স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রণালয়

Technical Brief 2

Estimating the Costs of Public Sector Provision of the Bangladesh Essential Health Service Package: Fourth Health Population and Nutrition Sector Programme

Background

The Government of Bangladesh is working to make substantial progress towards universal health coverage (UHC) by 2030 as part of Target 3.8 of the Sustainable Development Goals. The Ministry of Health and Family Welfare (MOHFW) updated the Bangladesh's Essential Service Package (ESP) during 2015–16 to be implemented from the fourth Health, Population, and Nutrition Sector Programme 2017–22 (fourth HPNSP), in the context of UHC. The updated ESP is structured into six core services, covering around 234 interventions to be provided through ten delivery channels from community clinics to district hospitals, including urban primary care facilities. Effective ESP implementation is a critical step to make progress towards UHC, and better understanding of ESP service costs is needed to grasp the financial feasibility of package implementation and trigger policy discussions and actions.

Under the leadership of the Health Economics Unit (HEU), the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) conducted a costing exercise from January to September 2017 with the support from the World Health Organization (WHO) Bangladesh. Necessary collaboration was extended to the study team by the Health Finance and Governance (HFG) project of the United States Agency for International Development (USAID). This brief describes the ESP costing analysis including its methodology, key findings, and recommendations. Further details of the costing, including methodology, list of data inputs and sources, all cost estimates, and assumptions are available in the full ESP costing report.[i]

Objective

This purpose of the analysis was to estimate the cost of providing the ESP through the public sector from 2016 to 2022, by programme, intervention, and delivery channel. The cost estimates are expected to assess the affordability by the government to implement the ESP in the current sector programme and advocate for increased domestic resources required to effectively implement the updated ESP during the target years.

Approach

The study team worked closely with the National Costing Resource Pool to estimate the costs of ESP provision using the OneHealth Tool (OHT)[ii]. The cost of providing the ESP through the public-sector from 2016-2022 was estimated, using the target coverage levels in the fourth HPNSP. More specifically, the cost was estimated for 20.4% population coverage (calculated weighted average of ESP intervention coverage) of ESP in 2016 and projected up to 33.0% population coverage (calculated weighted average of ESP intervention coverage is planned to increase by public sector delivery channels) in 2022. The process began by customizing the OHT for the updated Bangladesh ESP, which involved categorizing the six core ESP services into 12 OHT programme areas (see Box 1).

Box 1: OHT customization for the Bangladesh ESP

ESP Core Services	OHT Programme
Maternal, Neonatal, Child & Adolescent Health (MNCAH)	Maternal health, Neonatal health, Child health and immunization, Adolescent health
Family planning (FP)	FP
Nutrition	Nutrition
Communicable diseases	Tuberculosis (TB), Malaria, HIV/AIDS, Neglected Tropical Diseases, (NTDs)
Non-communicable diseases (NCDs)	NCDs
Management of other common conditions	Management of other common conditions

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consulting with program officials to consolidate the ESP interventions into a list of 132 interventions to be costed, and determining the delivery channels through which these interventions were available. The team applied an ingredients-based costing method using the OHT to cost all ESP interventions, except those for malaria, TB, HIV/AIDS, and NTDs, for which costs were estimated using aggregate budget line items obtained from programme implementers.

Data inputs were obtained from key surveys and other documents[iii] as well as interviews at study sites (see Table 1 for data sources). The team obtained health systems data from the Human Resource Management database, the District Health Information System (DHIS–2), the Director General (DG) for FP (for logistics), and physical inventories at study sites (for infrastructure). At the sub-national level[iv], the team collected data on treatment inputs required for each intervention (i.e., drugs, tests, supplies, and health personnel time) to understand current treatment practice in public sector at primary and secondary care settings.

Intervention costs were estimated using a mixture of 2016 practices, standard protocols (where available), and expert opinions when other data were not available (e.g., for hypertension).

The cost of each intervention was estimated as follows:

# of cases X cost per case per year
where # of cases = target population size X target population in need of intervention (%) X coverage (%)

The cost per case per year for each intervention was estimated using the medicines and supplies required to deliver the particular intervention, and a cost per minute of required health personnel time. In addition, the study team calculated a weighted average cost per service for each intervention, as the cost per service per person varied by delivery channel. The average cost per beneficiary was estimated as follows:

$$\frac{\textit{Total estimated cost of providing ESP in public sector}}{\textit{Estimated weighted population to receive ESP}}$$

where, the estimated weighted population to receive ESP = weighted average of coverage X total population

$$\%\ \text{weighted average of coverage} = \frac{\sum \textit{Population received ESP}}{\sum \textit{Population in need ESP}} \times 100$$

Table 1: Data sources

Information	Source
Human resources	Human Resource Management database, DG for Health Services (HS), DGFP, and Urban. Primary Health Care Service Delivery Programme.
Logistics	DHIS-2 and Directorate General of Family Planning
Infrastructure	Physical inventory at study facilities.
Treatment inputs	Standard treatment guidelines, and consultative meetings with programme officials/experts and service providers.
Drugs and supplies (e.g., prices and quantities) required for ESP interventions	Key informant interviews with service providers and store keepers at study sites, Essential Drug Company Limited, Operational Plans, Expanded Programm on Immunization (EPI) head office, DGHS, Essential Service Delivery price list, Institute of Public Health, MOHFW's diagnostic test price list, and market prices.
Average staff time per service provided	Key informant interviews with service providers and supervisors at study sites.
Coverage data (base year coverage)	Document review: Health Bulletin, Bangladesh Demographic and Health Survey (BDHS) reports, BDHS dataset, morbidity survey, urban health survey, literature search, and FP Management Information System.
Target year coverage	Operational and programme implementation plans for 2017-22.
Programme cost data	Consultative meetings with BRAC, Line Director-TB, malaria, HIV, Line Director-MNCAH, Line Director-Communicable Disease Control, and operational plans.

Cost Estimates

Main Findings

As shown in Table 2, the total cost of delivering the ESP was BDT 76,195.1 million in 2016; this total cost is estimated to increase to BDT 103,194 million in 2022. This estimate takes into account the cost of current and new services, assumptions, and inputs needed to reach the targets in the Operational Plans of the fourth HPNSP (2017–2022). This total is the cost of delivering 132 ESP interventions across 10 delivery channels in the public sector. In 2016, human resources accounted for approximately 58% of total costs, followed by 26% for drugs and supplies (see Figure 1).

The per capita public cost allocation of the ESP in 2016 was USD 6.1 and increases to USD 7.4 in 2022[v]. The OHT calculates cost per capita incurred by the government for providing ESP services by dividing the total cost calculated for ESP provision in the public sector by the total population of the country in a given year.

Figure 1: Percentage Distribution of Total ESP Costs, 2016

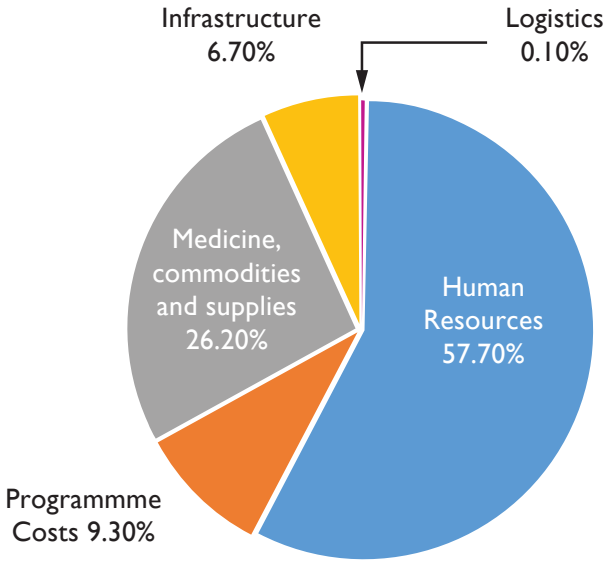


Table 2: Total ESP Costs, 2016–2022 in Million BDT (includes health system costs, not inflation)

Cost Component	2016	2017	2018	2019	2020	2021	2022	Total
Human resources	44,001	45,896	47,932	50,121	52,471	54,996	57,712	353,129
Medicines and supplies*	19,957	21,694	23,356	24,727	26,544	28,373	30,265	174,915
Infrastructure	5,084	9,229	7,218	7,321	7,506	7,411	7,402	51,169
Logistics	82	118	118	121	124	149	144	855
TB/leprosy, malaria HIV/AIDS, NTDs**, and general programme management costs***	7,073	7,108 .6	7,170.5	7,257	7,369	7,507	7,672	51,157
Grand total (BDT)	**76,195.1**	**84,045.4**	**85,794.1**	**89,546.4**	**94,014.3**	**98,436.1**	**103,194**	**631,225.5**
Public sector per capita allocation (BDT)^^	**475.2**	**517.2**	**521**	**536.8**	**556.5**	**575.4**	**596**	
Public sector per capita allocation (USD)^^	**6.1**	**6.4**	**6.5**	**6.7**	**6.9**	**7.1**	**7.4**	

* Without labour costs.

** These ESP programme areas were costed through aggregated budget costs (i.e., by budget line items for drugs/supplies, human resources, training, and behaviour change communication).

*** These include the costs of programme-related training, meetings, communication, media, advocacy, and monitoring and evaluation for the other core ESP services.

^^ This per capita calculation uses the grand total cost of ESP provision in the public sector and the total population in the country.

Note: exchange rate used in 2016: USD 1 = BDT 78.3; 2017-2022: USD 1 = BDT 80.5.

Public Cost Per Beneficiary and Public Cost Per Capita

In 2016, coverage of ESP services varied from low (e.g., 2.2% for female sterilization) to high (e.g., 82.5% for BCG vaccination), with an estimated weighted average of 20.4% coverage in the public sector[iv]. The study team calculated an average cost per beneficiary by dividing the total cost of providing the ESP in the public sector by the population that actually received ESP services during the base year (20.4%), and was expected to receive ESP services in the target years (using the weighted average coverage in 2017–22). In 2016, the average cost per beneficiary was BDT 2,349 (USD 29.8) this gradually decreases to BDT 1,805 (USD 22.4) in 2022 due to planned coverage increases and expected efficiency gains through using fixed assets (Figure 2.b).

On the other hand, the per capita public cost allocation of the ESP in 2016 was USD 6.1 and increases to USD 7.4 in 2022 (Table 2). The OHT calculates cost per capita for providing ESP services by dividing the total cost calculated for ESP provision in the public sector by the total population of the country in a given year.

Figure 2. a Total ESP Costs by years, 2016-2022

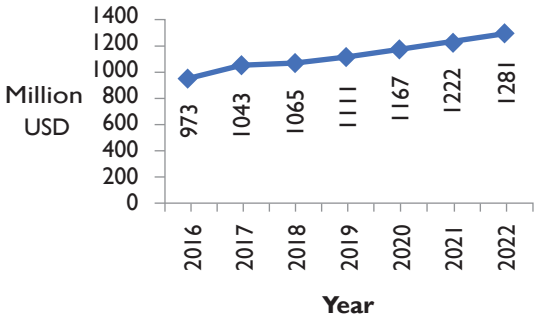


Figure 2. b Average ESP Costs per beneficiary, 2016-2022

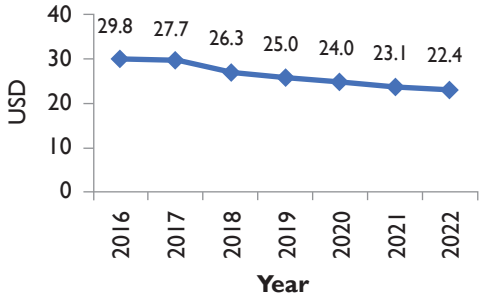


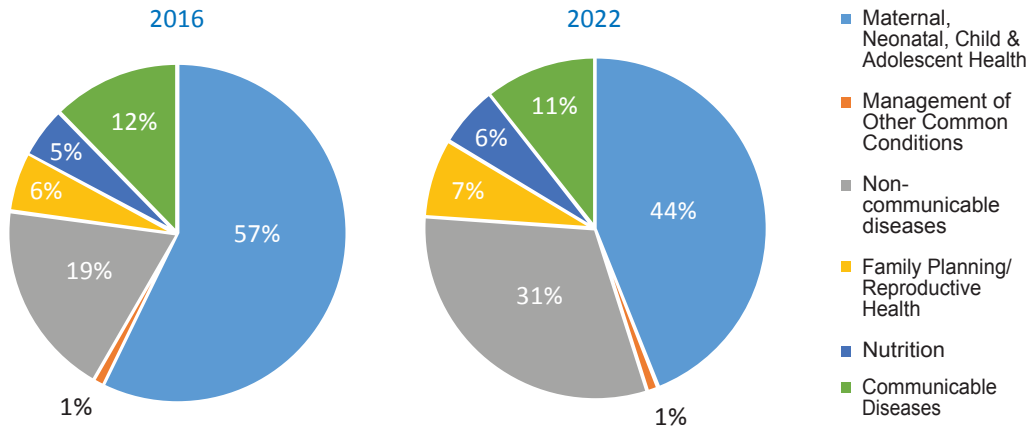
Table 3: Total Public Cost of Core ESP Services

ESP Programme Area	2016	2017	2018	2019	2020	2021	2022	Total
Maternal health	3,173	3,508	3,853	4,208	4,571	4,944	5,324	29,581
Neonatal health	145	160	176	192	209	227	245	1,353
Child health and EPI	14,137	14,448	14,651	14,522	14,797	15,035	15,314	102,904
Adolescent health	248	279	312	346	382	421	459	2,446
Subtotal for MNCAH	17,702.3	18,394.7	18,991.2	19,267.8	19,959.6	20,626.4	21,341.6	136,283.6
FP /Reproductive Health (RH)	1,752	2,016	2,297	2,597	2,914	3,249	3,602	18,427
Nutrition	1,515	1,717	1,919	2,135	2,358	2,584	2,826	15,054
NCDs	5,843	7,141	8,531	10,016	11,602	13,292	15,089	71,513
Management of other common conditions	320	350	381	414	449	485	523	2,921
TB and leprosy*	1,933	2,100	2,282	2,479	2,693	2,926	3,179	17,592
Malaria*	1,029	1,025	1,021	1,016	1,012	1,008	1,004	7,114
HIV/AIDS*	254	263	271	281	290	300	310	1,968
NTDs*	593	602	612	622	632	642	652	4,354
Subtotal	13,237.9	15,213.2	17,313.6	19,559.7	21,949.8	24,485.1	27,185.2	138,944.4
Total	30,940.1	33,607.8	36,304.8	38,827.5	41,909.4	45,111.5	48,526.8	275,228

* Includes aggregated programme cost by budget line items (human resources, drugs/supplies, training, and BCC)

With respect to all six core services included in the ESP, MNCAH services accounted for 57% of the total cost during the base year, spending for child health and EPI was the greatest (see Table 3, Figure 3). The projected cost of MNCAH care remains highest at 44% during the target years compared to other services due to the expected increase in coverage. On the other hand, the cost of NCDs services accounted for only19% during the base year, which seems quite low as primary health care for NCDs initiated during that year and all ESP interventions were not being delivered and coverage was lower. However, due to expected increased coverage of all NCDs interventions, the estimated projected cost of NCDs will considerably increase to 31% during the target year while, drugs and supplies for the NCDs will be the main cost driver.

Figure 3: Percentage Distribution of Health Service Costs by Core ESP Programme Areas, 2016 and 2022

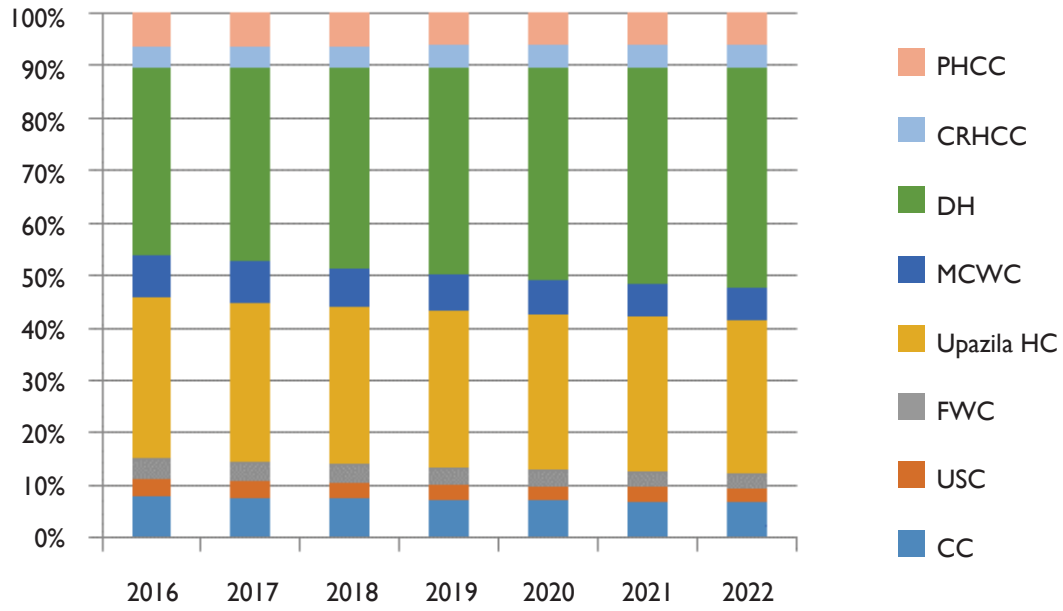


ESP Cost by Public Sector Delivery Channels

District Hospitals and Upazila Health Centers accounted for the highest proportion of the total ESP cost in 2016, and this trend is expected to continue over the target years (see Figure 4).

This could be attributed to several factors, including the larger size of these facilities, greater availability of a range of ESP services, and greater availability of drugs/supplies and medical personnel.

Figure 4: Percentage Share of ESP Cost by Delivery Channels[1], 2016-2022

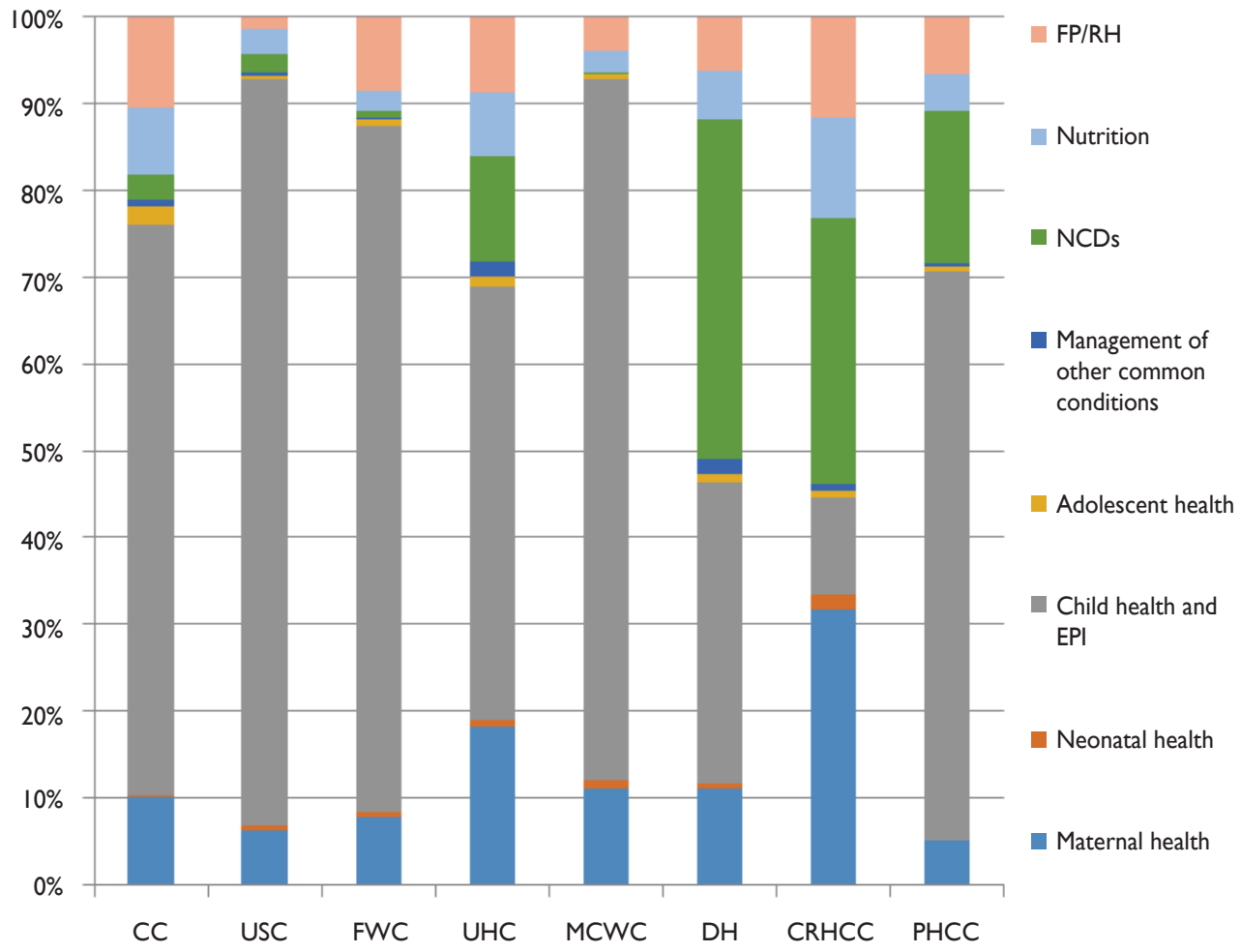


[1]PHCC= primary Health Care Center, CRHCC= Comprehensive Reproductive Health Care Center, DH=District Hospital, MCWC= Maternal and Child Welfare Center, FWC=Family Welfare Centre, USC=Union Sub-center, CC= Community Clinic.

ESP Cost by Programme Area and Delivery Channels

Child health and EPI accounted for the highest proportion of total ESP costs in all public-sector delivery channels, except District Hospitals and Comprehensive Reproductive Health Care Centres. This is due to fewer EPI activities through these channels. MNCAH services accounted for most costs at Upazila Health Complexes, where child and maternal health were the two highest cost centres. NCDs accounted for the highest costs at District Hospitals. See Figure 5

Figure 5: Percentage Share of ESP Programme[2] Cost by Delivery Channels, 2016



FP=Family Planning, RH=Reproductive Health, NCD= Non-communicable Diseases, EPI=Expanded Programme on Immunization

Health System Costs

The current ratio of doctors, nurses, and paramedics in Bangladesh is much lower compared to the WHO standard (1:1:2 and 1:3:5 respectively). Although Bangladesh has an overall staff shortage, human resources account for 58% of the total ESP cost in 2016 (BDT 44,001 million)—see Figure 1. In addition, while Bangladesh has a large physical infrastructure that is being used for ESP delivery, maintenance/rehabilitation of facilities is needed. Infrastructure costs increase from BDT 5,082.9 in 2016 to BDT 7,401.0 in 2022; these figures include both operating and capital cost.

With respect to logistics, the total cost in 2016 of drugs and supplies, including wastage and used drugs (consumption), was BDT 82 million, which increases to BDT 144 million in 2022.

ESP Cost and Macroeconomic Indicators

Table 4 compares projected ESP cost with projected government expenditure on health from 2016 to 2022.

Government expenditure on health upto 2022 was projected based on public expenditure on health from 1997 to 2015. By extrapolating intervention costs from 2016, combined with coverage estimates, the cost of delivering ESP services in 2022 is expected to be BDT 103,194 million (without inflation). This calculation shows that cost of approximately BDT 555,030 million (an average of BDT 92,505 million per year) will be required from 2017 to 2022 to achieve weighted average target coverage for the respective years (Table 4) among the population in need of these services through public sector. These figures suggest that on average 75% of total government health expenditure per year is required for effective ESP implementation with estimated weighted coverage) in the fourth health sector programme (2017-2022) through public delivery channels. This includes the health system targets outlined in the operational plans (e.g., human resources to deliver additional services, and infrastructure required).

Table 4 : Public ESP cost and Macro Economic Indicator

Macro-economic indicators	2016	2017	2018	2019	2020	2021	2022
Weighted average ESP coverage (%) by public delivery channels	20.4	22.6	24.6	26.7	28.8	30.9	33.0
Total ESP cost in million BDT	76,195.1	84,045.4	85,794.1	89,546.4	94,014.3	98,436.1	103,194
Government expenditure in health in million BDT*	106,967.9	111,635.8	116,303.7	120,971.6	125,639.5	130,307.4	134,975.3
ESP cost as % of government expenditure of health	71.2	75.3	73.8	74.0	74.8	75.5	76.5
ESP cost as % of GDP**	0.5	0.5	0.4	0.4	0.4	0.4	0.4

*Authors calculation using BNHA 1997-2015
**GDP estimates from IMF staff report 2017

Recommendations

Comprehensive ESP provision in Bangladesh is a critical part of the government's efforts towards achieving UHC as per the fourth HPNSP. These cost estimates will support the MOHFW and others to plan and budget for efficient delivery and expansion of ESP services during the period 2017–22. Going forward, the study team recommends:

Using these estimates for planning and advocacy:

- These results provide an estimate of the annual investment required for delivering ESP effectively. Policy planners may consider these estimates and use them to advocate for increased funding for health to match the costs.
- The National OHT Resource Pool should work under an institutional framework of the MOHFW to conduct additional costing exercises, including using standard treatment protocols for all services; these scenarios will be useful for the mid-term review of the fourth HPNSP and for planning of the next sector program. A detailed ingredients-based costing of TB, malaria, HIV/AIDS and Neglected tropical diseases (NTDs) interventions should be undertaken.

Using these estimates for future development of ESP:

- These estimates should be used by policymakers for further development of a feasible and efficient ESP package and for setting target of the coverage through public delivery channels for next sector programme. Other governance, supply-side readiness and operational issues should be addressed as well for implementation of the ESP.
- Future ESP cost estimates should also use standard protocols (normative costs) for all interventions, or WHO guidelines if Bangladesh-specific guidelines are not available, to identify the gap between current practice and protocols, and to provide planners with evidence to advocate for increase funding for the provision of quality ESP services across all relevant delivery channels.

Using these estimates to generate evidence on efficiency, equity and effectiveness in primary health care delivery systems

- As the country moves towards UHC by 2030, future analyses should look at the cost of current and projected coverage of ESP by both public and private sector and cost for service delivery by level of care (primary, and secondary). That exercise will help the government to plan and extend ESP coverage by both sector in a coordinated approach.
- Further studies should be conducted based on these cost estimates to generate evidence for gaining efficiency and promoting equity in the health sector.

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[i] *The Costs of the Bangladesh Essential Health Service Package: Fourth Health Population and Nutrition Sector Programme*. Dhaka: Ministry of Health and Family Welfare, Health Economics Unit and World Health Organization (WHO) Bangladesh; 2018.

[ii] The OHT is designed to support medium- to long-term (3 to 10 years) strategic planning in the health sector, and has been used to inform strategic planning processes in more than 30 low- and middle-income countries to date.

[iii] Health Bulletin, BDHS reports and dataset, morbidity survey, urban health survey, literature search, and FP management information system

[iv] National level: Jhenaidah (Kotchandpur and Harinakunda upazilas) and Dhaka North City Corporation (Urban Primary Health Care Clinic and Comprehensive Reproductive Health Care Centre).

[v] The ESP per capita cost does not indicate the cost of providing the ESP with 132 interventions at 100% coverage to all citizens.

[vi] This calculated weighted average coverage is based on the number of services needed for each intervention, but not on the channel through which the intervention is delivered. The weighted average coverage calculation also includes coverage of TB, HIV, NTD, and malaria interventions, for which intervention costs were not estimated using ingredients-based costing. This was to ensure an accurate estimate of the coverage of ESP services by year, including those health areas for which the costs were estimated differently