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The current costs of essential health services - a study of government facilities

Research paper 25

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Also available;

Public-private mix for health sector development: proceedings of the fourth annual conference, 25-26th July 1999

Bangladesh National Health Accounts 1996/97, Final report, Data International/ Health Economics Unit.

Foreword

This paper is the outcome of a research study initiated by the Health Economics Unit of the Ministry of Health and Family Welfare (MOHFW) as one of its research agenda which has been conducted by the Institute for Economic and Private Sector Development (IEPSD) in cooperation with the Health Economics Unit.

In its analysis the paper examines the cost structure and resource utilization pattern in the ESP services delivery at Upazila Health Complexes (UHCs) and below which would provide important data base for more realistic forecasting, budgetary allocation of resources so that ultimate vision and goal of national health policy can be achieved efficiently.

In terms of details, the information put together in the study report will be instrumental in identifying cost centres and cost implications for ESP services activities. Data concerning staff time utilization, per patient cost, cost variations are crucial indicators for evaluating the efficiency and making projections for the future. The survey will hopefully contribute to improving coverage and efficiency of ESP delivery at the local level. Therefore, this document is timed to fit into the planning framework.

In generating the report on costing ESP necessary support was provided by the Health Economics Unit, Directorates of Health, and Family Planning, MOHFW. Experts undertook intensive research on different dimensions of ESP service delivery and costs involvement. Health and family planning system in the Upazila level and below provided cooperation to the study team. In addition the study team sought cooperation from other relevant organizations.

I am deeply indebted and grateful to all experts and others who worked on and with the research team for their efforts in making the data available in such an analytical fashion and hope that the analyses and insights of this research study will be highly useful for necessary purposes including policy planning and monitoring of delivery of ESP performance.

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Acknowledgements

Amidst all the resources constraints the Government of Bangladesh (GoB) spends huge sums of money on health and family planning services in Bangladesh. GoB's spending in health and family planning has more than trippled in the past decade 1990-91 to 2000-01 over Tk. 27,600 millions a year which stresses both the importance of health in poverty reduction and the key role of the Government in achieving the 'Health For All' target with right level and mix of health outcomes.

The delivery and financing of the Essential Services Package (ESP) is to substantially reduce the burden of disease (the present value of future streams of disability – free life lost as a result of death, disease, or injury) at affordable costs. This research study provides the analysis of the costs of the mix of the ESP services delivered at Upazila level and below so that Government can allocate and/or reallocate resources in the most cost-effective manner.

IEPSD has conducted the study with all cooperation, help and intellectual guidance of the Health Economics Unit (HEU), Ministry of Health and Family Welfare (MOHFW), Government of Bangladesh. We are particularly grateful to Mr. Abul Qasem, Joint Chief and Line Director, PRU, Dr Tim Ensor, Senior Economist, HEU, and Quazi Liaquat Ali, Senior Assistant Chief, HEU for their constant support to the research team. We are also grateful to Director General, DGHS, Director General, FP and all the Line Directors, particularly the Line Directors, ESP for extending necessary cooperation to us.

We would like to sincerely thank all the health and family planning services providers and officials of twenty study UHCs, UHFWCs and other sample respondents for their time and cooperation extended to study teams, and to all members of the field data collection teams deployed by IEPSD. We also thank DFID, UK for their financial support to the study.

All the researchers who worked on the team warrant special recognition. Each has performed specific tasks and brought their own individual creativity to the entire exercise.

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Contents

Executive summary

The Essential Services Package (ESP) is mainly delivered through different levels of the primary health care system: Upazila Health Complex (UHC), the Union Health and Family Welfare Centres (UHFWCs) and Community Clinics (CCs). The principal objective of the ESP is to ensure equitable access to basic and the cost-effective health care services. Cost information on the components of the ESP is required in order to monitor the productivity and efficiency of service delivery and provide information on the costs of expanding the services to un-reached people and areas.

This paper is the first in a series of two on the costing of the essential service package. While this paper deals with the current cost of services provided the next paper (***research paper 26***) will concentrate on the cost of widening the coverage of ESP based on the characteristics of the population.

A number of studies has been carried out on the costing of ESP since the designing and launching of HPSP in July 1998. Prior to HPSP costing studies of the family planning programme and various aspects of primary care were also been carried out. This study aims to close the existing gaps in information on costs, particularly the way in which staff at Upazila level and below distribute their time between ESP components. The main purpose of this study is to provide a representative costing of essential services at the local level in the Bangladesh primary health sector. The broad objective is to develop a broad understanding of the way in which staff use their time across a range of facility levels and geographic areas.

Applying a multistage cluster procedure, a total sample of 20 Upazila Health Complexes (UHCs) and 18 Union Health and Family Welfare Centres (UHFWCs) was obtained. The sampling was representative of UHCs and UHFWCs in the country. The sample was drawn from all divisions of the country.

All the four principal components of ESP and their major sub-components have been costed: Reproductive health (maternal, family planning separated), Child Health, Limited Curative Care and Control of Communicable Diseases. More than 70% staff were covered in the direct and indirect observations while examination of relevant records/ logbooks was conducted for all the staff at the service delivery facilities. These data collection method included: (i) indirect observation; (ii) abstract of register/ log book; (iii) direct observation and interview; and (iv) patients/ exit clients interview

A comprehensive analysis of field data and other information was carried out to estimate total cost average cost, per patient cost, percent distribution, variation in cost and also the cost sharing by the patients. The findings show that the average monthly cost of ESP at Upazila Health Complex level is Tk. 682,854 providing services for an average of 14,210 patients. The average cost of per patient was computed to be Tk. 48.05 at that level. Total and average costs of specific components are shown in the table below.

Input / ESP Component	Average monthly patients No.	Staff cost Tk.	Commodities & consumables cost Tk.	Usage cost of equipment Tk.	Usage cost of Furniture & physical structures Tk.	Overhead cost at UHC Tk.	Super-overhead cost Tk.	Total ESP cost Tk.	ESP cost per patient Tk.
Reproductive Health Care	6,052	120,924	54,756	24,051	2,154	25,606	18,710	246,200	40.68
Maternal Health	*1,140*	*54,837*	*17,903*	*23,165*	*524*	*5,786*	*4,248*	*106,464*	*93.41*
Family Planning	*4,179*	*41,976*	*30,039*	*875*	*1,327*	*15,743*	*11,995*	*101,956*	*24.40*
Others	*734*	*24,112*	*6,813*	*10*	*302*	*4,076*	*2,467*	*37,781*	*51.48*
Child Health Care	5,967	138,909	69,452	4,093	2,707	33,771	24,890	273,822	45.89
Communicable Diseases Control	297	14,787	9,890	4,608	225	1,949	1,854	33,313	111.99
Limited Curative Care	1,876	82,280	21,184	1,065	1,109	12,878	9,074	127,591	68.02
Support Service	18	823	1,079	0	4	0	22	1,928	-
Total ESP	**14,210**	**357,724**	**156,360**	**33,817**	**6,199**	**74,204**	**54,550**	**682,854**	**48.05**

Staff cost constitutes 52% of the total ESP service delivery cost at UHC level. In terms of details, the Clinical staff members account for 41%, while the Field Service staff take 40% of the total staff time utilisation in ESP services delivery at UHCs. The Support Service staff members account for 14% of the total staff time utilisation while the Management staff constitute only 6% of the total staff time utilisation.

The average monthly cost of ESP at Union Health and Family Welfare Centres is Tk. 54,722 treating 1,253 patients with a per patient cost of Tk 43.67. More than 90% of the total ESP cost at UHFWCs is comprised of staff costs and costs of commodities and consumables. Cost of commodities and consumables constitutes the highest proportion of input costs of ESP accounting for 58% of the total cost which is followed by staff cost, which is 34% of the total cost.

There are wide variations in the cost across the country. The study findings suggest that the average monthly cost of ESP is 18% higher than average in Barishal Division and lowest in Rajshahi Division (84% of the average monthly ESP cost).

As the Government faces significant resources constraints in funding the Essential Services Package (ESP) and as the potential for additional resource mobilization is limited, so improvements in the internal efficiency of services delivery must be an essential component of efforts to provide the ESP to the target population. The analysis suggests that there is substantial variation in productivity between areas. As suggested in earlier studies, there appears to be scope for increasing use of services at relatively low additional cost through the use of idle staff time and excess physical capacity. This issue is taken up in research paper 26.

As Government wrestles with the financing of health care, a pragmatic involvement of nongovernmental organizations and the private sector in the delivery of services may be beneficial. In a competitive system, people seeking health services can choose from a variety of providers—public, private non-profit, and private for-profit. There are opportunities for the Government to form constructive partnerships with NGOs in delivering essential services. A much greater reliance on the competitive provision of service would likely improve both the responsiveness of health care systems to their clients and the efficiency with which they operate.

1. INTRODUCTION AND BACKGROUND

The Government of Bangladesh has been pursuing a policy of providing health care to all, particularly to the rural population who are often unserved or underserved. National commitment to making essential health care accessible to every individual and family in the community has been reflected in all relevant policies, plans, programs and action documents. The role of primary health care has been recognized and undertaken as the key approach to attaining the national goal of 'Health for All (HFA)' and thereby improving the productivity of the common mass and reducing poverty.

Health reform in recent time has shot up to the top of development agenda of Bangladesh mainly because of understanding of the potential for enormous gains in health at very low cost. In this backdrop, the Government of Bangladesh (GOB) has been implementing a pragmatic Health and Population Sector Strategy (HPSS) with a commitment to reform, accountability and serving the need of the people in an efficient way. HPSS provides for basic approaches and a number of support systems, at the centre of which is the 'Essential Services Package (ESP)' being implemented through Health and Population Sector Programme (HPSP) 1998-2003. The Essential Service Package (ESP), under the ongoing HPSP, has been designed by redefining and repackaging the primary health care services in the light of 'Reproductive Health' concept, MCH and other interventions. In the ESP services interventions are grouped into the following five major components:

- Reproductive Health Care (RHC);
- Child Health Care (CHC);
- Communicable Disease Control (CDC);
- Limited Curative Care (LCC); and
- Behaviour Change Communication (BCC).

The Essential Services Package (ESP) is mainly delivered through different levels of the primary health care system, i.e., utilizing the delivery mechanism of Upazila Health Complex (UHC) at the Upazila level, the Union Health and Family Welfare Centres (UHFWCs) at the Union level and Community Clinics (CCs) below Union level. One of the objectives of installing ESP is to create a one-stop services and to make health care services client-oriented, with a major shift in the attitude of the providers and the managers that, instead of serving the system they will serve the people for whom the system was designed in the first place. This also means involvement of the communities in the planning and delivery of services. These changes are to motivate the behaviour of both providers and the receivers. Packaging of primary health care services emphasizing client focus cuts across several areas of concern of–

- coverage and quality of services;
- cost-effectiveness;
- accountability; and
- financial sustainability.

Therefore, implementation of ESP has necessitated thorough overhaul and reorganization of the service delivery system. One of the key reforms undertaken in the five year HPSP is the restructuring of service delivery as the traditional structures of the Health and Population Directorates not only have been inadequate to meet the needs of the population, but also lacking cost efficiency. That means, under-utilization of resources and duplication of efforts gave rise to many problems.

Hence, the notion of 'packaging' and a 'single-point' delivery is meant to make the ESP both efficient and cost-effective. While the principal objective of the ESP is to ensure equitable

access to basic health care facilities, cost-effectiveness of the overall implementation mechanism is expected to play the crucial role.

GoB's spending in health and family planning has more than trippled in the past decade 1990-91 to 2000-01 over Tk. 27,600 millions a year which stresses both the importance of health in poverty reduction and the key role of the Government in achieving the 'Health For All' target with right level and mix of health outcomes. However estimated, there is a clear need for mobilizing substantial additional funds for implementation of the HPSP, and achievement of the HFA goal. The pertinent question therefore is, how to meet the sizeable resource gap of the future in a sustainable manner? While it will be necessary to increase budgetary allocations, only that will not solve the entire problem as the overall program impact depends on the efficient utilization of resources as well as cost effectiveness of the delivery mechanism. In this background, an indepth study of costs of the ESP services under HPSP is very timely and of immerse importance. Expenditures of ESP services consist of HPSP expenditure for the ESP delivery as well as portions of other expenditures for other HPSP components, i.e., activities directly related to the ESP delivery. In costing the ESP delivery, the expenditures can be broken down into four broad items of cost:

- manpower/ staff resource;
- commodities and consumables;
- physical capital (equipment and structure); and
- contingencies/ overheads.

This study purports a detailed operation research and analysis of cost structure, costing by components of ESP, as well as by various inputs/cost elements, including cost pattern and validity and respective contribution to overall programme performance.

This paper is the first in a series of two on the costing of the essential service package. While this paper deals with the current cost of services provided the next paper (research paper 26) will concentrate on the cost of widening the coverage of ESP based on the characteristics of the population.

2. RATIONALE OF THE STUDY

The delivery and financing of the Essential Services Package (ESP) is to substantially reduce the burden of disease (the present value of future streams of disability – free life lost as a result of death, disease, or injury) at affordable costs.

The main purpose of this study is to provide a representative costing of essential services at the local level in the Bangladesh primary health sector. It aims to close the existing gaps in information of costs, particularly the way in which staff at Upazila level and below distribute their time between different ESP components and sub-components/activities. Therefore, analysis of service providers' time on various interventions/ activities would illustrate, whether the 'time-use' is efficient or not, whether any unutilized capacity exists in the system, also the costs to clients in accessing the care, etc.

The ongoing health sector reorganization will have a far reaching effect on budgetary allocations, requiring better budget estimates in order to ensure that the resources available are utilized to their maximum efficiency. To elaborate, costing of ESP is necessary for a variety of reasons and has a renewed importance. The government has to operate under various constraints regarding the implementation of ESP and limited financial resources is one of them. This means, an assessment regarding the gap between the total amount of resources required and the amount that will be available to the government ought to be done. The assessment will assist determining a viable amount of cost recovery as well as measures

for prioritization of activities. Therefore, the study is to examine indepth how resources are actually utilized at Upazila level and below. In this background, the increasing necessity of the estimation and analysis of costs of the Essential Service Package (ESP) are in order to:

- provide better budget estimates;
- provide cost information for use in planning simulation models (e.g. the ESP costing model developed by Research Triangle Institute together with HEU); and
- provide unit service cost and cost for monitoring the cost and efficiency of the ESP package over time.

A number of ESP costing studies has already been conducted including estimates made by the Programme Co-ordination Cell (PCC) during the designing of HPSP, and also the work developed by the HEU for initial estimates of ESP costs. A gap in most of these estimates is that while it is possible to track the allocations for much of the development budget to ESP sub-components (such as care for malaria and emergency obstetric care), this is not entirely possible for the revenue budget as much of the revenue budget is spent on staff. Recent introduction of RIBEC codes now permits the detailed tracking of expenditures by line items at service delivery levels. But once again this only applies to the development budget expenditures. It is, therefore, absolutely necessary to undertake separate survey work that examines how all budgets are actually used at the local level (Upazila and below) for delivery of ESP. The resulting estimates will complement the health system on inpatient and outpatient services at Upazila and above facilities carried out by HEU.

The main types of data and information that were gathered and analysed to derive costs include:

- expenditure – full expenditures including patient contributions where the information were available;
- cost based norm budgeting based on population access and service use; and
- historic and input norm based budgeting.

The first two cost sources can serve different but overlapping purposes. Overall, the costing study would bring contributions to the planning, implementation and management of health services in following major ways:

Informed and realistic budgeting: ***each year operational plans are prepared, and Government with development partners has to prepare the budget for the next year. Good budgeting needs utilize norm based information to project needs for expenditure. It also needs to utilize expenditure data in order to take account of the efficiency of interventions as measured by the impact of past allocation of resources.***

Budgets may also use expenditure information on certain items where norm based information are missing. For example, if there is information on commodities necessary to provide certain services but none on the staffing pattern and level necessary to deliver the services, a budget may initially use past staffing patterns as a predictor of the future. Later these can be compared with what actually happens and with an ideal staffing norm once it becomes available.

Evaluation and monitoring*:* ***evaluation and monitoring of health sector programmes are likely to make use of field data. Baseline expenditure and benefit incidence provides a benchmark for comparing future interventions.***

Economic evaluation: ***unit cost data are fundamental inputs into economic evaluation. Economic evaluations of service delivery can be used to help plan interventions to make resource use more effective. Evaluations are usually at one of two levels. First, to improve the delivery of a given service or treatment (technical efficiency). Second, to help plan the division of a budget between the treatment of different diseases (allocative efficiency).***

Benefit incidence studies: ***benefit incidence studies can be a useful measure of who is benefiting from service delivery. How expenditure benefits women relative to men.***

3. OBJECTIVES

The broad objective of the study as stipulated in the ToR is – *to develop a broad understanding of the way in which staff use their time across a range of facility levels and geographic areas. This will be used to allocate the staffing budget by ESP components and non-ESP care.* The study is to delve into the costs of the various types of services being provided at the Upazila, and below.

The specific objectives of the study include:

- obtaining data pertaining to costs accrue on individual components and sub-components of ESP;
- obtaining detailed expenditure/ cost data on all line items and other inputs used in provision of ESP services; and
- conducting detailed analysis of the work patterns of the clinic, field and support staff.

4. SCOPE

In line with the above objectives, the scope of the study among other encompasses:

- to provide a brief review of current work on ESP costing;
- to carry out a cost analysis of ESP by components and by inputs sub-components at the Upazila and Union levels;
- to use the estimates to project total spending and unit costs by ESP components and sub-components and also inputs and provide unit cost data for ESP monitoring; and
- to document the methodology so that the study can be repeated for monitoring the HPSP.

5. LITERATURE ON ESP COSTING

A number of studies has been carried out on the costing of ESP since the designing and launching of HPSP in July 1998. Some costing studies of the family planning programme of Bangladesh have also been carried out in recent years; and studies on costing of various service components were also carried out in the past. The outcome of the exercises may not be fully comparable given the differences in purposes and methodological frameworks used, but they indeed provide useful information to developing an appropriate comprehensive methodology for costing of ESP and underpinning related policies.

Some of the key contributions in this area are:

- Bottom up costing of HPSP by the Projection Preparation Cell (PPC)
- Top-down expenditure analysis of ESP by the Health Economics Unit

- Costing of family planning programmes carried out by URC
- Financial Analysis of Mymensingh Medical College

A concise review of some of the important studies/ literature is provided in annex one.

6. FRAMEWORK FOR COSTING AND ANALYSIS

As it has been mentioned earlier that one purpose of this study is to analyse and project the financial implications of the HPSP in order to assess the future sustainability of the programme. Another is to examine the technical efficiency and cost effectiveness of delivery of services through a dynamic investigation into the ways and pattern of the use of resources. Yet another purpose is to look at the allocative efficiency of the HPSP in terms of unit cost analysis. Against these objectives, the study covers ESP delivery at Upazila level and below.

Generally, cost determination and effectiveness assessment are done with a relative approach. Under this approach, the process and the actual delivery need to be very carefully observed to judge time allocation and productivity. In other words, how the target clients are handled, what is being delivered, how it is delivered, and then what is the true utilization of time, what is the level of productivity and cost involvement; all these constitute the core of this operation research wherein precise criteria have been used for identification and weighing. While observation and survey constitute the prime vehicles/instruments to conduct the study, the other methods include literature review, examination of log book, one-on-one interview and benchmarking.

In the methodology and work plan for this research study, the above constitute the line of approach. Description of major approach as prelude to developing framework for ESP costing and analysis is embodied in the following sub-section.

6.1 Top-down and Bottom-up Approach – A Combination to Proceed

The particular canvas of the study calls for a distinction that is typically made between two types of costing – bottom-up and top-down. As the name implies, through a survey bottom-up costs are derived by calculating the unit cost of individual interventions/ activities at the facility level and then aggregate them to get the total cost. Top-down costs are obtained by taking aggregate expenditures or budgets and then apportioning them by level and intervention/ activity by using allocation factors

In practice, the distinction between these two costing approaches is not that clear cut, since a combination of the techniques is often used. A bottom-up costing method rather quite accurately describes the per patient use of medical supplies. For overhead items, however, such as maintenance and utilities, methods of estimating costs through apportionment is undertaken since accurate measurement of such items at the functional level (using department metres for example) may be expensive and likely to yield insufficient additional information to be worthwhile. As a result, most costing methods employ a combination of bottom-up and top-down accounting.

A distinction in the methodologies is due to the variation resulting from expenditure allocations and full cost accounting. Actually, this distinction rather than the variation in the bottom-up and top-down principles may account for apparent differences in bottom-up and top-down calculations. Expenditure allocations may either use actual past, or current expenditure, or future budgets as the basis for allocating 'costs' of services. In any health care system, a difference between actual and budget will be apparent. The extent of this difference will often depend on whether budgets are based on normative or on practical estimation of the

feasible resource envelope. If the former is adopted, the final results may be closer to the true cost of services provided the normative principles are based on sound and consistent methodologies for calculating activity based resource needs.

Top-down actual expenditure allocations are likely to diverge from bottom-up costs for two reasons. First, expenditures as recorded by the health service management information system may not embody full expenses incurred, but only the payments made. This means, if a payment for instance monthly salaries or a bill for equipment is delayed until the next financial year, then it is not recorded and as a consequence it underestimates the costs than they actually are. Full expenditure accounting must include these unpaid debts. And in addition, where a patient makes up the cost of care (from her/his own pocket) by sharing the cost of drugs or food, this should also be included in the true cost of care. Also adequate allowances must be made for amortization of equipment and building costs.

A second reason for the divergence is that health facilities operating under resource constraints will deliver a different magnitude/ pattern of services activities than those working with relatively more resources or a smaller package of services. Where resources are spread thinly, survival may mean reducing activity unless patients themselves can make up the cost. Where the patients are able to contribute to the cost may well differ from those most able to benefit from (essential) services and the pattern of resource use becomes distorted. As a result, costs based on ideal activity patterns will differ from those that are actually observed.

The bottom-up part of the analysis could be based for example, on the detailed commodity lists of equipment, consumables/ medical supplies to be used in a particular period of time. Although many of the supplies are disease specific, some of the supplies and a lot of the equipment have joint use across sub-components of the ESP. This is important when average and marginal cost data of sub-components are applied.

Given the above circumstances, the combination of top-down and bottom-up costing is a practical way to proceed with. But potential problem is that, it assumes that existing levels of staff, skill mix and work/activity schedules will be adequate to utilize the commodities and equipment in a way that delivers the planned level of services. That is, the production function, which calculates how a given resource inputs combination can be converted into desired outputs using the existing technologies, is the one operating at a close to optimal level. In this study, the detailed work pattern analysis will provide an useful insight as to the question and necessity of optimum utilization of staff resources.

6.2 Developing of Costing Model

The practical delivery of primary health care services is frequently made up of horizontal spreads and linkages where patients are treated for one disease. Cost analysis of ESP focuses the costs of providing a range of defined services at each service level. A good start is to cost out a typical facility at a particular since delivery level, showing how much it costs to provide good quality ESP services to a defined population of average morbidities. By ensuring that the model is dynamic, can we then examine the impact of changing parameters circumstances such as:

- changing staffing mix;
- assuming a different (higher or lower) level of morbidities;
- providing an increased or decreased range of services; and
- introducing cost-recovery (in conjunction with estimates of relevant elasticities).

Some ground work has been done in earlier costing studies. In particular, the PCC estimates provide a comprehensive listing of commodities/ supplies and equipment based on a

normative analysis of population in respect requirements of ESP services. Although these lists may need to be updated occasionally, they can be used for providing the baseline analyses of costs. However, as mentioned previously, small modifications would be required so that they reflect the full annual costs of commodities/ supplies and equipment.

7. SURVEY METHODOLOGY

7.1 Sample Determination and Selection

Applying a multistage cluster sampling procedure, a total sample size of 20 Upazila Health Complexes, 20 UHFWCs has been determined. Since Community Clinics (CCs) are yet to be established and become operational, CCs could not be included in the sample inspite of original plan. In the first stage of the selection procedure, all the Upazilas across the country were listed and then the sample was drawn from the cluster, i.e., UHCs. For statistical significance, a minimum 5% of the population should constitute an adequate sample size. There are about 402 UHCs and a sample of 20 UHCs was determined which makes a reasonably adequate sample base. In the second stage, one Union under each of the selected Upazilas was taken which provided an appropriate sample of Union level ESP delivery outfits[1].

7.2 Selection of Districts, Upazilas and Unions for the Survey

A critical aspect of the study was the selection of Upazilas and Unions so that they are representative of the universe and provide good data base. With that end in view and as per the above described sampling methodology as agreed by the HEU, at first, twenty (20) Districts were selected from all the six (6) Divisions of the country as follows: 4 Districts were selected from each of the four (4) old Divisions, while two (2) Districts were selected from each of the two (2) new Divisions (i.e. Barisal and Sylhet). This selection of Districts maintains the representative geographical coverage/distribution as required for such a study. 'Crude Death Rate (CDR)' and 'Infant Mortality Rate (IMR)' were the bases of selection of sample Districts.

Upazila, which is the important locale of the study, was selected from the sample Districts in the manner of one Upazila from each of the selected 20 sample Districts. Such selection of 20 sample Upazilas from 20 sample Districts was on the basis of three year (i.e., 1994, 1995, and 1996) bed occupancy data.

Union is the second tier of ESP delivery and in many respects it is the most important delivery point as it is more closer to community and also directly involved in the supervision of the operation of Community Clinics (outreach centres). Therefore, in many respects of ESP delivery and costing of ESP, the operation of UHFWCs is critical. From the 20 sample Upazilas selected earlier 20 Unions were carefully selected on the basis of the size of population of different Unions under each of the sample Upazilas thereby applying an overall ratio of (i) 40% sample Unions with high population size; (ii) 20% sample Unions with medium population size; and (iii) 40% sample Unions with low population size.

7.3 Identification of ESP Sub-Component/ Activity

The ToR emphasizes the necessity of maintaining uniformity of the definition of sub-components/ activities of ESP to be taken in the study with those used in the previous studies as well as in various planning and operational documents. This is to ensure broader use of the

[1] Field work could not be conducted in 2 UHFWCs as the management of those 2 UHFWCs did not extend cooperation inspite of that an official letter from the HEU was produced to them to provide data and information.

outcome of the study. So, the present study needs to be consistent with regard to using definitions of sub-components/ activities. Following this principle the identified ESP sub-components/activities have been defined in line with the terms of the PIP (Project Implementation Plan) –the main official source. All major sub-components/activities of ESP at the relevant tier of service delivery, except only the repetitive ones and those having no or insignificant cost implication were included in the list to be used for field data collection. Selection of each sub-activity was done considering the historical statistics of the number or percentage of service receiver and finally all care was taken so that in aggregation all important sub-activities are covered under five major components of ESP and that they reflect the comprehensive picture.

In summary, all the five principal components meant for ESP at Upazila and below and their major sub-components have been taken for costing, while some selection was made only in respect of sub-sub-components/ sub-activities under each of the sub-comments of the five principal components. Accordingly, the identification of ESP services constitutes all 5 principal components, all sub-components and 40 sub-sub-components/ sub-activities in case of UHCs; and 40 sub-activities in case of UHFWCs.

7.4 Selection of Service Providers for Observation and Interview

Different sets of staff are involved in the delivery of ESP services at different layers, i.e., UHC and UHFWC. At the UHC, the personnel are classified into: (i) Clinical Services (Hospital services, Clinical Contraception & Disease Control); (ii) Support Services (MIS, Planning, Accounts, Logistics, Training & Common Services); and, (iii) Field Services (Public Health, BCC, Nutrition, NGO Coordination & Vital Statistics).

At the UHFWC, however, there are no such classifications. Selection of staff has been made in a balanced manner to derive a detailed picture of staff time utilization at the respective facility locale.

While a coverage of 50% staff should be sufficient to calculate staff-time utilization and corresponding costs, however, more than 70% staff were covered in the direct and indirect observations while examination of relevant records/ logbooks was conducted for all the staff at each of the sample 20 UHCs.

For the UHFWC, all types of staff barring the MLSS and Guard were taken for observation and interview.

7.5 Data Collection Instruments

Identification of data and information needs in line with the foregoing guidelines served the basis to designing strategies, approaches, and instruments for the field work, i.e., efficient data collection and assessing the practical situation out in the field. After having done a field test of the draft instruments, four methods were adopted in carrying-out the survey work. These included:

i. Indirect Observation
ii. Abstract of Register/ log book
iii. Direct Observation and Interview
iv. Patients/ Exit clients interview

At least 5% of the in-door and out-door patients/ exist clients were interviewed in order to gather information of cost sharing, time given by the service providers, degree of satisfaction as well as other relevant facts. For each of the above methodologies, defined checklist and/or questionnaire as the case may be was used which also helped to carry out structured and

speedy data collection. Data were collected on expenditures, levels of staffing, pattern of time use by the staff, use of drugs and supplies, equipment, structures, overheads and other indicators for the second quarter (April – June) of calendar year 2000. The data set was designed to permit estimation of recurrent unit costs in delivering the ESP services. The total sample consisted of 20 UHCs and 18 UHFWCs.

7.6 Data Processing

Appropriate to the framework of cost analysis a series of customized templates was designed to conduct the analysis efficiently. Microsoft Excel Version-2000 was used to process the data. All the templates have been made to link with each other in such a manner that any change done in one template will automatically bring the required change(s) in other related templates. And a new template containing additional data and/or further processing of data can be linked with the existing templates. This will facilitate to replicate data processing of subsequent similar studies as well as application in any other data base software for further analysis.

8. ANALYTICAL FRAMEWORK

8.1 Analysis of Costs by ESP components

ESP costs have been calculated for activities, sub-components and components, at the ESP delivery centres. The ESP components are (i) Reproductive Health Care; (ii) Child Health Care; (iii) Communicable Diseases Control; (iv) Limited Curative Care; and (v) Support Services. Following bottom-up approach aggregation of activity based unit costs led to sub-component costs, and then aggregation of sub-component based unit costs formed cost of each component of ESP and finally total ESP cost has been found by adding the costs incurred for all components.

8.2 Analysis of Costs by Elements/ Inputs

Cost of ESP implies the amount of expenditure (actual or notional) incurred on, and/or attributable to ESP activities. These costs are classified primarily according to the factors/ inputs used in the delivery of ESP to which expenditures are incurred on. Broadly these inputs/cost elements are (i) Staff cost; (ii) Commodity and consumable cost; (iii) Usage cost of equipment (operating and depreciation [recurrent]; capital cost [non-recurrent]); (iv) Usage cost of physical structure, furniture and fixture (maintenance and depreciation cost [recurrent] and capital cost [non-recurrent]; (v) Overhead cost; and (vi) Super-overhead cost.

8.3 Basis and Accumulation of Costs

Through a systematic survey of the sample service delivery centres, cost data of different components were accumulated. These primary data and information were cross-checked with and supplemented by documents (copy of register, monthly report and audit report) and other secondary data from relevant agencies. Where required, a limited market survey of prices of different items and consultation with experienced officials and experts were conducted. All the relevant costs devoted to ESP (both at facility level and central level) have been accounted for in the analysis. Following bases have been applied to derive/ accumulate cost of different factors/ inputs at different levels:

Number of patients/ clients served is one of the most important bases for calculation of ESP unit cost, with cost of drugs, commodities & consumables, operating and depreciation cost of equipment, depreciation of furniture and physical structure inclusive. For each of the sub-

components of ESP, total patients served in three months were considered arrive at the monthly average number of patients.

Available staff time *refers to actual official time in terms of hours for which a service provider is paid on a monthly basis. Each staff's monthly available time for service delivery has been calculated taking 25 working days per month times 6.5 hours per day, thus giving 162 available staff hours of a service provider/ employee.* Cost of staff time per hour *has been calculated by dividing total monthly pay and allowances of a staff by monthly available staff hours. Total monthly pay and allowances include basic salary, house rent allowances and all other perquisites.*

Cost of Commodities and Consumables (CC) has been derived by taking into account the actual quantity of commodities and consumable being used to serve the patients multiplied by the unit cost of those items. The procurement cost or price of those consumables were re-confirmed, wherever necessary by surveying the market and consulting the budget. Commodities and consumables include medicine, registers and forms, general stocks that disinfectants, etc. Costs of commodities and consumables were calculated following a detailed bottom up approach. Primary reasons for following bottom up approach for estimating cost of commodities and consumables were to increase the degree of precision in costing the ESP delivery and to ascertain the accurate portion of cost attributable to ESP components, sub-components and sub-sub components.

Equipment include medical equipment, kit, surgical instruments, ambulance etc, which have service or useful life of generally more than one year. Cost of equipment implies the depreciation of those equipment and other actual operating and maintenance cost incurred during the period under review. In the absence of cost information, historical costs of equipment were worked out consulting the budget, by conducting limited market survey and by extrapolation of figures. Useful or service life of equipment in the UHC varies from three to twenty years. For determining the useful life of those equipment, budget information, discussion with key officials/users, and gathering data from other secondary source were utilized. Maintenance costs of equipment, however, have not been properly recorded in some of the centres and these were even compounded by lack of information regarding the procurement cost of those equipment. Projection and extrapolation were done wherever appropriate to ensure that appropriate costs would be taken into account. For depreciation, unit cost of those equipment was determined consulting relevant information. Depreciation was calculated using straight-line method, based on the useful life of the respective assets. The approach used was bottom-up.

Furniture used by the UHC and UHFWC include the items such as chairs, tables, almirah, cabinets, racks etc. and the usage cost of those items implies the depreciation of those items and some maintenance cost incurred during the period under review. A detailed bottom-up approach was applied for estimating the usage cost of Furniture and physical structures for the same reason as applied to costing the use of commodities and consumables. It is often difficult to find the actual *maintenance (usage) cost of physical structure* mainly because of poor record keeping and financial management. Nevertheless, figures as precise as possible have been obtained by extrapolating relevant data of such costs as were recorded in some centres.

Overhead costs at UHC level include travel allowance/ daily allowance of staff members, utility bills like, water, gas, electricity and telephone, repairs and maintenance, cost for diet, fuel, office supplies, land taxes and miscellaneous expenses. Actual expenses incurred during the time under review were taken into account for costing the overhead inputs that go into the delivery of ESP services. Any foreseeable expenses were also accounted for to arrive at the fully represented cost. Any amount that represents a full year's expenditure was segregated to

fit the review period. Therefore, a bottom-up approach was used to capture the actual expenses attributable to overhead cost.

Super-overhead cost was calculated using a top-down approach. Expenditures that incurred at the central level and District level agencies as attributable to ESP cost at Upazila level are referred to as the super-overhead cost. Super-overhead constitutes certain percentage of HPSP expenditure of non-ESP activities that are related to ESP delivery. According to PIP Part-I of HPSP 1998-2003, total ESP cost is 69.89% of the total HPSP cost, and out of that, the cost of ESP delivery at Upazila and below level is approximately 88%, while the rest are super-overhead which is very close to 8.36% of other HPSP activities that are directly and indirectly related to ESP delivery. In order to estimate the super-overhead cost, actual revenue expenditures for the above items/activities were taken and then 8.36% was applied to arrive at the annual super-overhead for the delivery of ESP at 402 UHCs and from that figure a monthly super-overhead cost per UHC was calculated.

8.4 Basis of Allocation and Apportionment of Costs

Cost allocation refers to charging identifiable items of cost to the service components or cost units, while cost apportionment involves the division of costs amongst two or more cost elements/ service components in proportion to the estimated service provided or some other basis.

Apportionment of joint costs is one of the most problematic areas of input valuation. While a greater degree of precision is attached to 'allocation' as it is a direct process when costs are identifiable, apportionment may be made only indirectly on some suitable bases. Generally, apportionment of such joint costs are made based on, what is called 'burden vehicle', e.g., indirect proportion to departmental output, direct staff cost (or direct cost of labour), staff hour utilisation etc., and sometimes these measures may be pre-determined. Bases used for allocation and apportionment are as follows:

- Staff costs were allocated to different components, sub-components/ activities on the basis of actual time spent for each of those components, sub-components/ activities.
- Costs of commodities and consumables are direct cost of ESP service delivery. Costs of those items were allocated to different components on the basis of actual quantity of commodities and consumable used in each of the components or sub-components.
- Costs on account of equipment, Furniture and fixtures were assigned to the components and sub-components on the basis of their direct attribution to those components, and in other cases, on a reasonable basis.
- Maintenance costs of physical structures were apportioned equally to each of the components/ sub-components.
- Overhead costs and super-overhead costs have been apportioned to each ESP component at the ratio of number of patients/clients served.

8.5 Analysis and Presentation of Findings

The analyses of data and study findings entail the cost estimates of ESP by five components and some sub-components as well as by major six category of inputs/ cost elements on the basis of allocation and apportion bases discussed in the foregoing section. The metamorphosis of analyses includes presentation of results mainly through the total average monthly cost, other items' average monthly cost, average number of patients, average monthly per patient cost, percent distribution of total cost by individual items, variations in ESP cost, and forecast

of costs owing to increased ESP coverage in terms of the average number of patients at UHCs.

9. CostS analysis of ESP delivery at UHCs

9.1 Analysis of Costs by ESP Components at Upazila Health Complexes

As discussed earlier that the Essential Services Package (ESP), which was designed by redefining and repackaging Primary Health Care Services under HPSP, comprises five major components, viz., (i) Reproductive Health Care (RHC); (ii) Child Health Care (CHC); (iii) Communicable Diseases Control (CDC); (iv) Limited Curative Care (LCC); (v) Behavioural Change Communication (BCC). Each of the major components is further divided into sub-areas (e.g., the reproductive health care is further divided into eight sub-areas); sub-areas are further divided into sub-sub areas and so on.

Costs of the components of Essential Services Package imply the notional or actual expenditure incurred on and/or attributable to each of the components of the ESP delivery at Upazila level. Costs incurred at the central level or at the District level attributable to ESP services at Upazila level have also been apportioned to the components to arrive at the actual costs being incurred.

To workout the monthly average cost of ESP services at UHCs, 20 Upazila Health Complexes (UHCs) were selected from six administrative divisions of Bangladesh using multistage probability sampling. Three months' (April – June 2000) actual and projected costs were taken into consideration to obtain the average monthly cost. In doing so, the actual cost for the month of June 2000 was taken as the base month calculation for making extrapolation or projection of the previous two months' figures, where required.

As shown in table – 1, the average monthly cost of ESP at Upazila Health Complex level is Tk. 682,854 for a monthly average of 14,210 number of patients constituting a per patient cost of Tk. 48.05 at that level.

Table 1: Breakdown of average monthly total cost of ESP at UHCs by its components

ESP Component	Average monthly patients No	Average monthly cost Tk.	As a % of total ESP cost	Per patient cost Tk.	As a % of per patient total ESP cost
Total ESP	**14,210**	**682,854**	**100%**	**48.05**	**100%**
Reproductive Health Care	6,052	246,200	36.0%	40.68	85%
Maternal Health		*106,464*	*43.2%*	*93.41*	
Family Planning		*101,956*	*41.4%*	*24.40*	
Others		*37,781*	*15.4%*	*51.48*	
Child Health Care	5,967	273,822	40.1%	45.89	95%
Communicable Disease Control	297	33,313	4.9%	112.16	233%
Limited Curative Care	1,876	127,591	18.7%	68.01	142%
Support Service (administration, BCC etc)	19	1,928	0.3%	101.47	225%

In terms of the cost of the ESP components, average monthly cost of Reproductive Health Care at the 20 sample UHCs is Tk. 246,200 as spent for an average of 6,052 numbers of patients in those UHCs constituting the per patient cost of Tk. 40.68. Average cost incurred for Child Health Care is Tk. 273,822 spent for an average of 5,967 number of patients constituting the per patient cost of Tk. 45.89. The 20 sample UHCs, average monthly cost for

Communicable Disease Control is Tk. 33,313, spent for average 297 number of patients making the per patient cost of Tk. 112.16. Limited Curative Care incurred an average monthly cost of Tk. 127,591 for an average of 1,876 patients, constituting per patient cost of Tk. 68.01.

From the presentation in figure – 1 it can be seen that the highest 40.1% of the total ESP cost at UHC level is attributable to Child Health Care followed by Reproductive Health Care which constitutes 36.0% of that cost of ESP at UHC level. Limited Health Care component accounts for 18.7% of the total cost of ESP while the rest 4.9% is attributable to Communicable Disease Control. The percentage share of support service in the total ESP cost is relatively extremely small, only 0.3% of the total ESP cost.

Figure 1: Percent distribution of average monthly cost of major components of ESP at UHCs

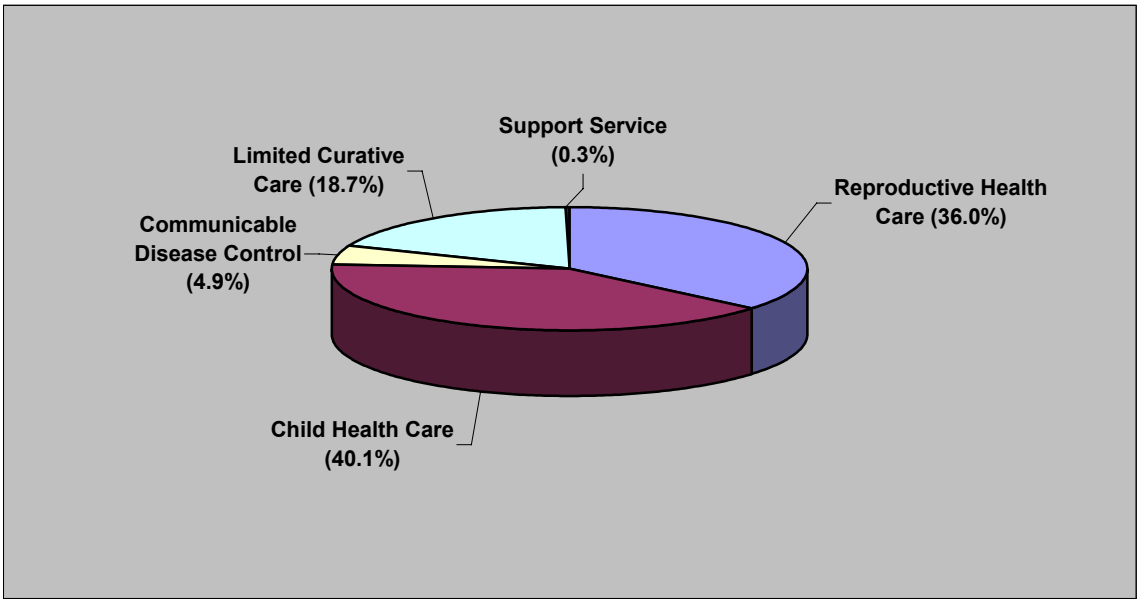
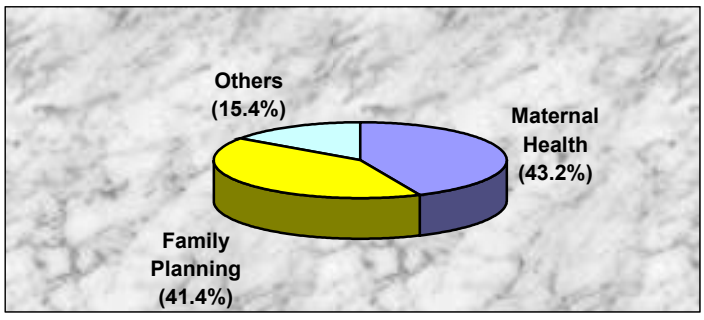


Figure 1.1: Distribution of major constituents as a percentage of total cost of Reproductive Health Care service at UHCs



In table – 1 Reproductive Health Care component of ESP is further segregated into three major sub-sub-components of ESP, namely, (i) Maternal Health, (ii) Family Planning, and (iii) Others. Cost incurred for ***Maternal Health*** service, which consists of (a) Antenatal Care, (b) Delivery Care, (c) Postnatal Care, and (d) Neonatal Care, is Tk. 106,464, representing 43.2% of the total cost incurred for Reproductive Health Care. Cost attributable *to* ***Family Planning,*** which represents the Family Planning component of Reproductive Health Care**,** is Tk. 101,956, representing 41.4% of the total cost of Reproductive Health Care. Cost incurred for ***Other***, which consists of (i) MR and Post Abortion, (ii) Adolescent Health, (iii) Management and Prevention/ Control of RTI/STDs and HIV/AIDS is TK 37,781 which is 15.4% of the total cost of Reproductive Health Care. Figure – 1.1 below depicts the percent distribution of monthly total RHC cost by the three sub-sub-components.

9.2 ESP Cost Analysis by Inputs/ Cost Elements at Upazila Health Complexes

Cost of Essential Services Package at Upazila level which is the total of notional or actual expenditure incurred on and/or attributable to the ESP services at Upazila level and proportion of costs incurred at Central level and/or at the District level attributable to ESP services at Upazila level has been classified primarily according to the category of inputs devoted to service activities. These broad inputs/cost elements upon which expenditures are incurred on are: (i) Staff cost; (ii) Commodities and Consumables cost; (iii) Usage cost of Equipment; (iv) Usage cost of Furniture and Physical Structures; (v) Overhead cost at UHC level; and (vi) Super-overhead cost.

Therefore, the total cost of ESP at UHC level consists of staff cost, cost of commodities and consumables used, usage cost of equipment, furniture and structure, overhead cost at UHC level, and share of Super overhead cost incurred centrally and/or at the district level.

Table 2: Breakdown of average monthly total cost of ESP at UHCs by category of inputs/ cost elements

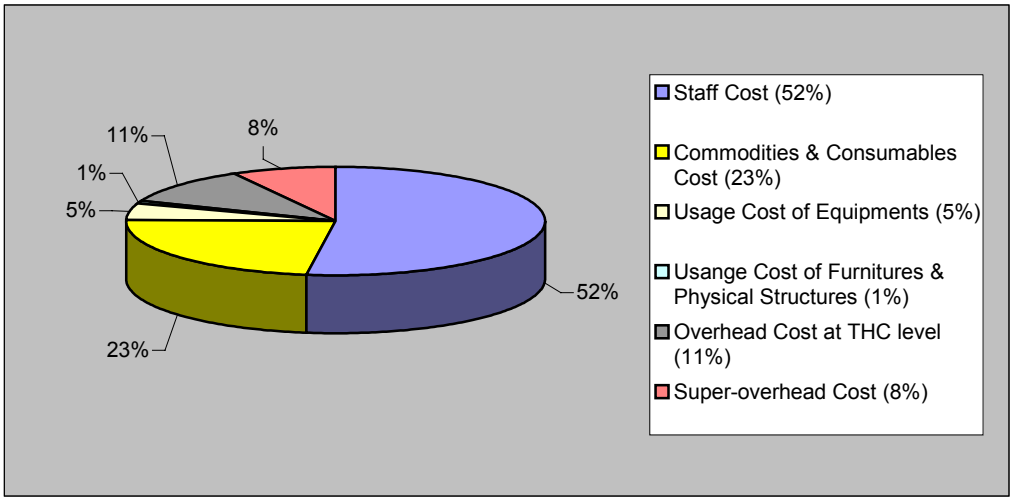
Inputs Category/Cost Element	Average monthly cost Tk.	Per patient cost Tk.	As a % of total ESP cost
Staff Cost	357,724	25.17	52%
Commodities and Consumables Cost	156,360	18.06	23%
Usage Cost of Equipment	33,817	4.15	5%
Usage Cost of Furniture and Physical Structures	6,199	0.44	1%
Overhead Cost	74,204	5.22	11%
Super-overhead Cost	54,550	3.84	8%
Total ESP	**682,854**	**48.05**	**100%**

Out of the average monthly cost of Tk. 682,854 for ESP delivery at UHCs serving an average 14,210 patients per month as shown in table – 2, an average monthly cost of Tk. 357,724 has incurred for staff time for an average of 14,210 patients constituting 52% of the total cost of ESP delivery at the UHC level.

Further, the average monthly cost attributable to commodities and consumables is Tk. 156,360 sharing 23% of the total cost of ESP. Average monthly usage cost of equipment is Tk. 33,817 which accounts for 5% of the total cost of ESP. Average monthly cost of usage of furniture & physical structure is Tk. 6,199 occupying only 1% of the total cost of ESP. Average monthly overhead cost at UHC is Tk. 74,204 which is 11% of the total cost of ESP, while super-overhead cost, a non-ESP cost indirectly and directly related to delivery of ESP, as incurred at the district and central level different agencies is Tk. 54,550 making 8% of the total cost for the delivery of ESP issues.

The above distribution of total ESP delivery cost among the major inputs/ cost elements is presented in figure – 2. As it can be seen that the staff cost constitutes the highest cost of ESP accounting for 52% of the total cost followed by commodities and consumables cost which is 23% of the total cost. Overhead cost at UHC level constitutes the third highest cost which is 11% of the average monthly total ESP cost. Usage cost of Equipment, Furniture and physical structure inputs share only 6% of the total average monthly cost at the 20 sample UHCs. Super-overhead cost, which implies the cost incurred at central and district level but attributable to ESP delivery cost at Upazila Health Complexes, constitutes 8% of the total ESP cost at UHC level.

Figure 2: Percent distribution of average monthly cost of major inputs to ESP at UHCs



9.3 Joint Analysis of ESP Cost by Components and Inputs

An overall picture of ESP costing is presented in table – 3 in light of the foregoing analysis. Here, cost of services for each component of ESP as well as share of different inputs specific to that component are analysed in a matrix form.

TABLE 3: BREAKDOWN OF AVERAGE MONTHLY TOTAL COST OF ESP AT UPAZILA HEALTH COMPLEXES BY COMPONENTS AND BY INPUTS

Input / ESP Component	Average monthly patients No.	Staff cost Tk.	Commodities & consumables cost Tk.	Usage cost of equipment Tk.	Usage cost of Furniture & physical structures Tk.	Overhead cost at UHC Tk.	Super-overhead cost Tk.	Total ESP cost Tk.	ESP cost per patient Tk.
Reproductive Health Care	6,052	120,924	54,756	24,051	2,154	25,606	18,710	246,200	40.68
Maternal Health	*1,140*	*54,837*	*17,903*	*23,165*	*524*	*5,786*	*4,248*	*106,464*	*93.41*
Family Planning	*4,179*	*41,976*	*30,039*	*875*	*1,327*	*15,743*	*11,995*	*101,956*	*24.40*
Others	*734*	*24,112*	*6,813*	*10*	*302*	*4,076*	*2,467*	*37,781*	*51.48*
Child Health Care	5,967	138,909	69,452	4,093	2,707	33,771	24,890	273,822	45.89
Communicable Diseases Control	297	14,787	9,890	4,608	225	1,949	1,854	33,313	111.99
Limited Curative Care	1,876	82,280	21,184	1,065	1,109	12,878	9,074	127,591	68.02
Support Service	18	823	1,079	0	4	0	22	1,928	-
Total ESP	**14,210**	**357,724**	**156,360**	**33,817**	**6,199**	**74,204**	**54,550**	**682,854**	**48.05**

9.4 Pattern of Staff Time Utilisation and Staff Cost at UHCs

Analysis of pattern of staff time utilization is indeed an important aspect of ESP costing from service delivery efficiency as well as resource allocation point of view. The Health Economics Unit (HEU) also emphasises the importance of analysing the staff cost and the pattern of staff time utilization. Staff time utilizations for patients under each component, sub-component and sub sub-component were analysed with required details.

Staff costs were computed on actual basis taking into account the actual staff emoluments paid at different UHCs under budgetary allocations. Staff emoluments consist of basic salary, house-rent and other admissible allowances. Per hour expenditure of staff time has been determined by dividing the total monthly emoluments by the available monthly staff working

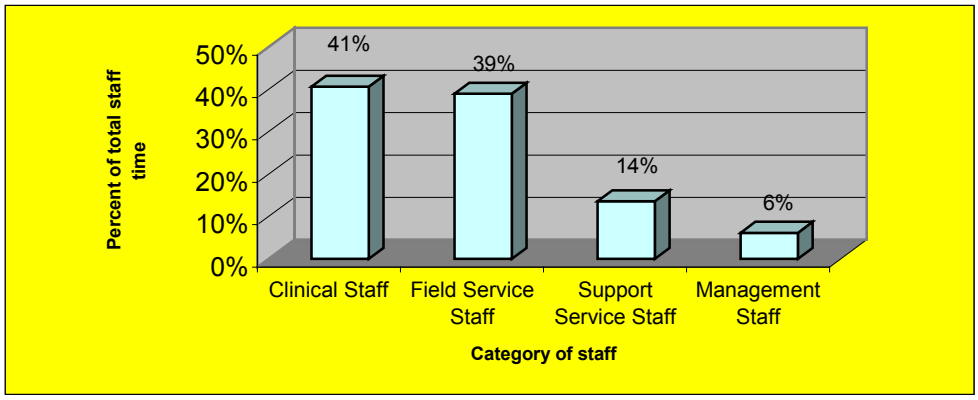
hours, and then using this expenditure figure to determine the service cost incurred on the basis of the time spent by the staff as observed for specific service components/ intervention/ activities.

Time spent by individual staff members for patients of each of the components, sub components and sub-sub components were analysed for higher degree of precision in calculating actual staff cost vis-à-vis staff time utilisation at UHCs. Three months (April – June 2000) actual and/or projected time utilisation by the staff members were taken into consideration to determine detailed monthly average of staff time utilisation. In doing that, actual time utilisation for the month of June 2000 was taken as the base for extrapolation or projection of figures of previous two months, where necessary. Actual staff time spent were taken from the log registers and other records of individual centres which were re-confirmed/counter checked by observing how service providers spend their time (time-motion method) and also by direct interviews with majority service providers (indirect observation). For further accuracy and to ensure proper representation, exit interview and survey of patients (patient flow analysis) were conducted.

9.5 Pattern of Staff Time Utilisation

Input cost analysis shows that (figure – 2) staff cost constitutes 52% of the total ESP service delivery cost at UHC level. As shown in table – 4 and figure – 4, Clinical staff members account for 41%, while Filed Service staff take 40% of the total staff time utilisation in ESP services delivery at UHCs.

Figure – 4: Percent distribution of staff time utilised on ESP by type of staff



Support Service staff members account for 14% of the total staff time utilisation while Management staff constitute only 6% of the total staff time utilisation.

As can be seen from table – 4 that out of 41% of the total staff time being utilised for ESP services by the Clinical staff members, the highest 48% time has been spent for the patients of Limited Curative Care, while the second highest time 39% is given to the patients of Child Health Care and 7% of the time to the patients of Communicable Disease Control.

Table 4: Utilisation of different categories of staff time for each of the

ESP Component / Category of Staff	Reproductive Health Care	Child Health Care	Communicable Disease Control	Limited Curative Care	Total	% of total time utilized
Clinical Staff	7%	39%	7%	48%	100%	**41% (3721.02 hrs.)**
Field Service Staff	59%	37%	2%	1%	100%	**39% (3621.51 hrs.)**
Support Service Staff	32%	48%	4%	17%	100%	**14% (1246.67 hrs.)**
Management Staff	36%	44%	3%	17%	100%	**6% (562.14 hrs.)**
Total	**34%**	**39%**	**4%**	**23%**		**100% (9151.35 hrs.)**

components of ESP

Note: staff time allocation obtained through observation and interview.

Out of 39% of the total staff time as spent by the Field Service staff, the highest 59% is devoted for the patients of Reproductive Health Care which is only 7% in case of the Clinical staff members. The next highest time spent by the Field Service staff members, which constitutes 37%, is for the patients of Child Health Care. Total time spent by Field Service staff members for Communicable Diseases Control and for Limited Curative Care is only 3%.

Support Service staff members spent the highest 48% of their time for the services of the patients of Child Health Care followed by 32% of their time for the patients of Reproductive Health Care.

Management staff members give 44% of their time to Child Health Care services followed by 36% of their time being spent for the patients of Reproductive Health Care. Each of the two categories, viz, Support Service and Management staff members spend 17% of their time for the patients of Limited Curative Care services.

As a whole, 39% of the total staff time is devoted to the patients of Child Health Care followed by 34% being spent for the patients of Reproductive Health Care. 23% of the total time is devoted to the patients of Limited Curative Care, while only 4% of the total staff time is devoted for the patients of Communicable Disease Control.

9.6 Staff Time and Cost Analysis

As can be seen from table – 5 illustrated below that the overall average monthly staff time utilization per patient is 0.64 hours, i.e., around 40 minutes. This scenario might seem somewhat unusual but this is because the time spent are divided between individual departments. All Clinical staff members together spend a monthly average of 1.04 hours per patient, which is around 1 hour 3 minutes, while Field staff members spend 0.34% of an hour (60 minutes), i.e., around 20 minutes per patient on a monthly average basis. Support Service staff members spend a monthly average of only 0.09% of an hour for each patient which is actually slightly higher than 5 minutes. Management staff members spend only 0.04% of an hour per patient, i.e., little more than 2 minutes are spent for a patient in a month (Table – 5).

Table 5: Analysis of staff time and cost in ESP delivery at UHCs

Time and Cost / *Staff Category*	Staff Time Utilization					Staff Cost			
	Monthly staff time utilization Hrs.	As a % of average total	Monthly patients No.	Monthly staff time utilisation per patient of an Hr.	As a % of Average	Average monthly staff cost Tk.	As a % of average total	Monthly per patient cost Tk.	As a % of Average
Average	**9,151.35**	**100%**	**14,210**	**0.64**	**100%**	**357,724**	**100%**	**25.17**	**100%**
Clinical	3,721.02	41%	3,581	1.04	161%	138,955	39%	38.81	154%
Field	3,621.51	39%	10,630	0.34	53%	146,303	41%	13.76	55%
Support Services	1,246.67	14%	14,210	0.09	14%	47,793	13%	3.36	13%
Management	562.14	6%	14,210	0.04	6%	24,673	7%	1.74	7%

Average monthly total staff cost at UHCs is Tk. 357,724. Amongst the different staff costs, cost attributable to Filed staff members is the highest, i.e., 41% of the total staff cost which, in terms of average monthly amount, is Tk. 146,303 as followed by Clinical staff members who spend Tk. 138,955, accounting for 39% of the total staff cost being incurred for ESP delivery at UHCs. Support Service staff share 13% of the total staff cost i.e., an average monthly cost of Tk. 47,793. Management staff members constitute only 7% of the total staff cost showing a monthly average amount of Tk. 24,673 (Table – 5).

Average per patient staff cost for ESP delivery at UHC level is Tk. 25.17 as computed at by dividing the total staff cost by the average number of patients served in a month. Clinical staff members time cost Tk. 38.81 for each patient served followed by Field staff members' time which cost Tk. 13.76 for each patient. Per patient staff cost on account of Support service staff members is Tk. 3.36, while Management staff cost per patient is Tk. 1.74 (Table – 5).

9.7 Time Utilization and Cost for ESP Component and Breakdown by Category of Staff

An analysis has been done to see the time utilization by major categories of staff and the corresponding cost in terms of each of the components of ESP. Table – 6 provides the analysis.

Table 6: ESP component-wise staff time vis-à-vis staff cost (monthly average)

ESP Components	Clinical		Field Service		Support Service		Management		Total	
	Staff Time Hours	Staff cost Taka	Staff Time Hours	Staff cost Taka	Staff Time Hours	Staff cost Taka	Staff Time Hours	Staff cost Taka	Staff Time Hours	Staff cost Taka
Reproductive Health Care	302	11,160	2,132	84,362	441	16,410	203	8,992	3,078	120,924
Maternal Health	*202*	*7,636*	*1,016*	*40,664*	*118*	*4,271*	*56*	*2,265*	*1,392*	*54,837*
Family Planning	*30*	*1,117*	*656*	*25,394*	*261*	*9,840*	*123*	*5,624*	*1,070*	*41,976*
Others	*69*	*2,406*	*460*	*18,303*	*62*	*2,299*	*24*	*1,103*	*616*	*24,112*
Child Health Care	1,407	52,005	1,345	53,980	560	21,947	250	10,977	3,563	138,909
Communicable Diseases Control	244	9,278	80	3,213	46	1,673	16	623	386	14,787
Limited Curative Care	1,767	66,424	49	4,040	199	7,744	93	4,072	2,108	82,280
Support Service	2	87	15	708	0	19	0	10	17	823
Total	**3,721**	**138,955**	**3,622**	**146,303**	**1,247**	**47,793**	**562**	**24,673**	**9,151**	**357,724**

From the above table time spent vis-à-vis cost are evident. In terms of time utilization, the clinical staff give the average highest time i.e., 3721 hours a month (incurring an average of Tk. 138,955). The field staff's time (3,622 hours a month) though slightly less than that of clinical staff time, the cost amount is just reverse the time comparison i.e., field staff incur slightly higher of the clinical staff cost but give relatively less time to the ESP services.

9.7.1 Breakdown of Reproductive Health (RH) Staff Cost

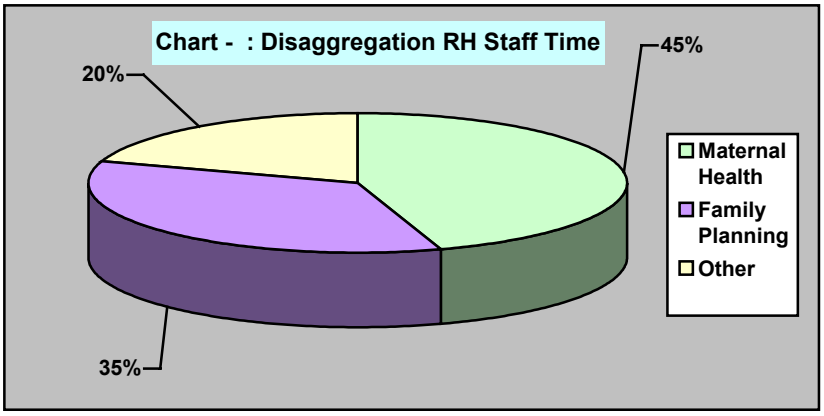
Reproductive Health (RH) being a very important component of ESP the RH staff time and cost have been disaggregated into Maternal Health, Family Planning and other.

Table 7: Breakdown of reproductive health staff time and cost

Reproductive Health Care	Staff Time Hr.	Percentage analysis	Staff cost Tk.
Total Reproductive Health	**3,078**	**100.00%**	**120,924**
Maternal Health	1,392	45.22%	54,837
Family Planning	1,070	34.76%	41,976
Other	616	20.01%	24,112

It is evident from the above table that Maternal Health takes the highest percentage of the total staff time and cost that account for Reproductive Health, which is around 45%, followed by the Family Planning sub-component taking around 35%, while 20% of the RH staff time and cost is spent for the other sub-components of the Reproductive Health Care.

The following pie chart depicts the disaggregation RH staff time cost in terms of the above discussed three sub-components.



9.8 UHC ESP Cost and Patient's Expenditure

Apart from the Upazila Health Complex's (UHCs) cost of ESP services, patients sometime spend from their own pockets and they supplement the total cost of ESP. These costs of patients include mainly the cost of medicine that patients have to purchase from outside, cost of investigation and some other items. Attempt was made to estimate a patient's own expenditure, however general way may be, by interviewing about 158 patients from 19 Upazila Health Complexes (UHCs) across the six administrative divisions. This helps to obtain an approximate average cost that has been borne by a patient in addition to UHC cost. Mentionable here that in calculating at the average UHC cost of ESP, approximately 284,207 monthly patients were taken, while the patient's own spending was determined on a randomly selected/ interviewed 158 patients. This certainly limits the significance of the findings of patients' own expenditure. Nonetheless, it does provide a good indication. Table – 8 analyses the average costs borne by a patient vis-à-vis UHC cost for ESP services.

Table 8: UHC cost of ESP vis-à-vis patient's expenditure

ESP Component	No. of respective of patients served (N=284,207)	UHC cost Tk.	Per patient UHC cost Tk.	Per patient own expenditure Tk.	No. of respective patients interviewed (N=158)
Reproductive Health Care	6,052	246,200	40.68	198.90	19
Child Health Care	5,967	273,822	45.89	151.89	19
Communicable Diseases Control	297	33,313	111.99	172.75	24
Limited Curative Care	1,876	127,591	68.02	150.40	96
Support Service	18	1,928	108.33		
Total	**14,210**	**682,854**	**48.05**	**159.81**	**158**

Average per patient UHC cost for ESP services is Tk. 48.05, but from the 158 patients interviewed, the average per-patient own expenditure as reported has been Tk. 159.81 implying that per patient spending by the patient himself/herself is 233% higher than that of the UHC cost.

For Reproductive Health Care, 19 interviewed patients' average per-patient own expenditure is Tk. 198.90 as against a UHC cost of Tk. 40.68, which that implies the cost borne by each patient is 389% higher than that of the UHC cost.

Each of the 19 interviewed patients of Child Health Care spends an average of Tk. 151.89 from his/her own pocket as against Tk. 45.89 spent by UHC for each patient of Child Health Care.

Each of the 24 interviewed patients' own spending for Communicable Disease Control services is Tk. 172.75, while UHC's cost on each patient of Communicable Disease Control component is Tk. 112.16. So, the patient's own spending is around 53% higher of that of the UHC's.

Out of a sample of 96 patients, average per-patient own cost for Limited Curative Care is Tk. 150.40 as against Tk. 68.01 being spent by UHC for each patient of Limited Curative Care component. This shows that a patient's average own expenditure is about 121% of that of the UHC cost.

9.9 Patients' View Regarding the Adequacy of ESP Services

In this section, effort has been made to explain the adequacy of ESP services and their delivery at UHCs from the patients' perspective in terms of 'satisfaction' or 'dissatisfaction' that they expressed toward the services.

Table – 9 gives an analysis of patients' degree of satisfaction in respect of services being delivered by Upazila Health Complexes. Patients' satisfaction may be somewhat subjective and the level varies depending upon various factors. Even an unpleasant attitude of a staff at the UHC entrance may have left adverse effect on the patient's satisfaction level. However, attention was given to minimize the incidence of such subjectivity. That is, patients interviewed were asked very specific questions to assess their satisfaction in terms of fulfillment of their need of ESP services. Also, the interviewers were trained to consider the context of the patient's overall comment.

Given the outcome of patients' interview, patients' satisfaction level can be shown at the two ends of a continuum, that is, 'satisfied' and 'not satisfied'. But there is another group in between these two extremes, i.e., moderately satisfied which implies that they are of the opinion that there are rooms for positive improvement. 'Satisfied' implies the adequacy of the services and their delivery by the UHC, while 'dissatisfied' implies the inadequacy. 'Moderately satisfied' indicates a degree of adequacy which is low and warrant improvement.

A total of 136 patients were interviewed from 19 UHCs under six administrative divisions. As shown in the Table – 9 that overall 51% is satisfied with the services being delivered from the UHCs, while 24% is dissatisfied with the service delivery, and 25% patients were 'moderately satisfied' implying that they feel that there are scopes for improvement. The following table analyses details of patients' satisfaction as to the delivery of ESP services at UHC level.

Table 9: Analysis of patients' satisfaction of ESP services from UHCs

ESP Component	Total	Satisfied	Dissatisfied	Moderately satisfied
Child Health Care	100% (N=18)	39% (N=7)	28% (N=5)	33% (N=6)
Communicable Diseases Control	100% (N=16)	63% (N=10)	25% (N=4)	13% (N=2)
Limited Curative Care	100% (N=81)	49% (N=40)	26% (N=21)	25% (N=20)
Reproductive Health Care	100% (N=21)	62% (N=13)	19% (N=4)	19% (N=4)
Total	***100% (N=136)***	***51%***	***25%***	***24%***

9.10 Distance and Mode of Transportation

Analysis of information given by patients shows that 33.54% patients stay within 2 kilometres of the UHC. In other words, they come from a distance of two kilometres from UHC. 23.60% of the patients come from above 2 kilometre but within 4 kilometre distances; and 35% patients come from a distance more than 4 kilometres from UHC. Following sub-section gives further information in this regard.

Average distance of ESP centres form the patients house, the mode of transportation being used and the time spent in travelling are important matters in respect of ESP services delivery. Of the 161 patients interviewed only 14 patients, constituting only 8% come to the ESP centre from a distance of 1 kilometre and 71% of them come on foot while the rest 29% uses rickshaw or rickshaw van as the means of transport. Around 34% patients come to ESP centre from a distance of 1 to 2 kilometres and 37% of them come on foot while 57% of them use rickshaw or rickshaw van as the mean of transportation. 24% of the patients stay within a range of 2 to 4 kilometres from the ESP delivery center and 12.5% of them use bus, tempo or they share baby taxis as a mode of their transportation. 45% of patients stay within a distance of 4 to 10 kilometres, and 25% of them use rickshaw or rickshaw van while the other 25% of them use bus, tempo or they share baby taxis to come to the ESP center, and 17.5% of them use boat as a means of transportation. 53% of patients live within a distance of 10 kilometres or more from the nearest ESP centre and 9% of them use bus as the means of transportation.

Of the total patients taken for interview, an overall 52% of patients use rickshaw or rickshaw van as the means of transport to visit ESP delivery centre followed by the second highest 20% who come on foot. Interesting to note here that there were patients who came to the ESP delivery centre as far as 30 kilometres distance from the ESP delivery centre. The following table sums up the analysis.

Table 10: Distance of ESP centre vis-à-vis mode of transportation

Distance Kilometres	No. of patients	Mode of Transportation						
		By foot	Rickshaw/ Rickshaw van	Boat	Bus	Tempo/ shared tax	Bicycle	Other transportation
< 1	14	10	4					
1 – 2	54	20	31	3				
> 2 – 4	38	1	29	2	2	3	1	
> 4 – 10	40	1	18	7	5	5		4
> 10	15		2	3	8			2
Total	**N = 161**	**32**	**84**	**15**	**14**	**8**	**1**	**6**
Percentage	**100%**	**20%**	**52%**	**9%**	**9%**	**5%**	**1%**	**4%**

In line with the above an analysis of the time of patients that is required to come to UHC is important. Following table analyses the time required by the patients to come to the ESP delivery centres. Only 5% of the sample patients require 10 minutes or less to reach the ESP delivery centre. 26% of the patients interviewed spend 10 to 20 minutes to reach the ESP centres while same percentage of the sample patients spend 40 minutes to 1 hour to reach the ESP delivery centre. Majority of the interviewed patients, i.e., 87% of the total patients interviewed spend a range of 20 minutes to 2 hours to reach the nearest ESP centre. 7% has to spend more than 2 hours to reach the nearest ESP centre.

Table 11: Analysis of time needed by patients to reach to the ESP centre

Time Needed (Minutes)	No of clients	Percentage
<10	8	5%
10 – 20	42	26%
> 20 – 40	31	19%
> 40 – 1 Hour	42	26%
> 1 H – 2 H	26	16%
> 2 H – 3 H	8	5%
> 3 H	3	2%
	160	**100%**

9.11 Patients' Willingness to Cost Sharing

The concept of free service has been changed over the past years. Cost sharing is thought to be important from the point of view of financial sustainability of any health program like HPSP.

Table – 12 analyses the patients' willingness to share cost. There might be some subjective judgment here however. Among the patients interviewed, 23% expressed their unwillingness to share any cost. 37% of the total patients interviewed have expressed their willingness to share 25 to 50% of the cost followed by a 16% of the interviewed patients who may share 10-25% of the cost.

Table 12: Analysis of patients' willingness to share cost

Patient (N = 165)		Amount of cost willing to share (in % of cost)
No	Percent	
38	23%	Not willing
26	16%	10 to 25% of cost
61	37%	25 to 50 % of cost
9	5%	Above 50% of cost
31	19%	100% cost

Interesting to note that the interview results show that 19% of the patients may be willing to bear 100% ESP services cost, while only 5% of the patients may share more than 50% of the cost but certainly les than 100% cost of the ESP services.

10. COSTS ANALYSIS OF ESP DELIVERY AT UHFWCs

10.1 Analysis of Costs by ESP Components at UHFWCs

Cost of Essential Services Package at Union Level implies the notional or actual expenditure incurred on and/or attributable to the ESP delivery at Union Level, i.e., at Union Health and Family Welfare Centres (UHFWCs). Out of a selected sample of 20 UHFWCs, finally eighteen Union Health and Family Welfare Centres (UHFWCs) across the six administrative Divisions in the country were finally covered in the study. Two UHFWCs despite earnest request and persuasion did not extend cooperation to carry out the study. Therefore, to workout the average monthly cost of ESP services at Union level, 18 Union Health and Family Welfare Centres (UHFWCs) were taken into account. Three months' (April – June

2000) actual and projected data were used to derive the average monthly costs. In this analysis, actual costs during the month of June 2000 were taken as the base for making extrapolation or projection of previous two months' figures, where required.

As shown in table – 13, the average monthly cost of ESP at Union Health and Family Welfare Centres is Tk. 54,722 for an average of 1,253 numbers of patients resulting a per patient cost of Tk 43.67 at that level.

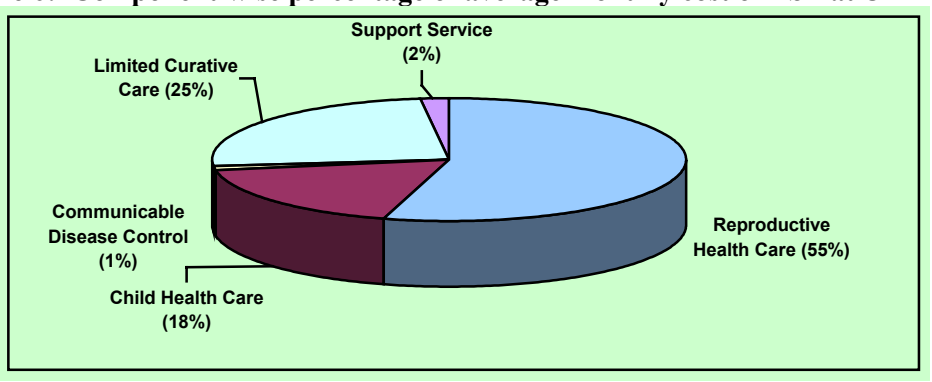
Table 13: Average monthly cost of ESP at a UHFWC and its breakdown by components

ESP Component	Average monthly patients No	Average monthly cost Tk.	Per patient cost Tk.	As a % of total ESP cost	As a % of per patient total ESP cost
ESP cost at a UHFWC	**1,253**	**54,722**	**43.67**	**100%**	**100%**
Reproductive Health Care	430	29,885	69.47	55%	159%
Child Health Care	511	10,042	19.66	18%	45%
Communicable Diseases Control	9	223	24.82	0%	57%
Limited Curative Care	303	13,662	45.10	25%	103%
Support Service	1,253	909	0.73	2%	2%

The average monthly cost of Reproductive Health Care services at UHFWCs level is Tk. 29,885 being spent for an average of 430 patients, and thus the per patient cost is Tk. 69.47. The average cost incurred for Child Health Care services at UHFWCs has been Tk. 10,042 as spent to cover a monthly average of 511 numbers of patients giving a per patient cost of Tk. 19.66. The average monthly cost for Communicable Disease Control service is only Tk. 233, spent for an average of 9 numbers of patients constituting the per patient cost of Tk. 24.82. Limited Curative Care service has shared an average monthly cost of Tk. 13,662 for an average of 303 numbers of patients constituting a per patient cost of Tk. 45.10.

From the presentation in table – 13, it can be seen that the highest 55% of the total ESP cost is attributable to Reproductive Health Care services followed by the cost of Limited Curative Care services which constitutes 25% of the total cost of ESP at UHFWC level. Child Health Care component constitutes 18% of the total cost of ESP while the share of Communicable Disease Control in the total cost of ESP at UHFWCs is negligible.

Figure 6: Component-wise percentage of average monthly cost of ESP at UHFWCs



10.2 ESP Cost Analysis by Inputs/ Cost Elements at UHFWCs

The total cost of ESP at UHFWC level consists of staff cost, cost of commodities and consumables used, usage cost of equipment, Furniture and structures, overhead cost at UHFWC level.

Therefore, four cost elements were assessed to calculate ESP delivery cost at UHFWC level. These are (i) Staff cost; (ii) Commodities and Consumables cost; (iii) Usage cost of Equipment; (iv) Usage cost of Furniture and Physical Structures; and (iv) Overhead cost at UHFWC.

Table – 14 shows average monthly total cost as well as the proportion of cost for each input devoted to ESP delivery at the eighteen sample UHFWCs. The average monthly cost of ESP calculated for each UHFWCs was Tk. 54,722, which can be generalised as the ESP delivery cost at UHFWC level in Bangladesh.

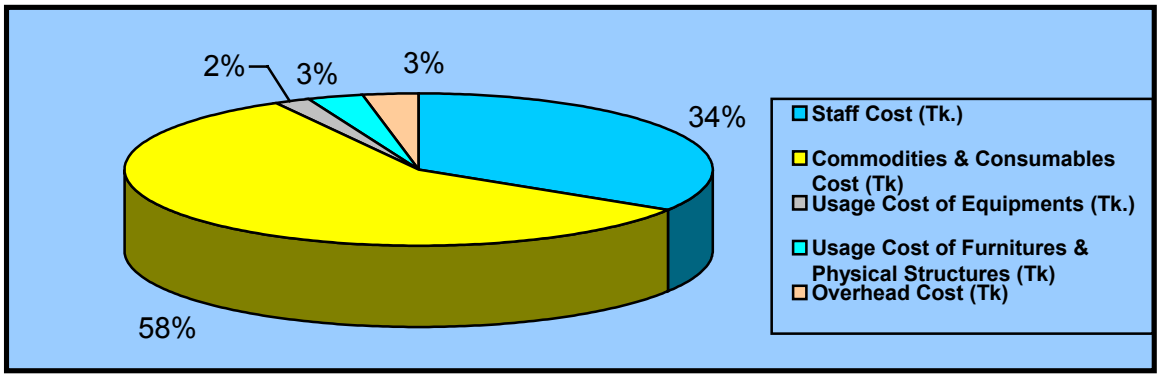
Besides the average total cost and components-wise proportion, an aggregate picture of ESP cost along with the magnitude of each input cost for all 18 sample UHFWCs has also been drawn in the table – 14, to provide a better understanding of ESP cost at each UHFWC level. The table also shows the per patient ESP cost as well as per patient cost for each of the ESP components at UHFWC level.

TABLE 14: BREAKDOWN OF AVERAGE MONTHLY COST OF ESP AT UHFWCS BY COMPONENTS AND BY COST INPUTS/ELEMENTS

ESP COMPONENT	Average monthly patients No.	Staff cost (Tk.)	Commodities & consumables cost Tk.	Usage cost of equipment Tk.	Usage cost of Furniture & physical structures Tk.	Overhead cost at UHFWC level Tk.	Total ESP cost Tk.	ESP cost per patient Tk.
Reproductive Health Care	7,744	87,657	413,720	14,690	11,030	10,841	537,938	69.47
Child Health Care	9,195	99,198	57,362	766	11,668	11,756	180,749	19.66
Communicable Diseases Control	162	3,583	0	0	278	161	7,187	44.37
Limited Curative Care	5,452	140,300	86,524	3,166	8,251	7,671	242,745	44.52
Support Service	0	0	16,370	0	0	0	16,370	0
Sample total ESP cost	**22,553**	**330,737**	**573,976**	**18,622**	**31,227**	**30,428**	**984,990**	**43.67**
Average cost at a UHFWC	**1,253**	**18,374**	**31,888**	**1,035**	**1,735**	**1,690**	**54,722**	**43.67**

More than 90% of the total ESP cost at UHFWCs is comprised of staff costs and costs of commodities and consumables. Cost of commodities and consumables constitutes the highest proportion of input costs of ESP accounting for 58% of the total cost which is followed by staff cost, which is 34% of the total cost. The rest 8% consists of Usage cost of Equipment (2%), Usage cost of Furniture and Physical Structures (3%), and Overhead cost (3%). The proportions of different cost elements/ inputs in the average total cost of ESP delivery at UHFWCs are illustrated by the following pie chart.

Figure 7: Percent distribution of cost of ESP by inputs at UHFWCs



10.3 Pattern of Staff Time Utilisation and Staff Cost

Staff costs were calculated on actual basis taking into account the actual staff salary being paid in different centres. Time spent by individual staff members for patients of each component, sub component and sub-sub-component were analysed in detail. Using three months' (April – June 2000) actual and derived time utilisation by the staff members the average monthly staff time utilisation was calculated, where actual time utilisation for the month of June 2000 was taken as the base for necessary extrapolation or projection of figures of previous two months, if any. Actual staff time spent were taken from the log-books and records of individual centres which were re-confirmed/counter checked by observing how service providers spend their time (time-motion study) and by direct interviews of providers (direct observation). For further accuracy and to ensure proper representation, exit interviews of the patients were conducted.

10.4 Staff Time Utilisation

Staff cost constitutes 34% of the total ESP cost, and this is the second highest input cost at UHFWC level. Average monthly staff time per patient in respect of 18 sample UHFWCs is 0.44 percent of an hour, that is, 26.4 minutes, which actually represents the average time spent by all service providers for one patient at UHFWC level in a typical month.

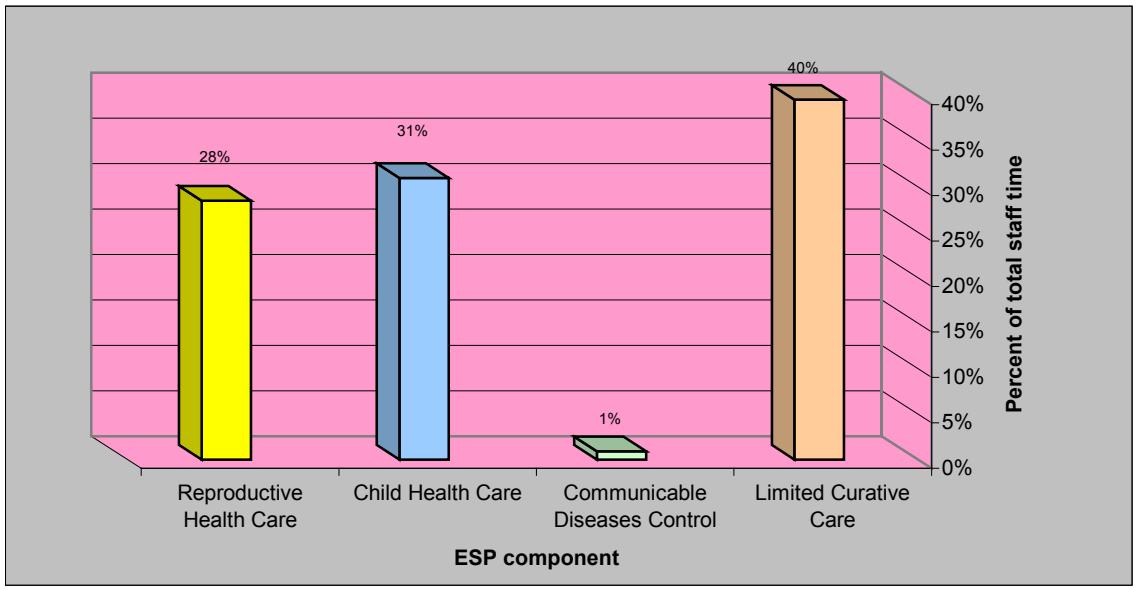
Further analysis of staff time utilization at UHFWC level can be done from the perspective of time devoted for each ESP component, which is shown in table – 15. Patients under LCC component get the highest time as a percentage (40%) of total staff time as well as in terms of per patient time (0.72% of an hour), while the second highest time (31%) is devoted to the patients of Child Health Care component.

Table 15: Percentage of staff time utilised for major components of ESP at UHFWCs

ESP Component	Average monthly patients No.	Staff time per patient % of an Hr.	Staff time utilized Hrs.	% of total staff time utilized for the component
Reproductive Health Care	7,744	.37	2,843	28%
Child Health Care	9,195	.33	3,093	31%
Communicable Diseases Control	162	.57	92	1%
Limited Curative Care	5,452	.72	3,951	40%
Support Service	0	-	-	0%
Total	**22,553**	**.44**	**9,979**	**100%**

As a whole, 40% [as shown in the following graph] of the total staff time is devoted to the patients of Limited Curative Care followed by 31% being spent for the patients of Child Health Care. And 28% of the total staff time is devoted to the patients of Reproductive Health Care while only 1% of the total staff time is devoted for the patients of Communicable Disease Control. Figure–8 depicts the proportion of staff time utilized for each of the ESP components.

Figure 8: Percent distribution of staff time utilization by ESP components

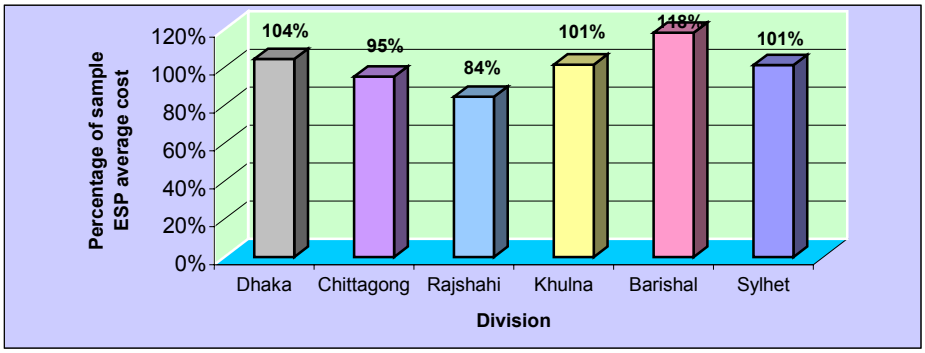


11. GEOGRAPHICAL VARIATIONS IN ESP COST

11.1 ESP Cost – Division-wise Analysis

Although the sample average of monthly cost of ESP at UHC level is Tk. 682,854, there has been a wide variations of that cost across the Divisions in the country. The study findings suggest that the average monthly cost of ESP is highest in Barisal Division, which is Tk. 806,801 and it is 18% higher than that of the sample average. Among the six divisions, average ESP cost at UHC level is lowest in Rajshahi Division representing only 84% of the overall sample average (national average) monthly ESP cost. Chittagong Division constitutes the second lowest with 5% less than the national average. ESP cost variation in Khulna and Sylhet Division is almost nil. Figure – 9 below illustrates the percent distribution of monthly average cost ESP at UHCs in respect Divisional breakdown.

Figure 9: Division-wise average cost of ESP as a percentage of total sample average cost at UHCs



The following table analyses the variations in average monthly ESP cost at Upazila level across the six divisions of Bangladesh.

11.2 Variation Analysis of ESP Cost by Components

As can be seen in table – 16 that the cost of services of different ESP components vary from one UHC to another and thus among the Divisions. The analysis reveals that the average monthly cost of Reproductive Health Care services is Tk. 355,024 in Barisal Division which is the highest among the Divisions showing 144% of the sample average (national average). On the other hand, Chittagong Division being the lowest in Reproductive Health Care cost (Tk. 153,878) constitutes only 63% of the sample average. Cost incurred for Child Health Care service is highest in Sylhet Division with an average monthly amount of Tk. 324,614, i.e., 119% of the sample average, while it is lowest in Dhaka Division (Tk. 247,536) representing only 90% of the sample average cost.

Table 16: Division-wise ESP cost by components at UHCs and variations

ESP	Dhaka		Chittagong		Rajshahi		Khulna		Barishal		Sylhet		Average
Component	Tk.	%	Tk.	%	Tk.	%	Tk.	%	Tk.	%	Tk.	%	Tk.
Reproductive Health Care	273,787	111%	153,878	63%	199,402	81%	270,681	110%	355,024	144%	274,290	111%	246,200
Child Health Care	247,536	90%	290,414	106%	249,978	91%	265,795	97%	307,382	112%	324,614	119%	273,822
Communicable Disease Control	42,561	128%	52,694	158%	22,096	66%	29,009	87%	23,200	70%	6,973	21%	33,313
Limited Curative Care	146,620	115%	151,379	119%	103,947	81%	124,186	97%	118,622	93%	83,686	66%	127,591
Support Service	2,236	116%	1,289	67%	1,355	70%	2,764	143%	2,573	133%	982	51%	1,928
Total ESP	**712,741**	**104%**	**649,655**	**95%**	**576,777**	**84%**	**692,435**	**101%**	**806,801**	**118%**	**690,544**	**101%**	**682,854**

Figures in % column indicate as a percentage of sample average

Cost incurred for Communicable Disease Control service varies largely across the Divisions. The highest cost being incurred for Communicable Disease Control services is in Chittagong Division (Tk. 52,694) which is 158% of the sample average cost of CDC services, while the lowest cost registered in Sylhet Division (Tk. 6,973) which is only 21% of the sample average. Cost incurred for Limited Curative Care service is highest in Chittagong Division (Tk. 151,379) constituting 119% of the sample average, while the lowest is in Sylhet division (Tk. 83,686) representing only 66% of the sample average.

Table 17: Division-wise ESP cost by inputs at UHCs and variations

Cost Input	Dhaka		Chittagong		Rajshahi		Khulna		Barishal		Sylhet		Average
	Tk.	%	Tk.	%	Tk.	%	Tk.	%	Tk.	%	Tk.	%	Tk.
Staff Cost	407,868	114%	348,282	97%	270,517	76%	357,898	100%	428,793	120%	310,639	87%	357,724
Commodities & Consumables Cost	154,660	99%	126,425	81%	145,280	93%	130,081	83%	217,861	139%	228,160	146%	156,360
Usage Cost of Equipment	30,431	90%	37,063	110%	28,788	85%	30,676	91%	47,613	141%	35,824	106%	33,817
Usage Cost of Furniture & Physical Structure	6,590	106%	8,579	138%	4,411	71%	6,841	110%	5,625	91%	2,439	39%	6,199
Overhead Cost at UHC level	58,643	79%	74,756	101%	73,232	99%	112,389	151%	52,360	71%	58,934	79%	74,204
Super-overhead Cost	54,550	100%	54,550	100%	54,550	100%	54,550	100%	54,550	100%	54,550	100%	54,550
Total cost	**712,741**	**104%**	**649,654**	**95%**	**576,777**	**84%**	**692,435**	**101%**	**806,801**	**118%**	**690,544**	**101%**	**682,854**

Figures in % column indicate as a percentage of sample average

11.3 Variation Analysis of ESP Cost by Inputs

Analysis in table – 17 shows that staff cost for ESP delivery across the Divisions varies within a range of the lowest 76% to the highest 120% of the sample average cost. The lowest staff cost of Tk 270,517 has been registered in Rajshahi Division, while the highest staff cost (Tk. 428,793) has been found in Barisal Division. Commodities and Consumable Cost varies across the Divisions with a range of 81% to 146% of the sample average cost. The lowest average being Tk. 126,425 has been found in Chittagong while the highest average (Tk. 228,160) has been in Sylhet Division. The lowest Usage cost of Equipment has been in Rajshahi Division (Tk. 28,788), which is 85% of the sample average, while it has been the highest (Tk. 47,613) in Barisal Division representing 141% of the sample average cost. Usage cost of Furniture and Physical Structures is highest in Chittagong Division (Tk. 8,579, 138% of the sample average), while it has been the lowest in Sylhet Division (Tk. 2,439, only 39% of the sample average). Overhead cost is highest in Khulna Division (Tk. 112,389,151% of sample average), while it is the lowest in Barisal Division (Tk. 52,360, 71% of the sample average).

12. ESP COST BETWEEN UHCS AND UHFWCS

This sub-section provides a comparison of average monthly cost of ESP between the two types of facilities. Such overall picture shows the average of ESP cost in an entire Upazila as well as the degree of relative efficiency of service delivery

As can be seen from table 18, the average monthly cost of ESP of the 20 sample UHCs taken under review comes to Tk. 682,854, and the average monthly cost of ESP of the 18 sample UHFWCs is Tk 54,722. The average per patient cost at UHCs has been Tk. 48.05, around 10% higher than that of the cost at UHFWCs, which is Tk. 43.67. However, this variation is mainly attributable to variations as in the degree and extent of ESP services interventions/ activities, that are carried out at each of the two tiers.

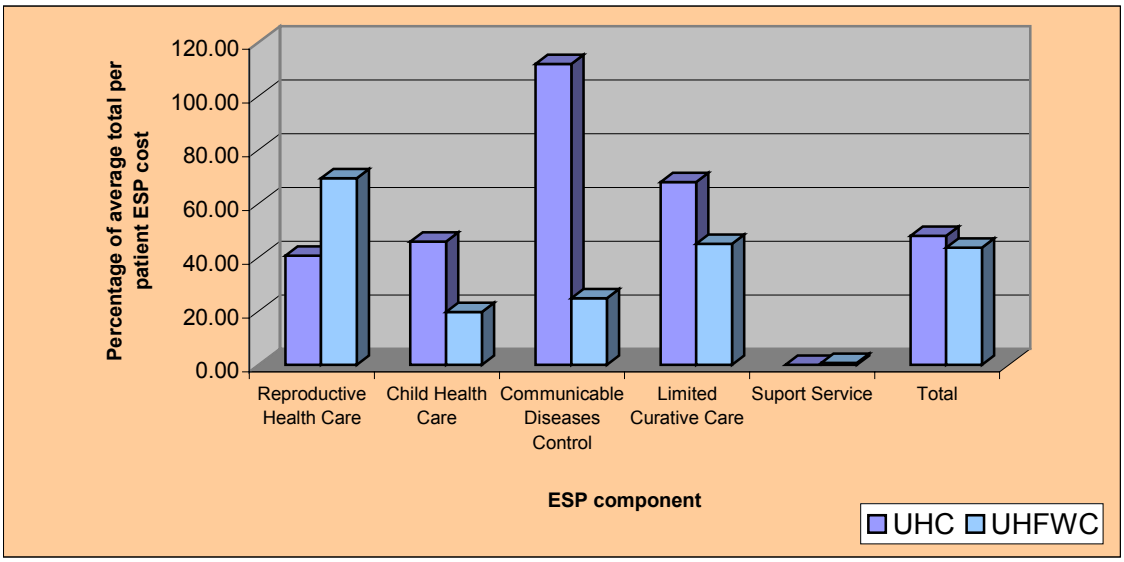
Table 18: Average monthly cost of ESP at UHCs and UHFWCs and breakdown by components

ESP COMPONENT	UHC			UHFWC		
	Average monthly cost Tk.	As a % of total ESP cost	Per patient cost Tk.	Average monthly cost Tk.	As a % of total ESP cost	Per patient cost Tk.
Total ESP	**682,854**	**100%**	**48.05**	**54,722**	**100%**	**43.67**
Reproductive Health Care	246,200	36%	40.68	29,885	55%	69.47
Maternal Health	*106,464*	*43%*	*93.41*			
Family Planning	*101,956*	*41%*	*24.40*			
Others	*37,781*	*15%*	*51.48*			
Child Health Care	273,822	40%	45.89	10,042	18%	19.66
Communicable Diseases Control	33,313	5%	111.99	223	0%	24.82
Limited Curative Care	127,591	19%	68.02	13,662	25%	45.10
Support Service	1,928	0%		909	2%	0.73

The average monthly cost incurred for Reproductive Health Care service at UHCs is Tk. 246,200 (36% of the total cost of ESP at UHCs), while the average monthly cost incurred for the same component of ESP at UHFWCs is Tk. 29,885 (55% of the total cost of ESP at UHFWC level). Per patient cost for Reproductive Health Care service at UHCs is Tk. 40.68, around 71% lower than the per patient cost of Reproductive Health Care service at UHFWCs, which is Tk. 69.47.

The average monthly cost attributable to Child Health Care at UHCs is Tk. 273,822 (40% of total cost of ESP at UHCs) as against the average monthly cost of Child Health Care at UHFWCs which is Tk. 10,042 representing only 18% of the average monthly total cost of ESP at UHFWCs. Per patient cost of Child Health Care at UHCs is Tk. 45.89, around 133% higher than that of UHFWCs, which is Tk. 19.66. Figure – 10 illustrates the average monthly per patient cost for different components of ESP at UHCs and UHFWCs.

Figure 10: Average monthly per patient cost for different components of ESP at UHCs and UHFWCs



The average monthly cost incurred for Communicable Disease Control at UHCs is Tk. 33,313 giving a comparatively higher per-patient cost of Tk 112 (351% higher than that of UHFWCs') as against Tk 24.82 incurred for each patient of Communicable Disease Control at UHFWCs (average monthly cost of Communicable Disease Control at UHFWCs is only

Tk. 223). Communicable Disease Control represents only 5% of the total cost of ESP at UHCs, while for UHFWCs, the same component of ESP represents less than 1% of the ESP cost. Limited Curative Care represents 19% (Tk. 127,591) of the average monthly total cost of ESP at UHCs with a per patient cost of Tk. 68. Limited Curative Care, on the other hand, represents 25% of the (Tk. 13,622) total cost of ESP at UHFWCs with a per patient cost Tk. 45.10, about 50% lower than that of the cost at UHCs.

13. GOVERNMENT ALLOCATION FOR ESP SERVICES AT UHCS AND BELOW

Government budgetary allocations to UHCs are inclusive of the expenditures for services from UHFWCs and CCs. For the 1999-2000 Financial Year, Government's original allocation to HPSP for both development and non-development expenditure was Tk. 2,441 crore, of which Tk 2,092 (around 85% of original budget) was actually spent. Expenditure for ESP was within a range of 60% to 70%. Government budget allocations for the 20 sample UHCs together are given in the table – 19 below:

Table 19: Government allocations to sample UHCs for the FY 1999-2000

(Tk. In lakh)

SL	Upazila	Non-Development (Revenue Expenditure)	Development Expenditure	Total Tk.
1	Sribardi	103.55	56.05	159.60
2	Gaffargaon	137.49	94.06	231.55
3	Goshairhat	57.10	32.84	89.94
4	Daulatpur	82.23	38.46	120.69
5	Palash	66.14	30.41	96.55
6	Teknaf	60.94	19.48	80.42
7	Anwara	101.26	46.14	147.40
8	Begumganj	241.17	133.84	375.01
9	Rowangchari	36.36	15.17	51.53
10	Domar	165.29	56.75	222.04
11	Shibganj	122.47	73.87	196.34
12	Manda	64.25	74.68	138.93
13	Alamdanga	94.17	61.51	155.68
14	Mohammadpur	85.66	43.72	129.38
15	Kalia	81.17	47.29	128.46
16	Monirampur	120.29	91.97	212.26
17	Nalchity	178.00	44.57	222.57
18	Galachipa	96.27	70.33	166.60
19	Zakiganj	69.04	38.61	107.65
20	Derai	68.36	41.89	110.25
		2,031.21	**1,111.64**	**3,142.85**
Average monthly per UHC		**8.46**	**4.63**	**13.10**

As can be seen from the above table that the total allocation to 20 Upazilas that were taken under review was Tk. 3,142.85 lakhs, of which Tk. 2,031.21 were allocated to non-development or revenue expenditures which accounted for 65% of the total allocation to those 20 upazilas.

Development expenditure allocations to those 20 upazilas, on the other hand, constituted Tk. 1,111.64 lakhs, which accounted for 35% of the total allocations to those upazilas

The average monthly allocated expenditure of the 20 sample UHCs is Tk. 13.10. In terms non-development (revenue) and development expenditures the aforesaid average is Tk. 8.46 and Tk. 4.63 respectively.

Table 20: Recurrent and Capital expenditure allocation to the sample Upazilas

(Tk. In lakh)

SL	Upazila	Recurrent	Capital	Total
1	Sribardi	159.39	0.21	159.60
2	Gaffargaon	231.41	0.14	231.55
3	Goshairhat	89.87	0.07	89.94
4	Daulatpur	120.64	0.05	120.69
5	Palash	96.52	0.03	96.55
6	Teknaf	80.24	0.18	80.42
7	Anwara	147.08	0.32	147.40
8	Begumganj	374.95	0.06	375.01
9	Rowangchari	51.52	0.01	51.53
10	Domar	221.70	0.34	222.04
11	Shibganj	196.10	0.24	196.34
12	Manda	138.93	-	138.93
13	Alamdanga	155.67	0.01	155.68
14	Mohammadpur	128.88	0.50	129.38
15	Kalia	128.36	0.10	128.46
16	Monirampur	212.00	0.26	212.26
17	Nalchity	222.54	0.03	222.57
18	Galachipa	166.60	-	166.60
19	Zakiganj	107.62	0.03	107.65
20	Derai	110.25	-	110.25
Total		**3,140.27**	**2.58**	**3,142.85**
Average monthly per UHC		**13.08**	**0.01**	**13.10**

From table – 20, the breakdown of total allocations for the 20 sample UHCs in terms of recurrent and capital expenditures shows that 99.91% of the Government allocations to the 20 sample UHCs both the non-development and development budgets was for recurrent expenditures and the negligible rest was for capital expenditures. The average monthly recurrent allocated expenditure of the 20 sample UHCs is Tk. 13.08 lakhs while the average monthly allocated capital expenditure is Tk. 0.01 lakh.

Table 21: Government allocation for UHCs by type of expenditures

(Tk. In lakh)

	Recurrent		Capital		Total	
	Amount	**%**	**Amount**	**%**	**Amount**	**%**
Non-Development	2029.78	99.93	1.43	0.07	2031.21	100
Development	1110.49	99.87	1.5	0.13	1111.99	100
Total	**3140.27**	**99.91**	**2.93**	**0.09**	**3143.2**	**100**

Table – 21 above presents the combined analysis of recurrent and capital expenditure allocations under non-development and development heads.

14. COMPARISON AND RECONCILIATION BETWEEN CALCULATED ACTUAL ESP COST AND GOVERNMENT ALLOCATION

Based on the analyses of actual ESP cost and Government allocation to primary health care (i.e., Upazila and below) made in the preceding sections, a comparison can be made between the actual annual cost of care and the Government budgetary allocation as follows:

Table 22: ESP cost actual vs Government allocation

Annual actual cost of care for a Upazila		Total ESP cost for a Upazila	Government annual allocation to a Upazila†	Variation from Govt. allocation
Average annual actual cost at UHC	Average annual cost at 6 UHFWCs*			
Average monthly actual cost × 12 months	Average monthly cost × number of UHFWCs × 12 months		Average monthly allocation × 12 months	
Tk. 682,854 × 12 = Tk. 8,194,248	Tk. 54,722 × 6 × 12 = Tk. 3,939,984	Tk. (8,194,248 + 3,939,984) = Tk. 12,134,232	Tk. 1,310,000 × 12 = Tk. 15,720,000	Tk. 3,585,768 (22.20%)

Government annual allocation vis-à-vis actual annual cost show a signification variation i.e., the calculated actual cost becomes 22.20% less than the Government allocation. A number of valid reasons are attributable to such variation. First of all, the major cause of variation is the pattern of staff time utilization which, on average, accounts for about 52% of the total ESP cost. In the calculation of actual cost of care, the actual staff time spent for the services to the patients was factored into the cost, whereas the Government allocation on account of pay and allowance is not dependent on the actual time given for number of patients served. That is, a staff receives monthly emoluments on a defined pay scale regardless of actual time given to the service delivery of ESP.

The second cause of variation lies in the selection and inclusion of ESP sub-components and sub-sub-components. As has been described in the methodology (identification of ESP sub-component/ activity) that while all components and major sub-components were taken for the study, some sub-sub-components and sub-components were precluded in order to make the study/ observation manageable and precise. As a matter of fact, increased number of sub-components/ sub-sub-components/ activities would have only raised the cost of study but yielding very insignificant gain.

The other reason of variation would be the use of MSR and their record and prices which were naturally variants because of the time of use and procurement, and poor recording of prices and usages. It has already been mentioned that the information gaps in respect of price, depreciation and so on were taken care of by resorting to extrapolation and limited market survey.

Additionally, the study time horizon was three months i.e., from April 2000 to June 2000 and costing provides the average of these three (3) months' actual expenditure on the ESP services. Obviously, the number of patients vary during different periods of the year. While the Government allocation is 'one' estimate for the entire financial year (12 months), the annual actual cost calculation is based on the monthly average of the three months' time-period taken for the study.

Although due to above cited reasons the annual actual cost of ESP services differs from what Government budgetary allocation shows, for all practical purposes, the study findings reflects

* It has been assumed that on average there are six (6) UHFWCs in a Upazila.
† Allocation to Upazila is inclusive of UHFWCs

the reality and provide useful insights and policy implications for the cost of ESP services and delivery efficiency.

The cost of increased number of sample particularly the breadth of services i.e., inclusion of more sub-sub-components in the scope of study would have outweighed the gain from such increase. Therefore, the overall costing and findings are undoubtedly representative as are based on an appropriate balanced sampling.

15. CONCLUDING REMARKS

When an organisation has been providing an essential services for as long as the Government health system a natural tendency is to assume that it is safe and reasonable to let this continue. But from efficiency and cost effectiveness point of view, it is important to challenge such comfortable assumptions, particularly when they relate to such a vital sector as essential health services. Costing the Essential Services Package provides necessary information about such efficiency. In the HPSP Government has stressed the need for costing of essential health services for efficient allocation and also cost-effective utilization of resources. Although some good amount of data and information have been generated through various studies covering costs of primary health and family planning services, the need for practically sound and plausible costing approaches and methodologies could hardly be overemphasised.

Again, such costing frameworks ought to find place in the institutional approaches of implementation and monitoring of primary health care services, — the ESP. A set of principles and bases of costing the ESP has been shaped in this study by investigating the details of cost structure and service delivery mechanism.

As mentioned before that from the procedural viewpoint, there exist three types of costing methodologies - top-down, bottom-up and a combination of both. Top-down costs, as the name implies, are usually obtained by using aggregate expenditures or budgets, and apportioning or allocating them by levels and/or activities using the appropriate allocation factors as the basis. Bottom-up costs, on the other hand, are derived by calculating the unit cost of individual activities at the functional level (where the costs are incurred) and then aggregate them to arrive at the total cost. Taking the instances of ESP cost elements, bottom-up method is capable of more or less accurately capturing the staff time attributable to per patient cost, or usage of consumables/ medical supply.

In this study, as has been demonstrated, a combination of both top-down and bottom-up methods was used. Expenditures on staff are generally calculated following top-down approach and so has been done in this study. However, for analysing the service pattern, time spent for each type of patient by each type of staff member, the bottom up approach has been used.

Mainly focus has been given on – how to develop the financial cost estimates of primary health care services – the ESP; and how to determine whether the Government would be able to afford extra costs of increased coverage.

The assessment of health programs is a major pre-occupation of government health planners. For example, they are often called upon to recommend the appropriate size and composition of a health sector investment program in the context of a five-year planning exercise. However, the analytical base supporting these policy choices is usually strikingly, limited.

In the background of HPSP and its estimated outlay over five years period, the affordability of the investment program itself is an important problem, the far greater problem is the

widespread undermining the effort analyze the future recurrent cost implications of the ESP and to assess whether these costs will be affordable given available financing sources. The effectiveness of HPSP investments depend largely on adequate levels of subsequent recurrent expenditure on such basic items as salaries for doctors and nurses, family planning experts, drugs, transport, and maintenance, which are needed to operate old and new facilities. The additional recurrent cost requirements created by HPSP must therefore be precisely estimated and assessed in relation to the projected recurrent expenditure constraint in order to provide a proper assessment of the affordability of primary health care services – the ESP.

The health sector has lagged behind in developing sound practices for costing. The principal problems of current practices can be grouped under the headings omissions and underestimation, mishandling of the capital/ recurrent issue, absence of shadow pricing, inadequate treatment of joint cost allocation, lack of cost models, and the failure to derive and effectively examine unit costs. The last is especially important since, as will be seen, unit costs are likely to play a critical role in practical efforts to improve analytic methods for project and sector work.

A review of past cost studies suggests that large errors are often introduced simply by not counting certain costs attributable to the services delivery or by substantially underestimating them. The chief areas of difficulty appear to be those listed in table 23 below. Sometimes the errors are merely the result of carelessness: for instance, annual replenishments of drug supplies are counted, but sometime not the initial stocking.

Table 23: Frequently overlooked or underestimated items

- Training (initial and refresher)
- Supervision (travel and per diem costs)
- Supplies other than drugs
- Initial stocks of supplies (both drugs and other)
- Utilities
- Maintenance and repair (vehicles; building and equipment)
- Upgrading of support structure, which is often allowed for in capital costs, but not recurrent and can be substantial
- Costs borne by entities other than those delivering the services, such as other sectoral institutions (e.g., contributions to staff retirement fund, subsidies for housing).

There is no reason why serious omissions and underestimation should have to persist in health service costing. Repeat survey will have to be used to develop comprehensive methodologies to deal with the above issues.

Finally, what is imperative for the Government is to install a management information system (MIS) to provide a constant flow of cost data on the performance of individual facilities and programs. Using this information, decision makers will be able to perform more accurately the implementation and monitoring tasks. An additional advantage of such a system is that it automatically provides the basic data necessary for cost, cost-effectiveness, and cost-benefit analyses. Thus, health economists and health system managers have reason to join together in urging the authorities to adopt simple MIS systems.

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ANNEX ONE: LITERATURE REVIEW OF ESP/PRIMARY CARE COSTING STUDIES

A number of studies has been carried out on the costing of ESP since the designing and launching of HPSP in July 1998. Some costing studies of the family planning programme of Bangladesh have also been carried out in recent years; and studies on costing of various service components were also carried out in the past. The outcome of the exercises may not be fully comparable given the differences in purposes and methodological frameworks used, but they indeed provide useful information to developing an appropriate comprehensive methodology for costing of ESP and underpinning related policies. In this annex we review some of the most important contributions to the costing of essential services and primary care.

1 PPC's Costing Exercise

Project Preparation Cell (PPC) of the Ministry of Health and Family Welfare (MOHFW) undertook a costing exercise of HPSP in April 1998 with the primary purposes of making an ***estimate of the resource requirements*** and ***financial planning*** for HPSP. The specific reasons for estimating the HPSP costs, according to the PPC document, are - (i) assessing the gap between the resources required and resources domestically available so as to determine the requirement of funding from the donor sources and/or cost recovery as well as prioritisation of activities; (ii) analysis of cost components and efficiency of resource allocation by estimating expenditure by input categories; (iii) helping MOHFW and development partners prioritising programme activities.

PPC divided the total expenditure of Health and Population Sector Programme (1998-2003) into two broad categories, viz., (i) expenditure for ESP delivery, and (ii) expenditures for other HPSP activities, including those that are directly or indirectly related to ESP delivery and hospital services. These include seven other components of HPSP.
In the PPC's methodology, expenditures for ESP service delivery and expenditure for ESP are not the same. Total expenditures for ESP were obtained by adding the expenditure for ESP delivery to the relevant portion of the expenditures for other seven components.

As considered practical, the method used for costing ESP was a mixture of the top-down and bottom up procedures. First, PPC and the Health Economics Unit (HEU) jointly obtained notional estimates of costs of ESP and included them in the original Programme Implementation Plan (PIP) for pre-appraisal. A Working group was formed during this pre-appraisal stage which reviewed and refined these estimates. After the mission these estimates were placed at a workshop with technical groups for finalisation. The workshop participants pointed out several points of the estimates that warranted changes. The workshop participants constituted two Review Groups, which, in consultation with a large group of concern people, obtained an estimate for each level of care (GoB 1998a: 72). The procedure used for estimating costs before the pre-appraisal was a 'top-down' one.

After the pre-appraisal, the reverse procedure was followed, i.e., bottom-up approach was adopted for the estimation of costs in a systematic and exhaustive manner. First of all, the relevant department identified the activities and tasks that would need to be carried out in the first year of HPSP to implement ESP over the target coverage. This was followed by the identification of the type and cost of inputs required for producing each unit of defined service (output). Then the total costs for each outcome at current market prices was estimated. Using the above the grand total of ESP delivery expenditures of the first year of HPSP was estimated. The estimated costs are categorised in three broad areas, viz., manpower, commodities and contingencies. Cost for subsequent year was calculated by using appropriate inflators (10%).

The estimate obtained through the bottom-up method differed substantially from that of obtained by using top-down method where the former was comparatively higher. There was a large gap between the estimated expenditure and the estimated resource envelope; and so the estimates obtained by the bottom-up method had to be adjusted to match the amount of resources allocated to each specific ESP components/ sub-components. In the adjustment to match the amount, the magnitude of programme activities in terms of the coverage and the quantum of services to be delivered per person had been reduced.

As it has been indicated in the HPSP document, the ESP costing and expenditure allocation methodology and procedures of PPC suffer from few drawbacks. Some of the important issues in this respect have already been dealt with by Tim Ensor (1999). However, the following issues may be pointed out here:

The lack of appropriate information base, reliance on notions, guesses, and to some extent application of arbitrary percentage in many cases made the PPC estimates a bit weak. In case of costing the direct ESP service delivery, i.e., first component of HPSP expenditure, these notions and guesses were substantiated by expert judgements. But, in apportioning the share of ESP and other seven non-ESP components in the HPSP expenditure, the notions and guesses themselves served the basis with little or no adjustment by the experts.

The ESP's share in the non-ESP components as shown in the PPC document do not provide cost estimates even by major areas of ESP let alone sub-areas, and so on. As a result, there is hardly any way to obtain individual estimate of cost for each major areas of ESP. In the PPC analysis information about the full cost of ESP and that by ESP components are not available which, however, are necessary to understand the extent of services, technical and allocational efficiency and other relevant dimensions of financial sustainability of ESP implementation.

2 Costing Exercise by Health Economics Unit (HEU)

Health Economics Unit's objectives to undertake costing analysis titled, '***Development of a simulation model for the costing of the essential package services in Bangladesh'***, largely differ from those of PPC's and HEU used slightly different methods and data sources. The main objective of HEU *was 'to design a model and conduct simulation exercises using cost information of ESP components in order to obtain the answers of some of questions regarding the efficiency and effectiveness of reorganisation and integration of the health sector*.' The paper also discusses the different methodologies followed by the two entities (PPC and HEU) in estimating ESP costs. Since the PPC method has already been discussed here the HEU's methodology.

The bones of HEU costing exercise were laid in a study that was carried out by Vern Hicks for the World Health Organisation (WHO). Hicks had used project concept papers (PCPs) and expert opinion as sources of many cost information and estimates. Although the figures derived by him provided an overall idea of the cost of ESP items, but it did not consider the detailed composition of the costs to bridge the gap. Therefore, the HEU obtained the disaggregated and additional cost information form project personnel and other sources through circulation of questionnaire and other procedures. The rough estimates that were worked out were further refined using information form secondary sources. The ESP cost estimates thus derived were used in a simulation model incorporating reorganization and integration of the health and population sector. This simulation model was used to obtain answer to a series of questions. The paper highlights a number of limitations of the cost estimates of both HEU and PPC.

The paper also makes a number of suggestions to improve the data sets so that these can be used for conducting cost-effectiveness analysis. However, its concluding recommendations

are to abandon the cost estimates of both HEU and PPC and obtain new estimates. For this it suggests using a different procedure, giving a number of steps.

Although all these previous studies attempted to design a framework for costing of the Essential Services Packages (ESP), none of the studies could sufficiently take within its grip the entirety of the costs involvement. Thus, a basic gap existed in the process of ESP costing.

3. University Research Corporation (URC) Model

A study titled '***Activity and Cost Analysis of Essential Health and Family Planning Services in Bangladesh***" was conducted by **University Research Corporation** (URC) during 1997-98. The objectives of the study were to obtain costs and expenditures data on services, analyse work patterns of field and clinic workers, and perform cost analysis of services being provided. This study provided an analysis of costs associated with some selected components of ESP at Upazila level and below. It also provided a detailed analysis of time used by different personnel. The ESP components that came under the study were ***family planning, antenatal care, safe delivery, emergency obstetric care, postnatal care, and expanded programme of immunization (EPI).*** The study was carried out in four predetermined government and non-government (NGO) programme sites of Rangpur and Jessore Districts being representative of high and low performing areas.

From procedural viewpoint, the study basically used the bottom up method. As many as 18 data collection instruments were used to obtain detailed information on various pertinent activities, work patterns and costs which covered all relevant domiciliary and facility level staff of family planning and health services at the Upazila level and below.

Costs that incur at Upazila level and below (three centres; at the Upazila health complex, at the family welfare centre level, and community level) were taken into consideration in estimation and analysis of costs. Super-overheads, i.e., costs being incurred at District and central level (that is, above Upazila level) were not estimated and analysed. The study considered the FWC level services to be the centre of analysis, and therefore most of the collected data on both cost and performance were related to the FWC. At the Upazila level, the study collected only cost data, while at the Community level, it focussed mostly on the data on time use by field staff.

The study compiled total cost and computed average cost for the Unions by using the following method. The total cost of the FWC was included as the main component of the Union level cost. To this was added a portion of the Upazila level cost that was incurred for the Union. This was done by dividing the total UHC cost by the number of Unions in that Upazila and then including the resultant amount in the Union cost component. The third component of the Union cost was the salary and allowance of the filed staff. The average cost of the services was obtained by dividing the total cost by the number of clients received services from the UHC, FWC and Community levels.

The costs of individual inputs were classified into a number of categories, following the RIBEC Model Budget classification, and divided into two broad groups – recurrent and capital. The costs of recurrent items were calculated from the annual expenditures on those items. Annualising their values and depreciating them gave the costs of capital items. This study calculated fixed, quasi-fixed and variable costs separately.

4 Financial Analysis of Mymensingh Medical College

Health Economics Unit conducted the study titled *'**Financial Analysis of Mymensingh Medical College Hospital**'* in June 1998. The overriding aim of this HEU study was to initiate a process of creating a pool of information about financing in the most expensive area of

Bangladesh health services, namely high unit cost hospital services provided by advanced care hospitals. And this study initiated that process by providing a financial analysis of Mymensingh Medical College Hospital for the fiscal year 1994 –95.

This study demonstrated the type of method required for gathering relevant financial data and in-depth analysis of a single facility. In this context, the MMCH analysis provided a working example as to how financial cost information and analysis should be linked with management system and improved hospital information system to enhance overall expenditure efficiency for medical college hospitals in Bangladesh.

Having analysed the available records regarding MMCH census, bed occupancy and supply distribution information, HEU combined patient wards and related data into eight inpatient ***departments***. Although eight departments were combined, HEU itself acknowledged that some had multiplicity (e.g., EENT), and some did not fall under a department in the strict sense (i.e., SKH).

These departments became final cost centres for the financial analysis. Detailed cost information of MMCH were derived directly from the records of the hospital and from other approaches covering in the production of services at the facility. These information were then organised in a manner systematic to the allocation into final activity centres. The procedure used in this exercise was the one commonly used in the managerial and cost accounting analysis of hospitals, referred to as 'Step-down' allocation method. Costs were aggregated in terms of expenditure categories that followed the real work done at the hospital, and the actual utilisation of the facility. These aggregated costs were assigned to a variety of direct and indirect overhead costs areas and then, through a detailed procedure, allocated or apportioned to final cost centres or departments.

Generally, Health Economics Unit attempts to consider full economic cost, not only financial costs as reflected in the available books and records. In this study, however, HEU made an attempt to analyse, in detail and for the first time in Bangladesh, the baseline of financial costs at a district level hospital – MMCH. This report provides a more fundamental but critical financial information as required for good cost-control and financial management at tertiary facilities in Bangladesh. The analysis of full economic cost, as HEU stated, had been set aside for future consideration.

Overall, this study has been a good beginning with detailed cost accounting of a major secondary health care centre in Bangladesh. Analysis of costs per patient day of inpatients and outpatients and for departments as well as the salary and benefits costs, capital costs, maintenance costs and other key costs of the hospital would be of great use to planners and policy-makers of the sector.

5 Other Studies

There were other notable studies conducted during 1995-1999 period to deal with various specific aspects of primary health care services in Bangladesh. To name a few, the studies conducted by B. Janowitz et.al. (1996), B Rahman et.al. (1996), A Barkat et.al. (1996), K Streatfield et.al. (1997), A Barkat et.al. (1999), Rannan-Eliya and Somanathan (1999) and T Ensor (1999)

One of the very early on studies that is still valid was the one conducted by Balk et.al. in 1988, titled, '***Analysis of Cost and Cost-effectiveness of the Family Planning – Health Services Project in Matlab, Bangladesh***". The basic methodology adopted by Balk et.al. to identify the key costs of service delivery and to estimate the full cost is quite interesting. Balk et.al. have illustrated the costing scheme as a framework of ***concentric rings*** divided into two rings – ***core service ring*** and ***outer ring***. All components have been divided into five groups

based on components proximity to service delivery. Based on a detailed analysis, Balk et.al. gave some suggestions which are still very much applicable

Streatfeild et.al. (1997) have conducted a focused study, ' Increasing Financial Sustainability of Family Planning Services in Bangladesh.' The study was conducted in the backdrop of the question, '*how can pricing of contraceptive supplies be used to encourage couples to go out of their homes to seek family planning services?*' The study observed that the current reliance on a home visit programme was an expensive way to deliver oral pills and condoms. The main thrust was that if the family planning programme was to gain sustainability in the future, in addition to increased funding, there must be progress in cost recovery and improvement in cost containment. The overall conclusion of the study was that the Government without negative consequences could impose some form of differential pricing for the Family Planning Programme. Therefore, appropriate pricing policies can be used by both the GoB and the NGOs to encourage clients to be more active in seeking family planning services, contributing to the sustainability of the programme in the long run.