Resource Gap for Public Sector Provision of the Expanded Programme on Immunization in Bangladesh, 2017-2022

1. Introduction

Bangladesh started the Expanded Programme on Immunization (EPI) in 1979, and its programme is considered a global success story with significantly improving coverage. The Ministry of Health and Family Welfare (MOHFW) is implementing EPI as part of child health care. EPI is there for included within the Maternal, Neonatal, Child, and Adolescent Health (MNCAH)[1] operation plan (OP) of the 4th Health, Population, and Nutrition Sector Programme 2017-2022 (4th HPNSP).[2] GOB is the major contributor to the resources required for EPI, followed by Gavi. Government of Bangladesh (GOB) also contributes health system costs for EPI service delivery. With strong government ownership by the Directorate General of Health Services (DGHS), high national coverage levels are maintained. Country official estimates, as well as WHO/UNICEF coverage estimates, show that diphtheria-tetanus-pertussis or DTP3 coverage has remained over 90% for more than ten years.[3] However, there are still inequities in coverage between urban and rural areas, in hard-to-reach geographic areas, and between socio-economic groups. To sustain EPI coverage and address existing gaps, the program needs adequate resources.

This analysis continues USAID Health Finance and Governance (HFG) project's support to the MOHFW and GOB towards evidence-based planning and strengthening Bangladesh's health system for Universal Health Coverage (UHC). HFG also conducted a similar resource gap analysis for the Essential Service Package (ESP) and tuberculosis (TB) in Bangladesh.[4, 5] Please see the full report for complete details on methods, limitations, and results for the resource gap analysis for ESP, TB, and EPI in Bangladesh.[6]

This brief provides an overview of the resource gap analysis for the EPI in Bangladesh, based on the distribution of domestic and external resources allocated to the EPI and the estimated costs for EPI in Bangladesh for the period 2017-22.

2. Objectives

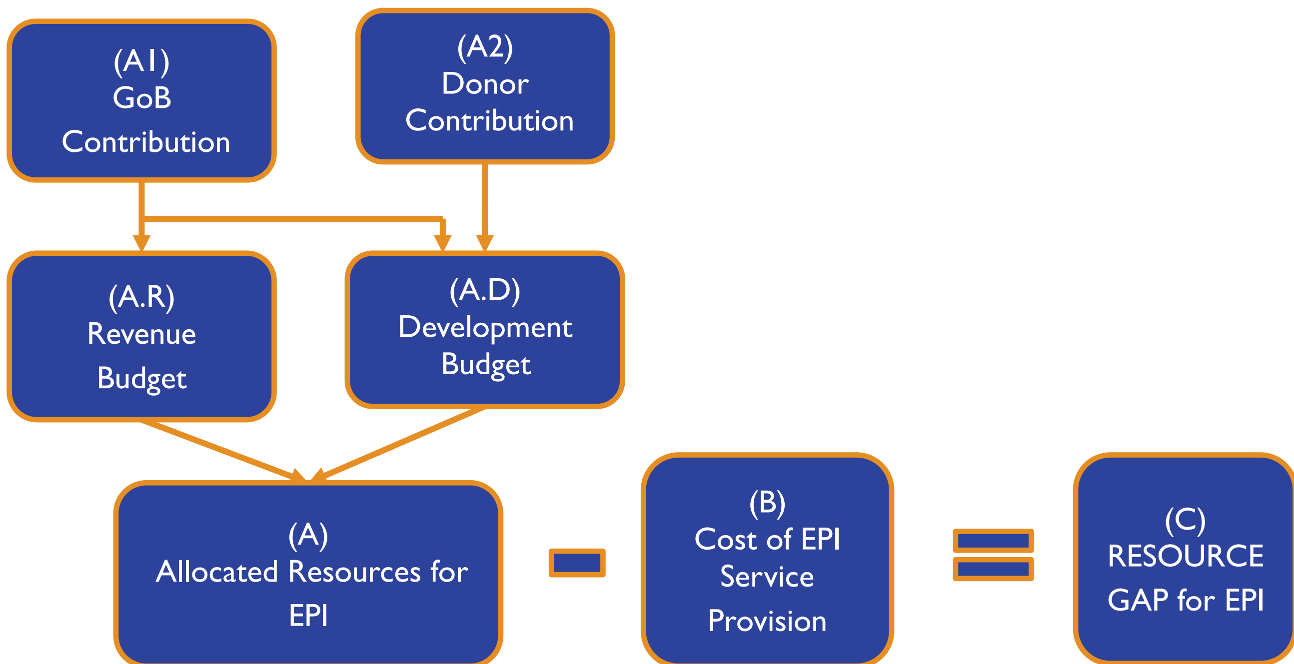
The objectives of this resource gap analysis were to:

- Analyze consolidated information on the resources available and estimated costs of implementing the EPI per the 4th HPNSP, and to determine the resource gap for the period 2017 to 2022;
- Generate evidence on the resource gap to inform policymakers on how best to achieve the current sector plan targets and to support future planning; and
- Inform domestic resource mobilization initiatives of the GOB to better plan for eventual transition from donor financing.

3. Methodology

HFG used a similar methodology to other resource modeling exercises conducted for HIV, TB, malaria, and nutrition programmes in countries undergoing donor transitions.[7, 8, 9] This included a simple analytic framework to estimate the future resource gap (if any) for Bangladesh's EPI. Components of the framework are shown in Figure 1 and explained below.

Figure 1: Analytic Framework for Resource Gap Analysis



Components of the framework are explained below.

(A) Allocated resources for the EPI: for the purposes of this analysis, these are from two sources:

- **(A.R) Revenue budget** is primarily allocated for health facilities, specifically human resources (HR), such as salaries, allowances, and other benefits; these constitute approximately 90% of the revenue budget.
  - **(A1) GOB contribution** to MOHFW for the EPI includes funding allocated by GOB through the revenue budget.
- **(A.D) Development budget** is generally more flexible; it covers the programmatic aspects of the EPI, such as the introduction of new vaccines and increasing and sustaining routine EPI. This is channeled through the sector programme, the 4th HPNSP; it also includes the health system strengthening aspects of the general health system, such as training, research and development, and monitoring and evaluation.
  - **(A1) GOB contribution** to MOHFW for the EPI, also includes funding allocated by GOB through development budget.
  - **(A2) Donor contribution** includes external resources from development partners allocated as part of the development budget.

(B) Cost of EPI service provision: Since 2016, HFG, in partnership with the World Health Organization (WHO) and the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b), have been supporting the MOHFW's Planning Wing and Health Economics Unit (HEU) to estimate the cost of providing the ESP through the public sector as per the plans and targets in the 4th HPNSP. Using findings from the costing study (henceforth MOHFW's 2018 ESP costing report),[10] HFG conducted this in-depth analysis to determine the resource gap for public sector provision of the ESP, TB, and EPI in Bangladesh using the Programme Implementation Plan (PIP) and OPs of 4th HPNSP as the basis.

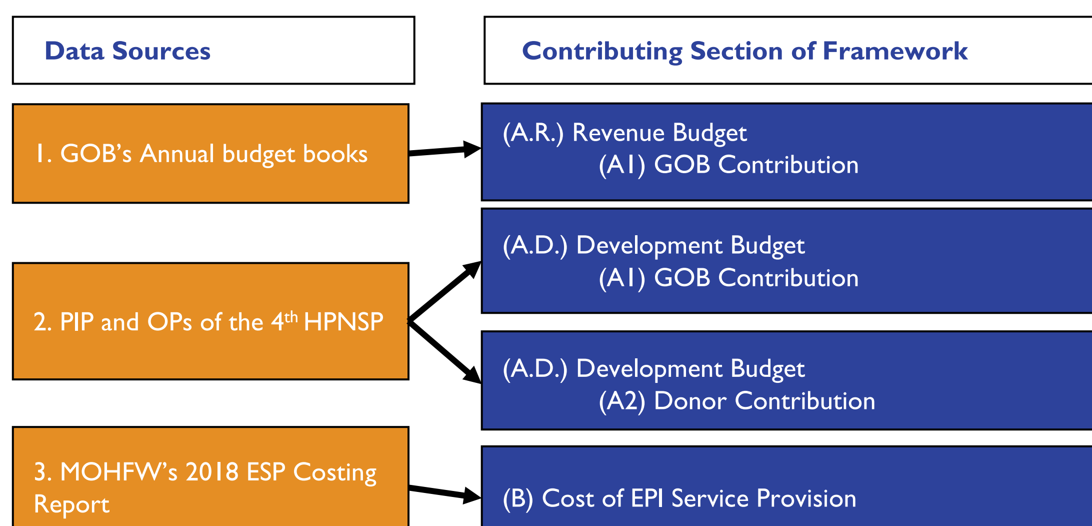
(C) Resource gap for EPI programme represents the additional resources the GOB will need to mobilize for the EPI to achieve the PIP targets in the 4th HPNSP. As depicted in **Figure 1**, the resource gap is the difference between the allocated resources for and the estimated cost of the EPI.

4. Data Sources and Analysis

Data on **allocated resources for EPI** was extracted from Bangladesh's development and revenue budgets:

- **Revenue budget (A.R)** data was compiled from Bangladesh's annual budget books 2017-18 for the health services division (HSD) and health education and family planning division (HE&FPD).[11,12] The revised budget for FY2016-17 and the intended budget for FY 2017-18 were extracted from these documents. We extracted budget amounts for ten different types of health facilities (E.G., Upazilla Family Planning Offices, Upazilla Health Complexes, Upazilla Health Offices, district hospitals, medical college hospitals), and for each type of health facility, the budget was provided in six different categories: officer salaries, employee salaries, allowances, supplies and services, repairs and maintenance, and assets collection and procurement. Revenue budget totals for FY2018-2019 to FY2021-2022 were projected using linear best fit for GOB projections for the revenue budget for FY2019-20, as well as actual expenditure data, including fiscal years from 2013-2016. For this analysis, we apportioned the budget for EPI based on assumptions made for health systems contribution twards EPI activities at various tiers.

Figure 2: Data Sources



- **Development budget (A.D)** data was extracted from the PIP and MNCAH OP of the 4th HPNSP. This provided a breakdown of funding from **GOB** and **Project Aid (PA)**, and the sum of **Direct Project Aid (DPA)** which takes the form of grants to GOB, **Reimbursable Project Aid (RPA)**, or loans to GOB. The MNCAH OP includes the total financial target for EPI (GOB plus PA) for each fiscal year from 2017 to 2022. HFG used the breakdown of the grand totals by source of funds (GOB or PA) to determine the annual breakdown of development budget amounts.

  HFG reviewed and extracted data for about 100 budget line items for EPI services from the MNCAH OP.[13]

  Apportioned budget for EPI: HFG apportioned the revenue budget amounts for EPI based on programme statistics and expert opinion.

- **Revenue budget (A.R):** salaries and benefits were apportioned based on assumptions of HR contribution (by each cadre) for EPI services, especially the front-line field workers for immunization; the same proportions were used to allocate the contribution of the remaining revenue budget (non-HR items) to EPI.

- **Development budget (A.D)** amounts for EPI services were directly extracted from the MNCAH OP.

Cost of EPI: Data on the **cost of EPI Service Provision (B)** was compiled from the MOHFW's 2018 ESP costing report. The cost estimates include the total cost of EPI service provision in Bangladesh. Using an ingredients-based methodology, the study team costed EPI services.

The data was obtained from 2016 current practices. Costs were based on the target population, the population in need, and the service coverage of EPI (for various vaccines). Service coverage for 2016 was obtained from a document review, and coverage for the period 2017 to 2022 was obtained from the PIP and OPs of the 4th HPNSP.

HFG converted the EPI cost estimates from calendar year to fiscal year by combining half of each consecutive calendar year. This was because the allocated resource data (revenue and development budgets) follow Bangladesh's fiscal year (July through June).

In order to undertake the analysis:

- Annual linear progress was assumed in achieving coverage targets from 2017 to 2022; and
- The revenue budget for EPI was apportioned based on a number of assumptions and expert opinion.

The full report[14] contains details of assumptions made for each of the compiled data sets.

5. Findings

A. Allocated Resources for EPI

According to the MNCAH Operational Plan FY2017-18, the total resource allocation for EPI is Bangladesh Taka (BDT) 2,043 Crore (United States Dollar or USD 254 million), which decreases gradually (except 2020-21) over the period to BDT 1,862 Crore (USD 231 million) in 2021-22 (Table 1). The grand total allocation for FY2017-22 is BDT 9,736 Crore (USD 1, 208 Million). There is a gradual decrease in the total allocated resources for EPI over the period as a result of decreasing trend in the development budget for EPI during the period.

We discussed potential reasons for the gradual decline in the allocated development budget for EPI with MOHFW officials. They identified two factors:

1) The initial years included plans and corresponding budgets for several supplementary immunization activities (e.g., Measles-Rubella (MR) campaign in 2018-2019, and introduction of the Rota and Human Papilloma Virus (HPV) vaccines), which were not included in later years; and
2) The budget for the last two years was not detailed and included as a placeholder with the understanding that these will be detailed out and may increase as a result of the 4th HPNSP mid-term review in 2019.

The total contribution from GOB for the EPI for the five-year period is BDT 3,763 Crore (USD 467 million), which accounts for 38.7% of the total resources for the EPI (see Figure 3). The GOB contributes about 40% of the development budget, and the remainder is from development partners. The revenue budget contribution from GOB increases steadily, while the GOB contribution towards the development budget decreases (Table 1).

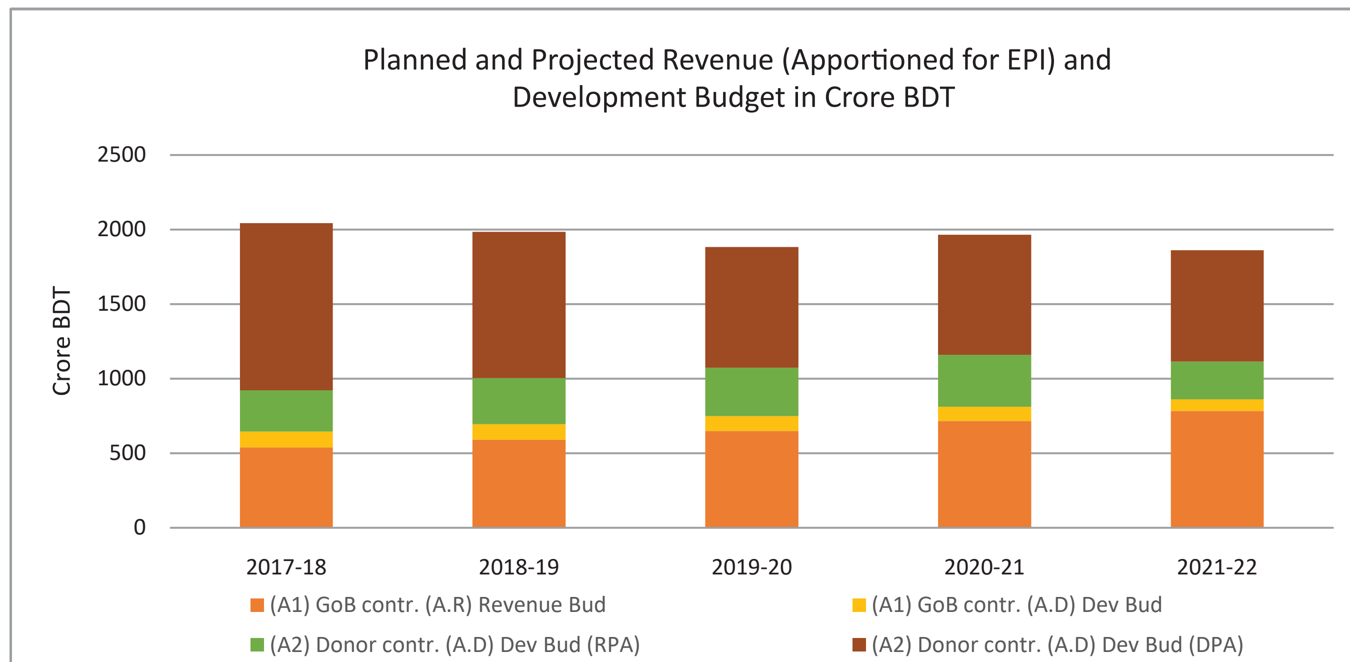
Table 1: Total Resources Allocated for EPI

YEAR	(A.R) Revenue budget		(A.D) Development budget		(A) Total Allocated Resources	
	(Crore BDT)	(Million USD)*	(Crore BDT)	(Million USD)*	(Crore BDT)	(Million USD)*
2017-18	538	67	1,505	187	2,043	254
2018-19	591	73	1,394	173	1,985	246
2019-20	650	81	1,232	153	1,882	234
2020-21	717	89	1,248	155	1,964	244
2021-22	784	97	1,077	134	1,862	231
Total	**3,280**	**407**	**6,456**	**801**	**9,736**	**1,208**

* Exchange rate used in 2017-2022: USD 1 = BDT 80.57

The total donor contribution for the EPI for 2017-2022 is BDT 5,974 Crore (USD 741 million), which accounts for about 61% of the total resources allocated (see Figure 3). Contributions from development partners (through the development budget) are about 60%, as planned in the 4th HPNSP. Of this, three-quarters is DPA and the remaining quarter is RPA (Table 1).

Figure 3: Apportioned Budget for EPI



Within the revenue budget for EPI, the largest portion is allocated to salaries of frontline health workers who deliver EPI services. The revenue budget is disbursed through EPI programme support offices (including divisional health offices, civil surgeon offices, Upazilla health offices, and Upazilla FP offices), EPI-specific offices (DGHS EPI offices), and hospitals under the general health system (including medical colleges, district hospitals, and Upazilla health complexes).

B. Cost of EPI Service Provision

Table 2 shows the cost of EPI for fiscal years from 2017-2022 derived from the MOHFW's 2018 ESP costing report. The gradual increase of total cost of EPI (from USD 421 Million in FY2017-18 to USD 462 Million in FY 2021-22) reflects the GOB's commitment to achieve increased coverage for EPI services by 2022 in accordance with the 4th HPNSP.

As per MOHFW's 2018 ESP costing report, the total cost of EPI during 2016-2022 is estimated to be BDT 24,368 Crore (USD 3,024 Million) by calendar year (Table 3). The cost per calendar year was converted into a cost per fiscal year to align with the budget allocation period in Bangladesh.

Table 2: Total Cost of EPI Service Provision by Fiscal Year, 2017-2022, including health systems costs, not including inflation

Items	2017-18	2018-19	2019-20	2020-21	2021-22	Total
(B) Cost of EPI (Crore BDT)	3,390	3,418	3,500	3,612	3,726	**17,646**
(B) Cost of EPI (Million USD*)	421	424	434	448	462	**2,190**

*Exchange rate used in 2017-2022: USD 1 = BDT 80.57

Table 3: Total Cost of EPI* Service Provision by Calendar Year, 2016-2022, including health systems cost, not including inflation

Items	2016	2017	2018	2019	2020	2021	2022	Total
Total cost of EPI (Crore BDT)	3,137	3,388	3,391	3,445	3,556	3,668	3,783	**24,368**
Total cost of EPI (Million USD*)	401	420	421	428	441	455	470	**3,024**

*Exchange rate used in 2016: USD 1 = BDT 78.3; 2017-2022: USD 1 = BDT 80.57

The analysis is based on the assumption that child health and EPI services constitute 43% of total health system costs (based on prior analysis conducted by icddr,b). Of this 43%, about 91% is for EPI. Thus, about 39% of the health system cost has been allocated to EPI. The justification of such a large allocation to EPI is not clear from the study. Subsequent discussion with MOHFW suggests this is very high, and that the estimates for child health and EPI in the MOHFW's 2018 ESP costing report are inflated. Nonetheless, these cost estimates were used for this analysis as the best available estimates at the time of writing.

C. Resource gap for EPI in Bangladesh

In 2017-18, the gap is approximately BDT 1,346 Crore (USD 167 Million), and by 2021-22, this is projected to reach BDT 1,864 Crore (USD 231 Million). Over the five-year period, the cumulative gap will reach BDT 7,909 Crore (USD 982 Million) (see Table 4 and Figure 4). The total resources for EPI will cover approximately 55% of the total cost resulting in a resource gap of about 45% for FY2017-22 (see Table 4).

Table 4: Resources, Cost, and Resource Gap for EPI Provision, FY2017-22

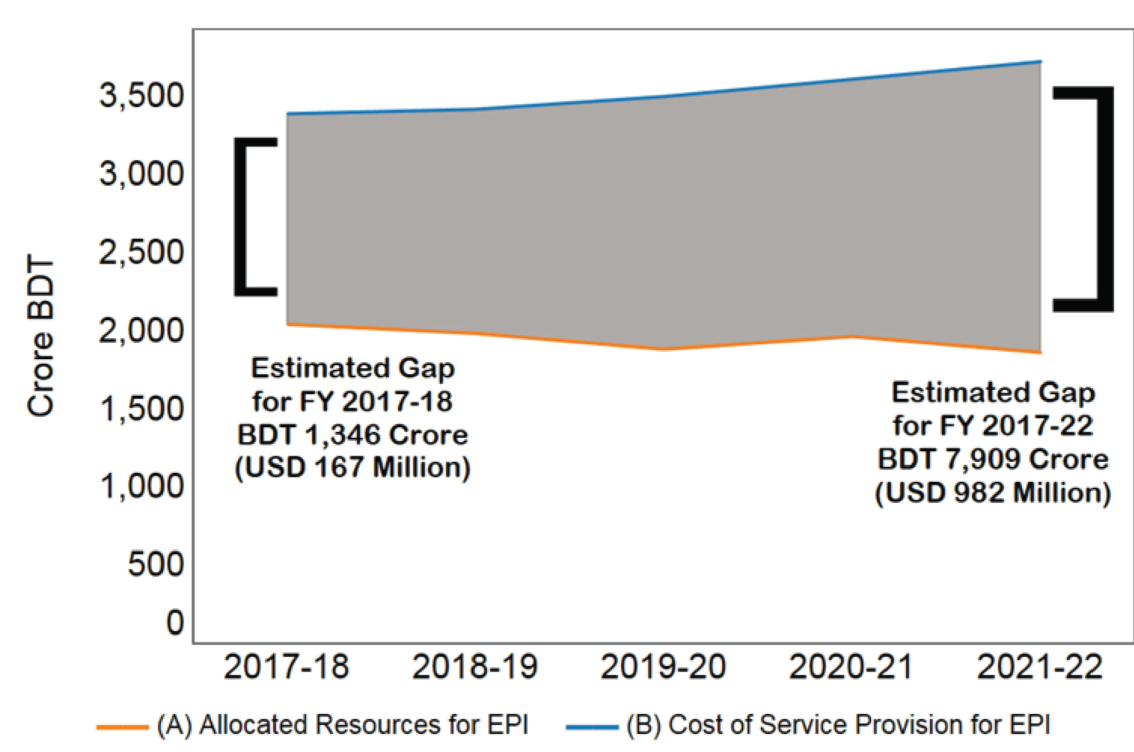
Year	(A) Total Allocated Resources for EPI		(B) Cost of EPI Service Provision		(C) Resource Gap for EPI		Gap as % of Cost
	(Crore BDT)	(Million USD*)	(Crore BDT)	(Million USD*)	(Crore BDT)	(Million USD*)	
2017-18	2,043	254	3,390	421	(1,346)	(167)	40%
2018-19	1,985	246	3,418	424	(1,434)	(178)	42%
2019-20	1,882	234	3,500	434	(1,618)	(201)	46%
2020-21	1,964	244	3,612	448	(1,648)	(204)	46%
2021-22	1,862	231	3,726	462	(1,864)	(231)	50%
Total	**9,736**	**1,208**	**17,646**	**2,190**	**(7,909)**	**(982)**	45%

*Exchange rate used in 2017-2022: USD 1 = BDT 80.57

EPI resources will decrease slightly over the five-year period, while costs are expected to gradually increase. The EPI resource gap may be overestimated. As mentioned earlier, in the absence of reliable data, the estimates from the MOHFW 2018 ESP costing report were used, which assume 39% of total health system costs belong to EPI. Due to this assumption, the costs may be overestimated resulting in a higher resource gap for EPI. The limited scope of this analysis did not permit revisions to the cost estimates with alternate assumptions.

As shown in Figure 4, the total resource gap over fiscal years 2017-2022 for EPI in Bangladesh is projected to be BDT 7,909 Crore (USD 982 Million), which is about 45% of the total cost for EPI services over this period. The resource gap for EPI in absolute terms is actually larger than the resource gap of the full ESP because the surplus amount from several programmes reduces the net gap for ESP. Among the service areas and their sub-components of the ESP, a number of programmes have resource gaps while several programmes have a surplus (e.g., family planning and management of other common conditions). As a result, the overall net resource gap for ESP is lower than that of EPI.

Figure 4: Estimated Resource Gap for EPI for FY2017-2022



6. Way Forward

Based on the results of this analysis, there is a substantial resource gap for public sector provision of EPI services if Bangladesh is to achieve the 4th HPNSP targets. Overall, the difference in resources allocated to EPI and its projected cost for the period 2017-2022 totals BDT 7,909 Crore (USD 982 Million). This gap indicates a need for the GOB and partners to advocate for additional resources to increase EPI coverage and achieve the 4th HPNSP targets.

The resource gap for EPI is estimated to be greater than the resource gap for ESP. This could be due to two factors:

- Firstly, among the ESP service areas and their sub-components, a number of programmes have a resource surplus (e.g., FP and management of other common conditions). EPI is a part of MNCAH services, and a number of sub-activities within this area have a resource surplus (e.g., neonatal health and adolescent health). As a result, while the overall ESP has a net resource gap, the resource gap for EPI in absolute terms is larger than the resource gap for the full ESP because the surplus amount of several programmes reduces the net gap for ESP.
- Secondly, the resource gap of EPI might be overestimated. In the absence of alternative data, this analysis used cost estimates from the MOHFW 2018 ESP costing report. This report assumes EPI constitutes 39% of the total health system costs, which might be much higher than reality. In turn, this has resulted in a higher resource gap for EPI. Future research activities should establish an accurate estimate of the health system contribution towards EPI in consultation with MOHFW officials to produce a revised cost estimate for EPI service provision.

In order to reduce the resource gap of EPI, the following next steps are recommended:

- Validate the findings: present and discuss these results in a clear and practical way with wider groups of GOB officials to validate and triangulate the estimates. Then, if required, estimates could be adjusted based on suggestions received.

- Advocate for additional resources: use these findings to advocate and mobilize additional resources, both domestically and from external sources. Donors such as Gavi may provide additional funds as part of their portfolio planning.
- Maximize efficiency: the GOB should seek to spend its resources as possible to increase the fiscal space for health. This may require additional analyses to identify some of the more easily attainable efficiency gains.

7. References

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[13] MNCAH, Maternal, Child, Reproductive, and Adolescent Health, Family Planning Field Services Delivery, Clinical Contraception Services Delivery Programme, National Nutrition Services, Communicable Disease Control, TB-Leprosy and AIDS/STD Programme, Non-Communicable Disease Control, National Eye Care, Community-Based Health Care, Information, Education & Communication, and Lifestyle, and Health Education and Promotion.

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