

Estimating costs of providing the ESP in Bangladesh

**Ministry of Health and Family Welfare
Government of the People's Republic of Bangladesh**

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The views expressed in this document are those of the contributors and do not necessarily represent the decisions or the stated policy of the World Health Organization

Acronyms

AHI	Assistant Health Inspector
ALOS	Average Length of Stay
ANC	Antenatal Care
BDHS	Bangladesh Demographic and Health Survey
BDT	Bangladesh Taka
BEmONC	Basic Emergency Obstetric and Neonatal Care
CC	Community Clinic
CDR	Case Detection Rate
CEmONC	Comprehensive Obstetric and Neonatal Care
CHCP	Community Health Care Provider
COPD	Chronic Obstructive Pulmonary Disease
CRHCC	Comprehensive Reproductive Health Care Centre
CSO	Civil Surgeon Office
DGFP	Directorate-General Family Planning
DGHS	Directorate-General Health Services
DH	District Hospital
DHIS-2	District Health Information System, version 2
DM	Diabetes Mellitus
DOT	Directly-Observed Treatment
DRS	District Reserve Store
DSF	Demand-Side Financing
EDL	Essential Drugs List
ENC	Essential Neonatal Care
EPI	Expanded Programme of Immunization
ESP/BESP	Essential (Health) Service Package/ Bangladesh ESP
FP	Family Planning
FPI	Family Planning Inspector
FWA	Family Welfare Assistant
FWV	Family Welfare Visitor
G&O	Gynecology and Obstetrics
GM	Growth Monitoring
GoB	Government of Bangladesh
HA	Health Assistant
HEU	Health Economics Unit
HI	Health Inspector
HNP	Health, Nutrition and Population
HTN	Hypertension
IAEDK	Inter-Agency Emergency Drugs Kit
IMCI	Integrated Management of Childhood Illnesses
IPV	Injectable Polio Vaccine
IUD	Intra-Uterine Device
LBW	Low Birth Weight
MCH	Maternal and Child Health
MCV	Meningococcal Vaccine
MCWC	Maternal and Child Welfare Centre
MIS	Management Information System
MLA	Ministry of Local Administration, Rural Development & Cooperatives
MNCAH	Maternal, Neonatal, Child and Adolescent Health
MO	Medical Officer

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MOHFW	Ministry of Health and Family Welfare
MR	Menstrual Regulation
NB	New Born
NCD	Non-Communicable Diseases
NGO	Non-Governmental Organization
NHA	National Health Accounts
NSV	No Scalpel Vasectomy
NVD	Normal Vaginal Delivery
OHT	One Health Tool
OPD	Outpatient Department
OPV	Oral Polio Vaccine
OR	Outreach
OT	Operating theater
PEN	Package of Essential NCD Interventions for PHC in low-resource settings
PHC	Primary Health Care
PHCC	Primary Health Care Centre
PNC	Post Natal Care
RD	Rural Dispensary
SACMO	Sub Assistant Community Medical Officer
SAM	Severe Acute Malnutrition
SBA/CSBA	Skilled Birth Attendant / Community SBA
SC	Satellite Clinic
SIP	Sector Investment Plan
STI	Sexually Transmitted Infections
TB	Tuberculosis
TT	Tetanus Toxoid
UHC	Upazila Health Complex
UHFWC	Union Health and Family Welfare Centre
UHS	Upazila Health System
UPHCSDP	Urban PHC Service Delivery Program
USC	Union Sub Centre
WHO	World Health Organization
WISN	Workload Indicators for Staff Needs

1. Introduction and Objectives

For the last year, the Ministry of Health and Family Welfare (MOHFW) of Bangladesh and its partners have been involved in the updating and further development of the Essential (Health) Services Package (ESP) with the aim of integrating it as one of the cornerstones of the forthcoming Strategic Investment Plan (SIP) for the Health Sector, which will establish priorities and allocation strategies for the next five years.

The ESP has been updated and presently is being discussed in the appropriate fora. The final version, however, can only be endorsed after the costs of its provision have been estimated and composition has been adjusted to what is affordable. Costing the ESP will also be used to allocate funds to the different Operational Units in charge of managing ESP services, as well as a resource mobilization tool to advocate for increased health expenditure.

With the support of WHO, the MOHFW has planned two ESP costing exercises. The first one, contained in this document, is a quick, approximate costing intended for estimating the resources necessary for the delivery of the whole package by the appropriate level of care. The second, much more detailed, will be conducted using the One Health Tool (OHT), and will establish the costs of every single service contained in the ESP. The aim of the first exercise is to assess general feasibility and affordability while the second may be used to decide on the final ESP composition, if specific, limited-priority services are deemed unaffordable for the system.

The costing here presented is part of a more general operational and financial feasibility analysis, where the existing public system of Primary Health Care (PHC) service delivery is briefly analyzed and its ability to deliver the ESP is assessed. The objective of this exercise is to estimate the expenditure incurred in the provision of PHC services in publicly-funded local health systems, both in rural and urban areas. A second objective is to project the costs of that same system –reformed if needed—to provide the whole range of services contained in the ESP. Rather than a single figure per capita or per contact, future costs will be modelled according to different scenarios of coverage and utilization, staff productivity and financial protection (e.g., whether complete courses of NCD medicines will be supplied and dispensed to all patients free of charge). A specific request from the Planning Wing-MOHFW is to estimate the average costs of providing the ESP by type of facility.

After this short introduction, the methodology for the exercise and its limitations are described. The document is then structured in three parts. The first part estimates the current expenditure of the local public health systems at the Upazila, as well as the referral District Hospital. The network of facilities will be described, as well as the human resources providing the services, whose performance will be established. Identified expenditure will be described according to operational units, facility level and economic classification. The second part follows the same process for an NGO system working under and funded by the Ministry of Local Administration in an urban area of Dhaka City.

The third part focuses on future costs to provide the whole ESP in those same rural and urban settings. The ESP components are listed, and consumption and coverage are projected, as well as staff workload and productivity. Necessary changes in the network are discussed. Projections of drug consumption are examined and total costs calculated and modelled.

Guidance was obtained from the MOHFW Planning Wing's Joint Chief Dr Muhiuddin Osmani as well as from WHO Country Office –Dr Olivia Nievera and Dr Valeria de Oliveira—. Relevant information was provided by different MOHFW Departments, including the Health Economics Unit, the Finance Department and others. Above all, the author is grateful to the dozens of district and sub-district managers and frontline staff who were patient enough to respond to his many questions and dug for the requested information. An earlier version of this document was improved thanks to comments provided by Olivia Nieveras, Tomas Zapata and Mohammad Touhidul Islam.

2. Methodology

2.1 General approach

The purpose of the exercise is to estimate the costs of a PHC system able to provide the whole range of services included in the ESP, rather than estimating the costs of individual services. To that end, an analysis will be performed of the two main models of service provision in rural and urban areas, followed by the projection of future costs against different scenarios.

The first part of the exercise consists in the estimation of the expenditure incurred in the management of the PHC system during the last fiscal year for which complete information exists, in this case 2014-2015, and its comparison with the system's output at that level.

Three Upazila Health Complexes and their peripheral facilities –union-level health centres and community clinics—, as well as one District Hospital are analyzed. For each local health system, the network of facilities and the services it provides are described. Actual and average teams by staff category and level of facility are also described, and compared to the reported activity by type of service. Recorded and/or estimated expenditure by type of service, level of facility and economic classification –limited to actual expenditure incurred during Fiscal Year 2014/2015, and therefore excluding depreciation costs, for example—is presented and discussed. The analysis is completed with an assessment of the current utilization of the system and its capacity to provide the complete ESP, presented in another document. For the District Hospital, only expenditure is analyzed.

For the second part, the same process is repeated in two so-called urban Partnership Areas in the North Dhaka City Corporation, where services are provided by NGOs with funding and under the supervision of the Ministry of Local Administration, Rural Development and Co-operatives (MLA). Each network is composed of Comprehensive and Reproductive Health Care Centres (CRHCC) as the main facility, and Primary Health Care Centres (PHCC) covering the territory.

The third part of the exercise attempts to project the current situation to a near future where the public networks described and assessed previously are modelled to being able to provide the whole range of ESP services to a substantial percentage of the population.

This part begins with the design of an “average” Upazila and urban Partnership Area in terms of size and population.

What follows is a summary projection of the amount of contacts that would be generated by specific services (e.g., Ante-Natal Care with full coverage of all expected pregnant women and an average of four ANC visits per woman, or the identification and management of a given percentage of expected Diabetic

patients). The numbers are adjusted to cover for services for which a proper estimate cannot be produced, such as general curative care. In addition to number of contacts, the average duration of each type of contact will be estimated.

The next step is to distribute the amount of work across facilities –by level— and outreach services, as well as by staff category. This allows projecting the necessary network of facilities and outreach sites, as well as the average teams to be deployed at each of them.

Staff productivity is calculated as the average time (number of minutes) of effective working time per year, and these figures will be compared to the time needed to provide the projected number of contacts.

The costs of running this network(s) will be calculated using quantities and prices of the two main inputs (salaries and drugs and supplies), and adjusting for other running costs. The point of view of this exercise is that of the provider; therefore, no direct (transport to the facility) or indirect (e.g. lost wages) costs to patients and users are calculated. Also, the exercise estimates only running expenditure.

Expenditure and costs are limited to UHS level. Not enough information was available to estimate overheads at higher level. Depreciation of building and equipment is roughly estimated but not included in the final cost calculations because of the intended use of the results for annual allocation purposes.

Costs are calculated in absolute terms for the model networks, as well as the average cost of running each type of facility. Total costs are then divided into the target population and the expected number of contacts, to estimate costs per capita and per unit of activity.

As a final step, estimated costs are recalculated modifying criteria such as number and length of the services provided, coverage, staff productivity or financial coverage.

2.2 Assumptions and estimates

For the calculation of future costs, the following decisions have been made:

Salaries are calculated according to the salary scale updated in 2015. Since the salary grade of most staff changes over time, an average has been chosen for the calculations, shown below. Community Health Care Providers (CHCP) are attributed a fixed salary of BDT 13,500 per month.

Category	Class	Avg Grade	Basic Salary (BS)	Housing (40% BS)	Festival (20% BS)	Medical (700 Tk)	Education (250 Tk)	Monthly Salary	Annual Salary
Medical Officer	1	7	29,000.00	11,600.00	5,800.00	700.00	250.00	47,350.00	568,200.00
Nurse	2	9	22,000.00	8,800.00	4,400.00	700.00	250.00	36,150.00	433,800.00
SACMO/MA	3	9	22,000.00	8,800.00	4,400.00	700.00	250.00	36,150.00	433,800.00
Medical Technologist	3	12	11,300.00	4,520.00	2,260.00	700.00	250.00	19,030.00	228,360.00
CHCP	NA	14	-	-	-	-	-	13,500.00	162,000.00
Health Inspector	3	13	10,200.00	4,080.00	2,040.00	700.00	250.00	17,270.00	207,240.00
Assistant Health Inspector	3	14	10,200.00	4,080.00	2,040.00	700.00	250.00	17,270.00	207,240.00
Health Assistant	3	15	9,700.00	3,880.00	1,940.00	700.00	250.00	16,470.00	197,640.00
Family Welfare Assistant	3	15	9,700.00	3,880.00	1,940.00	700.00	250.00	16,470.00	197,640.00
Family Welfare Visitor	3	9	22,000.00	8,800.00	4,400.00	700.00	250.00	36,150.00	433,800.00
Family Planning Inspector	3	14	10,200.00	4,080.00	2,040.00	700.00	250.00	17,270.00	207,240.00
Support	4	19	8,500.00	3,400.00	1,700.00	700.00	250.00	14,550.00	174,600.00

Table 1. Average Annual Salaries per Category. Cost Projections

Salaries are complemented with the allowances listed by UHC managers as routine, and calculated as a percentage of the basic salary, with the exception of Medical and Education allowances, which are fixed amounts.

Although the medicines to be used in the provision of the ESP have been selected, there is no clear criteria to estimate the quantities needed. As an alternative, the Inter-agency Emergency Health Kit (2011 update), developed by a number of UN Agencies working on health, has been chosen and adapted for this purpose (attached at the end of the document). The kit is composed of a basic unit –sufficient for the management of 1,000 cases— for the treatment of common conditions, and a complementary unit designed for the treatment of up to 10,000 cases with more sophisticated medicines. This model has been adapted to Bangladesh in the following way: the current Community Clinics Kits are the equivalent to the basic unit, which are complemented with other medicines at higher levels. The content of the emergency kit has been modified to adapt it to the Bangladesh Essential Medicines List. To calculate the amount (value) of medicines to project, the following assumptions were made:

Community Clinics will receive 1 basic kit per every 1,000 projected consultations.

Union-level facilities will receive 1 basic kit per every 1,000 consultations + the outpatient component of the complementary kit per every 10,000 consultations.

UHC will receive 1 basic kit per every 1,000 consultations + a complete complementary kit per every 10,000 consultations.

Union facilities and UHC will be complemented with NCD medicines according to projections.

The prices used are those provided by the Essential Drugs Company Limited, complemented with prices from private suppliers when necessary. Common drugs are complemented with NCD medicines, vaccines and Family Planning commodities, according to projected consumption and prices obtained from the MOHFW programs. These sources have been complemented with MSH's International Drug Price Indicator Guide.

Based on current expenditure identified during this exercise, other running costs –including from fuel to utilities, from stationary to fuel or travel, and from

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maintenance to small purchases of equipment—are calculated as 10% of the combined personnel + medicines expenditure.

2.2.1. Other estimates

Staff productivity is calculated using two components: average number of working days per year and average number of working minutes per working day.

According to the valid Labour Law, public sector workers should work no more than 48 hours per week and are entitled to 10 days of casual leave, 14 days of sick leave, 11 days of public (festival) holidays, and one day of annual leave per every 18 worked days. The result is adjusted to 260 working days per year.

Out of the 6.5 theoretical hours per day that most facilities should be open, it has been arbitrarily estimated that only 5 hours will be of effective work, or 300 minutes per working day or **78,000** potential working minutes per year.

Average time necessary for the proper provision of a service is usually calculated through a survey which measures a number of activities and extracts the average. These estimates are only available for some services in Bangladesh (Borghi et al 2010). Figures exist for other Asian and African countries, with large disparities among them (WHO 2010b, McQuide et al 2013, Seran et al 2009, Namaganda et al 2015). This is part of the WHO methodology Workload Indicators for Staff Needs (WISN) (WHO 2010a), gradually used by public health systems in the estimation of their workforce needs.

Table 2. Average time, in minutes, necessary for the provision of selected services.

Service	Bangladesh	Mozambique	Uganda	Namibia	Indonesia
Screening				25	
OPD consultation		10	10	25	
ANC 1st visit	34 ^a	10		30	20
ANC revisits	34	10		20	20
PNC	34	10		30	120 ^c
Growth Monitoring		10		10	
Immunization		5		10	
FP 1st visit		10		15	30
FP revisit		10		10	30
Dressing				10	
Delivery	240 ^b	120			480
Inpatient day - MO		10	15		
Inpatient day - Nurse		90	15		
Caesarean Section			60		
Major Operation			120		
Minor Operation			30		

a: Home ANC 56 min; b: home delivery: 420 min; c: PNC + Neonatal Care

2.3 Sources of information

A variety of sources of information has been used for this exercise, including:

Network and Human Resources for the visited Upazilas have been obtained from the UHC managers as well as from the DGHS-published Local Health Bulletins 2016 (<http://www.app.dghs.gov.bd/localhealthBulletin2016/>) . For urban areas, this information was provided by the NGO project managers. Local managers also made available this information, related to the Family Planning Services.

DGHS-related services' activity for 2015 was obtained from the Local Health Bulletins, as well as from the online version of the DHIS-2. Upazila-aggregated

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information for FP services was obtained from the DGFP Management Information System (MIS) (http://dgfpmis.org/ss/ss_menu.php). For urban areas, the Quarterly Performance Reports (QPR) uploaded at the Urban Primary Health Care Service Delivery Project (UPHCSDP) website (<http://uphcp.gov.bd/QPR.html>) were the source of data.

Expenditure data for Fiscal Year 2014-2015 was obtained at the visited UHC and District Hospital. For DGHS services, expenditure information was reasonably complete. Partial information on DGFP services was obtained locally. Aggregated, partial expenditure of non-development budget was obtained from the Budget Directorate at the MOHFW. Aggregated expenditure by development budget project was provided by the Planning Wing, MOHFW. The Health Economics Unit (HEU), MOHFW facilitated access to detailed expenditure –both development and non-development budgets—for 2011/2012. Expenditure in NGO-served urban areas was provided by the NGO project managers; this information was related to the year 2015, rather than to the fiscal year 2014/2015.

The Community Clinics Project provided information on costs of drugs, salaries and others.

Drug supply in terms of expenditure was obtained from the visited facilities – DH, UHC and union health centres—as well as from the District Reserve Stores (DRS) for DGHS-related facilities. For urban services, drug expenditure was part of the routine budget and expenditure.

Other health system and costing information was obtained from WHO, MOHFW units and partners, in the form of reports and costing estimates.

2.4 Field work

The Planning Wing-MOHFW selected Comilla District, in Chittagong Division, as the site where rural health systems should be analyzed. In addition to the Civil Surgeon Office, DRS, District FP Supervisor Office and District Hospital, three Upazilas were visited –Muradnagar, Chauddagram and Daudkandi--. In every selected Upazila, the UHC as well as at least one union health centre and one CC were visited. Visits included FP services.

For the analysis of urban areas, the NGO-provided services under the Ministry of Local Administration's UPHCSDP were chosen. Two Partnership Areas in North Dhaka City Corporation were selected and visited. In each of the areas, the CRHCC and at least one PHCC and one satellite clinic were visited.

Overall, a District Hospital, 3 UHC, 1 Rural Health Centre, 3 USC/UHFWC, 3 CC, 2 CRHCC, 2 PHCC and 2 Satellite clinics were visited in two weeks of June 2016. The main purpose of the visits was to verify the functioning of the local health systems, seek information on how planning and expenditure is done, and obtain information about issues not always reported in accessible places, such as expenditure and drug supply.

2.5 Limitations

Obviously, the number of local health systems used for data collection and analysis do not reflect properly the variety of contexts of Bangladesh. Due to time constraints, field work and data collection was restricted to three UHC in one district and two Partnership Areas in Dhaka City. Thus, the figures obtained during this exercise cannot be taken as definitive, but as merely orientative. They should be piloted in the coming months to

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test their robustness and to what extent are applicable to the different characteristics of the country's divisions.

Another difficulty faced to project service needs is the apparent absence of target groups estimates as a percentage of the total population. In the end, WHO (EPI Fact Sheet) provided an estimate for the main groups –pregnant women 2.3% of total population, under 1 year olds 2.2%, under 5 y.o. 10.5% and women of reproductive age 27%-- which will be used as the basis for calculations in the third part of the document.

DGHS and DGFP offer complementary services with some overlapping, for example in ANC/PNC. However, they use different information systems, which results in difficulties to obtain information that is comparable in detail for the same institutions.

Drug expenditure is not recorded in the facility where it is incurred, not even at UHC level (with the exception of IUD and implants, whose costs are attributed to Upazila FP Offices). Information on the value of the medicines distributed was obtained from the DRS for the three UHC and the DH, as well as the ceilings for distribution to USC/UHFWC (DGHS only). Cost of medicines for CC was obtained centrally at the Programme Management Unit, where the standard are 6 kits per CC per year, at a cost per kit of BDT 14,210.75. Expenditure on vaccines was calculated multiplying the number of doses applied by the unit cost per type of vaccine provided by the MOHFW. This figure was increased by the wastage rates 2013 obtained from WHO EPI Factsheet (87.4% for BCG, 1.4% for Penta, 36.3% for OPV, 64% for MCV and 37% for TT, and an estimate 20% for the remaining (Measles/Rubella and IPV)).

Information about supply of FP commodities and regular drugs to DGFP facilities (at union level) was not available. Drugs for common diseases were reportedly supplied irregularly, and are estimated at 20% of those supplied to DGHS union facilities. For FP commodities, the same process was followed than for vaccines.

Differently from rural areas, the NGO-managed local health system analyzed in this exercise are not the only public providers of PHC services. Large public hospitals reportedly provide PHC services to the same population. This information was not available, and the exercise is limited to the services provided under the aegis of the Ministry of Local Administration.

3. Part I. Current costs incurred in the provision of PHC services in Rural Areas

This chapter is devoted to the presentation and analysis of the data obtained from three upazila local health systems, as well as the District Hospital which acts as their referral facility for complicated cases.

In Bangladesh, districts are large institutions, averaging above 2 million people. The health system is managed by a Civil Surgeon and a Family Planning Supervisor. Civil Surgeon Offices (CSO) are in charge of supporting and monitoring the work of the Upazila Health Systems (UHS), the actual core of the public health system. The CSO assists the UHS in terms of drug supply, health information, cold chain, and others.

The District Hospital is a referral facility for secondary care, staffed by specialists and nurses. It provides specialized care of variable range, including Internal Medicine, Paediatrics, G&O and Surgery. The size usually varies between 100 and 250 beds. Larger Medical College hospitals, directly accountable to the DGHS, provide tertiary

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care and are the referral facilities for DH. At the same level of DH, districts have Maternal and Child Welfare Centres (MCWC), providing FP and other MCH services. MCWC are managed separately from the DH.

3.1 The public health system at the Upazila level

The Bangladesh public health system is characterized by the split between regular health services and those linked to Family Planning activities. At central level, two General Directorates –DGHS and DGFP—are in charge of managing each of the wings. The split follows all the way to the actual services provided in rural areas.

At the Upazila level, the Upazila Health Office (UHO) and the Upazila Family Planning Office (UFPO) are the local health management institutions, responsible for the organization of the health activities which happen in the area, particularly those outside health facilities.

The Upazila system of health service provision has the Upazila Health Complex (UHC) at the top, usually sharing premises with the UHO. This facility is staffed by physicians –including some specialists—, nurses and medical technologists (e.g. pharmacy, radiology, laboratory). The UHC provides broad Outpatient Care (OPD) including ANC/PNC, IMCI, EPI and curative care –which should include an “NCD corner” for the diagnosis and management of those conditions. The UHC also runs a round-the-clock Emergency Room and Delivery Room. UHC should perform major surgical operations, including Caesarean Sections (CS) and other obstetric operations, but not all do so at present¹. UHC provide inpatient care, as well as expanded diagnostic capacity with basic laboratory and simple radiology. At this level, FP services are provided at the MCH-FP Unit, which may be integrated into the UHC premises or, less commonly, self-standing.

Every union in the Upazila has a facility staffed by Medical Officers (MO), Medical Assistants (SACMO/MA), Pharmacists and Family Welfare Visitors (FWV). Depending on which wing manages the facility, they are known as Union Sub-Centres (USC, under DGHS) or Union Health and Family Welfare Centres (UHFWC) and Union Clinics, under DGFP. It should be noted that all USC should have a FWV (DGFP cadre) and all UHFWC should provide MCH and curative care, in addition to FP services. At present, the absence of a nurse/midwife and the inappropriate physical space prevents these facilities from attending deliveries, although it is planned that each USC/UHFWC will receive a newly trained midwife in charge of a round-the-clock maternity. For the moment, these facilities focus on OPD care in one shift. Despite the fact that union facilities are staffed by physicians and SACMO, they cannot currently be considered referral facilities for lower levels of care (CC for example) because of the lack of diagnostic tools and shortages of medicines.

¹ The DGHS DHIS-2 records that in 2015 302 UHC did not report any CS and 138 reported 10 or more.

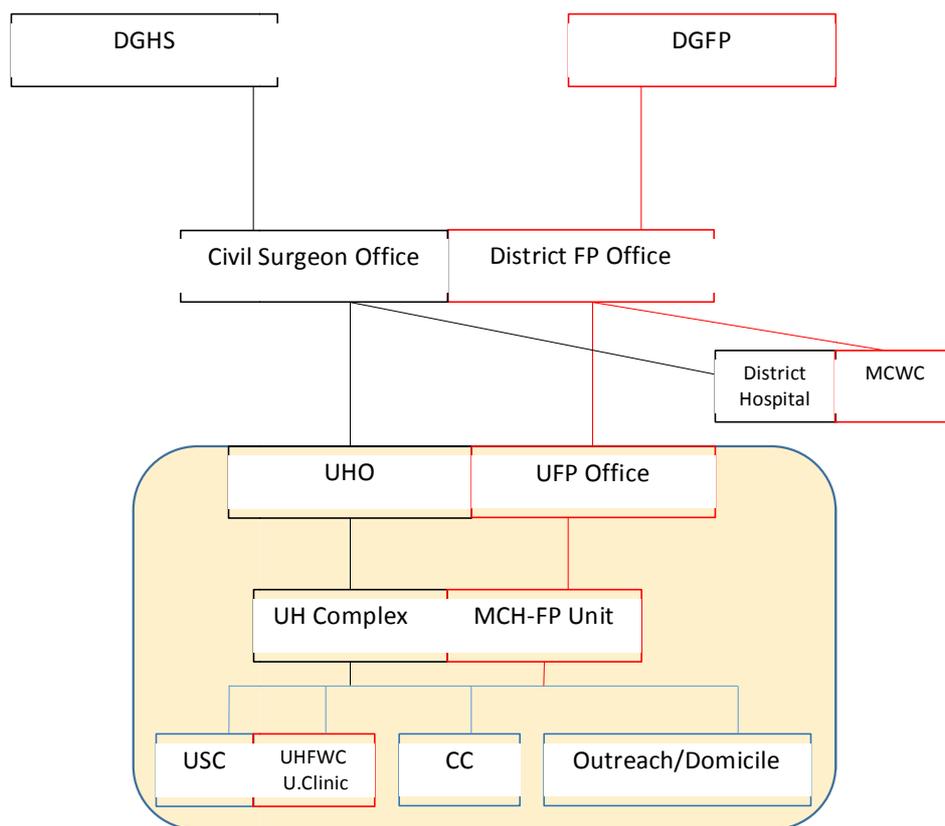


Figure 1. Upazila Health System and accountability lines

Below the level of union, health services are provided either by Community Clinics (CC) or community health workers. CCs are formally under the DGHS but provide the whole range of PHC services –ANC, PNC, IMCI, EPI (periodically), FP and curative care—. CCs are staffed by a Community Health Care Provider (CHCP), assisted on a part-time basis by a Family Welfare Assistant (FWA, under DGFP) and a Health Assistant (HA, under DGHS).

FWA and HA, supervised and supported respectively by Family Planning Inspectors (FPI) and Health Inspectors –and Assistant Health Inspectors—(HI/AHI), also provide services either domiciliary or at certain locations –satellite clinics and EPI sites—where the most common services are delivered periodically. Most FP and EPI services are provided in these locations.

3.1.1 Network of facilities

Each of the Upazilas visited for this exercise has an UHC with either 31 or 50 beds. They also have one or more Rural Health Centres –in practice, facilities of size and range of services between an USC and an UHC—. The availability of beds is very low, of 1.16 per 10,000 inhabitants (which doubles if private facilities –at the Upazila Town—are considered).

There is a union facility (2/3 of them UHFWC belonging to the DGFP) in every union. On average, RHC and USC/UHFWC have catchment populations nearing 30,000 people. Although each CC is expected to cover around 6,000 people, on average there is one such facility for every 14,000 in the surveyed area.

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Table 3. Network of Facilities in the three Upazilas

Upazila	Chauddagram	Daudkandi	Muradnagar	Total/Average
DH/UHC	1	1	1	3
Pop/Hospital				0
Beds	50	31	50	131
Rural/Urban HC	1	2	1	4
Beds		40		40
Bed/10,000 pop	1.02	1.98	0.79	1.16
USC/UHFWC	16	16	16	48
Pop/PHC facility	28,759	19,961	37,012	28,412
CC	42	23	42	107
Population/CC	11,640	15,622	14,981	13,807
Pop 2015	488,898	359,302	629,200	1,477,400

Source: Local Health Bulletin 2016 and calculations

If all basic facilities –USC, UHFWC and CC—are considered together, there is a health facility for every 10,000 potential users. Overall, Bangladesh has a public network composed of 1,362 USC (DGHS), 3,719 UHFWC (DGFP) and 13,500 CC.

3.1.2 Human resources

Health workers of the various categories are deployed following population criteria or the composition of standard teams by type of facility. Thus, for example, a USC/UHFWC team is composed of MO, SACMO, FWV and Pharmacist (plus support personnel). So far, workload is not one of the criteria for HRH management.

Table 4. Average team composition by type of facility. DGHS services

Facility	UHC 50 bed		UHC 31 bed		USC/UHFWC	
	Sanctioned	Filled Up	Sanctioned	Filled Up	Sanctioned	Filled Up
Physician	21.00	18.00	10.50	9.75	1.00	0.94
Nurse	16.33	14.00	10.50	8.75		
SACMO	2.00	1.33	1.50	1.50	1.11	1.00
M.Technologist	9.00	6.00	6.00	4.25	0.13	0.08

Source: Local health Bulletins 2016 and calculations

Physicians are present at UHC and USC/UHFWC. However, MOs formally posted at union facilities are frequently providing services in the nearby UHC. SACMO/MA and FWV often are the sole service providers at that level. Physicians and SACMO are in charge of most clinical activity at UHC and union facilities. Nurses are present exclusively in hospital settings –in this case the UHC—and focus on inpatient care and maternity services. In the current absence of midwives, normal deliveries are attended by this cadre, under the supervision of MOs and G&O. Nurses also may play roles as theater assistants. With the exception of pharmacists, who should also be deployed at union facilities, all Medical Technologists are positioned at UHC.

FWV are the DGFP cadres to be deployed at union facilities. Their job is to provide FP services and, in collaboration with MO and SACMO, participate in MNCAH services. One such cadre should be present at all union-level facilities, as well as at the UHC-MCH Unit.

CHCP are the main cadre staffing CCs. With a theoretical-practical training lasting 3 months, these cadres are in charge of providing limited curative care, including IMCI,

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common conditions, and screening for Non-Communicable Diseases (NCD). They should also be able to perform most procedures associated with basic MNCAH. CHCP are assisted by HA and FWA. Every CC should have one of each. Their schedule would be three days per week service at the CC and three more serving satellite clinics/EPI sites and providing domiciliary services. Their job profile is quite similar, focusing on ANC, PNC, EPI and BCC. Some may be trained as Community Skilled Birth Attendants (CSBA), entitling them to attend deliveries either at home or at the CC they serve.

Outreach services are provided by Community Health Workers. In addition to HA and FWA, each line of cadre has its own inspectors (AHI/HA for the HA and FPI for FWA), who can be based at union-level facilities, at UHC or at home.

According to the HRH Country Profile (MOHFW 2013), the standards that should guide deployment of community cadres are as follows: on the DGHS side, there should be one HA for every 4,000 people in rural areas, one AHI for every 5 HA and one HI for every 3 AHI. For a population of 100,000 people, this ratio should result in 25 HA, 5 AHI and 1-2 HI. FP services should be served by one FWA per 5,000-6,000 people, and one FPI for every 20,000 people. Using the same reference population, these cadres should number 15-20 FWA and 5 FPI. Overall, there should be a community worker per 2,000 people, or around 5 for every 10,000 people.

Table 5. Availability of staff by category in the visited Upazilas

Cadre/Upazila	Chauddagram	Daudkandi	Muradnagar	Total/Average
Physician/MO	31	36	35	102
Nurse	13	18	15	46
SACMO/MA	16	14	12	42
Medical Technologist	6	13	9	28
CHCP	41	32	40	113
Health Inspector	6	4	6	16
Assistant Health Inspector	17	11	17	45
Health Assistant	41	30	58	129
Other	-	34	31	65
Family Welfare Visitor	15	14	23	52
Family Planning Inspector	17	8	18	43
Family Welfare Assistant	56	36	95	187
Admin staff	2	1	1	4
Other	6	5	6	17
Total	267	256	366	889
<i>Physic/10,000</i>	<i>0.63</i>	<i>1.00</i>	<i>0.56</i>	<i>0.69</i>
<i>Nurse, SACMO&FWV/10,000</i>	<i>0.90</i>	<i>1.28</i>	<i>0.79</i>	<i>0.95</i>
<i>Facility based/10,000</i>	<i>1.53</i>	<i>2.28</i>	<i>1.35</i>	<i>1.64</i>
<i>HI, AHI & HA/10,000</i>	<i>1.31</i>	<i>1.25</i>	<i>1.29</i>	<i>1.29</i>
<i>FPI & FWA/10,000</i>	<i>0.15</i>	<i>0.12</i>	<i>0.18</i>	<i>0.16</i>
<i>CHCP/10,000</i>	<i>0.84</i>	<i>0.89</i>	<i>0.64</i>	<i>0.76</i>
<i>Comm. Workers*/10,000</i>	<i>2.30</i>	<i>2.27</i>	<i>2.10</i>	<i>2.21</i>
<i>Total skilled/10,000</i>	<i>3.83</i>	<i>4.55</i>	<i>3.45</i>	<i>3.84</i>

Community workers: CHCP, HI, AHI, HA, FPI, FWA

The three Upazilas targeted for this exercise show substantial differences in HRH availability (Table 5). Daudkandi seems better served than the other Upazilas in terms of facility-based staff (MO, SACMO, Nurses, FWV) and worse for community workers. On average, there are 1.64 such cadres per 10,000 people (above 2 in

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Daudkandi). The main reason for that may be the staffing of the two Rural Health Centres in that Upazila. There are just above two community workers for every 10,000 people, less than half the rate calculated before according to standards.

Comilla District Hospital has a team composed of 27 physicians, 70 nurses and 7 medical technologists.

3.1.3 Upazila Health System's output in 2015

As mentioned in the Methodology section, one of the limitations faced to conduct a proper analysis is the fragmentation of data. DGHS and DGFP –related services report through different information systems. It is unclear whether some of the data are merged and which sets of data are managed separately.

Tables 6 to 9 show the activity reported for the natural year 2015 by the three selected Upazila health systems. DGHS-managed services reported the highest number of activity realized, yielding on average 0.82 contacts per inhabitant per year. Out of the total OPD consultations, almost 60% were reported by CCs, 27% by UHC and the remaining (less than 15%) at union-level facilities. In addition to number and proximity, a good reason for that may be that CCs have a steadier drug supply than DGFP facilities, for example. If UHC/USC/UHFWC consultations are attended by MO and SACMO, and CC consultations by CHCP, on average the former would have attended just above 3,600 consultations/cadre while the workload of the CHCP would have almost doubled, exceeding 6,100 consultations per year. However, activity performed by HA/AHI/HI outside facilities is recorded at UHC level, likely making estimates of workload of MO/SACMO higher than the actual ones.

Table 6. Activity reported by DGHS facilities in 2015

Upazila/District	Chauddagram	Daudkandi	Muradnagar	Total/Average
At least 1 ANC	11,594	5,423	19,092	36,109
ANCs (4+)	4,051	3,488	5,938	13,477
Coverage ANC (4+)	36%	42%	41%	40%
Normal Delivery	1,486	1,485	1,012	3,983
Cesarean Section	50	294	-	344
Other Assisted Delivery	19	422	26	467
PNC Within 2 days	306	1,744	1,038	3,088
Maternal Death	-	-	-	-
Total Deliveries	1,555	2,201	1,038	4,794
Coverage inst. Deliveries	13%	18%	7%	12%
CS as % of inst. Deliveries	3%	13%	0%	7%
OPD visits < 5	120,170	57,213	55,237	232,620
OPD visits > 5	343,317	261,603	333,673	938,593
Emergency visits	6,222	18,632	11,389	36,243
Total visits	469,709	337,448	400,299	1,207,456
Cons/inhabitant	0.96	0.94	0.64	0.82
Hospital admissions	9,107	6,639	7014	22,760
Inpatient days	13,582	6,752	15,908	36,242
Admissions/100 pop	1.86	1.85	1.11	1.54

Source: Health Bulletins 2016 and DHIS-2

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Using the target group estimates mentioned in the Methodology section, coverage of ANC 4+ would be very similar across the Upazilas and around 40%, while reported institutional deliveries go from 7% of the expected ones in Muradnagar to 18% in Daudkandi. It is worth mentioning that the latter is a pilot Upazila for Demand-Side Financing (DSF), incentivizing both users and providers for the utilization of maternal care services. This is a probable reason for the comparatively high coverage and also for the higher number of CS recorded in this Upazila.

According to the Bangladesh Demographic and Health Survey (BDHS) 2014, ANC coverage countrywide is 64% for at least one consultation and 31% for four consultations, while institutional delivery rate is 37%, which drops to 13% if only public facilities are considered.

DGFP-managed services do not discriminate where services were provided. Overall, MNCH activity reported is just a fraction of the total activity of these services.

Table 7. Activity reported by DGFP services in 2015

Activity	Upazila	Chouddagram	Daudkandi	Muradnagar	Total/Average
Ante-Natal care(ANC)	Ist Visit	4,140	4,952	6,564	15,656
	2nd Visit	2,694	3,949	4,725	11,368
	3rd+	1,766	3,872	3,906	9,544
Delivery	Normal	393	1,444	786	2,623
	C-Section	-	42	5	47
	Others	-	-	-	-
PNC	PNC	3,500	5,616	5,668	14,784
FP	New Couple	1,188	760	1,443	3,391
General Patient	Male	15,955	17,180	15,255	48,390
	Female	70,112	65,175	78,655	213,942
	Total	86,067	82,355	93,910	262,332
Other Services	Under 1Year	6,517	8,245	13,829	28,591
	1-5year	16,394	16,177	25,972	58,543

The bulk of the workload of DGFP services is composed of the distribution and application of FP commodities and methods. Overall, pills and injectable methods are those preferred by covered couples.

Table 8. FP activity reported in 2015. Selected Upazilas

Method/Upazila	Chouddagram	Daudkandi	Muradnagar	Total
Pills	259,114	171,735	360,039	790,888
Condom	278,434	364,499	960,019	1,602,952
Inj_Vial	55,506	33,044	60,333	148,883
Inj_Syringe	60,150	35,060	63,707	158,917
IUD_Normal	688	935	997	2,620
IUD_Post Partum	44	99	-	143
Implanon	233	345	1,323	1,901
Implant_Remove	94	281	19	394
Emergency Contrac. Pill	39	88	94	221
Misoprostol	3,705	2,894	8,179	14,778
No Scalpel Vasectomy	44	138	41	223
Tubectomy_Normal	123	253	163	539
Tubectomy_Post Partum	169	94	110	373

Within the Upazila Health System, UHC is the only facility providing daily immunization services, while at the same time hosts the EPI cold chain and store. The vast majority of EPI activities are implemented at ward vaccination sites. In each ward, 8 vaccination sites are identified, including health facilities. Every week, two of the sites provide immunizations, so every site is visited once per month on fixed days. Depending on the number of unions, Upazilas may have hundreds of vaccination sites. Immunizations are primarily a DGHS responsibility and are provided by HA, often with the support of FWA.

According to the BDHS 2014, coverage of the main vaccines (BCG, Penta-3, OPV-3) exceeded 90% among children 12-23 months of age, while coverage of Measles vaccine was just below 80%. These figures coincide with the EPI Coverage Evaluation Survey 2014, although the rates obtained tend to be slightly higher. As mentioned before, all coverage rates are obtained by survey rather than administrative calculations, resulting in highly accurate figures. On the other hand, however, survey-obtained data tend to be general, not allowing for management decision-making at Upazila level.

Table 9. EPI services provided in 2015. Selected Upazilas

Vaccine/Upazila	Chauddagram	Daudkandi	Muradnagar	Total	Comilla District
epi (0-11) bcg	12,720	12,619	18,631	43,970	178,383
vit-a to women	5,050	8,195	10,708	23,953	65,256
mcv 2 given (12-23m)	13,131	11,120	16,810	41,061	147,075
epi women 15-49 give mr d	4,309	1,946	4,584	10,839	38,012
mr given (0-11m)	12,056	11,322	17,040	40,418	153,070
epi (0-11) opv 0	1	-	-	1	352
epi (0-11) opv 1	13,321	12,684	18,626	44,631	180,375
epi (0-11) opv 2	13,241	12,588	18,688	44,517	178,474
epi (0-11) opv 3	13,221	12,795	18,559	44,575	177,144
epi (0-11) opv 4	21,080	7,685	15,065	43,830	140,653
epi (0-11) penta 1	23,031	12,687	18,626	54,344	190,071
epi (0-11) penta 2	13,241	12,588	18,598	44,427	178,177
epi (0-11) penta 3	12,113	11,360	16,981	40,454	155,638
penta 3 given 0-11m	1,108	1,141	1,578	3,827	23,705
tt1	7,213	6,647	8,866	22,726	82,419
tt1 preg	1,172	1,584	4,279	7,035	34,385
tt2	7,632	7,126	9,214	23,972	85,829
tt 2 pregnant	1,099	1,864	4,587	7,550	35,080
tt3	7,799	8,510	11,624	27,933	94,666
tt3 preg	982	1,590	2,736	5,308	25,934
tt4	7,279	8,389	11,348	27,016	85,934
tt 4 preg	2,316	1,407	3,098	6,821	25,376
tt5	6,553	8,781	11,444	26,778	80,067
tt5 preg	2,083	2,523	4,147	8,753	31,543
total vaccines	179,261	155,890	233,735	568,886	2,137,891
Vit A	5,050	8,195	10,708	23,953	65,256

3.1.4 Expenditure

With the exception of the estimates for the Community Clinics, only expenditure related to non-development budget—that is, routine revenue expenditure—was obtained during the field work. Total expenditure in the three Upazilas amounted to BDT 335.5 million (around US\$ 4.3 million). More than half of the total amount was spent providing DGHS-related services and 37% on DGFP services. Nine percent was spent operating the 107 CCs.

Table 10. Estimated expenditure by institution managing the service. 2014/2015

Type of services	Chauddagram	Daudkandi	Muradnagar	Total	%
DGHS services	63,270,308	53,764,092	61,237,643	178,272,043	54%
DGFP services	38,581,359	34,187,425	50,977,046	123,745,830	37%
Community Clinics	10,887,309	7,663,484	10,709,109	29,259,902	9%
Total	112,738,976	95,615,001	122,923,798	331,277,775	100%

While CSO and Upazila-level managers denied any involvement on development budget expenditure, it has been possible to find some evidence of expenditure attributed to individual Upazilas in the 2011/2012 dataset. The amounts identified were below 5% of the current expenditure recorded in the general accounting system.

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Locally, managers referred to other sources of funding, such as DSF (Daudkandi) and imprest to incentivize utilization of permanent FP methods. No information was obtained about actual expenditure.

More than 2/3 of the funds spent at this level were used for Salaries and Allowances, and a quarter for Medicines and other medical supplies (including FP commodities and vaccines). At the District Hospital level, personnel expenditure was just below half of the total, and medicines and supplies more than one-third. Other goods and services – 16% of all expenditure at DH level—more than doubled the percentage spent at Upazila level. Recorded expenditure on Maintenance and Capital did not even amount to a percentage point of the total expense.

Table 11. Expenditure by Economic Classification. 2014/2015. Selected Upazilas and Comilla General (District) Hospital

Economic Classification	Chauddagram	Daudkandi	Muradnagar	Total	%	District Hospital	%
Personnel	77,244,655	67,168,300	84,114,624	228,527,579	69%	25,670,061	49%
Medicines & medical supplies	28,050,087	21,684,182	33,581,025	83,315,295	25%	17,850,000	34%
Other Goods and Services	7,404,033	6,467,573	4,979,234	18,850,840	6%	8,549,393	16%
Maintenance	40,200	94,946	49,300	184,446	0%	59,954	0%
Capital	-	200,000	199,615	399,615	0%	399,840	1%
Total	112,738,976	95,615,001	122,923,798	331,277,775	100%	52,529,248	100%

Expenditure on DGHS services –that is, UHC, USC and community services delivered by HA/HI— was obtained from the relevant UHC managers. That information excluded expenditure on medicines and medical supplies, which were obtained separately. Above 90% of the reported expenditure was on salaries and allowances.

Table 12. Expenditure with DGHS services. 2014/2015

Budget line/Upazila	Chauddagram	Daudkandi	Muradnagar	Total
PERSONNEL	40,579,247	33,873,396	39,020,837	113,473,480
GOODS & SERVICES	5,199,415	5,063,698	2,623,521	12,886,634
MAINTENANCE	39,000	79,946	48,100	167,046
CAPITAL		200,000	199,615	399,615
TOTAL	45,817,662	39,217,040	41,892,073	126,926,775

As for the less facility-based DGFP services, the share of personnel expenditure is even higher. In this case, the only supplies included are those related to IUD and implants. Part of the data was estimated applying a 20% --approximately the cumulative inflation rate—increase to the expenditure reported in the 2011/2012 dataset.

Table 13. Expenditure estimated for DGFP services. 2014/2015

Budget line/Upazila	Chauddagram	Daudkandi	Muradnagar	Total
PERSONNEL	30,023,408	28,110,904	38,613,787	96,748,099
GOODS & SERVICES	1,540,418	885,475	1,707,713	4,133,606
MAINTENANCE	1,200	15,000	1,200	17,400
CAPITAL	-	-	-	-
TOTAL	31,565,027	29,011,379	40,322,699	100,899,105

Community Clinics are funded through a Development Budget project. Detailed data on expenditure by Upazila is not available. An estimate was produced based on the average

(and fixed) salary and the projected number and cost of the Essential Drugs Kit supplied to these facilities.

Table 14. Expenditure estimated with Community Clinics. 2014/2015

Budget line/Upazila	Chauddagram	Daudkandi	Muradnagar	Total
Salaries CC (13,500 x 12 x no. CHCP)	6,642,000	5,184,000	6,480,000	18,306,000
Other CC expenditure (10% of salaries)	664,200	518,400	648,000	1,830,600
Drugs CC (6 kits x no. CC x 14,210.75 Tk)	3,581,109	1,961,084	3,581,109	9,123,302
Total Community Clinics	10,887,309	7,663,484	10,709,109	29,259,902

As mentioned, Drugs and Supplies are excluded from the routine accounting system. In fact, these information is not attributed to individual facilities or Upazilas. Data on the value of received supplies was obtained for the three UHC and the DH. The Comilla DRS reported the monetary ceilings for each DGHS-managed USC/UHF WC, which was used as a proxy. No data was available for DGFP-managed UHF WC; the arbitrary decision, based on anecdotal evidence, was made to estimate that those facilities would have received 20% of their DGHS peers.

Table 15. Expenditure with Medicines and Supplies, by type of facility. 2014/2015

Budget line/Upazila	Chauddagram	Daudkandi	Muradnagar	Total
Drugs UZHC	3,369,303	2,938,186	2,818,344	9,125,833
Drugs DGHS USC/UHF WC (no. x 210,000)	1,050,000	1,260,000	1,050,000	3,360,000
Drugs DGFP UHF WC (no. x 42,000)	462,000	420,000	462,000	1,344,000
Total drugs	4,881,303	4,618,186	4,330,344	13,829,833

Similarly, no data was available on expenditure with FP commodities. Unit prices were obtained from the MOHFW and were applied to the reported methods distributed across the system.

Table 16. Expenditure with FP commodities. 2014/2015

Method/Upazila	Price (Tk)	Chauddagram	Daudkandi	Muradnagar	Total
Low Dose Oral Pill	10	2,850,254	1,889,085	3,960,429	8,699,768
Injectable contraceptive (DMPA)	45	2,747,547	1,635,678	2,986,484	7,369,709
Condom	3	918,832	1,202,847	3,168,063	5,289,742
Misoprostol	8	32,604	25,467	71,975	130,046
Syringes	0.077	5,095	2,970	5,396	13,460
Total FP commodities		6,554,332	4,756,046	10,192,346	21,502,725

Finally, the expenditure with vaccines was estimated by multiplying the unit cost, obtained from the MOHFW, by the quantity of doses distributed/applied, adjusting upwards by the wastage rate of each vaccine.

Table 17. Expenditure estimated with Vaccines. 2014/2015

Vaccine/Upazila	Price (Tk)	Chauddagram	Daudkandi	Muradnagar	Total
BCG	12.64	301,208	298,816	441,180	1,041,204
TT	6.24	377,241	413,941	609,897	1,401,080
MR	47.27	928,249	752,582	1,226,548	2,907,379
OPV	14.82	1,229,432	924,175	1,432,923	3,586,530
Penta	183.30	9,199,076	7,021,282	10,368,174	26,588,532
Syringes BCG	9.05	215,680	213,967	315,906	745,553
Syringes 0.5 ml	6.01	782,457	724,103	1,082,598	2,589,158
total vaccines		13,033,343	10,348,866	15,477,226	38,859,435

When overall identified expenditure is compared with target population (the whole population in the selected Upazilas), the result is that on average, the public health system spent BDT 224 per capita (ranging from BDT 195 to BDT 266) to provide the

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described services. This figure translates into something around US\$ 3 per capita, or close to half the amount per capita identified as government expenditure in the last National Health Accounts (NHA).

By managing organization, DGHS spent BDT 121 (US\$ 1.6) per capita, while FP services were provided at a cost of BDT 84 (US\$ 1.1) per inhabitant. The whole network of Community Clinics cost BDT 20 (25 cents of US\$) per capita.

Table 18. Expenditure per capita (BDT) by Upazila according to managing institution

Type of services	Chauddagram	Daudkandi	Muradnagar	Average
DGHS services	129	150	97	121
DGFP services	79	95	81	84
Community Clinics	22	21	17	20
Total	231	266	195	224

According to the economic classification of the expenses, BDT 155 (US\$ 2) per capita were spent on personnel costs, BDT 56(US\$ 0.8) on medicines, FP commodities, vaccines and other supplies, and just BDT 13 (16 cents of US\$) on other running expenditure.

Table 19. Expenditure per capita (BDT) by Upazila according to budget line

Economic Classification	Chauddagram	Daudkandi	Muradnagar	Average
Personnel	158	187	134	155
Medicines & medical supplies	57	60	53	56
Other Goods and Services	15	18	8	13
Maintenance	0	0	0	0
Capital	-	1	0	0
Total	231	266	195	224

An aspect to take into consideration to assess the validity of these figures is that, as mentioned above, resources are allocated according to the size of the facility and the number of unions, but not the population. Consequently, comparable overall expenditure may be incurred in Upazilas of very different populations, which would yield very disparate expenditures per capita.

4. Part II. Current costs incurred in the provision of PHC services in Urban Areas

Two so-called Partnership Areas (PA) were visited –PA 2 and PA 4—, belonging to the Dhaka North City Corporation (DNCC), where services are provided by NGOs contracted by the Ministry of Local Administration through the Urban Primary Health Care Services Delivery Project (UPHCSDP) with funding from GoB, ADB, UK DfID, UNFPA and others. This is one of the two largest schemes providing PHC services to urban populations with focus on poor people, slum dwellers and floating populations, among others.

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4.1 The public health system in Urban Areas.

The UPHCSDP ensures the delivery of PHC services in 24 PA in the whole country, ten of which in Dhaka City, by contracting NGOs –in this case KMSS for DNCC PA 4 and Nari Maitree for DNCC PA 2—to provide a defined package of services. The structure of the service delivery system is common to all NGOs, and graphically shown in Fig 2.

Each PA becomes a project, managed by a Project Management Unit (PMU) appointed by the contracted NGO, and in charge of planning, organizing, supervising and reporting the services provided by the health facilities under the PMU. It also has the functions of staff recruitment, drug supply and financial management.

The PA network is composed of a Comprehensive Reproductive Health Care Centre (CRHCC), acting as referral unit and providing normal and assisted deliveries, Comprehensive Emergency Obstetric Care (CEmOC), management of neonatal complications, contraception including permanent methods, selected lab tests and with the capacity of inpatient care.

Depending on the catchment population, a number of Primary Health Care Centres (PHCC)² provide ambulatory services on maternal care (ANC, PNC), child care and immunization, FP including implants, Menstrual Regulation (MR), basic lab tests and limited curative care. Each PHCC runs two Satellite Clinics, where teams visit specific locations on weekly basis (6 locations per team), providing the same services with the exception of the lab tests.

Complex and severe patients, including cases of Severe Acute Malnutrition, are referred to tertiary care public hospitals in the area.

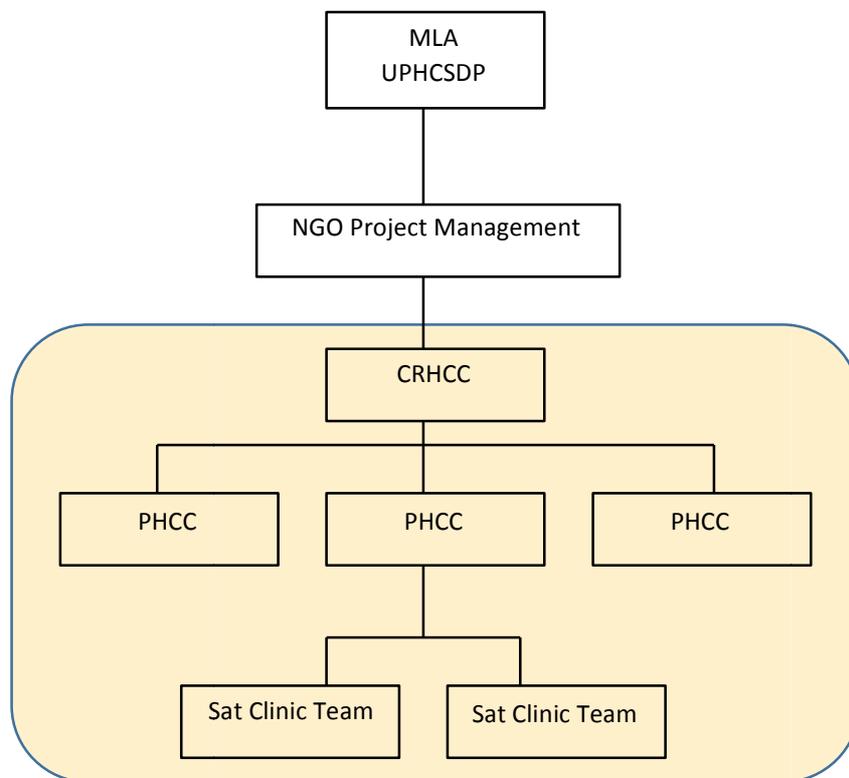


Figure 2. Structure of the UPHCSDP service delivery system

² As standard, each PHCC should serve between 30,000 and 50,000 people.

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Focus on poor populations is demonstrated by the identification of at least 30% of the served population as being poor. This identification was made through a survey using an ad hoc Proxy Means Test; reportedly, the survey is updated regularly. Identified poor beneficiaries are issued a “red card” which entitles them to free services. All other users are expected to pay, except for services such as EPI or FP. A five-year budget is approved at the inception of the contract; the NGO is expected to collect revenues through user fees amounting to at least 20% of the total annual budget. The balance is shouldered by the UPHCSDP, who also sets the price ceilings for services and supplies. However, expenditure exceeding budget is to be extracted from the managing NGO’s resources.

PMUs are in charge of drug procurement through quarterly biddings in the local market. Drugs are distributed and sold to non-red card users, reportedly as complete treatment courses; however, medicines for NCD and other chronic conditions are not available. Vaccines and FP commodities are received from the MOHFW at no cost.

4.1.1 Network of facilities

Central planning ensures a certain homogeneity in the availability of services because, while the only CRHCC has to cover the whole area, the number of PHCC is related to the target population. Table 20 shows relatively little variation between both areas.

Table 20. Network and availability of facilities in selected urban sites.

Facility	DNCC PA 2	DNCC PA 4	Total
CRHCC	1	1	2
PHCC	7	4	11
SatClin	14	8	22
<i>Population</i>	<i>309,000</i>	<i>211,856</i>	<i>520,856</i>
Pop per PHCC	44,143	52,964	47,351
Pop per SatClin	22,071	26,482	23,675

PMU, CRHCC and one PHCC usually coexist in the same premises. Most buildings belong to the MLA but some PHCC deliver services in rented premises.

4.1.2 Human Resources

Rather than average, the team composition of the different facilities can be described as fixed, since it is defined by the UPHCSDP management.

Table 21. Standard teams by type of health facility

Staff categ/Facility	CRHCC	PHCC	SatClin
MO (GP & Specialists)	6	1	
Nurses	4		
Paramedic (MA)	3	1	1
FWV	1	1	
Counselor	1	1	
Lab Technician	1	1	
Field Supervisor		1	
Service Promoter			1
FWA			1
Management, Admin & Support	16	4	
Total	32	10	3

CRHCC has two specialists (Paediatrician and G&O) and four MO. To cover the round-the-clock maternity services, including CEmOC, the NGO contracts additional gynecologists on a fee-for-service basis. Four nurses are in charge of ward and maternity, where deliveries are attended by or in the presence of a MO. Counselors provide advice on FP and guide the patients about the service they should attend. Paramedics (equivalent to SACMO or MA) staff the rooms for ANC/PNC and curative care. The FWV provides FP services, including the popular MR. The CRHCC has a clinic manager, in addition to the four-people team composing the PMU.

PHCC have no specialists or nurses. The remaining staff is quite similar than that of a CRHCC although in smaller numbers. Every PHCC has a field supervisor, in charge of organizing and supervising the Satellite Clinics. Every PHCC has two teams serving SatClin composed of a paramedic (curative care, EPI), a FWA (FP, maternal care) and a health promoter (health education).

Staff are recruited by the PMU and their salary level is set by the UPHCSDP at the same grade they would have in the public sector plus an increment of 5%. Meanwhile, the only allowances they reportedly receive are medical (BDT 700 per month) and Housing (40% of basic salary).

Table 22. Availability of HRH by category and PA

Staff categ/Area	DNCC PA 2	DNCC PA 4	Total
MO (GP & Specialists)	13	10	23
Nurses	4	4	8
Paramedic (MA)	24	15	39
FWV	8	5	13
Counselor	8	5	13
Lab Technician	8	5	13
Field Supervisor	7	4	11
Service Promoter	14	8	22
FWA	14	8	22
Management, Admin & Support	50	38	88
Total	150	102	252
Physicians per 10,000 population	0.42	0.47	0.44
Nurses, MA & FWV per 10,000 pop	1.17	1.13	1.15
Facility-based per 10,000 pop	1.59	1.60	1.59
Community-based per 10,000 pop	1.36	1.13	1.27

There is substantial similarity between the two areas in terms of availability of HRH when compared to population. The reason being that since the number of PHCC and SatClin depends largely on the population and the teams are fixed, staff numbers also depend on the population. However, large differences appear when existing workers are compared with the reported activity (see below). Assuming that curative contacts are attended by either MO or MA, the total number of contacts per cadre would be 4,900 in PA2 and 8,600 in PA4.

4.1.3 Services delivered in 2015

The Quarterly activity reports produced by the UPHCSDP are perhaps clearer but less detailed than those of the DHIS-2. Although most information is aggregated and does not allow determining at which level services have been provided, anecdotal evidence shows that CRHCC would be providing less than 20% of services common to all levels (e.g. ANC, FP, limited curative care). By programme, Child Health –including routine and campaign EPI and sick children—concentrates almost 1/3 of all activity. Two-thirds of the activity can be defined as preventive, or at least performed on non-sick users.

Table 23. Reported activity by PA. 2015

Service/Area	DNCC PA 2	DNCC PA 4	Total	%
Reproductive Health	135,789	110,923	246,712	22%
Child health Care	158,648	156,948	315,596	29%
Communicable Diseases	104,817	130,717	235,534	21%
Limited Curative Care	41,542	56,941	98,483	9%
BCC	121,053	89,634	210,687	19%
Total Contacts	561,849	545,163	1,107,012	100%
<i>Curative</i>	<i>181,325</i>	<i>216,200</i>	<i>397,525</i>	<i>36%</i>
<i>MNCAH, Preventive</i>	<i>380,524</i>	<i>328,963</i>	<i>709,487</i>	<i>64%</i>
<i>Total contacts per capita</i>	<i>1.82</i>	<i>2.57</i>	<i>2.13</i>	
<i>Curative contacts per capita</i>	<i>0.59</i>	<i>1.02</i>	<i>0.76</i>	
<i>MNCAH, Preventive contacts per capita</i>	<i>1.23</i>	<i>1.55</i>	<i>1.36</i>	

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Contacts per target beneficiary differ between areas, and on average exceed 2 contacts per head per year. PA4, with fewer beneficiaries and higher productivity per staff member, shows higher consumption per capita, particularly of curative care.

Reported deliveries attended at the CRHCC represented 32% of all expected deliveries³ --28% in PA2 and 39% in PA4—. CS as percentage of all institutional deliveries was high, 36% overall and 43% in PA2.

4.1.4 Expenditure

In principle, expenditure recorded and reported by the PMU covers all expenses incurred in the provision of these services, with the exception of FP commodities and vaccines, which are received free of charge from the MOHFW and for which no records were available. These supplies represented almost 20% of the total expenditure (or around BDT 40 per capita) at the Upazila level.

Almost 80% of all funds are spent on personnel, one-tenth on medicines and supplies and another 11% on Other Goods and Services.

Table 24. Expenditure 2015 by budget line and PA

Budget line/Area	DNCC PA 2	DNCC PA 4	Total	%
Personnel	25,484,961	15,574,754	41,059,715	77%
Meds & supplies	3,324,445	2,153,986	5,478,431	10%
Other G&S	3,639,420	2,056,814	5,696,234	11%
Maintenance	400,863	359,683	760,546	1%
Capital	423,600	96,318	519,918	1%
Total	33,273,289	20,241,555	53,514,844	100%

When compared with population, the figures obtained are certainly modest. Average total expenditure per capita is estimated at BDT 103 (US\$ 1.32), with small differences between PAs. Just about US\$ 1 (BDT 79) per target beneficiary was spent on personnel and much smaller amounts, below 20 cents of US\$, on medicines and other running expenditure.

Table 25. Expenditure per capita (BDT) by PA. 2015

Budget line/Area	DNCC PA 2	DNCC PA 4	Total
Personnel	82	74	79
Meds & supplies	11	10	11
Other G&S	12	10	11
Maintenance	1	2	1
Capital	1	0	1
Total	108	96	103

Per capita expenditure identified in urban areas is less than half that of UHS. The reason may be the bias of urban services towards MNCAH and FP activities, while most curative cases, including serious ones, are expected to seek care in other public or private providers.

³ Using 2.3% of the population as the target group.

5. Part III. Projecting costs of providing the 2016 ESP in rural and urban areas

The third chapter of the document projects the costs of providing the newly updated ESP in both rural and urban settings. For that, the existing PHC service delivery system will be adapted to “average” Upazila and Partnership Area settings.

The chapter starts by outlining the ESP components, and proceeds to present the calculations for an average Upazila, projecting a scenario of consumption and coverage of the different services. That is followed by a discussion of the potential productivity of the staff, as well as a projection of staff needs according to different setups. Drugs needs—including vaccines and FP commodities—are calculated later, leading to an overall cost for the whole system.

5.1 Composition of the Essential Service Package

The latest version of the ESP is structured in six main services and their components: Maternal, Neonatal, Child and Adolescent health (MNCAH); Family Planning (FP); Nutrition; Communicable Disease Control (CDC); Non-Communicable Diseases (NCD) and Management of Other Conditions.

For the purposes of this exercise, what is important is that those services can be grouped into different activity units, or ways in which services can be delivered. Thus, all services can be provided through outpatient consultations, inpatient care, surgical operations or deliveries. Note that support services—pharmacy, lab, X-Ray—are considered part of the main service (e.g., lab tests are not provided in isolation, but as part of a curative consultation or a standard checkup in ANC) and not calculated separately.

5.2 Rural Settings

5.2.1 The average Upazila Health System

The unit of cost calculation is the Upazila Health System (UHS), because it is the smallest unit which can provide the whole ESP. From the available information—both collected locally and published by the MOHFW (Health Bulletin 2015)—an average UHS has been designed with the following characteristics:

Population 350,000

Size 300 km²

Public Network: 1 UHC, 10 USC/UHFWC and 50 Community Clinics (one per 6,000 people excluding an urban area hosting an estimate of 50,000 people).

The main target groups have been calculated using WHO and National Census data, and are shown in Table 26.

Table 26. Average Upazila Health System. Target population groups

Target group	% pop.	Upazila	Union	CC area	Comments
Total population	100%	350,000	35,000	6,000	Target population for curative care
Pregnant women	2.3%	8,050	805	138	ANC, PNC, deliveries
Under 1 y.o.	2.2%	7,700	770	132	Immunization
Under 5 yo	10.5%	36,750	3,675	630	IMCI, growth monitoring
Women 15-49	26.7%	93,450	9,345	1,602	Family Planning
10-19 y.o.	21.0%	73,500	7,350	1,260	Adolescent health
>= 35 years of age	33.2%	116,200	11,620	1,992	NCD

With the estimated area and network size, the average radius per CC would be just below 1.4 km, and 3 km for a union-level facility, providing an excellent geographical accessibility.

5.2.2 Projecting service consumption and coverage

For each main ESP component, the potential workload has been calculated. The unit of activity (consultation, surgical operation, etc.) is defined, as well as the target group. The desired service coverage is set, and the standard/planned number of contacts per service (e.g., four ANC consultations per pregnant woman are set as the standard, and 6 sessions are required to complete the immunization schedule in children under one year of age).

Potential users are the result of combining target group and coverage, which is tentatively established at 100% unless there is a MOHFW statement defining a target (e.g. 50% of pregnant women receiving 4 ANC consultations, as stated in the final Sector Investment Plan (SIP) 2016-2021). Multiplying the number of users by the average number of contacts by service, the total number of contacts is achieved.

As described in the methodology section, different health systems allow different lengths of time for the realization of the same activity (for example, public health systems across Europe allow between 5 and 10 minutes for OPD consultations, while other countries are more generous). What appears in Table 27 is a tentative average which can be modified during the modelling of the projections. Noticethat in general the average length used for the calculations is generous; in the rural public health system of Bangladesh very few ANC consultations last 30 minutes and fewer OPD contacts complete 10 minutes. Multiplying expected number of contacts by the average length of each contacts produces the total expected workload in minutes, according to which all calculations will be made.

Table 27. Estimating coverage, utilization and total workload by service

Service	Unit of Activity	Target group	Coverage	Avg Contacts per User	Potential Users	Total projected Contacts	Avg Length/ Contact (min)	Total Time (min)
Maternal Care								1,674,400
ANC	Consultation	Pregnant women	50%	4	4,025	16,100	30	483,000
PNC	Consultation	Pregnant women	50%	1	4,025	4,025	20	80,500
Normal Delivery	Delivery	Pregnant women	65%	1	5,233	5,233	180	941,850
CS	Operation	Pregnant women	100%	1	805	805	120	96,600
Assisted delivery	Delivery	Pregnant women	100%	1	403	403	180	72,450
Neonatal care								322,000
NN care	Consultation	Neonates	100%	2	8,050	16,100	20	322,000
Child care								2,429,420
IMCI (ARI, Diarrhea)	Consultation	< 5 y.o.	100%	2	36,750	73,500	10	735,000
SAM	Consultation	< 5 y.o.	100%	4	5,255	21,021	20	420,420
EPI	Consultation	< 1 y.o.	100%	6	7,700	46,200	15	693,000
Growth monitoring	Consultation	1-5 y.o.	100%	2	29,050	58,100	10	581,000
Adolescent Health								73,500
Cons + counselling	Consultation	10-19 y.o.	10%	1	7,350	7,350	10	73,500
Family Planning								2,609,937
Pill	Consultation	Women 15-49	75%	4	35,044	140,175	10	1,401,750
IUD	Consultation	Women 15-49	75%	1	156	156	20	3,115
Implant	Consultation	Women 15-49	75%	1	735	735	10	7,355
Condom	Consultation	Women 15-49	75%	6	8,307	49,840	10	498,400
Inject	Consultation	Women 15-49	75%	4	16,094	64,377	10	643,767
Tubectomy	Operation	Women 15-49	75%	1	597	597	60	35,823
Tubectomy	Consultation	Women 15-49	75%	2	597	1,194	10	11,941
NSVasectomy	Operation	Partners	75%	1	156	156	30	4,673
NSVasectomy	Consultation	Partners	75%	2	156	312	10	3,115
Curative care								13,808,200
Acute conditions	Consultation	Total pop	100%	2	350,000	700,000	10	7,000,000
<i>NCD</i>								-
Diabetes	Consultation	>=35 yo	100%	6	11,620	69,720	20	1,394,400
HTN	Consultation	>=35 yo	100%	4	34,860	139,440	20	2,788,800
<i>Hospital Admissions</i>								
Inpatient days	MO consult.	Total pop	100%	3	8,750	26,250	10	262,500
Inpatient days	Nurse contact	Total pop	100%	3	8,750	26,250	90	2,362,500

By service, the rationale for the estimates is as follows:

Maternal care is composed of ANC, PNC and deliveries. According to the SIP, by 2021, fifty percent of pregnant women should receive 4 ANC consultations and 65% should be attended by Skilled Birth Attendants (SBA) in their deliveries. While 65% has been kept as the target for Normal Vaginal Deliveries (NVD), it has been considered that all expected complicated deliveries should be attended; ten percent of the expected deliveries has been set as the target for CS and 5% for other assisted deliveries.

All new born babies are expected to be assessed, two times on average. Equally, all children under one year are to be vaccinated and their growth monitored in six sessions during their first year of life. Children between 1 and 5 years of age are expected to be seen twice per year for growth monitoring.

Using the BDHS 2014 data, it is projected that 14.3% of children under 5 years suffer from Severe Acute Malnutrition (SAM) and that each patient will be seen four times. Projecting the prevalence of IMCI-related diseases (diarrhea, acute respiratory infection) in the BDHS 2014, it is estimated that children should be seen twice per year for this purpose.

Adolescent health services are less established than MCH ones. The projection made is that 10% of people in the 10-19 y.o. age group will be seen once.

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Projections for Family Planning are made taking into consideration the 75% target included in the SIP and the mix by FP method described in the BDHS 2014.

Curative care includes patients from communicable diseases to common conditions and emergency care. A coverage of 100% with 2 contacts per person per year are projected. For NCD, only Hypertension (HTN) and Diabetes Mellitus (DM) are used for the projections, estimating that prevalence would be around 30% and 10% respectively in the age group of people of and above 35 years of age. All patients are projected as covered; HTN patients will be seen 4 times per year, while DM ones will attend the health facility 6 times.

Hospital admissions are set at a very modest 2.5 admissions per 100 people per year. This covers admissions generated by CS and other obstetric conditions. Average length of stay (ALOS) is estimated at three days per admission. To cover these limited admissions, the UHC would require an increase of no less than 20 additional beds, not considering admissions not related to ESP activity.

Table 28. Overall workload by service component

Service	No. Contacts	Time (min)
Curative	1,003,681	12,338,620
MNCAH	147,875	2,233,000
FP	257,541	2,609,937
Inpatient care	52,500	2,625,000
Operations	1,208	169,050
NVD	5,233	941,850
Total	1,468,037	20,917,457

Overall, almost 1.5 million contacts with the health system would be necessary (or roughly 4 contacts per person per year), generating a workload in excess of 20 million minutes of staff time.

The Upazila public health system is composed of three types of facility, in addition to services provided at the community level, either in service-delivery sites or at the users' domicile. To proceed with the calculations, the level at which each service is provided is projected. Thus, all inpatient care and surgical services are delivered at the UHC level, while the majority (60%) of the MNACH and FP services are availed either at CC or the community. Table 29 shows the proposal for distributing service delivery by level.

Table 29. Distribution of the service workload across levels

Service	UHC	USC/UHFWC	CC	Community
Curative	20%	40%	40%	
MNACH	10%	30%		60%
FP	10%	30%		60%
Inpatient care	100%			
Operations	100%			
NVD	40%	50%		10%

GNA

It should be noted that the proposed distribution takes into account the planned deployment of newly trained midwives, which would staff all UHC and USC/UHFWC. Union-level facilities would become responsible for managing half of all SBA-attended deliveries. The share of curative activities at CC level may be considered too high, but it is lower than the current 60%, according to DHIS-2 data.

5.2.3 Projecting workload and productivity

In the methodology section, annual productivity by worker in the public health system has been estimated at 78,000 minutes (260 working days x 5 working hours/day x 60 minutes/working hour). However, many of the UHS workers are not, or only partially, based at formal health facilities; instead, they provide services at outreach delivery sites or even at people's homes. For that, they spend substantial time on traveling to the place and organizing the services in non-facility environments. It has been estimated that those workers can only devote 25% of their working time –or **19,500 minutes** per year— to actually provide the services. In practical terms, it means that, for example, a SACMO spends 30 minutes delivering an ANC consultation at the UHC, and a HA spends 120 minutes to do the same, because most of the time is used getting to the place where the service is to be provided.

5.2.4 Staff needs and costs

Staff needs are calculated according to three different scenarios:

Scenario I (Table 30) shows current average availability –by type of facility or by population for community workers—of HRH, as obtained during fieldwork. According to that, the UHS would require 96 additional health workers to perform the planned activities. Alternatives include an improbable increase of HRH productivity (number of working minutes per year) and a great reduction of the standard length of time for the delivery of the activities.

At UHC level, inpatient care and curative consultations would require additional staff. Overall, the system would be served by 238 technical staff, making an availability of almost 1,500 people per worker.

Table 30. Scenario I. Health worker average teams by health facility, using current availability.

Staff	UHC	USC/UHFWC	CC	Community	Total Upazila
MO	19	1			29
Nurse	14				14
Midwife	5	1			15
SACMO	2	1			12
Mtech	6	0.1			7
FWV	2	1			12
CHCP			1		50
FWA				44	44
FPI				10	10
HA				31	31
AHI				11	11
HI				4	4
Total	48	4	1	99	238
Workload in minutes					
Existing capacity	3,276,000	312,000	78,000	1,940,233	12,766,633
Required	6,122,808	685,925	98,709	2,999,947	20,917,457
Balance	2,846,808	373,925	20,709	1,059,715	8,150,825
Deficit FTE	36.50	4.79	0.27	54.34	95.90

Scenario II projects HRH availability according to established standard (sanctioned) teams by health facility and population : health worker ratio at the community level (e.g. one HA per 4,000 population, or one FWA per 5,000 people). The resulting workforce would be in excess of 11 staff members. While workers would be insufficient for the projected workload at facility level (lacking 29 staff at the UHC), almost 45 community workers would be redundant. Overall technical staff would grow to 357 or one health worker per 1,000 people.

Table 31. Scenario II. HRH availability according to standard teams and population : health worker ratio

Staff	UHC	USC/UHFWC	CC	Community	Total Upazila
MO	23	1			33
Nurse	17				17
Midwife	5	1			15
SACMO	2	1			12
Mtech	9	1			19
FWV	3	1			13
CHCP			1		50
FWA				70	70
FPI				18	18
HA				88	88
AHI				18	18
HI				6	6
Total	59	5	1	198	357
Workload in minutes					
Projected capacity	3,900,000	312,000	78,000	3,867,500	16,269,500
Required	6,122,808	685,925	98,709	2,999,947	20,917,457
Balance	2,222,808	373,925	20,709	-867,553	4,647,957
Deficit FTE	28.50	4.79	0.27	-44.49	-10.93

Finally, Scenario 3 handpicked the necessary changes according to the projected workload by type of service. For that, the minutes by service component and by activity obtained from applying the distribution of Table 29 are translated into Full-Time Equivalents (FTE) or, in other ways, number of staff required. Thus, at UHC level 32 staff would be necessary for curative care, 2.5 for FP and almost 4 to cover maternity services. For the ten union facilities, sixty-three staff would be necessary for curative care, and 63 CHCP at CC would be needed to cover for the planned curative consultations at that level. Some of the activities are performed by a specific cadre (e.g. FWV for FP, or nurse for inpatient care) but some staff members may perform more than one activity. For example, physicians and SACMOs may interchange their roles when working on curative consultations and MNACH services, although obviously the physician introduces an element of quality. The staff distribution proposed for Scenario III can be modified easily to achieve a different balance between MO and SACMOs. The latter have been increased on the grounds that SACMO may be easier to retain in rural areas, and are comparatively less costly than physicians.

Table 32. Workload (in minutes) and FTE needs by facility and by service component

Workload (min)	UHC	USC/UHFWC	CC	Community
Curative	2,467,724	4,935,448	4,935,448	-
MNACH	279,650	838,950	-	1,677,900
FP	189,872	569,615	-	1,139,230
Inpatient care	2,625,000	-	-	-
Operations	169,050	-	-	-
NVD	295,596	-	-	443,394
Total	6,026,892	6,344,013	4,935,448	3,260,524
FTE needs				
Curative	31.64	63.27	63.27	-
MNACH	3.59	10.76	-	86.05
FP	2.43	7.30	-	58.42
Inpatient care	33.65	-	-	-
Operations	2.17	-	-	-
NVD	3.79	-	-	22.74
Total	77	81	63	167

As a result, at UHC level, physicians would increase slightly, while nurses, midwives, SACMOs and FWV would increase substantially. At union facilities, staff with clinical tasks –MO, SACMO and FWV—would at least double. Community-based staff could be reduced; basically, most HA and FWA would be deployed supporting CCs. Overall technical staff would be 378, with a slightly reduced ratio population : worker than Scenario II but a completely different skill mix.

It is worth mentioning that the overall needs of CHCP are 63, while only 50 –the number of CCs—are planned, leading to a deficit of 0.27 FTE in each clinic. In that case, the only CHCP should increase his/her productivity by 27% or reduce the average time spent on the projected consultations. Alternatives include expanding the network of CCs to 63 or deploying a second CHCP in ¼ of the 50 CCs, enabling them to offer services in a second shift, for example.

Also the increase in personnel at union facilities might translate into the capacity to provide extended services.

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Table 33. Scenario III. HRH availability according to tailored skill mix by level

Staff	UZHC	USC/UHFWC	CC	Community	Total Upazila
MO	26	2			46
Nurse	25				25
Midwife	9	1			19
SACMO	12	3			42
Mtech	9	1			19
FWV	6	2			26
CHCP			1		50
FWA				64	64
FPI				10	10
HA				64	64
AHI				10	10
HI				5	5
	87	9	1	153	380
Workload in minutes					
Projected capacity	6,084,000	624,000	78,000	2,983,500	20,689,500
Required	6,122,808	685,925	98,709	2,999,947	20,917,457
Balance	38,808	61,925	20,709	16,447	227,957
Deficit FTE	0.50	0.79	0.27	0.84	2

Table 34 shows the projected staff costs by category, according to the scenarios described above. For the calculations, average annual costs per category were used, as described in the methodology chapter. Costs include admin and support staff.

Table 34. Projected staff costs by scenario.

Staff/Scenario	Avge annual salary	Scenario I		Scenario II		Scenario III	
		No.	Cost	No.	Cost	No.	Cost
MO	568,200	29	16,477,800	33	18,750,600	46	26,137,200
Nurse	433,800	14	6,073,200	17	7,374,600	25	10,845,000
Midwife	433,800	15	6,507,000	15	6,507,000	19	8,242,200
SACMO	433,800	12	5,205,600	12	5,205,600	42	18,219,600
Mtech	228,360	7	1,552,848	19	4,338,840	19	4,338,840
FWV	433,800	12	5,205,600	13	5,639,400	26	11,278,800
CHCP	162,000	50	8,100,000	50	8,100,000	50	8,100,000
FWA	197,640	44	8,755,610	70	13,834,800	64	12,648,960
FPI	207,240	10	2,111,115	18	3,626,700	10	2,072,400
HA	197,640	31	6,039,966	88	17,293,500	64	12,648,960
AHI	207,240	11	2,209,307	18	3,626,700	10	2,072,400
HI	207,240	4	785,531	6	1,208,900	5	1,036,200
Admin	228,360	4	913,440	4	913,440	4	913,440
Support	174,600	25	4,365,000	25	4,365,000	25	4,365,000
Total		267	74,302,018	386	100,785,080	409	122,919,000
in US\$			952,590		1,292,116		1,575,885
per capita			2.72		3.69		4.50

Overall costs with personnel would evolve from BDT 74 million (scenario I) to BDT 123 million (scenario III), or an average cost per capita of US\$ 2.7 to US\$ 4.5.

Distributing the projected costs across levels (Table 35), the main changes appear at UHC and, particularly, at USC/UHFWC, a facility which would increase greatly its profile in the UHS.

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Table 35. Projected staff costs by scenario and facility level

Facility/Scenario	I	II	III
UHC	25,675,800	30,368,880	42,918,480
USC	20,624,688	22,725,600	41,421,600
CC	8,100,000	8,100,000	8,100,000
Community	19,901,530	39,590,600	30,478,920
Total	74,302,018	100,785,080	122,919,000

5.2.5 Drugs and supplies

Projecting the needs of medicines, medical supplies, FP commodities and vaccines has two challenges: the mix of medicines and the required quantities. An approach is taken that offers a way out, using the Inter-Agency Emergency Drugs Kit (IAEDK)⁴. The IAEDK is the UN response to situations where lack of information prevents managers from tailoring supply to needs. Obviously this is not the situation in Bangladesh, but it is used as a simplified approach to calculating drug needs where past consumption is not useful because no facility provides full treatment courses of drugs, and should be replaced as soon as better info is available.

The IAEDK is composed of two units. A basic unit with medicines for OPD cases able to treat 1,000 cases on average, and a complementary unit with more sophisticated medicines, including those for inpatient care, sufficient to treat 10,000 cases. Thus, for every 10,000 consultations, 10 basic and one complementary unit should be supplied.

The IAEDK basic unit is remarkably similar, in concept and in quantities, to the EDL kit supplied to the CC, and thus the latter is taken as standard. The IAEDK complementary unit has been adapted taking into account the conditions/procedures included in the ESP and the updated Bangladesh EDL. The content of both units can be found as Annex 1 to this document.

In areas where Malaria is prevalent, extra units can be added to the regular ones.

To project NCD drugs in the absence of detailed treatment guidelines, the WHO *Package of Essential Noncommunicable (PEN) Disease Interventions for Primary Health Care in Low-resource Settings* has been taken as guidance. The PEN approach limits the number of drugs necessary to a just a few: Aspirin, Enalapril, Atenolol, Amlodipine, Simvastatine, Hydrochlorothiazide, Metformin and Insulin. Simvastatine was removed due to the high cost of the statins. The mix of medicines was estimated using internationally endorsed treatment guidelines. Thus, it is estimated that only 80% of the hypertensive patients require medication; of those, 40% require Enalapril, 20% Amlodipine, and 20% a combination of both drugs. Ten percent of the HTN patients require Atenolol and another 10% diuretics, while 20% need Aspirin. Obviously, these parameters can be modified according to experts' opinions.

As for Diabetic patients, the estimate is that 70% of those diagnosed require medication. Sixty percent will be treated with daily doses of Metformin and 5% will require Insulin.

⁴ Notice that the content of the kit is not designed to treat emergency issues, but to treat patients in a situation where normal procurement/supply procedures do not apply.

Necessities of Family Planning commodities are estimated using women of 15-49 years of age as the target population group. Coverage has been set at 75% and the mix of methods follows that found during the BDHS 2014.

Vaccines are calculated using 100% of children under one year of age as target group. Coverage is set at 100% and a vaccine-specific percentage has been added to cover wastage.

Tuberculosis (TB) drugs have been estimated according to the following parameters: expected cases are calculated using an incidence rate of 225 cases per 100,000 people and a Case Detection Rate (CDR) of 75% as stated in the SIP. Eighty-percent of patients receive the first-line scheme for new cases, and the remaining 20% are managed as re-treatments. TB schemes are those published by the Bangladesh National Guidelines for TB Control (WHO 2013).

Malaria medicines have not been included because of the variable geographical prevalence of the disease. However, the cost has been calculated using the items and quantities contained in the IAEDK, resulting in a projected cost for an Upazila in a high-prevalence district in excess of BDT 140 million, or almost double the projection for all other drugs and supplies, because of the high cost of first-line medicines, and resulting in an extra per capita cost of BDT 412.

HIV/AIDS drugs are not included because they are used mostly at NGO facilities or at higher level of care (Medical College Hospitals).

Prices of most drugs have been obtained locally, either from the publicly-owned Essential Drug Company Limited or from accredited private suppliers. They have been compared with average international prices obtained from the latest edition of the MSH International Drug Price Indicator Guide. Although prices of individual items tend to be different, overall costs for the composition of whole complementary unit are remarkably similar. Costs of the drugs contained in the IAEDK have been doubled to cover other consumables.

Projected consumption of medicines and supplies has been distributed across levels of care, according to the share of each level in the provision of the services requiring supplies. The UHC would consume close to 20% of all supplies, while the (10) USC/UHFWC and the (50) CCs divide almost evenly the remaining 80%.

Table 36. Estimated costs of medicines and supplies, by group and facility level

Meds & Supplies/ H.Facility	UHC			USC/UHFWC			CC/Community			Total	%
	Cont/share	Kits	Cost	Cont/share	Kits	Cost	Cont/share	Kits	Cost		
Basic kit	200,736	201	2,852,612	401,472	401	5,705,224	401,472	401	5,705,224	14,263,060	16%
Complementary kit	200,736	20	6,022,086	401,472	40	4,335,902				10,357,988	12%
Vaccines	10%		1,554,583	30%		4,663,748	60%		9,327,496	15,545,827	17%
FP commodities	10%		1,088,300	30%		3,264,899	60%		6,529,798	10,882,997	12%
NCD drugs	20%		7,273,873	40%		14,547,747	40%		14,547,747	36,369,367	41%
TB drugs	30%		468,552	40%		624,736	30%		468,552	1,561,841	2%
Total			19,260,006			33,142,256			36,578,817	88,981,079	100%

1 basic kit for every 1,000 consultations. 1 complementary kit for every 10,000 consultations (UHC complete Tk 300,000; USC/UHFWC OPD only Tk 108,000)

The overall estimated cost exceeds BDT 88 million. Forty-one percent of all costs correspond to NCD drugs, because of the high prevalence of those conditions and sustained consumption of diagnosed patients. As mentioned, drugs costs would grow exponentially if Malaria meds are included, to reach almost BDT 230 million.

Although it is not projected that CC may diagnose and manage NCD or TB cases, drugs costs with these conditions have been attributed to the CC level because they may participate in the supply of those meds to the patients, refilling prescriptions issued by MO/SACMO at higher levels.

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5.2.6 Investment and depreciation costs

Costs with construction, upgrading, renovation or rehabilitation of health facilities have not been included on the grounds that a survey would be required to identify the need of each individual facility.

Depreciation costs have been calculated but not added, at least in this first draft of the costing document, because while they are important in assessing the overall cost of providing the ESP, these amounts are not going to be part of annual allocation exercises, the main purpose of this exercise.

Annual depreciation costs have been estimated as the percentage of the expected life-span of buildings and equipment in a straight line. Thus, if a building is expected to last for 50 years, the annual depreciation cost would be 2% (1/50th) of the updated construction cost.

Construction costs by type of facility, as well as its size, were obtained from the Comilla District Engineering Department. Equipment costs are calculated as a percentage of construction costs.

Table 37. Projected depreciation costs, by type of facility

H. Facility	Construction costs by facility				Annual depreciation costs			No. facilities	Total depreciation costs
	Size (sqm)	Building	Equipment	Total cost	Building 2%	Equipment 10%	Total		
Community Clinic	50	1,400,000	280,000	1,680,000	28,000	28,000	56,000	50	2,800,000
UHFWC	372	13,000,000	2,600,000	15,600,000	260,000	260,000	520,000	10	5,200,000
UHC (50 bed)	2,000	260,000,000	78,000,000	338,000,000	5,200,000	7,800,000	13,000,000	1	13,000,000
Staff Quarters	1,000	35,000,000	3,500,000	38,500,000	700,000	350,000	1,050,000	1	1,050,000
Total annual costs									22,050,000

Total annual depreciation costs for the whole network, including staff quarters at the UHC, would amount to BDT 22 million, more than half of which to be incurred at the UHC.

5.2.7 Total estimated costs

Depending on the scenario, total costs incurred in the provision of the ESP services to the population of the average Upazila would range between BDT 179 million and BDT 233 million, or between BDT 513 (US\$ 6.6) and BDT 666 (US\$ 8.5) per capita.

Table 38. Total Estimated Costs, by Budget Line and Scenario

Budget line/Scenario	I	II	III
Personnel	74,302,018	100,785,080	122,919,000
Drugs & Supplies	88,981,079	88,981,079	88,981,079
Other G&S (10%)	16,328,310	18,976,616	21,190,008
Total	179,611,407	208,742,775	233,090,087
<i>In US\$</i>	<i>2,302,710</i>	<i>2,676,189</i>	<i>2,988,334</i>
Per capita			
Tk	513.2	596.4	666.0
US\$	6.6	7.6	8.5

Except for the Scenario I, personnel costs are the highest, reaching 53% of all expenditure in Scenario III.

It should be taken into consideration that in malaria-affected districts, drugs costs with that condition would add BDT 412 (US\$ 5.3) per capita, almost doubling the Scenario I estimate and taking Scenario III above BDT 1,000 (US\$ 13.8) per capita.

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5.2.8 Average costs by Health Facility

An attempt is made at estimating the cost of running one health facility of each type. To avoid misrepresentations, costs incurred in providing services at the community level have divided into those corresponding to the basic CC –CHCP salaries, medicines and other goods and services—and those mostly used by HA/FWA –their salaries, FP commodities and vaccines—. If all these costs are divided by the number of CC, each of those facilities would require BDT 634,074 for the costs associated with the CHCP and over BDT 1 million for the community costs.

The results, shown in Table 39, project that a UHC would cost eight times more than an upgraded USC/UHFWC, and 80% of the cost of the whole network of CCs.

Table 39. Average costs of one facility, by budget line and level

Budget line/HF Type	UHC	USC/UHFWC	CC base	CC community
Personnel	42,918,480	4,142,160	162,000	609,578
Drugs & Supplies	19,260,006	3,314,226	414,430	317,146
Basic Meds	2,852,612	570,522	114,104	
Complementary meds	6,022,086	433,590	-	
Vaccines	1,554,583	466,375	-	186,550
FP commodities	1,088,300	326,490	-	130,596
NCD drugs	7,273,873	1,454,775	290,955	
TB drugs	468,552	62,474	9,371	
Other G&S (10%)	6,217,849	745,639	57,643	92,672
Total	68,396,335	8,202,024	634,074	1,019,397
<i>in US\$</i>	<i>876,876</i>	<i>105,154</i>	<i>8,129</i>	<i>13,069</i>

5.3 Urban settings

The process followed to estimate costs in urban settings follows the same as for the Upazila Health System. The average Partnership Area would have a population of 260,000, and the network would be composed of one CRHCC, six PHCC and 12 Satellite Clinics.

Table 40. Projected coverage, utilization and workload by service. Urban setting

Service	Unit of Activity	Target group	Coverage	Avg Contacts per User	Potential Users	Total projected Contacts	Avg Length/ Contact (min)	Total Time (min)
Maternal Care								
ANC	Consultation	Pregnant women	50%	4	2,990	11,960	30	358,800
PNC	Consultation	Pregnant women	50%	1	2,990	2,990	20	59,800
Normal Delivery	Delivery	Pregnant women	65%	1	3,887	3,887	180	699,660
CS	Operation	Pregnant women	100%	1	598	598	120	71,760
Assisted delivery	Delivery	Pregnant women	100%	1	299	299	180	53,820
Neonatal care								
NN care	Consultation	Neonates	100%	2	5,980	11,960	20	239,200
Child care								
IMCI (ARI, Diarrhea)	Consultation	< 5 y.o.	100%	2	27,300	54,600	10	546,000
SAM	Consultation	< 5 y.o.	100%	4	3,904	15,616	20	312,312
EPI	Consultation	< 1 y.o.	100%	6	5,720	34,320	15	514,800
Growth monitoring	Consultation	1-5 y.o.	100%	2	21,580	43,160	10	431,600
Adolescent Health								
Cons + counselling	Consultation	10-19 y.o.	10%	1	5,460	5,460	10	54,600
Family Planning								
Pill	Consultation	Women 15-49	75%	4	26,033	104,130	10	1,041,300
IUD	Consultation	Women 15-49	75%	1	116	116	20	2,314
Implant	Consultation	Women 15-49	75%	1	546	546	10	5,464
Condom	Consultation	Women 15-49	75%	6	6,171	37,024	10	370,240
Inject	Consultation	Women 15-49	75%	4	11,956	47,823	10	478,227
Tubectomy	Operation	Women 15-49	75%	1	444	444	60	26,611
Tubectomy	Consultation	Women 15-49	75%	2	444	887	10	8,870
NSVasectomy	Operation	Partners	75%	1	116	116	30	3,471
NSVasectomy	Consultation	Partners	75%	2	116	231	10	2,314
Curative care								
Acute conditions	Consultation	Total pop	100%	2	260,000	520,000	10	5,200,000
<i>NCD</i>								
Diabetes	Consultation	>=35 yo	100%	6	8,632	51,792	20	1,035,840
HTN	Consultation	>=35 yo	100%	4	25,896	103,584	20	2,071,680
<i>Hospital Admissions</i>								
Inpatient days	MO consult.	Total pop	100%	3	1,300	3,900	10	39,000
Inpatient days	Nurse contact	Total pop	100%	3	1,300	3,900	90	351,000

Service consumption and workload are projected in the same way as for the UHS, and with the same coverage rates. The main difference is that hospital admissions have been reduced to 1 admission per 100 population, to cover basically obstetric and paediatric care. It has been considered that alternatives exist –e.g. Medical College Hospitals—within accessible geographical range to provide inpatient care.

Table 41. Overall workload by service component. Urban setting

Service	No. Contacts	Time (min)
Curative	745,592	9,165,832
MNCAH	109,850	1,658,800
FP	191,316	1,938,811
Inpatient care	7,800	390,000
Operations	897	125,580
NVD	3,887	699,660
Total	1,059,342	13,978,683

Overall, the projections estimate a workload of one million contacts –or almost 4 contacts per person—and 14 million minutes. Workload by service component has been

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distributed across levels according to the current share. CRHCC will concentrate on the most sophisticated services, while their contribution to basic care is more limited. Differently from the rural areas, it is not foreseen that PHCC will attend deliveries, which are only projected at CRHCC level.

Table 42. Distribution of projected workload across levels. Urban setting

Service	CRHCC	PHCC	SatClin
Curative	10%	45%	45%
MNACH	20%	40%	40%
FP	10%	40%	50%
Inpatient care	100%		
Operations	100%		
NVD	100%		

In terms of staff productivity, the main difference with the UHS is in the number of working minutes that community workers (those working at Satellite Clinics) are expected to deliver. It is considered that they will spend half their working day in travel to and from the SatClin sites, and in organizing work and visiting homes. Therefore, each of those workers is attributed a productivity of 39,000 working minutes per year.

Two scenarios of staff availability have been projected. In Scenario I, the current standards of team composition –fixed teams for CRHCC, PHCC and SatClin, with two SatClin per PHCC—have been maintained. The result is an availability of 88 technical staff for the whole PA, where almost triple would be necessary to absorb the projected workload.

Table 43. Projected average and total staff availability with current standards. Scenario I. Urban setting

Staff	CRHCC	PHCC	SatClin	Total Area
MO	6	1		12
Nurse	4			4
Midwife				-
SACMO	3	1	1	21
Mtech	1	1		7
FWV	1	1		7
Counselor	1	1		7
FWA			1	12
Field Supervisor		1		6
Service Promoter			1	12
Total	16	6	3	88
Workload in minutes (whole network)				
Existing capacity	1,170,000	2,106,000	1,404,000	4,680,000
Required	2,657,464	5,563,669	5,757,550	13,978,683
Balance	1,487,464	3,457,669	4,353,550	9,298,683
Deficit FTE	19	44	112	175

Scenario II projects the deployment of a sufficient number of staff to cover the workload calculated. The main changes are:

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At the CRHCC, the number of physicians increases to 10, eight midwives are added to manage labour room and maternity with an expected workload of 8 deliveries per day, and the number of SACMO and FWV double.

At the PHCC, the number of technical staff doubles in most categories. SACMOs increase greatly, to five per facility.

Table 44. Projected staff availability by HF and PA tailoring teams to need. Scenario II. Urban setting

Staff	CRHCC	PHCC	SatClin	Total Area
MO	10	2		22
Nurse	5			5
Midwife	8			8
SACMO	8	5	1	86
Mtech	1	1		7
FWV	2	2		14
Counselor	1	2		13
FWA			1	48
Field Supervisor		1		6
Service Promoter			1	48
Total	35	13	3	257
Workload in minutes (whole network)				
Existing capacity	2,652,000	5,382,000	5,616,000	13,650,000
Required	2,657,464	5,563,669	5,757,550	13,978,683
Balance	5,464	181,669	141,550	328,683
Additional FTE	0	2	4	6

Finally, while the team composition for Satellite Clinics remains the same, the number of teams increases to eight teams per PHCC, which in principle should allow the teams to provide services in the same neighborhood, rather than moving around.

These increase figures may allow the facilities, particularly PHCC, to work in double shifts, functionally increasing the facility's size and capacity. Alternatives include the setting up of a smaller Partnership Area and the provision of most activities at facility level.

If management, admin and support staff are added, the number of workers should grow from the current 133 to just above 300, and the costs from BDT 36 million to BDT 88 million, representing less than US\$ 5 per capita on personnel expenditure.

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Table 45. Projected staff costs by category and by Scenario. Urban setting

Staff/Scenario	Avge annual salary	Scenario I		Scenario II	
		No.	Cost	No.	Cost
MO	519,960	12	6,239,520	22	11,439,120
Nurse	396,480	4	1,585,920	5	1,982,400
Midwife	396,480	-	-	8	3,171,840
SACMO	396,480	21	8,326,080	86	34,097,280
Mtech	207,732	7	1,454,124	7	1,454,124
FWV	396,480	7	2,775,360	14	5,550,720
Counselor	207,732	7	1,454,124	13	2,700,516
FWA	179,508	12	2,154,096	48	8,616,384
Field Supervisor	207,732	6	1,246,392	6	1,246,392
Service Promoter	179,508	12	2,154,096	48	8,616,384
Admin	207,732	7	1,454,124	7	1,454,124
Support	158,340	34	5,383,560	34	5,383,560
Management	519,960	4	2,079,840	4	2,079,840
Total		133	36,307,236	302	87,792,684
<i>in US\$</i>			465,477		1,125,547
per capita			1.79		4.33

In Scenario II, staff costs incurred at the CRHCC would represent five times the cost with personnel at a PHCC, and more than 20 of a Satellite Clinic.

Table 46. Projected staff costs by facility. Scenario II. Urban setting

Staff/HF	Avge annual	CRHCC		PHCC		Sat Clinic	
		No.	Cost	No.	Cost	No.	Cost
MO	519,960	10	5,199,600	2	1,039,920	-	-
Nurse	396,480	5	1,982,400	-	-	-	-
Midwife	396,480	8	3,171,840	-	-	-	-
SACMO	396,480	8	3,171,840	5	1,982,400	1	396,480
Mtech	207,732	1	207,732	1	207,732	-	-
FWV	396,480	2	792,960	2	792,960	-	-
Counselor	207,732	1	207,732	2	415,464	-	-
FWA	179,508	-	-	-	-	1	179,508
Field Supervisor	207,732	-	-	1	207,732	-	-
Service Promoter	179,508	-	-	-	-	1	179,508
Admin	207,732	1	207,732	1	207,732	-	-
Support	158,340	14	2,216,760	3	475,020	-	-
Total		50	17,158,596	17	5,328,960	3	755,496
<i>in US\$</i>			219,982		68,320		9,686

Costs with medicines and supplies have also been calculated in the same way than for the UHS, resulting in a total estimated cost of BDT 70 million for the whole network. Thirty-eight percent of the funds would be spent on NCD drugs, and half of the total at the PHCC level.

Table 47. Estimated costs with medicines and supplies, by group and facility level. Urban setting

Meds & Supplies/ H.Facility	CRHCC			PHCC			Sat. Clinic			Total	%
	Cont/share	Kits	Cost	Cont/share	Kits	Cost	Cont/share	Kits	Co st		
Basic kit	74,559	75	1,059,542	335,516	336	4,767,937	335,516	336	4,767,937	10,595,416	15%
Complementary kit	74,559	7	2,236,775	335,516	34	10,065,487				12,302,261	17%
Vaccines	20%		2,309,666	40%		4,619,331	40%		4,619,331	11,548,328	16%
FP commodities	10%		808,451	40%		3,233,805	50%		4,042,256	8,084,512	11%
NCD drugs	10%		2,701,724	45%		12,157,760	45%		12,157,760	27,017,244	38%
TB drugs	40%		464,090	60%		696,135				1,160,225	2%
Total			9,580,248			35,540,455			25,587,284	70,707,986	100%

1 basic kit for every 1,000 consultations. 1 complementary kit for every 10,000 consultations (CRHCC complete Tk 300,000; PHCC OPD only Tk 108,000)

Total estimated costs climb from BDT 117 million in Scenario I to BDT 174 million in Scenario II. In the first scenario, medicines and supplies are the main cost driver (60% of all projected costs), while in the second costs with personnel (50%) are the main budget line.

Table 48. Total projected costs, by budget line and by Scenario. Urban setting

Budget line/Scenario	I	II
Personnel	36,307,236	87,792,684
Drugs & Supplies	70,707,986	70,707,986
Other G&S (10%)	10,701,522	15,850,067
Total	117,716,745	174,350,737
<i>In US\$</i>	<i>1,509,189</i>	<i>2,235,266</i>
Per capita		
Tk	452.8	670.6
US\$	5.8	8.6

The average cost of operating a CRHCC, according to Scenario II, would be BDT 29 million, more than double of the cost of one PHCC. Both at CRHCC and SatClin, personnel represent more than half of the total projected cost.

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Table 49. Average cost of one facility, by budget line and level. Urban setting

Budget line/HF Type	CRHCC	PHCC	SatClin
Personnel	17,158,596	5,328,960	755,496
Drugs & Supplies	9,580,248	5,923,409	533,068
Basic Meds	1,059,542	794,656	99,332
Complementary meds	2,236,775	1,677,581	-
Vaccines	2,309,666	769,889	96,236
FP commodities	808,451	538,967	84,214
NCD drugs	2,701,724	2,026,293	253,287
TB drugs	464,090	116,022	-
Other G&S (10%)	2,673,884	1,125,237	128,856
Total	29,412,728	12,377,606	1,417,421
<i>in US\$</i>	<i>377,086</i>	<i>158,687</i>	<i>18,172</i>

5.4 Modelling Scenario III

Scenario III in each setting represents the resource needs to achieve maximum coverage with reasonable quality of care (determined by the amount of time health workers are able to spend performing the activities) and with rational supply of medicines.

However, the cost per capita, estimated at almost BDT 670 (US\$ 8.5) is much higher than the BDT 227 (US\$ 2.96) currently spent in rural areas or the BDT 103 (US\$1.32), the average in urban settings. It is very unlikely that the GoB can afford this jump in resource allocation for the time being. Alternatives should be sought to determine how to reduce overall cost per capita within the MOHFW mandate and expectations.

It has been repeated that the two main drivers of health expenditure are personnel and drugs. In some scenarios, the cost with drugs and supplies may even exceed that of the numerous staff. Modifying the standards/assumptions used in the calculations with regards to these two economic components may result in a reduction of the projected costs.

Table 50. Total and per capita projected costs for different models of staff and medicines cost estimates

Budget line/Model	Scenario III	Coverage	Productivity	Combined	Smaller Upazila
Personnel	122,919,000	78,583,994	107,058,960	77,302,560	88,118,760
Drugs & Supplies	88,981,079	42,066,887	88,981,079	42,066,887	63,557,914
Other G&S (10%)	21,190,008	12,065,088	19,604,004	11,936,945	15,167,667
Total	233,090,087	132,715,969	215,644,043	131,306,392	166,844,341
<i>in US\$</i>	<i>2,988,334</i>	<i>1,701,487</i>	<i>2,764,667</i>	<i>1,683,415</i>	<i>2,139,030</i>
Per capita					
Tk	666	379	616	375	667
US\$	8.5	4.9	7.9	4.8	8.6

Four models have been tested to assess the effect of different –but realistic—assumptions on the projected costs. Only the rural setting is used for this exercise:

The first model calls for **Reduced Coverage**, fundamentally on curative care, on the grounds that there are other services –private, ayurvedic and higher-level

public hospitals—that patients are likely to frequent if they can. Public services in rural areas would therefore be used only by those who cannot choose, that is, the poor population. Keeping all other assumptions equal, calculations are based on a coverage of 25%, which results in a substantial (1/3) reduction of personnel costs but a dramatic (53%) drop on costs with medicines and supplies. Overall cost per capita would reduce by 43%, to US\$ 4.9.

The second approach tries to use better the available human resources, to **increase their productivity** so each staff member is able to manage more cases. To do so, there are two possible approaches: increasing average staff working time (e.g., by determining that effective working day is 6 hours and not 5), and/or reducing the time allocated to the realization of each activity. Increasing working time is difficult and requires a lot of managerial effort not easily translatable into the cost assumptions, although it might be possible to improve the figures for the community-based health workers. Instead, the approach taken has been to reduce the time allocated for ANC consultations from 30 to 20 minutes. Also the time for an NCD consultation is reduced from 20 to 10 minutes. The result is far from impressive, with an overall cost reduction of less than 10%, at the expense of a small (13%) decline in personnel expenditure.

A third model **combines** the two previously described, with reduction in coverage and increased staff productivity, which results in savings adding to 44% of the original (Scenario III) costs.

The fourth and final model takes into account that, if urban population is removed from the calculations, the population of the average Upazila would be much lower than the 350,000 used for the model (rounded up from the 323,000 mentioned in the Health Bulletin 2015). A **smaller Upazila** could have an effect on costs per capita because some fixed costs cannot reduce beyond a given level (for example, the minimum staff per facility has to be there regardless of the amount of activity, if the service is to be considered as operational). The fourth model repeats the calculations for an Upazila with a population of 250,000. Although total costs reduce by 28%, average costs per capita remain unchanged. This is because most calculations have taken population as the main criterion. The number of CCs necessary would be reduced to 33 instead of the 50 estimated for a larger Upazila.

All five models (Scenario III and variations) are compared to the current expenditure as estimated based on information collected locally, in terms of per capita by main economic classification (Fig 3). Even the most restrictive variation –improved productivity associated with sharply reduced coverage—would require a growth of 67% in total expenditure per capita, including a two-fold increase in drug expenditure.

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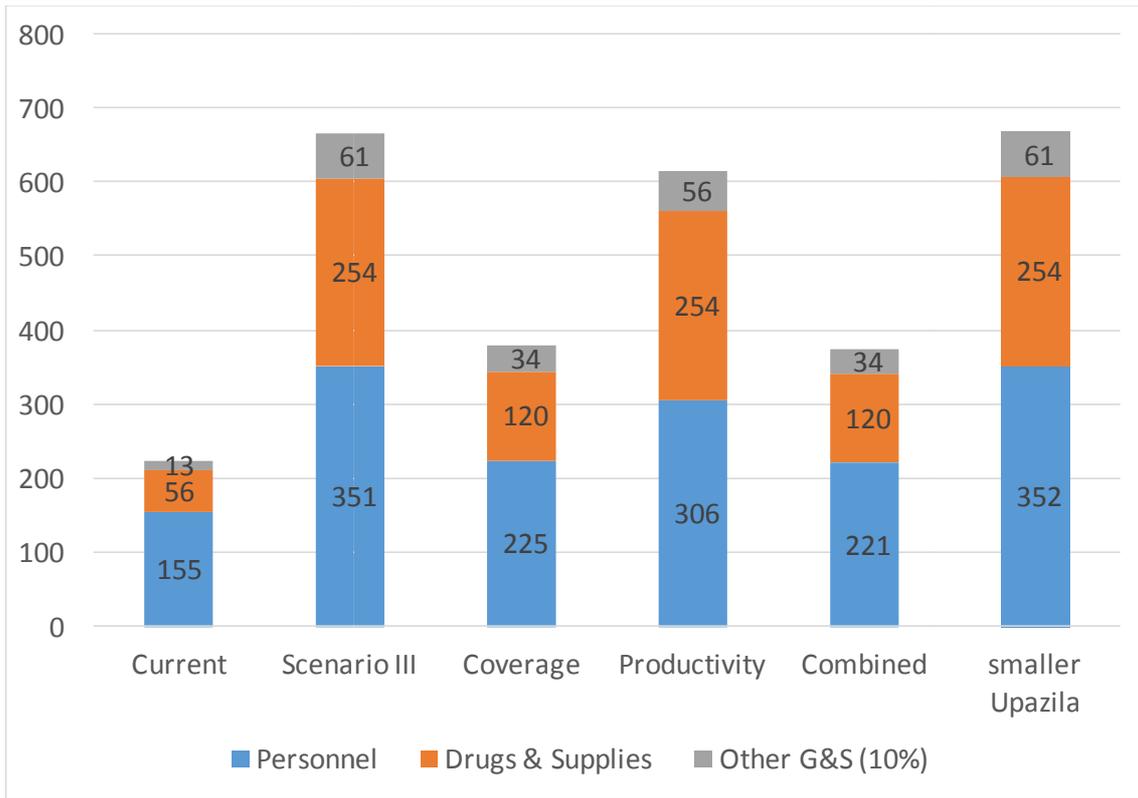


Figure 3. Total projected costs by scenario/model and budget line

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Annex 1. Composition of Essential Drugs Lists

Product	Unit	Qty
Kit for community clinic, for 1,000 consultations		
Amoxicillin capsule 250 mg	piece	500
Amoxicillin Dry Syrup 100 ml	bottle	12
Amoxicillin Paediatric drop 10 ml	bottle	10
Antiacid Chewable tablet 650 mg	piece	2,500
Chlorpheniramine Maleate Tablet 4 mg	piece	1,000
Ferrous Fumarate / Folic Acid Tablet (200 mg + 0.4 mg)	piece	2,000
Paracetamol Tablet 500 mg	piece	2,500
Penicillin-V Tablet 250 mg	piece	100
Salbutamol Tablet 2 mg	piece	500
Albendazole Tablet 400 mg (chewable)	piece	100
Benzoic & Salicylic Acid Ointment 1 kg (BA 6% + SA 3%)	jar	1
Chloramphenicol eye drop 0.5% 10 ml	bottle	20
Chloramphenicol eye ointment 1% 3 g	tube	20
Hyoscine Butyl-bromide Tablet 10 mg	piece	50
Metronidazole Tablet 400 mg	piece	1,000
Oral Rehydration Salt (ORS)	sachet	400
Salbutamol Syrup (2mg/5ml) 60 ml	bottle	24
Benzyl Benzoate Application (25% W/V) 100 ml	bottle	12
Chlorpheniramine Maleate Syrup (2mg/5ml) 60 ml	bottle	24
Cotrimoxazole Tablet 120 mg (SMZ 100 mg + TMP 20 mg)	piece	500
Cotrimoxazole Tablet 960 mg (SMZ 800 mg + TMP 160 mg)	piece	100
Neomycin & Bacitracin Skin Ointment 10 gm	tube	10
Paracetamol suspension (120 mg/5 ml) 60 ml	bottle	48
Vitamin-B Complex Tablet	piece	1,500
Zinc Dispersable Tablet 20 mg	piece	500
Doxycycline Capsule 100 mg	piece	150
Albendazole suspension		
Gentian Violet	bottle	1
Calcium Lactate		

SUPPLEMENTARY UNIT (10,000 consultations)

Product	Unit	Qty
Anaesthetics		
Halotane		
Nitrous Oxide-Oxygen		
Oxygen		
Thiopental Sodium 500 mg	ampoule	100
Lidocaine 1% injection 20 ml	vial	50
Analgesics		
Ibuprofen Tablets 400 mg	piece	20,000

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Product	Unit	Qty
Pethidine Hydrochloride 50 mg/ml	ampoule	50
Antiallergics		
Hydrocortisone powder for injection 100 mg	vial	50
Prednisolone tablets 5 mg	piece	100
Anticonvulsants/antiepileptics		
Diazepam injection 5 mg/ml 2 ml	ampoule	200
Magnesium Sulfate injection 500 mg/ml 10 ml	ampoule	40
Phenobarbital Tablet 50 mg	piece	1,000
Antidotes		
Activated Charcoal tab	piece	1,000
Anti-Infective Medicines		
Benzathine Penicillin, injection 2.4 million IU/vial	vial	50
Ceftriaxone injection 1 g	vial	250
Cloxacillin caps 250 mg	piece	2,000
Clotrimazol 1% cream	tube	100
Procaine Penicillin inj 3-4 million IU/vial	vial	200
Ciprofloxacin Tablet 250 mg	piece	1,000
Ciprofloxacin Tablet 750 mg	piece	500
Azithromycin tablet 250 mg	piece	200
Cefixime tablet 200 mg	piece	100
Cardiovascular Medicines		
Atenolol Tablet 50 mg	piece	1,000
Dermatological Medicines		
Silver Sulfadizine cream 1% 25 g	tube	30
Disinfectants and antiseptics		
Chlorhexidine solution 5% 1 litre	bottle	10
Chlorhexidine solution 7.1%		
Diuretics		
Furosemide injection 10 mg/ml 2ml	ampoule	20
Hydrochlorothiazide Tablet 25 mg	piece	200
Gastro-Intestinal Medicines		
Atropine injection 10 mg/ml 1 ml	ampoule	50
Promethazine Tablets 25 mg	piece	500
Medicines affecting the blood		
Folic acid Tablet 5 mg	piece	1,000
Oxytocics		
Misoprostol tablet 200 micrograms	piece	60
Oxytocin, injection 10 IU/ml 1 ml	ampoule	200
Psychotherapeutic Medicines		
Amitriptyline tablet 25 mg	piece	4,000
Haloperidol injection 5 mg/ml 1 ml	ampoule	20
Haloperidol Tablet 5 mg	piece	1,300

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Product	Unit	Qty
Diazepam Tablet 5 mg	piece	500
Medicines acting on the Respiratory Tract		
Epinephrine (adrenaline) injection 1 mg/ml 1 ml	ampoule	50
Salbutamol inhaler 0.1 mg/dose	unit	50
Solutions correcting water, electrolyte and acid-base disturbances		
Ringer's lactate 500 ml	bag	200
Glucose 5% injection solution 500 ml	bag	100
Sodium chloride 0.9% injection solution 500 ml	bag	100
Glucose 50% injection solution 50 ml	vial	20
Water for injection 10 ml	ampoule	2,000
Vitamins		
Ascorbic Acid tablets 250 mg	piece	4,000
Retinol (Vitamin A) capsules 200,000 IU	piece	4,000

MALARIA UNIT

TO ADD TO BASIC KIT

ARTEMETER + LUMEFANTRINE tab 20+120 mg	tab	6,120
Lancet for blood sampling	piece	1,000
Rapid Diagnostic Test	test	800

TO ADD TO COMPLEMENTARY UNIT

Artesunate 60 mg/ml 1 ml	amp	500
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