**	**Sylhet**
Crude MR Coverage	93.1	92.1	94.3	97.1	93.6	91.1	92.3	95.0	97.6	93.8	91.9
Valid MR Coverage	80.7	79.1	82.6	87.6	80.7	77.1	80.9	82.7	88.2	81.1	81.5

Crude Td Vaccination Coverage among Mothers with Children 0-11 Months Old											
Crude Td1	95.6	94.3	97.3	99.5	96.6	92.3	96.4	98.6	99.5	97.8	93.5
Crude Td2	92.6	90.1	95.7	99.1	95.0	86.7	93.6	97.8	99.1	94.2	93.0
Crude Td3	85.6	83.8	87.9	92.1	87.2	78.9	86.1	93.8	95.6	89.2	83.1
Crude Td4	75.1	74.5	75.8	76.7	79.2	67.6	74.6	80.2	85.2	82.6	71.0
Crude Td5	62.9	62.6	63.2	63.2	67.7	54.8	63.3	63.3	74.8	72.2	57.8
Valid Td Vaccination Coverage among Mothers with Children 0-11 Months Old											
Valid Td1	95.6	94.3	97.3	99.5	96.6	92.3	96.4	98.6	99.5	97.8	93.5
Valid Td2	92.6	90.1	95.7	99.1	95.0	86.7	93.6	97.8	99.1	94.2	93.0
Valid Td3	84.2	82.4	86.5	90.8	86.0	77.5	83.8	92.6	94.3	88.5	82.2
Valid Td4	71.9	70.9	73.1	73.6	75.0	63.7	71.8	77.1	83.0	81.1	68.6
Valid Td5	61.3	61.0	61.7	61.5	66.2	53.3	61.7	60.3	73.5	71.5	56.9
Newborn Protected at Birth											
PAB	89.8	89.3	90.3	95.4	92.0	86.1	84.3	95.1	96.4	92.1	91.4
Crude Td5 Vaccination Coverage among aged 18-49 Years Old											
Crude Td1	92.9	90.6	95.4	98.0	96.4	89.6	93.1	96.3	98.9	92.1	86.5
Crude Td2	90.1	86.6	93.8	96.7	95.4	85.1	90.7	94.8	98.3	88.2	85.2
Crude Td3	84.1	81.4	86.9	89.2	91.6	77.9	83.0	91.2	94.3	83.5	76.9
Crude Td4	74.3	72.4	76.3	77.3	84.3	68.8	71.5	75.3	85.3	73.8	64.5
Crude Td5	59.9	59.1	60.8	62.4	68.0	54.1	59.3	56.0	74.8	60.3	49.1
Valid Td5 Vaccination Coverage among aged 18-49 Years Old											
Valid Td1	92.9	90.6	95.4	98.0	96.4	89.6	93.1	96.3	98.9	92.1	86.5
Valid Td2	89.8	86.3	93.5	96.2	95.2	84.8	90.3	94.6	97.9	88.0	84.6
Valid Td3	82.6	80.3	85.1	86.9	90.5	76.5	79.5	90.4	93.1	82.8	75.6
Valid Td4	69.9	68.7	71.1	71.8	78.7	63.8	65.4	72.5	82.0	72.7	61.5
Valid Td5	58.0	57.8	58.3	59.0	66.3	52.0	56.3	53.8	73.6	59.9	47.8