

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

**Data Collection Survey on Health Sector in**  
**Bangladesh**  
**Final Report**

**March 2022**

**Japan International Cooperation Agency**

**IC Net Limited**

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## Abbreviations

4 <sup>th</sup> HPNSP	4th Health, Population and Nutrition Sector Programme
8FYP	8th Five-Year Plan
ADB	Asian Development Bank
AHI	Assistant Health Inspector
BAPI	Bangladesh Association of Pharmaceutical Industries
BASIS	Bangladesh Association of Software and Information Services
BMCD	Bangladesh Medical and Dental Council
BNMC	Bangladesh Nursing and Midwifery Council
BNP	Bangladesh Nationalist Party
BRAC	Bangladesh Rural Advancement Committee
BPRP	Bangladesh Preparedness and Response Plan for COVID-19
BPSC	Bangladesh Public Service Commission
BTRC	Bangladesh Telecommunication Regulatory. Commission
CBHC	Community Based Health Care
CC	Community Clinic
CG	Community Group
CHCP	Community Health Care Provider
CHW	Community Health Worker
CMSD	Central Medical Stores Depot
COVID-19	Coronavirus Disease 2019
CPI	Corruption Perceptions Index
CSBA	Community Based Skilled Birth Attendant
DD-FP	Deputy Director-Family Planning
DEMEW	District Electro-Medical Equipment Workshop
DGDA	Directorate General of Drug Administration
DGFP	Directorate General of Family Planning
DGHS	Directorate General of Health Services
DGNM	Directorate General of Nursing and Midwifery
DHIS2	District Health Information Software 2
DHS	Demographic and Health Survey
DOA	Department of Architecture
DPL	Development Policy Loan
EDCL	Essential Drugs Company Limited
EDL	Essential Drug List
EmOC	Emergency Obstetric Care
EPI	Expanded Program on Immunization
ESP	Essential Service Package
FPI	Family Planning Inspector
FWA	Family Welfare Assistant
FWV	Family Welfare Visitor
GDP	Gross Domestic Product
GED	General Economics Division
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMP	Good Manufacturing Practice
GNI	Gross National Income
HA	Health Assistant
HCFS	Health Care Financing Strategy 2012-2032
HED	Health Engineering Department
HEU	Health Economics Unit
HI	Health Inspector
HIS	Health Information System
HIV	Human Immunodeficiency Virus
HPNSDP	Health, Population and Nutrition Sector Development Program 2011-2016

HRIS	Human Resource Information System
HSD	Health Service Division
HSM	Hospital Service Management
icddr,b	International Centre for Diarrhoeal Disease Research, Bangladesh
ICRC	International Committee of the Red Cross
ICT	Information and Communication Technology
IDRA	Insurance Development and Regulatory Authority
IEDCR	Institute of Epidemiology Disease Control and Research
IOM	International Organization for Migration
ITU	International Telecommunication Union
IVD	In-Vitro Diagnostics
JCI	Joint Commission International
JICA	Japan International Cooperation Agency
LDC	Least Developed Country
MCH-FP	Maternal and Child Health – Family Planning
MCWC	Maternity and Child Welfare Centre
MDR-TB	Multiple Drug-Resistant Tuberculosis
ME&FWD	Medical Education and Family Welfare Division
MHVS	Maternal Health Voucher Scheme
MICS	Multiple Indicator Cluster Survey
MIS	Management Information System
MOHFW	Ministry of Health and Family Welfare
MOHPW	Ministry of Housing and Public Works
MOLGRD&C	Ministry of Local Government, Rural Development and Co-operatives
MRA	Microcredit Regulatory Authority
NCDs	Non-communicable Diseases
NDVP	National Deployment and Vaccination Plan for COVID-19 Vaccines in Bangladesh
NEMEMW&TC	National Electro Medical Equipment Maintenance Workshop and Training Center
NHSDP	NGO Health Service Delivery Program
NHSO	National Health Security Office
NGOs	Non-governmental Organization
OP	Operation Plan
PHC	Primary Health Care
PP2041	Perspective Plan of Bangladesh 2021-2041
PPE	Personal Protective Equipment
PRSP	Poverty Reduction Strategy Paper
PWD	Public Work Department
RCHCIB	Revitalization of Community Health Care Initiatives in Bangladesh
RMNCAH	Reproductive, Maternal, Newborn, Child and Adolescent Health
SACMO	Sub-assistant Community Medical Officer
SEARO	South-East Asia Regional Office
SDGs	Sustainable Development Goals
SIP	Sector Investment Plan
SOP	Standard Operating Procedures
SSK	Shasthyo Surokhsha Karmasuchi
SWAp	Sector-Wide Approaches
TBA	Traditional Birth Attendant
UFPO	Upazila Family Planning Officer
UHC	Universal Health Coverage
UH&FPO	Upazila Health & Family Planning Officer
UHFWC	Union Health and Family Welfare Center
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UPHCSDP	Urban Primary Health Care Services Delivery Project

USAID	United States Agency for International Development
USC	Union Sub-center
UzHC	Upazila Health Complex
WHO	World Health Organization

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## Summary

1. The People's Republic of Bangladesh (hereinafter referred to as "Bangladesh") has maintained solid economic growth, with real Gross Domestic Product (GDP) growth exceeding 5% annually since 2010. The country is expected to grow at a high rate in the 7% range and is attracting attention as a promising industrial base and market due to its solid economic growth. Gross national income per capita is also expected to exceed US\$2,000, and the country is expected to graduate from the Least Developed Countries (LDC) by 2026. However, for sustainable economic development, industrial diversification and reform of the financial structure are challenges, and the percentage of the poor must be further reduced from 24.3%. In recent years, in addition to natural disasters and climate change, the impact of the Coronavirus disease 2019 (COVID-19) pandemic and the influx of displaced people from Rakhine State, Myanmar on the economic and social situation and the health sector cannot be ignored.
2. The ruling Awami League announced Vision 2041 in 2014, aiming to eliminate extreme poverty and reach upper-middle income country status by 2031 and high-income country status by 2041. A long-term plan, Perspective Plan of Bangladesh 2021-2041 (PP2041), and a medium-term plan, the Eighth Five-Year Plan (8FYP), are currently being implemented to achieve this goal. In the health sector, the National Health Policy was announced in 2011. In addition to focusing on improving maternal and child health and nutrition, it also aims to utilize ICT, collaborate with other ministries and the private sector, and strengthen services for the socially vulnerable.
3. The Fourth Health Sector Program (4<sup>th</sup> HPNSP) is currently under implementation. It aims to address health sector issues in the target areas of "Governance and Stewardship," "Health Systems Strengthening" and "Quality Health Services." The 4<sup>th</sup> HPNSP Mid-term Review Report shows that while progress is being made in disease-specific measures and reporting, there are challenges in governance and stewardship in general, and in providing services for family planning and pregnant women who do not use health facilities, as well as some challenges in medium- and long-term efforts to improve the quality of services. The conclusion is that it would be difficult to achieve Universal Health Coverage (UHC) by 2030. There is also a strong need to improve operational efficiency by strengthening responsible departments and centralizing decision-making and system operation within the Ministry of Health and Family Welfare (MOHFW), and strengthening cooperation with actors, such as the private sector and other ministries. The 4<sup>th</sup> HPNSP was initially set to be implemented until 2022, but in order to ensure steady implementation, a one-year extension to June 2023 was decided.
4. The health situation of the people of Bangladesh has improved significantly, with an increase in life expectancy, a decrease in maternal and child mortality, and a decrease in infectious diseases. However, only about half of the population has access to essential health services, which remains an obstacle to



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further reducing mortality. Economic poverty makes achieving UHC difficult, as nearly 10% of households have health-related expenditures that exceed 25% of household expenditures. In addition, the structure of disease is rapidly shifting from infectious diseases to non-communicable diseases (NCDs), resulting in a "double burden of disease," where causes of death related to infectious diseases, pregnancy, childbirth, and newborns, although on the decline, coexist with the increasing number of deaths related to non-communicable diseases.

5. Maternal deaths have declined substantially since 2000 but are still higher than the South Asian average, and the pace of decline must be accelerated to reach the 2022 target of 121 maternal deaths per 100,000 live births. The maternal mortality rate in rural areas is twice that of urban areas, and the disparity is significant. The under-five and neonatal mortality rates have declined steadily and are 40 and 26 (per thousand live births), respectively, in 2019. However, the MOHFW aims to reduce these to 34 and 18 (per thousand live births), respectively, by 2022; therefore, the achievement is expected to be difficult. The HIV infection rate is low and tends to remain flat. On the other hand, TB incidence has been gradually increasing since 2000. Malaria remains endemic in areas bordering eastern India and western Myanmar, but progress is being made toward elimination. As for NCDs, the proportion of deaths from them is on the rise, with the share of deaths from NCDs among all deaths rising sharply from 52% a decade ago to 67% in 2016. Cardiovascular diseases, cancer, and respiratory diseases are the leading causes of death. The population is also gradually shifting from "high fertility and low mortality" to "low fertility and low mortality." There are concerns about the burden on public services and the need to strengthen the health system.
6. Regarding maternal and child health services, prenatal and postnatal care and emergency obstetric newborn care, facilities, and partnerships with NGOs and private healthcare facilities are improved. However, health personnel, healthcare facilities, medical equipment, infection control measures, laboratory capacity, and essential drugs are inadequate, and access to services as well as the quality of care is often a challenge. The use of family planning services has leveled off in recent years, with a combined utilization rate of 63% (2019) for modern and traditional contraceptive methods. There is a need to improve knowledge among youth and quality service provision to achieve the objective of an 80% contraceptive utilization rate by 2025. In the area of infectious disease control, efforts have been successful in controlling malaria and treating TB positives. Efforts to control NCDs are also intensified, but there are challenges such as the lack of a direct central government agency to lead the measures, incomplete surveillance system in hospitals, and lack of essential health service packages to control NCDs at all levels of healthcare facilities.
7. There are challenges in governance, health financing, human resources for health, healthcare facilities, medical equipment, and pharmaceuticals in the health system, which have impacted service delivery. In

governance, the main problems are inefficiencies caused by duplication of service delivery systems managed separately by the Directorate General of Health Services (DGHS) and the Directorate General of Family Planning (DGFP) of the MOHFW, and programs that do not take into account the realities at the field level due to limited decentralization. In health financing, public and private health expenditures combined account for 2.34% of the GDP, which is low compared to neighboring countries, while the high rate of out-of-pocket expenditure is remarkable, reaching 73.9% in 2018, which causes negative impacts on the use of health services by the poor, particularly. The problem of human resources for health is also extremely serious. Bangladesh formulated a health workforce strategy in 2015 and works to strengthen the development and deployment of human resources, but there is still a significant shortage in numbers, particularly of nurses. There is also a problem of uneven distribution of human resources in urban areas. Delays in the construction of new healthcare facilities and the allocation of equipment and human resources to these facilities, inadequate maintenance of healthcare facilities and equipment due to budget and human resource shortages, inefficient procurement systems for medical equipment and medicines, and inadequate inventory management of medicines, resulting in daily stock-outs, have all contributed to a decline in the quality of health services. This makes it difficult to achieve UHC.

8. Since 2009, the health information system has been developed. In particular, the introduction of District Health Information Software 2 (DHIS2) in 2011 has streamlined the process of collecting, compiling, integrating, analyzing statistics, and disclosing health information. Efforts have also been made to improve ICT literacy by developing ICT infrastructure at healthcare facilities and training for health personnel, greatly improving the health information system from the upazila to the central level. On the other hand, the following issues have been identified: inconsistency of health information across multiple platforms, difficulty in sharing health information with private healthcare facilities, lack of human resources and budget necessary for system development, and lack of utilization of health statistics for policy making. A balanced approach is needed to (1) strengthen governance for the enhancement and maintenance of health information systems, (2) introduce ICT systems suitable for data collection and management and standardize the development of health information systems, (3) develop institutional, organizational, and human resource capacity, and (4) develop and strengthen ICT infrastructure.
9. The private sector is growing, especially in Dhaka, where the number of private hospitals and clinics registered with the DGHS is rapidly increasing. A large number of private healthcare facilities, coupled with the low level of satisfaction with the services provided by public healthcare facilities, have made the private sector an important complement to government services. The Bangladesh government also aims to improve the coverage and quality of services by promoting partnerships with the private sector. However, except for facilities run by NGOs, the high cost of medical care makes it difficult for people other than middle- and high-income groups to use private facilities. The problem is also found in the delay in strengthening cooperation between the government and the private sector. The services provided

by private healthcare facilities also present problems such as inappropriate medication, poor sanitary conditions, lack of equipment, and different fees for different facilities. It is reported that many facilities are unregistered, and there is a need to strengthen regulation and supervision by the MOHFW. In addition, the high out-of-pocket expenditures are largely due to the fact that 64.5% of the payments are spent at pharmacies and drug retailers. The spending ratio is high because patients often purchase pharmaceuticals without seeing health personnel to finish the treatment. Although the private health insurance and medical device/pharmaceutical industries are growing, the industry as a whole is immature. Startup companies are also attracting attention for expanding online medical care under COVID-19, but they lack the necessary funding, human resources, and knowledge.

10. In the health sector in Bangladesh, donors have provided assistance under the Sector Wide Approach (SWAp) aid coordination framework since 1998, and in the 4<sup>th</sup> HPNSP, funding to the multi-donor trust fund and multilateral and bilateral assistance is provided under the SWAp framework. In MOHFW, programs are implemented through Operational Plans (OPs) led by Line Directors (LDs), each OP includes SWAp activities in line with the budget, and annual program reviews are conducted to verify program implementation and budget execution. Development partners provide support to the task groups and technical committees for OP operations. Local Consultative Groups (LCGs) serve as a coordination system between ministries and donors, and in the health sector, the Health, Population and Nutrition Consortium (HPNC), established as a working group of the LCGs, coordinates donors. Development partners such as the World Bank, WHO, UNFPA, UNICEF, ADB, USAID, FCDO (formerly DFID), and GIZ provide various support.
11. Cox's Bazar District of the Chattogram Division in southeastern Bangladesh is home to around 900,000 displaced people from Rakhine State, Myanmar, after the massive displacement in 2017. Both host communities and displaced people have high needs for social support and services, and the strain on the service delivery system has become an issue. In addition, the high infant mortality rate, high fertility rate, and gender-based violence (GBV) problems have been prominent in the district, and these have been exacerbated by the COVID-19 pandemic and the influx of displaced people. In the field, the following problems have been observed: 1) inadequate healthcare facilities and medical equipment; 2) drug stock-outs due to lack of timely procurement and proper storage and inventory management; 3) overcrowding of patients at the district hospital and upazila health complexes (UzHCs) due to a lack of structured referrals in addition to the increase in patients due to population growth and aging population; 4) lack of health personnel and an inadequate skill mix. There is a critical need to identify the number and capacity of healthcare facilities and the necessary equipment and human resources at the district, upazila, and community levels and develop a healthcare service delivery system. A number of development partners implement activities in the health sector in host communities and displaced people camps in Cox's Bazar district.

12. In this survey, a proof-of-concept (PoC) was conducted to verify and propose an ICT utilization plan that would contribute to solving issues in the health sector. For the PoC, the status of ICT utilization and issues in the Bangladesh health sector were identified, ICT utilization plans that contribute to solving the issues were identified, and an ICT utilization plan for the PoC was selected. A prototype based on the ICT utilization plan was then developed and introduced into the field, where health services are provided to demonstrate the actual operation of the system. A prototype was developed that combines the use of a health ID that uniquely identifies user households and the enhanced Expanded Program on Immunization (EPI) vaccination follow-up, and based on the results of the PoC of the ICT utilization plan in operation and the knowledge and experience of the subcontractor in implementing, introducing, and operating the health information system, the following measures were obtained as measures for utilization: (i) establishment and operation of a technical steering community for health information systems (HIS); (ii) implementation of ICT tools and capacity building related to local HIS after reviewing and optimizing the information collection and management workflow of targeted health services; and (iii) implementation and operation of health IDs. For (iii), health services would be optimized, and the collected health information would be properly managed and utilized for policy formulation in the health sector.
  
13. In the Bangladesh health sector, the Japanese government and the JICA have implemented projects that take advantage of Japan's strengths in maternal and child health. Recently the scope of assistance has been expanded to NCDs and human resources for health development for responding to the needs. In addition, a number of public-private partnership projects have been adopted in recent years, and Japanese companies have provided unique assistance in the field of medical equipment and improved nutrition. Japanese assistance at the community and healthcare facility levels has been highly evaluated. In this survey, the following areas were considered to have high future support needs: strengthening the health service delivery system through support for healthcare facilities and equipment and referral strengthening and support for implementation of health workforce strategy in Cox's Bazar district, and realization of a health information system ecosystem and introduction and dissemination of health IDs for achieving UHC.

## **Chapter 1      Outline of the Survey**

### **1.1 Background of the Survey**

The health sector in the People's Republic of Bangladesh (hereafter referred to as Bangladesh) still faces many challenges in achieving the Sustainable Development Goals (SDGs), including Universal Health Coverage (UHC). In addition, the outbreak of the novel coronavirus disease (COVID-19) has exposed the vulnerabilities of the health system. The health sector in Bangladesh needs to be strengthened now more than ever.

The Seventh Five Year Plan (FY2016/17-2020/21), a national development plan, aims to achieve UHC by ensuring access to health, nutrition, and population services, especially for vulnerable groups such as women, children, the elderly, and the poor; controlling fertility, and implementing adolescent and reproductive health. The plan also addresses strengthening support for communities and improving nutrition for women and children. The Fourth Health, Population and Nutrition Sector Program (2017-2022) (4<sup>th</sup> HPNSP), a sub-plan of the Seventh Five Year Plan, aims to expand access to quality and equitable health services so that all populations can enjoy good health and welfare. To achieve the goal, various measures are taken to enhance the governance of the Ministry of Health and Family Welfare (MOHFW), strengthening financial management and infrastructure, securing quality health personnel, and strengthening disease control.

In response to this, JICA has supported the strengthening of the Bangladesh health system by equipping healthcare facilities, developing human resources for health, and reinforced measures against non-communicable diseases (NCDs) through ODA loans and technical cooperation projects. Other donors, such as the World Bank, ADB, USAID, and GIZ, also provide assistance to the Bangladesh health sector under the aid coordination framework.

However, the Mid-Term Review Report of the 4<sup>th</sup>HPNSP, released in May 2020, reported slow progress on almost all indicators. There is concern that the impact of Coronavirus disease 2019 (COVID-19) delays the implementation of the 4<sup>th</sup> HPNSP furthermore.

The Government of Bangladesh formulated the Bangladesh Preparedness and Response Plan for COVID-19 (BPRP) in July 2020 to address the COVID-19 outbreak. The testing and treatment systems are gradually strengthened, and vaccination began in February 2021. However, it is necessary to address revealed vulnerabilities in the health system and service delivery challenges, such as insufficiencies of private hospitals' involvement, nosocomial infection control, and service delivery to the urban poor.

The next five-year plan, the Eight Five Year Plan (8FYP) (FY 2020/21 to 2024/25), strengthens equity, quality and efficiency in achieving UHC, as the former Plan. To address the various challenges in the health sector in Bangladesh, the government came out with the health program as follows: expansion and consolidation of community-based primary health care (PHC) services, restructuring of urban PHC services, up-gradation of existing health facilities and construction of new facilities, expansion of health protection schemes, incremental use of information technology, and establishment and updating of laws and policies to improve governance, equity, and inclusion.

## 1.2 Purpose of the Survey

The data collection survey (hereinafter referred to as the Survey) aims to analyze health sector issues in Bangladesh and review the initiatives of Japan and other donors in the sector. It will establish the direction of future assistance and effective aid approaches of JICA while paying attention to the existing policies in the Bangladesh health sector, such as 8FYP and the BPRP.

## 1.3 Outline of the Survey

### (1) Survey period

December 2020 to March 2022

### (2) Target area

All of Bangladesh

### (3) Relevant ministries, agencies, and institutions

The Ministry of Health and Family Welfare (MOHFW) is the primary ministry concerned. In addition to the MOHFW, the Finance Division and the Economic Relation Division of the Ministry of Finance are included when establishing the implementation system of loan aid projects.

The World Bank, the Asian Development Bank (ADB), the World Health Organization (WHO), the United Nations Children’s Fund (UNICEF), the United Nations Population Fund (UNFPA), and the United States Agency for International Development (USAID) are the relevant donors. Concerning local stakeholders, the Bangladesh Rural Advancement Committee (BRAC), the James P Grant School of Public Health of BRAC University, and healthcare-related companies (e.g., insurance, health tech) are included. Japanese companies interested in establishing a presence in Bangladesh, the Japan Chamber of Commerce and Industry (JCCI), and the Japan External Trade Organization (JETRO) are also be considered.

## 1.4 Survey schedule

The schedule of the Survey is shown in the table below. The scale of the field survey physically conducted by Japanese consultants in Bangladesh has been drastically reduced due to the pandemic of COVID-19 so far. The survey period was also extended to account for delays during the restriction measures from June to August 2021.

**Table 1-1 Survey schedule**

Schedule	Bangladesh/Japan	Main duties
December 2020 - January 2021	Work in Japan	Basic survey, preparation, and submission of the Inception Report
January - March 2021	Work in Japan	Literature review, interviews with relevant organizations, background information survey on a new development policy loan (DPL), preparation and submission of background paper drafts
March – April 2021	First field survey in Bangladesh	Selection of the sub-contractor for outsourcing of ICT utilization concept verification, conclusion of the contract, interviews with

Schedule	Bangladesh/Japan	Main duties
		relevant organizations regarding health information system and roles of the private sector
April – May 2021	Work in Japan	Literature review, interviews with relevant organizations, problem analysis, ICT utilization concept validation, background information survey on the DPL, preparation and submission of the background paper, preparation and submission of the Progress Report
June – December 2021	Work in Japan	Additional survey, examination of JICA’s new health sector assistances based on problem analyses, verification of the ICT utilization concept, survey in Southern part of the Chattogram Division
December 2021 - January 2022	Work in Japan	Review of new projects’ direction, preparation and submission of the Draft Final Report
January 2022	Work in Japan	Discussion on the direction of new projects
February 2022	Second field survey in Bangladesh	Discussion on the direction of new projects
February – March 2022	Work in Japan	Preparation and submission of the Final Report

### 1.5 Composition of survey team members

The composition of the team members for the Survey is shown in the table below.

**Table 1-2 Composition of survey team members**

Name	Role (Business in charge)	Company name
Takaharu Ikeda	Leader / Health System 1	IC Net Limited
Yoshie Mizogami	Deputy Leader / Health System 2	IC Net Limited
Noriaki Suzuki	Health Information System & ICT	IC Net Limited
Ken Araki	Health Policy & Finance	IC Net Limited
Yuko Otomo	Health Personnel	IC Net Limited
Haruko Shimomura	Health Care Facilities	K.I.TO Architects & Engineers Inc.
Yoichi Sugiura	Medical Equipment	me-training, Inc.
Naoe Sato	Health Services	IC Net Limited
Taiki Koizumi	Private Healthcare	IC Net Limited
Kazutaka Sekine	Health System 3	IC Net Limited

## **Chapter 2 Overview of the health sector in Bangladesh**

### **2.1 General situation**

#### **2.1.1 Demographics**

The population of Bangladesh is about 163 million as of 2019 data<sup>1</sup>. This is the eighth-largest population in the world, and the population is expected to reach 200 million by 2050. The ratio of urban to rural population is about 37% and 63 % as of 2019, but the percentage of the rural population is decreasing year by year<sup>2</sup>. The population density is about 1,239/km<sup>2</sup> (2018), which is the highest in the world except for island nations and city-states. Bengalis account for 98% of the total population. The population is predominantly young, with the largest proportion of both males and females are between the ages of 15 and 19, accounting for about 10% of the population. Life expectancy at birth has been increasing rapidly due to improvements in public health and the medical environment, from 64.45 years old in 2000 to 72.59 years old in 2019<sup>3</sup>.

#### **2.1.2 Economic conditions**

After the transition to a democratic system following the general elections in 1991, economic liberalization was promoted in Bangladesh, and the country has maintained steady economic growth since the 1990s. The real GDP growth rate has been above 5% per annum since 2010 and was 8.15% in FY2019<sup>4</sup>. Although it is expected to decline by a few percent in FY2020 due to the impact of the COVID-19, the growth rate is expected to remain in the high 7% range, and the economy is expected to continue growing steadily. A breakdown of GDP expenditure shows that private consumption accounts for 72.25%, followed by private investment (22.07%) and exports (17.2%), supported by high demand from the domestic private sector<sup>5</sup>.

Major export items are clothing products (including knitwear) (86.2%), jute products (2.6%), fish and seafood (0.7%), leather products (2.1%), and home textiles (0.8%), according to FY2019 data. Major import items were cotton and cotton products (20.8%), machinery equipment and parts (17.6%), mineral and petroleum products (15.9%), grains (7.1%), machinery and equipment (5.4%), iron and steel products (8.3%), plastic products (4.6%), edible oil (3.3%), and automobiles and vehicle parts (6.4%)<sup>6</sup>. The country is dependent on the garment industry to obtain foreign currency. It needs to diversify its industries and reform its financial structure to achieve sustainable economic development. In addition, there is an urgent need to improve basic infrastructure such as electricity and roads to promote further investment from overseas.

The government's finances are in a chronic state of deficit, and it has not been able to get out of the structure

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<sup>1</sup> World Bank. Population, total - Bangladesh (<https://data.worldbank.org/indicator/SP.POP.TOTL?locations=BD>). (Accessed on May 24, 2021)

<sup>2</sup> World Bank. Rural population (% of total population) - Bangladesh (<https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=BD>). (Accessed on May 24, 2021)

<sup>3</sup> World Bank. Life expectancy at birth, total (years) - Bangladesh (<https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=BD>). (Accessed on May 24, 2021)

<sup>4</sup> World Bank. GDP growth (annual %) - Bangladesh (<https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=BD>). (Accessed on May 24, 2021)

<sup>5</sup> Bureau of Statistics. GDP of Bangladesh at 2014-2015(p). ([http://203.112.218.65:8008/WebTestApplication/userfiles/Image/GDP/GDP\\_2014\\_15\(p\).pdf](http://203.112.218.65:8008/WebTestApplication/userfiles/Image/GDP/GDP_2014_15(p).pdf)). (Accessed on May 24, 2021)

<sup>6</sup> Ministry of Foreign Affairs, Basic Data of the People's Republic of Bangladesh (<https://www.mofa.go.jp/mofaj/area/bangladesh/data.html>) (Accessed on May 24, 2021) (In Japanese only)



of using foreign aid and domestic bank loans to cover the deficit. This is mainly due to the weakness of the governmental tax collection capacity and revenue base, as well as the inefficient use of state-owned enterprises to cover budget deficits.

### **2.1.3 Society and culture**

The ethnic composition of Bangladesh is mostly Bengali, but the Chittagong Hills along the border with Myanmar is home to 12 indigenous people, including the Chakma people, known as the Jumma. The official language is Bengali, and the literacy rate for people over 15 years old is 72.9%. The religious affiliation is Muslim (90.4%) and others (Hindus, Buddhists, Christians) (9.6%)<sup>7</sup>.

Since the transition to democracy in 1991, the two major political parties, the Bangladesh Nationalist Party (BNP) and the Awami League, have alternated in power, resulting in a continuing conflict between the two parties. Since 2014, the Awami League has won the general election, and Prime Minister Sheikh Hasina has been in power. General strikes (hartals) have been frequent and have a significant impact on economic and social activities. Since the terrorist attack on Dhaka in July 2016, which resulted in the death of 22 people, including JICA consultants, there have been sporadic bombings targeting police officers. However, there have been no new terrorist incidents involving foreign nationals as a result of the security authorities' efforts to clean up terrorist organizations and strengthen security and vigilance. However, there have been a number of small-scale bombings and other terrorist incidents in Dhaka and elsewhere, so continued caution is required.

Poverty remains a serious problem. As for the nation as a whole, the gross national income (GNI) per capita surpassed US\$2,000 for the first time in 2020, at US\$2,010, on the back of steady economic growth<sup>8</sup>. The country achieved all three of the Least Developed Country (LDC) graduation criteria set by the United Nations Development Committee<sup>9</sup>. Based on this situation, the UN Commission on Development Policy (CDP) annual meeting in February 2021 decided to recommend Bangladesh's graduation from LDCs, which the UN General Assembly adopted in November 2021. If there are no problems in the periodic performance review, Bangladesh is expected to graduate from the LDC in 2026. In addition, as a result of poverty reduction efforts since 2000, the percentage of the poor who fall below the national poverty line, calculated from the calorie intake threshold of 2,112 kcal 1per capita per day and non-food expenditures, was halved to 24.3% in FY 2016/17<sup>10</sup>.

The COVID-19 pandemic is expected to result in a sharp decline in demand for clothing products, especially for export, affecting job creation in urban areas, which has been an important driver of poverty reduction. Significant labor income losses are expected in the informal sector and labor-intensive sectors such as construction, and the negative impact on poverty is expected to be higher in urban centers. In addition,

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<sup>7</sup> Ibid.

<sup>8</sup> World Bank, GNI per capita, Atlas method (current US\$) - Bangladesh (<https://data.worldbank.org/indicator/NY.GNP.PCAP.CD?locations=BD>). (Accessed on July 17, 2021)

<sup>9</sup> World Bank, GNI per capita, Atlas method (current US\$) - Bangladesh (<https://data.worldbank.org/indicator/NY.GNP.PCAP.CD?locations=BD>). (Accessed on July 17, 2021)

<sup>10</sup> World Bank, 2020. Poverty & Equity Brief, Bangladesh. ([https://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global\\_POVEQ\\_BGD.pdf](https://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global_POVEQ_BGD.pdf)). (Accessed on May 24, 2021)

educational institutions have been closed for 18 months until September 2021, and as of January 2022, they have only reopened to a limited extent, which raises concerns about delays in learning.

Since August 2017, many people from Rakhine State in western Myanmar have fled to Bangladesh due to violence by Myanmar's national army, police, and vigilantes, creating a humanitarian crisis. In response to the massive influx of displaced people, the government of Bangladesh has set up temporary camps for displaced people in Cox's Bazar district, but has not accepted them officially, and has asked them to return to Myanmar. As of September 2021, there are approximately 900,000 displaced people living in densely populated camps, and health and nutrition problems, flood and fire damage, and security problems have been pointed out.

#### **2.1.4 Administration**

It is said that the administrative system in Bangladesh still retains the influence of the British colonial era, and bureaucracy is positioned as an important instrument for governance. The nature of the system has not changed much since the transition to democracy, except for the increase in the number of ministries and related agencies.

The head of the executive branch is the Prime Minister. The President appoints the leader of the winning political party as the prime minister after the parliamentary election. Ministers are selected by the Prime Minister and appointed by the President. The administrative structure consists of ministries and departments within the ministries. Politically appointed ministers serve as heads of ministries, and secretary generals (usually civil servants) serve as administrative heads and chief accountants. Currently, there are 39 ministries and about 1 million civil servants working there. The central administration adopts a two-tiered administrative system. The upper tier is the state-level central secretariat, consisting of ministries and departments that formulate policies, while the lower tier consists of "line" departments and directors attached to ministries and departments, which are mainly responsible for administrative tasks, service delivery, and implementation of government development programs.

Local government is divided into divisions and districts (as of 2021, there are eight divisions and 64 districts<sup>11</sup>). The highest administrative unit is the division, but the most important unit of local administration is the district. Under the districts are sub-districts (upazila) and unions, and in the urban areas are the city corporation and the pourashava. Health administration will be explained in Chapter 5. Although it is almost the same as above, the word is placed under the union in rural areas.

In Bangladesh, local administration is particularly weak, and not a few local governments are dysfunctional. A number of NGOs started their activities to support the return of Bengali refugees in the 1970s, and Bangladesh is now the country with the most active NGOs and civil society organizations among developing countries<sup>12</sup>. NGOs and civil society organizations play a major role in social development by providing public services on behalf of local governments. As far as the Bangladesh administration is concerned, the prevalence

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<sup>11</sup> Kolorob. Bangladesh District list: All Districts List according to the Division (<https://kolorob.com.bd/bangladesh-district-list/>). (Accessed on May 24, 2021)

<sup>12</sup> The total number of organizations is said to be more than 6,000. BRAC (Bangladesh Rural Advancement Committee) and Grameen Bank are considered to be the largest organizations in Asia.

of corruption among civil servants and politicians is also serious. The Corruption Perceptions Index (CPI) published by Transparency International ranks Bangladesh at a lowly 146<sup>th</sup> out of 180 countries, at 26/100 in the latest 2019 data<sup>13</sup>. Poor governance due to widespread corruption is considered to be a contributing factor to poverty in Bangladesh, and administrative reform is a long-standing issue.

### **2.1.5 Natural environment and climate change**

Bangladesh is highly vulnerable to natural hazards due to its geography, topography, diversity of rivers, and monsoon climate, and is prone to natural disasters such as floods, cyclones, storm surges, riverbank erosion, earthquakes, droughts, seawater intrusion, fires, and tsunamis. Floods and cyclones, in particular, have caused tremendous damage. Historically, the country has enjoyed rich land recharged by the overflow of the Ganges River, while flood damage occurs every year. About 80% of the country's total land area of about 148,000 km<sup>2</sup> is designated as flood inundation area. Cyclones have also resulted in the deaths of 364,000 in 1970<sup>14</sup>, 126,000 in 1991, 3,363 in 2007, and 190 in 2009. Droughts occur around March to May and often affect rice cultivation.

In addition, due to the maintenance of wells promoted after independence, many wells have been contaminated by arsenic, which originally existed in the geological formation, and this has become a nationwide problem. The problem is particularly serious in southeastern Bangladesh, where the government is strengthening measures with the support of international aid agencies but has yet to reach a drastic solution. More than 20 million people, mainly the poor, continue to drink well water contaminated with arsenic, putting them at risk of arsenic poisoning.

In addition, in recent years, the sea level has been rising year by year along the southern coast, leading to coastal erosion and the salination of groundwater, which in turn affects the availability of irrigation and drinking water. It has been pointed out that this is related to climate change, along with the huge size of cyclones, the extensive damage caused by floods due to heavy rains, and droughts caused by rising temperatures.

### **2.1.6 ICT diffusion**

As part of its national framework policy, the government of Bangladesh is promoting Digital Bangladesh, which promotes the introduction of information technology into management, operations and administration to improve business efficiency, transparency and accountability in all sectors of society, including business. The Digital Bangladesh Plan consists of four pillars: digital government<sup>15</sup>, promotion of ICT industry, connecting citizens, and human resource development, all of which are aimed at increasing employment opportunities in the country and promoting social and economic development.

As a result of these efforts, the ICT sector in Bangladesh has developed steadily and is expected to continue

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<sup>13</sup> Transparency International. Corruption Perceptions Index (<https://www.transparency.org/en/cpi/2019/index/bgd>). (Accessed on May 24, 2021). The closer to 100, the lower the level of corruption.

<sup>14</sup> At that time, Bangladesh was not yet independent (East Pakistan).

<sup>15</sup> It aims to reduce costs and manpower, improve administrative efficiency, and increase convenience for citizens by using ICT for administrative work of government agencies and various administrative procedures for citizens.

to expand. According to the International Telecommunication Union (ITU), the number of internet users has almost tripled from 6.5% of the population in 2013 to 18.02% in 2017. The Bangladesh Telecommunication Regulatory Commission (BTRC) has pegged the total number of internet subscribers at 102.1 million as of May 2020, which is about 62% of the population<sup>16</sup>. Most of the subscribers are using mobile broadband connections. However, in rural areas, many residents do not have mobile devices (e.g., cell phones, smart phones), and in many cases, the Internet connection is unstable depending on the terrain. The power infrastructure is also weak, and power outages often prevent data communication in healthcare facilities. In addition, while many of the younger generations have a good level of information literacy, the senior generation does not have sufficient information literacy.

Although Bangladesh ranks only 147<sup>th</sup> out of 176 countries in the 2017 ICT Development Index<sup>17</sup>, which indicates the ICT capability and readiness of countries, the adoption of ICT in business is steadily increasing. According to the Bangladesh Association of Software and Information Services (BASIS), Bangladesh has more than 1,500 registered software and IT companies and about 1 million professionals working in the ICT sector, excluding telecommunications. The export value of ICT is estimated to be over \$1 billion, with North America being the main destination.

## **2.2 National policy**

### **2.2.1 National development policy and planning**

Following Vision 2021, which was formulated as a manifesto by the ruling Awami League during the 2008 general elections and has been reflected in the major plans of various ministries, Vision 2041 was announced by Prime Minister Sheikh Hasina as a long-term vision plan related to the 2014 election manifesto. Vision 2041 aims to eliminate extreme poverty and reach upper-middle income country status by 2031 and high-income country status by 2041.

To realize Vision 2041, the Perspective Plan of Bangladesh 2021-2041 (PP2041) was formulated by the Planning Commission under the Secretariat of the General Economics Division (GED) of the Ministry of Planning in March 2020. The PP2041 sets out the following strategic goals<sup>18</sup>:

- Eradication of extreme Poverty by 2031; reducing Poverty to less than 3 percent by 2041.
- Towards upper middle-income country by FY 2031; High-income country by 2041.
- Industrialization with export-oriented manufacturing will drive structural transformation into the future.
- Increasing productivity and ensuring food security through a paradigm shift in agriculture.
- A service sector of the future will provide the bridge for the transformation of the rural agrarian economy to a primarily industrial and digital economy.

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<sup>16</sup> International Trade Administration. Bangladesh - Country Commercial Guide, Information and Communication Technology (ICT) (<https://www.trade.gov/country-commercial-guides/bangladesh-information-and-communication-technology-ict>). (Accessed on May 24, 2021).

<sup>17</sup> International Telecommunication Union. ICT Development Index 2017 (<https://www.itu.int/net4/ITU-D/idi/2017/index.html>). (Accessed on May 24, 2021)

<sup>18</sup> General Economics Division (GED), Bangladesh Planning Commission, Ministry of Planning, 2020. Making Vision 2041 a Reality: Perspective Plan of Bangladesh 2021-2041.

- The urban transition will be an essential part of the strategy to move to a high-income economy.
- Efficient energy and infrastructure will be essential components of the enabling environment that facilitates rapid, efficient and sustainable growth.
- Building a Bangladesh resilient to climate change and other environmental challenges.
- Establishing Bangladesh as a knowledge hub country for promoting a skill-based society.

The Five-Year Plan is formulated by the Planning Commission to implement the Perspective Plan. It is also positioned as a Poverty Reduction Strategy Paper (PRSP).

Currently, the 8th Five Year Plan (8FYP) is under implementation<sup>19</sup>. The main task of the 8FYP is to implement PP2041 so that Bangladesh will achieve upper-middle-income status by 2031 and move closer to the goals of achieving the key SDG targets and eliminating extreme poverty. In this context, the following six core themes are identified:

- Rapid recovery from COVID-19 to restore human health, confidence, employment, income and economic activities.
- GDP growth acceleration, employment generation, productivity acceleration and rapid poverty reduction.
- A broad-based strategy of inclusiveness with a view to empowering every citizen to participate fully and benefit from the development process and helping the poor and vulnerable with social protection-based income transfers.
- A sustainable development pathway that is resilient to disaster and climate change; entails sustainable use of natural resources; and successfully manages the inevitable urbanization transition.
- Development and improvement of critical institutions necessary to lead the economy to UMIC status.
- Attaining SDG targets and coping up the impact of LDC graduation.

Fifteen priority areas are defined in the 8FYP. These are related to the SDGs and align with the development vision and goals set in PP2041. The following are the 15 priority areas and the expected outcomes.

**Table 2-1 Priority areas of the 8FYP**

National priority	Outcome statement
Inclusive economic growth through macroeconomic stability	Conducive macroeconomic environment to promote inclusive growth, supported by trade and private sector development
Reducing poverty and inequality	Reduction in poverty and inequality across all groups and regions
Employment	Increased productive and decent employment opportunities for sustainable and inclusive growth
International cooperation and partnership	Strengthen international cooperation and partnership for sustainable development
Health and well being	Sustainable improvements in the health sector, including reproductive health and family planning, particularly of vulnerable groups
Quality education	Quality education for all to reduce poverty and increase economic growth
Agriculture and food security	Achieving food security and promoting sustainable agriculture for becoming a prosperous country
Clean water & sanitation	Ensure availability of safe drinking water and sanitation for all

<sup>19</sup> GED, Bangladesh Planning Commission, 2020. 8th Five Year Plan July 2020-June 2025: Promoting Prosperity and Fostering Inclusiveness.

National priority	Outcome statement
Transport and communications	Improved transport infrastructure for higher economic growth
Power, energy and mineral resources	Ensure sustainability in production, consumption and use of energy and mineral resources
Gender and social inequality	Achieve gender equality and empower all women and girls
Environment, climate change and disaster management	The natural environment is preserved and prevented from degradation, and a disaster management strategy exists, as well as ensuring climate change adaptation and mitigation
Information and communications technology (ICT)	Increased access to digital communications through telephone and broadband services
Urban development	Reduced urban poverty and improved living conditions through better city governance and service improvements
Governance	Promoting inclusive, transparent, accountable and effective democratic governance system and ensuring justice for all

The performance of the 8FYP will be assessed by 104 measurable indicators set for these priority areas.

### 2.2.2 Overview of National Health Policy

Based on the National Development Plan, the MOHFW released the National Health Policy 2011. The National Health Policy has the following goals.

**Table 2-2 Goals of the National Health Policy 2011**

No.	Goals
1	To deliver fundamental health services among people of all social strata to improve nutritional status and public health with the objective of establishing health as right in accordance with the Constitution and other international conventions.
2	To ensure easily accessible quality health services for the people, especially poor and marginalized section of the population in the urban and rural areas.
3	To ensure establishment of one community clinic for every six thousand people with the purpose of ensuring primary health service to all citizens.
4	To prioritize emergency medical care.
5	To reduce child mortality and maternal mortality rate to a rational level by 2021, on the occasion of the Golden Jubilee of Independence.
6	To strengthen and accelerate family planning and reproductive health services in order to achieve replacement level of fertility by 2021.
7	To take satisfactory actions to improve child and maternal health and to ensure the best possible safe delivery services in every village.
8	To create acceptability of family planning programs and ensure availability of family planning materials to the ultra-poor and low-income group of population.
9	To ensure gender equality in health care.
10	To ensure the maximum and best use of information technology for comprehensive management of health sector, including health services.
11	To ensure necessary equipment and manpower in public health centers and hospitals and improve quality of care through improved management.
12	To ensure quality service by private medical colleges, medical education and training institutes, hospitals, clinics and diagnostic centers and keep the services and education cost affordable for all people.
13	To modernize and update all kinds of medical education, nursing education, medical technology and medical assistant education systems according to the need of the country.
14	To ensure collective and coordinated efforts of different ministries, departments and private sectors related to public health and treatment.
15	To strengthen the disease prevention system and maintain and strengthen immunization programs to realize that objective.
16	To ensure the right to access to health information for all citizens.
17	To ensure the price control and availability of essential drugs.
18	To monitor health hazard and disease trends related to climate change and discover possible ways for

No.	Goals
	relief.
19	To make arrangements for improvement of alternative health care methods (Unani, Ayurveda and Homeopathy) and education.

The Fourth Health Population and Nutrition Sector Program (4<sup>th</sup> HPNSP) (see 2.2.3), National Nutrition Policy 2015, Healthcare Financing Strategy 2012-2032 (see 5.2.2), and Bangladesh Health Workforce Strategy 2016-2021 (see 5.3.1) are considered important policies and strategies linked to the National Health Policy<sup>20</sup>.

### 2.2.3 Implementation status of the 4<sup>th</sup> Health Sector Program

The MOHFW has developed a Sector Wide Approach (SWAp) since July 1998, and the current 4<sup>th</sup> SWAp is the 4<sup>th</sup> HPNSP. As a sub-program of the 7<sup>th</sup> and 8<sup>th</sup> Five Year Plans, it functions to realize them. The 4<sup>th</sup> HPNSP was originally planned to be implemented until 2022, but in the mid-term evaluation held in May 2020, it was discussed to extend the implementation period because of the progress made. Subsequently, the MOHFW decided to extend the 4<sup>th</sup> HPNSP by one year until June 2023 at the Bangladesh Government-Donor Meeting to ensure a continuous implementation period of the 4<sup>th</sup> HPNSP due to the impact of COVID-19 and the increased focus on providing health services to displaced people.

The 4<sup>th</sup> HPNSP is divided into three components: Governance and Stewardship, Health Systems Strengthening, and Quality Health Services. The target areas are listed in the table below, aiming to solve various issues in the health sector<sup>21</sup>.

**Table 2-3 Three components and target areas of the 4<sup>th</sup> HPNSP**

Component	Thematic area
Governance and Stewardship	<ul style="list-style-type: none"> <li>• Sector management</li> <li>• Governance and stewardship</li> <li>• Health financing and equity</li> <li>• Pharmaceuticals and drug administration</li> </ul>
Health Systems Strengthening	<ul style="list-style-type: none"> <li>• Human resource development and human resource management</li> <li>• Information management and data systems</li> <li>• Physical facilities, procurement and cold chain</li> <li>• Financial management and audit</li> </ul>
Quality Health Services	<ul style="list-style-type: none"> <li>• Reproductive, maternal, neonatal, child and adolescent health (RMNCAH)</li> <li>• Family planning</li> <li>• Primary health care (rural)</li> <li>• Primary health care (urban)</li> <li>• Secondary and tertiary care</li> <li>• NCD and lifestyle and environment</li> <li>• Communicable disease control</li> <li>• Nutrition</li> </ul>

<sup>20</sup> Management Information System, Directorate General of Health Services, Ministry of Health and Family Welfare, 2020. Health Bulletin 2019.

<sup>21</sup> From the 4<sup>th</sup> Health, Population and Nutrition Sector Program (HPNSP) 2017-2022 Mid-Term Review (MTR) 2020 Main Report. The categories of target areas are periodically reviewed during the progress management process of the 4<sup>th</sup> HPNSP. Table 2-3 shows what is presented in the Priority Action Plan for 2020.

The 4<sup>th</sup> HPNSP Mid-term Review Report released in May 2020 showed the progress by component as shown in Table 2-4.

**Table 2-4 Progress of the 4<sup>th</sup> HPNSP (at Results level)**

Component	Indicator	Progress
Governance and Stewardship	Governance and Stewardship Action Plan implemented in line with milestones	Off-Track
	Number of public and non-public facilities accredited	Off-Track
	% of DPs submitting annual performance reports on off-budget activities	Off-Track
	Incremental budget for MOHFW ensured	Off-Track
Health Systems Strengthening	% of service provider positions functionally vacant in district and upazila-level public facilities, by category	Off-Track
	Increase in the number of Operational Plans (OPs) with annual budget execution over 80%	On-Track
	Procurement lead time reduced for the packages tracked through SCMP	On-Track
	Number of performance monitoring reports prepared and disseminated annually	On-Track
	Number of UHFWCs under e-MIS scale up	On-Track
	Number of districts implementing comprehensive maternal perinatal and newborn death review	Some Progress
Quality Health Services	% of newborns received essential newborn care (ENC)	Some Progress
	% of infants aged 6- 23 months are fed with minimum acceptable diet	On-Track
	% of women aged 15-19 who have begun childbearing	On-Track
	% of population of age 25 years or above use tobacco	On-Track
	Contraceptive Prevalence Rate (CPR)	Off-Track
	CPR (modern methods) in lagging regions	Off-Track
	Antenatal care coverage (at least four visits)	Some Progress
	% of delivery by skilled birth attendant (SBA)	Some Progress
	% of mothers with non-institutional deliveries receiving PNC within two days	Off-Track <sup>22</sup>
	Ratio of births in health facilities of the richest wealth quintile to the poorest quintile	On-Track
	% of public health facilities/public service delivery points without stock-outs of essential medicines/FP supplies	Some Progress
	Tuberculosis case detection rate	On-Track
	Measles-Rubella (MR) immunization coverage among children under 12 months	On-Track
	% of public health facilities with at least one staff trained in pregnancy and childbirth	On-Track
	% of public facilities implement and monitor quality improvement activities	Some Progress

While good progress has been made on disease-specific measures and reporting, challenges are seen in governance and stewardship in general, as well as in family planning and service delivery to pregnant and lactating women who do not use health facilities. Some challenges have also been observed in medium and long-term efforts to improve the quality of services, and it has been concluded that it will be difficult to achieve

<sup>22</sup> In the main text of the Mid-term Review report, the assessment is “off-track,” but in Annex 3 of the report, it is “some progress.”



UHC by 2030.

Based on the results, the 4<sup>th</sup> HPNSP Mid-term Review Report made the following ten specific recommendations: there is a strong need to establish and strengthen the departments in charge within the MOHFW, unify decision-making and system operation, and improve operational efficiency by strengthening cooperation with actors outside the MOHFW, such as the private sector and other ministries.

1. Rapid expansion of financial protection (health budget expansion, health financing scheme redesign, etc.)
2. Strengthen governance and stewardship (establish new governance and management unit, strengthen the licensing system for facilities, etc.)
3. Reform and strengthen human resource management and institutional capacity (e.g., develop comprehensive training plans, develop medical specialists, etc.)
4. Reform and strengthen procurement in DGHS and DGFP and rationalize construction of new facilities (consolidate procurement lines, prioritize the use of existing facilities, etc.)
5. Improve availability of real time data (establish new units, examine and implement an integrated information system operation plan, etc.)
6. Strengthen maternal, newborn, child, and adolescent health (develop action plans, improve quality of services, strengthen partnerships with the private sector, NGOs, and other ministries, etc.)
7. Intensify efforts to address unmet family planning needs (clarify responsibilities, monitor quality, work with the private sector, etc.)
8. Phased strengthening of NCDs and mental health within PHC (strengthening preventive measures for NCDs, operationalizing mental health strategies, etc.)
9. Strengthen the rural PHC systems (update contracts and separation of duties with community health personnel, support the use of mobile health, etc.)
10. Strengthen the urban PHC system (strengthen the collaboration among ministries, private sector, NGOs, implement measures to address environmental health issues, etc.)

## Chapter 3 Current situation and issues of public health in Bangladesh

### 3.1 Overview

#### 3.1.1 Key health indicators related to the SDGs

The health status of the population has improved significantly, as evidenced by increased life expectancy, reduced maternal and child mortality, and decreased incidence of infectious diseases. However, only about half of the population has access to essential health services, which is an obstacle to a further reduction in mortality. Economic poverty also makes UHC difficult to achieve, as nearly 10 percent of households have health-related expenditures that exceed 25 percent of household expenditures<sup>23</sup>.

**Table 3-1 Health-related SDG indicators and progress<sup>2425</sup>**

Indicator	Baseline	Latest Status	Targets by 2020	Targets by 2022
3.1.1 Maternal mortality ratio (per 100 000 livebirths)	181 (SVRS, 2015)	165 (SVRS, 2019)	105	121
3.1.2 Proportion of births attended by skilled health personnel (%)	43.5% (MICS, 2012-13)	59% (MICS, 2019)	65%	65%
3.2.1 Under-5 mortality rate (per 1,000 livebirths)	36 (SVRS, 2015)	28 (MICS, 2019)	34	34
3.2.2 Neonatal mortality rate (per 1,000 livebirths)	20 (SVRS, 2015)	15 (MICS, 2019)	19	18
3.3.1 Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations	All ages: 0.01 (Women 15-49 years old: <0.01, Males 15-49 years old: <0.01) (UNAIDS, 2016)	All ages: <0.01 Adults aged 15-49: 0.015 (UNAIDS, 2018)	0.03	-
3.3.2 Tuberculosis incidence per 1 million population	287 (NTP 2016)	161 (DGHS)	250	-
3.3.3 Malaria incidence per 1,000 population	4.3 (MCP, 2015)	1.6 (WHO, 2019)	3	-
3.3.4 Hepatitis B incidence per 1 million population	-	-	-	-
3.3.5 Number of people requiring intervention against neglected tropical diseases	49,873,889 (WHO, 2016)	56,339,392 (WHO, 2019)	45,000,000	-
3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes, or chronic respiratory disease	21.0% (WHO, 2016)	21.6% (WHO, 2019)	15%	-
3.4.2 Suicide mortality rate	7.7 (BP, 2015)	7.6 (BP, 2019)	5.5	-
3.5.1 Coverage of treatment interventions for substance use disorders	16,416 (DNC, 2015, MOHA)	38,035 (DNC, 2018)	-	-
3.5.2 Harmful use of alcohol defined according to the	0.08 (WHO, 2016)	0.08 (DNC, 2018)	0.2	-

<sup>23</sup> Bangladesh Bureau of Statistics, 2017. Household Income and Expenditure Survey 2016-2017: Bangladesh, 2016-2017.

<sup>24</sup> Baseline, updated status, and targets to 2020 are taken from Sustainable development goals Bangladesh progress report 2020, Government of Bangladesh.

<sup>25</sup> For targets through 2022, see MOHFW. 2017. Program implementation plan: excerpt from the 4th Health, Population and Nutrition Sector Program (4th HPNSP).

Indicator	Baseline	Latest Status	Targets by 2020	Targets by 2022
national context as alcohol per capita consumption (aged 15 years and older) within a calendar year in liters of pure alcohol (ℓ)				
3.6.1 Death rate due to road traffic injuries	2.48 (PSD, 2015)	1.64 (PSD, 2018)	2.0	-
3.7.1 Proportion of women of reproductive age (aged 15-49 years) who have their need for family planning satisfied with modern methods	72.6% (BDHS, 2014)	77.4% (MICS, 2019)	75.0	-
3.7.2 Adolescent birth rate (aged 15-19 years old) per 1,000 women in that age group	75 (SVRS, 2015)	83 (MICS, 2019)	70	-
3.8.1 Coverage of essential health services (%)	52 (WHO, 2016)	54 (WHO, 2019)	65	-
3.8.2 Proportion of population with large household expenditures on health as a share of total household expenditure or income (%)	Population for whom health-related expenditures account for at least 25% of household expenditure: National: 9.5 Rural areas: 10.2 Urban: 7.7 (HIES-2017, BBS)	Population for whom health-related expenditures account for at least 25% of household expenditure: National: 9.5 Rural areas: 10.2 Urban: 7.7 (HIES-2017, BBS) <sup>26</sup>	-	-
3.9.1 Mortality rate attributed to household and ambient air pollution	-	-	-	-
3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation, and lack of hygiene knowledge	-	-	-	-
3.9.3 Mortality rate attributed to unintentional poisoning	0.3 (WHO, 2016)	0.3 (WHO, 2019)	0.3	
3.a.1 Current tobacco use among persons aged 15 years and older	43.3% (GATS, 2009, WHO)	35.3% (GATS, 2017, WHO)	35%	-
3.b.1 Proportion of the target population covered by all vaccines included in their national programme	78% (BDHS, 2014)	85.6% (BDHS, 2017-18)	95%	95%
3.b.2 Total net official development assistance to pharmaceutical research and basic health sector	-	-	-	-
3.b.3 Proportion of health facilities that have a core set of relevant	-	-	-	-

<sup>26</sup> No data updated since 2017. Therefore, 2017 data is the most recent data available.

Indicator	Baseline	Latest Status	Targets by 2020	Targets by 2022
essential medicines is available and affordable on a sustainable basis (%)				
3.c.1 Health worker density and distribution	7.4 (WHO, 2016)	8.3	18.9	-
3.d.1 International Health Regulations (IHR) capacity and health emergency preparedness (%)	78 (WHO, 2016)	58 (WHO, 2019)	95	-

### 3.1.2 Disease structure

As for the overall trend of causes of death, the percentage of deaths from neonatal disorders, lower respiratory tract infections, and tuberculosis, which traditionally accounted for the majority of deaths, has been decreased. On the other hand, as shown in Figure 3-1, non-infectious diseases such as stroke, ischemic heart disease, chronic obstructive pulmonary disease, diabetes, liver cirrhosis, and malignant tumors have increased between 2009 and 2019, and are now included in the ten leading causes of death. In particular, pulmonary diseases and diabetes have become prominent causes of death. The disease structure rapidly shifts from one based on infectious diseases to one based on non-communicable diseases. The background to such an "epidemiological transition" is the "population transition," which indicates a shift from "high birthrate and low death rate" to "low birthrate and low death rate." As a result, the causes of death related to infectious diseases, pregnancy and childbirth, and newborns, although on the decline, are mixed with those of non-communicable diseases, which are on the rise, creating a "double burden of disease" in which infectious diseases and non-communicable diseases coexist.

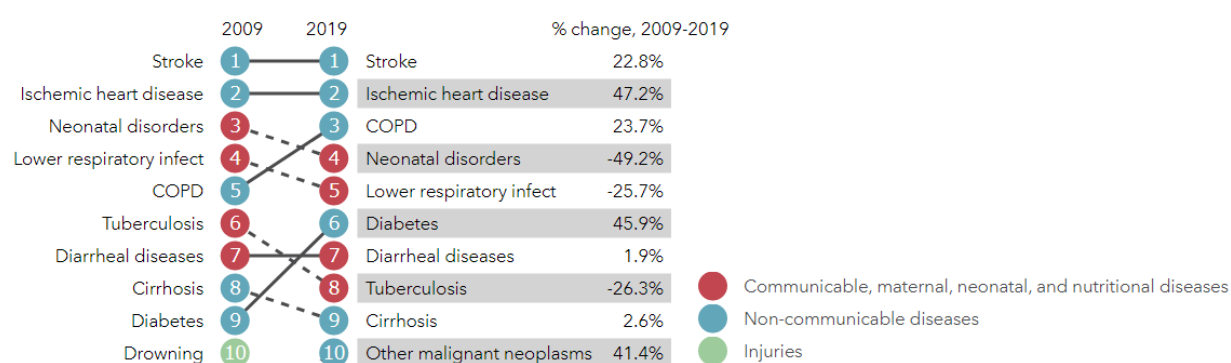
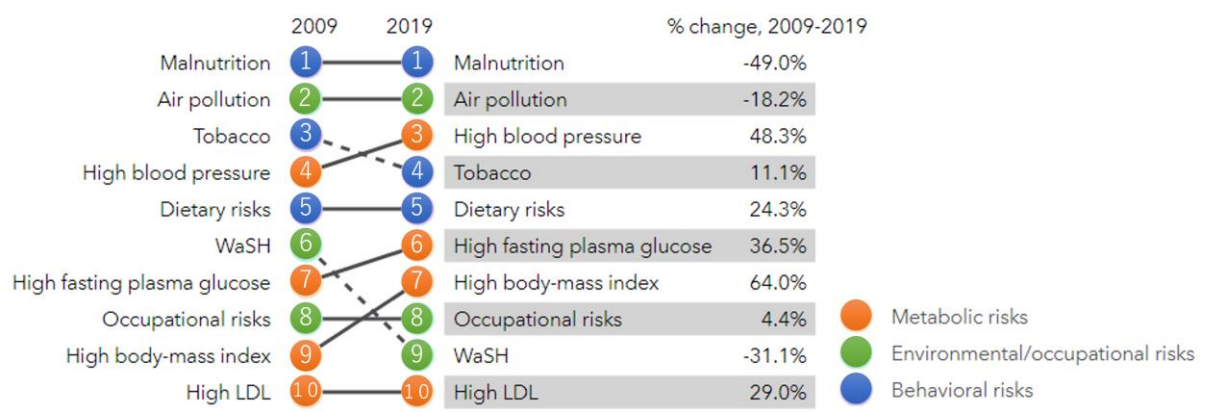


Figure 3-1 Top 10 causes of death in Bangladesh in 2009 and 2019 (all ages)<sup>27</sup>

Looking at the risk factors driving death and disability shown in Figure 3-2, malnutrition and air pollution still occupy the first and second place, although they have decreased in the past decade. On the other hand,

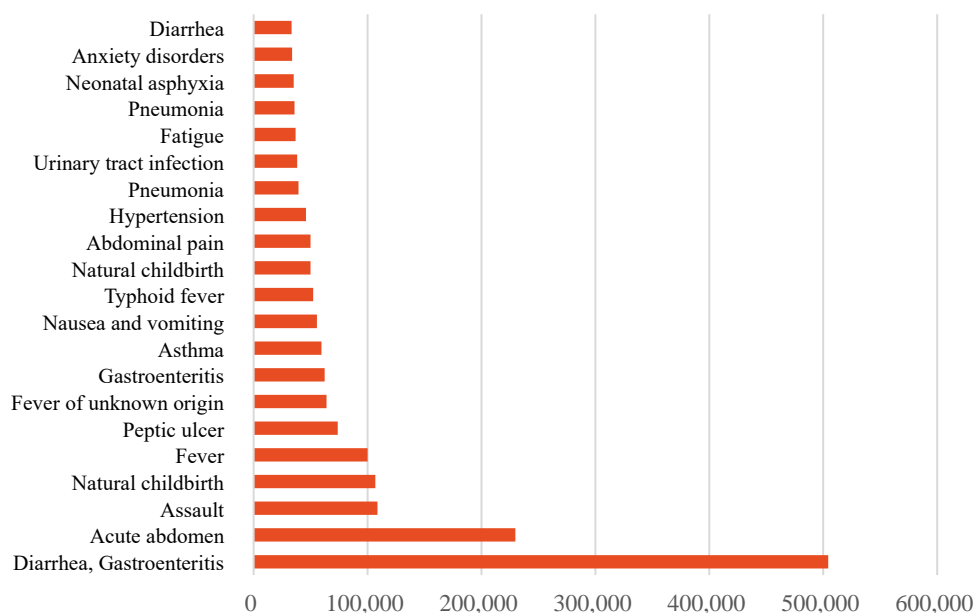
<sup>27</sup> Institute for Health Matrix and Evaluation, Bangladesh (www.healthdata.org/bangladesh). (Accessed on May 24, 2021)

behavioral risks such as hypertension, diabetes, obesity, and high LDL cholesterol have increased rapidly.



**Figure 3-2 Top 10 risk factors contributing to total number of DALYs in Bangladesh in 2009 and 2019 (all ages)<sup>28</sup>**

The graph shows the 20 major diseases and symptoms of patients admitted to public hospitals in Bangladesh (Figure 3-3). Diarrhea and gastroenteritis are the most common symptoms requiring hospitalization, followed by acute abdomen.



**Figure 3-3 Twenty major diseases among hospitalized patients (2018)<sup>29,30</sup>**

<sup>28</sup> Ibid.

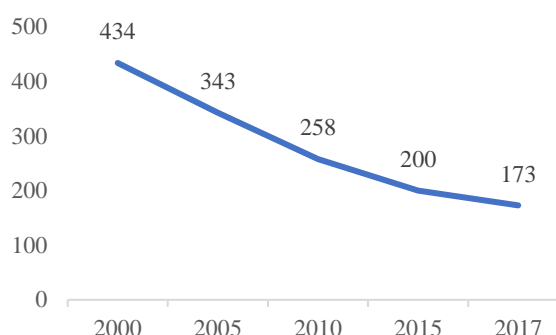
<sup>29</sup> There are overlapping categories for diarrhea, spontaneous labor, and fever, but differences are unknown.

<sup>30</sup> Management Information System, Directorate General of Health Services, Ministry of Health and Family Welfare, 2020. Health Bulletin 2019.

## 3.2 Maternal and child health

### 3.2.1 Maternal health

According to UN estimates, the maternal mortality ratio in Bangladesh is 173 (per 100,000 live births) in 2017 data. It remains high in the region, as the average for South Asia is 163. In Bangladesh, it is estimated that 5,100 mothers died during pregnancy, childbirth, and the postpartum period in the same year. As Figure 3-4 shows, there has been a significant decrease in the maternal mortality ratio from 434 in 2000 to a 60% decrease in 2017, an average annual decrease of 5.4%<sup>31</sup>. It is slightly



**Figure 3-4 Trends in maternal mortality ratio**

higher than the overall ratio of decline in maternal deaths in South Asia. The main reasons for the decline in the maternal mortality ratio are pointed out as a decline in the total fertility rate, improved use of maternal health services, and improved access to secondary and tertiary health care services, with improved education and employment of women and improved access to information which contributes indirectly<sup>32</sup>.

However, in order to achieve the 2022 target of 121 maternal mortality ratio, it is necessary to accelerate the speed of decrease. Note that the maternal mortality ratio for women in their 30s and 40s is higher than that for women in their teens and 20s, and the maternal mortality ratio is highest for women who have given birth four times. In addition, the maternal mortality ratio in rural areas is twice that of urban areas, showing a significant disparity<sup>33</sup>.

As shown in Figure 3-5, according to the 2016 MOHFW survey, maternal deaths are due to hemorrhage (31%), eclampsia (24%), complications from abortion (7%), obstructed or prolonged labor (3%), other direct causes (7%), and indirect causes (20%). The remaining 8% have undetermined causes. 24% of maternal deaths occurred during pregnancy, 7% during delivery, and 69 % postpartum.

<sup>31</sup> World Health Organization, UNICEF, World Bank Group, the United Nations Population Division. 2019. Trends in Maternal Mortality 2000 to 2017.

<sup>32</sup> Ministry of Health and Family Welfare. 2019. Bangladesh National Strategy for Maternal Health 2019-2030.

<sup>33</sup> Government of Bangladesh, Maternal Mortality Survey 2016.

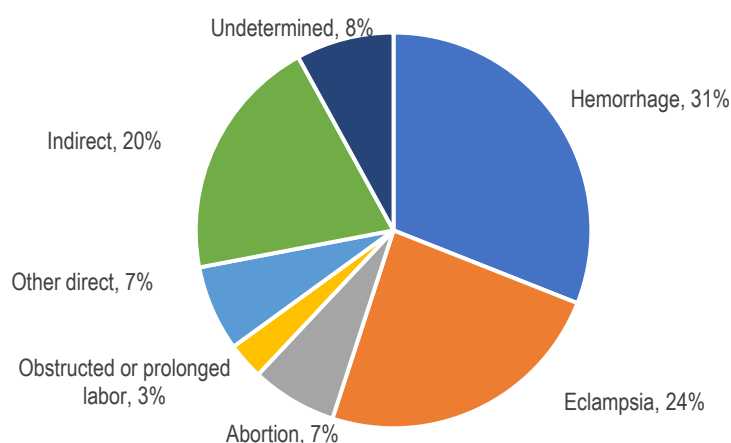


Figure 3-5 Causes of maternal death <sup>34</sup>

### 3.2.2 Child health

The child mortality rate in Bangladesh is steadily declining, as shown in Figure 3-6. According to the results of the Multiple Indicator Cluster Survey (MICS), the latest household survey, Bangladesh's neonatal mortality rate in 2019 was 26 (per 1,000 live births), infant mortality rate was 34 (per 1,000 live births), and under-five mortality rate was 40 (per 1,000 live births) <sup>35</sup>. The MOHFW aims to reduce the under-five mortality rate to 34 and the neonatal mortality rate to 18 by 2022, which will be difficult to achieve considering the MICS data. Bangladesh also has a high stillbirth rate of 25 (per 1,000 livebirths), suggesting poor quality of care during delivery.

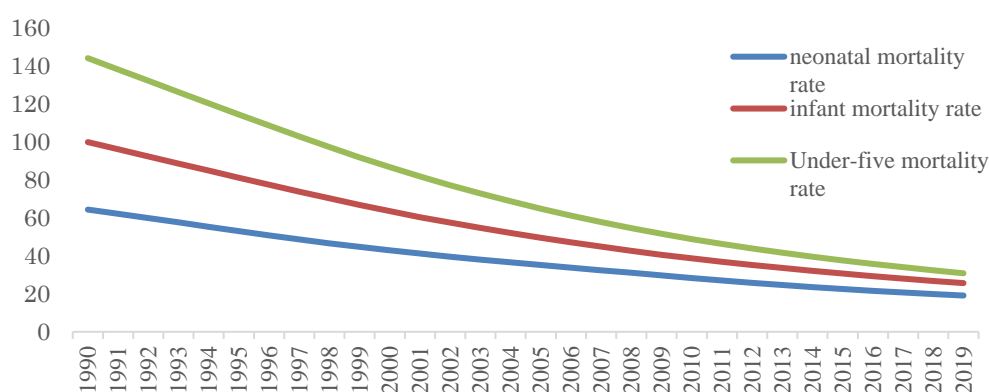


Figure 3-6 Trends in child mortality rates<sup>36</sup>

<sup>34</sup> Ibid.

<sup>35</sup> Multiple Indicator Cluster Survey 2019, Survey findings Report.

<sup>36</sup> United Nations Inter-Agency Group for Child Mortality Estimation (IGME) (<https://childmortality.org/data/Bangladesh>). (Accessed on May 24, 2021)

**Table 3-2 Latest child mortality rates and government targets**

	<b>UN estimates (2019)</b>	<b>MICS (2019)</b>	<b>Target value of MOHFW in 2022</b>
Neonatal mortality rate (per 1,000 livebirths)	19	26	18
Infant mortality rate (per 1,000 livebirths)	26	34	N/A
Under-five mortality rate (per 1,000 livebirths)	31	40	34

The causes of death in children under-5 years are preterm birth complications (20%), neonatal asphyxia (15%), pneumonia (15%), sepsis and other neonatal infections (12%), congenital anomalies (9%), diarrhea (6%), injuries (6%), non-infectious diseases (5%), measles (2%), meningitis/Japanese encephalitis (2%), and others (8%)<sup>37</sup>. There has been a significant change in the causes of death among children under five, with a significant decrease in pneumonia and diarrhea. The proportion of neonatal deaths (47%) has increased in relative terms due to an improvement in the establishment of survival after the first month of life. The causes of neonatal deaths include preterm birth complications (30%), neonatal asphyxia (23%), sepsis and other infectious diseases (20%), congenital anomalies (13%), pneumonia (6%), injuries (1%), diarrhea (1%), and others (6%)<sup>38</sup>. Worldwide, about half of under-five deaths are attributed to malnutrition<sup>39</sup>.

The 4<sup>th</sup> HPNSP mid-term review in 2020 pointed out that the main reasons for the high maternal, neonatal and stillbirth mortality rates are the still high proportion of home deliveries by traditional birth attendants, low utilization and quality of institutional deliveries, and limited access to 24/7 emergency obstetric and neonatal care<sup>40</sup>.

<sup>37</sup> Management Information System, Directorate General of Health Services, Ministry of Health and Family Welfare, 2020. Health Bulletin 2019.

<sup>38</sup> Ibid.

<sup>39</sup> Black, R. et al. 2013. "Maternal and Child Undernutrition and Overweight in Low-income and Middle-income Countries." The Lancet 382, no. 9890 (2013): 427-451

<sup>40</sup> Independent Review Team. 2020. 4th Health, Population and Nutrition Sector Program (HPNSP) 2017-2022 Mid-Term Review (MTR).



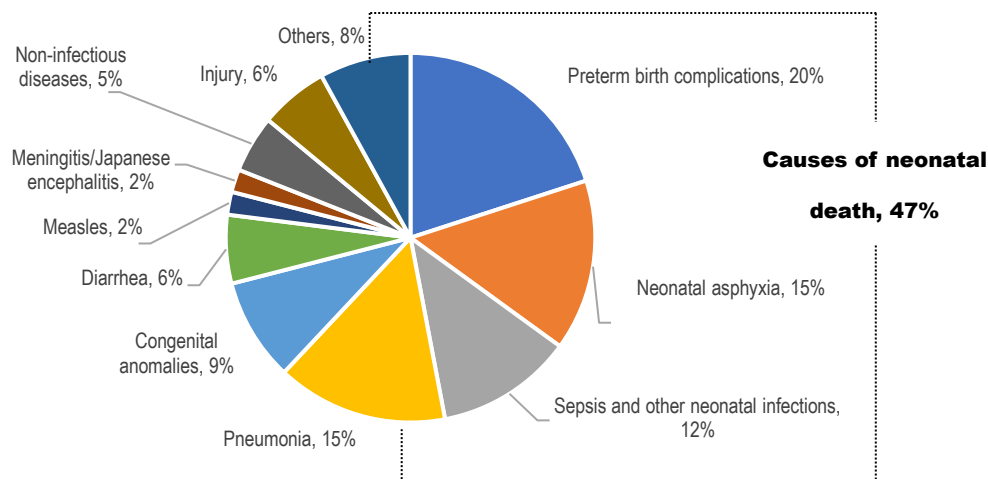


Figure 3-7 Causes of deaths among children under five<sup>41</sup>

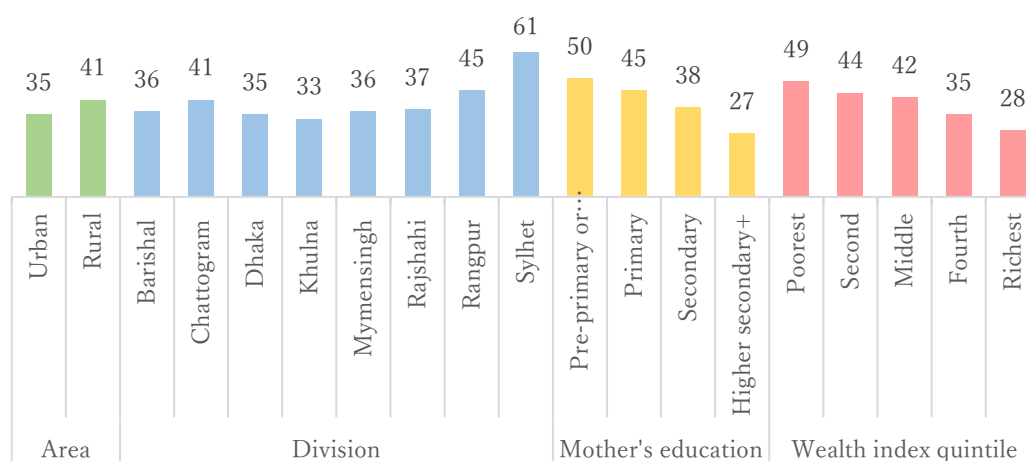
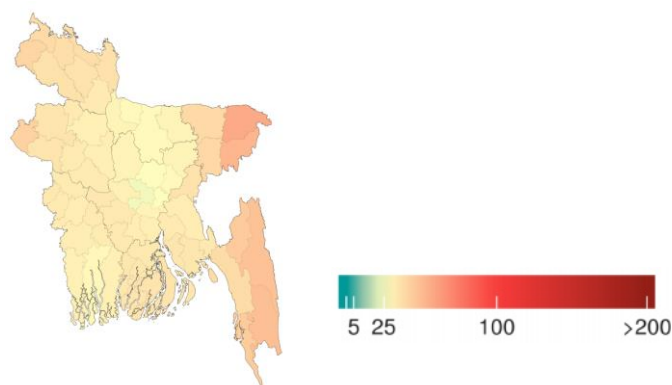


Figure 3-8 Under-five mortality rate by socioeconomic characteristics<sup>42</sup>

<sup>41</sup> World Health Organization, Bangladesh RMNCAH Factsheet 2018 ([https://www.who.int/docs/default-source/reproductive-health/maternal-health/rmncah-fs-ban.pdf?sfvrsn=46b905b6\\_2](https://www.who.int/docs/default-source/reproductive-health/maternal-health/rmncah-fs-ban.pdf?sfvrsn=46b905b6_2)). (Accessed on May 24, 2021)

<sup>42</sup> Multiple Indicator Cluster Survey 2019, Survey findings Report.

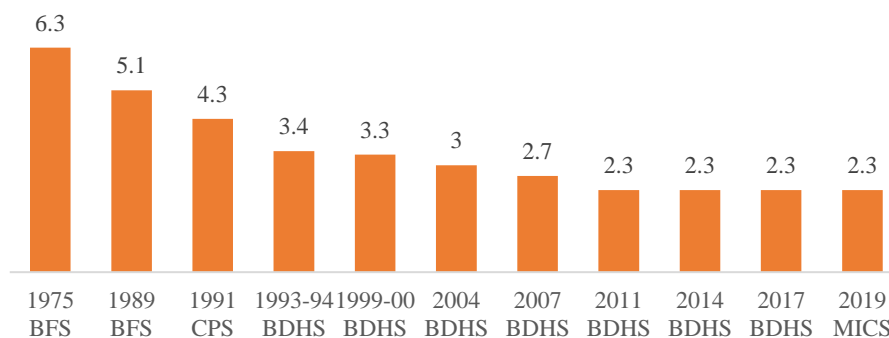


**Figure 3-9 Geographical distribution of under-five mortality rate<sup>43</sup>**

### 3.3 Sexual and reproductive health

#### 3.3.1 Fertility

As shown in Figure 3-10, the total fertility rate in Bangladesh declined rapidly from 6.3 per woman in 1975 to 5.1 in 1989 and 3.4 in 1994<sup>44</sup>. After a decade of stagnation, the total fertility rate declined again, reaching 2.3 per woman in 2011. Since then, the total fertility rate has remained at 2.3 until 2019 and is unlikely to reach the target of 2.0 for 2022 as stated in the 4<sup>th</sup> HPNSP. Factors contributing to the preference for the small family norm include changing social norms, rising incomes, declining child mortality, urbanization, rising education levels of women, and women's participation in the labor force<sup>45</sup>.



**Figure 3-10 Total fertility rate<sup>46</sup>**

<sup>43</sup> Institute for Health Matrix and Evaluation, Bangladesh ([www.healthdata.org/bangladesh](http://www.healthdata.org/bangladesh)). (Accessed on May 24, 2021)

<sup>44</sup> A demographic indicator that shows the average number of children a woman will have 15 from age to 49 age when she is considered capable of giving birth.

<sup>45</sup> Management Information System, Directorate General of Health Services, Ministry of Health and Family Welfare, 2020. Health Bulletin 2019.

<sup>46</sup> Abbreviations in the table indicate the following: BFS: Bangladesh Fertility Survey, CPS: Contraceptive Prevalence Survey, BDHS: Bangladesh Demographic Health Survey, MICS: Multi Indicator Cluster Survey

### 3.3.2 Adolescent pregnancy and childbirth

According to 2014 data, 31% of girls aged 15-19 had ever been pregnant or given birth<sup>47</sup>, but by 2019, this decreased to 19%; the MOHFW 2022 target of 25% has already been achieved<sup>48</sup>. In addition, socioeconomic characteristics such as rural areas, low education level, and low economic status are correlated with young pregnancy. Multinational studies have shown that young pregnancies are associated with a higher risk of complications and death during pregnancy and at birth<sup>49,50</sup>.

## 3.4 Infectious disease

### 3.4.1 HIV/AIDS

The HIV prevalence rate among people aged 15-49 years in Bangladesh is estimated to be less than 0.1%, saying there are 14,000 HIV-infected people in the country. This is as low as any other country in South Asia. However, the MOHFW reports that the majority of HIV-positive people are undetected and more than 7,000 HIV-positive people have not started anti-HIV treatment<sup>51</sup>. The HIV infection rate has remained unchanged since the year 2010. The highest HIV infection rate is among injecting drug users, who had an infection rate of 18% in 2016. Migrant and seasonal workers also account for 30%-40% of confirmed HIV-positive individuals, although infection rates have not been studied. In recent years, spouses of HIV-positive migrant and seasonal workers have become increasingly infected with HIV<sup>52</sup>. According to the Joint United Nations Programme on HIV/AIDS (UNAIDS) model, the most common route of transmission is from husband to wife through heterosexual sexual intercourse without the use of condoms.

**Table 3-3 Overview of HIV/AIDS** <sup>53,54</sup>

Indicator	Data	Year
HIV infection rate (15-49 years old)	0.1% or less	2018
Number of people infected with HIV	14,000	2018
Number of new HIV infections	1,600	2018
Number of deaths from AIDS	580	2018
HIV infection rates among injecting drug users	18%	2016
HIV infection rates among female sex workers	0.2%	2016
HIV infection rate among male-to-male sex workers	0.2%	2015

<sup>47</sup> National Institute of Population Research and Training (NIPORT), and ICF. 2020. Bangladesh Demographic and Health Survey 2017-18.

<sup>48</sup> Bangladesh Bureau of Statistics (BBS) and UNICEF Bangladesh. 2019. Progotir Pathey, Bangladesh Multiple Indicator Cluster Survey 2019, Survey Findings Report.

<sup>49</sup> Nove A, Matthews Z, Neal S, Camacho AV. Maternal mortality in adolescents compared with women of other ages: evidence from 144 countries. *Lancet Glob. Health.* 2014; 2(3):e155-64

<sup>50</sup> Ganchimeg T, Ota E, Morisaki N, Laopaiboon M, Lumbiganon P, Zhang J, et al. Pregnancy and childbirth outcomes among adolescent mothers: World Health Organization multicountry study. *International Journal of Obstetrics & Gynaecology.* 2014; 121(s1):40-8

<sup>51</sup> 4th HPNSP 2017-2022

<sup>52</sup> Ibid.

<sup>53</sup> HIV and AIDS Data Hub for Asia Pacific, Bangladesh Country Data (<https://www.aidsdatahub.org/resource/bangladesh-country-data>). (Accessed on May 24, 2021)

<sup>54</sup> UNAIDS, Bangladesh (<https://www.unaids.org/en/regionscountries/countries/bangladesh>). (Accessed on May 24, 2021)

### 3.4.2 Tuberculosis

Bangladesh has the seventh-highest incidence of tuberculosis (TB) in the world and is one of the 20 high TB burden countries in the world<sup>55</sup>. The incidence of TB has been gradually increasing since 2000, reaching 221 (per 100,000 population) in 2019. The morbidity rate is reported to be higher in urban areas. On the other hand, the mortality rate has slowly decreased since 2000 and is estimated to be 24 (per 100,000 population) in 2019. As a result, the country has achieved the goal of reducing TB deaths by 35% by 2020, as proposed in the End TB Strategy<sup>56</sup>.

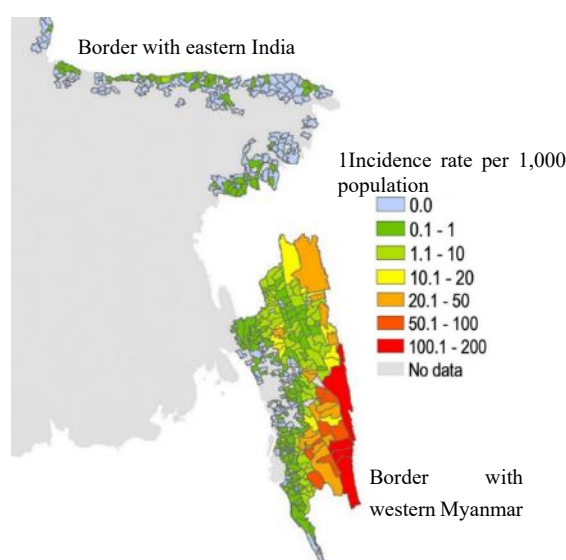
Bangladesh has a high incidence of multidrug-resistant tuberculosis (MDR-TB) and is one of the 20 MDR-TB burden countries in the world<sup>57</sup>. The number of tuberculosis cases among children is low at 4% of the total tuberculosis cases. The number of HIV-positive cases is low at 0.19% of the total TB cases, which means that TB-HIV co-infection is low.

**Table 3-4 Overview of tuberculosis (2019)<sup>58</sup>**

Indicator	Number of people	Rate (per 100,000 people)
TB incidence	361,000	221
Multidrug-resistant tuberculosis (MDR-TB) incidence	3,300	2
Overlapping infection of tuberculosis and HIV	700	0.43
Tuberculosis deaths (HIV negative)	38,000	24
Tuberculosis deaths (HIV positive)	150	0.1

### 3.4.3 Malaria

Malaria is endemic in 13 districts bordering eastern India and western Myanmar, with about 17.53 million people living in malaria-endemic districts<sup>59</sup>. Malaria is moderately endemic in three hilly districts but is on the verge of elimination in nine others. More than 90% of the total malaria cases have been reported from the three districts of Chattogram Hill Tracts (Rangamati, Khagrachhari and Bandarban) and Cox's Bazar district.



**Figure 3-11 Malaria endemic areas**

<sup>55</sup> World Health Organization. Global Tuberculosis Report 2020.

<sup>56</sup> Ibid.

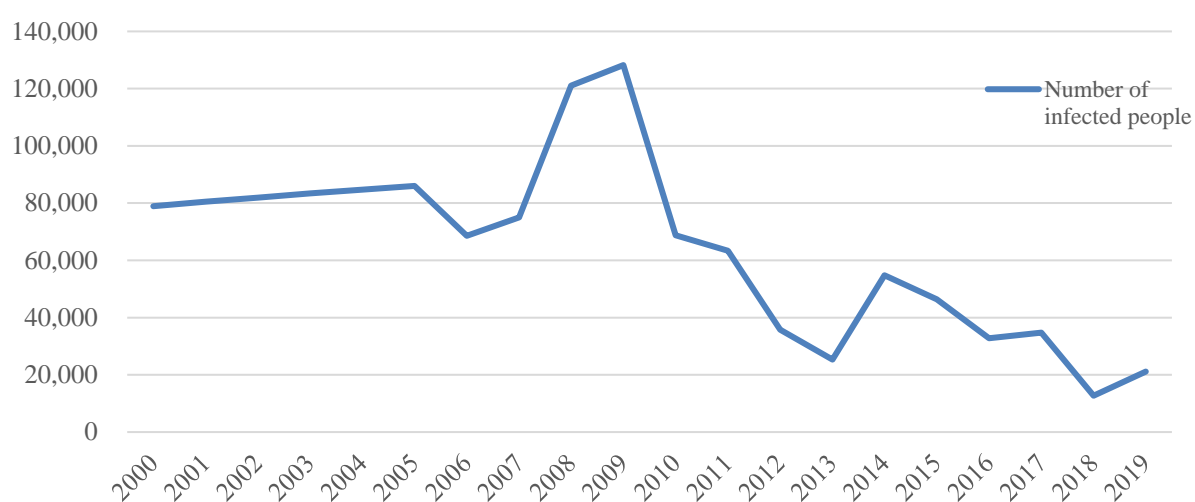
<sup>57</sup> Ibid.

<sup>58</sup> Ibid.

<sup>59</sup> WHO. 2020. World Malaria Report.

The malaria endemic areas are shown in Figure 3-11<sup>60</sup>. The number of malaria cases and deaths are also shown in Figure 3-12. Among the population living in malaria-endemic areas, the following groups are considered to be at particularly high risk<sup>61</sup>.

- Cultivators, loggers, and foresters
- Migrant workers, seasonal workers
- Displaced people
- Soldier
- Children under five years old and pregnant and nursing mothers
- Travelers and pilgrims from non-endemic areas



**Figure 3-12 Number of malaria cases<sup>62</sup>**

The number of deaths from malaria exceeded 250 in 2008 (264) and 2009 (251) but has remained below 200 in other years and has been kept below 100 since 2016.

### 3.4.4 Dengue fever

There is a risk of dengue fever infection throughout the year in Bangladesh, but the disease is especially prevalent during the rainy season from June to September. In recent years, due to climate change, population growth, and the influx of the virus from neighboring dengue-endemic countries, the number of infected people has been increasing, with 10,148 reported in 2018, 101,354 in 2019, and 1,405 in 2020<sup>63</sup>. The year 2021 saw a cumulative total of 24,277 infected people from January to November 4. The number of deaths was 95<sup>64</sup>.

<sup>60</sup> Noé, A., Zaman, S.I., Rahman, M. et al. 2018. mapping the stability of malaria hotspots in Bangladesh from 2013 to 2016. *Malar J* 17, 259.

<sup>61</sup> Ministry of Health and Family Welfare. 2020. health Bulletin 2019.

<sup>62</sup> WHO. 2020. World Malaria Report.

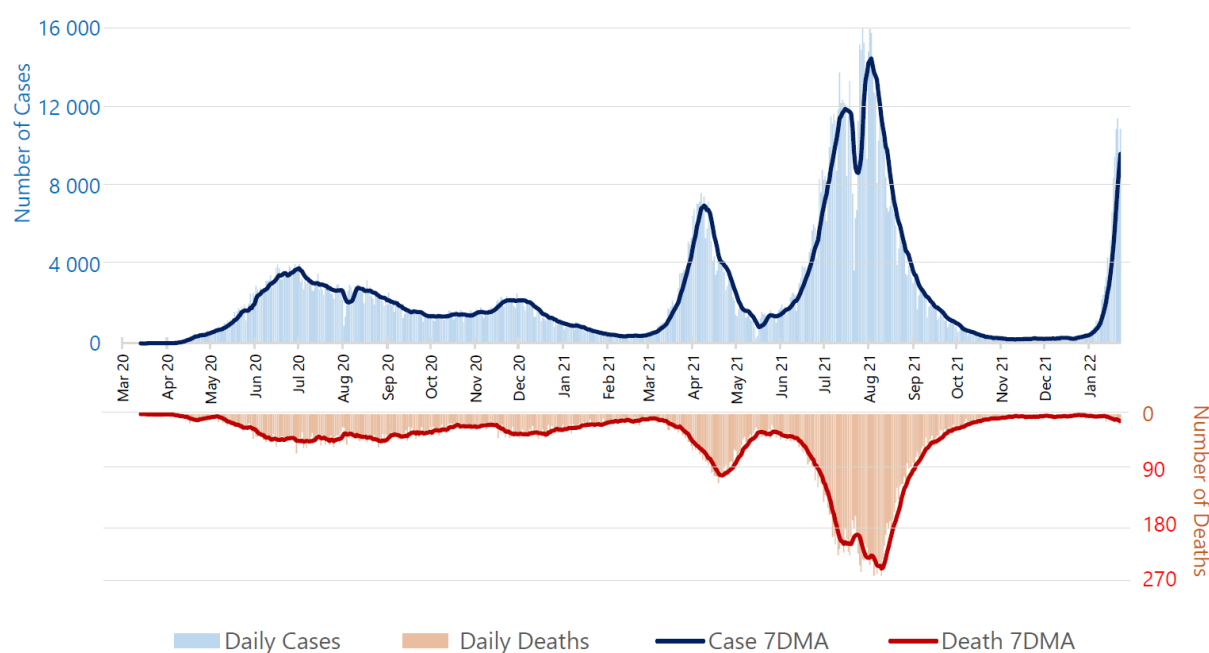
<sup>63</sup> Hasan et al. 2022. Devastating dengue outbreak amidst COVID-19 pandemic in Bangladesh: an alarming situation, *Tropical Medicine and Health* (2022) 50:11.

<sup>64</sup> Outbreak News Today, Bangladesh: Dengue death count rises to 95 (<http://outbreaknewstoday.com/bangladesh-dengue-death-count-rises-to-95-54995/>). (Accessed on February 25, 2022)

Infections are particularly high in the Dhaka Division, with 87 of the 95 deaths reported.

### 3.5 COVID-19

On March 8, 2020, the first case of COVID-19 was confirmed in Bangladesh<sup>65</sup>. As of February 26, 2022, the total number of confirmed cases and deaths is 1,941,816 and 29,024, respectively<sup>66</sup>. The fatality rate for infected people is reported to be 1.67<sup>67</sup>. The number of new confirmed cases per day had been below 1,000 since the beginning of 2021, but after March, the second wave of infections spread rapidly again, with the number of new confirmed cases reaching 7,626 on April 7, 2021. This was followed by the third wave from June to August 2021, which recorded 16,230 new cases on July 28, 2021. Then, the fourth wave of the Omicron variant occurred from January to February 2022, with new infections reaching 16,033 on January 25, 2022. The largest number of infected persons is in the 30-39 age group, followed by the 40-49 and 20-29 age groups. The largest number of deaths are among those aged 60 and above, followed by those in their 50s and 40s. Of the infected, 54% were from the Dhaka Division, followed by the Chattogram Division (18%).



**Figure 3-13 Number of positives cases and deaths (March 20, 2020, ~ January 23, 2022)<sup>68</sup>**

### 3.6 Non-communicable diseases (NCDs)

In Bangladesh, life expectancy increases with economic development, and urbanization continues rapidly. The country, like many low- and middle-income countries, is experiencing an "epidemiological transition" in

<sup>65</sup> Ministry of Health and Family Welfare, 2020. Bangladesh Preparedness and Response Plan for COVID-19.

<sup>66</sup> Directorate General of Health Services. 2021. Coronavirus COVID-19 Dashboard (<http://dashboard.dghs.gov.bd/webportal/pages/covid19.php>) (Accessed on February 27, 2022).

<sup>67</sup> WHO Bangladesh. Morbidity and Mortality, Weekly Update (MMWU) No.100, 24 January 2022.

<sup>68</sup> WHO Bangladesh. Morbidity and Mortality, Weekly Update (MMWU) No.100, 24 January 2022.

its disease structure, with the causes of disease and death shifting from infectious to non-communicable diseases (NCDs). Significant changes in diet and sedentary urban lifestyles have led to an increase in non-communicable diseases<sup>69</sup>.

The percentage of deaths due to NCDs among all deaths in Bangladesh has increased sharply from 52% a decade ago to 67% in 2016, with an estimated 570,000 deaths attributed to NCDs<sup>70</sup>. Cardiovascular diseases (30%), cancer (12%), and chronic respiratory diseases (10%) account for the majority of deaths (Figure 3-14). The National STEPS survey for non-communicable survey conducted in 2018 showed a high prevalence of underlying diseases and risk factors for non-communicable diseases among Bangladeshis. With the urgent need to address the increasing number of non-communicable diseases, the Bangladesh health system is in need of strengthening.

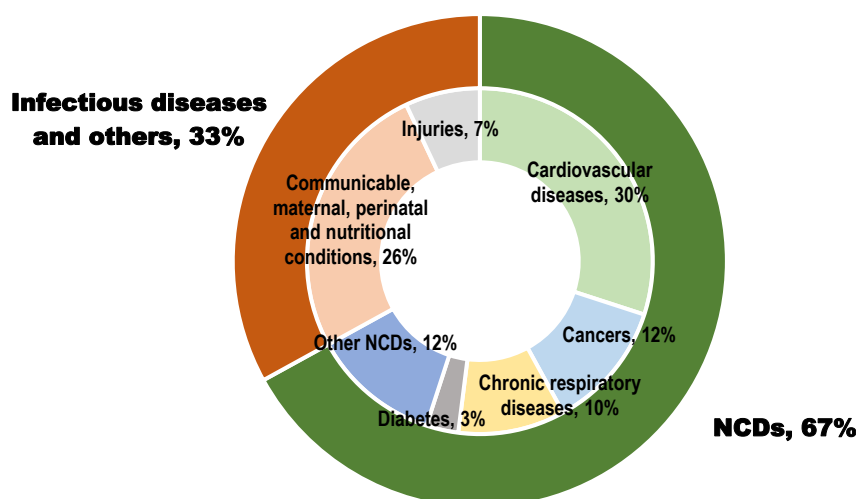


Fig. 3-14 Proportion of NCDs as a cause of death<sup>71</sup>

<sup>69</sup> Directorate General of Health Services, Ministry of Health and Family Welfare. 2007. Strategic plan for surveillance and prevention of non-communicable diseases in Bangladesh 2007-2010

<sup>70</sup> WHO. 2018. Noncommunicable Diseases (NCD) Country Profiles, [https://www.who.int/nmh/countries/bgd\\_en.pdf](https://www.who.int/nmh/countries/bgd_en.pdf)

<sup>71</sup> WHO. 2018. Noncommunicable Diseases (NCD) Country Profiles. [https://www.who.int/nmh/countries/bgd\\_en.pdf](https://www.who.int/nmh/countries/bgd_en.pdf)

**Table 3-5 Percentage of patients with underlying diseases and risk factors (%)<sup>7273</sup>**

Items		2018
Underlying diseases	Obesity (BMI $\geq$ 30): men	3%
	Obesity (BMI $\geq$ 30): women	10%
	Hypertension (blood pressure > 140/90 mmHg): men	17%
	Hypertension (blood pressure > 140/90 mmHg): women	24%
	Diabetes (fasting blood glucose > 126 mg/dl): men and women	8%
	Cardiovascular disease: men	10%
	Cardiovascular disease: women	11%
Risk factors	Below the minimum requirement of servings of fruits or vegetables (at least five servings per day)	90%
	Insufficient physical activity (<150 minutes of moderate-intensity activity per week, or equivalent): men	10%
	Insufficient physical activity (<150 minutes of moderate-intensity activity per week, or equivalent): women	15%
	Daily smoker: men	44%
	Daily smoker: women	1%

### 3.7 Malnutrition

#### 3.7.1 Child nutrition

According to the 2019 MICS, the percentage of stunting, underweight, and wasting among children under five was 28 %, 23 %, and 10 %, respectively. As shown in Figure 3-15, the nutritional status of children under five is improving markedly, and child malnutrition is gradually decreasing. If the percentage of stunting continues to decrease, the target of 25% for 2022 is likely to be achieved. Malnutrition is more prevalent in rural areas, Sylhet district, among children with mothers with lower levels of education, and among children living in households with lower economic status. Both underweight and stunting begin to increase significantly after 12 months of age. This period coincides with the end of breastfeeding and a few months after weaning for many infants, suggesting that the quality of the weaning diet has a negative impact on underweight and stunting.

In the 2019 MICS, the percentage of obese children under five was 2 %. The percentage of underweight children weighing less than 2,500 grams at birth, said to be a surrogate indicator of maternal nutrition and health status, was 15%. The "double burden" of over-nutrition among the wealthy in urban areas and under-nutrition among the poor in rural areas becomes clear, and there is a need to respond to the underlying changes in lifestyle, economic conditions, food environment, and social and cultural environment.

<sup>72</sup> National Institute of Preventive and Social Medicine (NIPSOM). National STEPS survey for NCDs risk factors in Bangladesh 2010.

<sup>73</sup> National Institute of Preventive and Social Medicine (NIPSOM). National STEPS survey for NCDs risk factors in Bangladesh 2018.



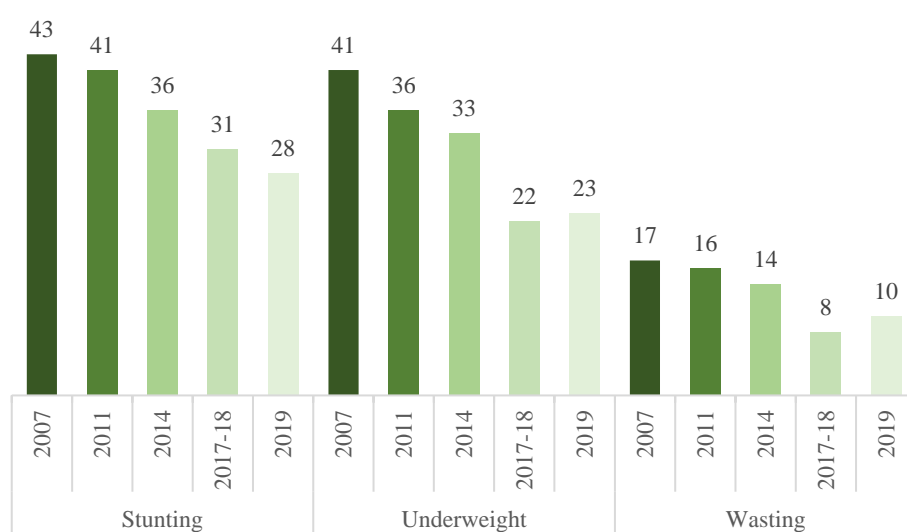


Figure 3-15 Percentage of malnutrition among children under five (%)<sup>74</sup>

### 3.7.2 Nutrition for mothers and pregnant women

14% of women of reproductive age in Bangladesh are severely stunted (<145 cm)<sup>75</sup>. A body mass index (BMI) of less than 18.5, which is considered thin, is found in 24% of married women of reproductive age and is 1.5 times higher in rural areas compared to urban areas (17% vs. 26%). One-third of pregnant women in Bangladesh are underweight, and 42% of married women of reproductive age (15-49 years old) are anemic<sup>76</sup>. Although women's nutritional status has improved slightly over the years, female malnutrition manifested as low body mass index, stunting, and anemia increases the risk of death due to prolonged and obstructed labor and heavy bleeding, leads to low birth weight and causes undernutrition in breast milk.

<sup>74</sup> Bangladesh Bureau of Statistics (BBS) and UNICEF Bangladesh. 2019. Progotir Pathey, Bangladesh Multiple Indicator Cluster Survey 2019, Survey Findings Report.

<sup>75</sup> National Institute of Population Research and Training (NIPORT), and ICF. 2020. Bangladesh Demographic and Health Survey 2017-18.

<sup>76</sup> National Institute of Population Research and Training (NIPORT), and ICF. 2020. Bangladesh Demographic and Health Survey 2017-18.

## Chapter 4 Current status and issues of health services

### 4.1 Current status and issues of maternal and child health services

#### 4.1.1 Current status of maternal and child health services

Pregnant women who received at least one antenatal care by a qualified health worker were 82% in 2017-18 Demographic and Health Survey (DHS) and 75% in the MICS 2019. Pregnant women who had four or more antenatal care (ANC) varied considerably from 47% in the DHS to 37% in the MICS. The 4<sup>th</sup> HPNSP aims to increase the rate of at least 4 ANC visits to 50% by 2022. The percentage of deliveries in health facilities was 53% in the DHS in 2017-18 and 50% in the MICS in 2019. The percentage of deliveries assisted by qualified personnel was 59% in the DHS and 53% in the MICS. The 4<sup>th</sup> HPNSP aims to increase the percentage of deliveries assisted by qualified personnel to 65% by 2022. Although about 70% of maternal deaths occur during the puerperium, only about half or less half of mothers receive postpartum care within 48 hours of delivery. The number of mothers who received postpartum care within 48 hours of delivery varied considerably, from 52% in the DHS 2017-18 to 31% in the MICS 2019. Eighty-six percent of women who delivered in a facility received postpartum care within two days of delivery from a qualified health care provider, compared to only 5% of women who delivered in a non-healthcare facility who received postnatal care in the same condition. In the DHS, newborns who received any type of newborn care within 48 hours of birth were 53%, while only 7.4% received all essential neonatal care<sup>77</sup>.

**Table 4-1 Current status of maternal and child health services and MOHFW targets<sup>78</sup>**

Indicator	Source	%
Percentage of pregnant women who received at least one antenatal care by qualified personnel	DHS 2017-18	82%
	MICS 2019	75%
Percentage of pregnant women who received four or more antenatal cares by qualified personnel	DHS 2017-18	47%
	MICS 2019	37%
	Target by 2025	80%
Percentage of deliveries in health facilities	DHS 2017-18	53%
	MICS 2019	50%
	Target by 2025	70%
Percentage of mothers who received postnatal care within 48 hours after delivery	DHS 2017-18	52%
	MICS 2019	31%
	Target by 2025	80%
Percentage of newborns who received any neonatal care within 48 hours after birth	DHS 2017-18	53%
	MICS 2019	6%
Percentage of newborns who received all essential newborn care	DHS 2017-18	7%

#### 4.1.2 Objectives of the 4<sup>th</sup>HPNSP on maternal and child health services

- Strengthen both basic emergency obstetric newborn care and comprehensive emergency obstetric newborn care.
- Improve the quality of antenatal and postnatal care and strengthen 24/7 birth attendant services at the

<sup>77</sup> Essential newborn care includes the use of a safe birthing kit or boiled razor blades, disinfecting the umbilical cord with chlorhexidine, dry care, and breastfeeding within the first hour<sup>1</sup> after delivery.

<sup>78</sup> Targets to 2025 are taken from MOHFW's Bangladesh National Strategy for Maternal Health 2019-2030 (2019).

facility level.

- Improve newborn care practices and services, including the implementation of the Comprehensive Newborn Care Package (CNCP).
- Improve the quality of care by ensuring skilled service providers, developing appropriate physical infrastructure, and improving "facility readiness," including medicines and medical equipment.
- Strengthen partnerships with NGOs and the private sector to replicate best practices.
- Strengthen cross-sectoral cooperation and coordination not only with the Directorate General of Health Services (DGHS) but also with NGOs, the private sector, and local communities.

#### **4.1.3 Challenges in maternal and child health services**

- Inadequate knowledgeable and skilled health care workers, facilities, equipment, infection control measures, laboratory capacity, and essential medicines all mean that health facilities are not ready to receive patients. As a result, the quality of care and access to maternal and child health services are inadequate. The reasons for the lack of readiness of maternal and child health services include the lack of centrally developed plans that are not optimized in the field and the lack of a performance review process and management and supervision of maternal and child health programs by health administrators.
- Due to inadequate regulation of the private sector, the quality of health services in private hospitals is low and unnecessary medical interventions are provided, such as cesarean sections performed on women who do not necessarily need them.
- Low utilization of neonatal stabilization units and special care neonatal units
- Lack of an effective and timely emergency transport system and referral system to secondary and tertiary health facilities.
- Insufficient behavior change communication activities in health facilities and communities.
- Lack of coordination and functional integration between the Directorate General of Family Planning (DGFP) and the Directorate General of Health Services (DGHS) hinders effective utilization of resources, resulting in duplication and inefficiencies in service delivery.
- Vacancies, low retention in posts, absenteeism, and lack of proficiency in skills of midwives, family welfare visitors (FWVs), family welfare assistants, women's health assistants, and other health workers responsible for maternal health. In addition, due to the lack of obstetricians and anesthesiologists, many upazila health complexes (UzHCs) are unable to provide comprehensive emergency obstetric and neonatal care (CEmONC).
- Women are not able to make their own choices regarding the use of health services, from family planning services to antenatal care, birth attendants, and postnatal care. Reasons for this include the low status of women in the family, low awareness and lack of recognition of risks, and lack of information about services and providers available in the community. Many women have little say in where they give birth, leaving these decisions to their husbands, mothers-in-law, and other family

members, and many deliveries still take place at home<sup>79</sup>.

- The direct and indirect costs of using maternal and child health services are high for many women, creating an economic barrier.

## 4.2 Current status and issues of sexual and reproductive health services

### 4.2.1 Current status of sexual and reproductive health services

In the 2019 survey, the combined use of modern and traditional contraceptive methods among married women (ages 15-19) was 63%, and when limited to modern contraceptive methods, the use rate was 59%<sup>80</sup>. Compared to data from 2011, 2014, and 2017, contraceptive use rates for modern and traditional contraceptive methods combined have remained largely unchanged for the past eight years through 2019. The MOHFW aims to increase the combined modern and traditional contraceptive use rate among early married women to 80% by 2025<sup>81</sup>. Modern contraceptive use is the lowest in 48% among women between 15 and 19. Regionally, the use of contraceptive methods tends to be low in Chattogram and Sylhet Divisions. The most commonly used contraceptive methods are oral pills (34%), hormonal contraceptives/injectables (13%), and male condoms (6%). The unmet need for family planning is 14% among married women aged 15-49 years. It is as high as 18% among women aged 15 to 19 who married early by age. It is as high as 20% on average in the Chattogram Division.

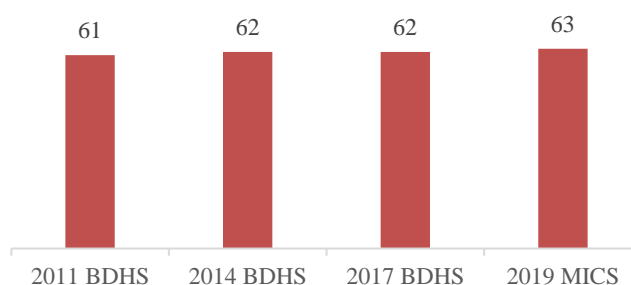


Figure 4-1 Contraceptive use rate (%)<sup>8283</sup>

### 4.2.2 Objectives of the 4<sup>th</sup>HPNSP on sexual and reproductive health services

- Improve the quality of sexual and reproductive health services, including sexually transmitted diseases, family health services, and menstrual regulation.
- Improve practices and services related to adolescent health. Promote and improve access to adolescent-friendly health services, especially at the facility and community levels.

<sup>79</sup> According to MICS 2019, the rate is 46.4% in a whole country.

<sup>80</sup> Bangladesh Bureau of Statistics (BBS) and UNICEF Bangladesh. 2019. Progotir Pathey, Bangladesh Multiple Indicator Cluster Survey 2019, Survey Findings Report.

<sup>81</sup> Ministry of Health and Family Welfare. 2019. Bangladesh National Strategy for Maternal Health 2019-2030.

<sup>82</sup> National Institute of Population Research and Training (NIPORT), and ICF. 2020. Bangladesh Demographic and Health Survey 2017-18.

<sup>83</sup> Bangladesh Bureau of Statistics (BBS) and UNICEF Bangladesh. 2019. Progotir Pathey, Bangladesh Multiple Indicator Cluster Survey 2019, Survey Findings Report.

- Improve adolescents' knowledge of sexual and reproductive health, nutrition, violence against adolescents, and mental health.
- Make positive changes in the sexual and reproductive health behaviors and attitudes of parents, teachers and others who act as "gatekeepers" for adolescents.

### **4.2.3 Challenges in sexual and reproductive health services**

- The supply of a wide range of contraceptives is not stable, causing stock-outs at health facilities. According to a survey in 2017, the number of facilities offering all five modern contraceptive methods (oral pills, hormonal contraceptives/injectables, condoms, intrauterine devices (IUDs), and subdermal implants) was 78%<sup>84</sup>. Few public health facilities offer both short-term and long-acting reversible contraceptive methods.
- Health facilities that meet all six WHO criteria for readiness to provide quality family planning services (national guidelines on family planning, health workers trained in family planning, blood pressure monitoring, oral pills, hormonal contraceptives/injectables, and condoms)<sup>85</sup> were only 22% in the 2017 survey<sup>86</sup>. The main reasons are the lack of national guidelines on family planning in facilities and the shortage of trained medical personnel.
- Adolescents aged 15-19 years lack knowledge and information on sexual and reproductive health, leading to unsafe sex, unwanted pregnancies, and abortions. There are also limited sexual and reproductive health services for adolescents available.
- In Bangladesh, there are many "child marriages," marriages that occur before the age of 18, even though the legal age for marriage is 18<sup>87</sup>. Girls under the age of 18 who marry are denied access to family planning information and services due to power imbalances between couples, normative gender roles at the community level, and social pressure to become pregnant soon after marriage.

## **4.3 Current status and issues in prevention and control of infectious diseases**

### **4.3.1 Current status of infectious disease prevention and control**

#### **HIV/AIDS**

Most HIV and AIDS prevention and control programs provided by the government and donors target key populations in the fight against AIDS, such as sex workers, injecting drug users, and male-to-male sex workers. Injecting drug users, who have the highest rates of HIV infection, safe injection use rates are relatively high, but Injecting drug users, who have the highest rates of HIV infection, have relatively high rates of safe injection use but low rates of HIV testing and condom use. It raises concerns about the spread of infection to spouses and sex partners of injecting drug users and the need for targeted prevention strategies and interventions. Among female sex workers and male-to-male sex workers, HIV infection rates are still low, but HIV testing

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<sup>84</sup> National Institute of Population Research and Training (NIPORT) and ICF. 2019. Bangladesh Health Facility Survey 2017.

<sup>85</sup> WHO. 2013. Service Availability and Readiness Assessment (SARA): an annual monitoring system for service delivery.

<sup>86</sup> National Institute of Population Research and Training (NIPORT) and ICF. 2019. Bangladesh Health Facility Survey 2017.

<sup>87</sup> According to MICS 2019, 60.0% of women aged 15-49 married before the age of 18.

and counseling and safe sex are underrepresented, and further interventions are necessary.

**Table 4-2 Key communities in the fight against AIDS<sup>8889</sup>**

Indicator		Data	Year
Injecting drug users	Population estimate	33,100	2015
	HIV infection rate	18%	2016
	Knowledge about HIV test results	27%	2016
	Coverage of HIV prevention programs	28%	2016
	Safe injection use rates	84%	2015
	Condom use rate	35%	2015
Female Sex Workers	Population estimate	140,000	2016
	HIV infection rate	0.2%	2016
	Knowledge about HIV test results	31%	2016
	Condom use rate	67%	2015
Men who have sex with men	Population estimate	101,700	2015
	HIV infection rate	0.2%	2015
	Coverage of HIV prevention programs	4%	2015
	Condom use rate	46%	2015

### **Tuberculosis**

In 2019, of the estimated 361,000 TB-positive individuals, 81% were notified to some health facility. Of these, only 26% were tested by rapid diagnostic methods. The percentage of TB patients who knew whether they had HIV infection was 3%. Of the notified TB-positive patients, 55% were adult males, 41% were adult females, and 4% were children. According to the MOHFW, approximately 150,000 TB cases per year go undetected, untreated, or unreported<sup>90</sup>. Of the TB-positive patients, including new and recurrent cases, registered in 2018, 94% were successfully treated. It is higher than the global average of 84%. Even for multidrug-resistant TB, the treatment success rate is 73%, much higher than the global average of 57%.

### **Malaria**

The National Malaria Control Program has been successful in controlling malaria, as seen from the reduction in the number of malaria cases and deaths. The program aims to reduce morbidity and mortality by 75% by 2025 and zero infections by 2030. Of the 13 malaria-endemic districts in the country, 9 are on the verge of elimination and are making good progress towards elimination. Activities in malaria control consist of early diagnosis in the community, prompt treatment, and prevention of exposure to vectors using insecticide-treated mosquito nets. More than 80% of malaria cases were treated door-to-door, and 11.4 million insecticide-treated mosquito nets were distributed free of charge. Resistance to artemisinin, the first-line drug, is seen in more than 10% of cases. Further efforts toward early detection, rapid treatment, comprehensive vector control,

<sup>88</sup> HIV AIDS Asia Pacific Research Statistical Data Information Resources AIDS Data Hub. 2021 Bangladesh Country Data. <https://www.aidsdatahub.org/resource/bangladesh-country-data> (Accessed on May 24, 2021)

<sup>89</sup> UNAIDS. 2021. Country Bangladesh Data. <https://www.unaids.org/en/regionscountries/countries/bangladesh> (Accessed on May 24, 2021).

<sup>90</sup> Ministry of Health and Family Welfare. 2017. Program implementation plan: 4th Health, Population and Nutrition Sector Program (4th HPNSP).

and cross-border cooperation and research are needed to eliminate malaria by 2030.

### **Dengue fever**

The MOHFW developed national guidelines for the clinical management of dengue fever in 2000<sup>91</sup>. It revises them periodically based on the epidemic situation (the latest revision was in 2018). The MOHFW also promotes measures such as clinical management training for doctors, nurses, and physicians nationwide, expansion of dengue fever treatment care in healthcare facilities, awareness-raising activities with special attention to children and community residents, securing diagnostic kits, and free diagnosis in public healthcare facilities and fixed diagnosis fees in private healthcare facilities. However, as noted above, the epidemic has not been prevented and controlled, and further strengthening of efforts is required, including collaboration between MOHFW and other ministries, vector control, strengthening community participation, and year-round surveillance.

#### **4.3.2 Objectives of the 4<sup>th</sup>HPNSP on prevention and control of infectious diseases**

- Apply HIV testing and counseling to 90% of estimated HIV-positive individuals by 2020 and increase detection rates by 2022.
- 90% of detected PLHIV<sup>92</sup> are on anti-HIV treatment by 2020, maintained through 2022.
- 90% of HIV-positive individuals are on anti-HIV treatment by 2020 and maintained through 2022.
- By 2022, the annual case detection rate for all TB will be at least 85%.
- Maintain and achieve a treatment success rate of at least 90% for non-multidrug-resistant TB and at least 75% for multidrug-resistant TB.
- Detect at least 80% of presumed multidrug-resistant TB cases and achieve 100% enrollment in treatment.
- Reduce the number of deaths from malaria to 5 within 2019, to zero within 2022, and gradual elimination within 2025.

## **4.4 Prevention and control of COVID-19**

### **4.4.1 Government response**

Since the spread of the disease, the government of Bangladesh has implemented containment measures such as the closure of educational institutions, entry restrictions and lockdowns, strengthening of COVID-19 compliant hospitals and laboratories, improvement of personal protective equipment (PPE) supply system, and fiscal stimulus measures. As national plans, "Bangladesh Preparedness and Response Plan for COVID-19" (BPRP) and "National Deployment and Vaccination Plan for COVID-19 Vaccines" (NDVP) were formulated. The MOHFW also prepared 37 guidelines and standard operating procedures (SOPs) to standardize infection

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<sup>91</sup> National Malaria Elimination & Aedes Transmitted Disease Control Program, Disease Control Unit, DGHS, 2018. National Guideline for Clinical Management of Dengue Syndrome, 4th Edition.

<sup>92</sup> People living with HIV

control measures<sup>93</sup>. The government has implemented three lockdowns so far. The first lockdown was implemented from March to May 2020 before the start of the first wave, the second lockdown from March to May 2021 in line with the second wave, and the third lockdown was imposed from May to August 2021 in line with the third wave.

#### **4.4.2 Testing capability**

When the infection was first confirmed in March 2020, the Institute of Epidemiology Disease Control and Research (IEDCR) was the only laboratory in the country that could test for COVID-19. Initially, the low testing rate for the population was criticized. Since then, laboratories have been established across the country, and currently, 857 laboratories conduct COVID-19 testing<sup>94</sup>. In December 2020, the government approved antigen testing for COVID-19 diagnosis to complement PCR testing capabilities, strengthening testing capacity. The number of tests conducted through February 26, 2022, was 13,355,191<sup>95</sup>. The highest number of tests performed per day was 55,284 on August 3, 2021.

#### **4.4.3 COVID-19 treatment facilities**

According to the COVID-19 Health Bulletin published in January 2021, as of December 24, 2020, there are 30 COVID-19 dedicated hospitals, 10,510 dedicated general hospital beds, and 582 ICU beds available in the country. All the dedicated hospitals are located in the vicinity of the capital city of Dhaka<sup>96</sup> and in the Chattogram district, while five patient beds have been reserved in each district and upazila. As for medical equipment, 13,505 dedicated oxygen cylinders, 678 nasal cannulae, 639 oxygen concentrators, and 554 ventilators are available<sup>97</sup>, but the number is insufficient. Most of them are concentrated in Dhaka, making it difficult to provide appropriate treatment to critically ill patients in rural areas, especially in remote areas.

#### **4.4.4 Support for personnel**

During the expansion of COVID-19 in 2020, hospitals and some doctors and nurses refused to accept COVID-19 patients because of their inability to provide adequate treatment due to lack of equipment and PPE and concerns about their infection. The government supports health personnel by providing incentives and health insurance benefits to COVID-19 frontline workers such as doctors and nurses in public hospitals and emergency employment of health personnel<sup>98</sup>. It also provides training for doctors and nurses in COVID-19 management, infection prevention and control, and telemedicine. However, strengthening the quality and quantity of human resources for COVID-19 and COVID-19 infection among health personnel<sup>99</sup> is still a major

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<sup>93</sup> <https://dghs.gov.bd/index.php/bd/publication/guideline> (Accessed on March 16, 2021)

<sup>94</sup> WHO Bangladesh. Morbidity and Mortality, Weekly Update (MMWU) No.100, 24 January 2022.

<sup>95</sup> DGHS Coronavirus COVID-19 Dashboard (<http://dashboard.dghs.gov.bd/webportal/pages/covid19.php>) (Accessed on February 27, 2022)

<sup>96</sup> Dhaka, Narayanganj, and Gazipur Districts.

<sup>97</sup> Ministry of Health and Family Welfare. 2021. COVID-19 Health Bulletin 2020.

<sup>98</sup> There are approximately 2,000 two doctors and 5,054 two nurses employed. In addition, laboratory technicians and pharmacists are employed.

<sup>99</sup> According to Bangladesh Medical Association, as of January 29, 2022, the total number of doctors, nurses, and other health care workers infected with COVID-19 was 9,545 (<https://bma.org.bd/>).



issue.

#### **4.4.5 Vaccination**

Large-scale vaccination of the COVID-19 started on February 7, 2021, in Bangladesh. It was suspended in April of the same year due to stock shortages. In June, it resumed as the procurement of vaccines progressed. As of December 22, 2021, 69,492,869 people received their first dose of vaccine, and 47,838,622 people completed the vaccination<sup>100</sup>. The government aims to vaccinate 80% of the population (138 million people). As a result of the early securing of vaccines with existing cold chain availability and utilization of the experience of the Expanded Programme on Immunization (EPI), it can be said that vaccination is progressing well. On the other hand, there is some avoidance of vaccination among the public, and further awareness-raising is required to achieve the NDVP's goal of vaccinating 80% of the population. In addition, 27% of the total number of vaccinations is in the Dhaka Division and 18% in the Chattogram Division, so it is necessary to accelerate vaccination in other areas, especially in remote areas.

#### **4.4.6 Public awareness**

In the absence of a definitive cure for COVID-19, individual measures to prevent infection, such as maintaining social distance and wearing masks, are extremely important. To raise public awareness, the government of Bangladesh conducts daily awareness campaigns through television, newspapers, and community radio and focuses on social media campaigns. Data shows that the level of understanding of the rural population regarding the knowledge and practices of COVID-19 is significantly low<sup>101</sup>, and there is a strong need for awareness-raising activities for the rural population, which is more vulnerable.

### **4.5 Current status and issues of NCD control**

#### **4.5.1 Current status of NCD control**

In response to the growing burden of non-communicable diseases, the government of Bangladesh has taken several steps to address NCDs as a priority health issue. The National Health Policy of 2011 advocates an integrative approach of prevention, treatment, and rehabilitation at all levels of health facilities, especially for diabetes, hypertension, and heart disease, by increasing awareness of lifestyle modification and health promotion. The Fourth Health, Nutrition and Population Strategic Investment Plan (4<sup>th</sup> HNPSIP) (July 2016-June 2021) and the health strategy of the Seventh Five-Year Plan recognize NCD control as a key issue. In particular, the health strategy of the 7<sup>th</sup> Five-Year Plan plans to implement large-scale health promotion for imminent non-communicable diseases. The 4<sup>th</sup> HNPSIP promotes quality control of public and private services on NCDs and standardization of services to support overall health care.

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<sup>100</sup> COVID-19 Vaccination Dashboard (<http://103.247.238.92/webportal/pages/covid19-vaccination.php>). (Accessed on December 22, 2021)

<sup>101</sup> Rahman et al. 2021. COVID-19 epidemic in Bangladesh among rural and urban residents: an online cross-sectional survey of knowledge, attitudes, and Epidemiologia 2021, 2, 1-13.

#### **4.5.2 Objectives of the 4<sup>th</sup> HPNSP on NCD control**

- Develop and implement effective, integrated, sustainable, and evidence-based policies on NCDs and their risk factors and determinants.
- Develop and strengthen the capacity to monitor NCDs, their impact, risk factors, and the impact of public health interventions.
- Address the determinants of NCDs and support and promote social and economic conditions that enable people to take control of their own health and adopt healthy behaviors.
- Strengthen health systems for early detection of NCDs and their risk factors in an integrated manner.

#### **4.5.3 Challenges for NCD control**

- Bangladesh does not have an agency under the direct control of the central government to take the lead in combating NCDs.
- Surveillance of NCDs and their risk factors in hospitals is incomplete and inaccurate. Major NCDs have only recently been included in the surveillance system, and the operational capacity of the system is limited.
- There is a lack of a tiered package of essential health services for NCD control. Community-level screening programs for NCD control have not yet been introduced. A package defining the roles and responsibilities of health facilities at each level, from tertiary facilities to community clinics, is needed.
- A major obstacle to the early detection and effective management of NCDs is the inadequate supply of affordable essential medicines and supplies. There is a need for an updated and stable supply of essential medicines list for NCD control.

### **4.6 Current status and issues of nutrition services**

#### **4.6.1 Current status of nutrition services**

In the DHS in 2014 data, 55% of infants under 6 months of age were fully breastfed, while that percentage increased to 65% in the DHS in 2017-18 in the MICS in 2019 MICS, the figure for this indicator was 63%. In the DHS in 2017-18, only 34% of infants 6-23 months old ate properly according to the recommended minimum acceptable diet<sup>102</sup>. In the MICS in 2019, the figure for the indicator is 27%, and the 4<sup>th</sup> HPNSP aims to increase the percentage to 45% by 2022. The proportion of infants aged 6-59 months who received vitamin A supplementation increased significantly from 62% in 2014 to 79% in 2017-18.

The Bangladesh National Nutrition Policy 2015 and the National Plan of Action for Nutrition (NPAN-2) were developed, adopting a multi-sectoral approach to achieve improved nutritional status in health, food, agriculture, environment, and education. The 4<sup>th</sup> HPNSP identifies adequate nutrition in the first 1,000 days of pregnancy to the second birthday as a central pillar in child growth and development. In recognition of this, it focuses on full breastfeeding and appropriate weaning, treatment of severe acute malnutrition (SAM),

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<sup>102</sup> Dietary behaviors that meet both the minimum meal frequency and the minimum dietary diversity as defined by WHO and UNICEF.

micronutrient supplementation of children, prevention of anemia in adolescent girls and pregnant and lactating women and improving infant and young child nutrition (IYCF) practices. In addition, the promotion of healthy eating for those found to be overweight or obese is also included in the strategic objectives.

#### **4.6.2 Objectives of 4<sup>th</sup>HPNSP for nutrition services**

- Strengthen the mainstreaming of nutrition issues in relevant sectoral policies, plans and programs.
- A comprehensive package of nutrition services is provided through the Directorate General of Health Services, Directorate General of Family Planning, and relevant ministries and organizations to prevent and reduce the double burden of malnutrition among the people of Bangladesh, with a special focus on children, adolescents, pregnant and lactating women, the elderly, the poor, and underserved populations. Expand a comprehensive package of services.
- Strengthen nutrition management practices and services for children under five, adolescents, and pregnant or lactating women.
- Ensure universal and equitable access to and use of quality nutrition services for all people in rural, urban and hard-to-serve areas.
- Develop and strengthen coordination mechanisms on nutrition with key relevant sectors and stakeholders to ensure a multisectoral approach at the national level.
- Improve activities related to food safety.
- Improve the capacity of human resources to manage, supervise, and deliver nutrition services.
- Strengthen the institutional capacity of the National Institute of Public Health and Nutrition as a center of excellence in nutrition.
- Strengthen nutrition information systems (NIS), monitoring and evaluation, surveillance, survey, and research capacity.

#### **4.6.3 Challenges in nutrition services**

- Although health facilities have child growth monitoring charts and health personnel is trained to measure children's height and weight, growth monitoring has not been done.
- Tertiary hospitals, divisional hospitals and upazila health complexes have established treatment services for severe acute malnutrition, but these are not fully utilized due to the mandatory 20-day hospital stay and the busy schedules of mothers and caregivers.
- The high-calorie milk needed for therapeutic feeding is frequently out of stock.
- Lack of continuous follow-up after discharge from the hospital for therapeutic feeding.
- The low proportion of pregnant and lactating women taking micronutrient supplements for the entire duration of their need.
- Few nutrition services and counseling are provided to improve the nutrition of adolescent girls, pregnant adolescent girls, and adolescent mothers.
- Women are the last to eat in rural households. Even in households where food is available,

undernutrition among women has been reported. Therefore, addressing malnutrition requires not only food security and nutrition education but also addressing gender issues and cultural norms.

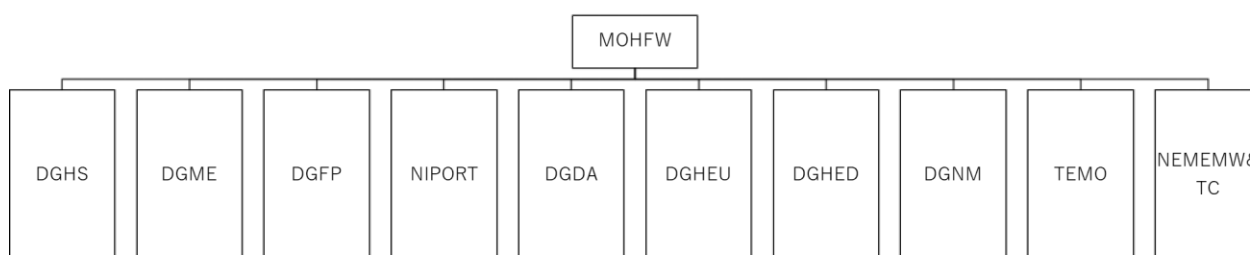
## Chapter 5 Current status of Bangladesh health system

### 5.1 Governance

#### 5.1.1 Health administration in MOHFW

In Bangladesh, the Ministry of Health and Family Welfare (MOHFW) is in charge of health administration, except for some areas such as urban health. In 2017, two divisions were established under the Minister and Vice Minister of Health to administer the MOHFW: the Health Services Division (HSD) and the Medical Education and Family Welfare Division (ME&FWD)<sup>103</sup>. The HSD is responsible for policymaking and managing health-related matters, maintenance of nursing care, and health financing. The ME&FWD is responsible for medical education, family planning, medical school and college, and birth and death registration.

The MOHFW has 10 implementing agencies, including the Directorate General of Health Services (DGHS), which manages health facilities and provides health services, the Directorate General of Family Planning (DGFP), the Directorate General of Nursing and Midwifery (DGNM), and the Directorate General of Drug Administration (DGDA) (see Figure 5-1)<sup>104</sup>.



**Figure 5-1 Implementing agencies of MOHFW**

#### **Health administration system under DGHS**

The DGHS is the largest implementation agency in MOHFW, with over 100,000 managers and staff. It is in charge of providing technical assistance in implementing and improving the program. Within the DGHS, there is a Director General, assisted by two Additional Director Generals (one in charge of administration and the other in charge of planning and development), under which there are several directors and deputy directors.

The health administration under the DGHS is divided into six levels: national, divisional, district, upazila, union, and ward, as shown in Figure 5-2. Health care services are divided into three levels: tertiary care facilities providing advanced medical care under central or divisional jurisdiction, secondary care facilities at the district level, and primary care facilities at the upazila, union, and ward levels.

<sup>103</sup> MOHFW, Health Bulletin 2019.

<sup>104</sup> Ibid.

	Responsible	Healthcare facilities
National level	<ul style="list-style-type: none"> <li>• Director of Institute</li> </ul>	<ul style="list-style-type: none"> <li>• Public Health Institute</li> <li>• Postgraduate Medical Institute &amp; Hospital</li> <li>• Specialized Health Center</li> </ul>
Division level	<ul style="list-style-type: none"> <li>• Divisional Director (Health)</li> <li>• Principal, Medical College / Director</li> </ul>	<ul style="list-style-type: none"> <li>• Medical College and Hospital</li> <li>• General Hospital with Nursing Institute</li> <li>• Infectious Disease Hospital, etc.</li> </ul>
District level	<ul style="list-style-type: none"> <li>• Civil Surgeon</li> <li>• Superintendent, District Hospital</li> </ul>	<ul style="list-style-type: none"> <li>• District Hospital</li> <li>• General Hospital</li> <li>• Specialized Hospital, etc.</li> </ul>
Upazila level	<ul style="list-style-type: none"> <li>• Upazila Health &amp; Family Planning Officer</li> </ul>	<ul style="list-style-type: none"> <li>• Upazila Health Complex</li> </ul>
Union level	<ul style="list-style-type: none"> <li>• Medical Officer</li> <li>• Health Inspector</li> </ul>	<ul style="list-style-type: none"> <li>• Rural Health Center</li> <li>• Union Sub Center</li> <li>• Union Health &amp; Family Welfare Center</li> </ul>
Ward level	<ul style="list-style-type: none"> <li>• Health Assistant</li> <li>• Community Healthcare Provider</li> </ul>	<ul style="list-style-type: none"> <li>• Community Clinic</li> </ul>

Figure 5-2 Allocation of responsible and healthcare facilities under the DGHS<sup>105</sup>

The health administration under the DGHS is divided into six levels: national, divisional, district, upazila, union and ward. Tertiary facilities and postgraduate medical education and training institutions are established at the national level. In the divisions, the Divisional Director monitors the divisional level health administration, and there are Deputy Directors and Assistant Directors. At least one infectious disease hospital and one or more medical college(s) with their hospital in each division. At the district level, the Civil Surgeon (CS) manages and supervises primary and secondary health services. Each district has a district hospital, which is managed by the superintendent. In some cases, the CS looks after the district hospital. The division also has medical colleges with attached hospitals, medical assistants' training schools, and nursing training institutes<sup>106</sup>.

The Upazila Health and Family Planning Officers (UH&FPO) are responsible for health administration at the upazila level and are responsible for managing primary health care (PHC) services in the upazila and all public health programs, including the upazila health complexes (UzHCs). Most upazilas have one UzHC, except for the upazila capital, where the UzHC also functions as the district hospital. At the union level, there are rural dispensaries (RD), union sub-centers (USC), and union health and family welfare centers (UHFWC), where doctors and sub-assistant community medical officers (SACMO) provide medical services. Union level facilities provide only outpatient services.

The MOHFW has established community clinics (CCs) at the ward level, which are managed by the Revitalization of Community Health Care Initiatives in Bangladesh (RCHCIB) project. The CCs provide a basic health care package including maternal and child health, reproductive health, family planning,

<sup>105</sup> Ibid.

<sup>106</sup> Ibid.

immunization, nutrition education, micronutrient provision, health education and counseling, infectious disease control, treatment of minor illnesses, first aid, and referral to higher-level health facilities. The CCs are governed by a management committee consisting of members elected from the community, including representatives from the local government and at least four women members.

See 5.4 below for information on facility conditions, personnel and equipment, and service provision at each healthcare facility.

### **Health administration system under DGFP**

The DGFP implements the Maternal and Child Health and Family Planning (MCH-FP) program using an extensive network of health facilities, satellite clinics, and domiciliary workers to provide services. More than 50,000 staff, health workers, and field workers are engaged in the work, and MCH-FP services cover from the district to the community level. At the district level, there are maternal and child health clinics at the district hospitals and maternal and child welfare centers (MCWC) where doctors, family welfare visitors (FWV), and nurses provide maternal and child health services, including antenatal and postnatal care, normal deliveries, and, child health services including expanded immunization programs (EPI), and family planning. Similar services are also provided at a model clinic attached to a public medical college hospital. The MCH-FP program is managed by the Deputy Director-Family Planning (DD-FP) at the district level and the Divisional Director (Family Planning) at the division level.

At the upazila level, the MCWC provides services equivalent to those at the division level. Almost all UzHCs have MCH-FP units that provide antenatal and postnatal care, normal deliveries, child health services including EPI, health education, and family planning services, and are staffed by a physician (in charge of MCH-FP) and FWVs. The upazila family planning officer: (UFPO) manages the family planning program, and a physician (in charge of MCH-FP) manages the provision of maternal and child health services at the upazila level.

At the union level, maternal and child health services are provided in almost all facilities. At the Union Health and Family Welfare Center (UHFWC), SACMOs and FWVs provide antenatal and postnatal care, normal deliveries, health education, child health services, family planning services, and treatment of general patients. FWVs are stationed at USCs and rural dispensaries under DGHS to provide maternal and child health services. SACMOs and FWVs also provide maternal and child health services and health education at satellite clinics<sup>107</sup> conducted monthly at the community level.

The DGFP has its own Family Welfare Assistants (FWA) for family planning services at home. FWA also provides services at CC and EPI outreach sites. A Family Planning Inspector (FPI) is responsible for managing the activities of the FWA as a union-level supervisor.

For information on the status of facilities, personnel and equipment, and service provision at each health facility, refer to the information below.

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<sup>107</sup> Staff visits schools and other public places where community residents tend to gather monthly to provide basic health services.

The DGHS and DGFP have separate health service management and delivery systems from central to ward level, but the inefficiencies of this dualization are often pointed out. Although there have been partial attempts to reform these systems, they have not been successful.

### **5.1.2 Role of other public and private institutions**

In the health service delivery system of Bangladesh, there is a multidimensional intertwining of public, NGO and private institutions. The MOHFW and its related regulatory bodies are responsible for direct and indirect oversight of the health service delivery by these institutions.

#### **Health service provision in urban areas**

Urban health services, including primary health care (PHC), are administered by the Ministry of Local Government, Rural Development and Cooperatives (MOLGRD&C). Since 1998, the ministry has implemented the Urban Primary Health Care Services Delivery Project (UPHCSDP) in partnership with urban local governments and NGOs working with them. The UPHCSDP aims to improve the health status of urban residents, especially the poor, through improved access to and use of efficient, effective, and sustainable PHC services. The UPHCSDP provides services in more than 150 health centers, 25 of which are equipped with hospitalization facilities, covering all city corporations and four pourashava. UPHCSDP's health services include maternal and child health, reproductive health, family planning, nutrition, infectious and non-communicable disease control, limited treatment, and diagnosis. The UPHCSDP health services are considered a model of public-private partnership to provide PHC to the urban poor, especially mothers and children.

In order to provide a comprehensive PHC service package including maternal and child health, family planning, and nutrition services to the urban population, additional measures must be taken to ensure adequate human and material resources at facilities run by MOLGRD&C and smooth referral implementation from these facilities to secondary and tertiary facilities run by MOHFW. The need for greater coordination between the two ministries is often noted. However, effective coordination mechanisms between MOHFW and MOLGRD&C are not fully functional, which is a challenge.

#### **NGOs**

The government of Bangladesh encourages the involvement of NGOs in the provision of health services, and more than 4,000 NGOs are active in the health sector, including international NGOs (e.g., CARE, Save the Children, World Vision), large national NGOs (e.g., Bangladesh Rural Development Committee (BRAC), Concerned Women for Family Planning, Grameen Kalyan Health Program), and hundreds of smaller local NGOs. NGOs are responsible for providing PHC services through clinics, satellite clinics, and community health workers (CHWs). The NGO Health Service Delivery Program (NHSDP) is a network of about 25 NGOs funded by USAID that provides maternal and child health and family planning services to about 20 million people through more than 399 clinics and about 8,800 satellite clinics. BRAC also has a large community-level network to provide PHC services, including basic health services, maternal and child health services,



infectious and non-communicable disease control, nutrition counseling. BRAC's programs include 55,000 CHWs working in rural and urban slums to provide prevention and simple treatment for women and children. Women and children prevention and simple treatment services are provided.

### **Private institutions**

The private health sector in Bangladesh includes large companies, small and medium enterprises, physicians and sole proprietors, and the informal sector. Hospitals, nursing and obstetrical facilities, clinics run by physicians, nurses, midwives, and paramedics, diagnostic facilities (e.g., laboratories and radiology rooms), provision of unlicensed alternative health care, sale of medicines in pharmacies, and unlicensed sale of fixed and mobile drug sales are provided. Most of the private service institutions are located in urban areas, resulting in geographical inequities in the provision of services. The majority of Bangladeshis usually purchase their medicines from private pharmacies, and direct purchase from private pharmacies is the most common way for rural residents and the urban poor to obtain medicines.

Medical services are mainly provided by facilities run by qualified medical practitioners, offering a wide range of traditional as well as modern medicine. Alternative medicine such as homeopathy and Ayurveda is also provided to the poor in rural areas<sup>108</sup>.

In Bangladesh, the private sector is growing rapidly, with a tremendous increase in the number of hospitals and hospital beds, as well as educational institutions. According to a survey conducted by the Bangladesh Bureau of Statistics just before the COVID-19 pandemic<sup>109</sup>, over the past two decades, the number of registered private hospitals has quadrupled from 1,125 to 4,452, clinics have tripled from 411 to 1,397, and diagnostic centers have increased six-fold from 1,778 to 10,291. Of the 16,979 private medical institutions, diagnostic centers accounted for more than 60 %.

For information on the status of facilities, personnel and equipment, and service provision at each private facility, refer to the information below.

### **5.1.3 Regulation**

#### **Regulatory body**

Under the MOHFW, the following six regulatory bodies are in place.

- Bangladesh Medical and Dental Council (BMDC)
- Bangladesh Nursing and Midwifery Council (BNMC)
- State Medical Facility (SMF)
- Pharmacy Council of Bangladesh (PCB)
- Bangladesh Homeopathic Board (BHB)

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<sup>108</sup> Parvez Sattar, 2021. Health Sector Governance: An Overview of the Legal and Institutional Framework in Bangladesh, Open Journal of social Sciences, Open Journal of Social Sciences, Vol.9, No.11.

<sup>109</sup> Bangladesh Bureau of Statistics, 2019. Report on the Survey of Private Healthcare Institutions.

- Bangladesh Board of Ayurvedic and Unani System of Medicine (BBAUSM)

The PCB is under HSD, and the other five regulatory bodies are under ME&FWD.

(1) Bangladesh Medical and Dental Council (BMDC)

BMDC is the regulatory body for the Bachelor of Medicine and Bachelor of Surgery (MBBS), Bachelor of Dental Surgery (BDS) and Medical Assistants, established by the BMDC Act, 2010. Currently, the number of medical and dental colleges and medical assistant training schools is increasing, and there is a need to increase the capacity of BMDC's human resources and resources to handle the expanding workload. The Council currently has 67 members, 8 of whom are members of the National Assembly. In addition, about 18% of the members are non-physicians. Only BMDC registrants are allowed to practice medicine in general, and violators are punished.

(2) Bangladesh Nursing and Midwifery Council (BNMC)

The BNMC is the regulatory body for nurses and midwives, established by the BNMC Act of 2016. The president of the council is the Secretary General of the MOHFW, and about half of the 22 members are MOHFW staff, making it difficult to ensure its independent function as a council. In addition to nurses and midwives, Family Welfare Visitors (FWV), community paramedics, and Community Skilled Birth Attendants (CSBA) are registered with the BNMC, which is responsible for issuing certificates to nursing and midwifery diploma holders and for registering degree holders.

(3) State Medical Facility (SMF)

The SMF issues certificates to medical technicians with diplomas, except for pharmacists and medical assistants. There is no law on which to base the establishment, and it is awaiting the adoption of the Bangladesh Allied Health Professional Education Board Law 2019. In addition to issuing certificates, there is a need for a registration body for medical technicians to ensure that they perform their duties properly.

(4) Pharmacy Council of Bangladesh (PCB)

The PCB is the regulatory body for pharmacists under the Pharmacy Ordinance, 1976. The Secretary General of the MOHFW is the chairperson of the council, which raises questions about the independence of the organization. The PCB issues diploma pharmacist certificates and is also responsible for the registration of pharmacists.

(5) Bangladesh Homoeopathy Board (BHB)

The BHB is the regulatory body for homeopathic therapists under the Bangladesh Homeopathic Therapists Ordinance, 1983. The BHB issues certificates to diploma holders and registers them. There are 19 members, out of which 16 must be homeopathic therapists, all of whom are currently homeopathic therapists.

(6) Bangladesh Board of Ayurveda and Unani Medicine (BBAUSM)

The BBAUSM is an organization concerned with Ayurveda and Unani. The legal basis for the BBAUSM is the Bangladesh Unani and Ayurvedic Practitioners Ordinance 1983. The Board is responsible for conducting exams, issuing degree certificates, and registration. The process to amend the Ordinance is underway. In addition to issuing certificates to diploma holders, the amendment, Bangladesh Unani and Ayurvedic Treatment Law 2018, proposes establishing a Bangladesh Unani Ayurveda Board to conduct exams and a Bangladesh Unani Ayurveda Medical Council to register practitioners.

As for these regulatory bodies, low capacity and lack of independence are generally pointed out as challenges.

**Issues related to regulations**

Bangladesh has enacted a number of policies, laws and regulations on specific areas, which constitute the regulatory framework for governance in the health sector. However, the need to review the existing policy and regulatory framework has been frequently pointed out. A paper by Sattar in 2021<sup>110</sup> specifically suggests the following responses.

- 1) It is of utmost importance to develop a strategy for decentralization and devolution beyond delegation within the MOHFW and DGHS. Although decentralization is underway, an effective decentralization process has not been followed in the health system, and executive power and effective decision-making are concentrated in the MOHFW. The lower levels of health administration merely implement the plans and programs decided by the MOHFW, and thus the plans and programs often do not reflect local realities. Necessary regulations need to be reviewed and implemented in order to materialize the process of delegation of authority.
- 2) Emphasis should be placed on inter- and intra-ministerial coordination to ensure a balance between the resources and activities of urban and rural areas, public and private sectors, government and NGOs, and to avoid conflicts and duplication.
- 3) Clearly define a set of norms, standards, and service-focused, user-friendly clinical and administrative regulations (from licensing to monitoring) for private institutions, traditional health services, and providers of these services, including amendments to the 1982 Medical Practice Private Clinics and Laboratories (Regulation).
- 4) Develop a revised DGHS HR manual, service rules, and code of conduct to ensure consistent grades, titles, and career development, and balanced distribution of responsibilities and lines of supervision, and new hiring criteria for technical heads (e.g., IT career personnel in charge of ICT for management positions, media personnel in charge of media and PR, legal experts in charge of law and policy).
- 5) Create an Urban Health Unit within the DGHS.
- 6) Conduct a thorough review of existing policy norms and principles to coordinate and align the code of

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<sup>110</sup> Parvez Sattar, 2021. Health Sector Governance: An Overview of the Legal and Institutional Framework in Bangladesh, Open Journal of social Sciences, Open Journal of Social Sciences, Vol.9, No.11.

conduct, professional and ethical standards with the legal and regulatory framework applicable to the regulatory bodies (public and private) for medical education and health services.

#### **5.1.4 Evaluation of governance in the mid-term review of 4<sup>th</sup> HPNSP**

Strengthening the governance of the health sector is a core objective of the 4<sup>th</sup> HPNSP, which calls for the establishment of the necessary legal and policy framework; efficient, equitable, and effective use of scarce health resources such as human resources for health and healthcare facilities; recognition of the importance of the health sector in national development; ensuring quality health services in both the public and private sectors; responsiveness and accountability to the public. The mid-term review of the 4<sup>th</sup> HPNSP assessed progress on these fronts<sup>111</sup>. A summary of the results is presented below.

- **Legal framework:** Efforts are underway to review existing laws and regulations to align with the current situation, such as the law regulating private medical, dental and nursing colleges and the law on private clinics, but the review and approval process is taking time. There is a need to accelerate the approval and adoption of bills more actively.
- **Accreditation system:** The uncontrolled expansion of private healthcare institutions without minimum quality assurance continues, and patients generally receive substandard care, such as unreasonable drug use and inadequate infection control, while paying high costs. The MOHFW recognizes the importance of regulating the private sector but has been slow to take action. The Bangladesh Medical Accreditation Law, drafted in 2015, needs to be ratified urgently to start accrediting public and private healthcare institutions. Accreditation based on meeting quality standards is effective in providing quality care and will serve as a foundation at the facility level for social protection schemes (e.g., Shasthyo Suroksha Karmasuchi (SSK)) and future health insurance schemes.
- **Strategic service procurement:** The 4<sup>th</sup> HPNSP aims to strengthen partnerships with the private sector to provide services to underserved and hard-to-reach populations, especially in urban slums. However, the procurement of private sector services by the Bangladesh government to date has been extremely limited. On the other hand, in the urban health sector, contracts have been signed for NGOs to provide PHC to urban slum dwellers, and service delivery to vulnerable groups has been realized. The public-private partnership approach of MOHFW is being pursued by first accrediting private providers, but more proactive measures are required (e.g., SSKs should be incorporated into private hospitals, contracting with private obstetricians and gynecologists and facilities to provide postpartum family planning).
- **Citizen grievance redressal:** There is a need to ensure that residents who have received services have the means to file complaints and provide feedback on the quality of care. The IT-based grievance system is well underway, and complaints have been received about shortages of health personnel and medicines, inadequate cleaning and maintenance of facilities, and corruption. However, effective

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<sup>111</sup> Independent Review Team. 2020. 4th Health, Population and Nutrition Sector Program (HPNSP) 2017-2022 Mid-Term Review (MTR).

measures, such as disciplinary actions, are needed to improve services when necessary.

- Organizational reform: The ongoing organizational reform of the DGHS is a step towards strengthening the organizational capacity of the MOHFW, but the measures to strengthen stewardship capacity to achieve UHC need to be taken urgently within the 4<sup>th</sup> HPNSP period and transferred to the next program. It is recommended that a unit be established within the MOHFW to handle governance, stewardship and regulatory functions.

Concerning the management and coordination of the health sector, the following issues related to timeliness and quality improvement of planning have been identified<sup>112</sup>.

- The attention of the MOHFW is focused on dealing with the Rohingya refugees and managing the epidemic of infectious diseases, and the COVID-19 response has a further impact on the steady implementation of the plan.
- There are continuing challenges related to the polarization of MOHFW. For example, the Operational Plans (OPs) of the 4<sup>th</sup> HPNSP<sup>113</sup> have separate OPs with DGHS and DGFP as lead agencies in the areas of planning and monitoring, health information systems, maternal and child health, or DGFP is not able to obtain necessary funds from OPs being implemented in collaboration between DGFP and DGHS.
- There is a tendency to focus attention on an increasing number of development projects.
- Prolonged vacancies in key positions such as line director, program manager, deputy program manager, make it difficult to take leadership.
- Higher-level committees (inter-agency coordination committees and intra-agency task groups) have not been convened, slowing down the momentum of strategic reforms.
- Funding allocation for strategically important OPs (Human Resource Development (HRD), Planning, Monitoring and Research (PMR), and Planning, Monitoring and Evaluation (PME)) is low.

In addition, the following challenges have been identified in the planning, budgeting and monitoring processes under the 29 Ops of the 4<sup>th</sup> HPNSP.

- In several OPs, strategies, activities, and budgets are not aligned, and activities in priority areas are not sufficiently advanced. In addition, the inadequate setting of indicators and targets has made it difficult to monitor progress.
- Planning that is not based on needs at the facility level has resulted in inadequate input of critical health services in health facilities. There are examples of staff and equipment shortages in new facilities and misallocation of staff to handle the equipment.

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<sup>112</sup> The World Bank, 2014. Bangladesh governance in the Health Sector: A Systematic Literature Review, Parves Sattar, 2021. Health Sector Governance: An Overview of the Legal and Institutional Framework in Bangladesh, Open Journal of Social Sciences, Vol.9, No.11, as examples.

<sup>113</sup> Implementation Plan for the 4<sup>th</sup> HPNSP. The 4<sup>th</sup> HPNSP has 29 OPs, and for each OP, a lead agency, implementing and coordinating agency, and related and supporting agencies have been established to implement the OP.

- Inefficiencies due to duplication of activities among OPs are observed.

Various issues related to governance are causing many challenges at the field level. For more information on these, refer to the following sections under 5.2.

## 5.2 Health financing

### 5.2.1 Overview

In the MOHFW, the Health Economics Unit (HEU), which reports directly to the Minister, is in charge of overall planning and coordination within the ministry, while the Health Service Division (HSD) and the Medical Education and Family Welfare Division (MEFWD), which are the two pillars of MOHFW policy implementation, have their budget and finance departments (see Figure 5-3). A few months before the start of the fiscal year (July to June of the following year), the MOHFW compiles the budget request for the next year and submits it to the Ministry of Finance. After subsequent negotiations, the Ministry of Finance finally submits the budget proposal to the Diet for approval around June.

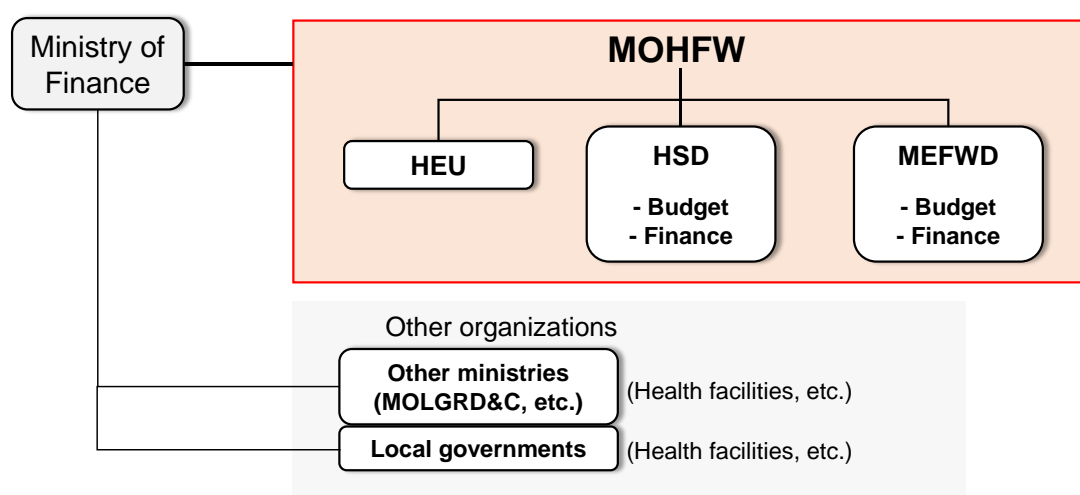
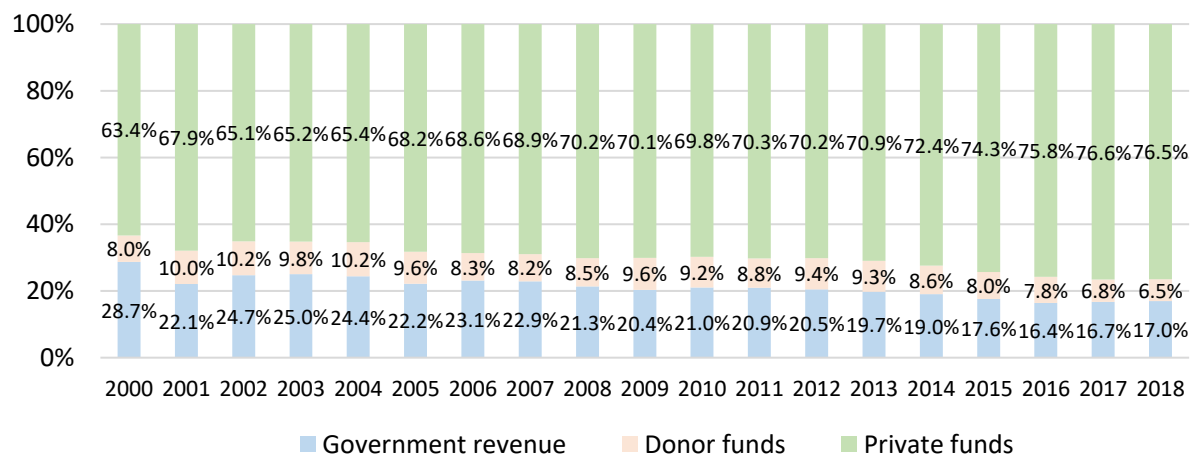


Figure 5-3 Key institutions for health financing<sup>114</sup>

Public sources of health financing consist mainly of government revenue from taxation and funds from foreign donors. According to WHO, the structure is around 70% government revenue and the rest from donor funds (72.3% government revenue and 27.7% donor funds in 2018). In the same year, including expenditures from the private sector, domestic and foreign public funding accounted for 23.5%, and private funding accounted for 76.5% of total healthcare expenditures<sup>115</sup>.

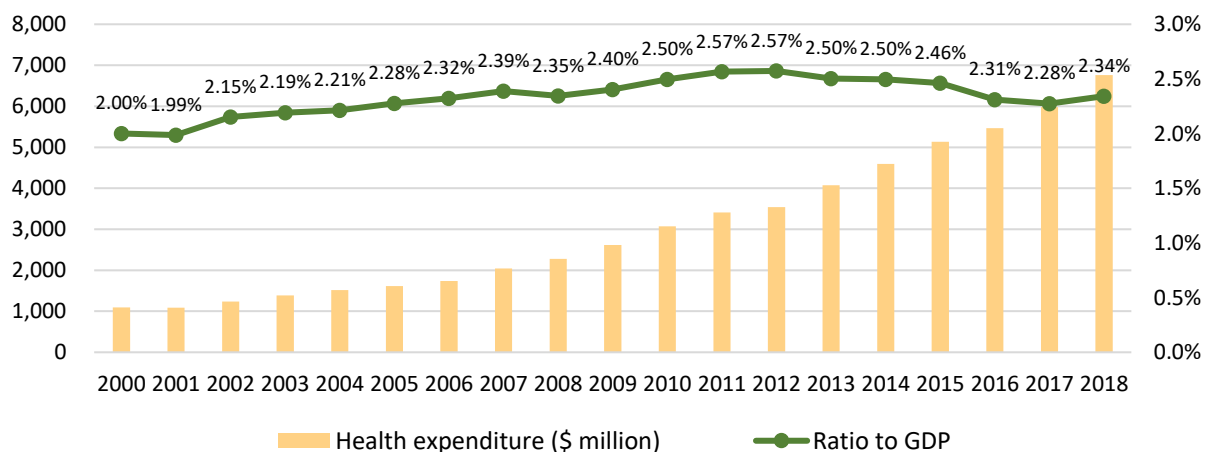
<sup>114</sup> Prepared by the research team from Health financing profile 2017 (WHO), Health Bulletin 2019 (MOHFW), and other sources.

<sup>115</sup> WHO, Global Health Expenditure Database (<https://apps.who.int/nha/database/ViewData/Indicators/en>). (Accessed on March 21, 2021)

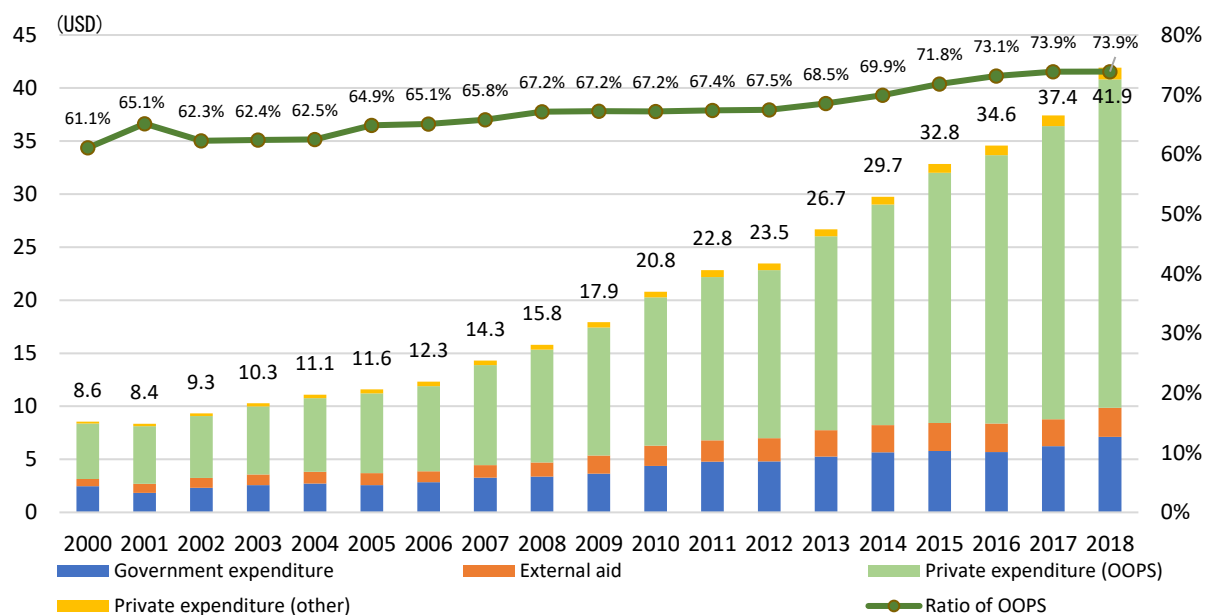


**Figure 5-4 Percentage of funding sources for health financing**

According to the WHO data mentioned above, the total public and private health expenditure in Bangladesh in 2018 was US\$ 6.76 billion or 2.34% of GDP. The per capita health expenditure was US\$41.9 (2018), which is 4.87 times higher than in 2000, in line with the growth in GDP per capita. What is striking is the high percentage of out-of-pocket spending on health care. The percentage has increased over the years and reached 73.9% in 2018 (see Figures 5-5 and 5-6).



**Figure 5-5 Total health expenditure and ratio to GDP**



**Figure 5-6 Health expenditure per capita and the ratio of OOP**

These figures are among the lowest among the countries in the WHO South-East Asia Regional Office<sup>116</sup> (SEARO), with total health expenditures of 2.34% of GDP and per capita health expenditures of US\$41.9 in 2018, both the lowest in the region. On the other hand, the Out-of-pocket expenditure ratio of 73.9% is the second-highest after Myanmar, much higher than the region's average of 26.8% (see Figures 5-7 and 5-8). The low amount of health expenditure is partly due to the low-income level compared to other countries. However, it also means that people can only receive simple and low-level services, and they often use private health institutions at their own expense because of concerns about the quality of public health care, with the purchase of medicines and laboratory tests accounting for most of the out-of-pocket expenses<sup>117</sup>. The high rate of OOP expenditure is a major barrier to improving access to healthcare for the poor, and the government aims to increase the share of government spending and reduce the OOP expenditure rate to 32% by 2032<sup>118</sup>.

<sup>116</sup> Bangladesh, Bhutan, North Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, and East Timor. However, North Korea was excluded due to lack of data.

<sup>117</sup> EBL Securities, Pharmaceutical industry of Bangladesh 3<sup>rd</sup> Edition.

<sup>118</sup> MOHFW, 2012. Expanding Social Protection for Health: Towards Universal Coverage - Health Care Financial Strategy 2012-2032.



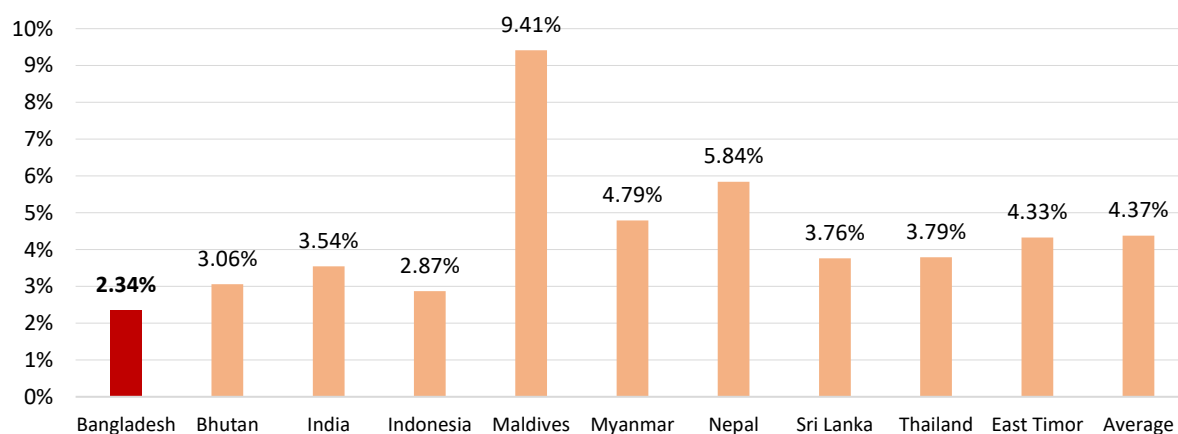


Figure 5-7 Comparison of total health expenditure and ratio to GDP with neighboring countries

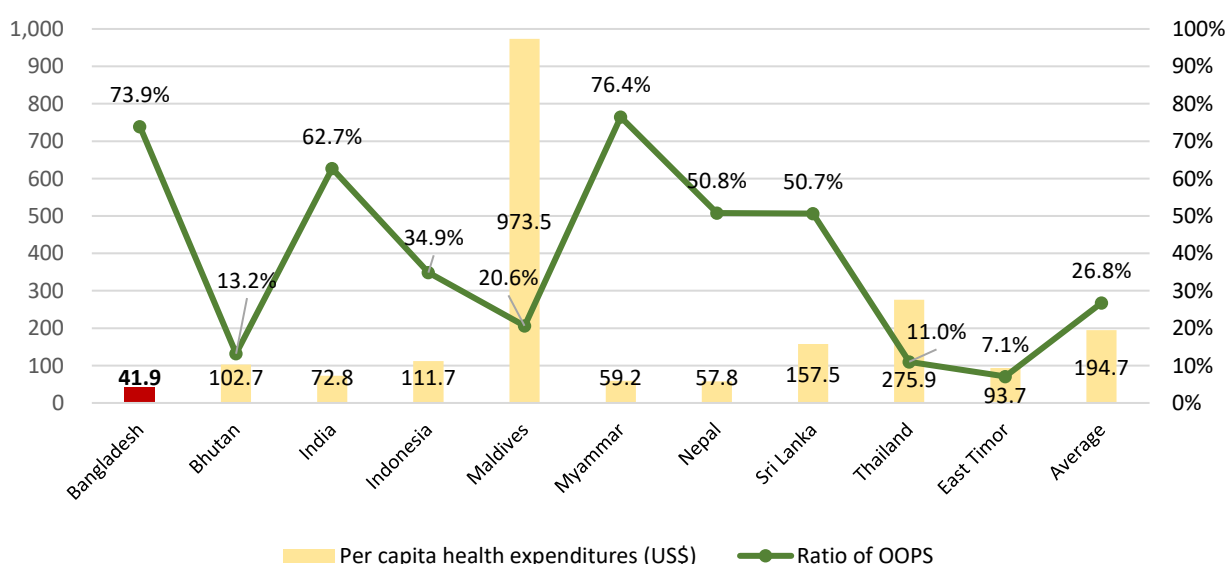


Figure-5-8 Comparison of per capita health expenditure and ratio to GDP with neighboring countries

### 5.2.2 Utilization of social security and public health insurance system

In principle, health service at public health institutions is free of charge. People often cannot receive adequate services due to the overwhelming shortage of personnel, equipment, and facilities. The quality of services provided is low, and even non-affluent residents often have to resort to self-pay treatment at private hospitals or purchase pharmaceuticals at pharmacies. In addition, they are burdened with the additional cost of medicines and transportation to the hospital, which is a major reason the ratio of out-of-pocket health expenses is extremely high at 73.9% in 2018, as shown in the previous section. In Bangladesh, the percentage of households considered "catastrophic"<sup>119</sup> is 15.6%<sup>120</sup>. Another survey estimates his percentage at 14.2% for

<sup>119</sup> Xu et al., Household catastrophic health expenditure: a multicountry analysis. *Lancet* 2003;362: 111-17

<sup>120</sup> Van Doorslaer et al. Catastrophic payments for healthcare in Asia. *Health Economics* 2007; 16:1159-84.

the country as a whole, compared to 8.6% in urban areas and 16.3% in rural areas<sup>121</sup>, making the burden of health costs a significant burden on the low-income population. According to a survey conducted by the Japan External Trade Organization (JETRO) in October 2012<sup>122</sup>, consultation fees generally paid range from 10 to 50 taka in public hospitals and 50 to 100 takas in community clinics<sup>123</sup>, while private hospitals charge between 500 and 1,000 takas. The salaries of doctors and medical staff working in public hospitals are relatively low, and sometimes there are no vacant posts, or they cannot get the post they want, so they often leave for private hospitals or abroad in search of better salaries and benefits<sup>124</sup>, which further strains public health care.

Bangladesh has made little progress in developing social security and public health insurance system, but the government has begun to consider a universal health insurance system in 2012 to achieve universal health insurance coverage for all citizens, starting with the 50 million poorest people and continuing through 2032. The plan is to raise the government's share of medical costs to 70%<sup>125</sup>. However, there are significant challenges in implementation, such as securing financial resources, lack of human resources, and problems in monitoring and supervision. It is also said that there is a tendency among the people to avoid entrusting their property to the government and a concept that health care must be provided free of charge<sup>126</sup>. In addition to the overall strengthening of the health system, efforts to overcome the barriers of users, such as community empowerment, are required.

The country's approach to financing the provision of basic health services to vulnerable groups is based on the Health Care Financing Strategy 2012-2032 (HCFS) developed by the Health Economics Unit (HEU) of the MOHFW in 2012. The goal is to achieve universal health coverage (UHC) by 2030. In line with the National Health Policy of 2011, which raised the importance of investing more funds in the health sector, the HCFS outlines the challenges and the way forward for health financing in Bangladesh. Many policy documents have pointed out the high out-of-pocket costs of health services in Bangladesh, and the HCFS identifies three main reasons for this: (1) inadequate health financing, (2) inequitable use of funds, and (3) inefficient use of existing resources. This situation greatly hinders access to basic health services, especially for the vulnerable groups, and requires financial support and economic protection. In order to provide financial protection and reduce the out-of-pocket costs for the population, HCFS set three strategic goals:

- Generating financial resources for effective health service delivery
- Promote access to health services and reduce inequities, especially for vulnerable groups
- Improving efficiency in the allocation and utilization of funds and resources

One of the key measures to materialize these goals is the Shasthyo Surokhsha Karmasuchi (SSK), a health

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<sup>121</sup> Kan et al., Catastrophic healthcare expenditure and poverty related to out-of-pocket payments for health care in Bangladesh- An estimation of Financial risk protection of universal health coverage. *Health Policy Plan.* 2017; 32(8):1102-10.

<sup>122</sup> JETRO, 2013. Bangladesh BOP Fact-Finding Report: Medical Situation" (In Japanese only)

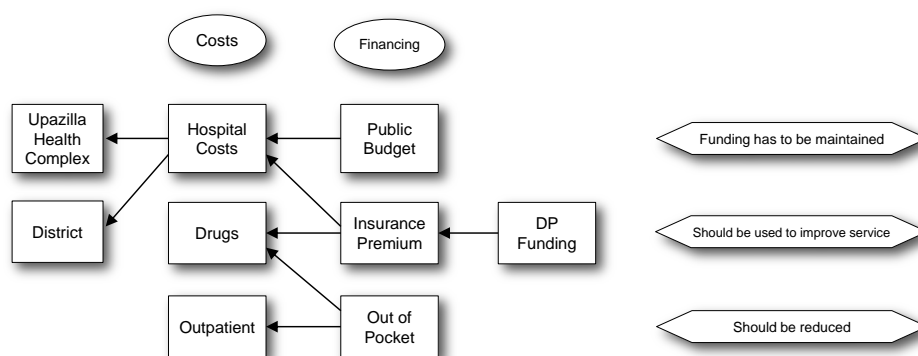
<sup>123</sup> Although there is no charge for the consultation, patients are actually charged for the consultation under various reasons, including the cost of medicines.

<sup>124</sup> Rintaro Mori, 2019. "Bangladesh: This is how distrust of public healthcare was born," m3.com (In Japanese only) ([https://career-lab.m3.com/categories/know\\_how/series/column/articles/258](https://career-lab.m3.com/categories/know_how/series/column/articles/258)) (Accessed on June 16, 2021).

<sup>125</sup> MOHFW, 2012. Expanding Social Protection for Health: Towards Universal Coverage - Health Care Financial Strategy 2012-2032.

<sup>126</sup> Joarder et al. 2019. Universal Health Coverage in Bangladesh: Activities, Challenges, and Suggestions. *Hindawi Advances in Public Health* Volume 2019.

care coverage program for vulnerable groups. Launched in 2016, SSK is currently piloted in the UzHCs of three upazilas (Kalihati, Ghatail, and Madhupur) in Tangail District of the Dhaka Division, covering 100,000 households and about 400,000 people out of a local population of about 1.3 million. Households below the poverty line can receive up to 50,000 Bangladeshi takas (about 600 US dollars) per year for inpatient treatment at UzHCs. As a result, the out-of-pocket expenses of SSK-eligible households are reduced, and the program has been recognized as effective in protecting the poor and promoting the use of services<sup>127</sup>. As indicated in the 8FYP, the government of Bangladesh is considering expanding the coverage of SSK to the remaining nine upazilas of Tangail district and 15 of the 129 wards of Dhaka city by June 2023, with a view to expanding the program nationwide in the future<sup>128</sup>. The funding for SSK consists of public funds, insurance premiums, and out-of-pocket expenses, but currently, due to budget shortfalls, public funds only contribute to the operation of the target UzHCs, and the cost of drugs and outpatient expenses are covered by insurance premiums and out-of-pocket expenses. Expansion of public health insurance is expected to reduce out-of-pocket expenses<sup>129</sup>.



Source: MOHFW (HEU)

**Figure 5-9 SSK's funding scheme**

Another major social protection scheme, the Maternal Health Voucher Scheme (MHVS), promotes the use of services by poor pregnant and nursing mothers<sup>130</sup>. Under the scheme, poor pregnant women with monthly income below 2,500 takas per month are issued vouchers for a support package (see Table 5-1) that includes three antenatal cares, delivery at a health facility, one postnatal care, cesarean section and other treatments, medicines, and subsidized transportation. The vouchers can be used at public hospitals and some private hospitals, and the hospitals can receive subsidies for their expenses<sup>131</sup>. The program was implemented in 21 upazilas when it started in 2007, but as of 2019, the coverage has expanded to 53 upazilas in 41 districts. The

<sup>127</sup> 4th Health, Population and Nutrition Sector Program (HPNSP) 2017-2022 Mid-Term Review (MTR) 2020.

<sup>128</sup> The Financial Express, 'Govt to introduce health insurance: PM' (June 12, 2019), (<https://today.thefinancialexpress.com.bd/first-page/govt-to-introduce-health-insurance-pm-1560966896>). (Accessed on March 21, 2021).

<sup>129</sup> Health Economic Unit (HEU), MOHFW, 'Financing SSK in Bangladesh', ([http://oldweb.heu.gov.bd/pdf/1\\_financing\\_ssk\\_in\\_bangladesh\\_v2.pdf](http://oldweb.heu.gov.bd/pdf/1_financing_ssk_in_bangladesh_v2.pdf)). (Accessed on March 30, 2021).

<sup>130</sup> Mahmood et al. 2019. Does healthcare voucher provision improve utilisation in the continuum of maternal care for poor pregnant women? Experience from Bangladesh. *Global Health Action*, 12:1.

<sup>131</sup> Fifty percent of the subsidy, excluding the cost of medicines and registration, is set aside in a fund to improve the services of the facility, and the rest is distributed to the health staff involved. This provision is not applicable to private hospitals.

budget is 672 million takas (2015-16), of which 200 million takas each is be used to fund service improvement in facilities and distribution to staff, and the rest is used to subsidize maternal expenses and operational costs of the program.

**Table 5-1 Support package of MHVS**

Item	Amount of subsidy for medical facilities (Taka)	Amount of subsidy for expectant and nursing mothers
Pregnancy Registration	20	
Blood and urine tests (Twice each)	140 (35×4)	Free of charge (no OOP expenses)
Antenatal care at a health facility (3 times)	150 (50×3)	Free of charge (no OOP expenses) + transportation (100 takas each)
Postnatal care at a health facility (once)	50	Free of charge (no OOP expenses) + transportation (100 takas each)
Normal delivery	300	2,000 (For deliveries at the healthcare facility) 500 (Midwife's fee in case of home delivery) + Transportation (100 takas)
Medicines	100	Free of charge (no OOP expenses)
Forceps delivery, placenta removal, uterine content removal, suction delivery	1,000	Free of charge + emergency transportation fee (up to 500 takas)
Medicines for eclampsia (convulsive seizures)	1,000	
Cesarean section surgery and its medicines	6,000	2,000 (In the case of treatment at an accredited health institution)

The mid-term review of the 4<sup>th</sup> HPNSP and various policy evaluations recognized that these measures play a certain role in protecting the vulnerable groups, including reducing out-of-pocket expenses and expanding access to health care. The 8FYP also indicated that SSK and MHVS would continue to be actively implemented as economic support measures for vulnerable groups. MOHFW aims to obtain a budget for SSK in all 12 upazilas of the division in FY2021-22, and the mid-term review of the 4<sup>th</sup> HPNSP identified scaling up SSKs as one of the three priority actions for health financing<sup>132</sup>.

However, even with the SSK scheme, the proportion of out-of-pocket expenses is still high due to lack of financial resources, the coverage of SSK and MHVS is limited to the poor, it takes a lot of time and effort to identify the target households, and there are many omissions of certification, payment delays, and low motivation on the part of service providers. Many issues need to be cleared to expand the program to the national level. In addition, many operational aspects need to be improved<sup>133</sup>, such as the lengthy process of issuing SSK user ID cards, the limited number of health institutions that can use both systems, and the complexity of the types of medicines that hospitals must have on hand due to the fixed number of medicines that are eligible for MHVS subsidies. In addition, the HEU's recommendations with external experts suggest

<sup>132</sup> The other two are to advise the Prime Minister to promote UHC and national insurance system on the occasion of the 100th birth anniversary of the first President and 50 years of independence, and to enact the Health Protection Act and establish the National Health Security Office (NHSO).

<sup>133</sup> Ahmed et al. 2018. Evaluating the implementation related challenges of Shasthyo Suroksha Karmasuchi (health protection scheme) of the government of Bangladesh: a study protocol. *bmc health services research* (2018) 18:552

that expanding the coverage of costs covered by health insurance and providing low-cost health care services to a larger number of residents will help promote the implementation of SSK<sup>134</sup>. Chronic financial difficulties and low public spending on the health sector also impede the widespread deployment of SSK and the expansion of beneficiary coverage, so securing a wide range of funding sources, including development partners and the private sector, is urgent.

As mentioned above, in Bangladesh, where the ratio of out-of-pocket expenses to health expenditures is remarkably high, the poor often turn to loan sharks or sell off their meager possessions to finance the large expenditures, thus creating a cycle of poverty. As the realization of UHC and the expansion of the health insurance system as a safety net for these vulnerable groups are urgently needed, the 4<sup>th</sup> HPNSP recommends the enactment of a Health Protection Act for the development of the health insurance system as one of the priority actions in the area of health financing. The first draft was prepared in 2014<sup>135</sup>, and it stipulates the National Health Protection Authority as the implementing agency, the establishment of a fund, and the issuance of health insurance cards. However, the bill has not yet been enacted, and the MOHFW, with the support of donors and other organizations, hopes to finalize the content to reflect the latest situation<sup>136</sup>.

The Health Equity Fund (HEF<sup>137</sup>) and the National Health Security Office (NHSO), which is in charge of the SSK and HEF, were proposed in the HCFS 2012-2032, which was formulated in 2012, to be developed by 2016, the final year of the Third Health Population and Nutrition Sector Development Program (HPNSDP), as social security measures along with the SSK. The HEF uses funds from the government and donors to pay for and reduce the medical costs of residents who are identified as poor and entrusts local NGOs and community organizations with the task of paying medical institutions, managing funds, and providing support to the target population. As planned, the SSK was launched in 2016, but the HEF and NHSO have not yet been established. The NHSO is required to be highly independent and efficient in its operations, including establishment and management of funds and flexible financial contributions. However, the lack of government guidelines, the lack of institutional design to manage the HEF, and the need for complex coordination with related agencies are believed to be factors that have prevented the plan from moving forward<sup>138</sup>, and no concrete roadmap for the development of the HEF and NHSO has been presented.

### **5.2.3 Trends in health expenditures and execution rate**

The total government budget allocated to the health sector in 2019-20 for HSD and MEFWD was 257.3 billion takas, an increase of 10.1 % over the previous year, accounting for 4.7 % of the total government budget, 0.9 % of nominal GDP for the same period. The actual execution amount was 175.3 billion takas, down 6.1% from the previous year, for an execution rate of 68.1%. In previous years, the overall execution rate of the

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<sup>134</sup> Health Economic Unit (HEU), MOHFW, 'Financing SSK in Bangladesh', ([http://oldweb.heu.gov.bd/pdf/1\\_financing\\_ssk\\_in\\_bangladesh\\_v2.pdf](http://oldweb.heu.gov.bd/pdf/1_financing_ssk_in_bangladesh_v2.pdf)). (Accessed on March 30, 2021).

<sup>135</sup> [http://www.mohfw.gov.bd/index.php?option=com\\_docman&task=doc\\_download&gid=4477&Itemid=75&lang=en](http://www.mohfw.gov.bd/index.php?option=com_docman&task=doc_download&gid=4477&Itemid=75&lang=en)

<sup>136</sup> Results of the survey team's interviews with the HEU.

<sup>137</sup> RTI International, 'Improving Health Care Delivery in Bangladesh'. (<https://www.rti.org/brochures/improving-health-care-delivery-bangladesh>). (Accessed on April 15, 2021).

<sup>138</sup> Ahmed et al. 2019, "Diagnostic Study of Public Financial Management: To Strengthen Health Financing and Service Delivery in Bangladesh", World Bank

government budget has been around 80%, and the same has been the case in the health sector. The initial budget for 2020-21 was 292.4 billion takas, a 13.7 % increase over the previous year, which was later revised to 314.7 billion takas by adding COVID-19 and other costs. The budget for 2021-22, which started in July 2021, is expected to increase with an estimated 327.3 billion taka.

**Table 5-2 Budget trends in the health sector**

(100M taka)		2017-18	2018-19	2019-20	2020-21	2021-22*
<b>Health Services Division</b>						
Ordinary expenses	Initial budget	833.1	911.8	1,000.8	1,283.0	1,291.4
	(execution amount)	(769.4)	(797.7)	(848.0)	-	-
Policy expenses	Initial budget	785.1	904.1	993.7	1,005.4	1,300.0
	(execution amount)	(534.2)	(671.6)	(533.1)	-	-
sub-total	Initial budget	1,618.2	1,815.9	1,994.5	2,288.4	2,591.4
	(execution amount)	(1,303.6)	(1,469.3)	(1,381.1)	-	-
	execution rate	80.6%	80.9%	69.2%	-	-
<b>Medical Education and Family Welfare Division</b>						
Ordinary expenses	Initial budget	279.9	312.4	345.8	391.7	425.9
	(execution amount)	(248.0)	(266.0)	(281.9)	-	-
Policy expenses	Initial budget	167.0	210.0	233.0	244.6	255.8
	(execution amount)	(132.3)	(132.4)	(90.2)	-	-
Sub-total	Initial budget	446.9	522.4	578.8	636.3	681.7
	(execution amount)	(380.3)	(398.4)	(372.1)	-	-
	execution rate	85.1%	76.3%	64.3%	-	-
<b>Health sector overall</b>						
Ordinary expenses	Initial budget	1,113.0	1,224.2	1,346.6	1,674.7	1,717.3
	(execution amount)	(1,017.4)	(1,063.7)	(1,129.9)	-	-
Policy exs	Initial budget	952.1	1,114.1	1,226.7	1,250.0	1,555.8
	(execution amount)	(666.5)	(804.0)	(623.3)	-	-
<b>Total</b>	<b>Initial budget</b>	<b>2,065.1</b>	<b>2,338.3</b>	<b>2,573.3</b>	<b>2,924.7</b>	<b>3,273.1</b>
	<b>(execution amount)</b>	<b>(1,683.9)</b>	<b>(1,867.7)</b>	<b>(1,753.2)</b>	-	-
	execution rate	81.5%	79.9%	68.1%	-	-
(Execution rate of all government budgets)		(80.4%)	(84.3%)	(80.3%)	-	-
YoY growth rate	Initial budget	-	13.2%	10.1%	13.7%	11.9%
	(execution amount)	-	(10.9%)	(-6.1%)	-	-
Total government budget ratio	Initial budget	5.2%	5.0%	4.9%	5.1%	-
	(execution amount)	(5.2%)	(4.8%)	(4.2%)	-	-
GDP ratio	Initial budget	0.9%	0.9%	0.9%	-	-
	(execution amount)	(0.7%)	(0.7%)	(0.6%)	-	-

\*2021-22: approximation  
(Source: Ministry of Finance)

The largest share of HSD expenditure (just under half of the recurrent expenditure, or about one-third of the total budget) is on personnel costs for hospital staff and administration, which increased by 34.4 % to 78.6

billion takas in the 2020-21 budget compared to the previous year. The second-largest category is medicines and medical supplies, which increased by 14.7 % to 45.2 billion takas (see Table 5-3). In terms of expenditure by administrative level - central government, districts, and upazilas - organizations and health facilities under the central government accounted for 82.7 % of the total budget in 2019-20, followed by upazilas at 15.1 % and provinces at 2.3 districts (see Table 5-4).

Since the public health insurance system is not yet fully developed in Bangladesh, the government does not pay reimbursement to health institutions to cover patients' out-of-pocket expenses, except for pilot projects such as SSK and MHVS. The budgeted expenditures of the HSD, which correspond to the medical fees, could not be confirmed. On the other hand, public health institutions, which provide health services free of charge, are funded by HSD in the form of personnel costs, medicines and medical supplies. In addition, expenses for some exceptional services, such as advanced medical care, mainly outsourced to external resources, are budgeted separately and usually account for about 1.5% of the HSD's recurrent expenditure.

**Table 5-3 HSD budget trends by objective**

(100M taka)	2018-19	2019-20	2020-21
<b>Ordinary expenditure</b>			
Personal expenses	590.8	595.0	786.4
General and administrative	75.4	88.7	104.9
Pharmaceuticals and medical supplies	353.0	406.2	451.8
Maintenance and management	65.3	77.9	93.3
Training	27.6	32.0	40.1
Other	102.2	117.0	140.9
Sub-total	1,214.3	1,316.9	1,617.3
<b>Capital expenditure</b>			
Buildings	315.4	355.8	368.9
Medical equipment	214.6	193.1	252.7
Other	16.3	25.0	17.6
Sub-total	546.3	574.0	639.3
<b>Reserve fund</b>	55.2	103.6	31.8
<b>Total</b>	1,815.9	1,994.4	2,288.4

(Source: Ministry of Finance)

**Table 5-4 HSD budget trends by organization**

(100M taka)	2018-19	2019-20	2020-21*	2021-22*
<b>Central government</b>				
HSD secretariat	332.4	518.2	498.6	450.7
Health Service Division headquarters	734.6	644.7	786.1	961.8
University hospitals	171.8	210.2	224.6	247.1
DGNM	143.0	135.7	143.6	158.4
Other health facilities	74.1	139.9	150.0	165.7
Sub-total	1,455.8	1,648.7	1,803.0	1,983.8
<b>District</b>				
CS office	1.7	1.9	2.1	2.3
District hospitals	75.8	43.1	43.0	46.1
Sub-total	77.5	45.0	45.1	48.4
<b>Upazila</b>				
Upazila health offices	108.8	113.4	120.2	138.9
Upazila health facilities	174.5	187.3	206.0	220.6
Sub-total	283.3	300.7	326.2	359.5
<b>Total</b>	1,816.6	1,994.4	2,174.3	2,391.7

\*2020-21 and 2021-22: planned budget as of 2019

(Source: Ministry of Finance)

In most years, the budget for the health sector is less than 1% of GDP, which is much lower than the average of 2.3% in other countries (according to WHO)<sup>139</sup>. In addition, health sector expenditure has been around 5% of the total government budget in previous years, which is far from WHO's recommendation that Bangladesh and similar countries should spend around 15% of their budget on the health sector<sup>140</sup>. In the 8FYP, the government of Bangladesh aims to increase the health sector budget from only 0.7% of GDP in 2019 to 2.0% by 2025 (in terms of executed amount)<sup>141</sup>. In line with this, 8FYP expects to allocate policy expenditures for new health service provision and improvement of the current administrative standard, as shown in the following table<sup>142</sup>. As shown in Tables 5-2 and 5-5, in the latest budget proposal for 2021-22, the total amount for the health sector is about 170 billion takas, almost in line with 8FYP's projection, but slightly below the projection when it comes to health services only.

<sup>139</sup> The Financial Express, 'A larger health budget essential' (12/11/2019), (<https://thefinancialexpress.com.bd/views/a-larger-health-budget-essential>). (Accessed on April 11, 2021).

<sup>140</sup> Fahim et al. 2018, "Financing health care in Bangladesh: policy responses and challenges towards achieving universal health coverage". International Journal of Health Planning and Management.

<sup>141</sup> The mid-term review of the 4<sup>th</sup>HPNSP recommended an increase to 1% of GDP by the end of the program (FY2021-22).

<sup>142</sup> In the 8FYP, the term Annual Development Programme (ADP) Budget or Development Budget is used, while the term "Operating Budget/Non-Development Budget" is used to refer to the current recurrent (mandatory) expenditures for maintaining government services.



**Table 5-5 Forecast of policy expenditures in the health sector**

(100M taka)	2021-22	2022-23	2023-24	2024-25	2025-26
Health Services Division	1,517	2,076	2,527	3,104	3,724
Medical Education and Family Welfare Division	184	226	261	304	365
Health sector overall	1,701	2,302	2,788	3,408	4,089

(Source: Ministry of Finance)

#### **5.2.4 Private insurance systems**

Major foreign companies, such as MetLife Alico, offer health insurance, but only for the middle and upper classes<sup>143</sup>. Some NGOs provide simple medical insurance, for example, introduce simple and effective premium structures along with microcredit. The Gonoshasthaya Kendra is an insurance that covers a certain amount of health expenses for the family per year, and the premiums vary according to income. The higher the income of the family, the higher the premium. Grameen Health Trust's micro-insurance program allows up to six family members to obtain a card with a fixed premium and present the card to receive free annual medical checkups and purchase medicines at discounted prices. For more information on private insurance schemes, please refer to Chapter 7.

### **5.3 Human resources for health**

#### **5.3.1 Overview of human resources for health in Bangladesh**

Bangladesh has not had a strategy on human resources for health for a long time, but in 2015, the Bangladesh Health Workforce Strategy was developed. The strategy has a mission to "ensure quality health service for all by developing skilled, motivated and responsive health workforce in adequate numbers and available equitably across the country" to develop and deploy a "quality health workforce for the health and wellbeing of the people of Bangladesh." The five intervention areas are (1) health workforce planning; (2) health workforce capacity development; (3) health workforce deployment, retention and professional engagement; (4) management of high-performance standard; and (5) health workforce information systems, with short-, medium-, and long-term activities set for each<sup>144</sup>. Strengthening and supporting human resources for health in Bangladesh has become one of the major topics of discussion as the national strategy has been formulated to address the strengthening of human resources for health from a comprehensive and long-term perspective.

The Essential Health Service Package (ESP) in Bangladesh is the cornerstone of the primary health care (PHC) strategy. For community-level health human resources who provide the ESP, which is the most accessible to the population, there are many job categories in Bangladesh, and the training period for each category ranges from just 21 days for a health assistant (HA) or family welfare assistant (FWA) to five years for a bachelor's degree and one year for an internship for a medical officer. Even within the same occupation, the length of education may vary depending on the training system. For example, a midwife may be educated

<sup>143</sup> JETRO, 2015. "Bangladesh BOP Fact-Finding Report: Medical Situation".(In Japanese only)

<sup>144</sup> Short term: 2016-17; medium term: five years to 2021; long term: to 2030. Human Resource Management Unit, MOHFW. Bangladesh Health Workforce Strategy 2015.

in a four-year bachelor's program, while a three-year diploma or a 12- to 18-month certification course is also available. HA, FWA and Community Health Care Providers (CHCP) are all called community health workers (CHWs). Table 5-6 shows the categories, training periods, and duties of the main health personnel at the community level who provide ESP.

**Table 5-6 Main categories, training period, and duties of health personnel providing ESP<sup>145</sup>**

Categories	Training period	Duties
Health Assistant (HA)	21 days	Antenatal care, postnatal care, essential newborn care, family planning, expanded program on immunization, social and behavior change communication <sup>146</sup> , home visits
Family Welfare Assistant (FWA)	21 days	Antenatal care, postnatal care, essential newborn care, family planning, expanded program on immunization, social and behavior change communication, home visits
Community Health Care Provider (CHCP)	3 months	Management of common conditions, antenatal care, postnatal care, essential newborn care, family planning, expanded program on immunizations, social and behavior change communication
Community Skilled Birth Attendant (CSBA)	6 months	Antenatal care, postnatal care, essential newborn care, family planning, expanded program on immunization, social and behavior change communication, normal delivery, identification of risk and danger signs
Family Welfare Visitor (FWV)	18 months	Antenatal care, postnatal care, essential newborn care, family planning (including menstrual regulation <sup>147</sup> and IUD), social and behavior change communication, normal delivery
Medical Technician - Laboratory - Radiology	- BSc 4years - Diploma 3 years - Certificate 12 months	Basic lab and X-Ray techniques
Sub-Assistant Community Medical Officer (SACMO)	Diploma 3 years	Neonatal sepsis, management of common conditions, including integrated management of childhood illness and others
Sanitary Inspector	Diploma 3 years	Water and sanitation, food safety
Pharmacist	Diploma 3 years	Drug requisition, stock management and dispensing
Nurse	- BSc 4 years - Diploma 3 years	Nursing and preventive care (excluding prescription)
Midwife	- BSc 4 years <sup>148</sup> - Diploma 3 years - Certificate 12-18 months	Midwifery including antenatal care, postnatal care, family planning (including menstrual regulation), normal delivery
Dental Surgeon	BDS 4.5 years	Dentistry
Medical Officer / Consultant	MBBS 5 years + 1 year internship Specialization	Preventive and curative care, normal and complicated deliveries, other services according to specialty

<sup>145</sup> Ministry of Health and Family Welfare, 2016. Bangladesh Essential Health Service Package (ESP).

<sup>146</sup> BCC: Health education, awareness-raising, public relations, and communication activities to promote social and individual behavioral change that contributes to the health of the target community and people, often described as SBCC: Social and Behavior Change Communication. (Source: JOICFP,2020 Request for Continued Support for the Provision of Sexual and Reproductive Health Services in Developing Countries in the Fight against Infectious Diseases in the Wake of COVID-19, p. 3) (In Japanese only).

<sup>147</sup> According to the Government of Bangladesh, Menstrual Regulation (MR) is a means of regulating the menstrual cycle in the absence of menstruation and is performed in health facilities by trained health care providers within a certain number of weeks of a woman's last menstrual period. (Source: Hossain, A. et al (2017) Access to and Quality of Menstrual Regulation and Postabortion Care in Bangladesh: Evidence from a Survey of Health Facilities, 2014, Guttmacher Institute, p.7).

<sup>148</sup> Currently, midwifery is integrated within the Bachelor of Nursing program.

The level of facilities where health personnel mainly work is shown in Table 5-7. The location closest to the population is the community, followed by union, upazila, and district. At the community clinics, not only doctors, who are medical officers, but also nurses, midwives, medical technicians, and sub-assistant community medical officers (SACMO) do not work, and it is HAs, FWAs, and CHWs (community health care providers (CHCP) and community skilled birth attendants (CSBA)) who run facilities at this level.

**Table 5-7 Level and facility where health personnel mainly work<sup>149</sup>**

	Community			Union	Upazila	District	
	Domicile	Satellite Clinic or Outreach Site	Community Clinic	Union Health and Family Welfare Center	Upazila Health Complex	District Hospital	Maternal and Child Health Welfare Center
HA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
FWA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
CHCP			<input checked="" type="checkbox"/>				
CSBA	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>				
FWV				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Medical technician					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SACMO				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Sanitary Inspector					<input checked="" type="checkbox"/>		
Pharmacist				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Nurse					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Midwife				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Dental Surgeon					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Medical officer				General Practitioner (GP)	GP / Specialist	Specialist / GP	Specialist / GP

### 5.3.2 Supply system of health workforce

Table 5-8 summarizes the main types of the health workforce in Bangladesh, their degrees obtained and years of education. Medical officers must have a five-year bachelor's education in a medical college and a one-year internship. There are two training patterns for nurses: a four-year bachelor's education at a nursing college, and a three-year diploma education at a nursing school. Midwifery training requires three years of education at a nursing college or nursing school.

**Table 5-8 Types of health personnel, degrees, and years of education<sup>150</sup>**

Health workforce	Degree	Training institution	Years of education
Medical officer	Bachelor of Medicine and Bachelor of Surgery (MBBS)	Medical college	Five years and one year of internship
Dental surgeon	Bachelor of Dental Surgery (BDS)	Dental college	Five years and one year of internship

<sup>149</sup> Ministry of Health and Family Welfare 2016. Bangladesh Essential Health Service Package (ESP).

<sup>150</sup> WHO Bangladesh, 2018. Mapping of Health Professional Education Institutions in Bangladesh.

Health workforce	Degree	Training institution	Years of education
Nurse	Bachelor of Science in Nursing (BScN)	Nursing college	Four years
	Diploma in Nursing and Midwifery (DNSM)	Nursing school	Three years
Midwife	Diploma in Midwifery (DM)	Nursing college, nursing school	Three years
Medical assistant	Diploma in Medical Diploma (DMA)	Medical assistant training school	Three years and one year of internship
Medical technician <sup>151</sup>	Medical Technology Diploma: Pharmacy	Medical technology school	Three years
	Medical Technology Diploma: Lab Technology		Three years
	Medical Technology Diploma: Radiology		Three years
	Medical Technology Diploma: Radiation Therapy		Three years
	Medical Technology Diploma: Dental Technology		Three years
	Medical Technology Diploma: Physical Therapy		Three years
	Medical Technology Diploma: Sanitary Inspection		Three years
	Medical Technology Diploma: Operating Room Support		Three years
	Medical Technology Diploma: Intensive Care Support		Three years
	Medical Technology Diploma: Prosthetics and Orthotics		Three years
	Medical Technology Diploma: Cardiology		Three years

The number of facilities and capacity by government and non-government to train doctors and nurses, nurses/midwives, and midwives are shown in Table 5-9.

**Table 5-9 Number of institutions training doctors, nurses/midwives and midwives and enrollment capacity in 2016<sup>152</sup>**

Health workforce	Training institution	No. of government training facilities (capacity)	No. of non-governmental training facilities (capacity)	Total number of training facilities (Total capacity)
Medical officer	Medical college	30 (3,234 students)	69 (6,200 students)	99 (9,434 students)
Nurse	Nursing college	19 (1,035 students)	39 (2,185 students)	58 (3,220 students)
Nurses/Midwife midwife	Nursing school / college	43 (Nursing and midwifery: 2,580, Midwifery: 975)	114 (Nursing and midwifery: 7,035, Midwifery: 560)	157 (Nursing and midwifery: 9,615, Midwifery: 1,535)

In the 45 years between 1971 and 2016, there was a significant increase in the number of major health professions educational institutions (a 31-fold increase from 22 to 674). The number of medical colleges increased from six in 1971 to 29 in 2000 (a five-fold increase) and 105 in 2016 (a more than 17-fold increase

<sup>151</sup> Currently, the Institute of Health Technology in Dhaka and Rajshahi offer a four-year bachelor's program in physical therapy, radiology, and laboratory.

<sup>152</sup> WHO Bangladesh, 2018. Mapping of Health Professional Education Institutions in Bangladesh.

from 1971). The number of nursing colleges increased from 5 in 1971 to 8 in 2000 and 64 in 2016 (an increase of about 13 times). The number of nursing schools almost tripled from 57 to 157 between 2010 and 2016.

**Table 5-10 Number of doctors and nurses training schools from 1971 to 2016<sup>153</sup>**

Year	Medical college	Nursing college	Nursing school
1971	6	5	8
1980	8	6	17
1990	11	6	33
2000	29	8	33
2010	62	30	57
2016	105	64	157

### 5.3.3 Demand for and sufficiency of health workforce

#### Number of doctors and nurses

According to WHO, the number of doctors and nurses/midwives per 10,000 population in Bangladesh is low compared to neighboring countries in Southeast Asia<sup>154</sup>. For example, the average number of doctors in the countries in the WHO South-East Regional Office (SEARO) is 8.1, while Bangladesh has 5.8, which is the second-lowest after Indonesia. The number of nurses/midwives is extremely low compared to the average of 17.9 in the SEARO, which is only 4.1. The global average is 15.6 for doctors and 37.6 for nurses/midwives, indicating that the number of these professionals in Bangladesh as a percentage of the population is limited. In addition, the WHO Global Human Resources Strategy for Health in 2016 recommended a new indicator of 44.5 doctors and nurses/midwives per 10,000 population for each category of doctors and nurses/midwives<sup>155</sup>, and Bangladesh is still far from the recommended standard. According to WHO guidelines, the ratio of doctors to nurses/midwives is 1:3, but there are more doctors than nurses/midwives, and a serious shortage of nursing professionals exists. In Bangladesh, the population tends to avoid nursing work for religious reasons. Even today, there is still a social stigma due to the incompatibility with social norms of nursing-specific work styles and tasks, such as women working at night, touching male and low-income patients, and doing "dirty" work. This is one of the main reasons for the shortage of nurses.

The chapter on nursing and midwifery services in the 8FYP states that the government will "continue to increase the number of nurses and midwives and provide training in skill development by increasing the number of posts in nursing professional training institutions" and that the government will focus on increasing the professional workforce of nurses and midwives.

<sup>153</sup> Ibid.

<sup>154</sup> WHO, 2020. World Health Statistics 2020.

<sup>155</sup> WHO, 2016. The Global Human Resources for Health Strategy.

**Table 5-11 Number of doctors and nurses/midwives per 10,000 population<sup>156</sup>**

	Bangladesh	India	Indonesia	Sri Lanka	Nepal	Average in SEARO <sup>157</sup>
Doctor (2010-2018)	5.8	8.6	4.3	10.0	7.5	8.1
Nurse / Midwife (2010-2018)	4.1	17.3	24.1	21.8	31.1	17.9

### **Demand and sufficiency of doctors**

According to the MOHFW Health Bulletin 2019, the number of registered doctors is 101,538. The total number of doctor posts allocated in the DGHS was 27,002 as of December 2019, with 25,594 filled posts, 1,408 vacant posts, and a vacancy rate of 5.21%. The vacancy rate for the same grade 1 posts other than doctors (excluding nursing posts) was 57.20%, and for the other grade 2 to 4 posts, it was 30.54%, 29.59% and 37.22%, respectively, indicating that the vacancy rate for doctors is low as compared to other staff.

Table 5-12 shows the results of a survey conducted in 2007. The distribution of doctors, nurses, and dentists per 10,000 population by geographic location (rural/urban) shows a significant imbalance in density, especially for doctors, with a bias towards urban areas. In terms of ratios, there are 7.25 times more nurses, 10 times more dentists, and 16.45 times more doctors in urban areas than in rural areas.

**Table 5-12 Distribution of doctors, nurses and dentists per 10,000 population<sup>158</sup>**

	Doctors	Nurses	Dentist
Rural areas	1.1	0.8	0.08
Urban areas	18.2	5.8	0.8

The health system in Bangladesh suffers from understaffing, uneven distribution of the workforce, and low retention of employees and service providers, especially in rural and remote areas. Doctor's absenteeism, in particular, is a long-standing problem<sup>159</sup>. Important factors influencing absenteeism include poor working conditions, fear of losing opportunities for further post-graduate career development, desire for private practice, work environments that are not sufficiently accommodating to women doctors, poor community relations, and weak regulations<sup>160</sup>.

### **Demand for and sufficiency of nurses**

In Bangladesh, as of April 2020, there are 66,958 registered nurses, 46% of whom work in the public sector. Most of them work in urban areas, where there are 5.8 nurses per 10,000 population, while there are only 0.8

<sup>156</sup> World Health Statistics 2020.

<sup>157</sup> Other than the above countries, Thailand, East Timor, Bhutan, Myanmar, Maldives, and the Democratic People's Republic of Korea are member countries of the WHO South-East Regional Office.

<sup>158</sup> Ahmed, S. M., et al. 2011. The health workforce crisis in Bangladesh: shortage, inappropriate skill-mix and inequitable distribution, Human Resources for Health, 22,9:3.

<sup>159</sup> Absenteeism in this case means that the employee leaves the workplace without authorization.

<sup>160</sup> Nahitun, N., et al. (2020) Where are the doctors? A study of absenteeism among doctors in rural Bangladesh, Anti-Corruption Evidence SOAS Consortium, Working paper 029

nurses per 10,000 population in rural areas<sup>161</sup>. According to the Bangladesh Basic Graduate Nurses Society (BBGNS), a student organization of nursing colleges in Bangladesh, many graduates cannot get jobs regardless of the shortage of nurses. It points out that about 110,000 nurses are unemployed, and this is because many private hospitals hire low-paying non-certified personnel as nurses. The total number of beds in public and registered private hospitals is 142,394, and about 43,000 nurses are employed in government hospitals. Under the Bangladesh Public Service Commission (BPSC), the government appointed 5,100 senior staff nurses from 11,357 candidates who passed the written exam in 2018. BBGNS requested to recruit 6,000 nurses from the remaining 6,257 candidates, and in 2020 MOHFW started the process of recruiting 2,500 nurses for the vacant posts<sup>162</sup>. In the same year, emergency hiring of nurses and other health workers for COVID-19 was also conducted<sup>163</sup>. However, there are still not enough civil servant nurses to work in public health facilities.

### **Demand for and sufficiency of midwives**

There are 4,396 registered midwives in Bangladesh as of April 2020. However, due to many birth cases in the country, a large number of midwives are needed to ensure healthy pregnancies for women and newborns, and about 22,000 midwives are needed to meet the need<sup>164</sup>.

Midwifery in Bangladesh has long been the responsibility of traditional birth attendants (TBA) and community skilled birth attendants (CSBA). While midwifery is included in existing nurse/midwife training programs, a professional midwifery education program has long been absent. In 2010, a six-month post-graduate basic certification program in midwifery was launched for existing nurses/midwives to promote evidence-based midwifery care. In the same year, the Prime Minister pledged to have 3,000 midwives in place by 2015. In addition, a three-year accreditation program for midwifery training was launched in 2013<sup>165</sup>.

### **5.3.4 Demand for and sufficiency of community health workers (CHW) and the CHW development plan**

According to the National Strategy for Community Health Workers 2019-2030<sup>166</sup> released in September 2019, there are more than 185,000 community health workers (CHW) in Bangladesh, about 70,000 are employed by the government and the rest work for NGOs. Among the CHWs employed by the government are Family Welfare Assistants (FWA), who provide family planning services in the community under the DGFP. There are also Health Assistants (HA) who provide immunization and primary health care services, and Community Health Care Providers (CHCP) who are responsible for prevention and basic treatment under the

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<sup>161</sup> The Financial Express, 'Challenges of nursing profession in Bangladesh', February 11, 2021 (<https://www.thefinancialexpress.com.bd/views/views/challenges-of-nursing-profession-in-bangladesh-1613053258>). (Accessed on May 24, 2021)

<sup>162</sup> The Business Standard, 'Bangladesh suffers from 76 percent shortage of nurses', May 3, 2020 (<https://www.tbsnews.net/bangladesh/health/bangladesh-suffers-76-percent-shortage-nurses-76387>). (Accessed on 24, 2021)

<sup>163</sup> Approximately 2,000 doctors and 5,054 nurses were employed. Laboratory technicians and pharmacists were also employed.

<sup>164</sup> Ara Bilkis, "Midwifery in Bangladesh: A brief introduction", BRAC School of Public Health, February 18, 2021

<sup>165</sup> Bogren, M., Begun F., Erlandson, K. 2017. The Historical Development of the Midwifery Profession in Bangladesh, *Journal of Asian Midwifery*, 4(1): 65- 74.

<sup>166</sup> Ministry of Health and Family Welfare. 2019. Bangladesh National Strategy for Community health Workers (2019-2030).

DGHS. Currently, there are 19,583 FWA working, and there are 23,500 allocated posts. 15,213 HA are working, and there are 21,000 allocated posts. About the CHCP, there are 13,908 employees and 15,213 allocated posts. All of these posts have vacancies. While there are about 3.8 CHWs per 10,000 population employed by the government, the situation of CHWs employed by NGOs varies. Some are employed full-time, some sell health items in the community, some are traditional birth attendants, and some are volunteers who do not receive any money.

The National Strategy for Community Health Workers 2019-2030 aims to provide policy guidelines and a framework for selecting, training, certification, recruitment, and deployment of CHWs. For specific training plans, two scenarios are provided that are necessary by 2030 to achieve the SDGs. Scenario 1 is an increase of 41,355 FWA and HA each and 18,000 CHCP, for a total need of 100,700. Scenario 2 is when one ward is added to each facility due to the expected increase in demand for community clinics, resulting in an increase of 41,355 FWA and HA and 18,000 CHCP, for a total need of 124,065.

### **5.3.5 Status of human resources information system**

A Human Resource Information System (HRIS) was introduced at MOHFW. The objective is to enhance the management of health personnel, including planning, decision-making, reporting, ensuring equitable deployment, monitoring, transfers, leaves, retirements, annual confidential reports, daily roster management, facility identification, and improved communication. The HRIS provides basic information on DGHS headquarters staff, tertiary care facilities, secondary care facilities, and all health care workers in primary care facilities, including community clinic level, along with their job titles, job classifications, regional distribution of health personnel, and vacancy rates<sup>167</sup>. It allows central authorities to identify shortages of doctors by geography and field and digitize transfers, training, and leaves of absence of doctors and other providers. They can also predict the number of health care workers who will retire in the next few years and make reliable projections for recruitment, staffing and planning based on these projections<sup>168</sup>.

The DGHS website<sup>169</sup> states that there are three databases for human resource management. They are the online Personal Data Sheet (PDS), the online Human Resource Management System, and the Field Staff Information System.

The PDS was developed for health workers of all kinds, both in the public and private sectors, but at present, it is mainly used by doctors working in the DGHS. The doctors themselves create and update the database, which contains detailed staff profiles who manage the PDS.

The Human Resource Management System is a human resource management database that receives human resource data provided by the healthcare facilities under the DGHS. The database can provide up-to-date

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<sup>167</sup> Mofijul Islam Bulbul et al, Development of HRIS (Human Resource Information System) for Health: Enormous impact to Strengthen Health System in Bangladesh, .International Scientific conference of public health foundation of Bangladesh, Conference paper, December 2015

<sup>168</sup> Enamul Haque et al. Design and development of an automated interoperable central HRIS for MOHFW of Government of Bangladesh to implement health workforce registry, 7<sup>th</sup> Regional public health conference, conference paper, December 2016

<sup>169</sup> DGHS website (Human Resource Databases), <https://dghs.gov.bd/index.php/en/e-health/our-chealth-eservices/84-english-root/chealth-eservice/104-human-resourse-databases>



information on the human resources of all DGHS staff at all times.

The Field Staff Information System creates the database by collecting data from field staff working at the community level and sending their personal information via SMS using their cell phones. The field staff includes HAs, assistant health inspectors (AHIs), health inspectors (HIs)<sup>170</sup>, family planning service personnel, and community health workers. The information in the database includes name, affiliation, place of work, and cell phone number.

In addition, the MOHFW has taken data from the personal data sheet database and created a database for leave management. It states that it is developing another new database to track information on dispatches for higher education.

### **5.3.6 Impact of COVID-19 on human resources for health**

The government announced that doctors and other health personnel on the frontline of the fight against the COVID-19 would be given two months of their basic salary as an incentive. It also announced in April 2020 that health workers would be covered by the insurance up to 1,00,000 takas<sup>171</sup>.

However, a news report on August 28, 2021, stated that nearly 9,400 health workers (3,106 doctors, 2,281 nurses, and 4,015 other health personnel) had been infected with the virus, and 186 doctors had lost their lives in the country, according to the Bangladesh Medical Association,<sup>172</sup>.

A study on mental health during the COVID-19 pandemic<sup>173</sup> was conducted among 1,000 nurses in 20 private and 8 public hospitals in the country during November and December 2020. The results showed that Bangladeshi nurses working in hospitals had a higher prevalence of depression, anxiety, stress, and psychological effects. Those female nurses were more susceptible to higher psychological effects than male nurses, and the factors contributing to psychological effects included not wearing full protective clothing while working and social stigma among nurses during COVID-19 were mentioned.

## **5.4 Healthcare facilities**

### **5.4.1 Classification of healthcare facilities**

#### **Public healthcare facility**

Public healthcare facilities in Bangladesh are generally under the jurisdiction of the MOHFW, with general hospitals and public health institutions under the DGHS and maternal and child health-related facilities under the DGFP. Although significant improvements can be seen in recent years, the high maternal mortality rate and under-five mortality rate have prioritized maternal and child health policies since the country was founded.

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<sup>170</sup> Health Inspectors (HIs) and Assistant Health Inspectors (AHIs) are in the same job category as Health Assistants (HAs), but the AHI supervises the HA, and the HI supervises the AHI.

<sup>171</sup> The Daily Star, "Incentives for those on the front line", April 20, 2020.

<https://www.thedailystar.net/frontpage/news/incentives-those-the-front-line-1894801> (Accessed on November 21, 2021).

<sup>172</sup> Dhaka Tribune, "Over 180 doctors killed due to coronavirus in Bangladesh", August 28, 2021

<https://www.dhakatribune.com/health/coronavirus/2021/08/28/over-180-doctors-killed-due-to-coronavirus-in-bangladesh> (Accessed on November 1, 2021).

<sup>173</sup> Chowdhury, Saiful Rahman and et al. (2021) Mental health symptoms among the nurses of Bangladesh during the COVID-19 pandemic, Middle East Current Psychiatry, 28 (23), p1-8

This has had a strong influence on the management system of healthcare facilities. The level of health service provision can be divided into three categories: tertiary care facilities providing advanced care under the jurisdiction of the central government or divisions, secondary care facilities at the district level, and primary care facilities at the upazila, union, and ward levels. A summary of the classification is as follows<sup>174</sup>:

[Tertiary care facility]

- There are general and specialized hospitals and facilities providing higher-level medical care in the center of Dhaka, specialized hospitals for dentistry and alternative medicine, and hospitals and educational facilities centered on medical colleges in each division. All of them play a role as the top referral facilities in the country.

[Secondary care facility]

- There is a district hospital and specialized hospitals for infectious diseases and chest diseases. The district hospital provides specialized secondary care and serves as a referral facility for upazila health complexes (UzHCs). In some areas, the district hospital also functions as the nearest UzHC. They are generally 100-250 bed facilities and are intermediate between UzHCs and divisional or tertiary care facilities at the divisional level in terms of function and scale.

[Primary care facility]

- The UzHC is the first referral facility for primary health care facilities. It is staffed by physicians (specialists) and can provide basic examinations with diagnostic equipment, simple radiological examinations, inpatient treatment, and emergency surgeries, including obstetric surgeries. The facilities range in size from 10 to 100 beds.
- The Union Health and Family Welfare Center (UHFWC) does not have a hospitalization function but provides a wide range of preventive and curative services at the union level. Officers (Family welfare visitors, Sub-assistant community medical officers) who are more highly skilled than the staff working at the community clinics are stationed there.
- The ward-level community clinic (CC) is the closest to the residents, covering a rural population of about 6,000~12,000 people, with facilities providing one-stop services on health, family planning and nutrition. They do not have inpatient facilities and operate mainly as PHC centers. All the CCs are built on land donated by the community members. They also provide regular health services as satellite clinics, using public places that are not usually used as healthcare facilities but are familiar to the local people, such as schools.
- In urban areas, urban dispensaries serve as primary health care service facilities. According to the

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<sup>174</sup> Health Facility Survey 2017 1.3 Health Service Delivery System of Bangladesh, Health Bulletin 2019 Chapter 5, 4<sup>th</sup> HPNSP 2017-2022 4.14 Physical Facilities Development (PFD)

MOHFW website<sup>175</sup>, urban dispensaries have been established in Dhaka and urban areas of all six divisions except Mymensingh and Barisal. In the four districts of Dhaka, Chattogram, Khulna, and Rajshahi, urban dispensaries and CCs are not located in the same upazila, and there is a clear distinction between urban areas and suburban areas. On the other hand, in Rangpur and Sylhet, there are 14 to 36 CCs in the upazilas where urban dispensaries are located, and there is no clear separation by area as in the other divisions. As noted in 5.1, the MOLGRD&C is responsible for PHC service provision in urban areas, and it is not uncommon for MOHFW and MOLGRD&C facilities to be located within the same district due to insufficient coordination between two ministries.

The number of healthcare facilities and beds under the MOHFW is as follows.

**Table 5-13 Healthcare facilities under MOHFW<sup>176</sup>**

Level	Administration	Type of facility	Scale (No. of beds)	No. of facilities	Total No. of beds	Population coverage (average)
3rd	Central/ Division	National post-graduate education and research institute	-	12	3,784	-
		Dental college (1), Medical colleges (18), Alternative medicine hospitals (2)	100 or more	21	15,413	
		Specialized centers (2), Divisional offices (8)	-	10	-	
		Specialized hospitals	-	5	1,450	
		Infectious diseases hospitals (5), Leprosy hospitals (3)	-	8	310	
		Other	500 or more	2	1,000	
		Mother and child health training institute (MCHTI) @ Azimpur, Dhaka	-	1	173	
		Fertility service treatment center (MFSTC) @ Mohammadpur, Dhaka	-	1	100	
2nd	District (64)	District hospitals	100~250	59	9,950	2.6 million
		Chest disease hospitals (14)	-	14	816	
		Other clinics (42), Offices (2+65)	-	109	-	
		Maternal and child welfare centers (MCWC)	-	60	-	
1st	Upazila (492)	Upazila health complexes (UzHC)	100 or more	3	300	330,000
			50 or more	345	17,250	
			31 or more	65	2,015	
			10 or more	11	110	
		Other public hospitals	50 or more	2	100	
			31 or more	7	217	
			30 or more	2	60	
			25 or more	1	25	
			20 or more	32	640	
			10 or more	17	170	
		(MCH-FP unit (in UzHC above))	-	427	-	
		Maternal and child welfare centers (MCWC)	-	12	-	
	Union	Union sub-centers (USC)	-	1,312	-	36,000

<sup>175</sup> [http://facilityregistry.dghs.gov.bd/report\\_org\\_list.php](http://facilityregistry.dghs.gov.bd/report_org_list.php)

<sup>176</sup> Health Bulletin 2019 P.159 Table 5.1, P.163 Table 5.2, Ministry of Health and Family Welfare, DGFP Maternal and Child Health Services (MCH) Unit <https://www.dgfpbd.org/>

Level	Adminis- tration	Type of facility	Scale (No. of beds)	No. of facilities	Total No. of beds	Population coverage (average)
	(4,554)	Union health and family welfare centers (UHFWC)	-	87	-	
		Urban dispensaries	-	35	-	
		School health clinic	-	23	-	
		Other health complexes	-	1	-	
		Union health and family welfare centers (UHFWC)	-	3,860	-	
		Maternal and child welfare centers (MCWC)	-	24	-	
Word (40,987)		Community clinics (CC)	-	13,907	-	4,000
		Satellite clinics/month <sup>177</sup>	-	30,000	-	
		Community clinics (CC)	-	12,217	-	

Note: Shaded areas are facilities under DGFP jurisdiction; others are under DGHS jurisdiction.

### **Private healthcare facilities**

Since 1976, private hospitals and NGOs have provided health services to an increasing number of people, complementary to the services of public healthcare facilities. Private facilities are registered and managed following the facility standards set by law and inspected by the DGHS and are generally concentrated in urban areas. On the other hand, there is a shortage of primary health care facilities in rural areas, and NGOs are working as PHC leaders to supplement these facilities. The government of Bangladesh encourages the involvement of NGOs in the provision of health services. More than 4,000 NGOs are active, ranging from large NGOs such as the Bangladesh Rural Advancement Committee (BRAC) to smaller regional NGOs. For example, the USAID-funded NGO Health Services Program (NHSDP) provides a comprehensive package of maternal and child health and family planning services, and BRAC uses its large network to provide PHC services<sup>178</sup>.

**Table 5-14 Number of private healthcare facilities<sup>179</sup>**

classification	Number
Registered private hospitals and clinics	5,321
Registered diagnostic centers	10,407
Number of beds in private hospitals and clinics	91,537

<sup>177</sup> Ministry of Health and Family Welfare, DGFP Maternal and Child Health Services (MCH) Unit <https://www.dgfpbd.org/>  
Satellite Clinic: Family Welfare Visitors conduct the satellite clinic (organized 8 satellite clinics in each union per month and also at urban slums and hard-to-reach areas) and ANC, PNC and other Reproductive Health related services are provided by her. hard-to-reach areas) and ANC, PNC and other Reproductive Health related services are provided by her.

<sup>178</sup> Ministry of Health and Family Welfare, 2017. Health Facility Survey

<sup>179</sup> Ministry of Health and Family Welfare, Health Bulletin 2019

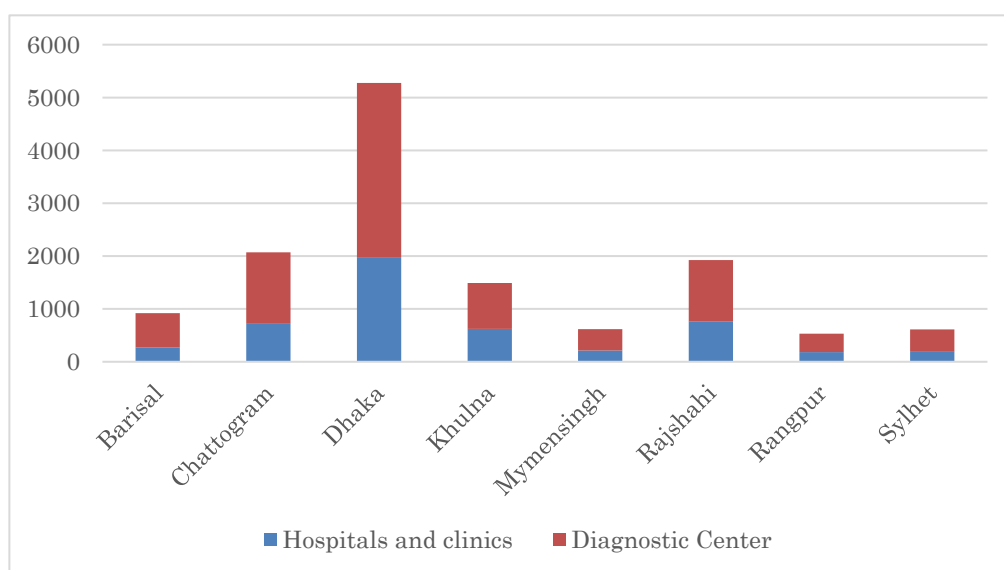


Figure 5-10 Distribution of private healthcare facilities by division<sup>180</sup>

The largest number of private healthcare facilities are located in the Dhaka Division. In all the divisions, the percentage of diagnostic centers that only provide diagnostic and laboratory services is higher than that of hospitals and clinics.

#### **Distribution of facilities and hospital beds by division**

The distribution of healthcare facilities by division is shown below<sup>181</sup>.

Table 5-15 Distribution of healthcare facilities by division<sup>182</sup>

Division	Public							NGO			Private	Total
	CC / UD	USC / RC	FWC	Upgraded FWC	UzHC	MCWC	DH	UPH CSDP clinic	Other clinic	Hospital	Hospital	
Barisal	1,061	58	208	28	34	10	6	14	34	1	13	1,119
Chattogram	2,400	238	468	203	89	18	11	101	55	0	164	2,638
Dhaka	2,431	308	422	184	75	14	14	114	167	3	215	2,739
Khulna	1,640	133	345	99	51	14	10	50	44	1	47	1,773
Mymensingh	1,147	114	195	45	30	4	3	20	22	0	14	1,261
Rajshahi	1,900	321	378	40	61	13	7	33	60	0	42	2,221
Rangpur	1,777	198	306	71	50	12	7	33	26	0	34	1,975
Sylhet	855	75	114	86	31	6	4	33	15	0	34	930

Most of the facilities are located in the Dhaka and Chattogram Divisions, which have large metropolitan

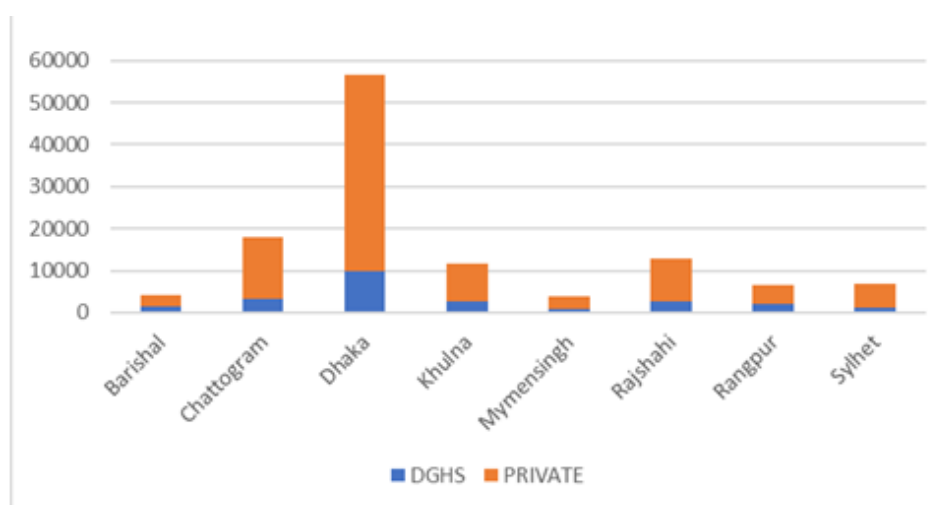
<sup>180</sup> Ibid.

<sup>181</sup> Ministry of Health and Family Welfare, Bangladesh Health Facility Survey 2017

<sup>182</sup> Ibid.

areas, but this may be because secondary and tertiary facilities are also concentrated in urban areas. In the other divisions, CCs account for an extremely high percentage of the total number of facilities, and even in the Sylhet Division, which has the fewest CCs, they account for 855, or 60% to 70% of the total number of facilities.

In the CC, community groups (CGs) manage the facilities with the government's support, but it is not easy for a central government agency to oversee and maintain such a large number of facilities. As pointed out in the 4<sup>th</sup> HPNSP, it is necessary to develop comprehensive facility maintenance standards and a management system that can keep an eye on every corner of the many facilities and determine whether they need maintenance or not.



**Figure 5-11 Distribution of licensed hospital beds by division**

According to the MOHFW website<sup>183</sup>, the number of licensed beds in registered hospitals is summarized by jurisdiction. It can be seen that the number of beds in private facilities is overwhelmingly large compared to the number of beds under the jurisdiction of DGHS in all divisions. In reality, there are not a certain number of large hospitals with more than 500 beds, but rather a large number of small hospitals with 10 to 20 beds registered.

#### 5.4.2 Policies related to healthcare facilities

##### **Standard health services and human resources for health by classification of healthcare facilities**

In the Essential Health Service Package (ESP), essential health services and required health personnel are summarized for each category of healthcare facilities. Table 5-16 outlines the basic information useful when looking at the status of facility maintenance.

<sup>183</sup> Facility Registry Government of People's Republic of Bangladesh Ministry of Health and Family Welfare <http://facilityregistry.dghs.gov.bd/report.php> (Accessed on November 28, 2021)

**Table 5-16 Health services and required human resources for health by healthcare facility**

Classification	Required Services	Additional Services	Human resources for health in need
District hospital	Comprehensive obstetric and neonatal care, emergency obstetric care, critical care, neonatal resuscitation and sepsis, preterm birth treatment, NCD diagnosis and treatment, normal delivery, SBCC, immunotherapy, pediatric care, family planning, severe acute malnutrition, prenatal and postnatal care, health awareness activities	Trauma care, ophthalmic surgery, general surgery, obstetric fistula	Family Welfare Visitor (FWV), medical technician (laboratory technician, radiologist), pharmacist, nurse, midwife, dentist, general practitioner (GP), specialist
MCWC	Emergency obstetric care, critical care, neonatal resuscitation and sepsis, preterm birth treatment, NCD diagnosis and treatment, normal delivery, SBCC, immunotherapy, pediatric care, family planning, severe acute malnutrition, prenatal and postnatal care, health awareness activities	Comprehensive obstetric and neonatal care	FWV, medical technologists (lab technicians, radiologists), pharmacists, nurses, midwives, GPs
UzHC	Emergency obstetric care, critical care, neonatal resuscitation and sepsis, preterm birth treatment, NCD diagnosis and treatment, normal delivery, SBCC, immunotherapy, pediatric care, family planning, severe acute malnutrition, prenatal and postnatal care, health awareness activities	Comprehensive obstetric neonatal care, general surgery, obstetric fistula	FWV, medical technician (lab technician, radiologist), SACMO/MA, sanitation inspector (SI), pharmacist, nurse, midwife, dentist, GP, specialist
Union Health and Family Welfare Center (UHFWC)	Normal delivery, newborn care, pediatric medicine, health counseling, NCD diagnosis, SBCC, immunotherapy, pediatric medicine, family planning, severe acute malnutrition, prenatal and postnatal care, health awareness activities	Emergency obstetric care, lab-based diagnosis	Assistant health inspector (AHI), health inspector (HI), family planning inspector (FPI), FWV, SACMO/MA, pharmacist, midwife, GP
Community Clinic (CC)	NCD diagnosis, SBCC, immunotherapy, pediatric medicine, family planning, severe acute malnutrition, prenatal and postnatal care, health awareness activities	Childbirth, delivery	HA, FWA, CHCP, CSBA

### **Healthcare facilities planning in the 4<sup>th</sup> HPNSP**

The construction engineering departments function as implementing agencies for facility development. Depending on the size of the area under their jurisdiction, the Department of Architecture (DOA) and the Public Work Department (PWD) of the Ministry of Housing and Public Works (MOHPW) are in charge of district hospitals (more than 50 beds), while the Health Engineering Department (HED) of MOHFW is in charge of UzHCs and below (less than 50 beds). The implementing agencies are spread across different departments<sup>184</sup>. The PWD Health Division is responsible for developing facilities of urban dispensaries<sup>185</sup>.

<sup>184</sup> JICA 2015, "Final Report on the Preparatory Survey for the Maternal and Child Health Improvement Project (Health, Population and Nutrition Sector Development Program) (Phase2), Bangladesh," (In Japanese only)

<sup>185</sup> 2018 Final Report on the Information Collection and Verification Survey for the Universal Health Coverage Promotion

**Table 5-17 Implementing organizations and responsibilities in healthcare facility construction<sup>186</sup>**

		Implementing Organization		
		Organization	Department	Tasks
Tertiary	Central institutions, university hospitals, general hospitals, specialized hospitals	MOHPW	DOA	<ul style="list-style-type: none"> <li>Site selection and preliminary survey</li> <li>Formulate a master plan</li> <li>Schematic and basic design of healthcare facilities above district hospitals</li> </ul>
Secondary	District hospitals		PWD	<ul style="list-style-type: none"> <li>Preparation of rough estimates</li> <li>Implementation design for healthcare facilities above district hospitals</li> <li>Estimation, bidding</li> <li>Construction management</li> </ul>
Primary	UzHCs, UHFwCs, CCs	MOHFW	HED	<ul style="list-style-type: none"> <li>Design and cost estimation for healthcare facilities below UzHCs and dormitories under the jurisdiction of the MOHFW</li> <li>Construction contractor registration management and arrangements, construction management</li> </ul>
	Urban dispensaries			(Same as District hospital)

HED and PWD undertake the construction work as the implementing agencies, but it has been pointed out that the progress of the work is not satisfactory in 4<sup>th</sup>HPNSP<sup>187</sup>. As a countermeasure, the MOHFW, in coordination with HED and PWD, prepares a process schedule to guide the process management. In the development program, the implementing agencies are also involved in formulating comprehensive maintenance plans and preparing equipment and facility charts for hospitals and various types of facilities to guide the operational planning of healthcare facilities. The activities listed in the 4<sup>th</sup> HPNSP that the implementing agencies will be involved in are listed below. The total number of facilities to be constructed exceeds 500 in the 4<sup>th</sup> HPNSP alone, although 15 items are indicated.

**Table 5-18 Planned activities and targets for healthcare facilities in the 4<sup>th</sup>HPNSP<sup>188</sup>**

	Planned activities	Targets by 2022	Remarks
1	Restructuring of UzHC and UHFwC	Reconstruction of 250 UzHCs and UHFwCs that are no longer able to provide necessary services due to aging.	
2	Restructuring of Community Clinics	Reconstruction of 2000 CCs	
3	Upgrading UHFwC	Upgraded <u>300</u> of the 911 facilities in need of upgrading	
4	Upgrading UzHC	<u>45 facilities</u> upgraded from 31 beds to 50 beds	327 facilities have been already upgraded.
5	Upgrading district hospitals	<u>15 facilities</u> upgraded from 50 beds to 150, 200, or 250 beds	In progress for 20 facilities
6	Construction of UHFwC	Construction of <u>157 facilities</u> with plans	

Project in the People's Republic of Bangladesh.

<sup>186</sup> Ministry of Health and Family Welfare, 4<sup>th</sup>Health Population and Nutrition Sector Program 2017-2022.

<sup>187</sup> Ministry of Health and Family Welfare, 4<sup>th</sup>Health Population and Nutrition Sector Program 2017-2022.

<sup>188</sup> Ibid.



	Planned activities	Targets by 2022	Remarks
		to build in 439 unions without UHFWC	
7	Construction of MCWC	Construction of 51 facilities with hospital beds	
8	Construction and establishment of Institute of Health Technology	In addition to the facilities listed on the right, <u>nine more facilities</u> will be constructed to expand the number of health technicians.	8 facility is complete, 7 facility is under construction.
9	Construction of Medical Assistant Training School	Medical assistant training facilities: 10 facilities planned for construction during HPNSDP, 1 facility completed, 9 facilities under construction.	
10	Construction of UzHC	Construction of 50-bed UzHCs in newly established counties (10 facilities planned to be constructed during the HPNSDP).	2 facility is complete, 4 facility is under construction.
11	Construction of Children's hospital (Shishu)	<u>Proposal to build a new hospital</u> in the center of the city for a public children's hospital with 25 beds.	4 facilities planned for construction during HPNSDP, 2 completed, 2 under construction
12	Construction and establishment of nursing schools	<u>Establishment of nursing colleges and nursing training institutes and upgrading of existing institutions</u> to expand and enhance nursing institutions.	
13	Construction of office building	Establishment of new offices necessary for collaboration with private sector and NGOs and implementation of health activities	
14	Construction of other health-related facilities	<u>Reconstruction and renovation of the chest disease hospital and remodeling and renovation of the existing upazila family planning store</u>	
15	Infrastructure maintenance	Allocate maintenance costs to the development budget and create a comprehensive maintenance plan	

In the 4<sup>th</sup> HPNSP, measures related to healthcare facilities are summarized in the Physical Facility Development (PFD) OP<sup>189</sup>. While it is considered important to improve the quality of health services, there have been many cases where facilities have been built, but the deployment of equipment and human resources has not kept pace. The following activities are included in the measures to solve this problem.

- (1) MOHFW will prepare the completion schedule for process control in coordination with HED and PWD and supervise the progress.
- (2) The plan will focus on constructing facilities related to the storage and distribution of medicines and other goods in remote areas and services to ethnic groups.
- (3) Strengthen coordination with HRD (human resources), PSSM-FP and PSSM-HS (equipment) OPs to provide timely staffing and equipment to facilities and activate operations.
- (4) Develop a comprehensive maintenance plan.
- (5) Determine construction needs prepare detailed construction plans and comprehensive construction

<sup>189</sup> Ministry of Health and Family Welfare, 4<sup>th</sup> HPNSP.

- plans.
- (6) Functional individual restrooms, privacy in examination rooms, nursing corners will be planned from a gender perspective, considering barrier-free facilities that are easy to use for the elderly and disabled.
  - (7) Since the planning of nursing schools and other health education facilities is closely related to human resource strategies and human resource planning, decisions should always be coordinated with human resource strategies and deployment plans.
  - (8) Equipment tables and organization charts created during the HPNSDP period will be kept updated to be used for new construction and upgrades.

### **Policies to improve the sanitation environment of healthcare facilities**

The MOHFW-led National Strategy for WASH in Healthcare Facilities 2019-2023 aims to strengthen all healthcare facilities in Bangladesh to receive standardized and effective infection prevention and control (IPC) services and move towards universal health coverage. Specific strategic goals, including standards and guidelines for water, latrine, and sanitation in healthcare facilities, are outlined to clear the path to quality health care services. Efforts to improve sanitation have been neglected for many years, despite being closely related to the risk of infectious diseases, antimicrobial resistance, morbidity, and mortality. Its importance has also been recognized in recent years, as inadequate sanitation in healthcare facilities is a major source of patient dissatisfaction and impedes seeking institutional delivery and care.

The team surveyed the sanitary environment in healthcare facilities. Even in large hospitals, the hygienic environment varied, with no cleaning except outpatient facilities for patients, indicating a lack of awareness of cleaning management.



The above is the toilets in a small hospital with 500 beds. In addition to the toilets for patients, the toilets for staff also need to be maintained and kept clean, but in reality, this is not done thoroughly.



Supplies such as soap and toilet paper, which are essential for preventing infection and maintaining cleanliness, are also stolen as soon as they are installed. Supply management and installation methods must also be devised to prevent theft.

As for medical wastes, proper disposal of these is essential for public health, but in practice, although there has been some progress in their safe disposal, the challenges are significant. Many facilities do not have incinerators and cannot dispose of their wastes consistently and properly within the hospital. The DGHS has introduced a hospital management system using color bins in some hospitals, but this system is only for segregation, and further disposal is outsourced to NGOs or private companies, which is not substantial hospital treatment. In addition, it is not possible to confirm whether the final disposal destination is appropriate or not. The problem of medical waste disposal has been widely covered by the media and has become one of the most pressing issues facing healthcare facilities, as shown below<sup>190</sup>.

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<sup>190</sup> Dhaka Tribune. 2020. Clinical wastage from SBMCH dumped on open ground of the hospital (<https://archive.dhakatribune.com/bangladesh/nation/2020/09/08/clinical-wastage-from-sbmch-dumped-on-open-ground-of-the-hospital>). (Accessed on January 7, 2021)

Home / Bangladesh / Nation

## Clinical wastage from SBMCH dumped on open ground of the hospital

Anisur Rahman Swapan, Barisal

Published at 03:53 pm September 8th, 2020



A hospital worker dumps clinical wastage on open ground of the Sher E Bangla Medical College Hospital (SBMCH)  
Dhaka Tribune

### **Power supply**

Although there has been an improvement in the electricity supply in healthcare facilities, power outages are still frequent, and the supply is far from sufficient<sup>191</sup>. Particularly in CC, only 47% of the total electricity supply is available. Even healthcare facilities that have beds and operate 24 hours a day do not have a 100% power supply. It is essential to take measures such as always considering backup power supply.

It is not a problem limited to healthcare facilities, but the country is experiencing a number of problems, including power shortages due to the prevalence and economic growth. The government of Bangladesh is promoting a policy and master plan to increase power generation in the country<sup>192</sup>, and Japan is continuing its support.

### **5.4.3 Overview and current status of facilities supported by Japan**

#### **[Grant] The Project for Improvement of Maternal and Child Health Training Institute**

A grant aid project was completed in 2000 to improve and expand facilities that contribute to the training of staff to provide maternal and child health services. The Maternal and Child Health Training Institute is a clinical facility with obstetric hospital functions. The impact of the project has been highly evaluated in that the expansion of the delivery and operating rooms has made it widely known that doctors are providing cesarean section services and that the facility, which was only an upazila-level maternal and child health center, has become a national-level high-quality clinical facility after Japan's support.

<sup>191</sup> Ministry of Health and Family Welfare, Health Facility Survey 2017

<sup>192</sup> Power System Master Plan 2010, 2016, etc.

A survey of the current status of the building shows that it is evolving as a top referral clinical facility, with the addition of a social welfare department and automation of the administrative system. The construction of a 14-story accommodation facility for trainees and service providers is currently planned for another site. Government approval has been obtained, but the project has not been implemented due to budget shortage.



Outpatient



Childcare Center

Waiting area

The need to expand the facility itself has been recognized, and expectations for donor support have been seen. Along with the aging of the facilities, various problems related to the facilities, such as the lack of men's restrooms and the neglected breakdown of the air conditioning system, have become apparent.

The survey team asked about the drawings of the facility but could not find them, and it took a long time to get a reply. The personnel in charge replied that since the building was built with Japanese assistance, it should be on the Japanese side. To properly maintain and update the facilities, it is essential to manage the drawings by plotting the latest information at the site, but one of the challenges is the lack of understanding.

#### **[Loan] Maternal, Neonatal and Child Health Improvement Project (Phase 1) (Health, Population and Nutrition Sector Development Program)**

Under the Health, Population and Nutrition Sector Development Program (HPNSDP) framework, training, procurement of materials and equipment, and construction of facilities were carried out to improve maternal and child health services, strengthen health systems and contribute to national maternal and child health.

#### **[Loan] Maternal, Neonatal and Child Health (MNCH) and Health System Improvement Project**

The project aims to improve maternal and child health services and strengthen the health system by supporting maternal and child health activities that contribute to the HPNSDP and the improvement of services provided by healthcare facilities at all levels, thereby contributing to the improvement of the health of the people of Bangladesh. Specifically, the project involves the development of educational and living facilities for a nursing college (on the Bangladesh side), the provision of equipment and materials for the expansion of secondary healthcare facilities, the construction of diagnostic imaging buildings at seven medical university



hospitals in all seven divisions (at the time), and the procurement of diagnostic imaging equipment and training.

It is an ongoing project. Bidding for the diagnostic imaging building was conducted at the end of May 2021, and a contractor was selected<sup>193</sup>.

### **[Loan] Health Services Strengthening Project**

With NCD control and urban health improvement as new health challenges, this project aims to build a system that will contribute to strengthening NCD control and improving urban UHC by improving the quality of primary and secondary health services. Specifically, primary and secondary healthcare facilities are being expanded and reconstructed<sup>194</sup>.

#### **5.4.4 Impact of COVID-19 on healthcare facilities**

COVID-19 has inevitably increased the demands on healthcare facilities. More space is needed to maintain social distancing in the facilities. Many healthcare facilities are also required to have the functions of an infectious disease hospital in addition to their existing functions. Specifically, ventilation systems for hospital rooms, negative pressure rooms, ICU beds equipped with monitoring equipment, and expansion of the oxygen supply system necessary for treatment are needed. The Bangladesh Preparedness and Response Plan for COVID-19 (BPRP) calls for the development of adequate infrastructure and laboratories to conduct COVID-19 testing. It also states that healthcare facilities need to meet water and sanitation standards as part of infection prevention and control (IPC) measures but recognizes that considerable investment will be required to achieve this. The challenges that existed before the pandemic are now more clearly recognized.

### **5.5 Medical equipment**

#### **5.5.1 Related organizations for medical equipment**

In Bangladesh, the Directorate General of Drug Administration (DGDA) of the MOHFW is responsible for medical devices and provides guidelines for classifying and registering medical devices<sup>195</sup>. The following three organizations are responsible for the procurement, repair, and maintenance of medical equipment. The roles and tasks of each organization are described below.

#### **Central Medical Stores & Depot (CMSD)**

Under the DGHS, Central Medical Stores & Depot (CMSD) is responsible for bidding, procurement, storage and distribution of all medical equipment in the public sector in the country, and collaboration with DGHS and CMSD is essential for medical equipment-related projects. The CMSD is responsible for repairing and maintaining purchased equipment during the warranty period and may enter into a separate maintenance contract with the manufacturer's agent after the warranty period.

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<sup>193</sup> BD-P83 Maternal Neonatal and Child Health and Health System Improvement Project Progress Report.

<sup>194</sup> BD-P104 Health Service Strengthening Project Progress Report.

<sup>195</sup> Directorate General of Drug Administration, 2015, Registration Guidelines for Medical Devices Bangladesh.

**National Electro Medical Equipment Maintenance Workshop and Training Center (NEMEMW&TC)**

The NEMEMW&TC is under the direct control of the MOHFW. Of the 95 authorized positions, 70 are staffed. The breakdown is shown in Table 5-19<sup>196</sup>.

**Table 5-19 Personnel structure of NEMEMW&TC<sup>197</sup>**

Occupation/Position	No.
Chief Technical Manager	1
Technical Manager, Repair	1
Technical Manager, Training	1
Sub Assistant Engineer	12
Sr. Technician	18
Technician	12
Supply and procurement officer	1
Other staff	9
Unconfirmed	15

When procuring new equipment, NEMEMW&TC inspects it at CMSD's warehouse to ensure whether it meets the bid specifications. At end-user healthcare facilities, NEMEMW&TC attends deliveries and coordinates and supports the initial training for doctors, nurses, and other users. NEMEMW&TC is also responsible for its upkeep at the end of the manufacturer's warranty period. Although NEMEMW&TC has engineers and technicians on staff, it does not have sufficient human and material resources to deal with problems, especially outside the metropolitan area. It does not own a fleet of vehicles, and its staff is not properly trained in handling and repairing medical equipment; hence cannot perform routine maintenance on medical equipment. In addition, NEMEMW&TC does not have records of equipment other than those procured domestically. The budget for 2014 was 15 million takas (about \$195,000)<sup>198</sup>.

**District Electro Medical Workshop (DEMEW)**

The DEMEW is under the control of the Director of the Provincial Health Office, who is responsible for the health administration of the province in which it is located, and is a subordinate organization of the DGHS, although it is not under its direct control. It has offices in 18 districts and collaborates with NEMEMW&TC. Each DEMEW serves 3.5 districts on average and has a staff of 9. The total number of staff in the 18 DEMEW is 162. The breakdown is shown in Table 5-19. Like the NEMEMW&TC, the DEMEWs are not adequately staffed with trained personnel and are not properly equipped with the necessary diagnostic and repair tools. NEMEMW&TC and DEMEW focus on repairing air conditioners and refrigerators and have little to do with medical equipment maintenance<sup>199</sup>.

<sup>196</sup> Bangladesh Biomedical Equipment Repair and Maintenance. 2014. Project HOPE-The People-to-People Health Foundation.

<sup>197</sup> Ibid.

<sup>198</sup> Ibid.

<sup>199</sup> Ibid.

**Table 5-20 Personnel structure of DEMEW<sup>200</sup>**

Occupation/Position	No.
Workshop supervisor	18
Mechanics	54
Junior Mechanics	36
Store keeper	18
Driver	18
Helper	18

### 5.5.2 Procurement and repair of medical equipment

#### Supply

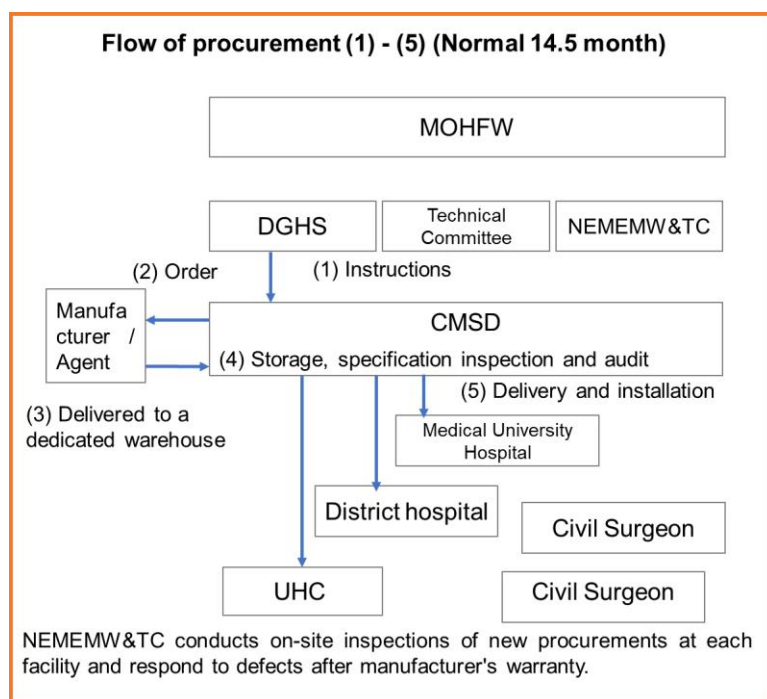
Funding for the construction of facilities and procurement of medical equipment will be carried out following the Public Procurement Rule (2008) and the Project Procurement Act (2006). Suppose the funds are for Reimbursable Project Aid to implement health sector programs. In that case, they should be based on the Guidelines for Borrower Procurement of Equipment, Works and Non-Consulting Services under World Bank Loans and Gifts (World Bank, January 2011). Under the 4<sup>th</sup> HPNSP, Community Based Health Care (CBHC) and Health Service Management (HSM), operational plans implemented under the DGHS, are responsible for equipment maintenance and procurement<sup>201</sup>. CBHC is responsible for equipment maintenance and procurement for primary health care facilities with less than 100 beds, while HSM is responsible for secondary and tertiary healthcare facilities with more than 100 beds<sup>202</sup>. Figure 5-12 shows the mechanism for procurement of medical equipment and the roles and flow of each organization when repairs are needed.

<sup>200</sup> Adapted and prepared from Project HOPE-The People-to-People Health Foundation.

<sup>201</sup> Program Management & Monitoring Unit (Pmmu) Planning Wing Ministry of Health and Family Welfare Government of The People's Republic of Bangladesh, 4th HPNSP.

<sup>202</sup> JICA, 2018. Data collection survey for universal health coverage promotion project in the People's Republic of Bangladesh - Final Report





(1), (2): The CMSD receives instructions from the DGHS line director and places orders with the manufacturer's agent.

(3): Delivered to CMSD's dedicated warehouse.

(4): Inspections will be conducted to ensure that the bid specifications are met, and an inspector will be dispatched by the national tax authority to verify the results.

(5) Delivery and installation of medical equipment at medical facilities at all levels.

**Figure 5-12 Flow of medical equipment procurement<sup>203</sup>**

It often takes time from (1) to (5), and on average, it takes 14.5 months from the time CMSD receives the equipment in its warehouse to the time it is transported to the end-user healthcare facility and installed<sup>204</sup>. Since the manufacturer's warranty period for a medical device is normally one year, the warranty expires before the device can be used. One of the reasons why it takes so much time before the equipment is delivered to the healthcare facilities is that the healthcare facilities, which are the end-users of the CMSD, have to secure a place to install the equipment, and delays in installing the equipment (e.g., electricity, water, medical gas) are pointed out<sup>205</sup>. Various problems were reported in 2020 that could be attributed to the CMSD not functioning or a lack of coordination with other agencies. Specifically, the approval of the COVID-19 test kit took too long, resulting in supply delays, which led to accusations against the CMSD from many pharmaceutical and medical supply companies. It has been pointed out that the series of problems were caused by the lack of coordination between CMSD and DGHS<sup>206</sup>. CMSD has also been criticized for supplying 20,000 fake N95 respirators to 10 public hospitals, where it was pointed out that CMSD officials failed to inspect the products<sup>207</sup><sup>208</sup>. In addition, there were newspaper reports that hundreds of ICU beds were abandoned at CMSD

<sup>203</sup> Adapted and prepared from Project HOPE-The People-to-People Health Foundation.

<sup>204</sup> World Bank 2008. Medical Equipment Surveys (MES),

<sup>205</sup> Adapted and prepared from Project HOPE-The People-to-People Health Foundation.

<sup>206</sup> The Daily Star "Coronavirus Testing Kits: In stores, but not in testing centres". The Daily Star. 2020-07-08. Retrieved 2021-05-20. (<https://www.thedailystar.net/news/bangladesh/news/7-new-bridges-northern-dists-havoc-rivers-faulty-designs-2123341>) (Accessed on July 28, 2021)

<sup>207</sup> The Daily Star "20,000 fake N95 masks supplied to 10 hospitals". The Daily Star. 2020-09-30. Retrieved 2021-05-20. (<https://www.thedailystar.net/frontpage/news/20000-fake-n95-masks-supplied-10-hospitals-1969713>) (Accessed on July 28, 2021)

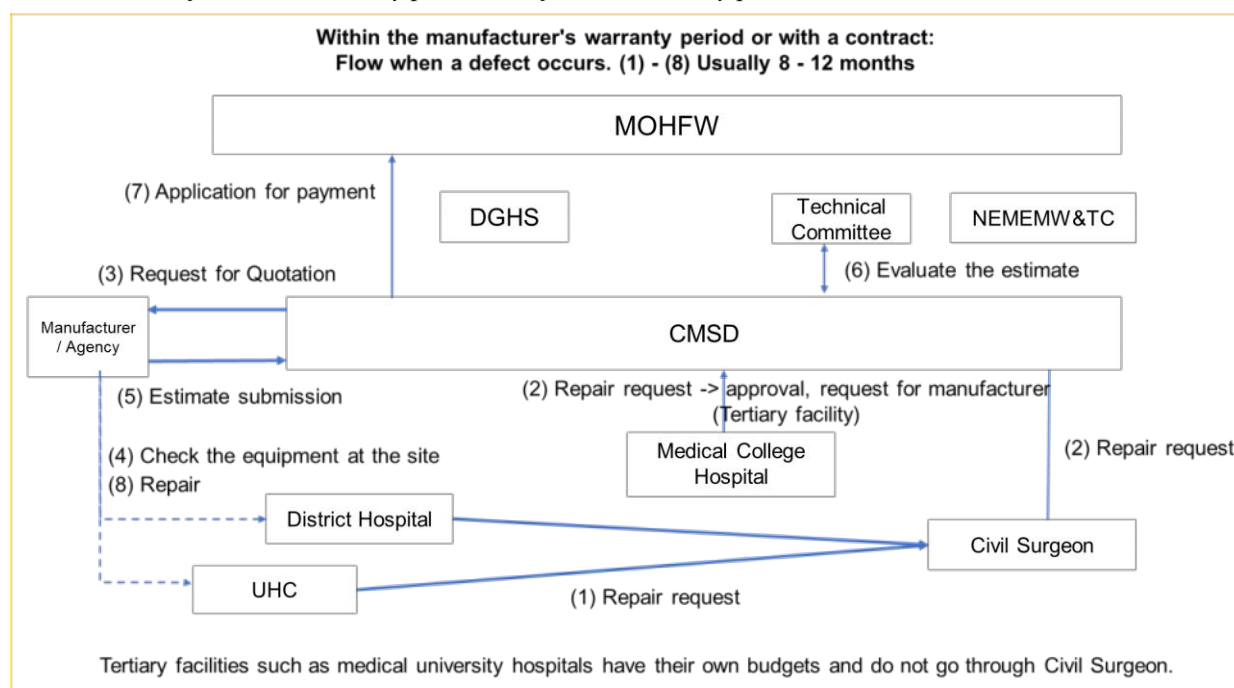
<sup>208</sup> Dhaka Tribune "Probe body: N95 mask scam planned, a punishable offence". Dhaka Tribune. 2020-07-17. Retrieved 2021-05-20. (<https://www.dhakatribune.com/bangladesh/corruption/2020/07/17/probe-body-n95-mask-scram-planned-a-punishable-offence>) (Accessed on July 28, 2021)

and not delivered to the facilities for a long time<sup>209</sup>.

## Repair

Equipment repair is under the jurisdiction of CMSD within the manufacturer's warranty period (1-5 years) or after the warranty period if a new maintenance contract is signed with the manufacturer. If no maintenance contract is signed, it becomes under the jurisdiction of NEMEMW&TC.

*Within the manufacturer's warranty period, or after the warranty period when there is a maintenance contract*



**Figure 5-13 Flow of medical equipment repair within the manufacturer's warranty period or after the warranty period when there is a maintenance contract<sup>210</sup>**

The CMSD retains ownership of the equipment during the manufacturer's warranty period and is, therefore, the primary party responsible for repairs. After the manufacturer's warranty period expires, the same treatment is applied if a maintenance contract is signed.

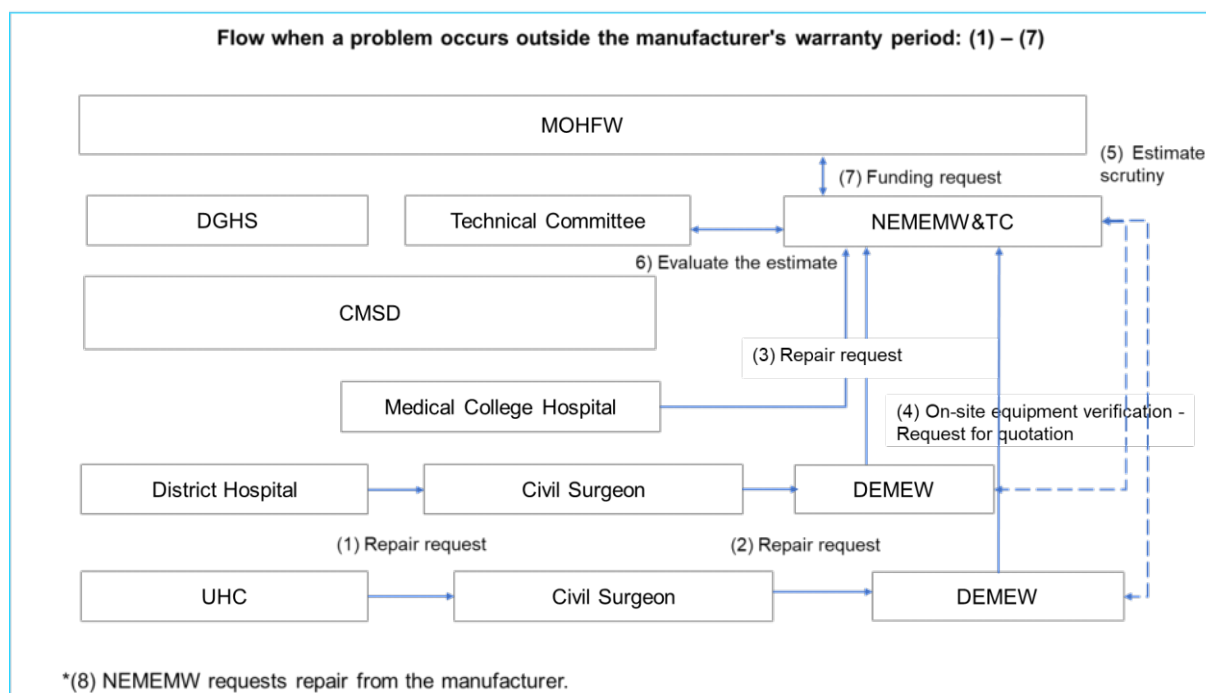
- (1): At the district level and below, the person in charge of the healthcare facility should provide the civil surgeon with information about the equipment and a request for repair in writing.
- (2): The civil surgeon provides information on the equipment and requests repair in writing to the CMSD who procured the equipment. Tertiary level facilities shall make the request directly to the CMSD.
- (3)~(5): CMSD requests the manufacturer's agent to survey the equipment, and the agent submits a report to CMSD with a quotation.

<sup>209</sup> Dhaka Tribune "Hundreds of ICU beds lying idle at CMSD". Dhaka Tribune. 2020-12-28. Retrieved 2021-05-20. (<https://www.dhakatribune.com/health/coronavirus/2020/12/28/hundreds-of-icu-beds-lying-idle-at-cmsd>) (Accessed on July 28, 2012)

<sup>17</sup> Ibid.

- (6): If the repair cost exceeds 25,000 takas, CMSD submits the estimate to the Technical Committee for evaluation of the estimate.
  - (7): Once approved by the committee, CMSD submits an estimate to MOHFW for funding, as they typically do not have a budget for equipment repairs.
  - (8): After approval by MOHFW, CMSD orders repairs from the manufacturer's agent<sup>211</sup>.
- The whole process usually takes 8 ~12 months and often results in no repair.

After the manufacturer's warranty period has expired and there is no maintenance contract



**Figure 5-14 Flow of medical equipment repair after the manufacturer's warranty period has expired and there is no maintenance contract<sup>212</sup>**

After the warranty period, operations related to repair are transferred to NEMEMW&TC.

- (1): Below the district level, the person in charge of the healthcare facility writes to the civil surgeon to provide information about the equipment and request repairs.
- (2): The civil surgeon writes to DEMEW for information about the equipment and a request for repair.
- (3): DEMEW then writes to NEMEMW&TC in Dhaka for information about the equipment and request for repair. However, tertiary level facilities such as medical colleges make their requests directly to NEMEMW&TC.
- (4): NEMEMW&TC requests DEMEW to survey the equipment and provide a quotation.
- (5) - (6): NEMEMW&TC examines the estimates and requests the Technical Committee to review them.
- (7): NEMEMW&TC seeks funding from MOHFW after approval by the Technical Committee.

<sup>211</sup> Project HOPE - The People-to-People Health Foundation, 2014.

<sup>212</sup> Adapted and modified from Project HOPE-The People-to-People Health Foundation.

(8): After approval by MOHFW, NEMEMW&TC places an order with the manufacturer.

If a tertiary level facility cannot cover the cost of repairs with its funds, it must seek MOHFW funds directly from CMSD through a process of review by the technical committee. Healthcare facilities do not have records of the costs incurred to repair medical equipment<sup>213</sup>.

### 5.5.3 Maintenance and management status of medical equipment

The Medical Equipment Surveys (MES) of 2008 and 2012 reported problems with medical equipment in Bangladesh<sup>214</sup>. To address these issues, the MOHFW, with funding from the UK Department for International Development (DFID), conducted a feasibility study to identify the state of repair and maintenance of medical equipment, the scope and need for services, and the possibility of strengthening the capacity of the public system and establishing viable centers to provide necessary services when needed<sup>215</sup>. According to their size and level, the following 14 health facilities in Dhaka and Khulna were selected for the study. The study was conducted on a large scale, with a total of 1,529 medical devices surveyed across all healthcare facility categories, which provides an understanding of the medical device situation in Bangladesh.

**Table 5-21 Healthcare facilities surveyed<sup>216</sup>**

Classification of facilities	Name of healthcare facility
University hospital	Dhaka medical college Hospital, Dhaka
	Khulna Medical college Hospital, Khulna
Highly specialized hospital	SSANH: Shaheed Sheikh Abu Naser Specialized Hospital, Khulna
	NIO&H: National Institute of Ophthalmology and Hospital, Dhaka
District hospital	Jessore General Hospital, Jessore
	Narayangonj Sadar Hospital, Narayangonj
UzHC	Dumuria UzHC, Khulna
	Dacope UzHC, Khulna
	Dhamrai UzHC, Dhaka
	Savar UzHC, Dhaka
Maternal and Child Welfare Center (MCWC)	Jessore Sadar MCWC, Jessore
	Munshigonj Sadar MCWC, Munshigonj
Union Health and Family Welfare Center (UHFWC)	Chuadanga Sadar UHFWC, Jessore
	Sonargaon UHFWC, Dhaka

<sup>213</sup> Project HOPE - The People-to-People Health Foundation, 2014.

<sup>214</sup> Ibid.

<sup>215</sup> Ibid.

<sup>216</sup> Ibid.

**Table 5-22 Status of Equipment in the Target 14 facilities<sup>217</sup>**

Name of healthcare facility	Total number of devices owned	No. of available devices	No. of devices that cannot be used	No. of devices not installed and not in operation
Dhaka medical college	567	210	341	16
Khulna medical college	174	118	53	3
SSANH: Shaheed Sheikh Abu Naser Specialized Hospital, Khulna	117	71	45	1
NIO&H: National Institute of Ophthalmology and Hospital, Dhaka	252	204	43	5
Jessore General Hospital	152	100	44	8
Narayangonj Sadder UzHC	100	52	38	10
Dumuria UzHC	18	9	9	0
Dacope UzHC	39	19	20	0
Dhamrai Dhaka	47	24	18	5
Savar Upazila Health complex Dhaka	24	13	8	3
Jessore Sadar MCWC	10	7	3	N/A
Munshigonj MCWC	15	10	5	0
Chuadanga UHFWC	7	6	1	N/A
Sonargaon UHFWC	7	6	1	N/A
Total	1529	849	629	51

As shown in Table 5-22, the results suggest that a large number of devices are not being used. The reasons why the equipment is already installed but not in use include equipment failure, abandonment after failure, absence of users, and lack of training. In addition, there are many cases where the building facilities (e.g., electricity, medical gas, water supply, drainage) necessary to operate the equipment are not yet in place, even though the equipment is new and newly installed. In addition, there are many cases where the equipment is left in an uninstalled state due to the lack of proper prior coordination between the supplier and the receiving facility, such as the lack of room or space for installation<sup>218</sup>.

**Table 5-23 Repair status of equipment in need of repair at healthcare facilities<sup>219</sup>**

Classification of healthcare facilities	Devices repaired out of those identified as needing repair (%)	Repairer's affiliation (%)		Cases left unrepaired for more than one year (%)
		Technician in MOHFW	Manufacturer's agent	
University hospital	9	2	7	81
District hospital	7	N/A	N/A	93
MCWC	1	N/A	N/A	99
UzHC	3	N/A	N/A	97

It shows that most devices are left unrepaired even when they are considered in need of repair. Even when repaired, there is a high dependence on the manufacturer<sup>220</sup>. When a problem occurs under the conditions of a

<sup>217</sup> Adapted and modified from Project HOPE-The People-to-People Health Foundation.

<sup>218</sup> Project HOPE - The People-to-People Health Foundation 2014.

<sup>219</sup> Ibid.

<sup>220</sup> Ibid.

manufacturer's warranty period or a maintenance contract, the manufacturer can take care of the repair. When the warranty period has expired and there is no contract, the manufacturer often provides an expensive repair estimate. When a decision is made not to rely on the manufacturer, NEMEMW&TC assumes responsibility but cannot repair the product due to problems with its repair capability. As a result, it is considered to be abandoned.

**Table 5-24 Percentage of equipment that underwent preventive maintenance in healthcare facilities<sup>221</sup>**

Classification of healthcare facilities	Equipment that received preventive maintenance (%)	Respondents' affiliation (%)		Equipment that has not received preventive maintenance (%)
		Technician in MOHFW	Manufacturer's agent	
University hospital	2	0	2	98
District hospital	2	0	2	98
MCWC	0	0	0	100
UzHC	1.5	N/A	N/A	98.5
UHFWC	0	0	N/A	100

Conducting regular inspections for preventive maintenance on medical equipment before problems occur can prevent breakdowns and detect small problems at an early stage. This will ultimately lead to the prevention of large-scale and expensive repairs and medical accidents. However, broken equipment has been left unattended in the hospital for years in many facilities.

When the manufacturer's warranty expires and the device is unrepairable, the healthcare facility asks NEMEMW&TC to investigate, and if the results show that it is not economically viable to repair the device, NEMEMW&TC recommends its disposal. Then, if there is still some resource value, such as metal, the healthcare facility can sell the equipment through bidding. However, if the equipment contains radioactive materials, the National Atomic Energy Commission is responsible for its disposal<sup>222</sup>.

### **Training at facilities on medical devices**

Table 5-25 shows the results of interviews regarding training at each facility from the 2014 survey.<sup>223</sup>

<sup>221</sup> Ibid.

<sup>222</sup> Ibid.

<sup>223</sup> Ibid.

**Table 5-25 Results of survey on training in medical facilities**

Name of healthcare facility	Interviewees	Staff who have received training	Staff who have not received any training	Staff who responded that they would like to receive training
Narayanganj Sadar	8	1	7	8
Savar Upazila Health complex	6	2	4	6
Dhamrai Upazila Health complex	6	1	5	6
Munshiganj Maternity and Child Welfare Centers	1	0	1	1
Dacope Upazila Health complex	6	5	1	4
Dumuria Upazila Health complex	5	4	1	5
NIO&H: National Institute of Ophthalmology and Hospital, Dhaka	13	1	12	12
Total	45	14	31	42

Although the sample size is not large, many staff members have not received any training, indicating that the organizational training system is not yet in place.

#### 5.5.4 Logistics management system for medical equipment

The following are two typical logistics management systems for pharmaceuticals and medical equipment, managed and operated by DGHS and DGFP.

##### **Asset Management System (AMS)**

The system was piloted at the 250-bed Moulvibazar District Hospital by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) program<sup>224</sup> under the auspices of the United States Agency for International Development (USAID) (completed in November 2016). The background to the development of the system is that MOHFW procured a large number of medical and non-medical equipment, including IT equipment, on an annual basis but did not have the means to implement a systematic process to deploy, operate, maintain, upgrade, and dispose of these assets in a cost-effective manner. Therefore, the MOHFW needed to have reliable and timely data on the performance of its healthcare-related assets in various situations, from operations to evaluation.

Assets covered by AMS include, but are not limited to, various medical equipment, furniture and fixtures, ICT and communication equipment (e.g., computers, projectors), electrical and electronic equipment, vehicles, and transportation equipment. The definition of an "asset" is a tangible asset purchased by MOHFW and valued at 30,000 takas or more and provided with two years after-sales service.

In addition, the system analyzes asset-related data and generates interactive dashboards to help decision-

<sup>224</sup> Programs in the implementation of MOHFW's Directorate General of Family Planning (DGFP), Directorate General of Drug Administration (DGDA), Directorate General of Health Services (DGHS) including CMSD, National Tuberculosis Program (NTP), and Maternal, Newborn, and Child Health (MNCH) system strengthening activities.

makers track information on various assets. This clarifies rights and responsibilities from procurement to maintenance, minimizes loss and misuse, and improves the procurement and maintenance services of much-needed equipment.

The basis of AMS operation is the centralization of information. In addition to assets procured or distributed by CMSD, all assets procured by each healthcare facility or acquired with assistance from external organizations and existing equipment from before AMS operation are registered by CMSD and bar-coded with an asset number. The system is expected to operate between MOHFW, NEMEMW&TC, CMSD, and healthcare facilities. It is assumed that MOHFW takes the initiative in its operation, and it is necessary to secure a budget, organize an IT team, and provide training to users to maintain and develop the system<sup>225</sup>.

### **Electronic Logistics Management Information System (eLMIS)**

The eLMIS is managed by the DGFP and is a system that collectively manages logistics information for warehouses located in Bangladesh and can be accessed by district warehouses and donors. For example, the system manages data on the inventory and supply of materials and equipment, such as female contraceptives and syringes, to healthcare facilities and monthly reports and is used to formulate procurement plans. Logistics is also managed for medical equipment. On the other hand, it does not include information on procurement such as bidding, installation at facilities, or use of materials and equipment. Inventory information at the upazila warehouses, which are downstream of logistics, and supply from the upazila warehouses to the healthcare facilities are reported and tabulated on a paper basis<sup>226</sup>.

The above two systems are logistics management information systems with the same purpose, but the scopes of their specifications are different, and the possibility of mutual linkage has not been confirmed. In addition, both systems are logistics management information systems and do not include the management of medical equipment at each facility over time. The following "Life Cycle Management System for Medical Equipment" is indispensable to understand this.

#### **5.5.5 Life cycle management system for medical devices**

There is no paper-based medical device management ledger for all healthcare facilities, nor is there a unified national lifecycle management system for medical devices. Through its Strengthening Integrity and Accountability Program (SIAP), USAID supports the development of a database for tracking the life cycle of 20 high-value devices, but the information is fragmented<sup>227</sup>. In general, such a database needs to record equipment-specific information from the manufacturer as well as information on procurement (e.g., price, year), installation, maintenance, repair, disposal, personnel, and training history over time. A web-based cloud would be useful for centralized management of each facility and for regional and national utilization

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<sup>225</sup> Introduction of an Electronic Asset Management System in Bangladesh Health Systems: Completion of the Tool Pilot in Moulvibazar District Hospital, November 2016, USAID and SIAPS (Systems for Improved Access to Pharmaceuticals and Services).

<sup>226</sup> USAID, 2009. Deliver Project, Frequently Asked Questions, Web-Based Logistics Management Information System, Bangladesh.

<sup>227</sup> USAID, SIAPS 2016, Standardization of Medical Equipment Report.



information, which would be useful for effective utilization of medical equipment and standardization of specifications, renewal planning, and even joint purchasing<sup>228</sup>.

#### **5.5.6 Standard medical equipment list by facility category**

The MOHFW has adopted the Essential Health Service Package (ESP) to guarantee universal access and improve the quality of Health, Nutrition and Population (HNP) services. ESP equipment is a requirement for each level of public health facilities<sup>229</sup>. See the end of this section for the list of minimum medical equipment for each level (Attachment 1). In addition, a table of organization and equipment (TOE)<sup>230</sup> has been developed, which specifies the medical equipment that should be equipped for each facility above a certain size (Attachment 2). The TOE is intended to serve as a guideline for the planning and operation of medical equipment at different levels within the national health care system. It also defines the architectural requirements, such as building-side electricity, medical gas, water, and other facilities required during the planning phase of medical equipment installation and the human resources required for operation and maintenance. However, there is no information on new procurement and installation since the list was defined<sup>231</sup>, and it is necessary to verify the validity and usefulness of the list in the future.

On the other hand, as shown the Table 5-25 below, the National Institute for Population Research and Training conducted the Health Facilities Survey (HFS 2017) for 1,524 facilities in 2017, and this survey was used to determine the percentage of facilities with basic medical equipment in the outpatient area ((1) adult scales, (2) child and infant scales, (3) thermometers, (4) stethoscopes, (5) blood pressure monitor, and (6) examination lamp) in the outpatient areas of the target facilities. Although it depends on the equipment, a simple comparison of the percentage of all equipment owned shows that private hospitals are the most equipped, followed by NGO-run facilities, then district hospitals, MCWCs, and UzHCs. The union level public facilities, UHFWC and Union Sub-Center (USC/RD), had the lowest maintenance (sufficiency) rate<sup>232</sup>. The TOE mentioned above uses almost the same names as the equipment in items (1) through (6) above, but the specifications are unclear, so a simple comparison cannot be made.

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<sup>228</sup> WHO June 2011, Introduction to medical equipment inventory management, Medical device technical series

<sup>229</sup> Ministry of Health and Family Welfare Government of the People's Republic of Bangladesh, August 2016, Bangladesh Essential Health Service Package (ESP)

<sup>230</sup> Table of Organization and Equipment (TOE) for 10-, 20-, 50-, 250- and 500-Bed Hospitals in Bangladesh, April 2016.

<sup>231</sup> USAID, SIAPS 2016, Standardization of Medical Equipment Report

<sup>232</sup> National Institute of Population Research and Training (NIPORT) 2017, Bangladesh Health Facility Survey 2017 Preliminary Report.

**Table 5-26 Status of the sufficiency of basic medical equipment<sup>233</sup>**

Facility Type	Name of equipment						All (1) to (6)	Number of facilities
	(1) Adult scales	(2) Scales for children and infants	3) Thermometer	4) Stethoscope	5) Blood pressure monitor	(6) Examination lamp		
<b>District hospital and upazila facilities</b>	<b>87.8</b>	<b>79.9</b>	<b>90.4</b>	<b>97.8</b>	<b>97.3</b>	<b>79.7</b>	<b>60.9</b>	<b>44</b>
District hospital	90.3	80.6	88.7	98.4	96.8	87.1	66.1	5
MCWC	93.4	75.6	85.6	96.7	94.5	74.4	56.6	7
UzHC	86.2	80.8	91.7	98.0	98.0	79.8	61.0	32
<b>Union level public facilities</b>	<b>75.2</b>	<b>56.3</b>	<b>67.5</b>	<b>95.5</b>	<b>89.8</b>	<b>50.4</b>	<b>23.0</b>	<b>361</b>
UHFWC	80.4	58.1	67.9	94.6	90.6	52.7	25.1	250
USC/RD	63.5	52.2	66.5	97.5	87.9	45.1	18.3	111
<b>Community Clinic</b>	<b>88.2</b>	<b>60.0</b>	<b>91.6</b>	<b>93.0</b>	<b>82.0</b>	<b>46.8</b>	<b>22.8</b>	<b>1,012</b>
<b>NGO hospitals and facilities</b>	<b>98.9</b>	<b>86.0</b>	<b>98.1</b>	<b>99.2</b>	<b>98.1</b>	<b>94.1</b>	<b>79.5</b>	<b>64</b>
<b>Private hospitals</b>	<b>98.5</b>	<b>89.7</b>	<b>97.4</b>	<b>100.0</b>	<b>100.0</b>	<b>92.8</b>	<b>82.8</b>	<b>43</b>

Note: Some subtotals and totals in percentages do not match, but this is probably due to rounding.

### 5.5.7 Professional engineer for medical devices (Bio Medical Engineer: BME)

The medical equipment technical teams at NEMEMW&TC and DEMEW, the National Institute of Cardiovascular Disease (NICVD), and other tertiary care facilities responsible for medical equipment maintenance consist of BME Bachelor of Engineering Engineers (four-year-long university degree), BMET Diploma Engineers (Vocational training for three years after high school diploma), and Technicians (Vocational training for three years after secondary school diploma). On the other hand, healthcare facilities below the size of district hospitals do not have such specialized staff. Some of the technical staff involved in medical equipment have not received any formal training, while others have received training from NEMEMW&TC in addition to on-the-job training. Technical staff often receive training from equipment manufacturers, but most training is done overseas. Gano University, located in the suburbs of Dhaka, has BME and Biomedical Engineering departments, and the first batch of 30 students graduated in 2013, all of whom are employed in the private sector. As shown in Table 5-26, NEMEMW&TC has 7 engineering bachelor engineers, 12 diploma engineers, and 30 technicians on staff; NICVD has 1 engineering bachelor engineer, 3 diploma engineers, and 3 technicians<sup>234</sup>. With the support of Japan's Ministry of Economy, Trade and Industry

<sup>233</sup> USAID/NIPOR Bangladesh, 2017, Health Facility Survey Preliminary Report, National Institute of Population Research and Training (NIPORT) Percentage of basic medical equipment sufficiency in the outpatient areas of target facilities.

<sup>234</sup> Project HOPE - The People-to-People Health Foundation, 2014.

(METI), a Japanese company (Green Hospital Supply) has started a project to establish a BME department in 2016<sup>235</sup>.

**Table 5-27 Assignment of medical technology professionals in major organizations (persons)<sup>236</sup>**

	BME	BMET	technical assistant
NEMEMW&TC	7	12	30
NICVD	1	3	3

### 5.5.8 Lessons learned from Japan's assistance (loans, grants, technical assistance)

#### **The Project for Improvement of Maternal and Child Health Training Institute**

Under the "Project for Improvement of Maternal and Child Health Training Institute" implemented by JICA from 1998 to 2000, 188 types of equipment were provided to the maternal and child health training institute in Dhaka, including examination tables, ultrasound equipment, delivery tables, oxygen inhalers, and models of pregnant women for training. During the defect inspection one year after delivery, defects were reported in the ultrasound fetal heart monitor, distillation equipment, hemoglobin meter, spectrophotometer, and autoclave, but all of them were easily repaired during the defect inspection period and recovered. On the other hand, no defects were found in the advanced and expensive medical equipment, and it is commendable that information was shared within the project and early action was taken<sup>237</sup>. In the ex-post evaluation of the project in 2006, some of the equipment was rearranged to fit the actual operation after installation, suggesting that experts' opinions were not fully reflected in the basic design stage. The medical equipment was generally used in good condition, but some of the Japanese equipment was not used because spare parts could not be procured due to insufficient budgetary measures by the implementing agency<sup>238</sup>. In the defect inspection report and the ex-post evaluation report, it was evaluated that the equipment maintained through the grant aid was properly utilized by the technical cooperation project and that detailed follow-up was realized through maintenance support, and that the cooperation between the grant aid and the technical cooperation project was effective. Regarding the maintenance of medical equipment after the completion of the technical cooperation project, it was suggested that it is necessary to conclude a maintenance contract with the local agent of each piece of equipment for proper maintenance and that budgetary measures for this purpose are essential.

#### **The Project for Support to Strengthening of Emergency Obstetric Care Service**

In the "Project for Support to Strengthening of Emergency Obstetric Care Service" implemented by JICA

<sup>235</sup> Ministry of Economy, Trade and Industry (METI), Country Report on the International Development of Medical Services, Basic Information on Healthcare Market Environment in Emerging Countries, Bangladesh Chapter "Development of Clinical Training Bases, Bio Medical Engineer Training, Establishment of a medical engineer training school, establishment of a BME (Bio Medical Engineer) department, and development of clinical training bases with local partner AICHI Group. We will open a medical technician training school, establish a BME (Bio Medical Engineer) department, and develop a clinical training base with our local partner, AICHI Group, and implement Japanese-style BME training. (In Japanese only)

<sup>236</sup> Project HOPE - The People-to-People Health Foundation, 2014.

<sup>237</sup> JICA, 2002, Deficiency Inspection Report: Improvement Plan for Maternal and Child Health Training Institute (Grant Aid) (In Japanese only)

<sup>238</sup> JICA, 2006. Project Ex-post Evaluation Table: Improvement Plan for Maternal and Child Health Training Institute (Ministry of Foreign Affairs Evaluation Project). (In Japanese only)

in 2002-2004, operating tables and laparotomy equipment sets were provided to 57 district hospitals and 192 UzHCs nationwide as medical equipment for comprehensive emergency obstetric care, and delivery tables, sterilizers for boiling instruments, height scales were provided as equipment for basic emergency obstetric care. In cases where local procurement was difficult, some facilities had problems with maintenance and management due to the lack of budget allocation for supplies and equipment maintenance from the government. There was a variation in the management of equipment. Some facilities reported that they need to improve the equipment arrangement in their facilities. In addition, it was pointed out that there was a lack of information on local distributors who deal in spare parts<sup>239</sup>.

**Project for Research and Development of Prevention and Diagnosis for Neglected Tropical Diseases, especially Kala-Azar**

Under the JICA technical cooperation project "Project for Research and Development of Prevention and Diagnosis for Neglected Tropical Diseases, especially Kala-Azar," 2011-2016, the Surya Kanta Kala-azar Research Center (SKKRC) was provided with sophisticated and expensive laboratory equipment such as biochemical analyzers, fully automated hemocytometers, cooled microcentrifuges, high-speed cooled centrifuges, inverted microscopes, and fluorescence microscopes, as well as diagnostic ultrasound equipment for medical services. During the project period, technical guidance was also provided to the local staff on the procurement of reagents, consumables and equipment management practices to maintain the SKKRC laboratory functions for research and diagnostic services. Recommendations made by the project include (1) Discussions among MOHFW and other related parties under the advice of JICA experts on the costs required for the future maintenance and utilization of the SKKRC laboratory equipment procured through the project, as well as the securing of infrastructures such as electricity and water so that the environment can be maintained even after the project ends. (2) To ensure that the environment is maintained even after the completion of the project, the roles of the concerned parties should be clearly defined by the end of the project period, and the roles should be shared within MOHFW and reported to JICA. The importance of the maintenance and management system of the provided equipment in the project is emphasized<sup>240</sup>.

**Attachment 1 Essential Health Service Package (ESP)<sup>241</sup>**

Medical service/equipment	CC	UHFWC	UzHC
<b>Outpatient / Basic Medical Care</b>			
Stethoscope	✓	✓	✓
Sphygmomanometer (instrument used to measure blood pressure)	✓	✓	✓
Scales for children and adults	✓	✓	✓

<sup>239</sup> JICA, 2008, Project Ex-post Evaluation Table: Support Plan for Strengthening Emergency Obstetric Care Services. (In Japanese only)

<sup>240</sup> JICA, 2015. Summary Table of Evaluation Results: Technical Cooperation Project (International Science and Technology Cooperation for Global Issues) "Neglected Tropical Diseases: Establishment of Diagnosis System and Research Project for Vector Control, Especially for Kala-Azar. (In Japanese only)

<sup>241</sup> Ministry of Health and Family Welfare Government of the People's Republic of Bangladesh, 2016, Bangladesh Essential Health Service Package (ESP).

Medical service/equipment	CC	UHFWC	UzHC
Auriscope		✓	✓
Eyesight test chart		✓	✓
Penlight	✓	✓	✓
Clock	✓		
Timer for measuring respiration frequency	✓	✓	✓
Examination table (at a doctor's office)	✓	✓	✓
Stadiometer	✓	✓	✓
Measuring tape	✓	✓	✓
Growth measurement chart	✓	✓	✓
Hearing-impaired discriminator			✓
Traube stethoscope	✓	✓	✓
Medical thermometer	✓	✓	✓
Minor surgery set (forceps and pruners)	✓	✓	✓
<b>Prenatal Care / Family Planning Consulting Room</b>			
Stethoscope	✓	✓	✓
Sphygmomanometer (instrument used to measure blood pressure)	✓	✓	✓
Drip stand		✓	✓
Parabolic reflector		✓	✓
Open-air light		✓	✓
Examination table (at a doctor's office)	✓	✓	✓
Manual aspirator		✓	✓
Scales for children and adults	✓	✓	✓
Measuring tape	✓	✓	✓
Traube stethoscope	✓	✓	✓
Medical thermometer	✓	✓	✓
<b>Maternity room</b>			
Delivery table	special	special	✓
Neonatal heating system			✓
Stethoscope	special	✓	✓
sphygmomanometer (instrument used to measure blood pressure)	special	✓	✓
Drip stand		✓	✓
Normal delivery set	special	✓	✓
Neonatal resuscitation cart	special	✓	✓
Manual aspirator		✓	✓
Traube stethoscope	special	✓	✓
Medical thermometer	special	✓	✓
Newborn height measurement scale		✓	
Digital newborn weighing scale	special	✓	✓
Open-air light	special		✓
Minor surgery set (forceps and pruners)	special	✓	✓
Aspirators (manual and electric)		✓	✓
<b>Neonatal unit</b>			
Neonatal heating system			special
Phototherapy machine			special
Digital newborn weighing Scale			special
Neonatal resuscitation kit (including bag valve mask)			special

Medical service/equipment	CC	UHFWC	UzHC
Aspirator (for newborns)			special
Pulse oximeter			special
Medical thermometer			special
Newborn baby scales			special
<b>Operating room</b>			
Hydraulic operating table			✓
Open-air light			✓
Electrical scalpel			✓
Anesthesia machine			✓
Laryngoscope			✓
Pulse oximeter			✓
Trolley			✓
Instrument set for Cesarean section			✓
Minor surgery set (forceps and pruners)			✓
Laparotomy set			✓
Hysterectomy Set			✓
Adult first-aid cart (including bag valve mask)			✓
Oophorectomy			✓
Vasectomy			✓
Electro coagulator (electrocautery)			✓
Aspirator (manual and electric)			✓
(Medical oxygen gas cylinders, laughing gas cylinders)			✓
<b>Laboratory</b>			
Microscope			✓
Sputum and blood specimen bottles			✓
Electric/manual centrifuge			✓
Biochemical analysis equipment			✓
Blood storage refrigerator			✓
Blood glucose monitoring device		special	✓
Constant temperature water tank			✓
<b>Radiation and other departments</b>			
Ultrasound diagnostic equipment			✓
X-ray machine			✓
Automatic X-ray film developing machine			✓
12-lead electrocardiograph			✓
<b>Dentistry</b>			
Dental treatment unit			✓
<b>(Hospital) ward</b>			
Stethoscope			✓
Sphygmomanometer (instrument used to measure blood pressure)			✓
Cart			✓
Medical thermometer			✓
Scales for children and adults			✓

✓ : Applicable, Special: for specially selected facilities

**Attachment 2: Summary of standard medical equipment list by facility category<sup>242</sup>**

As shown below, a list of standard equipment and materials has been prepared for each facility level<sup>243</sup>. Equipment and materials deployed in facilities smaller than those of the relevant size and classification are generally included in the higher-level facilities, and equipment and materials specific to facilities of the size and classification are shown below.

**Rural health centers (10 beds)**

<b>Typical equipment</b>
Microscopes, spectrophotometers, centrifuges, electrocardiographs, blood glucose meters, suction machines, oxygen cylinders, manual resuscitation equipment (for children and adults), nebulizers, sphygmomanometers, stethoscopes, thermometers, Scherkastens, height and weight scales, examination lights, autoclaves, various examination tables, storage rooms, etc.

**Mother and Child Welfare Centers (10-20 beds)**

<b>Typical equipment</b>
Electric scalpel, anesthesia machine, shadowless lamp, operating table, delivery table, fetal heart monitor, pulse oximeter, laughing gas cylinder, patient monitoring device, open incubator, etc.

**Primary-level hospitals (50 beds)**

<b>Typical equipment</b>
Biochemical analyzer, thermostatic bath, medical refrigerator, dental unit, transport ventilator, stretcher, fetal heart rate labor chart, ultrasound machine, X-ray machine, self-checking machine, protective clothing, dosimeter, air conditioner, dehumidifier, defibrillator, etc.

**Secondary-level hospitals (250 beds)**

<b>Typical equipment</b>
Plasma freezers, cooling centrifuges, blood heating systems, plasma thawing thermostatic chambers, ovens, color Doppler ultrasound systems, treadmills, bedside monitors, automated cardiology machines, infusion pumps, syringe pumps, external pacemakers, Holter electrocardiographs, intravascular ultrasound systems, high-speed rotating coronary atherectomy device, hematology analyzer, blood culture device, immunology analyzer, biosafety cabinet, erythrocyte sedimentation rate analyzer, blood coagulation time analyzer, ELISA immunoassay analyzer, thermostatic machine, oven, electronic balance, electrolyte analyzer, ophthalmoscope, audiometer, laryngoscope, tympanoscope pharyngoscope, tympanometer, frenulum speculum, otoscope, surgical drill, endoscopic otolaryngology surgery set, navigation system, microdebris device, hysteroscope, nerve stimulator, urological diagnostic and treatment equipment, vaginal speculum, large autoclave, wheelchair, microfiber microscopes, keratometer, refractometer, Yag laser Refractometer, Yag laser system, ophthalmology unit, lens phacoemulsification aspirator, ophthalmic surgical microscope, medicine storage, C-arm x-ray system, CR (digital x-ray) system, MRI (0.3-0.4), x-ray fluoroscopy system, CT scanner <sup>64</sup> , ultrasound system (4D), laparoscopic surgery set, etc. etc.

<sup>242</sup> USAID, SIAPS 2016, Standardization of Medical Equipment Report.

<sup>243</sup> USAID, 2016. Table of Organization and Equipment for 10,-20,50,-,250- and 500-Bed Hospitals in Bangladesh: Standardization of Medical Equipment.

### **Tertiary-level hospitals (500 beds)**

<b>Typical equipment</b>
Ward beds, rectoscopes, upper gastrointestinal endoscopy systems, lower gastrointestinal endoscopy systems, ultrasound endoscopes, small intestine endoscopes, duodenoscopes, X-ray fluoroscopy equipment, 13C urea diagnostic equipment, hydrogen breath test equipment, cath labs (ceiling running, floor running), enhanced extracorporeal counterpulsation, ICU beds, ventilators circulatory monitor, blood gas analyzer, medical supply refrigerator, patient heating system, instrument cleaning and disinfection system, ultrasonic cleaner, surgical hand washing system, panoramic x-ray system, cone beam CT, indirect mirror, ambulance, cadaver refrigerator, trial lens set, intraocular pressure gauge, autorefractometer, ophthalmic ultrasound system Corneal imaging system, optical tomography, argon laser surgery system, contrast detection system, extraocular surgery set, dialysis machine, water treatment system for dialysis, dialysis bed, air bed, electroencephalograph, electromyograph, neurotransmission velocity measurement system, orthopedic bed, biochemical analyzer, biosafety cabinet, PCR test system, deep freezer, MRI Deep freezer, MRI (MRI1.5), human specimens and other educational equipment and materials, kitchen equipment and materials, linen equipment and materials, etc.

## **5.6 Medicines**

### **5.6.1 Policy and relevant institutions**

The National Drug Policy was revised in 2006. Keeping in mind the growth of the pharmaceutical industry in Bangladesh and the need to ensure the safety of medicines, the policy sets out measures to (i) ensure the availability of safe, effective and quality medicines, (ii) ensure rational and safe use of medicines and appropriate dispensing, (iii) achieve self-sufficiency in the manufacture of medicines and raw materials, (iv) increase exports of medicines, and (v) establish an effective monitoring system. The policy is designed to establish an effective monitoring system<sup>244</sup>. Many of the goals of the previous policy in 2005 have not been achieved, and there is a particular need to strengthen measures to promote the rational use of medicines and to monitor the use of medicines.

The Directorate General of Drug Administration (DGDA) of the MOHFW is responsible for the regulation of pharmaceutical products. DGDA, which was upgraded to a Directorate General in 2010, oversees and enforces all pharmaceutical regulations in force in the country and regulates activities related to the importation of all types of pharmaceutical products, procurement of raw materials and packaging, manufacture and importation of finished products, exportation, marketing and pricing<sup>245</sup>.

In addition to the DGDA, MOHFW has two other drug-related functions: the DGHS and the Essential Drugs Company Limited (EDCL), which is responsible for the production and procurement of essential drugs. The DGHS is deeply involved in pharmaceutical administration, regulating health care services, allocating the budget for drugs, managing committees and standard treatment guidelines, and has its own Central Medical Stores & Depot (CMSD) in charge of drug procurement. As a result, problems have arisen; for example, the Essential Drugs List (EDL) formulated by the DGDA is not sufficiently referenced by the DGHS and CMSD. There is a need to coordinate with multiple departments for drug budget allocation and promotion of pharmacy education<sup>246</sup>.

<sup>244</sup> National Drug Policy 2016.

<sup>245</sup> From the DGDA website (<https://www.dgda.gov.bd/>).

<sup>246</sup> World Health Organization, Regional Office for South East Asia, 2014. Medicines in Health Care Delivery - Bangladesh - Situation Analysis.



### 5.6.2 Challenges of essential drug lists

The current EDL was developed in 2008 and includes a wide range of drugs, but does not include many of the drugs needed in hospitals, such as cephalosporins (antibiotics used to treat infectious diseases such as pneumonia and meningitis), while it also includes drugs for chronic diseases that are beyond the scope of essential medicines include diabetes (glibenclamide, gliclazide, metformin, soluble insulin), hypertension (amlodipine, atenolol, hydrochlorothiazide, methyldopa, nifedipine, enalapril), and cancer (methotrexate, cyclophosphamide). In addition, inconsistencies have been pointed out, such as the inclusion of human immunoglobulin and peritoneal dialysis solution, while 5% dextrose for intravenous infusion is not included.

As a result, the EDL is no longer perceived as necessary, with about half of the drugs prescribed in public hospitals being non-EDL drugs, even though policy dictates that the majority of drugs used should be included in the EDL. Furthermore, many patients are prescribed non-EDL medicines at public hospitals, which are not available in public facilities, which they then purchase from private pharmacies. These problems have affected the supply and availability of medicines in no small way, and the need to revise the EDL has been pointed out<sup>247</sup>.

### 5.6.3 Pharmaceutical procurement

The organizations involved in the procurement of medicines are listed in Table 5-28.

**Table 5-28 Pharmaceutical procurement agencies<sup>248</sup>**

Role	MOHF W	Other instituti ons	Institution name and details
Selection	✓		DGDA
Supply volume determination	✓		DGHS coordinates with CMSD and EDCL, considering the demand from medical facilities.
Supply	✓	✓	CMSD conducted a central procurement. Some local procurement is done by the Civil Surgeon Office. Some public medical facilities also procure their supplies.
Pricing	✓	✓	DGDA adjusts the prices of some EDL drugs. The prices of other drugs are determined by the manufacturers.
Storage	✓		Medical facilities, CMSD
Distribution	✓		Distributed by CMSD and EDCL according to the needs of medical facilities.
Monitoring and evaluation	✓		MOHFW monitors the status of drug management in public healthcare facilities.

#### **Procurement at the central level**

According to the policy, medicines for public health facilities are to be purchased from EDCL (70%), CMSD (25%) and local suppliers (5%). As mentioned earlier, EDCL generally supplies EDL drugs, while CMSD also supplies non-EDL drugs and medical equipment. CMSD supplies medicines to the civil surgeon, district hospitals, and public health programs run by DGHS line directors. Tertiary hospitals are not required to procure

<sup>247</sup> Ibid.

<sup>248</sup> Ibid.

from CMSD but are required to purchase from manufacturers pre-approved by CMSD.

Procurement is done annually based on an independent volume forecast based on historical supply, and the DGHS ultimately approves the procurement plan. If the cost of a single item or package exceeds US\$300,000, a national or international bidding process is used. For procurement of goods, SOPs have been prepared in accordance with the Public Procurement Act of 2006 and the Public Procurement Regulations of 2008, but there are no specific provisions for pharmaceuticals, and CMSD uses the World Bank procurement guidelines.

The procurement process has improved significantly in recent years, but the overall lead time is estimated to range from 45 to 60 weeks.

The following points have been pointed out as issues related to procurement<sup>249</sup>.

- WHO prequalification requirements make product specifications inflexible.
- It is difficult to balance quality, budget, and procurement guidelines.
- High bid prices are set due to collusive practices.
- Since 80% of the payments are made prior to receiving the medicines, it is difficult to take action when inferior medicines are received.
- Sample tests on the quality of pharmaceutical products are conducted overseas after shipment because there are no WHO-accredited laboratories in Japan, making it difficult to ascertain the details of the tests.

### **Procurement at healthcare facilities**

Healthcare facilities can order medicines from EDCL and CMSD according to their budget, but in practice, the budget available for healthcare facilities below the district level to procure medicines on their own is limited. District hospitals may purchase up to 25,000-taka worth of drugs, and UzHCs may purchase up to 15,000 takas worth of drugs without bidding. Procurement will be managed by the civil surgeon and the district hospital Director. CCs whose drugs are purchased centrally do not make their purchases. Specialized and tertiary hospitals may allocate 25-30% of their budget for independent purchase from 40 manufacturers pre-qualified by CMSD. Procurement is managed by the hospital director and will be done through bidding based on procurement rules.

#### **5.6.4 Pharmaceutical management**

##### **Management at the central level**

A "pull system" is followed wherein each facility orders medicines from EDCL on a quarterly basis and from CMSD on an annual basis, within its budget. Upon receipt of the order, medicines are distributed to each facility either by EDCL on a quarterly basis or by local manufacturers used by CMSD, depending on the demand of the medical facilities. Only in the case of imported medicines, the medicines are stored in CMSD warehouses and distributed from the warehouses to the healthcare facilities. The CC uses a "push system" where medicines are supplied directly from the EDCL on a quarterly basis within the framework of the

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<sup>249</sup> Ibid.

Community Health Project under the DGHS. This may lead to stock-outs and redistribution among the CCs of medicines with short use-by dates.

### **Management in public healthcare facilities**

Many facilities experience stock shortages of drugs, but with the exception of CC, drugs are not redistributed among facilities. Outpatient pharmacies are managed by pharmacists, and inventories are generally well maintained. In wards, on the other hand, the storage of medicines is often poor, and inventory records are poorly maintained. Medication records for individual inpatients are not properly maintained, and nurses are also at risk of administering the wrong medication to patients because they cannot track the status of medication from individual patient records<sup>250</sup>.

Major essential medicines are estimated to be 61-75% available at district hospitals and UzHCs and 100% at CCs, but stock-outs are occurring due to budget shortages. In addition, there is a shortage of pharmacists, and the drug management information system has not been digitized, making it often difficult to accurately track drug consumption, inventory status, and expiration dates.

## **5.7 Service delivery**

### **5.7.1 Overview**

The MOHFW has four bureaus as major service implementation organizations: DGHS, DGFP, Directorate General of Nursing and Midwifery (DGNM), and DGDA, each with independent bureau functions, budgets, and operations. The DGHS and DGFP play a central role in providing health care services in MOHFW. The DGHS is mainly responsible for the provision and quality assurance of health and medical services other than family planning and nutrition programs, while the DGFP focuses on family planning and reproductive health from the perspective of improving the health of families, including mothers, children and adolescents. At the upazila level, there is some integration of DGHS and DGFP facilities, such as the Union Health and Family Welfare Center (UHFWC) and community clinics, but the structure and management systems of the two directorates are independent from the central to the field level, and the lack of horizontal coordination is a challenge<sup>251</sup>.

**Table 5-29 Summary of health service delivery system (under DGHS jurisdiction)<sup>252</sup>**

Level	Jurisdiction	Healthcare facilities (DGHS)	Person in charge/responsible
	DGHS		• Director General, Director, Deputy Director
3rd	National	• Public Health Institute • Postgraduate Medical Institute & Hospital • Specialized Health Center	• Director of Institute, Deputy Director, Assistant Director

<sup>250</sup> Ibid.

<sup>251</sup> JICA, 2010. Preparatory Study Report for the Project on Strengthening the Maternal Protection Service System in the People's Republic of Bangladesh. (In Japanese only)

<sup>252</sup> Management Information System, Directorate General of Health Services, Ministry of Health and Family Welfare, 2020. Health Bulletin 2019.

Level	Jurisdiction	Healthcare facilities (DGHS)	Person in charge/responsible
3rd	Division (8)	<ul style="list-style-type: none"> <li>Medical College and Hospital,</li> <li>General Hospital with Nursing Institute</li> <li>Infectious Disease Hospital</li> <li>Institute of Health Technology</li> </ul>	<ul style="list-style-type: none"> <li>Divisional Director (Health), Deputy Director, Assistant Director</li> <li>Principal, Medical College/ Director (Medical College Hospital), Vice Principal, Medical College/Deputy Director (Medical College Hospital)</li> </ul>
2nd	District (64)	<ul style="list-style-type: none"> <li>District Hospital</li> <li>General Hospital</li> <li>Medical College &amp; Hospital</li> <li>Chest Disease Clinic</li> <li>Tuberculosis Clinic</li> <li>Leprosy Hospital</li> <li>Medical Assistant Training School</li> </ul>	<ul style="list-style-type: none"> <li>Civil Surgeon, Deputy Civil Surgeon</li> <li>Superintendent, District Hospital, Resident Medical Officer</li> </ul>
1st	Upazila (492)	<ul style="list-style-type: none"> <li>Upazila Health Complex (UzHC)</li> </ul>	<ul style="list-style-type: none"> <li>Upazila Health &amp; Family Planning Officer, Resident Medical Officer</li> </ul>
1st	Union (4,554)	<ul style="list-style-type: none"> <li>Rural Health Center</li> <li>Union Sub Center</li> <li>Union Health &amp; Family Welfare Center (UHFWC)</li> </ul>	<ul style="list-style-type: none"> <li>Medical Officer/Assistant, Sub-assistant Community Medical Officer/Pharmacist</li> <li>Health Inspector, Assistant Health Inspector</li> </ul>
1st	Ward (40,987)	<ul style="list-style-type: none"> <li>Community Clinic (CC)</li> </ul>	<ul style="list-style-type: none"> <li>Health Assistant, Community Healthcare Provider</li> </ul>

The number in parentheses in "Jurisdiction" is the number of facilities.

**Table 5-30 Summary of Health service delivery system (under DGFP jurisdiction)<sup>253</sup>**

Level	Jurisdiction	Healthcare facilities (DGFP)	Person in charge/responsible
	DGFP		<ul style="list-style-type: none"> <li>Director General, Director, Deputy Director</li> </ul>
3rd	National	Specialized Hospital: <ul style="list-style-type: none"> <li>Maternal and Child Health Training Institute (MCHTI), Azimpur, Dhaka.</li> <li>Mohammadpur Fertility Services and Training Centre (MFSTC), Mohammadpur, Dhaka.</li> <li>Model Clinics</li> <li>NGO Clinics (supporting operation)</li> </ul>	<ul style="list-style-type: none"> <li>Director of Institute, Deputy Director, Assistant Director</li> </ul>
3rd	Division (8)	<ul style="list-style-type: none"> <li>Clinic of medical college and Hospital</li> </ul>	<ul style="list-style-type: none"> <li>Divisional Director (Family Planning)</li> </ul>
2nd	District (64)	<ul style="list-style-type: none"> <li>Mother and Child Welfare Centers (MCWC)</li> <li>NGO Clinics (supporting operation)</li> <li>Maternal and Child Health and Family Planning (MCH-FP) clinics</li> </ul>	<ul style="list-style-type: none"> <li>Deputy Director (Acting).</li> <li>Assistant Director (Family Planning)</li> <li>Assistant Director (Clinical Contraception)</li> <li>Medical Officer (Clinic)</li> </ul>
1st	Upazila (492)	<ul style="list-style-type: none"> <li>Maternal and Child Health and Family Planning (MCH-FP) unit at Upazila Health Complex (UzHC)</li> <li>Mother and Child Welfare Center</li> </ul>	<ul style="list-style-type: none"> <li>Upazila Family Planning Officer (UFPO)</li> <li>Medical Officer for MCH(MO-MCH) in each Upazila</li> </ul>

<sup>253</sup> Bangladesh Health bulletin, 2012, MCH Services Unit, DGFP Bangladesh (<http://dgfp.gov.bd/site/page/b36b79d1-d8a7-4cd6-926b-1de2136cad1a/>). (Accessed on February 13, 2021), District (Services), DGFP Bangladesh ([http://www.dgfp.gov.bd/site/page/92476f13-5e3c-4ecf-a5ea-ae9c2a805c9/District-\(Services\)](http://www.dgfp.gov.bd/site/page/92476f13-5e3c-4ecf-a5ea-ae9c2a805c9/District-(Services))). (Accessed on February 13, 2021).

Level	Jurisdiction	Healthcare facilities (DGFP)	Person in charge/responsible
		<ul style="list-style-type: none"> <li>• (MCWC)</li> <li>• NGO Clinics (supporting operation)</li> </ul>	<ul style="list-style-type: none"> <li>• Assistant Family Welfare Officers (MCH-FP) at MCH unit at UzHC</li> <li>• Family Welfare Visitor (FWV)</li> </ul>
1st	Union (4,554)	<ul style="list-style-type: none"> <li>• Union Health and Family Welfare Centers (UHFWC)</li> <li>• Mother and Child Welfare Center (MCWC)</li> <li>• NGO Clinics (supporting operation)</li> </ul>	<ul style="list-style-type: none"> <li>• Medical Officers for Family Welfare (UHFWC) in selected UHFWCs (not everywhere)</li> <li>• Assistant Family Welfare Officers (MCH-FP) at MCH unit at UzHC</li> <li>• SACMO and Pharmacist (Not everywhere)</li> <li>• Family Welfare Visitor (FWV)</li> <li>• Family Planning Inspector (FPI)</li> <li>• Family Welfare Assistant (FWA)</li> </ul>
1st	Ward (40,987)	<ul style="list-style-type: none"> <li>• Satellite Clinics (Per Month)</li> <li>• Community Clinics</li> </ul>	<ul style="list-style-type: none"> <li>• Family Welfare Assistant (FWA)</li> </ul>

The number in parentheses in "Jurisdiction" is the number of facilities.

### 5.7.2 Referral system

Regarding the referral system, patient referrals from health assistants, family welfare assistants, and community health care providers to primary healthcare facilities or between healthcare facilities at different levels are routine. The numbers are noted in the monthly reports<sup>254</sup>. The challenge in the operation of the referral system is that the system itself is utilized by each program or project, resulting in a situation where irregular referrals stand side by side. Although the services that should be provided by the facilities are determined at each level, shortages of human resources, medicines, and equipment occur on a daily basis, and the response is to transport them according to the situation. The Hospitals and Clinics Section of DGHS formulated guidelines for structured referral and planned to disseminate them to district and university hospitals by 2013<sup>255</sup>. However, dissemination to primary health care facilities and field workers below UzHCs is inadequate. As a result, the burden on district and university hospitals of having patients pass through the hierarchy of healthcare facilities to receive direct care at higher-order hospitals continues, and patients' understanding of and cooperation with the health care system is needed<sup>256</sup>.

The reason behind the poor functioning of the referral system is that, in addition to the shortage of human resources, medicines and equipment and irregular referrals mentioned earlier, the quality of services provided

<sup>254</sup> JICA, 2010, Preparatory Study Report for the Project on Strengthening the Maternal Protection Service System in the People's Republic of Bangladesh. (In Japanese only).

<sup>255</sup> According to the aforementioned document, the plan was to be disseminated to 59 district hospitals and 14 university hospitals nationwide by 2013. The contents of the plan are as follows: (1) the Hospital Management Committee will educate residents to promote the use of primary medical facilities, (2) a standardized letter of referral will be introduced, and patients with a letter of referral will be given priority treatment, and (3) a counter-referral system will be introduced to provide follow-up care at lower-level healthcare facilities after receiving treatment at higher-level hospitals. As of December 2009, six hospitals (Khulna University Hospital, Khulna District Hospital, Shatkira District Hospital, Chapai Nawabganj District Hospital, Bagerhat District Hospital, and Rajshahi University Hospital) have introduced the system, and 15 more hospitals have completed orientation. A further 15 hospitals are reported to have completed orientation.

<sup>256</sup> bdnews24.com, Bangladesh can treat 80 percent patients at lower facilities: WHO expert (<https://bdnews24.com/health/2019/04/04/bangladesh-can-treat-80-percent-patients-at-lower-facilities-who-expert>). (Accessed on February 22, 2021).

by primary healthcare facilities is not trusted by users. As a result, many residents use pharmacies instead of healthcare facilities nearby or visit higher-level hospitals directly, even in critical situations. There is an urgent need to improve the quality of services at primary healthcare facilities and normalize the flow of referrals from communities to primary facilities to secondary and tertiary facilities. Efforts are needed to improve the quality of health care services by MOHFW, such as allocating the budget for human resources, medicines, and equipment, improving system operations, and providing training for human resources<sup>257</sup>.

### **5.7.3 Provision of health services at community clinics**

Community clinics (CCs)<sup>258</sup> are facilities where people can receive basic care for health, family planning, and nutrition, and each facility covers a rural population of about 6,000 to 12,000. All CCs are built on land donated by neighboring communities and are an example of a public-private partnership. The government bears the cost of operation, including construction, medical supplies, and medical personnel, but community groups (CGs) manage the facilities with the government's support. Between 1998 and 2001, more than 10,000 CCs were constructed, of which about 8,000 were functioning, but CC activities were closed down due to a change in government in 2001. In 2009, the CCs were re-opened under the Government of Bangladesh's "Revitalizing Community Health Care Initiatives in Bangladesh" project, and in addition to rehabilitating the facilities and supplying medicines, new health personnel called Community Health Care Providers (CHCPs) had been assigned to each CC.

Since July 2015, all activities in CCs have been implemented under the DGHS Operational Plan, namely Community Based Health Care (CBHC) under the Health, Population and Nutrition Sector Development Program (HPNSDP) (2011-2016)<sup>259</sup>. According to the data as of December 2018, a total of 13,907 CCs are in operation, with an average of 9.51 million visits made by users every month across the country. In addition, 79,054 normal deliveries took place at CCs over about 10 years from 2009 to November 2019. At the community level, health assistants (HA), health inspectors (HI), and assistant health inspectors (AHI) have been assigned as domiciliary workers. And under DGFP, family welfare assistants (FWA) and family planning inspectors (FPI) have also been assigned as domiciliary workers.

In the strategic plan of the HPNSDP, the establishment of an upazila health system consisting of three layers of CCs at the community level, Union Health and Family Welfare Centers (UHFWCs) and Union Health Centers at the union level, and UzHCs at the upazila level was identified as a key issue for strengthening PHCs<sup>260</sup>. As mentioned earlier, many NGOs and international organizations are providing support to the CCs on the basis of the basic principle of community participation, such as cooperation through a land donation by community residents, and the government of Bangladesh believes that such community-based support

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<sup>257</sup> WHO, 2017, Primary Health Care Systems, Case study from Bangladesh.

<sup>258</sup> Management Information System, Directorate General of Health Services, Ministry of Health and Family Welfare, 2020. Health Bulletin 2019.

<sup>259</sup> The project has been continued based on 4th HPNSP since 2017.

<sup>260</sup> JICA, 2012. Data collection survey on Health Sector in Bangladesh.

contributes greatly to the achievement of the SDGs<sup>261</sup>.

The impact of the COVID-19 expansion on health services in 2020 was not insignificant: CCs and UHFWCs, which are the first and most important health facilities accessed by the population, experienced reduced access during the COVID-19 pandemic. According to World Vision's survey of 2,671 households conducted in May 2020<sup>262</sup>, the percentage of households accessing CCs before COVID-19 was 79.17%, but it dropped to 45.33% after the pandemic. In the UHFWC, the access rate was 19.7%, compared to 46.8% before COVID-19. As a result of reduced accessibility to health care at the household level, 49% of women and children are unable to access health care services at healthcare facilities, and face problems such as failure to receive routine immunizations and malnutrition. According to a survey conducted by the Bangladesh University of Health Sciences in 2020<sup>263</sup>, 47% of pregnant women received four or more antenatal care on average in 2017-18, before the COVID-19 challenge, but the figure dropped to 37.6% in 2020. The data for only the rural areas surveyed showed a drop to 30.3%.

#### **5.7.4 Overview of Essential health service package (ESP)**

The Essential Service Package (ESP) was revised in the first half of 2015 in preparation for the 2016 Sector Investment Plan (SIP)<sup>264</sup>. The ESP is compiled as a document that includes a list of public health and clinical services provided at the primary and secondary levels for the health services<sup>265</sup> needed to expand access to achieve UHC<sup>266</sup>. The document also describes the minimum required facilities, human resources, equipment, and medical supplies to provide health services<sup>267</sup>. After its update in 2016, the ESP continued under the 4<sup>th</sup> HPNSP. The main ESP services are (1) maternal, infant, child, and adolescent care, (2) family planning, (3) nutrition, (4) infectious diseases, (5) non-communicable diseases, and (6) other services such as eye, ear, and dental care, which are provided at CCs, UzHCs, and district hospitals. In urban areas, services are also provided by private clinics, local governments, and NGOs.

#### **5.7.5 Service utilization by healthcare facility**

Table 5-31 shows the outpatient receipts by type of public healthcare facility based on data from January to December 2018<sup>268</sup>. The number of users of community clinics is 66%, and the number of facilities is nearly

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<sup>261</sup> Management Information System, Directorate General of Health Services, Ministry of Health and Family Welfare, 2020. Health Bulletin 2019.

<sup>262</sup> World Vision, 2020. COVID-19 Impact Assessment Report.

<sup>263</sup> Impact of COVID-19 on Essential Health Services in Bangladesh: A rapid assessment, Bangladesh University of Health Sciences (BUHS) and BRAC Advocacy for Social Change (ASC), 2020.

<sup>264</sup> Bangladesh, 2016. Essential Health Service Package (ESP).

<sup>265</sup> Health services, defined as EPS, refer to (1) maternal, newborn, child and adolescent health care, (2) family planning, (3) nutrition, (4) infectious diseases, (5) non-communicable diseases, and (6) other diseases.

<sup>266</sup> The primary and secondary level facilities where ESP is provided are: (1) Users' homes, (2) Satellite Clinics and Outreach, (3) CCs, (4) Union-level facilities (combination of UHFWC and Union Health Sub-Centers (USC)), (5) UzHC, (6) District Hospitals, (7) MCWC.

<sup>267</sup> WHO, Supporting the implementation of the ESP (<https://www.who.int/bangladesh/activities/supporting-the-implementation-of-the-essential-service-package/supporting-the-implementation-of-the-essential-service-package>). (Accessed on February 13, 2021)

<sup>268</sup> Management Information System, Directorate General of Health Services, Ministry of Health and Family Welfare, 2020.

14,000 nationwide, indicating that the clinics are operating frequently. MOHFW estimated one hundred ten million people in 2018 as the projected annual number of users, and the actual number of users was about 104 million, almost 95% of the total. According to the MOHFW report of the same year, post-graduate medical institutions and specialty hospitals handled 1.32 million emergency patients, university hospitals 1.92 million, district hospitals 2.51 million, and UzHC received the highest number of 3.8 million.

**Table 5-31 Outpatient reception by facility (2018)**

Facilities	Outpatients	
	Number	%
Post-graduate medical institutions and specialized hospitals	7,291,894	4.60
University hospitals	9,358,559	5.90
District hospital	12,002,656	7.57
Hospitals with 10, 20, 31, 50, 100 beds	423,409	0.27
UzHC	24,776,798	15.62
Hospital specializing in pulmonary diseases and tuberculosis	45,703	0.03
Hospital for infectious diseases	40,996	0.03
Community Clinics	104,701,823	66.00
Total	158,641,838	100.00

On the other hand, in Bangladesh, the role of NGOs and private facilities in providing health services is significant. Cooperation with the private sector and NGOs is essential in all areas, including maternal and child health, awareness-raising on reproductive health, infectious and non-communicable disease control, nutrition improvement, and health promotion. For example, in terms of the location of deliveries, the percentage of normal deliveries in public facilities is 71.35% and in private/NGO facilities is 31.61%, while for cesarean sections, public facilities are 27.97%, and private/NGO facilities are 67.48%<sup>269</sup>. In addition, in the number of Emergency Obstetric Care (EmOC), the public facilities provide 51.3%, and private/NGO facilities provide 48.7%<sup>270</sup>, which shows the importance of private/NGO facilities in maternal care. In addition, the number of hospital beds under the jurisdiction of DGHS is 3.3 per 10,000 people, while the number of private hospitals registered with DGHS is 5.53, indicating the significant role of private and NGOs in health services involving emergency and hospitalization.

## 5.8 Health information system

### 5.8.1 Overview

Before 2009, different Health Information Systems (HIS) with different specifications were introduced by various international organizations and NGOs to collect health information without prior coordination. In the case of clinics without computers, paper forms were sent to the MOHFW by mail, and the MOHFW had to manually input the huge number of forms sent by the clinics. The complicated process of collecting health information led to an overload of work at the end of the clinics, delays in providing information to the MOHFW, and a long time to organize the information so that the situation could be grasped only after one year. In

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Health Bulletin 2019. The actual number of outpatient admissions is likely to be higher than the figures in the table because the information is not aggregated.

<sup>269</sup> Ibid.

<sup>270</sup> Ibid.



addition, health information from the clinics was often lost in the process of health information collection. Thus, in the past, the HIS was heavily burdened with the processing work of collecting, inputting, compiling, and statistically analyzing health information, resulting in significant delays and loss of health information.

On the other hand, several organizations have jurisdiction over health information, and they have vertical relationships with each other, which is a major challenge for integrating health information systems. Table 5-32 summarizes the related organizations and their business scopes (related health services and coverage) for health information systems.

**Table 5-32 Summary of relevant agencies and business scopes governing health information**

Stakeholders of health information	Related health services	Business scope
MIS (Management information system) unit, DGHS	Health services (consultation and treatment) Antenatal care Vaccinations (on-site prevention and treatment) Nutrition improvement (mainly for mothers and children)	Public facilities at the national, district, upazila, and community levels
MIS unit, DGFP	Family planning Maternal and child health services Vaccinations (mainly for infants and young children) Minor medical services Nutrition improvement (mainly for infants and young children)	Public facilities at the national, district, upazila, and community levels
Ministry of Local Government and Rural Development and Cooperatives (MOLGRD&C)	Maternal and child health services	Primary healthcare facilities and services in urban areas
Private hospitals and clinics	General health services	Private hospitals and clinics in urban and rural areas

In recent years, the DGHS and the DGFP have made progress in the development of health information systems, but in the field, the roles and support of DGHS and DGFP for health services such as maternal and child health services and non-communicable diseases overlap, resulting in inefficient operation of health resources and double standards in the presentation of health information in the aggregation of health statistics. Although there have been efforts to link and integrate health information systems, linkage and integration have not progressed due to the different standards for health information systems handled by the MIS (Management Information System) units in each directorate and their different strategies and policies. Private hospitals and clinics have their health information management systems, and some health services (such as vaccination information and information on epidemic infectious diseases such as COVID-19) are reported to MOHFW and integrated. However, other information such as patient information and consultation findings of each health service is only shared by some private hospitals and clinics. Furthermore, health information from urban primary healthcare facilities and services under the Ministry of Local Government, Rural Development and Cooperatives (MOLGRD&C) is shared with MOHFW only for epidemic infectious disease information such as COVID-19, and health information from MOLGRD&C is not yet digitized. Because of the manual work

involved, the HIS is not functioning efficiently in information collection, recording, and integration of information. These are the major challenges for the integration of health information by MOHFW.

### **5.8.2 Types and utilization of public health information systems**

From 2014 to 2017, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) supported the MIS unit of the DGHS to help strengthen the HIS with a focus on the public health sector in Bangladesh. As a first attempt, GIZ supported the establishment of a national-level health database by centralizing the various health information databases that had been managed separately within the DGHS. Later in 2011, the District Health Information Software 2<sup>271</sup> (DHIS2: <https://dhis2.org/>), a web-based health information database system, was introduced to establish a national-level health data warehouse. The work of collecting, compiling, integrating, statistically analyzing, and disclosing health information in real time from the higher-level public facilities (e.g., UHC, district hospitals, central referral hospitals, and higher-order medical facilities) has been streamlined. In addition, as a comprehensive approach to strengthen the HIS promoted by GIZ, not only the centralization of databases and improvement of systems but also the development of ICT infrastructures such as the introduction of PCs in healthcare facilities and ICT literacy training for health personnel in simple PC operation and DHIS2 utilization, have been carried out to promote HIS at the national, district and upazila levels. In addition, ICT literacy has been improved by training medical personnel on simple PC operation and DHIS2 utilization.

With these supports, the ICT infrastructure of the DGHS and the public healthcare facilities under its jurisdiction (outside Dhaka City) has been improved as of 2014, and the health information system from the upazila to the national level has been dramatically improved. Health information related to (1) health services, (2) immunization services, and (3) nutrition improvement services are now directly input into computers installed in the facilities and processed in real-time. DHIS2 also includes a visualization function that allows the processed health information to be converted into graphs, charts, and diagrams to compile reports on the health sector and make policy recommendations.

From the homepage of the DGHS (<https://dghs.gov.bd/>), click on the link labeled "DHIS2," and a screen dedicated to DHIS2 will be launched<sup>272</sup>. After logging in with the given username and password, you can enter and view health information data. For guest users, you can view the charted health statistics by clicking on "Dashboard" in the menu list on the left side of the DGHS homepage<sup>273</sup>.

OpenMRS (<https://openmrs.org/>)<sup>274</sup>, which includes the function for health professionals and CHWs to track pregnant women and children, and record pregnant women and children individually to strengthen and expand

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<sup>271</sup> It is the world's largest community health information software, developed by the University of Oslo, and is used as a platform for managing health information. It is a free web database system that has been adopted by more than 73 countries. It is designed to work together with other health information systems in each country.

<sup>272</sup> <https://centraldhis.mohfw.gov.bd/dhismohfw/dhis-web-commons/security/login.action>

<sup>273</sup> <http://103.247.238.92/webportal/pages/>

<sup>274</sup> OpenMRS is a free, collaborative platform for developing software to support the management of health information and the delivery of health services in developing countries. OpenMRS is designed for use in environments with very low resources for information system development and operation, at minimal cost, and supports specification changes such as adding new data items, input/output control screens, and reporting functions without programming. It is being used as a platform for many institutions in developing countries.

maternal and child health services, was also introduced. The mobile application, developed using OpenMRS, allows the health information of pregnant women and children in each household collected during door-to-door visits to be imported into an electronic medical record system for use in the clinic<sup>275</sup>. In some areas, services have also been launched to capture health information of pregnant women and children who are unable to come to the clinic, including necessary care and follow-up. It has also strengthened the HIS that contributes to UHC, as an attempt to provide health services to a large number of residents has been initiated.

In the provision of routine health services, the burden of managing health information has been greatly reduced through the direct input of health information into personal computers and its real-time aggregation and analysis (digitization). The health databases managed by the DGHS were integrated on the DHIS2 platform, enabling the provision of interrelated, high-value-added health information. In addition, health care providers in public facilities under the MOHFW can now use the DHIS2 platform to electronically record individual patient information at the community level and obtain individual health information on pregnant women and children. To be noted, this individual patient information is compiled at the upazila level and submitted to the MOHFW as secondary information at the upazila level for inclusion in DHIS2. In some areas, patient information is used to provide services such as door-to-door visits to patients who cannot come to the clinic, and health education, guidance, and awareness-raising by CHWs.

On the other hand, the DGFP has also adopted DHIS2 as its platform, and health information on (1) family planning, (2) vaccination (mainly for infants and young children), (3) adolescent health services, and (4) nutrition improvement services (mainly for infants and young children) has been digitized. It was created as a separate database from the one managed by the DGHS. As a result, the HIS managed by the DGHS and the HIS managed by the DGFP exist separately as independent databases. For example, at the community level, the same patient information is registered in different HISs, resulting in duplicate patient information, which cannot be simply added together as health statistics. On the other hand, when compiling health information as statistical data, there are many differences in the methods of compiling, the accuracy of compiling, and the timing of compiling. In order to ensure the completeness, consistency, and integration of this information, it is necessary to analyze each other's HIS systems and coordinate the selection and prioritization of the health information that is needed.

Table 5-33 summarizes the major public health information systems.

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<sup>275</sup> The health information collected by the mobile application is only being used in some of the regions (upazilas) where it has been implemented, and the information is not being shared with DHIS2.

**Table 5-33 Overview of major public health information systems**

Name	Scope	Target services
<b>1. Directorate General of Health Services (DGHS)</b>		
1-(1). DHIS2 central database (for healthcare facilities above the upazila level)	A health information system that compiles health information at the upazila level and above. All health information is entered at the healthcare facilities, and aggregate reports are automatically generated. Graphical and graphical health statistics can be viewed on the Web.	It records information on routine health services and does not cover detailed patient records such as health survey data, patient satisfaction surveys, or maternal and child information. <ul style="list-style-type: none"> <li>✓ General health care information and healthcare facility information</li> <li>✓ Aggregate reports at the upazila level and above, etc.</li> </ul>
1-(2). DHIS2 complementary system (for community level facilities including unions)	The system collects basic health information (facility information, population estimates, etc.) as well as individual health information from community clinics, records daily health information (patient information, number of cases per disease, etc.), and allows users to view aggregated community-level health information on the Web.	It covers primary health information services, which includes detailed patient information on mothers and children, in addition to routine health information. <ul style="list-style-type: none"> <li>✓ General health information, maternal and child health information</li> <li>✓ Community clinic information</li> <li>✓ Generate aggregate reports at the community clinic level</li> </ul>
1-(3). CBHC program support system (CHCP System/OpenMRS)	The system is designed for health volunteers to record patient information (per household) through household visits to assist in tracking and following up on health care. In case of emergency, the system also assists in referrals to upazila-level facilities.	<ul style="list-style-type: none"> <li>✓ Use the patient registration form to register patients per household</li> <li>✓ View and update community clinic profiles</li> <li>✓ Health volunteers provide health education information to patients.</li> <li>✓ Health volunteers view and modify the health profiles of registered patients</li> </ul>
1-(4). Multipurpose activity management system by health volunteers (MHVs System/OpenSRP)	It is a management system for recording the activities and monitoring the performance of health providers and CHWs working at the community level. The system also functions as a health education tool for community-level health providers and CHWs to provide health education, guidance, and enlightenment to community residents and is used as a support tool to promote the achievement of UHC. It can also be used as a support tool to promote the achievement of UHC. However, since it is being introduced on a trial basis and is only being used in two upazilas, it needs to be expanded in the future.	It is a smartphone application that allows users to modify, add, delete, and view health information of the community clinic from their smartphones. <ul style="list-style-type: none"> <li>✓ GPS function to record and check the location of the household</li> <li>✓ Log-in information and activities of health professionals and health volunteers can be recorded.</li> <li>✓ Ability to view the health status of each household</li> <li>✓ Can also be used for personnel evaluation of health personnel by linking with the HRIS system.</li> </ul> <p>This system is currently undergoing implementation testing and is not yet fully operational. It is currently being tested for future use.</p>
1-(5). Health and medical activity support system (DHIS2 Trucker/OpenSRP)	A system for managing activities related to health care. Currently, the system is being used for immunization management. The system provides services such as monitoring the immunization status of women and children under five and managing immunization records and schedules.	<ul style="list-style-type: none"> <li>✓ Register and supervise children under 5 and women 15~49 years old as vaccinated subjects</li> <li>✓ Add a notification reminder function based on the registrant's vaccination schedule.</li> <li>✓ Manage vaccination campaigns</li> </ul>
1-(6). Shared health record information system (SHR)	A system for sharing all health record information to manage the health record information of all citizens (all those eligible for health services). DHIS2 is a system that integrates secondary information at each upazila level, whereas SHR is a national health record.	It is not a system for specific health services but a system for supplementing and managing the health records of each citizen using a health ID that uniquely recognizes each citizen. Some communities have been collecting and managing health records using the health ID on a trial basis, but the system has not yet been implemented.

Name	Scope	Target services
	Individual health records are managed by health IDs.	
1-(7). Health care window service system (Sastha Batayan, Health online window service)	A 24-hour online consultation service for patients on health issues. Provides health advice and information on other related services through inquiry number 16263. The service is operated by the MIS of DGHS and is linked to online consultation services from healthcare facilities if required.	Provides services such as performance management for health care window services and support for telemedicine. <ul style="list-style-type: none"> <li>✓ Daily call report records</li> <li>✓ Count and manage the number of health care consultations</li> <li>✓ Information and profile management of doctors who can provide telemedicine</li> <li>✓ Counting of complaints and management of complaint cases related to health care</li> </ul>
1-(8). National COVID-19 monitoring system	This system is used to manage the number of COVID-19 tests, the number of positive cases, and the subsequent course of treatment. While normal health information is mainly provided by public facilities under the MOHFW, information on the number of COVID-19 tests and positive cases is provided by almost all healthcare facilities in the country.	Each laboratory registers the number of tests and the number of positive cases on the same day. The following day, the number of cases per upazila, district, and the entire country are announced. A total of 500 people are mobilized to register this information. <ul style="list-style-type: none"> <li>✓ Registration and management of COVID-19 test information</li> <li>✓ Information on positive patients and monitoring of treatment progress</li> <li>✓ Registered and managed by inspector's phone number</li> <li>✓ Identify hospital information (number of beds) and number of deaths</li> </ul>
1-(9). COVID-19 vaccination management system (Surokkha)	COVID-19 system for managing vaccination status (registration of vaccinated subjects, tracking after vaccination, etc.)	<ul style="list-style-type: none"> <li>✓ Number of COVID-19 vaccine registrations</li> <li>✓ Confirmation of COVID-19 vaccination status</li> <li>✓ Issuance of COVID-19 Vaccine Certificate</li> </ul>
1-(10). Non-communicable disease information management system (NCD-eMIS system)	A non-communicable disease (NCD) information management system developed by the eMIS platform. Health Assistants (HAs) access the system's URL from their tablets to activate the system, which screens patients at risk for NCDs (e.g., over 40 years old, pregnant and nursing mothers) and provides care at community clinics or community health centers for those identified as adults with NCDs. The system aims to link patients identified as having NCDs to health services provided by UzHCs, such as care at community clinics or referral from community clinics to UzHCs.	The system is a web-based mobile application designed and developed as part of USAID's NCD support and is being supported for implementation by the JICA technical cooperation project, Project for Strengthening Health Systems through Organizing Communities (SHASTO). It is planned to be introduced in six upazilas (already introduced in three upazilas in other districts (as of July 2021). The system is developed by the International Centre for Diarrhoeal Disease Research (icddr,b), and the health information collected by the system is stored on a server in icddr,b. The system is not linked or integrated with the MOHFW's system. The health information collected by the system is stored on a server in icddr,b. The system is not linked or integrated with the system of the MOHFW.
1-(11). MOHFW Human Resources Information Management System (MOHFW-HRIS)	HRIS is a system for managing the human resource information of DGHS staff. HRIS contains basic staff information, their compensation, career information, etc., and supports DGHS staff in making appropriate decisions on human resources.	<ul style="list-style-type: none"> <li>✓ Personnel profile of MOHFW staff</li> <li>✓ MOHFW staff transfer information</li> <li>✓ Information for performance evaluation of MOHFW staff</li> <li>✓ Display of MOHFW staff assignment information and organization chart</li> </ul>
1-(12). Medical facility and	A system for centralized inventory management and other asset information	<ul style="list-style-type: none"> <li>✓ Register and monitor information on medical and non-medical devices</li> </ul>

Name	Scope	Target services
equipment inventory management system (AMS)	for facilities (including healthcare facilities) under DGHS.	✓ Information management of assets owned by MOHFW
<b>2. Directorate General of Family Planning (DGFP)</b>		
2-(1). Electronic medical information system (eMIS/DHIS2 database)	The system is designed to support household visitation services by a staff of the DGFP. The system is also linked to the national population registration system (PRS) and is used to collect routine household health information. The system serves as a platform to monitor the health status of households.	The eMIS tool consists of three modules: i) population and family information management; ii) community residents' housing, facilities and infrastructure information management; and iii) family welfare-related information management functions for supervisors and monitors of family welfare services. ✓ Household housing environment and health information ✓ Checking the status of family welfare services and their effectiveness
2-(2). Family welfare service support system (FPMIS/DHIS2 Database)	A system for registering and managing information on the provision of services and support related to maternal and child health, family planning, and nutrition improvement; a system for monitoring operations to support the work of DGFP staff; and a system for monitoring the performance of DGFP staff.	✓ Registration and management of facility information for specialized hospitals and upazila- and district-level health facilities ✓ Monitor, compile and generate reports on the status of monthly family welfare services (maternal and child health services, reproductive health services, and nutrition improvement services)
2-(3). PMIS (Personnel management system)	PMIS is a system for managing the personnel information of DGFP staff. Basic information of staff, their treatment, career information are registered in PMIS to support appropriate decision-making on personnel matters by PMIS staff.	✓ Personnel profile of MOHFW staff ✓ MOHFW staff transfer information ✓ Training information for MOHFW staff ✓ Performance evaluation of MOHFW staff ✓ Display of MOHFW staff assignment information and organization chart
2-(4). eLMIS (Logistics medical information system)	An information system to manage facilities and equipment related to family welfare services procured by DGFP. A web-based system tool for monitoring logistics at the national, district and upazila levels.	✓ Monitor logistics of facilities and equipment related to family welfare services and provide information on procurement delays and bottlenecks. ✓ Identify, monitor, and manage the inventory of facilities and equipment related to family welfare services and generate reports at the national, district, and upazila levels.

Each system has its ID, and the system itself assigns a unique ID for information management. System in 1-(1) provides secondary information from higher-level health facilities, including the upazila level, and does not have information items such as individual health service records or IDs that uniquely identify citizens. Systems 1-(2) to 1-(10), as well as 2-(1) and 2-(2), already incorporate information items such as Health ID<sup>276</sup>, National ID<sup>277</sup>, and Birth ID<sup>278</sup>, to link these IDs to health service records in the future. These IDs, however, are not mandatory input items and are not used in practice. In the systems of 1-(11) and 2-(3), the IDs are the personnel codes of the MOHFW staff and other health personnel. In the systems of 1-(12) and 2-(4), medical equipment is individually recognized and assigned an ID. These materials and equipment are also associated

<sup>276</sup> The DGHS is planning to introduce health IDs to improve and expand the quality of health services.

<sup>277</sup> A national ID given to citizens above the age of 18 for election administration, but not to those below the age of 18. In order to use it as an ID for health services, the number of generations it can cover is limited.

<sup>278</sup> A household registration ID given to people who register their birth at the municipal office. It is also used as an ID for COVID-19 vaccination, but it was reaffirmed that there are many people who do not have a household ID.

with the IDs of their locations and places of installation.

The MIS of DGHS and DGFP do not have sufficient budget from the government and are dependent on donor support for demonstration, verification, initial cost, and equipment input for HIS implementation. Although MOHFW is motivated to digitize the health sector, the budget is insufficient. In addition, community-level clinics have little interest in new technologies, and training on HIS implementation and operation relies on donor-prepared training programs. MOHFW's HIS-related training is impersonal and does not function as a ministry-wide training program. ICT literate health personnel have not been sufficiently trained. Due to the absolute lack of budget and the low ICT literacy and motivation of health personnel, the personnel working with ICT tools such as tablets in the field stop working just because the tablet breaks down. After that, the tablet is not replaced for a long period, and due to the low ICT literacy and low motivation of the medical staff, no alternative plan is found when the tablet breaks down, and the work is stopped for a long period because of the breakdown. In other words, even if HIS is introduced, some malfunctions hinder the overall operation of HIS. When ICT tools and systems are introduced in the field, although the tools are used and the systems are operated as expected, the efficiency of the work processes at the field level and the utilization of the collected information have not been improved. The remarkable effects of the ICT introduction have not been obtained.

### 5.8.3 Private and other health information systems

Some private hospitals and clinics are connected to the DHIS2 platform of the DGHS and provide health information directly, but many use their own HIS. About half of the private hospitals and clinics provide health information to the DGHS either by digitizing the information and providing it via e-mail or by printing the information and mailing it in paper form. Table 5-34 summarizes the major private health information systems.

**Table 5-34 Overview of major private health information systems**

Name	Scope	Target services
<b>3. Private hospitals and healthcare facilities</b>		
3-(1), Health and medical management information system (HMIS) Electronic management system (EMR)	It is a system that registers patient information, symptoms, prevention and treatment details, and centrally manages each patient's information with a unique identifier strictly controlled by the EMR. Symptoms and prescriptions of the same patient are also recorded, and the system has a basic referral function.	While the system can identify patients through unique identifiers and seamlessly provide consultations, prescriptions, and treatments, it is a closed system within each private hospital or clinic and cannot be viewed or managed as public information. <ul style="list-style-type: none"> <li>✓ General health information and healthcare facility information</li> <li>✓ Information on materials and equipment in the facility (procurement and inventory management)</li> </ul>
3-(2), Mobile health for Health, Nutrition and Population Sector Program (HNPP BRAC)	HIS, supported and developed by BRAC, an international NGO, is an integrated solution developed for the operational management of the Health, Nutrition and Population Sector Program (HNPP). The personal information of service beneficiaries is registered, including service history, without duplication to provide and	Due to the operational management of the HNPP, the main role of the HNPP is the provision of health services and their management, and the integrated health information is not used for public health policy. <ul style="list-style-type: none"> <li>✓ Registration of beneficiary households</li> <li>✓ Service provision to households and record of visits</li> </ul>

Name	Scope	Target services
	manage a wide range of health services. The program is open to all citizens of Bangladesh and is supported by about 7,000 support staff in each region.	<ul style="list-style-type: none"> <li>✓ Management of migration of beneficiary households (biometrics, etc.)</li> <li>✓ Immunization records</li> <li>✓ Service delivery records for non-communicable diseases</li> <li>✓ Procurement, inventory management, and monitoring functions for medical supplies and equipment used for services</li> </ul>

Other primary healthcare facilities in urban areas (in Dhaka city) within the jurisdiction of MOLGRD&C are not connected to the DHIS2 platform of MOHFW. The health information of these facilities is not digitized, and the information collection, recording and integration are not done efficiently with manual work. As a result, only a small amount of health information is provided to the MOHFW. It is hoped that the entire process of providing information from these healthcare facilities will be digitalized and that health information from all healthcare facilities, including private ones, will be shared.

#### 5.8.4 Health information system introduced by the cooperation of Japan

Table 5-35 lists projects and support related to health information systems through Japanese cooperation.

**Table 5-35 Achievements of projects and support related to health information systems through Japan's cooperation**

Period	Relevant HIS	Support contents
<b>Project for Strengthening Health Systems through Organizing Communities (SHASTO) [JICA Technical Cooperation Project]</b>		
2017~2022	In the project pilot area (six upazilas), ICT technology is being used to screen patients at risk of NCDs (e.g., over 40 years old, pregnant and nursing mothers) and manage care and referrals in community clinics for patients identified as adults.	The NCD information management system was developed by the icddr,b. Health Assistants (HAs) are responsible for entering information into the system, using tablets that HAs use in other health programs (immunization program) projects. In addition, the project supports NCD-related awareness-raising activities using social networking sites (Facebook and YouTube). The project also distributes tablets for the training of nurses responsible for NCD services (purchased with SHASTO project funds).
<b>Health checkup business survey [JICA Private Sector Partnership Project]</b>		
2018~2020	Demonstration of optimization of health checkups and cost reduction through the introduction of a digital X-ray diagnostic imaging system	Verification of the introduction of Japanese healthcare products by a private Japanese company. The verification itself has already been completed, and the possibility of future use has not yet been confirmed.

In these projects, Japan has only provided ICT equipment and technology. Japan's cooperation in this field is still limited.



## Chapter 6 Performance of the Bangladesh health system

### 6.1 Quality of health care services

#### 6.1.1 Patient satisfaction

Responding to the needs and desires of patients is a central tenet of "humanistic" health services. Therefore, patient satisfaction is an essential indicator in measuring the quality of care. Patient satisfaction in Bangladesh varies widely by region and healthcare facility. According to an exit survey conducted in primary to tertiary healthcare facilities in the districts of Rajshahi and Sylhet, overall, 63% of patients were satisfied with the health services. Patients who visited private health facilities were more satisfied (73%), while those who used primary health facilities were less satisfied (52%)<sup>279</sup>.

In an exit survey conducted at 55 public healthcare facilities in Bogra District, Rajshahi Division, 45% of the patients felt given privacy. Fifty-three percent of patients received health advice from health care providers, and 48% received some explanation of their health condition. The average waiting time at outreach services was 41 minutes, and the average waiting time at health facilities was 22 minutes<sup>280</sup>. In another study, a survey was conducted on patient satisfaction in the outpatient ward of UzHCs in Dumlai, Dhaka District. The main results are summarized in Table 6-1.

**Table 6-1 Patient satisfaction**<sup>281</sup>

No.	Answers to questions	Percentage of responses
1	Satisfied with doctor's care	96%
2	Satisfied with the care provided by the nurses	84%
3	Satisfied with the pharmacist's response	72%
4	Satisfied with the response by the office staff	80%
5	Satisfied with the doctor's explanation of the reason for the test	76%
6	Nurses are cooperative with patients and proficient in the use of medical equipment	78%
7	Satisfied with the pharmacist's explanation of the medication written on the prescription	81%
8	Satisfied with the work of the office staff	76%

In Bangladesh, cleanliness, privacy, convenient office hours, and the possibility to ask health personnel questions about illness and other issues are important determinants of satisfaction<sup>282</sup>. In a study conducted in a rural area, the attitude of health personnel, such as treating patients with respect and courtesy, was the most important factor in patient satisfaction<sup>283</sup>. Governance problems in hospitals and other facilities have negatively affected the delivery of health services, leading to low service utilization. Problems like shortage

<sup>279</sup> Adhikary et al. 2018. Factors influencing patients' satisfaction at different levels of health facilities in Bangladesh: results from patient exit interviews, PLoS One. 2018 May 16;13(5):e0196643.

<sup>280</sup> Aldana et al. 2001. Client satisfaction and quality of health care in rural Bangladesh, Bull World Health Organ. 2001; 79(6): 512-517.

<sup>281</sup> Mahejabin et al. 2016. Patients' satisfaction with services obtained from a health care centre in rural Bangladesh, Delta Medical College Journal 4(2):77.

<sup>282</sup> Adhikary et al. 2018. Factors influencing patients' satisfaction at different levels of health facilities in Bangladesh: results from patient exit interviews, PLoS One. 2018 May 16;13(5):e0196643.

<sup>283</sup> Aldana et al. 2001. Client satisfaction and quality of health care in rural Bangladesh, Bull World Health Organ. 2001; 79(6): 512-517.

of medicines and consumables, lack of skilled health personnel, arrogant and callous attitude and behavior of health personnel, discriminatory treatment of the poor, unreasonable collection of medical fees, long waiting time, underdeveloped referral system, unfriendly office hours, etc. have contributed to low patient satisfaction<sup>284,285</sup>. Although staffing is improving in tertiary hospitals due to the prioritized allocation of resources, there are still too few health personnel and insufficient support staff for the workload. The outpatient department of the district hospital is overcrowded, with most of the patients suffering from diseases that could have been treated at lower-level facilities. Doctors have little time to see each patient, hampering diagnosis and treatment<sup>286</sup>. Patients who are dissatisfied with domestic health services travel to neighboring countries such as India, Thailand, and Singapore to seek services<sup>287</sup>.

### 6.1.2 Patient safety

Safe healthcare services that do not cause harm to patients are important indicators in measuring the quality of care as well as patient satisfaction. In Bangladesh, medical errors cause injury or death to thousands of patients every year<sup>288</sup>. Medical malpractice is an act of negligence by a healthcare facility, health personnel, administrative staff, cleaners, or other parties, which results in substandard care and imposes physical, social-psychological, and financial burdens on the patient. Medical malpractice is sensationalized on TV and in newspapers every month<sup>289</sup>. In Bangladesh, for various reasons, patients' rights are often neglected, and in some healthcare facilities, patients are perceived as consumers of health services and medical practice as a means of making money<sup>290</sup>. Medical errors are used to evaluate the quality of care and health systems because they threaten the patient's right to life and health. The most frequently reported medical errors are summarized in Table 6-2.

**Table 6-2 Medical errors reported in Bangladesh<sup>291</sup>**

Type	Examples	Causes
Overlooked or misdiagnosed diseases	Overlooked or misdiagnosed cancer. Misdiagnosis of heart attack or stroke. Overlooked pulmonary thromboembolism.	The doctor makes a diagnosis without fully interviewing or examining the patient. Problems in performing the test. Disregard and violation of protocol.
Delayed diagnosis and	Delayed diagnosis of coronary	Excessive workload for physicians.

<sup>284</sup> Uddin et al. 2017. Patient satisfaction with doctors' care in Bangladesh: a case of government hospital, *J Fam Med.* 2017; 4(6): 1132.

<sup>285</sup> Andaleeb et al. 2007. Patient satisfaction with health services in Bangladesh, *Health Policy and Planning*, Volume 22, Issue 4, July 2007, s 263-273.

<sup>286</sup> Independent Review Team. 2020. 4th Health, Population and Nutrition Sector Program (HPNSP) 2017-2022 Mid-Term Review (MTR).

<sup>287</sup> Iqbal et al. 2014. Patients' Satisfaction with the Medical Services in Bangladesh: A Case Study on the City Hospital Limited, Dhaka, *Daffodil International University Journal of Business and Economics*, Vol. 8, No. 1.

<sup>288</sup> Karim et al. 2013. Medical negligence laws and patient safety in Bangladesh: an analysis, *Journal of Alternative Perspectives in the Social Sciences* (2013) Volume 5 No 2.

<sup>289</sup> Akter. 2015. a contextual analysis of the medical negligence in Bangladesh: laws and practices, *Northern University Journal of Law*, 4.

<sup>290</sup> Karim et al. 2013. Medical negligence laws and patient safety in Bangladesh: an analysis, *Journal of Alternative Perspectives in the Social Sciences* (2013) Volume 5 No 2.

<sup>291</sup> Chowdhury et al. 2018. Medical negligence and deceptive medical practices in Bangladesh health segment: an appraisal, *BiLD Law Journal- Vol. III, Issue II*, and from Medical negligence laws and patient safety in Bangladesh: an analysis, above.

Type	Examples	Causes
treatment	artery disease, heart attack, and stroke.	Lack of highly skilled physicians. Disregard and violation of protocols.
Medical errors during surgery	Leaving gauze or medical instruments inside the body. Mistakes in the surgical site. Suture failure. Anesthesia accident.	Shortage of doctors with high skill levels. Experienced surgeons and anesthesiologists leave surgery and anesthesia to their assistants. Miscommunication among medical personnel. Recording errors.
Prolonged and futile treatment	Continue ineffective and unnecessary treatment without monitoring the patient's progress.	Putting money-making ahead of patient interests. Disregard and violation of protocols.
Patient misidentification	Wrong referrer. Patient confusion.	Miscommunication. Recording errors. Confirmation errors.

Bangladesh lacks a comprehensive law that adequately punishes medical malpractice and improper medical practices, with only disparate provisions in the Constitution, Civil Code, and Penal Code. As a result, countless cases of medical malpractice are prosecuted, but only a few are convicted<sup>292</sup>. As a result, medical malpractice is widespread, threatening the safety and lives of patients. There is an urgent need to establish a health system that emphasizes patient safety, fosters a sense of ethics and professionalism among health personnel, and adheres to protocols and guidelines.

## 6.2 Equity

The International Society for Equity in Health defines equity as “the absence of systematic and repairable differences in one or more aspects of health among socially, economically, demographically and geographically defined populations or population groups.” Equity in health care is one of the central pillars for UHC promotion. The idea that not only biological factors such as heredity and lifestyle, but also social factors such as race, gender, education, income, occupation, and social participation have a significant impact on health is well established internationally and has been discussed at the World Health Assembly in 2009 and the World Conference on Social Determinants of Health in 2011 to increase equity in health. The idea that social factors have a significant impact on health is well established internationally.

As shown in 5.2, the proportion of out-of-pocket medical expenditure is as high as 73.9% in Bangladesh, one of the highest in the world. Due to distrust of the quality of health services in public health facilities, many citizens rely on private health facilities, but most of the medical expenditure in private health facilities is self-financed (93%)<sup>293</sup>. However, there is a large disparity in the services received depending on the financial strength of the household. The 2017-18 Demographic and Health Survey (DHS) also shows inequities across most indicators by economic status, education level, gender, location (urban vs. rural), and geography<sup>294</sup>. The following differences are found in indicators related to fertility, family planning, maternal and child health and nutrition, the following differences are found. The disparities are often large.

<sup>292</sup> Dahlawi, Saad et al. "Medical negligence in healthcare organizations and its impact on patient safety and public health: a bibliometric A bibliometric study." *F1000Research* vol. 10 174. 3 Mar. 2021.

<sup>293</sup> The World Bank, 2014. *World Development Indicators: Bangladesh*.

<sup>294</sup> Bangladesh Demographic and Health survey 2017-2018.

- Age at first marriage: The percentage of women aged 20-24 who were married before 18 is 74.2% in the lowest income quintile compared to 45.4% in the highest income quintile (average: 58.9%).
- Young pregnancy and childbirth: The percentage of women aged 15-19 who have given birth or are pregnant with their first child is 40.2% among those who have not completed primary education and 12.7% among those who have completed secondary education or higher.
- Family planning: The percentage of married women aged 15-49 years whose family planning needs are not being met is 18.0% in the Chattogram Division compared to 8.1% in the Rampur Division (average: 12.0%).
- Antenatal care visits: The percentage of pregnant women who received four or more antenatal care visits, one of which was by a skilled technician, was only 31.8% in the Sylhet division, while in the Khulna Division, more than half (54.8%) received antenatal care (average: 43.7%).
- Malnutrition: The percentage of stunting among children under 5 years old is 43.0% if the mother has no education and 17.8% if the mother has secondary education or higher.

In Bangladesh, the Constitution, policies and plans include improving access to health for the rural population and poor and vulnerable groups. Various efforts are underway to improve inequities, such as the health care coverage programs for vulnerable groups (SSK and MHVS) mentioned above. However, the expansion of COVID-19 has had a particularly large impact on the poor and vulnerable groups, once again highlighting health disparities.

### 6.3 Efficiency

The concept of efficiency in the health sector, and the question of cost-effectiveness, is one of the most debated issues in health care performance. Efficiency captures the extent to which inputs into the health system have been used to achieve goals. In the health sector, poor or inadequate quality care may continue to be provided inefficiently because the market mechanism, as it is commonly called, does not work. This can have serious consequences, such as patients not receiving the best possible care and suffering health disadvantages, inefficient service delivery consuming excessive resources, resulting in other patients who would have benefited from the service not receiving it, and reducing the willingness of the health system to raise funds<sup>295</sup>.

In the Bangladesh Health System Review conducted in 2015, the following analysis of the efficiency of the health system was made<sup>296</sup>.

#### **Distribution efficiency**

The allocation of resources to public healthcare facilities is based on the number of hospital beds, not on disease severity, population size, or regional needs. Traditionally, resource allocation has been skewed towards secondary and tertiary facilities, and insufficient resources have been allocated to primary healthcare facilities. However, with the introduction of SWAps, this trend has been slightly improved, as SWAps has increased funding for PHC services through ESPs, and these funds are now allocated to primary health care facilities used by the rural poor.

<sup>295</sup> European observatory on Health System and Policies, 2016. Health System Efficiency: How to make measurement matter for policy and management.

<sup>296</sup> Asia Pacific Observatory on Health Systems and Policies. 2015. Bangladesh Health System Review.

### **Technical efficiency**

Inadequate infrastructure, shortage of goods and equipment, and inadequate human resources in public health facilities are the major factors contributing to the inefficiency of health services provided in the facilities. Concerning medicines, inadequate list of essential medicines, violation of good manufacturing practices for medicines, and the prevalence of expired, counterfeit, and low-quality medicines due to incomplete regulation by the DGDA are observed, hampering proper service delivery. In terms of human resources, in addition to the overwhelming shortage of doctors, nurses, and technicians, there is a major challenge in the skill mix of these health care professionals. Against the ideal ratio of doctors, nurses, and technicians recommended by WHO (1:3:5), the ratio in Bangladesh is 1:0.4:0.24. There is no prospect of improving the ratio of nurses and technicians soon.

### **6.4 Effectiveness**

In assessing the effectiveness of health services in Bangladesh, unqualified doctors, medicine sellers and traditional healers, regarded as the main providers of health services in poor rural areas and informal settlements in Dhaka city, are essential. In rural areas, 40% to 80 % of health services are provided by unqualified health care providers<sup>297298</sup>. They are widely accepted because they are deeply rooted in the local culture and community, are easily accessible, provide services inexpensively, and accept payment after payment or in kind. People turn to them when they have a fever, cold, diarrhea, headache, and digestive disorders. They rarely refer their patients to specialists or pathologists. Because of their lack of medical education, they use unscientific and unproven diagnostic and treatment methods and do not have or have difficulty using appropriate medical equipment. Over-prescription of antibiotics, polypharmacy and the use of expensive and unnecessary drugs are frequently reported problems<sup>299300</sup>. Aggressive sales campaigns by drug sales representatives contracted by pharmaceutical companies and the availability of drugs that originally require prescriptions at unlicensed drug outlets without pharmacists have been identified as the reasons behind these problems. Even when ineffective and unsafe practices cause serious consequences, the fatalism prevalent in rural areas, means that unqualified and unofficial doctors, medicine vendors, and traditional healers are rarely blamed and punished<sup>301</sup>.

### **6.5 Responsiveness**

Health system responsiveness is a concept that contributes to improved health by responding to current and future health needs. A highly responsive health system can respond quickly to changing health needs, improve

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<sup>297</sup> Ahmed SM, Hossain MA. Knowledge and practice of unqualified and semi-qualified allopathic providers in rural Bangladesh: implications for the HRH Health Policy. 2007 Dec;84(2-3):332-43.

<sup>298</sup> Mohiuddin AK. An extensive review of patient health-care service satisfaction in Bangladesh. *Adesh Univ J Med Sci Res* 2020;2(1):5-16.

<sup>299</sup> Nahar, Papreen et al. "What contributes to inappropriate antibiotic dispensing among qualified and unqualified healthcare providers in Bangladesh? A qualitative study." *BMC health services research* vol. 20,1 656. 15 Jul. 2020.

<sup>300</sup> Saha S, Hossain MT. evaluation of medicines dispensing pattern of private pharmacies in Rajshahi, Bangladesh. *BMC Health Serv Res*. 2017 Feb 13;17(1):136.

<sup>301</sup> Ahmed SM, Hossain MA. Knowledge and practice of unqualified and semi-qualified allopathic providers in rural Bangladesh: implications for the HRH Health Policy. 2007 Dec;84(2-3):332-43.

access to health services, and improve the quality of care. High responsiveness is positioned as a goal of health systems<sup>302</sup>. Responsiveness is used to measure how well a health system meets the expectations of patients and their families. The WHO suggests analyzing the following eight items to assess responsiveness: (1) dignity, (2) autonomy in decision-making and respect for rights, (3) confidentiality of personal information, (4) clarity of communication, (5) immediate attention which is made possible by short waiting times, (6) access to social support, (7) a comfortable space, and (8) the ability to choose health care facilities and providers<sup>303</sup>.

The exit survey using the WHO framework assessed the responsiveness of public healthcare facilities under MOHFW, private healthcare facilities, and healthcare facilities supported by donors and operated by NGOs, based on interviews with outpatients in Dhaka, Rajshahi, and Khulna cities (Table 6-3). Overall, about half of the patients who used the public healthcare facilities reported poor responsiveness, which was the lowest rating. In contrast, donor-supported and NGO-run healthcare facilities had the highest ratings for responsiveness. Public healthcare facilities had particularly low ratings for responsiveness regarding immediate attention, comfortable space, autonomy in decision-making and respect for rights<sup>304</sup>. These items with low reactivity are considered obstacles to the use of public healthcare facilities and should be considered seriously.

**Table 6-3 Percentage of respondents who answered "moderate," "poor," or "very poor" on a 5-point scale**

Responsiveness	Public healthcare facilities	private healthcare facilities	Healthcare facilities supported by donors <sup>305</sup> and run by NGOs
Dignity	35%	24%	14%
Autonomy in decision-making and respect for rights	60%	68%	55%
Confidentiality of personal information	51%	21%	11%
Clarity of communication	44%	30%	19%
Immediate attention	67%	68%	31%
Comfortable space	66%	42%	22%
Ability to choose healthcare facilities and providers	15%	8%	4%
<b>Total</b>	<b>48%</b>	<b>37%</b>	<b>22%</b>

<sup>302</sup> Mirzoev, Tolib, and Sumit Kane. "What is health systems responsiveness? Review of existing knowledge and proposed conceptual framework. Review of existing knowledge and proposed conceptual framework." *BMJ global health* vol. 2,4 e000486. 31 Oct. 2017.

<sup>303</sup> WHO. *The Health Systems Responsiveness Analytical Guidelines for Surveys in the Multi-country Survey Study*. 2005.

<sup>304</sup> Hamid, Syed Abdul, and Afroza Begum. "Responsiveness of the urban primary health care delivery system in Bangladesh: A comparative A comparative analysis." *The International journal of health planning and management* vol. 34,1 (2019): 251-262.

<sup>305</sup> The survey includes USAID and DFID.

## Chapter 7 Role of the private sector

### 7.1 Overview

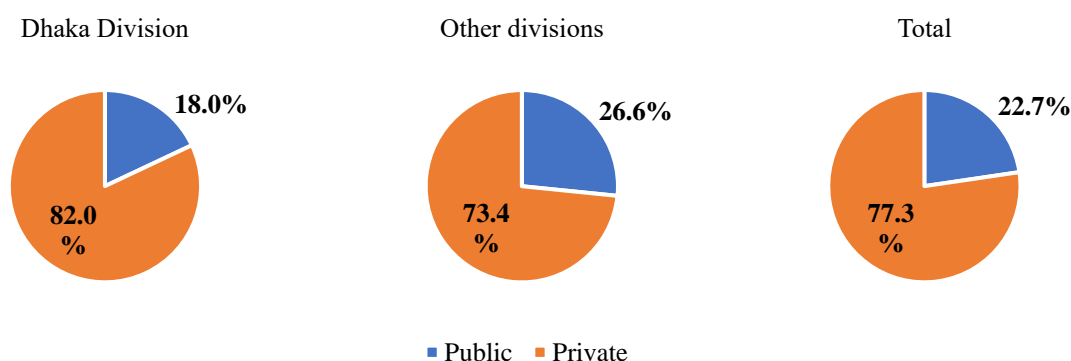
#### 7.1.1 Overview of the private sector

The private sector includes services provided by government-registered hospitals, clinics, diagnostic facilities, and drug outlets, as well as informal health services. At present, 5,321 private hospitals and clinics and 10,407 diagnostic centers are registered with the DGHS, and the number is rapidly increasing, especially in Dhaka. In addition, more than 130,000 retail pharmacies and wholesale pharmacies are listed on the DGDA website.

**Table 7-1 Number of facilities in the private sector<sup>306</sup>**

Facility type	Number of facilities
Private hospitals and clinics	5,321
Diagnostic center	10,407
Retail pharmacies	133,201
Wholesale pharmacies	2,387

According to the Bangladesh National Health Accounts in 2018, 77.3% of health expenditure is done by the private sector. By division, Dhaka has the highest percentage of private sector spending (82%), which may be due to a large number of private sector facilities and its high purchasing power.



**Figure 7-1 Public and private sector health expenditures<sup>307</sup>**

When looking at the breakdown of health expenditure, patient out-of-pocket payments are the largest, accounting for 67% of the total, of which 64.5% is spent in pharmacies/pharmaceutical retail. In Bangladesh, a large number of pharmacies are generally the first point of contact for patients, and they often end up purchasing medicines without visiting a medical institution, which is thought to be the reason for the high percentage of expenditure in this sector.

<sup>306</sup> (1) Ministry of Health and Social Welfare, 2019. Health Bulletin 2019, (2) Directorate General of Drug Administration. Pharmacies. (<http://www.dgda.gov.bd/index.php/pharmacies/allopathic-retail-pharmacy>). (Accessed on April 30, 2021).

<sup>307</sup> Compiled from Ministry of Health and Family Welfare, 2018. Bangladesh National Health Accounts 1997-2015.

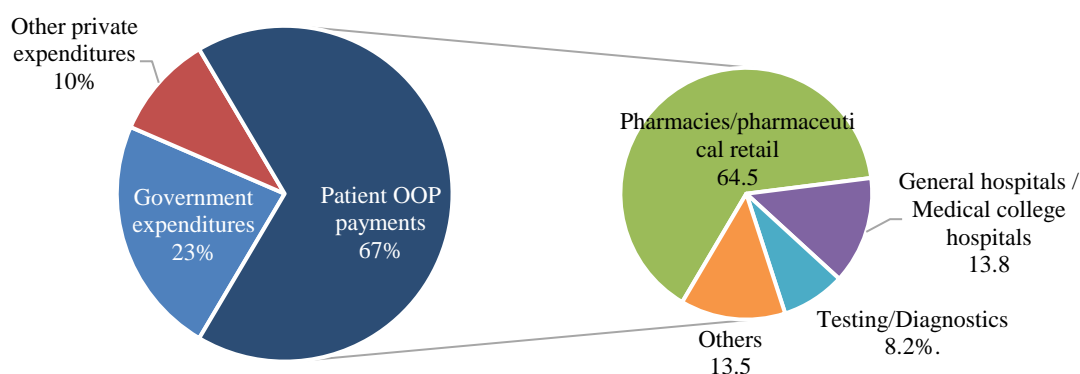


Figure 7-2 Breakdown of health expenditures<sup>308</sup>

### 7.1.2 Legislative system

#### Private hospitals and clinics

According to the Medical Practice and Private Clinics and Laboratories (Regulation) Ordinance, 1982, a DGHS license is required for private hospital businesses in Bangladesh. The conditions for issuing a license as stipulated in the Ordinance include the following<sup>309</sup>:

- Appropriate facilities with a hygienic environment
- At least 80 square feet of floor space per patient
- Air-conditioned operating room
- Installation of specified essential equipment
- Adequate supply of life-saving and essential medicines
- Full-time medical personnel (1 doctor, 2 nurses, 1 janitor per 10 beds)
- Medical specialists for surgery, procedures and patient management

In addition to the basic hospital equipment and staffing standards, the law stipulates maximum prices for each medical treatment, inspections of registered facilities by the DGHS, and penalties for violating the law. Since its formulation in 1982, the law has been used to issue and renew licenses to private hospitals. However, with the rapid increase in the number of private medical institutions, there is a need to strengthen regulation and supervision to ensure the quality of medical services, and the government is currently preparing a new law<sup>310</sup>.

#### Pharmaceuticals

The DGDA is in charge of pharmaceutical regulations, and a license issued by the Chief of Directorate,

<sup>308</sup> Ibid.

<sup>309</sup> Ministry of Law, Justice and Parliamentary Affairs, 1982. Medical Practice and Private Clinics and Laboratories (Regulation) Ordinance, 1982.

<sup>310</sup> Directorate General of Health Service. Introduction (<http://hospitaldghs.gov.bd/introduction/>). (Accessed on January 21, 2021). The Daily Star, 2020. New law underway to improve healthcare quality at private hospitals. (<https://www.thedailystar.net/business/news/new-law-underway-improve-healthcare-quality-private-hospitals-1886428>). (Accessed on February 12, 2021).



appointed by the DGDA Director General, is required for the manufacture, storage, sale, import and export of medicines<sup>311</sup>. The registration of medicines is regulated by the Drug (Control) Ordinance 1982<sup>312</sup> as follows:

- No drug of any kind may be manufactured for sale, imported, distributed, or allowed to be sold unless it is registered with a licensing authority.
- The licensing authority shall not register a drug unless it is recommended by the Drugs Control Committee.
- Registration must be granted under conditions specified by the licensing authority.
- Registration is valid for five years unless revoked earlier.

In addition, the National Drug Policy 2016 states that the manufacture of medicines is not permitted without proper equipment and quality assurance controls. For highly technical drugs and those that require different manufacturing equipment and dedicated facilities for production, registration is only possible if the facilities meet the standards according to the WHO Good Manufacturing Practices (GMP) guidance<sup>313</sup>. In addition, imported drugs must be registered for sale under the same brand name in at least one of the following countries: the United States, the United Kingdom, Germany, France, Switzerland, Japan, and Australia, and must have been obtained from a manufacturing plant in one of these countries.

### **Medical equipment**

In the Registration Guidelines for Medical Devices Bangladesh 2015 issued by the DGDA, medical devices are classified into two categories, medical devices excluding in vitro diagnostic devices (IVDs) and IVDs. In addition, the devices are classified into four classes based on the degree of hazard<sup>314</sup>.

**Table 7-2 Medical devices (other than in vitro diagnostic devices (IVDs))**

Class	Risk level	Examples of medical equipment
A	Low risk	Surgical wound openers, tongue depressors
B	Low to medium risk	Hypodermic needle, aspirator
C	Medium to high risk	Ventilator, bone fixation plate
D	High risk	Artificial heart valves, implantable defibrillators

**Table 7-3 In vitro diagnostic devices (IVDs)**

Class	Risk level	Examples of medical equipment
A	Low risk to individuals Low risk to public health	Clinical chemistry analyzer, pre-prepared culture substrate
B	Moderate risk to individuals Low risk to public health	Vitamin B12, pregnancy self-test kit, antinuclear antibody, urine test strips
C	High risk to individuals Moderate risk to public health	Blood glucose self-test, HLA test, PSA screening, rubella
D	High risk to individuals High risk to public health	HIV blood donation screening, HIV blood testing equipment

<sup>311</sup> Directorate General of Drug Administration. Background (<https://www.dgda.gov.bd/index.php/downloads/background>). (Accessed on January 20, 2021)

<sup>312</sup> Directorate General of Drug Administration, 1982. Drugs (Control) Ordinance 1982.

<sup>313</sup> Directorate General of Drug Administration, 2016. National Drug Policy 2016.

<sup>314</sup> Directorate General of Drug Administration, 2015. Registration Guidelines for Medical Devices Bangladesh 2015.

According to the guidelines, Class A medical devices do not need to be registered and only need to notify the DGDA of their compliance with the Declaration of Conformity. Class B, C, and D medical devices require product registration for import and manufacture, and the manufacturer or importer of the device must submit an application for registration with the documents specified by the DGDA. Based on these documents and inspections, the DGDA registers the device.

## 7.2 Private healthcare facilities

### 7.2.1 Current status and issues of private healthcare facilities

In recent years, the number of private healthcare facilities has grown rapidly due to economic growth and rising personal incomes: the number of private hospitals and clinics registered with the DGHS has increased from less than 3,000 in 2013 to 5,321 in July 2019. The number of private diagnostic centers<sup>315</sup>, which do not have beds and specialize in the diagnosis, has also nearly doubled since 2013 to 10,407. As for the number of registered private facilities in each division, about 40% of private hospitals, clinics and diagnostic centers are located in Dhaka (see Table 7-4).

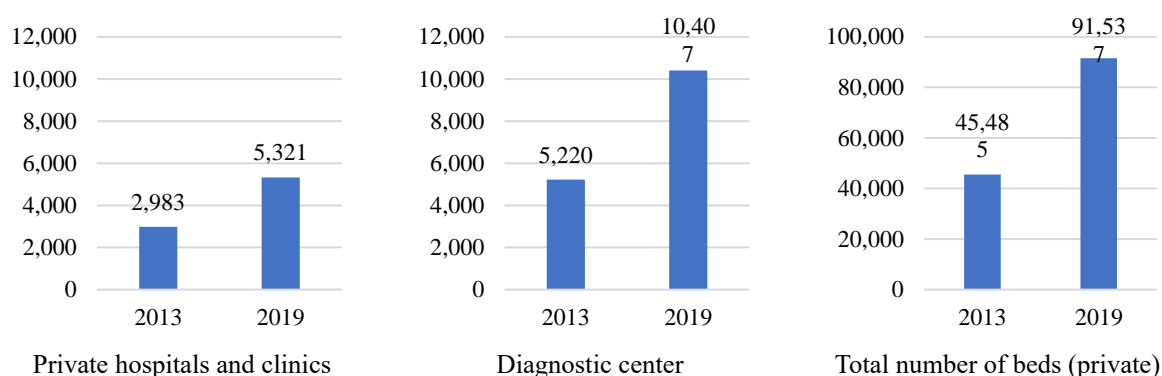


Figure 7-3 Number of facilities and beds in private healthcare facilities<sup>316</sup>

Table 7-4 Number of registered private healthcare facilities by division<sup>317</sup>

Division	Dhaka	Rajshahi	Chattogram	Khulna	Barisal	Mymensingh	Sylhet	Rangpur
Private hospitals and clinics	1,980	758	720	622	267	215	187	181
Diagnostic center	3,295	1,164	1,349	867	655	404	425	348

Note: There is an error in the total number of facilities in Figure 7-3 and this table.

Private healthcare facilities are considered to have higher user satisfaction than public healthcare facilities. However, they tend to be more expensive<sup>318</sup>. Therefore, the users of private healthcare facilities are mainly

<sup>315</sup> A facility that does not have hospital beds and provides only examination and health checkup services. These facilities are used by patients who have received orders for tests from medical facilities and by those who receive health checkups for preventive purposes.

<sup>316</sup> Ministry of Health and Social Welfare, 2014. Health Bulletin 2014, and Ministry of Health and Social Welfare, 2019. Health Bulletin 2019.

<sup>317</sup> Prepared from data provided by DGHS (March 22, 2021)

<sup>318</sup> Begum, F., et al. 2021. Healthcare Cost and Patient Satisfaction: A Comparative Analysis between Public and Private

from the middle to high-income groups. Larger facilities offer a full range of non-medical services and facilities to meet the needs of users who seek a comfortable stay.

Due partly to the already widespread use of cell phones and the expansion of COVID-19, private hospitals are now offering online consultation services using video calling tools such as WhatsApp and Skype, electronic payments such as bKash, and web-based online appointment systems. In addition, the number of facilities equipped with expensive medical equipment such as CT and MRI is increasing, especially in urban areas.

With regard to billing patients for health services, some private hospitals have partnered with insurance companies, and the insurance companies pay the hospitals directly. This avoids temporary financial loss for the patient and is considered to be a countermeasure against uncollectible accounts for the hospital.

In addition to a large number of private healthcare facilities, the private sector plays an important role in complementing government services due to problems such as congestion in public facilities, shortage of medicines, and low satisfaction with services. However, since public and private health insurance is hardly widespread at present, it is difficult for private hospitals alone to provide services to people other than the middle and high-income groups from a management perspective. The government aims to improve the coverage and quality of services by strengthening cooperation with the private sector, but it has been pointed out that progress has been slow<sup>319</sup>. In addition, the services provided by private healthcare facilities are not always of high quality, and issues such as inappropriate medication, poor sanitation, lack of equipment, and different fees for different facilities have been pointed out. With the rapid increase in the number of private healthcare facilities, it is said that there are many unregistered facilities, and the MOHFW is required to strengthen its regulation and supervision<sup>320</sup>.

### **7.2.2 Review of major private healthcare facilities**

An overview of the major private healthcare facilities in Dhaka is provided below.

#### **(1) United Hospital<sup>321</sup>**

A private hospital established by the local United Group in 2006. Located in the Gulshan, Dhaka, it covers an area of 450,000m<sup>2</sup> and has more than 500 beds. It has 44 departments, including cardiology, emergency medicine, obstetrics, diabetes and endocrinology, neurosurgery, anesthesiology, oncology, gastroenterology and hepatology, psychiatry, and pediatrics. It is equipped with expensive equipment such as CT scans and MRIs. As of January 2021, the hospital has a dedicated room for patients with COVID-19, an ICU equipped with a ventilator, and an area for isolation of patients and those suspected of having COVID-19 and is ready to respond around the clock. They also provide services for home use, such as online medical treatment and specimen collection.

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Hospitals in Bangladesh.

<sup>319</sup> Independent Review Team, 2020. 4th Health, Population and Nutrition Sector Program (HPNSP) 2017-2022 Mid-Term Review (MTR) 2020.

<sup>320</sup> Mohiuddin AK, 2020. An extensive review of patient health-care service satisfaction in Bangladesh. *Adesh Univ J Med Sci Res*, 2(1), 5-16.

<sup>321</sup> United Hospital Limited. Home (<https://uhlbd.com/>). (Accessed on January 20, 2021)

(2) Japan East-West Medical College Hospital<sup>322</sup>

A private hospital located in Uttara, northern Dhaka. It is operated by Ship Aichi Medical Services (a joint venture between East West Medical College Hospital and Green Hospital Supply Co. It started as a 280-bed hospital when it opened in 2000, but JICA invested in its expansion and operation in 2018, and it now has 600 beds. The hospital is equipped with high-level equipment such as MRI and CT scans, and has more than 400 medical professionals, including more than 100 doctors and 200 nurses. It offers a wide range of medical services, including internal medicine, surgery, pediatrics, obstetrics and gynecology, nephrology, emergency intensive care, ophthalmology, otolaryngology, radiology, cardiology, dermatology, psychiatry, and rehabilitation.

(3) Evercare Hospital Dhaka<sup>323</sup>

A private hospital located in Bashundhara, northeast of Dhaka. The hospital was formerly known as Apollo Hospitals (established in 2005 by India's Apollo Hospitals Group in a joint venture with local STS Holding) but was renamed Evercare Hospital Dhaka in 2020 after the Evercare Group, which operates hospitals mainly in South Asia and Africa, and the CDC Group, a British state-owned development finance institution, acquired a majority of the voting shares. With a total of 425 beds, the 11-story building with a floor area of 435,000 square feet is equipped with the latest medical, surgical and diagnostic facilities. It offers a wide range of medical services, including internal medicine, respiratory medicine, neurology, ophthalmology, dental surgery, dermatology and venereology, urology, diagnostic radiology and IVR, and gastroenterology and hepatology, as well as online medical services. It is the only hospital in Bangladesh that has received JCI certification, an international evaluation of medical function.

(4) Yamagata Dhaka Friendship General Hospital<sup>324</sup>

It is a private hospital opened in 1997 by Dr. Eklasur Rahman, an orthopedic surgeon who studied at Yamagata University, with the support of Japan. Originally a 20-bed facility located in the Lalmatia area of Dhaka, it was relocated to the Banasree area in 2019 and expanded to 59 beds. With the relocation, the hospital's name was changed from "Yamagata Dhaka Friendship Hospital" to "Yamagata Dhaka Friendship General Hospital. In addition to a dedicated floor for Japanese patients, the hospital has an isolation ward and a 6-bed ICU in response to the outbreak of the COVID-19. The department offers orthopedics, dentistry, internal medicine, surgery, respiratory medicine, pediatrics, obstetrics and gynecology, otolaryngology, dermatology, neurosurgery, ophthalmology, plastic surgery, and anesthesiology. In 2020, the hospital received the 16th JICA President's Award, which is given to individuals and organizations that have made significant contributions to human resource development and social and economic development in developing countries.

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<sup>322</sup> Japan East West Medical College Hospital. Home (<https://jewmch.com/>). (Accessed on January 20, 2021)

<sup>323</sup> Evercare Hospital. Home (<https://www.evercarebd.com/>). (Accessed on January 20, 2021)

<sup>324</sup> 1) Yamagata-Dhaka Friendship General Hospital. Home (<https://ydfgh.org/>). (Accessed on June 7, 2021), 2) Japan International Cooperation Agency. News release ([https://www.jica.go.jp/press/2020/20201008\\_10.html](https://www.jica.go.jp/press/2020/20201008_10.html)). (Accessed on June 7, 2021) (In Japanese only), 3) Ministry of Foreign Affairs. World Medical Situation in Bangladesh (<https://www.mofa.go.jp/mofaj/toko/medi/asia/bangla.html>). (Accessed on June 7, 2021). (In Japanese only)

### 7.3 Private health insurance

#### 7.3.1 Current status and issues related to private health insurance

Although the information on the insurance industry is prepared and published by the Insurance Development and Regulatory Authority (IDRA), data focusing on private health insurance has not been prepared, making it difficult to accurately assess the current situation. According to interviews with several sources, including MOHFW and Dhaka University, the population coverage of private health insurance is less than 1%. According to WHO, private health insurance accounted for only 0.2% of the total health expenditure in Bangladesh in 2018, suggesting that the penetration of private health insurance is low<sup>325</sup>.

Table 7-5 presents data on the overall size of the insurance industry, including health insurance, in Bangladesh and emerging Asian countries. Bangladesh's total premiums in 2019 were about US\$1.475 billion, with a moderate five-year CAGR of 2.3%; the ratio of total premiums to GDP was 0.57%, and the per capita premium was US\$9, indicating that the industry is small compared to other countries.

**Table 7-5 Gross premiums and growth rates by country (2019)**<sup>326</sup>

Country	Total insurance premium (Millions of USD)	Gross premiums as a percentage of GDP (%)	Insurance premiums per capita (USD)	2014-19 Average annual growth rate CAGR (%)
Bangladesh	1,475	0.57	9	2.3
India	106,307	3.76	78	8.8
Thailand	27,123	4.99	389	4.6
Indonesia	22,286	1.99	82	7.8
Malaysia	17,150	4.72	536	1.6
Vietnam	7,368	2.24	76	23.3
Philippines	6,195	1.72	57	1.4
Sri Lanka	1,090	1.25	51	5.1

The insurance business is a licensed business, and according to the Insurance Act 2010, there are two types of insurance companies: life insurance companies that deal with products related to human life, and non-life insurance companies that deal with products not related to human life<sup>327</sup>. In principle, life insurance companies and non-life insurance companies are segregated in terms of the products they offer, but health insurance is offered by both. In addition, there are micro health insurance products with smaller premiums and coverage, which are mainly provided by microfinance institutions (MFIs) and NGOs. Micro health insurance providers are characterized by the fact that they offer not only insurance products but also other financial products such as health services and microcredit, which greatly contribute to the provision of health services to low-income and rural areas. Under the Microcredit Regulatory Authority Act 2006, which is administered by the Microcredit Regulatory Authority (MRA), MFIs can provide various microinsurance services to their members

<sup>325</sup> World Health Organization. Global Health Expenditure Database (<https://apps.who.int/nha/database/Select/Indicators/en>). (Accessed on February 22, 2021)

<sup>326</sup> Adapted from Swiss Re, 2020. Sigma World insurance: riding out the 2020 pandemic storm, and Swiss Re, 2015. Sigma World insurance in 2014: back to life.

<sup>327</sup> Ministry of Finance, 2010. Insurance Act 2010.

and their family members, although the Insurance Act does not allow them to operate insurance business without approval. The distinction between health insurance and micro-health insurance is not clear.

In the future, it is expected that the need for private health insurance will gradually increase in accordance with the increase in the middle class due to economic growth and the growing demand for advanced health services such as cancer treatment, but there are also many challenges. According to past surveys, the main challenges in conducting insurance business include a lack of reliable statistical information, a shortage of professional actuarial personnel, and inadequate legal and supervisory systems<sup>328</sup>. In addition, since health insurance involves medical service providers as a third party, it is necessary to improve the quality of healthcare facilities and human resources, realize the same services at the same price, and expand the public health insurance system.

### **7.3.2 Review of major private insurance companies**

The following is an overview of the major private insurance companies and micro health insurance providers.

#### **(1) MetLife Bangladesh (American Life Insurance Company Ltd.)<sup>329</sup>**

MetLife Bangladesh is the Bangladeshi subsidiary of MetLife, a leading life insurance company in the U.S. Established in 1952, MetLife is now the largest life insurance company in Bangladesh, with premiums written of 26,635.6 million takas in FY2018, accounting for about 30% of the market share (in terms of premiums written) in the life insurance industry. The company is rated AAA, the highest rating, by the Credit Rating Agency of Bangladesh (CRAB). The company has nine offices in the country and about 16,000 insurance recruiters. The company's health insurance products include individual and group insurance, and a variety of main and special policies are available, including products that cover hospitalization due to illness or injury, and products that cover only specific diseases.

#### **(2) Green Delta Insurance Company Limited<sup>330</sup>**

It was established in 1985. It is a local capital non-life insurance company and is the leader in the non-life insurance industry with premiums written of 3,678.6 million takas in 2018, accounting for about 11% of the market share (in terms of premiums written). The company is headquartered in Dhaka and has 43 branches across the country. The company has been awarded AAA, the highest rating, by the CRAB for seven consecutive years. The company's medical insurance policy is an actual cost-reimbursement type, which covers hospital bed charges, consultation fees, tests, medicines, surgeries, and other related services. As of February 2021, the company also offers a policy specifically for COVID-19. As the operator of the government-led SSK scheme, the company has been distributing health insurance cards to low-income people in rural areas since 2016 and is working to improve the system for free medical services.

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<sup>328</sup> JICA, 2016. Report on the Project Preparation Study on the Development of Microinsurance Business in Bangladesh (Promoting BOP Business Cooperation) (In Japanese only).

<sup>329</sup> MetLife Bangladesh. Home (<https://www.metlife.com.bd/>). (Accessed on February 22, 2021)

<sup>330</sup> Green Delta Insurance Company Limited. Home (<https://green-delta.com/>). (Accessed on February 22, 2021)

(3) Grameen Kalyan<sup>331</sup>

Grameen Bank is a non-profit corporation established in 1996 by Muhammad Yunus, the founder of Grameen Bank, to provide micro health insurance. Its mission is to implement and support sustainable programs that contribute to the improvement of rural livelihoods and to reduce socio-economic and health inequalities due to regional differences. It provides basic healthcare services through 135 health centers nationwide. The health centers cover a population of more than 7 million people and provide medical services to more than 720,000 people annually. The micro health insurance provided by the corporation covers up to six family members per policy. The coverage is mainly in-kind and includes medical examinations and pathological tests at the health center, discounts on the purchase of medicines, free regular medical checkups, and hospitalization benefits.

(4) Gonoshasthaya Kendra<sup>332</sup>

It is a public-interest foundation established in 1972. It has 43 health centers and 6 hospitals and provides health services and micro medical insurance in 32 upazilas in 20 districts. Micro-medical insurance is a benefit-in-kind program that provides medical services such as consultations, emergency medical care, vaccinations, and health checkups at hospitals and health centers operated by the corporation, either free of charge or at a partial cost to the patient. The premiums are set differently for each of the six income groups, and the higher the income of the individual or family, the higher the premium. The premiums also differ according to region and smoking status, with urban areas and smokers being charged higher premiums.

## **7.4 Pharmaceutical industry**

### **7.4.1 Domestic market and global positioning**

The pharmaceutical industry in Bangladesh started in the 1960s and has developed into one of the major industries supporting the country's economy. About 80% of the medicines produced in Bangladesh are generics, and the main products are gastrointestinal drugs, antibiotics, and antipyretics. 98% of the domestic demand is met by domestic production. On the other hand, domestic companies are mainly manufacturers of pharmaceutical preparations, and most of the active pharmaceutical ingredients (APIs) are imported from overseas, such as India and China. The government aims to reduce the import of APIs from 97% in 2016 to 80% by 2032 and has come up with incentives such as tax exemptions, tax breaks, and cash incentives for API manufacturers. In addition, it is currently constructing an API park with a collection of plants that manufacture APIs.

The market size of the pharmaceutical industry in Bangladesh is 205.118 billion takas, with a high CAGR of about 15% over five years<sup>333</sup>. Most of the domestic companies mainly target the domestic market, and the export value of pharmaceutical products is small at about US\$130 million. Since the import value of bulk

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<sup>331</sup> Grameen Kalyan. Home (<http://www.grameenkalyan-info.org/index.php>). (Accessed on January 20, 2021)

<sup>332</sup> Gonoshasthaya Kendra. About (<https://gonoshasthayakendra.com/about/>). (Accessed on April 23, 2021); and United States Agency for International Development, 2016. Landscape of Prepaid Health Schemes in Bangladesh.

<sup>333</sup> Ministry of Health and Social Welfare, 2019. Health Bulletin 2019.

pharmaceuticals is large at about 600 million dollars, the balance of imports and exports shows an excess of imports<sup>334</sup>. Table 7-6 shows the major destination countries for pharmaceutical exports. The top 10 countries account for about 70% of the total export value, but most of them are middle- and low-income countries, and only a few major companies have been able to enter developed markets with strict pharmaceutical regulations.

In the National Drug Policy released in 2016, the government has set the expansion of pharmaceutical exports as one of its goals and has indicated its commitment to providing incentives and eliminating tariff and non-tariff barriers to promote exports<sup>335</sup>.

**Table 7-6 Pharmaceuticals Exports by Major Destination Country, 2018/19<sup>336</sup>**

Rank	Country	Export value (US\$)	Percentage
1	Myanmar	20,887,962	16.1
2	Sri Lanka	16,904,900	13.0
3	America	13,693,767	10.5
4	Philippines	9,203,789	7.1
5	Kenya	6,121,482	4.7
6	Afghanistan	5,733,442	4.4
7	Vietnam	5,000,631	3.8
8	Cambodia	4,840,310	3.7
9	Slovenia	3,915,634	3.0
10	Nepal	3,247,677	2.5
-	Other (111 countries)	40,397,691	31.1
-	Total	129,947,285	100.0

India and China are the leading suppliers of generic drugs in the world, but compared to these two countries, Bangladesh's pharmaceutical industry is a late entrant and still small in scale. Bangladesh has advantages in human resources, such as lower labor costs than India and China, and an abundance of white-collar workers such as pharmacists and chemists. Another external factor that will have a positive impact on Bangladesh's pharmaceutical industry is the special measures under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement)<sup>337</sup>. Under this agreement, Bangladesh, as a least developed country, is allowed to postpone implementation until 2033, and is currently allowed to manufacture and sell patented drugs without paying patent fees. With these strengths and opportunities, it is quite possible for the Bangladesh pharmaceutical industry to increase its presence in the global market.

The development and quality control system for pharmaceuticals, which has been an issue in the past, is gradually being improved. The number of DGDA-registered contract research organizations in the country has been gradually increasing from four in May 2017 to 12 in May 2021<sup>338</sup>. In March 2020, the National Control Laboratory received WHO certification. The application process for accession to PIC/S (Pharmaceutical

<sup>334</sup> The Business Standard. Pharma industry spending a fortune on importing raw materials (<https://www.tbsnews.net/companies/pharma/pharma-industry-spending-fortune-importing-raw-materials>). (Accessed on May 1, 2021)

<sup>335</sup> Directorate General of Drug Administration, 2016. National Drug Policy 2016.

<sup>336</sup> Export Promotion Bureau, n.d. Export Statistics 2018-2019.

<sup>337</sup> An international treaty that entered into force in 1995. Under this agreement, members of the World Trade Organization (WTO) are required to introduce international patents, including substance patents, for inventions related to pharmaceuticals.

<sup>338</sup> Directorate General of Drug Administration. Approved CRO (<https://www.dgda.gov.bd/index.php/information-center/good-clinical-practice-gcp/179-approved-cro>). (Accessed on May 6, 2021)



Inspection Convention and Pharmaceutical Inspection Co-operation Scheme), a global GMP, is also underway.

#### 7.4.2 Overview and current status of major pharmaceutical companies

According to the Bangladesh Association of Pharmaceutical Industries (BAPI), there are 257 pharmaceutical companies registered with the DGDA, of which about 150 are currently in operation<sup>339</sup>. Most of them mainly target the domestic market, and only about 50 companies are engaged in export. As a characteristic of the pharmaceutical industry in Bangladesh, local companies are extremely active, and the top 10 companies in terms of market share are all local companies. The top three companies account for about 40% of the market share. While large pharmaceutical companies are expanding their presence both domestically and internationally, covering exports including regulated markets such as the U.S., medium-sized and smaller companies are focusing on the domestic market and low and middle-income countries where drug regulations are less stringent.

**Table 7-7 Top 10 pharmaceutical companies by revenue (2018)<sup>340</sup>**

Rank	Company name	Sales (billion takas)	Market share (%)
1	Square Pharmaceutical	34.76	16.95
2	Incept Pharmaceutical	22.73	11.08
3	Beximco Pharmaceutical	16.94	8.26
4	Renata	10.66	5.20
5	Healthcare Pharmaceuticals	10.61	5.17
6	Opsonin Pharma	10.42	5.08
7	Advanced Chemical Industries (ACI)	8.99	4.38
8	Eskayef Bangladesh	8.96	4.37
9	Aristopharma	8.42	4.11
10	The ACME Laboratories	7.21	3.52

##### (1) Square Pharmaceutical Ltd.<sup>341</sup>

Founded in 1958, it is the largest pharmaceutical company in Bangladesh and has been in the top position since 1985. It has an authorized capital of 10 billion takas, paid-up capital of 8,864.51 million takas, and more than 9,000 employees. It has 10 formulation plants and one API plant in Dhaka and Pabna district. It is currently constructing a new API production facility in API Park in Munshiganj district. The company has its own sales network in 26 locations in the country. The company was a pioneer in 1987 when it started exporting medicines for the first time in Bangladesh and has now expanded its exports to 42 countries in Asia, Africa, Oceania, Latin America, North America, and Europe. Its products include analgesics, anesthetics, anti-inflammatory drugs, anti-allergic drugs, anti-diabetic drugs, cardiovascular drugs, muscle relaxants, anti-viral drugs, and vitamins.

<sup>339</sup> Bangladesh Association of Pharmaceutical Industries. Overview (<http://www.bapi-bd.com/bangladesh-pharma-industry/overview>). (Accessed on February 22, 2021)

<sup>340</sup> ESL Securities, 2019. Pharmaceutical Industry of Bangladesh 3rd Edition.

<sup>341</sup> Square Pharmaceuticals Ltd. Home (<https://www.squarepharma.com.bd/>). (Accessed on February 22, 2021)

(2) Incept Pharmaceutical Ltd.<sup>342</sup>

Established in 1999, it is one of the leading pharmaceutical companies. It has two manufacturing plants in the suburbs of Dhaka at Savar and Dhamrai. It is also preparing to set up a production base for APIs in API Park. The company's products include tablets, capsules, oral liquids, ampoules, dry powder vials, suspension powders, nasal sprays, eye drops, creams, ointments, lotions, gels, drug-filled syringes, gelatin capsules, lyophilized injections, vaccines, and many more. The company has 25 sales offices nationwide and has established a strong domestic distribution channel. The company is also active in overseas expansion, having received GMP certification from several countries and organizations, including the United Kingdom, Canada, and Germany, and exports its products to 74 countries in Asia, Europe, Africa, North America, Central and South America, and Oceania.

(3) Beximco Pharmaceutical Ltd.<sup>343</sup>

The company was founded in 1976 and is one of the leading companies in the pharmaceutical industry. The company originally started out as an importer and distributor of German pharmaceutical giant Bayer AG and U.S. pharmaceutical giant Upjohn. In 1980, the company signed licensing agreements with both companies and began domestic production. Later, in 1983, the company began producing its own products and went public in 1985. Its products include antibiotics, analgesics, anti-diabetics, respiratory disease drugs, cardiovascular drugs, central nervous system drugs, dermatological drugs, and gastrointestinal drugs. With the philosophy of providing high-quality generic drugs at low prices, the company produces more than 300 generic drugs. Its manufacturing plant is located in Dhaka, where it produces formulations and APIs, and like Square and Incepta, it is preparing a production base for APIs in API Park. The company was an early exporter to highly regulated markets such as the U.S., Australia, and Europe, and has now expanded its exports to over 50 countries.

## 7.5 Medical device industry

### 7.5.1 Domestic market and global positioning

According to research firm Fitch Solutions, the medical devices market in Bangladesh in 2019 was worth about \$290 million (Table 7-8). Although still small in size compared to other countries, it is a notably growing sector and is expected to reach about \$430 million by 2023 (see Figure 7-4).

**Table 7-8 Medical devices market size by country (2019)<sup>344</sup>**

Country	Market size (US\$ billion)	Average annual growth rate CAGR (%)
<b>Bangladesh</b>	<b>2.90</b>	<b>10.5</b>
India	52.80	7.8
Thailand	16.08	8.8

<sup>342</sup> Incept Pharmaceutical Ltd. Home (<http://www.inceptapharma.com/>). (Accessed on February 22, 2021)

<sup>343</sup> Beximco Pharmaceutical Ltd. Home (<https://www.beximcopharma.com/>). (Accessed on February 22, 2021)

<sup>344</sup> Fitch Solutions, 2020. Worldwide Medical Devices Market Forecasts.

Country	Market size (US\$ billion)	Average annual growth rate CAGR (%)
Vietnam	15.91	9.5
Malaysia	15.48	8.8
Indonesia	11.26	9.4
Singapore	6.59	9.1
Philippines	5.53	9.1

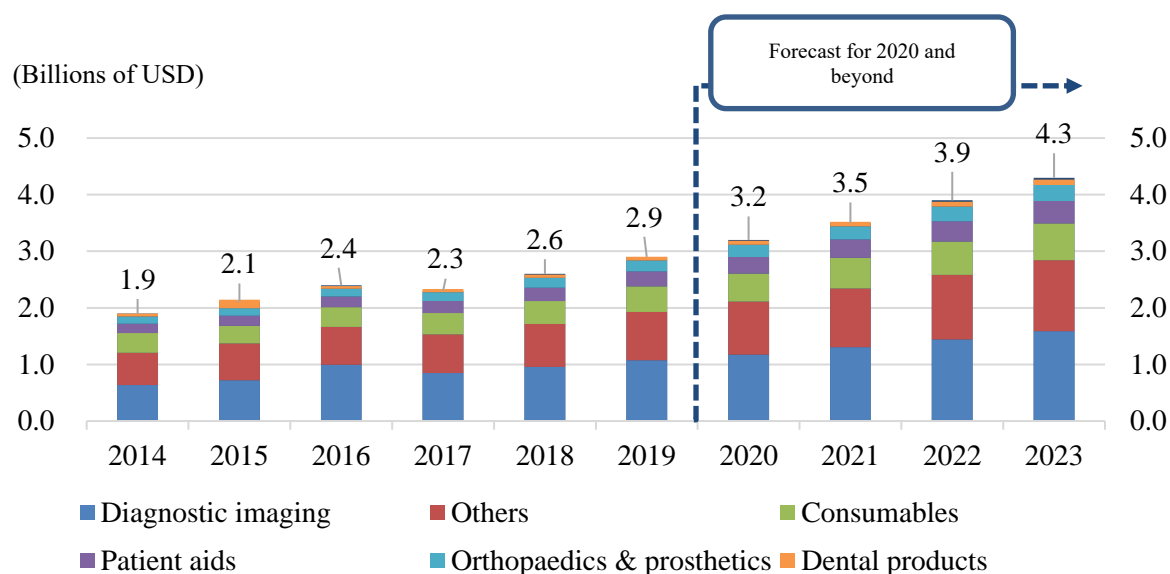


Figure 7-4 Bangladesh medical device market forecast<sup>345</sup>

Factors contributing to the growth of the medical device market include economic growth and rising national income, increasing average life expectancy and changing disease structures, increasing demand for high-quality medical services, and the growing number of medical facilities, especially in the private sector. The market is expected to expand further as the government continues to improve the social security and public medical insurance systems.

A unique feature of the medical device market in Bangladesh is that it is heavily dependent on imports. Bangladesh relies on imports for more than 90% of its medical devices, with medical device imports totaling approximately US\$270 million in 2019 (see Figure 7-5). In the past, medical devices made in Germany and Japan were widely distributed, but in recent years, inexpensive medical devices made in China have been on the rise; the major import partners for medical devices in 2015 were China, Germany, Singapore, India, and the U.S. (see Figure 7-6).

<sup>345</sup> Ibid.

(Billions of USD)

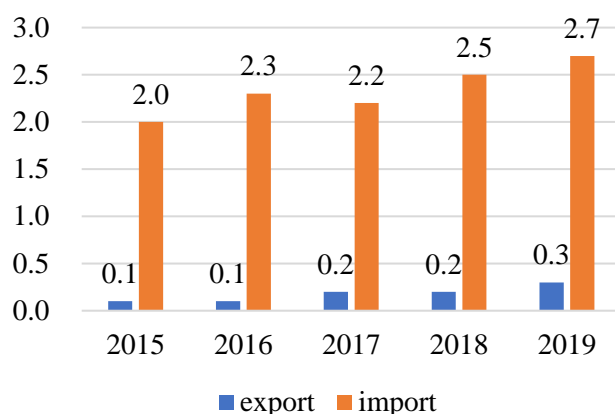


Figure 7-5 Import and export value of medical devices<sup>346</sup>

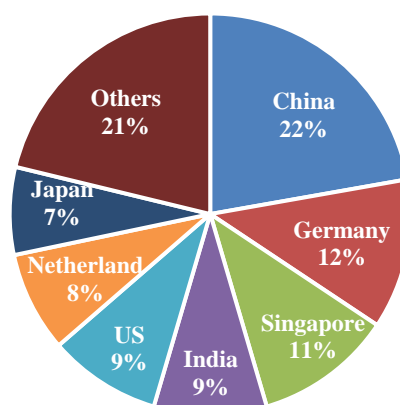


Figure 7-6 Import partners (2015)<sup>347</sup>

As domestic demand for medical equipment has increased in recent years, there has been a move to manufacture disposable medical equipment such as syringes, injection needles, infusion sets, alcohol pads, blood transfusion sets, and surgical gloves in Bangladesh. However, medical devices that require advanced technology are still not manufactured, and most are imported.

### 7.5.2 Overview and current status of major medical device manufacturers

As mentioned above, Bangladesh relies on imports for most of its medical equipment. Therefore, while it is estimated that there are more than 200 medical device importers in the country, only a few companies are engaged in medical device manufacturing<sup>348</sup>. The following is an overview of the major domestic medical device manufacturers.

#### (1) JMI Syringes & Medical Devices Ltd. <sup>349</sup>

Established in 1999. One of the JMI Group companies engaged in the manufacture and sale of medical devices, pharmaceuticals and vaccines, dialysis centers, real estate development, and printing and publishing business. The company manufactures disposable medical devices such as syringes, infusion sets, and IV catheters and exports them to Singapore, Thailand, Myanmar, Spain, and Portugal, in addition to the domestic market. The JMI Group also includes JMI Hospital Requisite Manufacturing Ltd., which manufactures medical plastic, rubber, and silicon components, and Nipro JMI Co., Ltd., which manufactures blood circuits. The entire group employs more than 7,000 people.

<sup>346</sup> Ministry of Economy, Trade and Industry (METI), 2021. International Healthcare Country Report: Basic Information on Healthcare Market Environment in Emerging Countries, Bangladesh. (In Japanese only)

<sup>347</sup> Ibid.

<sup>348</sup> 1) JICA, 2016. Research Report: Medical Devices Market in Bangladesh. (In Japanese only), 2). The Daily Star, 2021. Imports lead medical consumables market (<https://www.thedailystar.net/business/economy/news/imports-lead-medical-consumables-market-2223911>). (Accessed on December 9, 2021).

<sup>349</sup> 1) JMI Group. Home (<https://www.jmigroup-bd.com/>). (Accessed on December 9, 2021), 2) Nipro Corporation. News release (<https://www.nipro.co.jp/news/document/190722.pdf>). (Accessed on December 9, 2021) (In Japanese only), 3) Ministry of Economy, Trade and Industry, 2021. Country Report on International Healthcare Development: Basic Information on Healthcare Market Environment in Emerging Countries, Bangladesh. (In Japanese only)

(2) GETWELL Limited<sup>350</sup>

Established in 2016. It is a company in the PRAN-RFL group operating in multiple sectors such as agro-food processing, dairy products, plastic molding and light metal industry. It has a manufacturing base in Habiganj Industrial Park and manufactures disposable syringes, auto-disable syringes, insulin syringes, IV cannulae, scalp vane sets, pregnancy test kits, and adhesive plasters. In August 2017, the company obtained ISO 9001 certification, an international standard for quality management systems, and in June 2017, it started its pharmaceutical business.

(3) ANC Medical Device Bd. Ltd.<sup>351</sup>

Established in 2016. It is part of the Graphic Machinery and Equipment (GME) group, which imports and sells medical equipment, printing equipment, and cosmetics. The company has a factory with 171,896 square feet in the Dhamrai district on the outskirts of Dhaka and employs about 3,000 workers. With technical support from Germany, Korea, China, and India, the company manufactures medical devices such as vacuum blood collection tubes, disposable syringes, insulin syringes, injection needles, infusion sets, alcohol pads, adhesive plasters, and scalp vane sets. The company has obtained ISO 13485 certification, an international standard for quality management systems for medical devices.

## **7.6 New services**

### **7.6.1 Startup ecosystem overview**

It is estimated that there are more than 1,000 Bangladeshi startups today, providing employment to about 1.5 million people<sup>352</sup>. The three main startup centers are Dhaka, Chattogram, and Sylhet, where about 200 new startups are born every year. In order to support startups, the government established a state-owned venture capital company, Startup Bangladesh Limited, in 2020, which provides financial support to start-ups, community building through the establishment of start-up facilities such as co-working spaces, and entrepreneurship training programs. Support for startups by the private sector and educational institutions is also increasing, and although the scale is still small compared to neighboring India and Southeast Asian countries, steady progress is being made toward the formation of a startup ecosystem. The following are some examples of public and private sector support for startups. The main institutions and their roles are shown below.

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<sup>350</sup> GETWELL Limited. Home (<https://www.getwellltd.com/>). (Accessed on December 9, 2021).

<sup>351</sup> 1) ANC Medical Device Bd. Ltd. Home (<https://ancmedicaldevice.com/>). (Accessed on December 9, 2021), 2) Business Tribune, 2021. World-class medical equipment maker 'ANC' plans to reduce import dependence (<https://business-tribune.com/money-market/article/202/World-class-medical-equipment-Maker-ANC-plans-to-reduce-import-dependence>). (Accessed on December 9, 2021).

<sup>352</sup> Light Castle Partners, 2020. Bangladesh Startup Ecosystem.

**Table 7-9 Major start-up support institutions and their roles in Bangladesh**

Organization	Role	Examples
government body (agency)	Startup and Innovation Support	Information and Communication Technology Division, Startup Bangladesh, Hi-Tech Park Authority
Educational and research institutions	Research and technology transfer and human resource development	University of Dhaka, BRAC University, University of Liberal Arts Bangladesh, North South University, Daffodil International University, Independent University Bangladesh Independent University Bangladesh
Incubator/accelerator	Fostering seed and early-stage startups	Grameen Phone Accelerator, ScaleUp Bangladesh, Startup Dhaka, Banglalink IT Incubator, a2i, EMK Center, BASIS, BRAC, Toru, Light Castle Partner
Venture capital and angel investors	Investing in startups	Bangladesh Angels, Pegasus Tech Venture, SBK Tech Ventures, Bangladesh Venture Capital, BD Venture, Pegasus Tech Ventures, Venture Capital and Private Equity Association of Bangladesh (VCPEAB)
Events	Provide opportunities for interaction with investors and large corporations	Student to Startup, Accelerating Asia, COVID Accelerator, Connecting Startups
Media	Disseminating information on startups	SD Asia, Future Startup, Tiger Cage
Co-working space	Provide workspace and networking opportunities	Hubdhaka, Regus, Moar, Co+Lab, Bonik coworking, Locus, Workstation101, Daffodil Business Incubator, Shuru Campus

### 7.6.2 Current status and challenges of new business implementation

IT cannot be ignored as a target business segment for startups as a global trend. The recent trend of startups in the health sector in Bangladesh has one thing in common: IT-based business models. The government is promoting "Digital Bangladesh" with the aim of transforming Bangladesh from a least developed country to a middle-income country by 2021, using information and communication technology as a driving force for growth. A number of start-up companies, including those in the health-tech sector, are already providing IT-based services to promote the realization of "Digital Bangladesh. The government is actively investing in the promotion of IT, including the establishment of Tier 4 <sup>353</sup>national data centers<sup>354</sup>, as well as the construction of high-tech parks, software technology parks, and IT training and incubation centers at 28 locations in the country<sup>355</sup>. As of January 2021, the number of cell phone subscriptions in Bangladesh reached 170 million, or 105% of the total population, and the number of internet subscriptions has spread to 112 million, or 70% of the population. The environment necessary for the provision of IT-based services is gradually improving<sup>356</sup>.

However, according to the World Bank's Doing Business 2020, which ranks the quality of the business environment, Bangladesh ranks 168th out of 190 countries and 7th out of 8 countries in South Asia, indicating that the business environment is still immature compared to other countries. In particular, the following points were pointed out as problems in implementing new businesses:

<sup>353</sup> The Uptime Institute, a private organization in the U.S., defines tier as a facility standard for data centers, which are classified into four tiers from Tier 1 to Tier 4, with Tier 4 being the highest.

<sup>354</sup> Bangladesh Hi-Tech Park Authority. Annual Report 2019-2020.

<sup>355</sup> ICT Division. Ongoing Projects (<https://ictd.portal.gov.bd/site/page/847fccce-adfa-4bf0-b0b2-cb18d6208000/On-going-Projects>). (Accessed on February 21, 2021)

<sup>356</sup> Bangladesh Telecommunication Regulatory Commission. License & Statistics (<http://www.btrc.gov.bd/license-statistics>). (Accessed on February 21, 2021)

- Difficulties in raising funds

High bank interest rates, strict loan conditions (e.g., business track record, collateral requirements), lack of agreement on values and expectations between investors and entrepreneurs.

- Lack of human resources to support startups

While about 30,000 people with IT backgrounds are produced every year, there is a mismatch between the content of education and training at educational institutions and the skills required in the business world, and there is a lack of knowledge, skills, and experience in management. There are few people with an entrepreneurial spirit and passion for starting their businesses, and some of the best graduates from the Bangladesh University of Engineering and Technology (BUET) and other institutions are oriented toward overseas.

- Underdeveloped policies on startups

Lack of concrete government policies and plans to foster startups.

### **7.6.3 Review of major new services**

The major healthcare-related services that have emerged in the past decade include online doctor search and appointment services, online ordering and delivery of medicines and hygiene products, and online medical and health consultation services. Since the lockdown caused by COVID-19 in March 2020, some companies in other fields have responded to new healthcare-related needs, such as a ridesharing-related startup that launched a pharmaceutical delivery service. The following is a list of major new services in recent years.

#### **(1) Dhaka Cast<sup>357</sup>**

Established in 2019. The company provides a one-stop service for people with diabetes. The service provides comprehensive support for diabetics, including 24-hour online consultation service with medical specialists, consultation service with nurses, caregivers, physiotherapists, and nutritionists, continuous blood glucose monitoring and management, notification service to recommend medical checkups, basic health checkups at home, analysis service, and home delivery service of medicines and foods. This is a comprehensive support service for people with diabetes. It also disseminates information and holds webinars for diabetes education.

#### **(2) CMED Health<sup>358</sup>**

Established in 2016. The company provides a health management system for the prevention of lifestyle-related diseases. It acquires vital data of individuals through dedicated smart health management devices, which can be managed and shared with medical professionals on an app. In response to the spread of the COVID-19, the company is currently working with DGHS to build a COVID-19 surveillance platform using AI technology to alert the community, screen, and follow up with those who are positive or suspected to be

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<sup>357</sup> Dhaka Cast. Home (<https://dhakacast.com/>). (Accessed on February 22, 2021)

<sup>358</sup> CMED Health. Home (<https://cmed.com.bd/>). (Accessed on February 22, 2021)

positive.

(3) Praava Health<sup>359</sup>

Established in 2016. The company provides medical services that combine telemedicine with physical clinics. Patients pay a fee per visit, and there are also membership plans that provide medical services for a fixed fee. About 40 percent of the company's consultations are provided virtually. It is the country's first government-approved private laboratory for COVID-19, and in 2020, it conducted 75,000 tests for new coronas. In March 2021, the company announced a Series A round of financing totaling \$10.6 million.

(4) Maya<sup>360</sup>

Founded in 2011. The company operates a platform that allows users to consult with doctors and other medical professionals via video phone or text. The platform has about 10 million users and more than 300 registered healthcare providers. It also provides medical information, including COVID-19, health and beauty-related information, and management applications. In February 2021, the company announced that it had raised \$22 million in funding, the largest amount ever raised by a Bangladeshi health tech company.

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<sup>359</sup> Future Startup. The Future Startup Dossier: Praava Health (<https://futurestartup.com/2021/03/30/the-future-startup-dossier-praava-health/>). (Accessed on April 20, 2021); and TechCrunch: Praava Health raises \$10.6M to increase access to quality healthcare in Bangladesh (<https://techcrunch.com/2021/03/07/prava-health-raises-10-6m-to-increase-access-to-quality-healthcare-in-bangladesh/>). (Accessed on April 20, 2021)

<sup>360</sup> Maya. Home (<https://www.mayaiswithyou.com/>). (Accessed on February 22, 2021); and The Daily Star, 2021. Health-tech startup Maya raises \$2.2m for expansion (<https://www.thedailystar.net/business/news/health-tech-startup-maya-raises-22m-expansion-2042213>). (Accessed on February 23, 2021)



## Chapter 8 Cooperation of Japan and other donors to the health sector

### 8.1 Framework for cooperation

The health sector in Bangladesh is supported by donors under the aid coordination framework of the Sector Wide Approach (SWAs). In the 4<sup>th</sup> HPNSP, donors contribute funds to the Multi-Donor Trust Fund, and multilateral and bilateral assistance is promoted under the SWAs framework. The World Bank, WHO, UNFPA, UNICEF, ADB, USAID, FCDO (formerly DFID), GIZ are major donors. The World Bank supports the health sector program as a core donor, while JICA has supported the health sector program as a parallel donor. MOHFW implements the program through OPs led by line directors (LDs), each of which includes SWAs activities in line with the budget and an annual program review to verify program implementation and budget execution status. The development partners support the task groups and technical committees for the OP operations. In addition, since the introduction of SWAs in 1998, pooled funds funded by development partners have been established, and donors have been providing funds to the pooled funds. The World Bank is responsible for managing the pooled funds.

In addition, the Local Consultative Group (LCG) functions as a coordination system between ministries and donors and is used by donors who do not participate in SWAs to coordinate specific programs. Specifically, the Health, Population and Nutrition Consortium (HPNC), which was established as a working group of the LCG, serves as a mechanism for donor coordination<sup>361</sup>.

While SWAs have made some progress in financial management, government ownership, and coordination between the government and donors, there are still challenges in achieving effective and efficient assistance through aid coordination.

### 8.2 Assistance from development partners

#### 8.2.1 Overview

The 4<sup>th</sup> HPNSP is supported by 14 development partners. Table 8-1 shows the support provided by development partners when its program implementation plan (PIP) was developed.

**Table 8-1 Development partners' contribution for 4<sup>th</sup> HPNSP<sup>362</sup>**

No.	Source	Amount in million USD	Amount in Lac BDT	RPA <sup>363</sup> in Lac BDT	Other than RPA (in Lac BDT)
1	International Development Association (IDA) credit	500.00	392500.00	392500.00	0.00
2	World Bank Global Financing Facility (GFF)	15.00	11775.00	0.00	11775.00
3	Global Affairs Canada (GAC)	TBD*	-	-	-
4	JICA credit	51.71	40592.35	37232.55	3359.80

<sup>361</sup> Terms of Reference: Health, Population and Nutrition Consortium, Bangladesh.

<sup>362</sup> Ministry of Health and Family Welfare. 2017. Program implementation plan: 4th Health, Population and Nutrition Sector Program (4th HPNSP).

<sup>363</sup> Assistance through pooled funds. In contrast, in direct project assistance (DPA), the development partner directly manages disbursements

No.	Source	Amount in million USD	Amount in Lac BDT	RPA <sup>363</sup> in Lac BDT	Other than RPA (in Lac BDT)
5	Swedish International Development Agency (SIDA)	21.70	17034.50	17034.50	0.00
6	United Kingdom Department for International Development (DFID)	TBD*	-	-	-
7	United States Agency for International Development (USAID)	40.00	31400.00	31400.00	0.00
8	UNICEF	15.00	11775.00	0.00	11775.00
9	WHO	30.00	23550.00	0.00	23550.00
10	Swedish Export Credit Agency (EKN)	8.13	6382.05	6382.05	0.00
11	GAVI- Health System Strengthening Support (GAVI-HSS)	84.00	65940.00	0.00	65940.00
12	GAVI- Immunization Services Support (GAVI-ISS+MR)	500.00	392500.00	0.00	392500.00
13	Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM)	146.00	114610.00	0.00	114610.00
14	UNFPA	11.00	8635.00	0.00	8635.00
	<b>Total</b>	<b>1422.54</b>	<b>1116693.90</b>	<b>484549.10</b>	<b>632144.80</b>

\*GAC and DFID expressed their willingness to remain in the 4<sup>th</sup> HPNSP but were yet to decide on their contributions.

The following is a summary of support from major development partners.

## 8.2.2 World Bank

The World Bank has been one of the key partners in the Bangladesh health sector since 1975. It has begun developing a Country Partnership Framework (CPF) to support Bangladesh from 2023 to 2027. To prepare the CPF, the World Bank intensifies consultations with stakeholders in Bangladesh, including the government, private sector, civil society, and other development partners. The main projects financed by the World Bank are as follows

### Health Sector Support Project (HSSP)

The HSSP, launched in July 2017, aims to strengthen core management systems in the health, nutrition, and population sectors and service delivery in targeted areas<sup>364</sup> and consists of three components as the 4<sup>th</sup> HPNSP. Support for the 4<sup>th</sup> HPNSP is underway based on a mechanism in which funds are provided according to improvements in defined indicators, known as DLI (Disbursement linked indicators). The project period is 6.5 years until the end of December 2023<sup>365</sup>, and the amount of support is US\$1.1 billion. Allocations to each component are (1) US\$175 million for governance and stewardship, (2) US\$369.5 million for health system strengthening, and (3) US\$555.5 million for quality health services.

<sup>364</sup> Chattogram and Sylhet Divisions.

<sup>365</sup> Originally 2022 scheduled to run until the end of the year, the term was extended due to the extension of the end date of the multi-donor trust fund co-financing the HSSP to the date of the 2023/23 year.

### Additional Financing for HSPP

Additional financial (AF) assistance of US\$50 million is provided to HSPP for 5 years from 2018 to 2023 to expand health services, strengthen MOHFW's crisis response capacity, and support displaced people from Rakhine State, Myanmar in Cox's Bazar district. IDA18 Regional Sub-Window for Refugees and Host Communities (worth US\$41.67 million) are utilized. The AF directly supports the Government of Bangladesh's Preliminary Action Plan.

Also, the World Bank is implementing Health and Gender Support Project (HGSP) in Cox's Bazar district (see details in Chapter 10).

In addition, the following projects in the health sector projects are being prepared:

- Urban Health, Nutrition and Population Project: Improve PHC-centered health service delivery to urban populations and develop and strengthen government capacity and systems.
- Bangladesh - Improving Services Quality of Hospital Network and Financial Protection for the Poor: Support for improving the quality and utilization of clinical Services for priority diseases and expanding the coverage of the health protection schemes.

### **8.2.3 Asian Development Bank (ADB)**

In its country partnership strategy (CPS) from 2021 to 2025, the Asian Development Bank (ADB) has adopted an approach to support sustainable, resilient, and inclusive growth in Bangladesh. Strategic priorities have been set for competitiveness, employment, and private sector development; addressing climate change; and strengthening human resources and social protection. Under the CPS, the following support is provided in the health sector.

#### Support for Health Care Improvement Project

Technical Assistance (TA) Special Fund to improve access and quality of comprehensive PHC services, including immunization; strengthen the effectiveness and efficiency of health systems to achieve UHC; and reduce the impact of COVID-19 through vaccine production, genomic surveillance, mobile testing capacity, and surveys on vaccine evasion. The US\$1 million in assistance is provided through the fund. The project's duration is three years, from December 2021 to November 2024.

#### Urban Primary Health Care Services Delivery Project

Building on the achievements of two previous urban primary health care projects (UPHCP I and UPHCP II) implemented by the Government of Bangladesh and ADB, the Urban Primary Health Care Service Delivery Project aims to develop and strengthen institutional capacity for sustainable PHC and poverty reduction service delivery in urban areas through a public-private partnership. US\$142 million in assistance is planned for 11 city corporations and 14 pourashava over five years from April 2018 to March 2023.

#### **8.2.4 World Health Organization (WHO)**

The World Health Organization (WHO) has supported the health sector since 1972 after Bangladesh's independence. WHO chairs the Consortium of development partners. It also coordinates the health sector activities in Cox's Bazar district with the MOHFW and the Refugee Relief and Repatriation Commissioner (RRRC), as indicated in Chapter 10.

WHO support is implemented following the Country Cooperation Strategic Agenda. The five strategic priorities of the 2017-2021 Country Cooperation Strategic Agenda are (1) communicable diseases, (2) non-communicable diseases, (3) promoting health through life course, (4) health systems, and (5) emergency preparedness, surveillance and response<sup>366</sup>, and efforts continue to be based on a comprehensive perspective.

In December 2021, the Swedish government signed an agreement to assist Bangladesh in achieving the SDGs through the contribution of US\$8.5 million to WHO Bangladesh. Through the project "Strengthening Health Systems in Bangladesh," the capacity to detect and control antimicrobial-resistant bacteria will be strengthened, mental health care will be improved, quality of health services in Cox's Bazar district will be maintained, and national health financing will be activated to achieve UHC.

#### **8.2.5 United States Agency for International Development (USAID)**

United States Agency for International Development (USAID) is developing activities in economic growth, education, health, energy, environment, food security, disaster management, and democracy and governance following its Country Development Cooperation Strategy (2020 - 2025). In the health sector, USAID is focusing on improving maternal and child health, expanding family planning and reproductive health, integrating family planning and nutrition into essential health care services, and strengthening public health systems to improve the quality and availability of services throughout Bangladesh.

SHOUHARDO (Strengthening Household Ability to Respond to Development Opportunities) III has been in place since September 2015 for five years (extended through September 2022). Under SHOUHARDO III, CARE Bangladesh is implementing the project with partner NGOs, with funding from USAID and complementary funding from the Government of Bangladesh. Specifically, support is provided to the poor and extremely poor in eight districts in northern Bangladesh to improve food and nutrition security and resilience with gender equality in mind.

Health-related activities are aimed at health, hygiene, and nutrition behavior change, including (1) providing households with access to health and nutrition services and improving household capacity for optimal health care, and (2) strengthening health systems with the aim of providing timely health and nutrition services to improve the health and well-being of poor and extremely poor pregnant and nursing mothers, children under 5 years old, and adolescent girls<sup>367</sup>.

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<sup>366</sup> WHO, 2018. Bangladesh Country Cooperation Strategy at a glance.

<sup>367</sup> CARE, 2018. SHOUHARDO III.

### **8.2.6 United Nations Children's Fund (UNICEF)**

The 2022–2026 Government of Bangladesh-UNICEF country program of cooperation is aligned with the 8FYP and consists of six areas targeted by UNICEF to contribute to achieving its goals: health, nutrition, education, child protection, WASH and social protection<sup>368</sup>.

Specific areas of activity are defined as follows:

- Support the achievement of the 8FYP health targets.
- Support the achievement of UHC through support for policies, strategies, investment cases, fiscal space analyses and delivery models for primary health care within the COVID-19 response.
- Support for strengthening of the health management information system through innovative technology.
- Support to the district health administration to provide inclusive and high-quality preventive and curative maternal, newborn, child and adolescent health and immunization services.
- Strengthen partnerships between researchers, health care workers and the private sector.
- Strengthen the linkages between community health systems and primary health care and all service delivery platforms.
- Raise awareness of environmental health, including climate change

### **8.2.7 International Organization for Migration (IOM)**

The International Organization for Migration (IOM) established an office in Bangladesh in 1998 and implements programs on migration awareness, promotion of safe migration, rescue and reintegration of migrants and displaced persons, acquisition of rights and social protection of migrants, and skills development of migrants. Current activities are focused on assisting displaced people from Rakhine State, Myanmar in Cox's Bazar district, providing assistance in shelter establishment, water and sanitation, health, gender-based violence response, and alternative energy. In the health sector, assistance is provided in the camps for displaced people and host communities as follows<sup>369</sup>.

1. Provide primary health care services: support 40 healthcare facilities in the camps for displaced people and host communities, general outpatient and inpatient care for communicable and non-communicable diseases, child health, sexual and reproductive health services, mental health and psychosocial support services, referral and gender-based violence (GBV) response services.
2. Infection prevention and control and emergency response: operation and management of severe acute respiratory infection isolation and treatment centers (SARI ITC) in two camps for displaced people. A total of 199 dedicated COVID-19 beds are provided. It also operates a COVID-19 quarantine facility, provides ambulances to transport COVID-19 patients, conducts community activities, and provides testing, treatment, patient monitoring, and training for health personnel to respond to other infectious diseases, such as diphtheria and acute, watery diarrhea.

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<sup>368</sup> UNICEF, 2021. Country Programme Document: Bangladesh.

<sup>369</sup> IOM, Monthly Situation Report, September 2021.

3. Mental health and psychosocial support: awareness-raising activities, counseling, and case management in healthcare facilities and communities.

IOM also conducts COVID-19 vaccinations<sup>370</sup> at health posts in camps for displaced people operated by IOM and partner agencies and implements health education on vaccination. In addition, as shown in Chapter 10, IOM works with the World Bank Health and Gender Support Project (HGSP) to improve facilities at the Cox's Bazar Sadar District Hospital and community clinics.

### **8.2.8 United Nations High Commissioner for Refugees (UNHCR)**

The United Nations High Commissioner for Refugees (UNHCR) has implemented protection and assistance activities for displaced people since August 2017. The strategy for assistance is as follows<sup>371</sup>:

1. Strengthening the protection environment and ensuring full access to critical protection services.
2. Improving the well-being of refugees by promoting capacity-building and supporting adequate living conditions.
3. Facilitating a comprehensive package of solutions, prioritizing preparations for voluntary and sustainable return to Myanmar.
4. Strengthening partnerships with the Government of Bangladesh, catalyzing strategic partnerships, increased localization and support to host communities.

In the health sector, the response to COVID-19 is underway in the camps for displaced people and host communities. In 2021, the severe acute respiratory infection isolation and treatment center (SARI ITC) was established in each of the camps for displaced people and host communities in Ukhiya, as well as intensive care units (ICU), high-dependency units (HDU), and critical care beds at the Cox's Bazar Sadar District Hospital. The UNHCR also promotes community awareness campaigns and vaccination campaigns for displaced people. In addition, it supports the construction of a new outpatient ward at Cox's Bazar Sadar District Hospital and works with Gonoshasthaya Kendra (GK), which operates a local health institution, to provide financial support for health and nutrition projects implemented by GK.

In December 2021, an agreement was signed in which the Japanese government will provide US\$4.4 million to UNHCR to build a specialized hospital with an inpatient ward near Kutupalong camp in Ukhiya upazila and provide operational support for the hospital for three years. For more information on support for the Ukhiya Specialized Hospital, see 10.7.

Details of the development partners' activities in Cox's Bazar district are also presented in "10.7 Support by development partners."

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<sup>370</sup> Ibid. During the second round of the COVID-19 vaccination campaign in the camps for displaced people (ended September 23, 2021), 6,693 people were vaccinated.

<sup>371</sup> UNHCR Bangladesh, Global Focus ([https://reporting.unhcr.org/bangladesh#\\_ga=2.254422024.1605392676.1645951475-1653543055.1643004926](https://reporting.unhcr.org/bangladesh#_ga=2.254422024.1605392676.1645951475-1653543055.1643004926)). (Accessed on February 26, 2022)

### 8.3 Achievements of Japan's cooperation

In the field of health in Bangladesh, JICA has been providing various kinds of assistance in the framework of loans, grant aids, technical cooperation projects, and ODA based on the concept of program support for effective implementation of assistance that takes advantage of Japan's strength in maternal and child health (see Table 8-2). Recently, the scope of support has been expanded to include non-communicable diseases and human resource development in line with local needs. In addition, a number of public-private partnership projects have been adopted in recent years, and support utilizing the characteristics of Japanese companies is being provided in areas such as medical equipment and nutrition improvement. Japan's support at communities and healthcare facilities has also been highly evaluated locally.

**Table 8-2 Recent cooperation by the Japanese government and JICA**

Type	Project name	Period/Conclusion date
<b>Loan</b>	Health Services Strengthening Project	L/A signed: Jun. 2018
	Maternal, Neonatal and Child Health (MNCH) and Health System Improvement Project	L/A signed: Dec. 2015
	Maternal, Neonatal and Child Health Improvement Project (Phase 1) (Health, Population and Nutrition Sector Development Program)	L/A signed: 2012.1
<b>Technical cooperation project</b>	Project for Strengthening Health Systems through Organizing Communities	2017.7 - 2022.7
	Project for Capacity Building of Nursing Services	2016.1 - 2021.1
	Safe Motherhood Promotion Project (Phase 2)	2011.7 - 2016.6
	Project for Research and Development of Prevention and Diagnosis for Neglected Tropical Diseases, especially Kala-Azar	2011.6 - 2016.5
<b>Private Sector partnership project</b>	Basic Survey on the Introduction of Portable Echo in Home Visits	FY 2019
	SDGs Business Survey on Health Screening Business to Improve Access to Health Services	2018.2-2020.11
	Preparatory Survey for the Euglena Cookie Business	2015.5 - 2017.7
<b>Project supported by the Ministry of Economy, Trade and Industry of Japan</b>	Project for Establishing an International Health Care Hub in Bangladesh through a Participatory Platform for Medical Service Businesses	FY 2018
	Bangladesh Disaster Preparedness and Community Emergency Center Project	FY 2017
	Project for the Dissemination of Japanese Health Checkups and Examinations	FY 2016
	Development of Japanese-style Clinical Training Centers and Bio-Medical Engineer Training project	FY 2016
<b>Project supported by the Ministry of Health, Labour and Welfare of Japan</b>	Training of Percutaneous Mitral Valve Commissurotomy Technicians in Bangladesh for Mitral Stenosis Patients	FY 2018
	Strengthening Nursing Clinical Practice Teaching Capacity in Cambodia, Laos, Myanmar, and Bangladesh	FY 2016

## Chapter 9 Analysis of challenges in the health sector in Bangladesh

### 9.1 Governance

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
There are overlaps and inefficiencies in the health service delivery system managed by DGHS and DGFP.	Polarization of health administration from the central to the community level.	Establishment of a cross-sectoral governance unit. Review and organize duplicate work.	There have been many attempts at reform, but they have not been successful due to resistance to the reform of the existing system.	Continued planning and implementation of development programs that do not take into account system efficiency.	Appropriate resource allocation. Improve the quality of services.
The programs implemented do not match the actual situation in the field and are ineffective.	Limited transfer of authority from MOHFW to subordinate health administration.	Strengthen planning and monitoring capacity at the upazila and district levels. Further promotion of decentralization.	It is difficult to promote decentralization without a higher level of political initiative. Strengthening the quality and quantity of management personnel at the upazila and district levels is essential.	Programmatic constraints on donor support. Interest in and demand for more efficient support.	Improvement of facilities and proper allocation of personnel and equipment in medical facilities. More appropriate service provision.
Increase in patient burden and decline in quality of service due to an uncontrolled expansion of private healthcare facilities.	Inadequate regulation of the private sector by MOHFW.	Review the regulations according to the actual situation. Proactive public-private partnerships. Technical assistance in the implementation phase of regulations.	Comprehensive regulation of the private sector is unrealistic, and loopholes always remain. MOHFW's resistance to the active use of the private sector.	Populations' expectations and demands for private healthcare facilities and services provided by the private sector due to distrust of public services.	Reduction of unnecessary patient burden. Improve the quality of services. Promote public-private partnerships.
Priority activities of the OP are not implemented as planned.	Lack of consistency between OP activities and budget. Duplication of activities between OPs.	Technical support for OP creation. Organize and integrate OPs.	Political initiative is essential to organize and integrate existing OPs.	Continue donor support in line with existing OPs.	Steady implementation of priority activities. Improve the efficiency of budget allocation.



## 9.2 Health financing

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
The ratio of out-of-pocket medical expenses is extremely high.	Public medical insurance system is not well developed. The quality of medical services in public hospitals is low, and the population has to rely on OOP treatment.	Expansion of the public health insurance system. Increase resources for public hospitals (personnel, facilities, etc.).	In addition to securing financial resources, it is necessary to develop laws such as the Health Protection Law and organize an implementation organization.	The government plans to raise the health sector budget from the current 0.7% of GDP to 2% and to reduce the self-financing ratio by less than half to 32%, with the possibility of a significant increase in financial resources.	Achievement of UHC. Improving the quality of services in public hospitals.
There are many challenges in managing financial protection measures for vulnerable groups.	There are many disincentives to promote the use of the system, such as the time-consuming certification process. The procedures in health facilities are complicated and inefficient.	Improving efficiency by reviewing the operation systems.	When shifting from pilot to wide-area deployment in the future, measures to revamp business processes and reduce management costs are necessary.	The establishment of a National Health Security Office (NHSO) to centrally administer a series of protection measures has been proposed for many years but has yet to be realized. NGOs have shown a presence in local health services, and collaboration measures are effective.	The pace of subject certification will accelerate. The efficient and low-cost operations will allow it to expand nationwide quickly.
The health budget is not being fully implemented.	The health budget has been expanding and increasing, but the trend has been accelerated by measures such as COVID-19. The budget execution capacity of the organization has not kept pace with the budget increase.	Strengthen public investment capacity, especially in the health and finance sectors.	Need to develop legal systems and coordinate with relevant ministries.	This is partly due to the time required for approvals and procurement processes with other agencies, etc.	It will respond quickly to budget increases and contribute greatly to the realization of UHC.

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
		Correction of bloated business processes and improvement of efficiency through the transfer of authority to local governments and the private sector.			Public-private partnerships will be promoted, especially in the health insurance system, and the system will be widely disseminated.

### 9.3 Human resources for health

Key issues	primary factor (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
Compared to the world average and neighboring countries, the number of nurses per population is inadequate.	There is no implementation plan for human resource strategy for health. Recruitment, training, and promotion are not effectively managed <sup>372</sup> . The number of nursing colleges is small compared to the population.	Develop an implementation plan for human resources strategy for health care. Consider increasing the number and capacity of nursing colleges in line with strategies and plans.	Lack of personnel and capacity at MOHFW.	Even if health workforces are trained, there is a possibility that they will leave the country in search of employment with better conditions.	Improving the quantity and quality of care in health care activities, reducing the burden on other professions, improving patient safety, etc.
There is no equal distribution of medical personnel between urban and rural areas. (The number of doctors per 10,000 population is 10.8 in Dhaka and 1.7 in Barisal) <sup>373</sup>	There is no implementation plan for health human resources strategy.	Promote the development and implementation of strategies for appropriate staffing.	Even if staffing is planned, it is expected that many health professionals will not want to go to rural areas.	There is a possibility of further population influx to urban areas in the future.	Improving access to core healthcare facilities for the population, especially in rural areas.
Despite the fact that the number of nurses is exceedingly small, many nurses are unemployed.	Many private hospitals hire non-certified nurses to employ them at lower salaries.	Consider guidance from MOHFW and legal measures.	Lack of personnel and capacity at MOHFW.	Depending on the business conditions and policies of private hospitals, they may not follow the	Only certified nurses will be employed, and unemployment will be reduced.

<sup>372</sup> Rafiqul et al. 2020, Challenges for health care services in Bangladesh: An Overview Journal of Nursing and Health Science, Vol 9, Issue 1, Ser. I.

<sup>373</sup> Ibid.

Key issues	primary factor (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
				guidance, etc.	
The status and remuneration of CHWs vary from full-time employment to unpaid volunteers and are not uniform.	Various NGOs use CHWs, but their status and compensation vary widely from organization to organization.	The strategy by MOHFW on CHWs aims to provide policy guidelines and a framework for selection, training, certification, recruitment and placement.	Lack of personnel and capacity at MOHFW.	Even if policy guidelines and frameworks are developed, it is unclear to what extent NGOs will comply.	The strategy by the MOHFW on CHWs allows for criteria to be set for selection, training, certification, recruitment, and placement.

#### 9.4 Healthcare facilities

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
Delays in the progress of ongoing facility improvement projects as policy issues.	Lack of coordination between competent ministries (policy promotion team) and implementing agencies (PWD, HED). In addition, lack of technical and human resources.	Develop a comprehensive timeline (already started). Clarification of the department in charge.	The process needs to be made realistic by the engineers of the implementing agency.	The staffing of the implementing agencies is complex.	Promote systematic facility maintenance through appropriate process management. Improved access to medical facilities.
Even if the facilities (infrastructure) are in place, they may not function because the equipment and personnel that should be deployed cannot keep up.	Lack of coordination with departments in charge of equipment and human resources in policy promotion.	In cooperation with the departments in charge of equipment and human resources, create an equipment list and organization list, and make them part of the facility improvement plan.	It is desirable to create a collaboration system so that changes made by each related team are always synchronized.	The affiliations of the ministries concerned, the implementing agencies, the policy operation teams, and the people involved are diverse and complicated.	Effective use of health facilities/ Improvement of health service delivery.
Appropriate maintenance and management measures are not being taken for aging facilities and equipment.	Maintenance standards are not in place. Inadequate communication of information to competent ministries and implementing agencies.	Development of comprehensive facility maintenance standards (partially started). Clarification of the department in	The maintenance standards need to be comprehensive and provide various options to assign the right person to the right job.	Organize information on public-private partnerships, such as facilities donated by residents. Vulnerable power supply.	Clean treatment environment through proper maintenance and renewal of equipment. Provision of medical care environment.

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
		charge.			
Toilet hygiene is not maintained in a clean environment.	The customary way to use a toilet is based on flushing. Lack of awareness on the part of the facility to maintain cleanliness.	Strengthen cleaning. Staff training. The spread of dry toilets.	Budgetary measures to enable the training and expansion of cleaning staff.	Theft of supplies such as soap and toilet paper.	Improve the sanitary environment in the facility. Strengthen the infection prevention environment. Improvement of patient services.
Medical waste is not properly managed	Many hospitals do not have incinerators. They do not have consistent and proper medical waste disposal within the hospital.	Expansion of facilities such as incinerators. Make students aware of public health risks. Staff training. Strengthen the law.	It is necessary to establish more enforceable laws and regulations, and measures that can encourage or motivate the construction of facilities.	Chronic budget shortage	Improve the sanitary environment in the facility. Strengthen the infection prevention environment.

### 9.5 Medical equipment

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
Operation when procuring new medical equipment and until recovery when a problem occurs.	The operation is complicated, and many departments' speculations and interests (facilities, civil surgeons, NEMEMW&TC, DEMEW, CMSD) are intertwined.	Review of regulations and operations.	Respect for donor-implemented reform support.	Donor policy and manufacturer's intentions (cost).	Appropriate procurement plan can be properly operated, and proper maintenance can be achieved. Contribute to the improvement of the quality of medical care.

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
Lack of ability to maintain and manage medical equipment (1)	There is an overwhelming qualitative and quantitative shortage of human and material resources in NEMEMW&TC and DEMEW, responsible for the maintenance and training of medical equipment. Lack of budget makes it difficult to attract talented engineers.	The importance of maintaining medical equipment at MOHFW was recognized and budgeted. • Reduce the burden on directly-managed staff by enhancing the scope and duration of manufacturers' and distributors' warranties. Shift from in-house production to outsourcing.	Analyze the causes of a large number of permanent vacancies, review the organizational structure and operations, and consider providing incentives to raise staff awareness. The cost of procuring equipment could pressure the government's finances if manufacturers' services become more extensive.	Lack of coordination, information sharing and rules among donors and between central government and localities.	Realization of appropriate procurement and maintenance of medical equipment. Reduce the incidence of medical accidents and extend the life cycle. Raise awareness among staff. Improvement of the quality of health care.
Lack of ability to maintain and manage medical equipment (2).	Limited sharing of information and resources due to lack of a unified medical equipment management database system.	Establishment of a common system for the selection, procurement, maintenance, management, and disposal of medical equipment at the national and local levels.	Trends in decentralization need to be taken into account. It is recommended to start with paper-based ledger management.	The intrusion of a wide variety of medical equipment supports from donors. The limitations of information and resource sharing among DGs.	Cost reduction and safety improvement through medical equipment models and joint (bulk) purchasing unification. Reduce operating costs through appropriate lifecycle management.
Shortage of medical device-related engineers (BME/BMET) as a country.	Inadequate education system and educational institutions.	Study foreign countries' systems to improve related laws and educational institutions. Also, implementation of conditional scholarships.	Outflow of talented people overseas and to manufacturers.	Technical support from advanced countries, such as dispatching lecturers, is important.	Strengthen the national system for medical equipment through industry-government-academia collaboration. Creation of home-grown medical equipment manufacturers.
The problem of abandoned medical devices that cannot be repaired.	Many medical devices have not been installed or are beyond repair and have been left for a long	Cross-organizational budgeting and development of a viable improvement	Implement measures to remedy the root cause and return to the original state as soon as	Provide appropriate equipment for the facilities (human, material, and	Effective use of existing equipment and utilization of limited space.

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
	time without being moved or discarded.	plan - early implementation. Inter-facility trade.	possible.	financial) by carefully examining the specifications of the equipment used for support.	

## 9.6 Medicines

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
It takes a long time to procure medicines.	It takes time for DGHS to approve the procurement plan. The bidding process is complex. Balance with the need to ensure quality.	Flexible political decisions on a case-by-case basis, such as allowing emergency use of the COVID-19 vaccine. Review and streamline the bidding process.	Risk hedging against problems such as drug damage and cheap drugs.	Outbreak of a pandemic. The occurrence of chemical damage.	Avoiding drug stock-outs at medical facilities. Prescription of appropriate medications.
Out of stock at a healthcare facility.	Insufficient inventory control at healthcare facilities. Improper storage and prescription of medicines.	Training for medical personnel. Deployment of regular pharmacists. Digitalization of drug management systems. Redistribution of medicines among facilities.	Insufficient number of pharmacists. Establishing a management body for drug redistribution. The need for training at the facility level due to digitization.	Ad hoc response by donor agencies. Approval and distribution of new drugs.	Appropriate treatment for the patient. Prevention of chemical damage.
Medicines needed for treatment are not properly distributed to healthcare facilities.	The list of essential medicines is inappropriate.	Review the list of essential medicines which are appropriate for the current situation.	The list needs to be revised periodically. It is necessary to disseminate the revised list and provide training to health personnel.	Approval and distribution of new drugs.	Standardized use of essential drug lists will increase operational efficiency. To reduce the burden of purchasing medicines for patients. Appropriate drug supply and inventory management.

## 9.7 Service delivery

When considering the issue of inadequate service supply, it can be inferred that the lack of financial resources is a fundamental factor. In this section, the issues in the lack of financial resources are not analyzed. The issues related to service delivery are organized in five aspects: 1) inadequate hospital service functions, 2) lack of decision-making power due to the delay in decentralization, 3) incomplete free services, 4) lack of human resources to provide services, and 5) lack of participation of human resources to support services in the community. The following is a summary of the issues related to service supply.

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
Inadequate hospital service functions (e.g., low number of hospital beds per 1,000 population (0.79)).	In addition to the small number, although district-level hospitals are being established, their operation rate is poor due to insufficient deployment of medical personnel and low operational costs.	Work on improving the quality of medical care, including investing in staffing and operational costs to increase the utilization rate.	The country's health financing burden may increase.	If the number of users who need to be hospitalized increases due to insufficient health prevention, the number of hospital beds will need to be increased permanently.	Improving the quality of services.
Lack of decision-making authorities due to delay in decentralization (delay in service provision in emergencies).	The decision-making power is still concentrated in the MOHFW.	For example, a pilot program to enable local governments to hire health personnel should be implemented. Allocate emergency expenses in the annual health plan (budget application). Capacity building of MOHFW staff on decentralization	The country's health financing burden may increase.	Insufficient capacity of local government. The MOHFW staff does not have a good grasp of the current situation in rural areas.	Expand access to services for the poor. Promotion of community welfare.
Complimentary services are incomplete. (Burden on the poor and accessibility regressed).	Users have to pay a large amount of their expenses, especially for medicines and tests. Incomplete budget allocations, such as no operating costs for emergency vehicles.	Survey OOP expenses for drugs, tests, etc., and implement policies to reduce the amount of OOP expenses. Increase the percentage of annual operating expenses while reviewing SOPs for medical facilities.	The country's health financing burden may increase.	With the increase in the number of non-communicable diseases and chronic disease cases, the cost of drugs and tests is likely to increase permanently.	Expand access to services for the poor.
Lack of human	Lack of	Secure a budget	The country's	Due to	Improving the

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
resources for service provision	implementation plan of the national strategy for human resource development in health care. Medical staffing is unevenly distributed in urban areas. The hiring of nurses in the public sector had been suspended for several years.	for the development and implementation of a health workforce strategy (cost of hiring civil servants).	health financing burden may increase.	geographical factors, etc., the trained personnel are not deployed to rural areas or prescribed medical facilities.	quality of services.
Lack of participation of human resources to support services in the community.	People with bureaucratic experience, politicians, and local influential people organize health committees, etc., and the voices of the general population, women, and low caste people are not reflected.	Formulate a medium- to long-term vision for resident participation at the primary level. Include a budget for public participation and awareness in the district annual plan.	The country's health financing burden may increase.	It is important that socio-cultural barriers do not prevent residents from participating.	Expand access to services for the poor.

## 9.8 Health information system

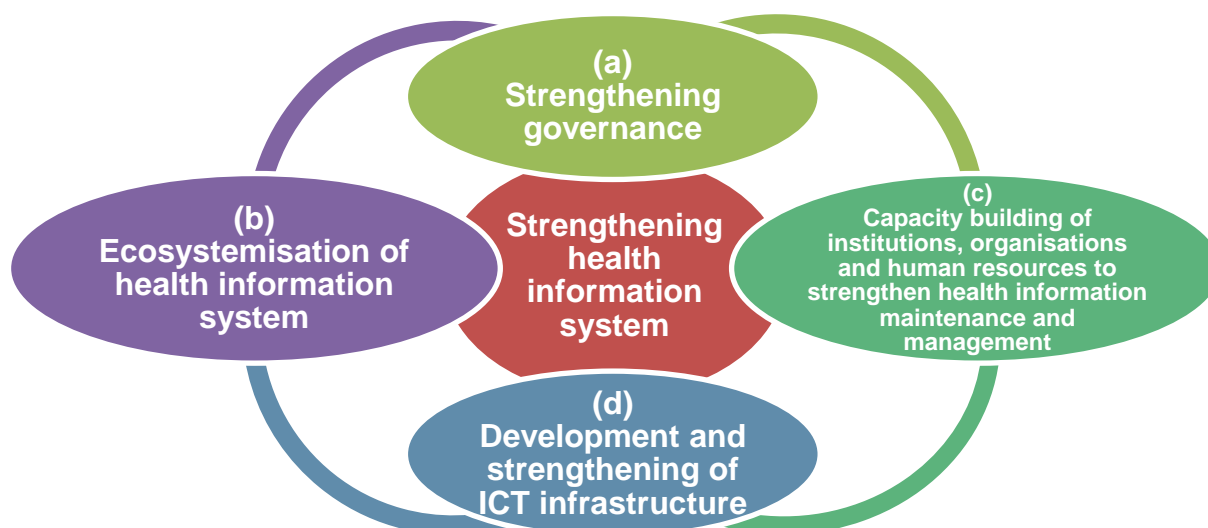
Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
Inconsistencies in health information.	There are two DHIS2 platforms in MOHFW, and patient information is duplicated. It makes it difficult to integrate health statistics information.	Analysis and selection of health information items to be integrated. Introduction of country-wide unique identifiers that identify individuals.	Consultations for consistency are underway in the two directorates and are currently being verified and analyzed.	Each directorate has its own health services and authority, and there is a stove-piped health administration structure that cannot be addressed by mere integration.	Able to aggregate and present more accurate health statistics. Reduces costs associated with health information aggregation.
Difficulty in sharing health information with the private sector and other institutions, and insufficient understanding of the actual	MOHFW mainly has jurisdiction over public healthcare facilities, while private hospitals and clinics are under their management. The primary healthcare facilities in Dhaka	Analyze and select health information to be integrated and agree with stakeholders on the minimum health information required. For the private sector,	It is necessary to analyze and select health information that is necessary under the direction of strengthening the entire health system and the future health	In private hospitals and clinics, individual patients' health information is personal information, and some private health care providers feel	A more realistic picture of the health sector can be obtained. It will be possible to allocate budgets and personnel to health services in a manner appropriate to



Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
situation.	city are within the jurisdiction of MOLGRD&C. Information management policies are different is difficult to unify them.	continue negotiations on whether it can be provided and promote digitalization to MOLGRD&C.	policy, and it is necessary to examine not only HIS but also the entire health system.	uncomfortable sharing it. Careful and persuasive explanation is needed for sharing health information.	the actual situation in each sector.
Insufficient resources (human resources and budget) for health information system development.	There is not enough budget from the government, and the demonstration, verification, initial cost, and equipment investment are dependent on support from donors, and the budget is insufficient. ICT literacy among clinic staff is also low. In addition, interest in new technologies is low, and as a result, it is difficult to develop medical personnel with ICT literacy.	It is necessary to review existing systems, determine which systems are necessary, and optimize the ICT system (Ecosystem). It is also necessary to involve the private sector and collaborate with health and medical businesses.	Donor support is needed to analyze existing systems and determine which systems are needed. Duplication of systems should be avoided as much as possible, and only those necessary for health policy planning and management should be used. The analysis mentioned above and verification, rather than system integration, can be the key to building an Ecosystem.	The MOHFW tends to be concerned only with technical validation. It is important to review health policies and planning methods to determine what is needed in the health sector, and to examine policy levels such as the extent to which health information should be managed.	Although it is unlikely that a sufficient budget will be generated for the construction and improvement of the health information system, it is expected that the current HIS operation cost will be reduced by eliminating waste. It is also expected to improve health services by improving the ICT literacy of health personnel.
There is insufficient use of health statistics information for policymaking in the health sector.	The two DHIS2 platforms in MOHFW are not integrated. It is difficult to share health information with each other due to discrepancies in the collection date of meta-information and different collection conditions. Timely health information needed for policymaking in MOHFW is insufficient in quantity and quality and cannot be used for health policymaking. It is not possible to use the information for	Organize information items on the two DHIS2 platforms and analyze and select information items that need to be integrated, focusing on information items considered important for policymaking. Unify the collection method of the selected information items. Two systems will be operated to ensure a minimum level	It takes much time to reconcile the policy policies of the two directorates within the MOHFW and to analyze and select the health information needed for these policies. Political agendas need to be taken into account more than technical verification, and consultations and agreements within MOHFW are necessary. Duplication of patient information must	Careful consultation and discussion among DGHS and DGFP are necessary for the rubbing together of policies and the analysis and selection of health information. However, due to the impact of the COVID-19, opportunities and venues for consultations among them are limited, making it difficult to hold substantive discussions. Another	If health statistical information becomes practically useful for health policy, it will be possible to optimize budget allocation to health services and improve the quality of health services themselves.

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
	health policymaking. There are a large number of information items provided by the health information, and the information is not managed to a level where it can be used for policymaking.	of quality and, in turn, attempt to aggregate, analyze, and utilize health information that can be used for policymaking.	also be taken into consideration.	bottleneck is the work overload due to the response to the COVID-19.	
Inadequate management of individual patient information and inability to follow up on prevention and treatment.	The lack of unique identifiers of residents/patients with the DGHS and DGFP and other health sector-related agencies makes it difficult to identify individual patients. Even if a patient is identified, it is difficult to follow up with adequate prevention and treatment, as the follow-up may require materials and equipment such as therapeutic and preventive drugs for various health service provisions, as well as social infrastructure for accessing health services.	Having an upazila-level identifier would be a national-level undertaking, and cooperation within the health sector, including MOHFW, as well as with other ministries is essential. On the other hand, it is possible to narrow down the scope and have a unique identifier within the scope, which can be followed up individually. In addition, substantial treatment and prevention follow-up is also possible by building cooperative relationships with stakeholders within the scope.	The difficulty differs greatly depending on whether individual patients are to be followed at the national level as a whole or whether they are to be identified by a unique identifier within a closed scope such as a community. It is important to determine whether the scope for identifying individual patients should be at the national, community, or upazila/district level, as well as to collaborate with stakeholders within the scope and determine the rules for providing health services.	Individual patient information can also be personal information. It is necessary to consider how to handle it. Primary healthcare facilities in Dhaka that are under the jurisdiction of the private sector or other organizations need to be in line with the policies of the respective institutions and organizations, and individual follow-up at the national level involves ethical difficulties. Individual preventive and curative follow-up is possible if the urgency and importance of the situation are of a scope that exceeds ethical considerations.	Within the optimal scope, prevention and treatment of individual patients can be followed. In addition, by working with stakeholders within the scope and agreeing on the content of the health services to be provided, more practical health services can be provided to each individual, which will also strengthen UHC. The ability of individual patients to manage their personal information will also improve the ethical perspective.

In developing measures to use ICT to help solve the problems of the health sector, it is essential that the following four components function equally well.



**Figure 9 1 Conceptual diagram of the four components for strengthening the health information system**

An overview of the four components is given below.

- (a) Governance and policymaking: Governance strengthening components to strengthen and maintain the country's HIS, including coordination mechanisms for the subsystems that make up the HIS, strategic and budgetary plans and policies to strengthen the HIS
- (b) Systems development and implementation: Appropriate ICT systems will be implemented for data collection and management, and the maintenance and management of these systems will be strengthened. In addition, the development will be based on open source, and an open-source community for health information system development will be developed to standardize the development of health information systems.
- (c) Capacity development of institutions, organizations, and human resources to strengthen health information maintenance and management: Using available local resources, strengthen institutional, organizational, and human resource aspects to strengthen health information maintenance and management and achieve effective and efficient workflow.
- (d) Development and enhancement of ICT infrastructure: Develop and strengthen the ICT hardware resources necessary for the series of system cycles of development, verification, and operation of health information systems. ICT infrastructure will be developed and strengthened based on social infrastructure (e.g., electricity, internet access) in the area where the health information system will be implemented.

In utilizing ICT in the health sector, it is essential to effectively and efficiently utilize the ICT resources provided for health information system strengthening and maintenance and develop these components in a balanced manner.

## 9.9 Private Sector

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
[Private healthcare facilities] Private healthcare facilities are expanding uncontrollably.	Registration and certification systems to ensure the quality of medical services are not yet in place. Weak oversight and management system by DGHS.	Develop legal and supervisory systems to register and monitor facilities that meet certain standards.	Lack of personnel and capacity of DGHS in operation.	With the increase in the number of facilities and the rising income level of the people, the importance of private healthcare facilities and the need to strengthen their supervision are expected to increase.	Improving the safety and quality of private health care services. Promote cooperation between the public and private sectors.
[Private health insurance] The industry is immature and lacks many of the prerequisites for business success.	The legal, regulatory and supervisory framework for the insurance business is not yet in place. Lack of statistical data necessary for product development and risk selection. Shortage of professional actuarial staff.	Organize priority issues and formulate strategies for the future development of the industry.	Measures to expand the public health insurance system and to improve the quality of healthcare facilities should also be considered.	Since the health insurance business involves health facilities as service providers, it is difficult to spread under circumstances where the quality of medical services cannot be ensured.	Formulation of future development strategies. Improving patient access to healthcare and reducing the economic burden. Increase in investment by private medical institutions.
[Pharmaceutical industry] Compared to the size of the industry, exports have remained small.	High production costs of finished products due to dependence on imported APIs. Existence of regulations that inhibit overseas investment and exports (e.g., restrictions on the amount of overseas remittances).	Expansion of technical support and incentives for API production. Easing of regulations that hinder foreign investment and exports.	Improvement of business disincentives such as inadequate infrastructure and complicated administrative procedures is also necessary.	India and China are losing their cost competitiveness.	Expansion of export target markets and increase in export value from API exports.
[New service] Lack of management resources (funds, human resources, knowledge) required for new businesses.	Difficulty in raising funds (e.g., high interest rates at banks, lack of business experience and collateral for startups). Mismatch between the content of education and training provided	Expansion of financial and managerial support for start-ups (e.g., the establishment of a start-up support platform with the participation	Since the support institutions for startups are concentrated in Dhaka, it is expected that some of the measures may be difficult to implement in rural areas.	Many startups have been hit by the spread of the COVID-19, and the need for short-term funding is particularly high.	Enhancement of management resources required for new businesses. Increase in the number of start-up companies. Development of startup

Key issues	Main causes (bottlenecks)	Measures	Notes on the measures	External factors	Expected results
	by educational institutions and the capabilities of human resources required by industry. Lack of knowledge, skills, and experience necessary to start a business. Policies for long-term startup development have not yet been formulated.	of a wide range of stakeholders). Education and training that emphasizes practical learning by utilizing private sector human resources and creating encounters with entrepreneurs. Formulate policies to foster startups.			ecosystems.

Based on the above analysis in the subsectors, the survey team identified the following issues as major challenges that need to be addressed.

- Service delivery: inadequate hospital service functions (insufficient number of beds, human resources, and operational costs), duplication and inefficiency of service delivery systems.
- Healthcare facilities and equipment: improper maintenance of facilities, delays in equipment procurement and maintenance, insufficient capacity and number of technicians.
- Medicines: delays in procurement, inappropriate allocation of medical supplies, stock-outs.
- Human resources for health: the shortage of nurses, inappropriate allocation of health personnel.
- Health information system: systems are in disarray with no workflow, making it difficult to share information even within the MOHFW.

The survey team identified the following needs as particularly high while considering the assistance provided by ongoing projects of JICA.

- Strengthening the referral system among healthcare facilities
- Improvement of facilities and equipment of healthcare facilities
- Appropriate inventory management of pharmaceuticals
- Strengthening of the health information system through the use of ICT

## Chapter 10 Health situation in Cox's Bazar District

Based on the results of the survey and the analysis of the Bangladesh health sector up to the previous chapter, this survey held multiple discussions with JICA since the summer of 2021 regarding the concept of new projects. Several concepts were discussed, but as mentioned in Chapter 9, it was decided to consider the formulation of projects that would address issues in the health sector with high support needs, and field surveys were conducted to explore the possibilities of assistance in the southern Chattogram Division, particularly in Cox's Bazar District. The field surveys were conducted in November and December 2021, with a literature review and interviews. The results are summarized below.

### 10.1 Overview of the target area and health situation

#### 10.1.1 Overview of Cox's Bazar District



Figure 10-1 Map of Cox's Bazar District

Cox's Bazar district is a District under the Chattogram Division. It is famous for one of the longest sandy beaches in the world (120 km long, including mudflats) and is a major tourist destination in Bangladesh. It covers an area of 2,491.86 km<sup>2</sup> and has a population of approximately 2.29 million<sup>374</sup>. During the rainy season, there is so much rainfall that it is one of the heaviest in the world. Because it is a coastal area, flooding and tidal flooding are common. Cyclones also occur from April to May and from October to November.

Nine upazilas (Cox's Bazar Sadar, Chakaria, Ramu, Kutubdia, Moheshkhali, Teknaf, Ukhiya, Pekua, and Eidgaon<sup>375</sup>) are located in the district.

In 2017, a mass exodus of the Rohingya, a Muslim minority, from the Rakhine State of neighboring Myanmar began. The United Nations High Commissioner for Refugees (UNHCR) estimates that approximately 725,000 displaced people entered Bangladesh during the first year, creating the "world's largest camp for displaced people" in Cox's Bazar District. According to UNHCR registration data as of September 2021, the population of displaced people in Cox's Bazar District is estimated at 902,947<sup>376</sup>. The camps are

concentrated in Ukhiya and Teknaf upazilas (34 camps existed as of March 2021<sup>377</sup>), with 26 camps and 5 host unions in Ukhiya upazila and 8 camps and 6 unions in Teknaf upazila. The Kutupalong camp in Ukhiya upazila

<sup>374</sup> Humanitarian Data Exchange v1.60.5 (<https://data.humdata.org/dataset/cod-ps-bgd/resource/d3ee1ccb-9efb-412f-9323-cd4dc9606f7d>). (Accessed on February 1, 2022)

<sup>375</sup> Eidgaon upazila was established in July 2021.

<sup>376</sup> WHO-Health Sector Cox's Bazar, Health Sector Bulletin #16 (July - September 2021).

<sup>377</sup> ISCG Secretariat, 2021 Joint Response Plan for the Rohingya Humanitarian Crisis.

is known as the largest camp for displaced people in the world. In these upazilas, host communities and displaced people have high social support and service needs, and the burden on the service delivery system is a major problem. It should be noted that since December 2020, the Bangladesh government has relocated the displaced people to the sand and gravel island of Bhasan Char, located about 60 km offshore from the mainland.

### **10.1.2 Health situation of the population in Cox's Bazar District**

#### **Overview**

Cox's Bazar District is one of the districts where health indicators compare poorly with the Bangladesh national average. In particular, high infant mortality rates, high fertility rates, and gender-based violence (GBV) are prominent. These problems are exacerbated by the COVID-19 pandemic and the influx of displaced people from Rakhine State in Myanmar. The total fertility rate in Cox's Bazar District was 3.2 in 2016 data, above the national average of 2.1<sup>378</sup>. The infant mortality rate was 61 per 1,000 live births compared to the national average of 47 per 1,000 live births in the MICS 2012-2013, and the rate of stunting among children under 5 years old was also higher than the national average (49.5% compared to the national average of 42%)<sup>379</sup>.

Host communities have high rates of gender-based violence (GBV), with 48% of married women experiencing violence in the Chattogram Division in a 2015 survey<sup>380</sup>. In Cox's Bazar District, one One-Stop Crisis Center (OCC) and two One-Stop Crisis Cells (one in Teknaf and one in a camp for displaced people in Ukhiya) provide GBV response services, but they fall far short of covering the needs of the community.

#### **Situation of displaced people**

The displaced population includes vulnerable groups, such as women and children, and has limited knowledge about access to health services. Low immunization coverage (less than 4%)<sup>381</sup> before the influx into Bangladesh makes displaced children vulnerable to infectious diseases. The risk of infectious diseases spreading from the camps to the host community is also often noted. In addition to cholera and other waterborne diseases, there is also a risk of dengue fever and malaria.

According to the WHO report in November 2021, there were 316 confirmed cases of acute watery diarrhea (AWD) and 111 cholera cases in both host communities and displaced people, with most cases (76%) identified in Ukhiya upazila<sup>382</sup>. Dengue cases were 92% displaced people and 8% host communities. Diphtheria was reported in 9,089 cases in camps and 246 cases in host communities.

Concerning the health of displaced people and their access to health services, a household survey conducted in 2021 for 999 households<sup>383</sup> indicated the following issues:

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<sup>378</sup> Data from the Cox's Bazar civil surgeon office. Note that according to DHS 2017-2018, the total fertility rate for the entire Chattogram Division was 2.5 (national average: 2.3).

<sup>379</sup> Data from the Cox's Bazar civil surgeon office.

<sup>380</sup> Bangladesh Bureau of Statistics, Ministry of Planning, 2015. Report on Violence Against Women (VAW) Survey 2015.

<sup>381</sup> Data from the Cox's Bazar civil surgeon office.

<sup>382</sup> Ibid.

<sup>383</sup> Rawal et al. 2021. Health problems and utilization of health services among Forcibly Displaced Myanmar Nationals in

- Women's health: complications associated with pregnancy and childbirth, GBV.
- Child health: fever, diarrhea, colds, malaria.
- Men's health: physical discomfort, HIV/AIDS, insecurity and discrimination in their lives, and insecurity due to lack of employment opportunities.
- Antenatal care: 61.2% of women had two or more antenatal care while 28.9% had none.
- Delivery: 85.2% delivered at home. In one-third of the cases, complications associated with pregnancy and childbirth were observed.
- HIV/AIDS: All were aware of HIV/AIDS, but 78.0% did not know how it is transmitted.
- Family planning: 45.2% did not.

The health situation of displaced people is not good, with inadequate access to and use of health services; knowledge on HIV/AIDS, family planning, and GBV is also lacking. A combination of factors such as home delivery practices, religious values, hesitancy to go to a healthcare facility, lack of midwives at the nearest health facility, closure of facilities in the camp, and concerns about cost have impeded access to maternal and child health services. In addition to the development of human resources and facilities, there is a need for health education based on cultural and religious considerations.

## 10.2 Healthcare facilities in Cox's Bazar District

The number of healthcare facilities in Cox's Bazar District is shown in Table 10-1.

**Table 10-1 Healthcare facilities in Cox's Bazar District<sup>384</sup>**

Location	Facility type	Number	Total
<b>Host communities</b>	District hospital	1	266
	Upazila health complex	7	
	St. Martin's hospital	1	
	TB clinic	1	
	Union sub-center (USC)	13	
	Union health and family welfare center (UHFWC)	49	
	Mother and child welfare center (MCWC)	1	
	Community clinic (CC)	193	
<b>Camps for displaced people</b>	Health post	89	178
	Primary health care center	42	
	Secondary health facility	4	
	Diarrhea treatment center	1	
	Women friendly space (WFS)	29	
	Severe acute respiratory infection isolation and treatment center (SARI ITC)	13	

The distribution of healthcare facilities by upazila is as follows.

Bangladesh. Global Health Research and Policy (2021) 6:39.

<sup>384</sup> Data from the Cox's Bazar civil surgeon office.



**Table 10-2 Overview of healthcare facilities by upazila<sup>385</sup>**

Upazila (population in the host community)	Healthcare facility
Cox's Bazar Sadar (459,082)	54 facilities (district hospital, TB clinics, medical college hospitals, upazila health complexes (UzHC), UHFWCs, USCs, CCs, hospitals and clinics run by NGOs)
Chakaria (474,465)	65 facilities (UzHC, UHFWCs, USCs, CCs, hospitals and clinics run by NGOs)
Ramu (266,640)	42 facilities (UzHC, UHFWCs, USCs, CCs, hospitals and clinics run by NGOs)
Kutubdia (125,279)	22 facilities (UzHC, UHFWCs, USCs, CCs, hospitals and clinics run by NGOs)
Moheshkhali (321,218)	40 facilities (UzHC, UHFWCs, USCs, CCs)
Teknaf (264,389)	24 facilities (UzHC, UHFWCs, UHCs, CCs, hospitals and clinics un by NGOs)
Ukhiya (207,379)	24 facilities (UzHC, UHFWCs, USCs, CCs)
Pekua (171,538)	22 facilities (UzHC, UHFWCs, USCs, CCs)

Although the ratio of the number of facilities is generally in line with the ratio of the host community population, the number of facilities is not sufficient to meet the needs of the host community and the displaced people, considering the displaced people of nearly 1 million as mentioned above and their current concentration in Ukhiya and Teknaf upazilas. In addition, as discussed below, the main healthcare facilities have problems with inadequate infrastructure, equipment, and human resources, making it difficult to say that adequate services are provided.

### 10.3 Situation of major healthcare facilities

The situation of healthcare facilities visited during the field survey conducted from November to December 2021 and those for which data was collected at the civil surgeon office is summarized below.

#### 10.3.1 Cox's Bazar Sadar District Hospital

##### Overview

The Cox's Bazar Sadar District Hospital is a general hospital that provides secondary health care services in the district and is used by both host communities and displaced people. According to the refugee health unit of the district hospital, an average of 800 to 1,000 displaced people per month are referred to the district hospital mainly from health posts and hospitals in the camps. Although the hospital has 250 beds, it is overcrowded with more than 500 inpatients per day, and patients without beds are forced to sleep on mattresses and sheets on the floor. The number of outpatients averages 731 per day.

According to the operational plan for Health and Gender Support in Cox's Bazar District (January 2020 - January 2023), the district hospital plans to strengthen its response to the ESP and gender-based violence (GBV)<sup>386</sup>, including infrastructure improvements such as safe water and sanitation facilities, electricity supply,

<sup>385</sup> Ibid.

<sup>386</sup> Specifically, maternal and newborn health, adolescent health, nutrition, diagnosis and treatment of infectious diseases, emergency, mental health, behavior change communication, treatment for sexual harm, DNA testing, counseling, and strengthening interdepartmental collaboration.

and facility renovations, and the provision of medical equipment and supplies are urgently needed. The details of development partner support provided to the district hospital are shown in "Annex 1: Assistance by development partners for Cox's Bazar Sadar District Hospital".



Inside the district hospital

### **Medical equipment**

Diagnostic equipment and devices such as incubators, microscopes, colorimeters, and glucometers and basic equipment such as stethoscopes, scales, thermometers, and blood pressure monitors were lacking. Table 10-3 details the equipment problems found in the field survey.

**Table 10-3 Equipment issues at the district hospital<sup>387</sup>**

<b>Equipment</b>	<b>Details</b>	<b>Number</b>	<b>Problem</b>
Electrolyte analyzer	Mod: Eaylyte Plus	1	Not working properly
Bio Chemistry Analyzer	Mod: Haemolyzer 3000	2	Not working properly
USG Machine	Mod: Sonalisa32, Mod: DP-7, Landwind, F-37	4	Not working properly
Color doppler echo	Mod: F-37 Hitachi Aluka	1	Not work at all
Diathermy machine	Mod: Encore, Alsalom and Valylab	6	Problem in the diathermy cord and circuit
Pulse oximeter	Mod: Accuro and Skytron	5	No reading is visible, cable damaged
ENT Operating Microscope	Mod: Evaluation XR6 SEILER	1	Problem in light
Pt. Monitor	Mod. MEK Korea, G3C	3	No reading appears
ICU Ventilator	Mod: Savina 300 Drager, PB 840, eVolution	3	Not working properly
ECG Machine	Mod: BPL, E care, Seiler	6	Pt. cable and circuit problem
Colposcope, Luviva Advanced Cervical Scan	Mod: 13500, USA	1	Not working properly
CCU Monitor	-	8	Not working

<sup>387</sup> Data from the Cox's Bazar civil surgeon office.

Equipment for advanced treatment and testing was found to be inoperable. One biomedical engineer from IOM is affected to the district hospital to maintain the medical equipment.

### **Human resources**

According to data from the civil surgeon office, health personnel at the district hospital are assigned as follows. In the MOHFW Facility Registry, the vacancy rate is 66.74%<sup>388</sup>.

**Table 10-4 Health personnel in the district hospital<sup>389</sup>**

Post	Sanction	In place	Vacant
Civil Surgeon	1	1	0
Deputy Director (Family Planning)	1	1	0
Upazila Health & Family Planning Officer (UH&FPO)	1	1	0
Medical Officer - clinic	1	1	0
Medical Officer - maternal and child health and family planning	1	0	1
Upazila Family Planning Officer	1	1	0
Health Inspector	3	3	0
Assistant Health Inspector	8	8	0
Family Planning Inspector	10	10	0
Gyne Consultant	2	1	1
Pediatric Consultant	2	1	1
Consultant Anesthesia	2	1	1
Family Welfare Visitor	8	7	1
Medical Officer (at UHFWC level)	2	2	0
Sub-Assistant Community Medical Officer (SACMO) (Health)	10	3	7
SACMO (Family Planning)	7	7	0
Health Assistant	40	32	8
Family Welfare Assistant	44	28	16
Family Planning Volunteer	17	0	17

The availability of human resources with the necessary skills has always been a major challenge in Cox's Bazar District. In addition, as shown in Table 10-4, there are many vacant staff positions at the field level. Compounding the shortage in health personnel is the problem of inadequate skill mix, which affects the provision of health services. The desired division of roles and collaboration between different professions cannot be achieved, and services are not adequately provided. Although district hospital has increased the number of beds to meet patient demand, they have been slow to secure the human resources needed to meet the increased number of beds.

### **Medicines**

One hundred forty-seven medicines and medical supplies are available at the district hospital. Shortages of several drugs were observed due to patient overload. Procurement, storage, and inventory management are not

<sup>388</sup> MOHFW, Facility Registry ([http://facilityregistry.dghs.gov.bd/hrm\\_status.php?org\\_code=10000922](http://facilityregistry.dghs.gov.bd/hrm_status.php?org_code=10000922)). (Accessed on December 25, 2021).

<sup>389</sup> Data from the Cox's Bazar civil surgeon office.

adequate, and some frequently used drugs, such as antibiotics and dermatitis treatments, were not in stock. The list of medicines and medical supplies is updated monthly, but there is no established procedure for updating the list. In addition, there is no qualified pharmacist assigned to the hospital.

The hospital has a pharmacy for outpatient operated by a pharmaceutical distributor (M/S Alam Medical Hall).



Outpatient pharmacy in the district hospital

### 10.3.2 Ramu UzHC

#### Overview

The Ramu UzHC has 75 beds and provides maternal and child health (including obstetric emergencies), pediatrics, immunizations, nutrition, adolescent health, treatment of infectious and sexually transmitted diseases, a special newborn care unit (SCANU), and cervical cancer screening services. According to the latest Health Bulletin for Ramu upazila<sup>390</sup>, 1,570 minor surgeries were performed from January to November 2021.

Handwashing facilities have been installed at the entrance of the UzHC with the support of USAID.



Handwashing facilities at the hospital entrance

<sup>390</sup> Ramu UzHC, Health Bulletin (January - November 2021).

Electricity is supplied by National Grids, but solar power is also available as an alternative power source. Water is supplied by a pipeline (a tube well is available as an alternative water source). Toilets and a waste management facility (pit) are installed.

The status of medical equipment is as follows.

**Table 10-5 Medical equipment at Ramu UzHC<sup>391</sup>**

Equipment	No. of equipment (total)	No. of functioning equipment	No. of equipment that can be repaired
Ambulance	2	1	1
Anesthesia machine	1	1	0
Autoclave	1	1	0
Defibrillator	0	0	0
Diathermy	1	1	0
ECG	1	1	0
Endoscopy	0	0	0
Microscope	2	2	0
X-ray	1	1	0
Ventilator	0	0	0
CT scan	0	0	0
MRI	0	0	0
Ultrasonogram	1	1	0

Ramu UzHC does not have skilled technicians and has maintenance challenges.

### **Human resources**

The MOHFW Facility Registry shows that the vacancy rate in Ramu UzHC is 39.20%<sup>392</sup>. According to the latest Health Bulletin of Ramu UzHC, the vacancy rate is 37.50% for medical officers, 38.63% for field staff, 57.14% for medical technicians, and 45.16% for nurses, with a particularly high vacancy rate for medical technicians<sup>393</sup>. The challenge is the lack of skilled technicians for X-ray and ultrasound examinations and the reliance on donor funding to hire support staff such as cleaners and night security guards.

### **Medicines and medical equipment**

According to the UH&FPO, there is a shortage of drugs for diabetes, cardiac disease, and hypercholesterolemia. Also missing are blood pressure monitors, blood glucose meters, stethoscopes, and scales.

<sup>391</sup> Ibid.

<sup>392</sup> MOHFW, Facility Registry ([http://facilityregistry.dghs.gov.bd/hrm\\_status.php?org\\_code=10000922](http://facilityregistry.dghs.gov.bd/hrm_status.php?org_code=10000922)). (Accessed on December 25, 2021).

<sup>393</sup> Ramu UzHC, Health Bulletin (January - November 2021).

### **10.3.3 Ukhiya UzHC**

The Ukhiya UzHC has 30 beds and provides maternal and child health (including obstetric emergencies), pediatrics, immunizations, nutrition, adolescent health, treatment of infectious and sexually transmitted diseases, SCANU, and cervical cancer screening services. Counseling and mental health services are also provided to the growing number of displaced people. According to the latest Health Bulletin for Ukhiya upazila, 92,030 outpatients, 32,016 emergency patients, and 9,539 inpatients from January to November 2021<sup>394</sup>.

Electricity is supplied by National Grid, but a diesel generator is available as an alternative power source. Water is supplied by a pipeline (a tube well is installed as an alternative water source). Toilets and a waste management facility are installed.

The UzHC lacks diagnostic equipment and devices such as microscopes, blood glucose meters, and only one X-ray machine available. The challenge is that the diagnostic capacity is not adequate to meet the number of patients.

The facility has been allocated 20 civil service medical personnel posts, but the number of assigned positions is only five. According to the MOHFW Facility Registry, the vacancy rate is 57.81%<sup>395</sup>, meaning more than half of the posts are vacant. According to the latest Health Bulletin of the UzHC, the vacancy rate is 80.00% for medical officers, 39.47% for field staff, 28.57% for medical technicians, and 66.66% for nurses<sup>396</sup>, indicating a high vacancy rate for medical officers and nurses.

### **10.3.4 Teknaf UzHC**

The Teknaf UzHC is equipped with 30 beds. It is located away from the main camps for displaced people and is relatively little used by displaced people. Like other UzHCs, it provides maternal and child health (including obstetric emergencies), pediatrics, immunizations, nutrition, adolescent health, treatment of infectious and sexually transmitted diseases, SCANU, and cervical cancer screening services. According to the latest Health Bulletin for Teknaf upazila, there were 73,796 outpatients, 20,671 emergency patients, and 9,595 inpatients from January through November 2021<sup>397</sup>.

Electricity is supplied by National Grid, but a diesel generator is available as an alternative power source. Water is supplied by a pipeline (a tube well is installed as an alternative water source). Toilets and a waste management facility (pit) are installed. Diagnostic equipment and devices such as microscopes and blood glucose meters are in short supply, and diagnostic capacity is insufficient to meet the number of patients.

The MOHFW Facility Registry shows a vacancy rate of 57.14%<sup>398</sup>, with more than half of the posts vacant. According to the latest Health Bulletin of the Teknaf upazila, the vacancy rate is 60.00% for medical officers,

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<sup>394</sup> Ukhiya UzHC, Health Bulletin (January - November 2021).

<sup>395</sup> MOHFW, Facility Registry ([http://facilityregistry.dghs.gov.bd/hrm\\_status.php?org\\_code=10000922](http://facilityregistry.dghs.gov.bd/hrm_status.php?org_code=10000922)). (Accessed on December 25, 2021).

<sup>396</sup> Ukhiya UzHC, Health Bulletin (January - November 2021).

<sup>397</sup> Teknaf UzHC, Health Bulletin (January - November 2021).

<sup>398</sup> MOHFW, Facility Registry ([http://facilityregistry.dghs.gov.bd/hrm\\_status.php?org\\_code=10000922](http://facilityregistry.dghs.gov.bd/hrm_status.php?org_code=10000922)). (Accessed on December 25, 2021).

37.25% for field staff, 62.50% for medical technicians, and 63.88% for nurses<sup>399</sup>; the high vacancy rate for medical officers, nurses, and medical technicians affects the service provided by the facility.

### 10.3.5 Other UzHCs (Chakaria, Pekua, Moheshkhali, Kutubdia)

Table 10-6 summarizes the general situation of other UzHCs.

**Table 10-6 Overview of Chakaria, Pekua, Moheshkhali, and Kutubdia UzHCs  
(Data from January to November 2021)<sup>400</sup>**

UzHC	No. of beds)	No. of patients	Equipment
Chakaria	50	Outpatient: 115,457 Emergency: 41,544 Inpatient: 16,066	Anesthesia machines (1 of 2), autoclaves (3 of 4), microscopes (2 of 5), ultrasound machines (1 of 3) are available. Lack of blood glucose meters and scales.
Pekua	31	Outpatient: 131,208 Emergency: 9,710 Inpatient: 6,108	Ambulance (1 of 2) available. No defibrillator, ultrasound equipment, ventilator.
Moheshkhali	50	Outpatient: 78,197 Emergency: 24,839 Inpatient: 16,034	X-ray equipment is out of order. No defibrillator, ultrasound equipment, ventilator.
Kutubdia	50	Outpatient: 54,932 Emergency: 7,583 Inpatient: 6,487	Only one anesthesia machine. Ambulances (1 of 2), electrocardiographs (2 of 3), and microscopes (1 of 2) are available. No defibrillator, ultrasound equipment, ventilator.

### 10.3.6 Community clinics

The number of community clinics in Cox's Bazar District by upazila is shown below. See "Annex 2: List of Community Clinics in Cox's Bazar District " for a list including CC names.

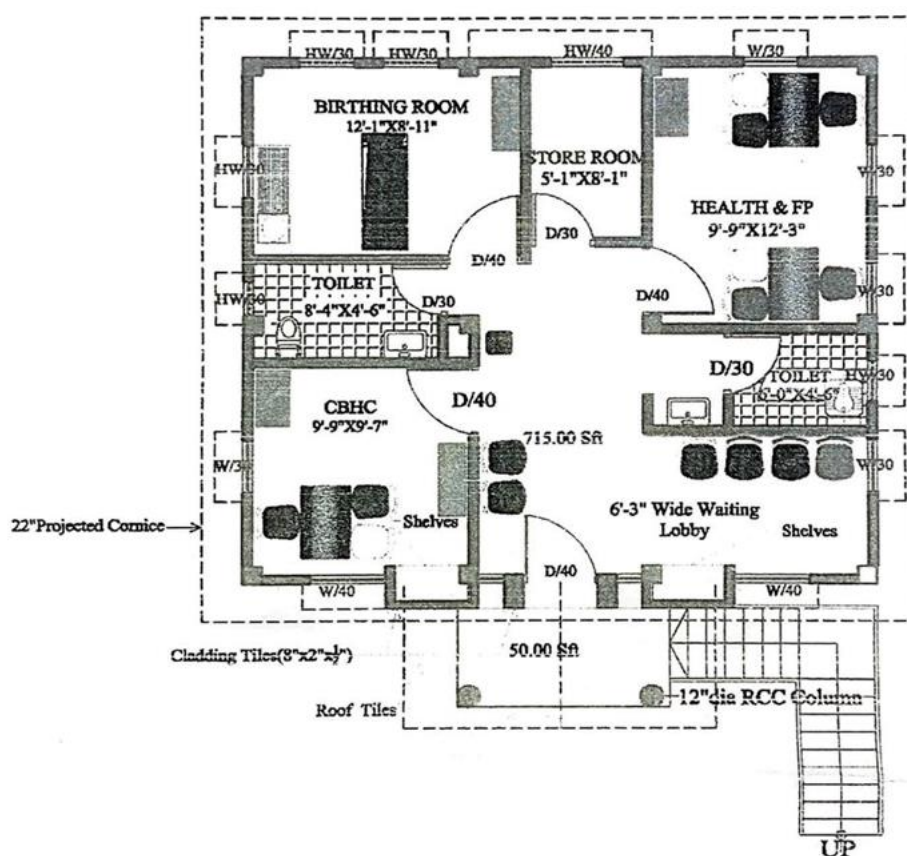
<sup>399</sup> Teknaf UzHC, Health Bulletin (January - November 2021).

<sup>400</sup> Chakaria UzHC, Health Bulletin (January - November 2021), Pekua UzHC, Health Bulletin (January - November 2021), Moheshkhali UzHC, Health Bulletin (January - November 2021) and Kutubdia UzHC, Health Bulletin (January - November 2021).

Table 10-7 CCs in Cox's Bazar District<sup>401</sup>

Upazila	No. of CCs
Cox's Bazar Sadar	29
Chakaria	45
Ramu	28
Kutubdia	12
Moheshkhali	29
Teknaf	17
Ukhiya	17
Pekua	16
<b>Total</b>	<b>193</b>

The International Organization for Migration (IOM) plans to rebuild 116 of the 193 CCs (Cox's Bazar Sadar upazila: 19, Chakaria upazila: 14, Ramu upazila: 18, Kutubdia upazila: 12, Moheshkhali upazila: 18, Teknaf upazila: 8, Ukhiya upazila: 17, Pekua upazila: 10). The UH&FPOs determined the areas to be supported by IOM from CCs with poor facility conditions or areas vulnerable to cyclone damage<sup>402</sup>. Rehabilitation will be implemented with the support of the World Bank's Health and Gender Support Project, and IOM will initiate a bidding process. The reconstruction is scheduled to be completed in December 2023. As of December 2021, construction had not yet started. The CC will be reconstructed according to the following new drawing<sup>403</sup>.



New drawing for CC

<sup>401</sup> Data from the Cox's Bazar civil surgeon office.

<sup>402</sup> Interview with the Cox's Bazar civil surgeon office.

<sup>403</sup> Ibid.



As shown in Annex 2, JICA supports the renovation of some of the CCs in the district through the Maternal, Neonatal and Child Health and Health System Improvement Project. No other donors plan to renovate or reconstruct CCs. However, there are some CCs not subject to IOM renovation but in need of assistance due to their deteriorating condition (the photos below are examples).



After the COVID-19 outbreak, temporary assistance for water supply and sanitation facilities in CCs has been provided by NGOs. Photos of the water supply system are shown below. The water and sanitation facilities in CCs in Cox's Bazar District are generally weak, which is one of the challenges.



**Tecchi Para CC (Chakaria upazila)**



**Azam Nagar CC (Chakaria upazila)**

According to the Cox's Bazar civil surgeon, the CCs in Cox's Bazar District have the following problems related to land management.

- Legal documents (deed) are not available at all CCs across the district.
- Legally, five decimals (about 202.5 m<sup>2</sup>) of land are required for a CC, but it is less than that in many cases.
- According to the right-of-way records (Dag / Khatian), a CC is supposed to exist, but in reality, there

are lands where there is no CC.

- Land boundaries are unclear.

#### 10.4 Referral system

The lack of well-functioning referrals in the Bangladesh health sector is seen as one of the major challenges to efficient use of limited healthcare resources and to improve the quality of health services. The 4<sup>th</sup> HPNSP lists one of its 10 strategies "rolling out an upgraded Essential Services Package (ESP) with greater functional coordination of services at the field level and a functional referral system."<sup>404</sup> The MOHFW, development partners, and researchers have analyzed referrals, and the challenges generally identified are as follows.

**Table 10-8 Referral issues in the Bangladesh health sector<sup>405</sup>**

Category	Problems
Referral criteria and system	<ul style="list-style-type: none"> <li>• There are no referral criteria to guide healthcare providers in referring patients, resulting in unnecessary referrals and delays in referrals.</li> <li>• It is not clear where responsibility lies for the death of a patient that occurs on the way to referral centers.</li> <li>• Referrals are made without the necessary tests and diagnoses being performed, which lengthen the length of the patient's stay at the referring healthcare facility.</li> </ul>
Self-referral	<ul style="list-style-type: none"> <li>• Many patients visit from one level to another to receive better service.</li> </ul>
Communication	<ul style="list-style-type: none"> <li>• Referrals of patients without prior appointments cause unnecessary crowding in tertiary care facilities.</li> <li>• Some healthcare facilities lack communication tools.</li> <li>• Feedback system after patient referrals (counter-referrals) is poor.</li> </ul>
Resources	<ul style="list-style-type: none"> <li>• Shortage of medical personnel at all levels of health care facilities.</li> <li>• Lack of medical equipment and maintenance.</li> </ul>
Transport	<ul style="list-style-type: none"> <li>• Ambulances are not consistently used between healthcare facilities.</li> <li>• Ambulances are not equipped with the necessary life support medical equipment.</li> </ul>

In some areas, such as maternal and child health and at the community level, referral standards have been developed, and efforts are actively underway to make the referral system work, but there are no national referral standards or guidelines that all health professionals can rely on, and there is no structured referral system in place.

#### **Referral system for displaced people**

In Cox's Bazar District, unnecessary and inappropriate referrals have also resulted in patient overcrowding at some UzHCs and Cox's Bazar Sadar District Hospital, as mentioned above. The influx of displaced people from Rakhine State, Myanmar, has made the problem even more serious and complicated. However, Standard Operating Procedures (SOPs)<sup>406</sup> were approved in July 2018 for the referral of displaced people. The SOPs

<sup>404</sup> MOHFW, 2017. Program Implementation Plan (PIP), 4th HPNSP.

<sup>405</sup> 4<sup>th</sup> HPNSP, The World Bank, 2020. Project Appraisal Document for Health and Gender Support Project for Cox's Bazar District., Adams et al. 2020. Modelling improved efficiency in healthcare referral systems for the urban poor using a geo-referenced health facility data: the case of Sylhet City Corporation, Based on Bangladesh, BMC Public Health (2020) 20:1476, Ahasan et al. 2021. Referral norms for the New Normal, J Medicine 2020; 22: 51-56, etc.

<sup>406</sup> Standard Operating Procedures for Secondary and Tertiary Medical Referral Cases of Forcibly Displaced Myanmar Nationals, 2018.

outline the roles and responsibilities of health personnel in providing primary health care services in the camp and the criteria and procedures for referral to secondary and tertiary healthcare facilities. The SOPs define Ukhiya UzHC, Teknaf UzHC, MSF clinic in Kutupalong camp, and field hospitals as primary referral hospitals. The Cox's Bazar Sadar District Hospital, the eye hospital in the district, and the Hope Foundation hospital are secondary referral hospitals. The Chattogram Medical College Hospital and the specialized hospitals in Chattogram District are tertiary referral hospitals. It also stipulates that Ukhiya UzHC, Teknaf UzHC, and Cox's Bazar Sadar District Hospital outside the camps have a referral committee to determine whether or not a referral can be made, except in emergency cases.

In addition, if the referral mechanism is not fully functional or in case of an emergency, the UHNCR and IOM have established the medical referrals for acute life-threatening conditions (MRALC) mechanism<sup>407</sup> to provide individualized support to referrals when life-threatening cases occur in their respective areas of responsibility. At the time of the December 2021 field survey, the SOPs for referrals of displaced people were being discussed for revision. It was said that the MRALC mechanism would be integrated into the revised SOPs in the future.

### **10.5 Health service delivery in Bhasan Char**

The Ashrayan Project (Ashrayan-3) was announced to build 100,000 housing units on Bhasan Char and to relocate 100,000 displaced people from the camps in Cox's Bazar District to the island, with the cooperation of the Bangladesh Navy to develop island infrastructure. The relocation of displaced people began in December 2020, and as of January 31, 2022, the number of displaced people relocated to Bhasan Char was 17,649<sup>408</sup>. Although UN agencies were not initially involved in the relocation program, the Government of Bangladesh and UNHCR signed an MOU in October 2021, ensuring UN involvement on Bhasan Char for humanitarian assistance to displaced people. The UNHCR will provide services and protection to displaced people relocated to the island.

On Bhasan Char Island, a 20-bed hospital is operated by the Bangladesh government. Staff members provide services in two shifts but are not available during certain times and cannot provide services continuously. Another issue is that the hospital does not have a fully established service delivery system, as staff members are temporarily rotated to the hospital and not formally assigned. In the future, the hospital will provide outpatient, emergency, inpatient, maternal health, including normal delivery and cesarean section, newborn and child health, sexual and reproductive health, uterine cancer screening, mental health and psychosocial support, emergency transport, x-ray and pathology, surgery, and referrals for displaced people requiring more advanced treatment<sup>409</sup>. There is a need for medical equipment and funding needs for referrals using ships.

As discussed below, a system for comprehensive and continuous service provision by NGOs and UN

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<sup>407</sup> Interviews with the MOHFW Coordination Cell in Cox's Bazar District, and the Refugee Relief and Repatriation Commissioner.

<sup>408</sup> Joint Government of Bangladesh - UNHCR Population map as of 31 January 2022.

<sup>409</sup> Ibid.

agencies has not yet been established, as in the camps for displaced people in Cox's Bazar District. Therefore, when advanced medical treatment is required, displaced people must be transported by boat to healthcare facilities on the mainland. According to information from the refugee relief and repatriation commissioner (RRRC), referrals are expected to be made from Bhasan Char to the nearest Noakhali District Hospital or Chattogram District Hospital.

### **10.6 Issues identified in the field survey**

Based on the field survey results up to 10.5, the survey team identified the following issues in the health sector in Cox's Bazar District.

- Healthcare facilities and medical equipment are inadequately maintained. It is not uncommon to find facilities whose infrastructure remains unrehabilitated after natural disasters such as cyclones and floods or that have not expanded sufficiently to accommodate population growth and the influx of displaced people. As for medical equipment, while shortages are a problem, there are also many cases where equipment has broken down after installation and is no longer in use.
- Stock-outs of pharmaceutical products are observed. There is a shortage of pharmacists in the district hospital and UzHCs. Procurement of pharmaceuticals in anticipation of demand, proper storage and inventory management are challenges. Although the list of medicines and supplies is updated, procedures for updating the list have not been established, which does not help inventory management. Stock-outs of frequently used antibiotics and non-infectious disease medicines are also observed at many facilities.
- The number of patients at the district hospital and the UzHCs exceeds the facility's capacity. In addition to the increase in patients due to population growth and aging, there is constant overcrowding due to the lack of structured referrals from the community level and from lower-level healthcare facilities, and the large number of patients (both host communities and displaced people) who come directly to the district hospital and the UzHCs.
- The shortage of health personnel is serious. Vacancies relative to the assigned posts are conspicuous at the district hospital and UzHCs. At the UzHC level, it is not uncommon for the vacancy rate to exceed 60%. The skill mix of doctors, nurses, and technicians at all facilities is inadequate, and the infrastructure to provide services of a certain level of quality is not in place. In addition to the shortage of health personnel, there is also a shortage of cleaners, security guards, and other support staff, many of whom are dependent on donor support for their employment.
- In response to the current catchment population and projected future population growth, there is a critical need to identify the number and capacity of healthcare facilities and necessary equipment and personnel at each level and develop a service delivery system.

### **10.7 Support from development partners**

As indicated in 10.6, the health sector in Cox's Bazar District faces significant challenges. A number of development partners implement health sector support activities in both camps for displaced people and host

communities to address the humanitarian crisis caused by the influx of displaced people.

### **10.7.1 Overview**

Under the leadership of the Government of Bangladesh, international and bilateral government agencies, international and local NGOs, and other organizations involved in humanitarian assistance developed the 2021 Joint Response Plan (JRP) for the Rohingya humanitarian crisis<sup>410</sup>. The organizations implement funding and assistance activities based on the JRP to address the needs of displaced people and reduce the impact on host communities in Ukhiya and Teknaf upazilas. In the health sector, the following objectives have been set.

1. Improve equitable access to and utilization of life-saving and comprehensive primary and secondary health services for all crisis-affected populations.
2. Ensure infection prevention and control measures and timely response to all communicable diseases with outbreak potential, including COVID-19, and preparation for and response to other health emergencies, including during the monsoon and cyclone seasons.
3. Encourage healthy living and improve health-seeking behaviors and utilization of essential service packages by countering misinformation and supporting community engagement.
4. Ensure robust health sector coordination, partner collaboration, information management and monitoring, and technical leadership to achieve rational, standardized and accountable health service delivery.

Specifically, for the displaced people, the following measures are indicated to be focused: continued focus on COVID-19 prevention and countermeasures; strengthening of comprehensive and specialized service delivery and referral systems; improvement of emergency medical services; promotion of community-level awareness and community participation; provision of information and monitoring of vaccinations, including COVID-19, prevention and treatment of NCDs. For the host communities in Ukhiya and Teknaf upazilas, the plan will promote availability and access to essential service packages at the district, upazila, and union levels, community participation, care for those infected with COVID-19, services free of charge to the host community in camps and at nearby camp facilities, sexual and reproductive services, and referral system. The JRP will be prepared for 2022, and the agencies plan to continue to respond.

The following table shows the types and number of development partners and local organizations in the health sector active in Cox's Bazar District as of December 2021.

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<sup>410</sup> ISCG Secretariat, 2021 Joint Response Plan for the Rohingya Humanitarian Crisis.

**Table 10-9 Development partners and local organizations working in the health sector in Cox's Bazar District<sup>411</sup>**

Classification	Host communities	Camps for displaced people
UN agency	5	5
Red Cross and Red Crescent Society	1	1
Bilateral and multilateral donors	20	20
International NGO	31	31
National NGOs	21	21
Academic institution	2	2
Others	1	1
<b>Total</b>	<b>81</b>	<b>81</b>

As Table 10-9 shows, all development partners and local organizations implement activities for both host communities and camps for displaced people. A list of all 81 organizations is presented in Annex 3: List of Development Partners and Bangladesh Organization in Cox's Bazar District.

The support of the various agencies in the health sector in Cox's Bazar District is implemented in accordance with the following coordination mechanism<sup>412</sup>.

- WHO, together with the MOHFW and the Refugee Relief and Repatriation Commissioner (RRRC), continues to provide leadership, coordination, supportive supervision and collaborative support to all health partners and sectors.
- District level: a Strategic Advisory Group (SAG), with representatives from the MOHFW coordination center, the RRRC health unit, health sector working group coordinators, UN, international and national NGOs, serves as an advisory to the health sector coordinator. Seven working groups<sup>413</sup> in the sector coordinate different health activities.
- Camp Level: the Camp Health Focal Points (CHFPPs), supported by IOM and UNHCR, represent health sector coordination at field level and maintain linkages to Cox's Bazar through field coordinators.
- Health Sector Strategic Plan (HSSP) 2022-2023 and Health Sector Referral SOP: The two documents are currently being reviewed and undergoing the necessary administrative process and will be ready in Q1 2022.
- Accountability to Affected Population (AAP) framework: Developed in August 2021 as a support document for health sector support organizations to mainstream the AAP.
- Health facility monitoring: Quarterly health facility monitoring assessment is conducted with the assistance of the community health focal points (CHFPPs).

In the following, some of the programs/projects being implemented by the development partner are summarized<sup>414</sup>.

<sup>411</sup> Data from the Cox's Bazar civil surgeon office.

<sup>412</sup> WHO-Health Sector Cox's Bazar, Health Sector Bulletin #16 (July - September 2021).

<sup>413</sup> Sexual and Reproductive Health (SRH) WG, Mental Health and Psychosocial Support (MHPSS) WG, Emergency Preparedness and Response (EPR) WG, Community Health Workers (CHW) WG, Epidemiology WG, Infection Prevention Control WG, Case Management WG

<sup>414</sup> Includes projects completed in December 2021, when the field survey was conducted.

### **10.7.2 Emergency Department Support Project in Cox's Bazar District Hospital, International Committee of the Red Cross (ICRC)**

The International Committee of the Red Cross (ICRC) is implementing the Emergency Department Support (EDS) project, which aims to provide emergency medical services and strengthen the management capacity of the emergency department at Cox's Bazar District Hospital starting July 2019. The project was originally scheduled to run for three years but was extended in August 2021 and is now scheduled to run through 2023. The project aims to reduce patient deaths by providing emergency medical care in line with international standards, bearing in mind that emergency medical care in Bangladesh is still in its infancy, that the lack of beds in district hospitals makes it difficult to serve patients who are eligible for emergency medical care, and that this benefits both the displaced people and the host community. The following assistance is provided<sup>415</sup>:

- Renovation and improvement of the emergency department to improve capacity: 10-bed isolation wing, treatment rooms, emergency room, infection control room, training rooms, and storage facilities.
- Support for medicines, medical equipment, and supplies needed for emergency medical care
- Incentive payments to emergency department medical officers, nurses, and support personnel (cleaners, security guards)
- Training: capacity building on basic emergency care, initial care of trauma patients, emergency lifesaving, mass casualty accident response, manual handling, clinical nursing.
- Triage, one-way patient flow procedure maintenance.

In addition, COVID-19 response includes implementation of an emergency response plan, modification of the influenza patient response entrance/area for COVID-19 patients, volunteer medical care training for COVID-19 patients who do not meet admission criteria and the establishment of a treatment room outside the emergency department, a five-bed high care unit in the emergency department, patient screening, and support for personal protective equipment (PPE).

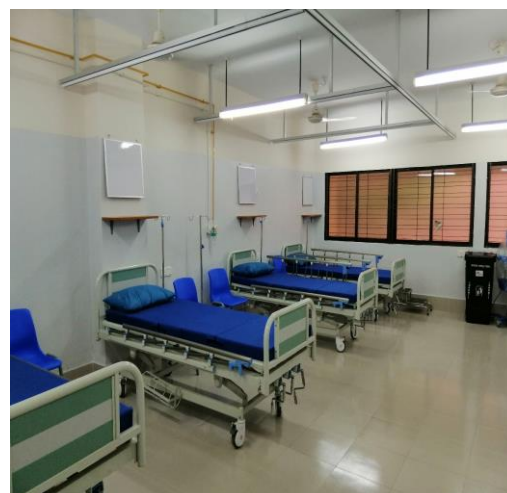
These overall enhancements to the facilities, equipment, and personnel of the emergency department have facilitated the care of patients in need of emergency care, reduced unnecessary hospitalizations, and alleviated patient overcrowding at the district hospital, according to the personnel. Continued support for the emergency department and strengthening of cooperation with the MOHFW will be provided to make the emergency department of the district hospital a model for "emergency medical centers" in Bangladesh.

Below is the status of improvements to the observation room and procedure station, as obtained from the district hospital staff.

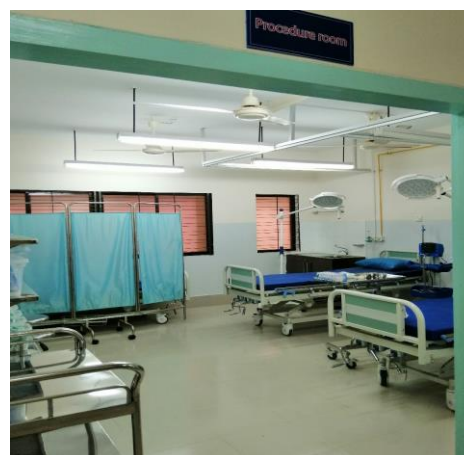
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<sup>415</sup> Interviews with ICRC staff and resource persons at the district hospital.

## Observation Room Before After



## Procedure station Before After



It is noted that, toward the end of the project in 2023, it is necessary to improve the procurement of pharmaceuticals, address human resource shortages, and improve the standard of care in non-emergency departments of the district hospital. Even if the EDS project has alleviated patient overcrowding, overcrowding in the district hospital remains a serious problem that needs to be addressed comprehensively.

### 10.7.3 Environmental Health and Infection Prevention and Control Support Project, Médecins Sans Frontières (MSF)

The project began in 2018 (completed at the end of December 2021) at the Cox's Bazar District Hospital with Médecins Sans Frontières (MSF) support. Activities in three axes aimed at improving environmental



hygiene and infection prevention and control (IPC) were carried out<sup>416</sup>.

- Hand hygiene: placement of liquid soap and hand sanitizer, installation of small water stations, and monitoring of practices using hand hygiene observation tools.
- Environmental hygiene: cleaning of hospital wards, waste management, placement of equipment and supplies necessary for a sanitary environment, monitoring of waste segregation status and quantity/weight, monitoring of cleaning status using ultraviolet light.
- Awareness-raising activities: hygiene education for hospital patients and attendants, training for nurses and cleaners.

Additional activities included laundry services in the ICU, coronary intensive care unit, COVID-19 unit, emergency department, and screening at the hospital entrance. For these IPC activities, incentives were paid to 80 hospital staff, including IPC focal points, 10 nurses, 4 cleaning supervisors, and 46 cleaners, for a total monthly expenditure of approximately 15,000 euros for this project.



**Before and after comparison of waste management**

The project assessed the IPC Assessment Framework (IPCAF)<sup>417</sup> to evaluate the implementation of IPC programs in acute care facilities, with a score of 416 out of 800 (intermediate level). In particular, it was found that there were still areas for improvement regarding surveillance of healthcare-associated infections, staffing, and workload. On the other hand, the practice of hand hygiene by hospital staff improved from 9% in 2018 to a maximum of 51% in 2021. It is also reported that about 450 COVID-19 pneumonia patients could have received assistance in terms of IPC, which was particularly significant under the project conducted an assessment of the IPC Assessment Framework (IPCAF) to evaluate the implementation of IPC programs in acute care facilities, with a score of 416 out of 800 (intermediate level). In particular, it was ascertained that

<sup>416</sup> Interviews with IPC staff and resource persons at Cox's Bazar Sadar District Hospital.

<sup>417</sup> World Health Organization, 2018. Infection Prevention and Control Assessment Framework at the Facility Level.

there are still areas for improvement regarding surveillance of healthcare-associated infections, staffing, and workload. On the other hand, the practice of hand hygiene by hospital staff improved from 9% in 2018 to a maximum of 51% in 2021. It is also reported that about 450 COVID-19 pneumonia patients could have received assistance in terms of IPC, which was particularly significant under the pandemic.

#### **10.7.4 Severe Acute Respiratory Infection Isolation and Treatment Centre (SARI ITC) Support Program, UNICEF**

The program was launched on August 31, 2020, as a humanitarian program to address the COVID-19 outbreak in host communities and camps for displaced people. The SARI ITC in Teknaf upazila is managed by the International Center for Diarrheal Disease Research (icddr,b) in cooperation with UNICEF, with financial support from Western countries including Australia, EU, Germany and Sweden, and the World Bank. The program was scheduled to end in December 2021, but an extension to July 2022 was proposed, and at the time of the site visit in November 2021, UNICEF was considering whether to extend the program. As of February 2022, the extension had been approved, and an agreement document would be exchanged soon.

The SARI ITC is a simple facility (made of bamboo) built on the icddr,b property in Teknaf upazila that provides medical care in a 95-bed<sup>418</sup> inpatient ward, high dependency unit (HDU), outpatient, emergency, and diagnostic unit and ambulance transport to the Cox's Bazar District Hospital on a 24-hour basis<sup>419</sup>. Home isolation and telephone follow-up of discharged patients and patients with minor illnesses and behavior change communication regarding contact identification, mask use, hand washing, and social distancing for COVID-19 patients are also in place. In addition, a supply chain management system has been established that works closely with vendors to support logistics specialists and biochemical engineers in the procurement, maintenance, and inventory management of medical equipment, medicines, and medical supplies.

The SARI ITC actively collaborates with public institutions and partner organizations. For example, Teknaf UzHC supports the operation of an in-house influenza consultation and treatment area, and online registration of the COVID-19 vaccine. The SARI ITC accepts referrals from the Teknaf UzHC. WHO provides PCR testing assistance, capacity building on IPC, online training for clinicians on COVID-19 case management, and epidemiological information on COVID-19. The program also receives maintenance and power backup support for the oxygen plant from the IOM.

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<sup>418</sup>As of the November 2021 survey, COVID-19 beds: 80, diarrhea beds: 12, and emergency beds: 3.

<sup>419</sup> Interview with resource person of icddr,b.



The SARI ITC

The main challenges of the program included the following:

- Continuation of activities after the support period ends.
- Increased treatment costs due to an increase in moderate and severe COVID-19 patients.
- Vulnerability of simple bamboo facilities to disasters.
- Oxygen cylinder filling stations are far away, requiring 4 to 5 days for filling operations.
- Ambulance: Only one rental ambulance is available. Also, it takes two hours one way to reach the district hospital.
- The distance from the camps for displaced people is as far as 15km, which is inaccessible.

Regarding the continuation of activities after the support period, it is considered to continue its operation as a respiratory infectious disease hospital or a hospital specializing in infectious diseases, utilizing existing equipment and human resources, and to establish a satellite clinic, mobile clinic, or health post where health personnel is stationed to provide general outpatient care in the camps for displaced people, or to operate as a chronic disease hospital or a primary care center for NCDs, responding to local needs.

#### **10.7.5 Construction and operation of HOPE Field Hospital for Women, HOPE Foundation for Women and Children in Bangladesh**

The Hope Foundation is a non-profit organization founded in 1999 by a Bangladesh-American pediatrician from Cox's Bazar. To provide health services to the poor in southern Bangladesh, the Foundation builds healthcare facilities and provides health education and rehabilitation for the disabled. 40-bed maternity hospital and 15 rural health centers have been built and operated. The maternity hospital includes an outpatient clinic, inpatient ward, pediatric ward, obstetrics ward, laboratory, X-ray, delivery room, emergency room, pathology room, physical therapy room, operating room, pharmacy, and rehabilitation room.

In August 2017, the Foundation started to provide health services to the displaced people from Rakhine State, Myanmar. A 100-bed HOPE Field Hospital for Women, specializing in women, was opened in a camp for displaced people Ukhiya upazila. Nine primary health care centers have also been established. These

healthcare facilities operate 24 hours a day and are accessible to host communities and displaced people<sup>420</sup>. In addition, outreach activities and training for midwives and field workers are implemented. The Foundation also participates in the World Bank's Health and Gender Support Project for Cox's Bazar District and has been responsible for implementing activities at 41 healthcare facilities at the union level and 8 healthcare facilities at the upazila level since 2021.

HOPE Field Hospital for Women is currently the only 24-hour hospital in the camps for displaced people, with a total staff of 159, including 21 physicians (in charge of obstetrics and gynecology, anesthesiology, pediatrics, and outpatient services), 13 midwives, and 25 nurses. UNFPA supports maternal and child health and family planning services. The following table shows the number of services provided at the hospital from January 2020 to October 2021.

**Table 10-10 Services provided in HOPE Field Hospital for Women (January 2020 - October 2021)<sup>421</sup>**

Service	Number
Antenatal care	4,221
Normal vaginal delivery	1,328
Cesarean section	1,269
Postnatal care	2,840
Family planning	6,276
Inpatient care non COVID-19	2,959
Outpatient consultation non COVID-19	62,106
Emergency outdoor care	6,613
Inpatient care (COVID-19)	2,933
Outpatient COVID-19 consultation	27,368
PCR test	4,565
COVID-19 positive patients served	365
Dental care	1,041
Pediatric services	19,173
Dermatological care	6,595
Mental health care	1.192

Since 2021, COVID-19 vaccinations have also been administered, and 553 displaced people were vaccinated during the first vaccination campaign in August 2021.

<sup>420</sup> Interview with resource persons of Hope Foundation.

<sup>421</sup> Data from Hope Foundation.





**Hospital entrance**



**Reception**

HOPE Field Hospital for Women's challenges include the following<sup>422</sup>:

- While maternal and family planning services are provided with support from UNFPA, donor support for other services such as general outpatient, inpatient, emergency, and dental services is not sufficient.
- There is a lack of medicines for maternal and child health and general medical services.
- While demand for services other than maternal and child health and family planning is increasing, there is a staff shortage.

#### **10.7.6 Construction and operation of Ukhiya Specialized Hospital, UNHCR**

In December 2021, an agreement was signed for the Government of Japan to provide US\$4.4 million to UNHCR to improve the health situation in Cox's Bazar District, including displaced people and host communities. Three years of UNHCR support is planned to construct a new Ukhiya specialized hospital with an inpatient ward near Kutupalong camp, Ukhiya upazila, which will provide specialized treatment, same-day surgery, mental health and psychological support, and other secondary-level health care services previously unavailable to the displaced people. Construction of the specialized hospital began in 2021. In 2022, the existing SARI ITC in the camp will be converted into an inpatient ward with 30 beds. After the hospital is open, UNHCR will be responsible for its management, procurement of surgical equipment, medicines and consumables, and strengthening human resources to provide the services. The support will end in 2024, and the hospital will be handed over to MOHFW.

The results of the hearing from UNHCR (February 2022) are as follows:

- Equipment and human resources will be deployed, but the timeframe and budget are limited to provide adequate support. Support will also be provided for human resources for the provision of services in specialized hospitals but on a limited basis.
- Although support for human resources of the MOHFW is not envisaged, the capacity of the MOHFW

<sup>422</sup> Interview with resource persons of Hope Foundation.

is not sufficient, and there are concerns about the operational structure and sustainability of the hospital services after the support ends in 2024, and the hospital is handed over to the MOHFW.

- UNHCR's current support is targeted at specialized hospitals and does not plan to provide support to union or community level healthcare facilities or the district hospital. The support is be limited to the provision of secondary level services and does not cover advanced medical services, including ICUs.
- There is a need for assistance in implementing appropriate referrals to alleviate congestion in some hospitals. However, there is no concrete picture of how the establishment of the Ukhiya specialized hospital will relieve patient overcrowding at Cox's Bazar Sadar District Hospital.

In addition, the following discussion was held regarding the possibility of JICA support for the health sector in Cox's Bazar District.

- This UNHCR assistance targets only some of the facilities, and additional support is needed to improve health service delivery in the district.
- The Cox's Bazar Sadar District Hospital is limited in size, and there is potential for support for hospital extension.
- There is also scope for support for hospital operations after the handover of the specialized hospital to the MOHFW in 2024.
- It is difficult to ascertain the trend of support from development partners for host communities, so it is also meaningful to understand the direction of their support from a long-term perspective. For this reason, UNHCR wants JICA to share ideas for its possible support and the timing of the start of support in the future.

#### **10.7.7 Health and Gender Support Project for Cox's Bazar District, World Bank**

The Health and Gender support Project for Cox's Bazar District (HGSP) is a three-year, three-month project that began at the end of March 2020 and will end at the end of June 2023 to provide health, nutrition, and population (HNP) support to displaced people and host communities. It is implemented to improve access to and utilization of HNP services and gender-based violence (GBV) response services. The HGSP supports (a) the provision of HNP and GBV response services to displaced people, (b) addressing additional needs of host communities resulting from the diversion of existing support resources to the displaced people, (c) adopting a systematic approach to address the needs of both host communities and displaced people, and (d) responding to future emergencies through the Contingent Emergency Response Component (CERC)<sup>423</sup>. Linked to the ongoing Health Sector Support Project (HSSP) and Additional Financing for the HSPP, the project plan was developed with other development partners.

The HGSP consists of the following 4 components. The amount of support for each component is shown in parentheses.

- 1) Strengthening integrated HNP & GBV response services in all tiers of health care and in the DRP

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<sup>423</sup> The World Bank, 2020. Project Appraisal Document for Health and Gender Support Project for Cox's Bazar District.

- camps (US\$100 million)
- 2) Strengthening government system's capacity to deliver enhanced services in Cox's Bazar (US\$45 million)
  - 3) Stewardship, Management and Coordination (US\$5 million)
  - 4) Contingency Emergency Response Component (CERC) (None)

The result chain is created for components 1) through 3), as shown below.

**Table 10-11 Result chain of HGSP<sup>424</sup>**

Component		Output	Outcome	Project Development Objective (PDO)
1)	Strengthening integrated HNP & GBV response services in all tiers of health care and in the DRP camps	<ul style="list-style-type: none"> <li>• Integrated HNP and GVB response service package developed.</li> <li>• Required HR recruited to provide HNP and GVB services.</li> <li>• Facilities renovated with adequate amenities.</li> <li>• Awareness raised through community mobilization.</li> <li>• Comprehensive BCC strategy developed and implemented.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased number of beneficiaries utilizing HNP services</li> <li>• Increased number of women and girls utilizing GBV services</li> <li>• Increased number of facilities ready to provide enhanced HNP and GBV services</li> </ul>	Improve access & utilization of HNP and GBV response services among the host & DRP in Cox's Bazar
2)	Strengthening government system's capacity to deliver enhanced services in Cox's Bazar	<ul style="list-style-type: none"> <li>• HR trained to deliver integrated services.</li> <li>• Required medicine, commodities and equipment provided.</li> <li>• Healthcare waste management system enhanced.</li> <li>• Logistics management for supplies improved.</li> <li>• Strengthen management information systems.</li> <li>• Strengthened referral system established.</li> <li>• Citizen engagement and grievance mechanism (GRM) process implemented.</li> </ul>		
3)	Stewardship, Management and Coordination	<ul style="list-style-type: none"> <li>• Management and coordination meetings taking place at different tiers including.</li> <li>• Activation of existing committees at different tiers.</li> </ul>		

Specific activities include providing appropriate human resources, upgrading facilities for service delivery,

<sup>424</sup> Ibid.

and expanding service delivery in underserved areas. The project comprehensively supports strengthening health services and GBV response services through a multifaceted approach.

Concrete activities in several outputs are presented below.

### **Component 1: Healthcare facility development**

Detailed assessment of the condition of existing facilities, including the Cox's Bazar Sadar District Hospital, Mother and Child Welfare Centers of the host community, and the Women Friendly Spaces in the camps for displaced people. Based on the assessment results, solar power, backup generators, safe water supply facilities, and sanitation facilities (separate toilets for men and women) have been installed at the community clinics, UHFWCs, and the UzHCs. In addition, ramps, handrails, and signage have been installed to make the facilities accessible to everyone, including people with disabilities. Accommodations for health personnel have also been renovated to ensure human resources and 24-hour service. Climate-resilient and environmentally sustainable design is used for renovations.

### **Component 2: Human resource management and capacity development**

There are remote areas in Cox's Bazar District that are inaccessible, and deployment and retention of human resources is a constant challenge. The problem is further compounded by an inadequate skill mix of human resources and a lack of support personnel. Therefore, human resource management and capacity development of existing human resources in healthcare facilities and one-stop crisis centers have been strengthened by using standard protocols and training packages already in place for HNP, GBV response, and waste management, and by conducting regular training to strengthen the capacity of health personnel in all categories. Training is also provided for community support groups (CSGs) and community-level volunteers to promote HNP and GBV prevention activities in communities

### **Component 2: Supply chain and store management system**

Developed a system for store management, order planning, and inventory replenishment to ensure the supply of essential medicines, medical supplies, medical equipment such as blood pressure monitors, scales, digital X-ray equipment, and other needs-based supplies at healthcare facilities. Support has been provided for the procurement and supply of medicines and essential supplies to avoid stock-outs and to meet the expected increase in service utilization. This supply chain strengthening support is based on the logistics management system implemented by the DGFP and deployed in the DGHS. In parallel with the HGSP, USAID provides technical assistance to support implementing a logistics management information system.

### **Component 2: Referral system**

Referrals are currently done in an undocumented and informal manner at healthcare facilities in Cox's Bazar District. Clear referral procedures have been developed, and referral pathways have been established following protocols created for the HGSP. It is expected that patients in host communities are referred to the appropriate



level of healthcare facilities when more advanced treatment is required and that the displaced people can receive more advanced healthcare services outside the camps when necessary.

In addition, IOM, UNFPA, UNICEF, and WHO are implementing the HGSP together with MOHFW. The roles of each organization are as follows<sup>425</sup>:

- IOM: responsible for the reconstruction of CCs and the rehabilitation and staffing of Cox's Bazar District Hospital. As of September 2021, the facility assessment of the CCs was completed, and the facility assessment of the district hospital was underway.
- UNFPA: responsible for strengthening sexual and reproductive health and GBV prevention and response services. Specifically, strengthening services at the UzHCs, implementing midwifery care at the UHFWCs, providing integrated sexual and reproductive health and GBV services at the Women Friendly Spaces, managing the WFSs, and supporting procurement and supply of family planning supplies.
- UNICEF: immunization, vaccine supply and logistics support; maternal, newborn and infant health and nutrition service delivery support.
- WHO: hired environmental, social development, and gender experts for HGSP implementation. Providing support to strengthen screening, diagnosis, and treatment of tuberculosis and NCDs.

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<sup>425</sup> Interviews with HGSP personnel.

## Chapter 11 ICT utilization plans to help solve problems in the health sector

In this survey, a proof-of-concept (PoC)<sup>426</sup> was conducted as subcontracting work to verify and propose ICT utilization measures that would contribute to solving issues in the Bangladesh health sector. As part of the PoC, the ICT utilization status and issues in the health sector in Bangladesh were identified, and ICT utilization plans that would contribute to solving the issues were selected. A prototype<sup>427</sup> based on this ICT utilization plan was developed and introduced to the field for demonstration during actual operation. Based on the demonstration results obtained through these PoC experiments, we developed ICT utilization measures that would contribute to solving issues in the health sector. This series of PoC activities were conducted as sub-commissioned work. The following is a description of the work, the results of each work process, and a draft of the ICT utilization plan.

### 11.1 Details of the subcontracting work

The subcontracting work consists largely of four work processes (assignments).

Work Process 1	To understand the status of ICT utilization and challenges in the health sector in Bangladesh.
Work Process 2	To identify the ICT utilization plans in the Bangladesh health sector based on the status of ICT utilization.
Work process 3	To Select an ICT utilization plan for a demonstration from the established ICT utilization plans and develop a prototype. Through the development of the prototype, the PoC of the selected ICT utilization plan is demonstrated.
Work process 4	To introduce the prototype into the health service field to demonstrate the concept of the proposed ICT utilization during actual operation. To formulate measures for ICT utilization that will contribute to solving issues in the health sector based on the results of the preliminary survey and implementation of the PoC.

Based on the preliminary preparation of the PoC and the results of the demonstration, a plan for the use of ICT to help solve problems in the health sector will be developed. The survey will refer to the results of this work and the proposed ICT utilization and present to the MOHFW a proposal for improving the health information system (HIS) in Bangladesh and a draft plan for utilizing ICT to improve and strengthen the HIS.

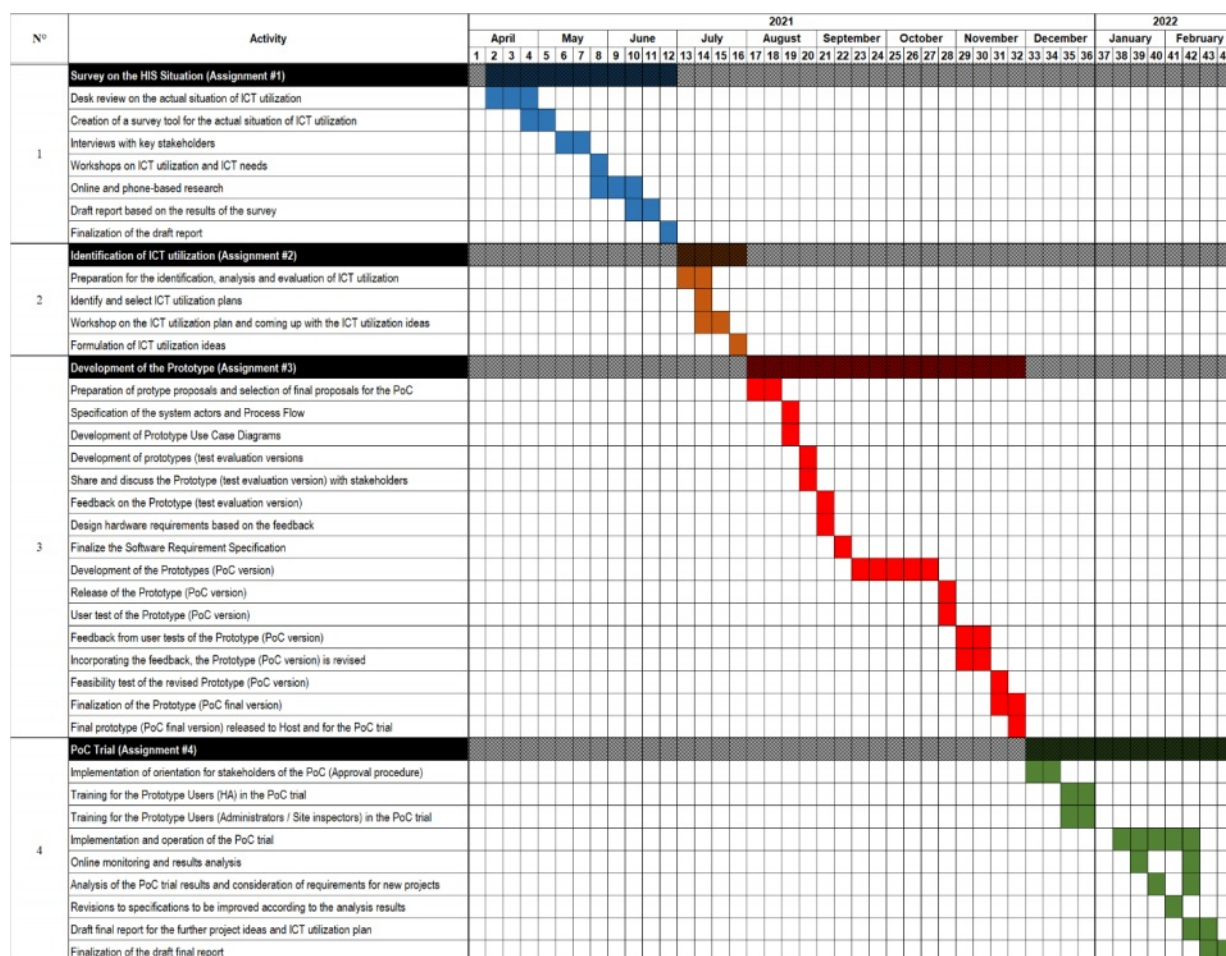
In developing the prototype and the PoC of the proposed ICT utilization during actual operation, the team aimed for a PoC that focused on the development of smartphone (iOS/Android) applications and web applications, rather than an ICT utilization demonstration that would involve the installation of equipment. The survey also identified possible ICT applications for [a] developing health sector strategies and strengthening appropriate budget management and governance, [b] strengthening health systems (human resources, equipment, budget, and information processes), and [c] enhancing quality health service delivery. Among them, we selected the most important and urgent ICT utilization plans, developed a prototype for PoC based on the ICT utilization plans, and conducted a PoC for operation by introducing the prototype into health

<sup>426</sup> Proof of concept is a method of verifying and demonstrating whether a concept or theory can be put to practical use by using and demonstrating a simple implementation of the principle.

<sup>427</sup> A prototype version of a product to verify that there are no problems with the basic design in proceeding with product development. In this report, mobile applications and web applications used for PoC are collectively described as prototypes.

services.

The schedule for the subcontracting work is as follows: Work process 1: survey to understand the status of ICT utilization and issues (3 months), Work process 2: identification of ICT utilization plans (1 month), Work process 3: selection of ICT utilization plan for PoC and development of a prototype (5 months), and Work process 4: conceptual demonstration of actual health service operation using the prototype, compilation of ICT utilization demonstration results, and formulation of ICT utilization measures that contribute to resolving issues in the health sector (2 months). The work schedule is shown in Figure 11-1.



**Figure 11-1 Schedule for subcontracting work**

The survey results on the status of ICT utilization and issues in work process 1 were reflected in the health information system section of "Chapter 5: Current status of the Bangladesh health system" and "Chapter 9: Analysis of challenges in the health sector in Bangladesh". For the proof of concept for this subcontracting work, work process 3 corresponds to the demonstration during system design and development and work process 4 corresponds to the demonstration work during system implementation and operation.

## 11.2 Identification of ICT utilization plans that contribute to solving issues in the health sector

In identifying ideas for the use of ICT in the Bangladesh health sector, the team reviewed existing information, conducted key informant interviews on the use of ICT in the health sector, and conducted workshops (June 2021) with stakeholders from health information management system units (DGHS-MIS/DGFP-MIS) of the MOHFW to gather and analyze information.

The following major steps were taken to identify ICT utilization measures in gathering and analyzing the information.

- Identification of ICT application areas that contribute to health system strengthening
- Identification of applicable ICT utilization plans and analysis of their feasibility and points to note

Then, the team identified the ICT utilization plans, as shown in Table 11-1.

**Table 11-1 Summary table of ICT utilization plans in Bangladesh health sector**

ICT application area	Applicable ICT utilization plans	Feasibility and points to note	
Develop health sector strategies and strengthen appropriate budget management and governance	Compilation and analysis of health statistics and their visualization	The DHIS2 platform is used to consolidate and visualize health statistics, and ICT tools and other tools are required to support the harmonization of the DGHS, DGFP, and their respective DHIS2 databases. ⇒ Grasping the actual situation of the health sector and formulating health policies tailored to the actual situation.	A review and standardization of protocols for health information standardization and aggregation processes is required to resolve the duplication of health statistics in each DGHS and DGFP. Another solution is introducing and establishing health IDs that uniquely identify each individual in service delivery.
	Appropriate identification and monitoring of health status and decision support mechanisms	ICT solutions for follow-up of individual health situations collected during health service delivery, identification of health service vulnerable persons and allocation of appropriate resources. ⇒ Able to achieve appropriate allocation of health resources, and with limited health resources, greater impact can be expected.	A number of ICT tools have been introduced to collect individual-level health information and support service delivery, including the DHIS2 tracker, eMIS and OpenSRP. On the other hand, these ICT tools are not yet fully operational and are all in the pilot stage. In addition, there is a need to scale up ICT solutions, integrate and link functions, and promote their use in the field.
	SDG achievement progress monitoring and evaluation analysis	SDG trackers for monitoring progress in achieving the SDGs have been introduced in all ministries. However, aggregated health statistical information is low in quality and quantity, and the evaluation and analysis of progress on indicators related to the health sector of the SDGs are insufficient. ⇒ If more correct health statistics can be aggregated, it is possible to monitor the SDG indicators in realistic ways.	The SDG tracker is managed by all relevant ministries and utilized for monitoring SDG indicators. In the future, regular aggregation and reporting of health statistics information required for SDG indicators, as well as aggregation of high-quality health statistics information that can accurately identify actual health situations, will be required.
	Monitoring of Public Investment Effectiveness Indicators (DLI)	The National Nutrition Improvement Service (NNS) is piloting the aggregation and monitoring of public investment impact information related to maternal and child nutrition improvement, which is part of the DLI indicators. ⇒ If the program is expanded nationwide, the local nutritional situation will be understood, and efforts to improve	Currently, UNICEF is piloting MUKTO (public monitoring function of local nutrition situation) to optimize and improve information aggregation and monitoring operations to understand public investment effectiveness information related to nutrition improvement and strengthen monitoring support. In the future, it is hoped that

ICT application area	Applicable ICT utilization plans	Feasibility and points to note
	nutrition will be made in the right places at the right time.	MUKTO will be introduced at the national level after the pilot and necessary improvements.
	<p>Linkage and optimization between DGHS and DGFP core systems</p> <p>Within the MOHFW, DGHS and DGFP each have their information unit, and DHIS2, the core system, is managed separately. It is extremely difficult to implement an ICT solution for integration. ⇒If a certain level of coordination becomes possible, it will be possible to grasp the actual situation of the health sector and formulate health policies tailored to the actual situation.</p>	<p>The possibility of integrating the core systems managed by DGHS and DGFP has been discussed for several years, but no solution has been found. Rather than integration, the two systems should aim for collaboration, such as linking only the minimum information items necessary to understand the effects of health service projects and health circumstances.</p>
Strengthen health systems (human resources, equipment, budget, and information processes)	<p>Inventory Control</p> <p>A Supply Chain Management Portal (SCMP) and Electronic Logistics Management Information System (eLMIS) are in operation to support inventory management of health resources needed for health service delivery. ⇒A more accurate inventory can be determined if the information is sufficiently collected and updated.</p>	<p>Healthcare facility-based inventory (medical equipment and supplies and medicines) is managed, and ICT is utilized. The operational aspect is not properly utilized, and capacity building is needed to strengthen the operation. In addition, there is inadequate understanding of the materials, equipment, and medicines needed.</p>
	<p>Human Resource Management</p> <p>The Human Resource Information Management System (HRIS) is in operation to manage human resources in the MOHFW. In other HIS, healthcare professionals and HAs are also registered and managed. A proposal for ICT utilization, such as linking HRIS with user registration data in other HIS, is required. ⇒By interlocking with other systems, it is possible to improve the efficiency of HIS as a whole and manage and evaluate human resources following actual operations.</p>	<p>DFHS and DGFP use separate HRISs, but there is little need for integration. By linking with other HISs, functions such as evaluation of MOHFW staff and management and performance evaluation of community health personnel could be realized.</p>
	<p>Management of healthcare facilities and medical equipment</p> <p>Real-time monitoring system for medical and non-medical equipment status. ⇒Expansion of this system will enable the management of materials and equipment down to the union community level.</p>	<p>Although utilized in healthcare facilities at the upazila level and above, it is not fully utilized at the union and community level.</p>
Enhance quality health service delivery at the household level (community level)	<p>Dissemination and retention of health services to household and individual levels</p> <p>An ICT module (RapidPro) is used to generate message notifications and reminder functions using SNS based on basic resident and health service delivery information. It is envisioned to be used for various health service delivery from tablets held by health volunteers. It is also envisioned to be used for simple health education and awareness-raising activities. ⇒Wider dissemination and familiarization of health services to residents with mobile devices.</p>	<p>RapidPro is open source and is already widely used in the country. It is used to register the basic information of the target population and to follow up on the delivery of health services based on the registered information. The content of the SMS can be customized and targeted at the household or individual level to provide health education. Other possible linkages include the multifunctional social networking services WhatsApp and Instagram. However, when sending SMS messages to individuals, for example, there is a cost for the residents who receive the messages. Consideration must</p>

ICT application area	Applicable ICT utilization plans	Feasibility and points to note
		be given to expanding the program to include vulnerable groups.
Follow-up on prevention and treatment for households and individual patients	The Shared Health Record (SHR) system, which DGHS considers full-scale implementation, has partially implemented a function to register individual basic information and assign a uniquely recognized health ID but is not yet in full-scale operation. ⇒Contribute to the realization of UHC by having the follow-up of prevention and treatment strengthened for households and individual patients.	Important priorities for MOHFW (especially DGHS). Currently, the MOHFW is not yet able to manage health information at the household and individual level, and only health statistics at the upazila level and above are managed by the MOHFW. Once the SHR system is fully operational, it will be possible to realize treatment and preventive follow-up for individual beneficiaries.
Monitoring of routine immunizations and vaccination status	ICT support is needed to enable timely EPI services to increase immunization coverage. DHIS2 Trucker is piloted. ⇒Increase the vaccination rate and allow timely EPI vaccination.	An important priority for MOHFW (especially DGHS). Currently, the DHIS2 Trucker is piloted in some areas. Further assistance is required for full-scale operation.
Identification and monitoring of COVID-19 vaccination status	ICT (Surokkha) for vaccination management is introduced after identifying the target population based on the existing basic resident register to promote COVID-19 vaccination. ⇒Expansion of COVID-19 vaccination.	MOHFW has linked Surokkha, a system for managing COVID-19 vaccinations, with the NID database, which maintains the Basic Resident Registry, to identify those eligible for vaccination. The urgency and ICT needs are high but have already been addressed.
Maternal and child health services	An ICT (DHIS2 Trucker) is piloted to manage information related to antenatal and postnatal maternal and child health service delivery, follow up on health checkups, prevention and treatment for households and individual mothers and children. The full-scale operation has not yet been implemented. ⇒Expand maternal and child health care services and strengthen follow-up.	DHIS2 Trucker, already piloted by UNICEF in some upazilas, is an ICT tool to support health services provided by the DGHS. Facilities at the union level and community clinics record information on maternal and child health consultations. Maternal and child health statistics are aggregated at the upazila level.
Health services related to reproductive and adolescent health	ICT utilization targeting service delivery by DGFP. ICT tools for operational support have not been introduced, and it is possible to introduce ICT support only for performance management of service delivery by DGFP. ⇒The full-scale introduction of the program will expand and strengthen the follow-up of health services related to reproductive and adolescent health.	The DGFP system uses the eMIS platform, and the same platform should be used for ICT development for service delivery. Other overlaps with the target population of health service delivery by the DGHS should be noted in the evaluation of project effectiveness.
Disease surveillance and follow-up treatment and prevention	Use of ICT to support regular monitoring of disease status with community health volunteers. ⇒Strengthen disease surveillance and follow-up on treatment and prevention by following up on maternal and child health services and EPI vaccinations.	While analyzing the use of ICT in supporting health services, including maternal and child health and EPI services, which have been introduced on a pilot basis, the proposed use of appropriate ICT will be discussed.

ICT application area	Applicable ICT utilization plans	Feasibility and points to note	
	Reporting births and deaths	Linkage with the OpenCRVS system that manages the domestic basic family registry, or use of ICT to link and harmonize with the OpenCRVS system. ⇒ More residents can be registered and used as a basic resident register by properly incorporating this system into the birth and death reporting process.	Many residents are not yet registered in the OpenCRVS database. There are attempts to register households and individuals through health services and to create a database, and there is a need to link the two databases together in a consistent manner.
	Referral/ counter-referral enhancement	The MOHFW considers using ICT to enhance the referral function from one level to higher-level healthcare facilities. However, many facilities do not digitize each patient's medical history, making it difficult to enhance referrals through the use of ICT. ⇒As more resident information is digitized and more medical facilities have their diagnostic records digitized, the referrals can be gradually enhanced.	DGHS is trying to promote the digitization of each patient's medical history at healthcare facilities by using the OpenMRS+ solution. On the other hand, OpenSRP is an appropriate platform for managing the household and individual health information and has a proven track record of implementation; integration between OpenMRS+ and OpenSRP is currently being attempted but will require more human and technical resources to realize.
	Identify and manage medical supplies needed at the household and individual level	It is necessary to determine the population of health service beneficiaries to utilize ICT in the area. At present, ICT needs are low. ⇒Even if medical supplies at the household and individual level are identified and managed, there is always a shortage of supplies and little need to identify and manage them.	If ICT is utilized, it will optimize health service delivery and allow limited health resources to be allocated to the right place at the right time.
Enhance quality health service delivery at the facility level	Primary-level health services	The DHIS 2 complementary system maintains records of outpatient visits at the union and community clinic (CC) levels of healthcare services. The DHIS 2 Trucker also enables follow-up on patient treatment and prevention based on outpatient consultation records. ⇒Strengthening of primary-level health care services (treatment and prevention).	Outpatient consultation records are electronic at the union level and the CC. However, since outpatients are not managed in a specific manner, individual patient follow-up is not fully available. Daily consultation records are compiled monthly and reported to the upazila level. The outpatient consultation records held by the union-level facilities and CCs allow for follow-up on treatment and prevention, but human resources are inadequate, and follow-up is done in few cases.
	Preventive services in healthcare facilities	The history of preventive services such as health education, nutrition improvement, and prevention/vaccination is mainly paper-based and stored in records. Some healthcare facilities pilot the ICT to support nutrition improvement through the DHIS 2 Trucker and eMIS platforms. ⇒Able to enhance preventive services and consolidate more accurate health statistics at healthcare facilities (mainly at the union level and CCs).	ICT tools have been developed to assist in managing preventive services (recording, tabulation and reporting) and future preventive planning and follow-up, but none are fully operational. The functionality of the ICT tools introduced on a trial basis needs to be enhanced, and the dissemination of these ICT tools and the implementation systems and capacity building in the field that are needed to implement them need to be developed.

ICT application area	Applicable ICT utilization plans	Feasibility and points to note
Maternal and child health services / sexual and reproductive health services	<p>ICT utilization for maternal and child health services under the DGHS is the same as for primary-level health services, with the DHIS 2 complementary system and the DHIS 2 Trucker available for use. On the other hand, for health service delivery related to reproduction under the DGFP, health service records are digitized by ICT tools using eMIS as a platform.</p> <p>⇒Strengthen sexual and reproductive health service delivery under the DGFP.</p>	<p>They are trying to achieve health information management, including maternal and child health services, among healthcare facilities by deploying OpenMRS+ ICT solutions. However, the deployment of PCs in healthcare facilities below the upazila level is insufficient, and the ICT solution has not yet been deployed. In addition, the lack of internet connectivity in some healthcare facilities also makes it difficult to deploy the ICT solution.</p> <p>On the other hand, health service delivery related to reproduction under the DGFP remains status quo, with no plans for subsequent development of ICT utilization.</p>
Treatment and follow-up of outpatients at secondary-level facilities and above	<p>DHIS 2 is being utilized to consolidate health statistical information and for monthly reporting. It has been implemented and is fully operational in almost all healthcare facilities at the upazila level and above. In addition, OpenMRS+ is an ICT solution designed for implementation in healthcare facilities, enabling the recording and management of outpatients. In the future, it aims to provide treatment and prevention according to the household and individual levels.</p> <p>⇒Able to strengthen preventive services at secondary-level facilities (district-level hospitals) and consolidate more accurate health statistics information.</p>	<p>To realize household- and individual-level treatment and prevention using OpenMRS+, the full-scale introduction of this ICT solution, strengthening the implementation system at each healthcare facility, and improving the ICT literacy of health personnel will be necessary. Creating a population database for the target area will enable us to grasp the number of people in the target area and the actual status of treatment and prevention in the area. In order to manage properly and smoothly the above, it is desirable to introduce a health ID that uniquely recognizes each individual.</p>
Inpatient treatment and follow-up	<p>Similar to the proposed ICT utilization for outpatients, DHIS2 is utilized for aggregation and monthly reporting of health statistics, and OpenMRS+ is implemented to manage individual inpatient information. Information such as patient profiles, admission records, treatment history updates, and consultation and treatment results are entered and managed within the facility.</p> <p>⇒Strengthen the management of hospitalized patients, and strengthen understanding of treatment and follow-up after treatment.</p>	<p>Both systems (DHIS2/OpenMRS+) have been introduced in healthcare facilities at the upazila level and above, but the use of OpenMRS+ has not progressed. ICT literacy also needs to be improved. In addition, at present, information management is limited to within facilities and has not yet reached the point of sharing information between facilities or managing and sharing information specific to individual patients. As with outpatients, an ICT solution that manages individual patient information and shares it among facilities through the introduction of health IDs is desired.</p>
Laboratory services (test result management services)	<p>OpenMRS+ is introduced in healthcare facilities at the upazila level and above for the laboratory service. Laboratory technicians can use the ICT solution to manage laboratory test result information and share test results with relevant health professionals in the facility.</p> <p>⇒Hospital test results management and sharing of test results with other departments can be performed appropriately and quickly.</p>	<p>The lab technician labels and maintains the samples to be tested to track them. Test results are uploaded to the system so that other health professionals can review the results. Test results are highly confidential information and must be handled with care. At present, the priority level of ICT utilization for this ICT-applicable area is lower than that of other areas.</p>



ICT application area	Applicable ICT utilization plans	Feasibility and points to note
Referral (counter-referral) services between healthcare facilities	OpenMRS+ has a module that uniquely recognizes individual patient information across facilities and manages information such as outpatient, consultation, examination, and hospitalization when necessary. By deploying this ICT solution to all healthcare facilities and introducing a system that uniquely recognizes individual patients, referrals (counter-referrals), and the like will be possible. ⇒Strengthen health referrals between healthcare facilities.	DGHS-MIS is attempting to deploy OpenMRS+ to all healthcare facilities, but there are many obstacles to deployment, such as insufficient ICT infrastructure (e.g., PCs), lack of a system for implementing OpenMRS+ in facilities, and poor individual ICT literacy. The primary key for uniquely recognizing service delivery records also differs from facility to facility, making it difficult to share information among facilities. Accurate information management of individual patient information through the introduction of health IDs is required.

The participants discussed the importance of using ICT to capture and manage the household and individual health information through the interviews and workshops. They also discussed the urgent need to increase capacity to collect individual health information and implement unique health IDs that can be uniquely recognized. It is desirable to monitor the actual health status of communities and individuals, grasp the status of health service provision in real-time, and monitor the performance of health service provision to each individual at any time.

In addition, many respondents expressed the desire to establish a means to determine the number of health service beneficiaries (population) and to utilize ICT to support capacity building at the field level, where health services are provided. Even if the health sector has a large amount of aggregated health statistical information necessary when formulating strategies and making policy decisions, it cannot be said that the health information system is being fully utilized unless used appropriately. Key decision makers in the health sector must grasp necessary and realistic health statistical information, have the analytical skills to use this information, and use ICT to capture the essence of health statistical information. Many expressed a desire to implement capacity building modules for targeted decision making and ICT tools for knowledge management process strengthening that would enable decision makers to make evidence-based decisions for optimizing appropriate health system resources and services, with that authority at each level. A number of opinions were expressed. Based on the above interviews and analysis, the following three points were identified as the most important ICT utilization plans that would contribute to solving issues in the health sector.

- Use of ICT to capture and manage the household and individual health information and implement uniquely identifiable health IDs for this purpose.
- Establishment of means to determine the number of health service beneficiaries (population) and support capacity building at the field level where health services are provided.
- Simplification of targeted decision-making processes based on health policies and implementation of ICT tools to strengthen knowledge management processes so that evidence-based decisions can be made to ensure that health system resources and services are optimized and properly utilized.

## **11.3 Outline of the prototype and demonstration using the prototype**

### **11.3.1 Formulate a prototype proposal**

Based on the ICT utilization plans that contribute to solving issues in the health sector identified and organized in 11.2, the team selected ICT utilization plans for the PoC. In the selection process, under the leadership of the subcontractor, several ICT utilization plans were prepared in advance, and a workshop with DGHS-MIS was held again (July 2021). The following considerations were made with the subcontractor in developing the ICT utilization plans that could be the subject of this proof-of-concept project.

**Consideration 1:** When the subcontracting work content was initially formulated, the team envisioned a smartphone application for community residents, given the high rate of smartphone ownership in Bangladesh (more than 80%). However, through the survey to understand the current situation (Work process 1), it was confirmed that at the community level, households with inadequate health services either do not own smartphones or do not have the information literacy to use smartphones. The subcontractor recommended that "for this PoC, it would be better to use a health information management application for smartphones and tablets with health assistants (HAs), who are supporting the expansion of health services at the community level, as the users. Based on this, it was decided that the users of the prototype to which the proposed ICT application should be applied should be HAs, not community residents, who are the beneficiaries of the application.

**Consideration 2:** Many ICT utilization plans and implementations have already been proposed and implemented in Bangladesh by many donors, international NGOs, and companies. While these have contributed to the improvement of ICT technology in the health sector in Bangladesh, (1) in many cases, the proposals and implementation of ICT utilization plans ended halfway and were left unattended, not becoming fully operational and running, wasting resources, and (2) there were many cases of half-implemented systems that were not fully operational and running, wasting resources. Both the MOHFW and the subcontractor recognized the importance of standardization of existing systems rather than the need to propose new plans and ideas.

**Consideration 3:** In Bangladesh, there are two types of IDs that uniquely identify each citizen: (1) a household registration ID (BRID) and (2) a national ID (NID). (1) is an ID registered at birth, similar to the family register in Japan, but not all Bangladeshis have this ID. (2) is an ID obtained when a person obtains the right to vote and is limited to those 18 years of age or older. The MOHFW is in the process of assigning each patient a **health ID** that uniquely recognizes all persons eligible for health service provision, but although the Shared Health Record Information System (SHR) itself has been implemented, it has not yet reached full-scale operation. The handling of IDs with these different purposes and subjects (target users) also needs to be verified.

**Consideration 4:** The DGHS and DGFP MIS (Management Information Systems Unit) have different information systems, and information is not integrated. By establishing health IDs that uniquely identify patients in each system and using the same IDs, it will be possible to take measures against duplication of statistical compilation and medical support. In addition, by targeting citizens who are not recognized by other IDs (1) and (2), it will be possible to expand health services in the future.

**Consideration 5:** Assigning unique **health IDs** to health service targets and implementing them as unique IDs in various existing HISs will make it possible for HISs to collaborate and integrate health information. In this PoC project, the team wants to verify how HIS that have been developed and operated separately can be linked and how health information can be integrated. However, the timeframe and budget for this PoC are limited, and the PoC must consider the activity limitations under the COVID-19.

**Consideration 6:** In the past 10 years, Bangladesh has been digitizing for health system strengthening based on major ICT platforms such as DHIS2, DHIS2 Trucker, eMIS, OpenSRP, OpenMRS+, RapidPro, and SHR. The coordination and utilization of these ICT platforms is also an important target for verification in this concept demonstration.

In addition to these considerations, the areas in which PoC can be conducted and the scope of implementation should also be considered. Due to the limited time and effort required and the limited activities under the COVID-19, the development effort for the prototype should be minimized by reusing a platform and application that have already been proven, and the target area should have a rich experience in pilot projects and be suitable for the introduction and operation of the prototype. The following for ICT utilization plans were tentatively selected, as shown in Table 11-2, based on the judgment that regions with good implementation systems are desirable.

**Table 11-2 Prototype proposal based on the ICT utilization plans**

<b>ICT utilization plan 1:</b>	
<b>Utilize health IDs that uniquely distinguish citizens / follow up on prevention and treatment of patients, strengthen the referral system</b>	
<b>User:</b> Health Assistants (Community health workers at upazila level)	<b>Functions</b>
	<ul style="list-style-type: none"> <li>✓ Assign health IDs to family members from SHR replica servers</li> <li>✓ Ability to register, edit, and delete household health information</li> <li>✓ Display health information for the household and display individual health information for family members according to their assigned health IDs</li> <li>✓ Compile health information on households or individual family members as health statistics</li> <li>✓ Refer the family member to the nearest healthcare facility and share the family member's medical examination and health information with the healthcare facility (referral service)</li> <li>✓ Verify integration and sharing of collected health statistics information with DHIS2</li> <li>✓ Read barcodes on health ID cards (HID), view individual health information, and verify linkage with other HIS</li> </ul>

<p><b>Effectiveness</b></p> <ul style="list-style-type: none"> <li>■ Creation of individual patient profiles</li> <li>■ Tracking of health services using a unique health ID and coordination with other health services</li> <li>■ All households in a community can be visited, and household health information and family member health information can be registered. If there are enough human resources to cover all households, it will be possible to accurately determine the number of beneficiaries (population) of health services</li> <li>■ Consolidate to detail level report generation</li> <li>■ Strengthening referral services</li> </ul>	<p><b>Possible difficulties in implementation and operation</b></p> <ul style="list-style-type: none"> <li>◆ It takes a lot of human resources and time to go door-to-door to households and input health information in the area covered by the PoC, and the resources given to this PoC are not sufficient to handle all of the proposed ICT utilization.</li> <li>◆ Although the SHR is implemented within MOHFW, it is not accessible with this PoC; DHIS2 is similarly inaccessible. A temporary system environment needs to be created.</li> <li>◆ Difficulty in sharing and managing data between different institutions due to bureaucratic and technical barriers.</li> </ul>
<p><b>ICT utilization plan 2: Health information system for enhanced EPI vaccination follow-up</b></p>	
<p><b>User:</b> Health Assistants</p>	<p><b>Functions</b></p> <ul style="list-style-type: none"> <li>✓ Automatic generation of vaccination schedules</li> <li>✓ Colored notification feature to identify those eligible for vaccination who have missed a vaccination</li> <li>✓ Vaccination monitoring function by health assistants</li> <li>✓ Referral function to the most appropriate healthcare facility based on consultation results at the time of vaccination</li> <li>✓ Automatic generation of vaccination progress reports</li> <li>✓ SMS notification and reminder function of vaccination dates to vaccination targets</li> <li>✓ Automatic generation of health assistant activity performance record reports</li> </ul>
<p><b>Effectiveness</b></p> <ul style="list-style-type: none"> <li>■ Adherence to vaccination dates for timely vaccination and increased coverage</li> <li>■ Rapid vaccination follow-up and expansion of EPI vaccination coverage</li> <li>■ Automated EPI vaccination resource estimation and inventory management</li> <li>■ Support decision-making on immunizations with automatic generation of real-time EPI vaccination reports</li> <li>■ Real-time generation of vaccination reports reducing workload at the field level</li> </ul>	<p><b>Possible difficulties in implementation and operation</b></p> <ul style="list-style-type: none"> <li>◆ In order to calculate EPI vaccination coverage, it is necessary to determine the population of those eligible for vaccination at the community level. Within the limited timeframe and resources of this PoC study, it is difficult to visit households in the community and ascertain the number of persons eligible for vaccination per community.</li> <li>◆ If notification of vaccination dates and times and reminder notifications are sent via SMS, the cost of distributing these notifications could be enormous.</li> </ul>
<p><b>ICT utilization plan 3: Health information system for strengthening follow-up of maternal and child health services</b></p>	
<p><b>User:</b> Health Assistants</p>	<p><b>Functions</b></p> <ul style="list-style-type: none"> <li>✓ Functions to support maternal and child health services (immunizations, antenatal and postnatal follow-up on maternal and child conditions) and manage maternal and child health information for each household, mother, and child.</li> <li>✓ Colored notifications and alert generation to identify vulnerability occurrences</li> <li>✓ Risk scoring and risk flagging capabilities for identifying and following up with mothers and children with prenatal and postpartum problems</li> <li>✓ Refer patients to appropriate healthcare facilities according to the results of counseling by the maternal and child health service and support the sharing of referral information</li> <li>✓ Automatic generation of health statistics reports of maternal and child health information for each community clinic</li> <li>✓ Health assistants' ability to monitor the performance of maternal and child health care services and automatically generate reports on the progress of support operations</li> <li>✓ Ability to share health information to DHIS2, DHIS Trucker, and SHR</li> </ul>
<p><b>Effectiveness</b></p> <ul style="list-style-type: none"> <li>■ Utilizing automatic risk flags that identify priorities through more accurate monitoring of maternal and child health services, it is possible to identify and follow up on mothers and children with prenatal and postnatal problems. As a result,</li> </ul>	<p><b>Possible difficulties in implementation and operation</b></p> <ul style="list-style-type: none"> <li>◆ Maternal and child health services involve many elements and MOHFW-related departments, making coordination with each department during implementation and operation extremely difficult.</li> </ul>

<p>it is expected to reduce maternal and child mortality and morbidity.</p> <ul style="list-style-type: none"> <li>■ Daily monitoring and prompt follow-up support will enable the expansion of health services to underserved mothers and children.</li> </ul>	<p>Implementation and operation are considered extremely difficult for a proof of concept that requires implementation and operation in a short period of time.</p> <ul style="list-style-type: none"> <li>◆ There are many existing ICT solutions for maternal and child health services, each functioning independently. Standardization of individual ICT solutions is essential for comprehensive service provision such as maternal and child health services, but extremely difficult to achieve in this proof-of-concept period.</li> </ul>
<p><b>ICT utilization plan 4: COVID -19 health information system for vaccination promotion and monitoring</b></p>	
<p><b>User:</b> Health assistant, Multipurpose health volunteers (MHV) NGO deploys frontline medical personnel</p>	<p><b>Functions</b></p> <ul style="list-style-type: none"> <li>✓ Management of COVID-19 vaccinators (browse, search, vaccination rate progress management) function</li> <li>✓ Follow-up functions for first and second vaccinations, alert/remind individuals who have not been vaccinated</li> <li>✓ Ability to identify patients with adverse reactions to COVID-19 vaccination for subsequent follow-up and to put the right resources in the right place for care</li> <li>✓ Ability to download a COVID-19 vaccination certificate for each individual who has been vaccinated with COVID-19 vaccine (issuance of vaccine certificate)</li> <li>✓ System integration with Surokkha and other OpenSRP and SHR integration functions</li> </ul> <p>* Surokkha already has functions of COVID-19 vaccine registration, checking COVID-19 vaccine status, and downloading COVID-19 vaccine certificates. In addition, the Open SRP already has functions for notifying local healthcare providers and managing immunization data for target age groups, and it is necessary to link and coordinate with these existing functions.</p>
<p><b>Effectiveness</b></p> <ul style="list-style-type: none"> <li>■ Unvaccinated households and individuals can be identified and followed up.</li> <li>■ Integration with SHR will improve future vaccination coverage.</li> <li>■ The COVID-19 vaccination status by region, district, and community can be monitored to identify areas with low vaccination rates and follow-up to improve vaccination rates.</li> <li>■ Reduces the workload of frontline healthcare workers</li> </ul>	<p><b>Possible difficulties in implementation and operation</b></p> <ul style="list-style-type: none"> <li>◆ Surokkha has only recently begun operations. In general, it is extremely difficult to cooperate and coordinate with a newly started system.</li> <li>◆ Especially concerning Surokkha, the person in charge is extremely busy under the COVID-19, making cooperation and coordination even more difficult.</li> <li>◆ Surokkha's operation is still unstable. Extremely difficult to implement new initiatives.</li> <li>◆ The population of vaccination targets is not fully known, making it difficult to ascertain the actual vaccination coverage.</li> </ul>

The prototype proposal in Table 11-2 was presented to the parties involved in this proof-of-concept in the workshop in July 2021. While all of the prototypes were agreed on their necessity and importance, the participants expressed concern that the scope of ICT utilization plan 3, "Maternal and child health services," is larger than the other proposals, and that it may be difficult to conduct a proof of concept in a limited period and with limited resources. Regarding ICT utilization plan 4, "COVID-19 vaccination promotion and monitoring," DGHS-MIS expressed concern that the existing system (Surokkha) was having trouble at the time of the workshop, and the person in charge of the system was extremely busy dealing with the trouble. Some commented that ICT utilization plan 4, which requires coordination with the system, was inappropriate for this proof-of-concept. As a result, the DGHS-MIS agreed to develop a prototype based on a combination of some functions of ICT utilization plan 1, "Use of uniquely identifiable health ID" and ICT utilization plan

2, “Enhanced EPI vaccination follow-up.”

11.3.2 Prototype overview

The following figure shows the hardware specifications of the prototype.

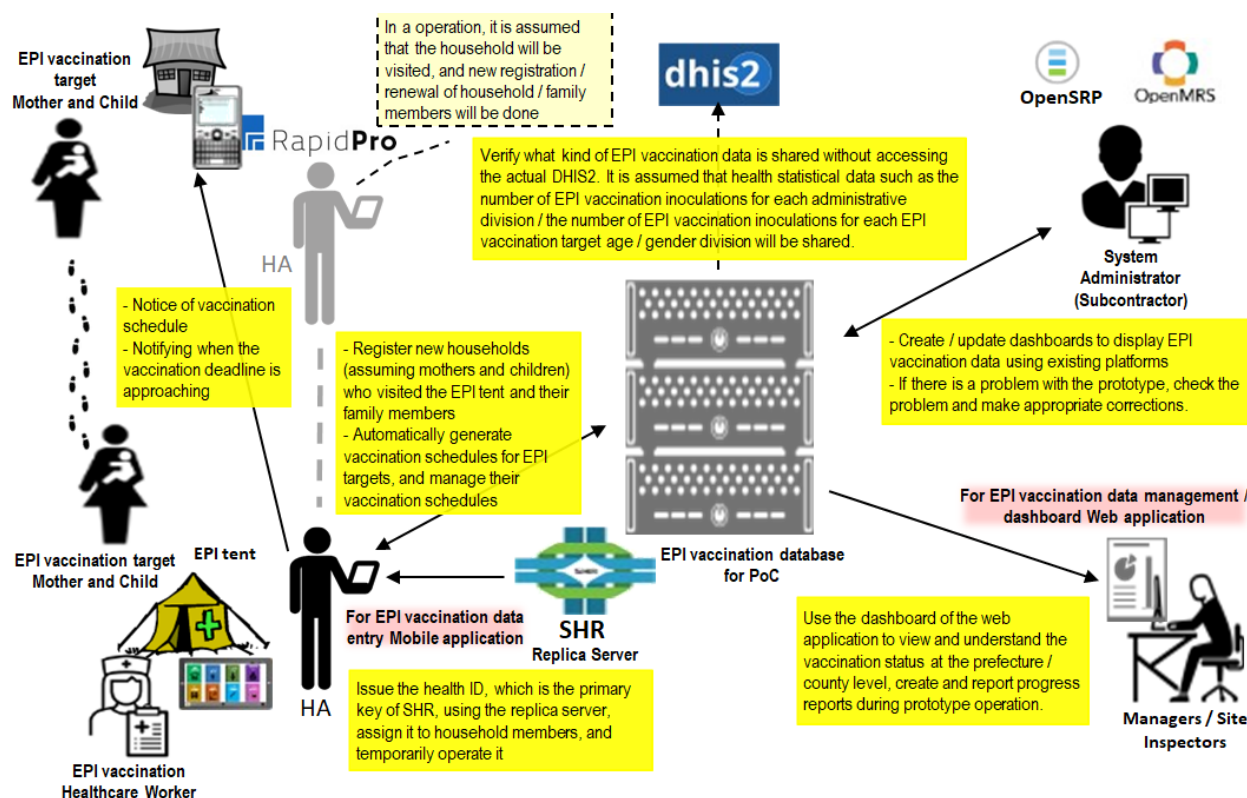


Figure 11-2 Outline of hardware specifications of the prototype for proof of concept

The assumed users of the prototype used in the proof of concept are as follows.

- **Health assistant (HA):** In the EPI<sup>428</sup> tent, responsible for registering basic household and personal information of mothers and children coming for vaccination, entering and managing immunization-related information.
- **Administrator / Site supervisor:** Responsible for managing the input of vaccination information, managing and supervising the work of the HAs, and providing on-site guidance to the HAs at the site level.
- **System administrator:** DGHS-MIS staff from the civil surgeon office is responsible for preparing and reporting EPI vaccination progress reports at the district and upazila level and identifying and resolving problems during prototype operations.

<sup>428</sup> The Bangladesh government promotes an open-air Expanded Program of Immunization (EPI). The program divides the upazila into about eight zones, and each week, EPI tents are set up in two zones to provide vaccinations to mothers and their children who visit the tents.

The prototype consists of a mobile application and a web application. The mobile application is used to register the basic information of vaccination targets (children aged 0-5 and mothers aged 15-49) at the EPI tent, and the registered information is stored on the server of the subcontractor<sup>429</sup>. The EPI vaccination management information is then entered into the mobile application each time a vaccination is administered, and the EPI vaccination management information database is updated. This management information is temporarily stored on the mobile device in an offline environment without internet access. When connected to the Internet, the information is synchronized with the database on the server, and the EPI vaccination management information in the database is always kept up to date<sup>430</sup>.

The mobile application also includes SMS-based message notifications<sup>431</sup> for vaccination follow-up to households and individuals who have not been vaccinated (notifying them of upcoming vaccination items, scheduled vaccination dates and locations, and reminding them if they have not received their scheduled vaccinations after the scheduled dates). The system also provides notifications to improve vaccination coverage. The web application can be used by administrators/site supervisors and system administrators to monitor the progress of EPI vaccinations, check immunization coverage by region<sup>432</sup>, district, upazila, and community, and allocate EPI vaccination resources appropriately according to the progress of immunization coverage (The PoC only presents the EPI vaccination status and vaccination rates for the upazila in the demonstration, and does not include subsequent verification of utilization.).

The proof of concept also includes the linkage with other existing systems, such as DHIS2 and SHR, managed by servers in the MOHFW and cannot be directly accessed. Therefore, this proof of concept is limited to the verification of the proposed information items on the EPI vaccination progress report shared with DHIS2. For the verification of linkage with SHR, a replica server that imitates SHR was set up on the server of the subcontractor, and it has the function of issuing and assigning health IDs. At the time of registration of basic information on vaccination targets, a health ID that is supposed to be uniquely recognized by all HIS handled by MOHFW is assigned, along with the new registration of family members. The health ID is used for individual vaccination management and vaccination follow-up. Since the scope of this PoC does not envisage the linkage verification of the individually assigned health IDs with HIS of other health services, it only proposes HIS of other health services that can be linked with the health IDs. The health services that can be linked to the health ID are envisioned to include community-based maternal and child health services and NCD health services.

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<sup>429</sup> The purpose of this proof-of-concept is to verify the ICT utilization plan using the prototype, and as soon as the results of the demonstration are obtained, the database entered and stored using the prototype was deleted on the due date of the performance of the re-commissioning work contract (February 28, 2022), taking into consideration that vaccination-related information is personal information. In addition, since the prototype itself is not a prototype for subsequent full-scale operation, the prototype installed on the server owned by the subcontractor was also deleted. Therefore, the prototype cannot be used after the day following the said due date. The detailed design and source code of the prototype were submitted as the final deliverables of the re-commissioning work.

<sup>430</sup> The mobile application's functions for registering, modifying, and deleting household and individual information, as well as for inputting information offline and then synchronizing it online, utilize modules provided by the OpenSRP platform.

<sup>431</sup> The SMS-based message notification function utilizes a module of the RapidPro platform.

<sup>432</sup> Based on the basic information of the EPI vaccination target population, the vaccination progress management and reporting functions utilize modules provided by the OpenSRP platform.

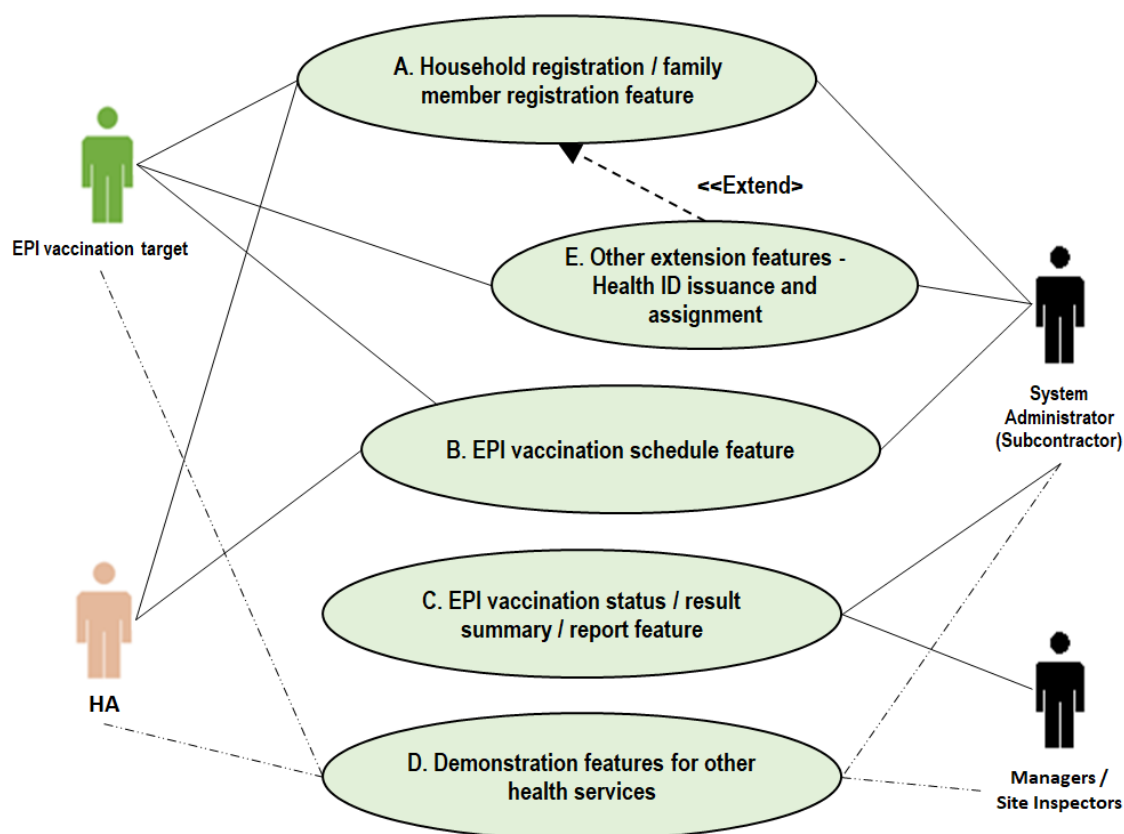


Figure 11-3 Use case (function) diagram of a proof-of-concept prototype

The functionality of the prototype used in this proof-of-concept is shown in the UML<sup>433</sup> use case diagram. An overview of each of the functions shown in the diagram is as follows.

**A. Household registration/family member registration feature:**

The HA registers new households (assuming mothers and children) and family members who visit the EPI tent. At that time, the HA asks the SHR replica server to issue a health ID and assign it to the newly registered household as the ID of the family member. In actual operation, it is necessary to ensure consistency with existing SHRs, but this is outside the scope of this proof-of-concept. It is envisioned that in actual operation, instead of registering households that visit the EPI tent, each household in the target community will be visited to register information on households and their family members in the entire community. However, as this cannot be done within the time frame of this proof-of-concept, it attempts to register households and family members by targeting mothers and children who visit the EPI tent.

**B. EPI vaccination schedule feature:**

This function is designed to manage the vaccination schedule for the target population. For newly registered

<sup>433</sup> It is a general-purpose, development-specific modeling language used in software engineering. It is intended to provide a standardized modeling method for visualizing system design. In this report, use case diagrams are used to express what can be done with the system “from the user's point of view.”



households and individual family members who are eligible, a subsequent vaccination schedule is automatically generated based on their age at the time of registration and vaccination records. By using the SMS function of the mobile device, the automatically generated individual vaccination dates and times are notified to the target person's mobile device in advance. Those who do not show up on the scheduled vaccination date will be reminded, and the HA will follow up with them. Other functions include a vaccination management support tool for HAs, who are the users of this function (Among the vaccination targets of the community in charge, those who have not been vaccinated as scheduled are identified and color-coded according to whether they have been vaccinated or not, for easy visual management).

### **C. EPI vaccination status / result summary / report feature:**

This function displays the vaccination status (vaccination status of households and individuals in the target community, counseling results at the time of vaccination, records of the health status of the vaccinated) and tabulates the results of vaccination implementation as statistical data, which can be viewed by relevant parties using a dashboard. All users can view the data, and the displayed data can be saved in various file formats (CSV, Excel, PDF).

### **D. Demonstration features for other health services (interface only developed for validation):**

A simple interface for using other health services was incorporated to test the applicability of the prototype to other health services. The prototype incorporates an interface for inputting growth records (height, weight, and head circumference) and medical records of children aged 0-5 years eligible for EPI vaccination and displays the inputted growth record data. In the prototype, individual health information, including vaccination information and child growth records, can be retrieved by health ID, and each health information can be viewed through a tab menu.

### **E. Other extension features - Health ID issuance and assignment (interface only developed for validation):**

This function accesses the SHR replica server to issue and assign a temporary health ID. This temporary health ID is used to uniquely recognize and manage individual health information in the prototype.

Please refer to " Annex 4: Detailed design document for PoC of ICT utilization plan" for details of the prototype specifications. Please refer to " Annex 5: Prototype for PoC of ICT utilization plan" for the URL and access information for using the prototype. For other user manuals of the prototype, please refer to " Annex 6: User manual for mobile application for PoC ICT utilization plan" and " Annex 7: User manual of web application for PoC ICT utilization plan", respectively.

### **11.3.3 Prototype implementation and operation**

An attempt was made to introduce a prototype to the site to conduct a proof of concept for the operation of the selected ICT utilization plan. Table 11-3 shows the operational proof-of-concept scope of the ICT

utilization plan.

**Table 11-3 Operational PoC scope of the ICT utilization plan**

Installation area / operation period	Ramu upazila, Cox's Bazar / 1 month (for 1 cycle of EPI)
PoC users	HAs (3), Administrator (1) / Site supervisors (2), System administrator (1)
Way of introduction	Two-day training for users (Day 1: lecture, Day 2: implementation exercise)
Scope of introduction	One union in Ramu upazila was selected for the EPI tent that tours the area. 100 times/month per user (HA), 100 x 3 persons for 300 times recorded.

The implementation requires approval from the MOHFW and cooperation from the users (HAs, administrators/site supervisors, and system administrators) of the prototype. Since the subcontractor has extensive experience in HIS implementation, the proof-of-concept results for the prototype's implementation and operation were supplemented with knowledge and experience gained from the subcontractor's past HIS implementation experience. In implementing the prototype, training was provided to the users of the proof-of-concept. Please refer to "Annex 8: Training report for prototype introduction and operation" for the training record.

#### 11.4 Summary of demonstration results

The following table summarizes the demonstration results for the tentative proof-of-concept items identified prior to the proof-of-concept. Proof of concept for ICT utilization was conducted during the identification and selection of ICT utilization plans, the implementation of a prototype based on the selected ICT proposals, and the introduction and operation of the prototype. The approval process from the MOHFW took more than two months, and the time frame for the operational proof of concept for the ICT utilization plan was compressed from one month to two weeks. Therefore, to compensate for the short time frame for the operational proof of concept, the knowledge and experience of the subcontractor in the past implementation and operation of HIS were also added to the proof-of-concept results.

**Table 11-4 Proof-of-concept results**

Proof-of-concept item		Results	Notes, limitations
<b>a) Results through a proof-of-concept pre-survey</b>			
a)-1	The health system's highest ICT utilization needs are:	The DGHS strongly advocates introducing a health ID that uniquely identifies the person eligible for health services. The introduction of a health ID is one of the highest priority ICT utilization plans to promote the understanding and follow-up of individual health information and ensure consistency among systems.	Many HIS systems are developed based on open-source platforms. It seems more realistic to encourage the collaboration of systems from a technical rather than a political aspect. On the other hand, collaboration with institutions other than MOHFW (MOLGRD&C, private sector) is also important but extremely difficult.
a)-2	In the health sector, the biggest challenge in using ICTs is:	Duplication of organizational roles within the MOHFW (DGHS and DGFP), weak coordination of the MOHFW for ICT support by donors, low capacity of ICT solution	See the analysis of issues in health information systems. Weak coordination of the MOHFW for ICT support by donors is a major

Proof-of-concept item		Results	Notes, limitations
		implementation sites (health facilities, communities), inconsistencies in actual operations and duplication of ICT tools.	factor. Policy and technical coordination are needed.
a)-3	Many national and international institutions have promoted ICT use in the health sector. What are the challenges in collaborating with these institutions, and what possible ways of collaboration can be considered:	National and international institutions have provided support for ICT utilization as soon as they could obtain funding according to their respective policies, but there has not been sufficient coordination prior to the introduction of ICT and follow-up and coordination after the introduction of ICT. In order to promote effective ICT utilization, it is necessary to review and optimize the workflow following the situation at the sites where health services are provided.	The MOHFW is required to have policies and rules for the use of ICT and to take the initiative in managing the timing and destination of ICT introduction.
a)-4	There are three major core systems: DGHS-DHIS2, DGFP-DHIS2, and SHR. The segregation of each core system and how they will work together in the future:	DHIS2 manages secondary information (health statistics) compiled by healthcare facilities (facilities above upazila level), while SHR is intended to manage individual health information (uniquely recognized by health ID) and is segregated. DGHS and DGFP overlap in the health information handled by each system, making segregation difficult. By introducing and applying health IDs, the population of health service providers can be grasped, and the situation can be properly understood. On top of that, it will be possible to appropriately distribute the health services provided by each bureau, grasp the effects of such services, monitor them periodically, and grasp their effects more accurately by continuing to do so.	The organizational structure of the MOHFW results in the duplication of some health services. It is difficult to segregate the systems unless the overall implementation structure for health service provision is segregated. Realistically, it is beyond the scope of the HIS to segregate these overlapping roles and responsibilities. On the DGHS side, health IDs should be introduced, operated, and established ahead of time (accurate population counts and appropriate follow-up using health IDs). A more realistic approach would be to link the two systems using health IDs.
a)-5	Other issues faced during the demonstration in surveying the status of ICT utilization and identifying utilization plans, and how these issues should be addressed in the future:	The MOHFW did not fully understand the content of the introduced ICT technology, the actual status of ICT utilization, and its progress on a trial basis. In addition, no one in charge had a comprehensive grasp of ICT utilization. It took a lot of time to identify a person in charge who grasped the technical details and understood the current status of ICT utilization.	The subcontractor had a lot of experience with MOHFW and knew how ICT technologies had been introduced. If it is difficult for MOHFW to have a comprehensive understanding of ICT technologies that have been introduced, it would be effective to establish a technical community among development vendors and create a mechanism for exchanging information with each other.
<b>b) Results through the development of a proof-of-concept prototype</b>			
b)-1	Many platforms have been introduced for ICT development, but what are the challenges and what measures are needed to solve them:	With the support of international organizations, platforms such as DHIS2, SHR, OpenMRS, OpenSRP, eMIS, RapidPro, and DHIS2-Trucker have been provided as open source. The purpose and functions of each of these platforms need to be organized, and the development vendors need to define and make known the rules in terms of technology when utilizing ICT.	Different development vendors recommend different platforms and common modules (e.g., icddr,b recommends eMIS, while the re-commissioning vendor recommends OpenSRP). Fairness must also be maintained in the interests of development vendors.
b)-2	Information items to be shared to link the prototype with the existing DGHS-DHIS2 and SHR	<b>Shared Information Items (Draft)</b> <b>DGHS-DHIS2:</b> Number of EPI vaccinations per administrative category, number of vaccinations per age group eligible for vaccination and gender category, vaccination	In order to link with DGHS-DHIS2 and SHR, it is necessary to assume full-scale operation. For actual sharing of health information, DGHS-DHIS2 shares health

Proof-of-concept item		Results	Notes, limitations
	systems:	service record per HA (if the number of populations can be identified, vaccination coverage, distribution plan of EPI resources per administrative category can be shared in the future) <b>SHR:</b> EPI vaccination status of each EPI subject tied to health ID, health status at the time of vaccination, individual unvaccinated trends.	statistics at the upazila level and above as monthly reports, while SHR shares individual information by linking it to health IDs. However, this is a large amount of information and will take time to implement.
b)-3	In order to determine the progress of EPI services as a percentage, the number of people served (population) needs to be determined by communities and by unions, upazilas, and regions. How can these population numbers be ascertained:	A survey of community health status is being piloted by the HIS of CBHC services. Although limited to some districts and upazilas, it is important to continue this activity. A health ID can be assigned at the same time to create a database associated with the health ID. Subsequent updates can be made as needed by other community-based health services (maternal and child health, EPI) to determine the number of people in the population.	The EPI service target population is also the target population of the MCH service and the target population of the CBHC service to determine the actual health status of the household (at union level). Currently, each of them uses a different HIS to collect and manage health information. Eco systemization of these is needed first. There are nearly 5,000 unions in an upazila, and it takes a lot of time and effort to cover the entire country.
b)-4	What health services, other than EPI services, need to be linked using health IDs or could be linked to strengthening the health system:	EPI services are community-based health services, and similar health services should be targeted for ICT utilization in parallel with EPI services. Other health services, such as CBHC services (community health condition survey and prevention), NCD services (nutrition improvement support services for subjects over 40 years old), and maternal and child health services (maternal health checkups, postpartum health checkups, fostering monitoring) can be linked to community health services. An ecosystem of health systems can also be created.	In the health services that have been made linkable, a HIS has been developed for each of them. Integration and coordination of these HISs should be considered. The development vendors of each HIS are different, and coordination and collaboration are required with each development vendor, with MIS, and with the international organizations that have funded the development vendors for their support policies, as well as for future collaboration methods.
b)-5	Based on the prototype developed in this proof-of-concept, what are the main challenges in development, assuming that other health services with high needs for collaboration are also incorporated:	Some modules of the HIS for CBHC services were utilized to develop the prototype for this proof-of-concept, and development could be completed in a short period of time (about one month). For maternal and child health services, there is a DHIS2 Trucker, which has been introduced on a trial basis but is not yet in full-scale operation. However, since it utilizes the same platform as the prototype, it is possible to integrate and link the DHIS2 Trucker with the functions of the prototype. Integration of HIS for NCD service support is difficult because of the different platforms and development vendors. However, it is possible to establish a community health database linked to health IDs used for NCD services.	Regarding the method of integration and collaboration, a working group could be formed with the development vendor involved in developing the HIS in question, the MIS, and the international organizations that have funded the vendor. Example: Assign health IDs along with the actual status of the community by HIS of CBHC services, and then try to monitor and update them as needed through various health services by the integrated version of DHIS2 Trucker and prototypes. These databases managed by health IDs can be integrated and linked by using NCD services.
b)-6	Open source is used in the health sector in Bangladesh. On the	Open source requires no licensing fees and lowers HIS development and operation costs with no post-implementation usage costs. For	Many platforms have been introduced without sufficient coordination, resulting in

Proof-of-concept item		Results	Notes, limitations
	benefits of using open source and whether HIS development should continue to be done through open source:	the health sector, many international organizations have provided useful open-source platforms. Many domestic development vendors have sufficient development capacity using open-source platforms. We encourage the continued use of open-source platforms in the future.	duplication of HIS and insufficient sharing of the actual status and progress of platform implementation. It is desirable to coordinate the actual implementation of open-source platforms and, in cases where they have been introduced on a trial basis, their progress and future expansion among the parties concerned, and to create a mechanism for coordination.
b)-7	Other challenges faced during the demonstration in developing systems for ICT utilization plan and how these challenges should be addressed in the future:	In this proof-of-concept, a great deal of time was required for the survey of the current status of ICT utilization, its results, the selection of ICT utilization plans for the prototype development, and the subsequent prototype development and its implementation, and the approval process, although the COVID-19 also had an impact on the process. It is necessary to proceed with development based on the assumption that a lot of time will be required.	It took one month to coordinate a workshop to share the results of an ICT utilization survey, two months to select an ICT utilization plan for the prototype, and more than two months from prototype development to implementation, partly due to the request for human resources from the Civil Surgeon office of the site where the prototype would be introduced.
b)-8	In addition to the concepts to be demonstrated above, other considerations in HIS development:	In the case of full-scale HIS development for implementation and operation, it is also important to manage the development progress. It is also desirable to introduce tools that allow the development progress to be checked online.	As soon as the development vendor on the Bangladesh side is identified, it is advisable to select a development progress check tool and set rules.
<b>c) Results through the operation of a prototype for proof-of-concept</b>			
c)-1	Is the prototype user-friendly (easy enough to use):	The prototype mobile application was developed based on the HIS for CBHC, which is currently in trial operation, and is highly complete; the web application can be used for detailed queries and has sufficient functionality. It is desirable to improve the use of colors and the arrangement of tab menus from the user's point of view.	The prototype mobile application has similar EPI functionality to the DHIS2 Trucker. The team compared the two and found the prototype to be superior. However, there are many input items, and it is necessary to focus on the necessary information.
c)-2	Pros and cons of information items for use in health policy related to EPI vaccination:	Merely compiling and reporting the number of EPI vaccinations per administrative category is not sufficient. It is necessary to grasp the target population and the vaccination rate for each administrative division.	Human tactics are required to grasp the population, and a long-term perspective is necessary. Strategies such as proceeding in stages, starting with areas with the highest degree of understanding and priority, are necessary.
c)-3	Utilization of messaging function through social networks, its effectiveness and improvements:	In the HIS for CBHCs, a message notification function linked to the SNS function has also been introduced and has had a certain effect as a reminder to community residents. The younger generation is particularly accustomed to using this function, which has been highly effective. For the older generation and those who do not have cell phones, HA visits to households are also indispensable.	The results are not based on an actual demonstration using a prototype but were verified based on the usage of other HIS with the same module and its effectiveness. For communities with a large number of elderly who do not have cell phones, it would be effective to conduct a separate educational campaign on health services as well.
c)-4	This time, mothers and children visiting the EPI tent are targeted. Is it possible to follow up	Based on the past implementation experience of the subcontractor, they were able to identify the range of households that visit the EPI tent by relying on the names of communities and landmarks recognized within the area, and with	An attempt to demonstrate the same concept was made but could not be implemented. In practice, it is assumed that in vaccination, household visits are made to identify

Proof-of-concept item		Results	Notes, limitations
	with the target households with the information provided:	information such as the name of the head of the household, in many cases, they were able to identify where the household resided. Follow-up is possible.	those eligible for vaccination, and if location information is recorded at the time of the visit, sufficient follow-up is possible.
c)-5	On whether the use of ICT tools can reduce the workload of health assistants (HAs):	In order to solve issues in the health sector, individual follow-up and proper identification of actual conditions are required to promote the improvement and expansion of the quality of health services. In order to introduce ICT tools based on the pursuit of this effect and to mitigate the associated increase in workload, it is essential to optimize the workflow and build the capacity of local resources in the area of implementation.	While an increase in workload at the community level is inevitable to produce new effects, it is important to attempt to alleviate some of that increased workload. In order to strengthen the health information system, it is essential to promote a good balance between policy, ICT implementation, ICT infrastructure development, and optimization and strengthening of the implementation system.
c)-6	There have been past attempts to determine the nurturing and nutritional status of mothers and children under 2 years of age at the time of EPI vaccination service provision. Can health ID be used to provide health services not only at the time of vaccination service provision but also for mothers and children under 2 years of age with current local resources:	The prototype and workflow planned for this proof-of-concept project require the following work processes: 1) mother and child visit the EPI tent ⇒ 2) registration of household and family members of the mother and child and assignment of health ID ⇒ 3) preliminary examination and counseling of the mother and child to be vaccinated ⇒ 4) vaccination of the mother and child ⇒ 5) input and recording of vaccination items. By handling the process of (2) at the time of household visits, the overall work process can be reduced, and other health services can be provided and recorded. More health resources will be needed to handle other health services and increase recording tasks.	It will also be necessary to test the use of other health services on a trial basis to determine how much work can be handled with only existing local resources and optimize each health service's work accordingly. It would be possible to proceed gradually by registering household/family members of target unions, assigning them health IDs in advance, and then conducting pilot operations of combined operations of multiple health services, starting with those unions that have completed these measures.
c)-7	Considering the time, labor, and other costs involved in implementing the prototype developed in this proof-of-concept, what is the timeframe and input items needed to promote the strengthening of health services specific to EPI services:	The most time-consuming part of implementing this proof-of-concept was the explanation to the MOHFW and its approval process. If these efforts were omitted, it would have been possible to select the ICT utilization plan, the development and implementation of the prototype, and the demonstration during implementation in about four months. Development for the full-scale operation would require more time. The system would then continue to be implemented and operated in multiple districts on a trial basis for about one year and would be ready for full-scale implementation and operation in about two years. In the meantime, it will be necessary to coordinate the MOHFW, MIS, and development vendors with international organizations and work in parallel to unify the platform and coordinate with other HISs to collaborate. As input items, human resources are needed, including (1) experts for HIS strengthening, (2) ICT planning and support experts for technical coordination of HIS development, (3) ICT utilization capacity strengthening experts for local capacity	For full-scale HIS enhancement based on this proof-of-concept, it is necessary to select the platform that will serve as the foundation for the HIS and coordinate work with development vendors and the international organizations that have supported them. Once certain rules are set and agreed upon, the detailed design of the HIS should be implemented. The selection of the development vendor for the subcontracting work will depend on the platform on which the HIS will be developed, and the MOHFW should be fully consulted to ensure fairness.

Proof-of-concept item	Results	Notes, limitations
	building, and (4) domestic subcontractor for system development together with experts in health administration. The following is a brief overview of the project. Other ICT infrastructure development will be handled through coordination with other international organizations.	

The results of this proof-of-concept described above lead to the following conclusions.

- Due to the lack of a functioning coordination mechanism for ICT implementation, many different platforms (DHIS2, SHR, OpenMRS, OpenSRP, eMIS) are mixed, and the actual implementation of each is not understood. No one in charge or engineer has a comprehensive grasp of the actual utilization of the platforms, making coordination among the systems extremely difficult and to the detriment of the realization of the HIS ecosystem. In order to organize the specifications of each platform, the purpose and functions of the HIS using the platform, and to make the coordination mechanism function for ICT implementation, it is necessary to define and inform the development vendors, together with the MIS, of the rules (e.g., mandating which platforms can be used, implementing health ID, linking with other core systems such as DHIS2, SHR and HRIS) when ICT is used.
- ICT implementation targeting the community level is underway, but local resources and capacity are insufficient and not fully effective. It is possible to improve and expand the quality of health services by following up with individual health sectors to solve their problems and properly understand their actual conditions. When introducing ICT tools based on the premise of aiming for this new effect, in order to manifest the effects of ICT tool introduction, such as the computerization of diagnostic records and the associated streamlining of operations, including the automation of tabulation and monthly reporting, the optimization of the workflow and local resources at the capacity building is necessary.
- In addition to understanding the population of people eligible for health services, the introduction and application of health IDs will enable a proper understanding of the profile of people eligible for health services (e.g., number of people eligible per administrative division, number of people eligible per attribute, vulnerable population regions and population). This will enable the appropriate allocation of health service resources, the identification and regular monitoring of the effects of such allocation, and the provision of enhanced and appropriate health services through the continuation of these activities. By sharing this health service information with the central level and managing it appropriately, it will be possible to utilize it in the formulation of health sector policies and medium- to long-term plans, thereby contributing to the sustainable development of the health sector.

**Annex 1: Assistance by Development Partners for Cox’s Bazar Sadar District Hospital**

**Name of Organization:** United Nations Population Fund (UNFPA)

<b>Name of Active Project (s)</b>	<b>Project Duration (Months)</b>	<b>Project End Date (DD.MM.YYYY)</b>	<b>Scope of Work</b>
1. Strengthening EmONC	48 Months	31.12.2021	HR support: Funding of 9 midwives to support CEmNOC services in Labour room, delivery room and operation theater. Partner: RTMI
			Build capacity: Capacity building of the health care providers working in CEmNOC (Junior Doctors, nurses, midwives) Partner: RTMI
			Mentorship Program: Supportive supervision/ Mentoring to the Midwives and Medical Officers in the Labour ward. Partners: OGSB and Save the Children
2. Strengthening CEmONC	48 Months	31.12.2022	UNFPA's Support to 4th HPNSP through DGHS
			Salary of Five Physician to support the Labour Room.
			Salary for one driver to support the emergency referrals
			Salary for four Support staffs to support the operation
			Capacity building of Midwives: Capacity building of the health care providers working in CEmONC(Junior Doctors, nurses, midwives). Partners: Jhpiego and Ipas.
3. Health Sector Response to Gender Based Violence (IP: Hope Foundation and OGSB)	26 months	31.07.2023	To strengthen system and capacity at the institutional and individual levels for integrated SRHR and GBV prevention and response services in Cox's Bazar
			Advocacy to improve availability, accessibility of 24/7 quality GBV services at DH and 7 UHCs and its utilization by the GBV survivors
			Ensure Health Sector Response to GBV services at DH and UHCs including medical



Name of Active Project (s)	Project Duration (Months)	Project End Date (DD.MM.YYYY)	Scope of Work
			<p>care, medico-legal care and psychosocial care</p> <p>Capacity building of the health care providers (doctors, nurses, midwives, SACMO, FWV) of DH, UHCs and UH&amp;FWC</p> <p>Availability and utilization of GBV service related supplies and commodities at DH and UHCs including register, forms, survivor kits etc.</p> <p>Ensure availability of GBV service data in DHIS2 from DH and UHCs for evidence based decision making</p> <p>Supportive supervision and monitoring for 24/7 emergency services for GBV survivors</p> <p>Establish an effective referral system from union to Upazila or district for medical services, police or legal services</p> <p>Orientation of the Field Workers on guiding principles of GBV services and for information for the communities</p>
<p>4. Sexually Transmitted Infections (STIs) IP: Light House)</p>	<p>12 months</p>	<p>31.12.2021</p>	<p>Strengthening Sexually Transmitted Infections (STI) services in DH and UHCs</p> <p>Advocacy to improve STI services in DH and UHCs especially Point of Care and etiologic management of STI</p> <p>Capacity building of the doctors on STI case management especially etiologic management of STIs</p> <p>Ensure syphilis screening among the pregnant women during antenatal care to eliminate congenital syphilis</p> <p>Introduce a STI register in DH to develop a service database</p>

**Name of Organization:** United Nations High Commissioner for Refugees (UNHCR)

Name of Active Project (s)	Project Duration (Months)	Project End Date (DD.MM.YYYY)	Scope of Work
<p>1. Supporting and implementing COVID-19 treatment services to the host community and refugees through establishment and expansion of ICU, HDU and severe ward</p>	<p>16 months</p>	<p>31.10.2021</p>	<p>Specific objective 1: Manage critical patients in COVID 19 pandemic</p>
			<p>Specific objective 2: Infra structure modification for COVID-19 management. Bed capacity: 10 ICU Beds, 8 HDU beds and 18 severe ward beds</p>
			<p>Specific objective 3: Full staffing support (recruitment, salaries, transport) HR support: 114 staffs ( 2 senior consultants, 4 junior consultants, 20 medical officers, 4 in charge nurses, 10 ICU nurses, 20 senior staff nurses, 5 staff nurses, 2 nutritionists, 2 IPC supervisors, 2 X-ray technicians, 3 medical technologists, 1 ward master, 1 assistant ward master, 19 ward boys, 19 cleaners)</p>
			<p>Specific objective 4: Supply of oxygen and medical equipment 580 oxygen cylinders and medical air Laboratory set up in the ICU wing</p>
			<p>Specific objective 5: supply od medicines and medical consumables Provision of personal protective equipment</p>
			<p>Specific objectives 6: Nutritional support for patients Recruitment of 2 nutritionists</p>
			<p>Specific objective 7: Capacity building of staffs with support of the partners</p>
			<p>Specific objective 8: Reinforce infection control and prevention activities by deploying 30 cleaning staff in the main hospital for long time through RRRC office</p>
			<p>Specific objectives 9 : To strengthen hospital laboratory two laboratory technician deployed through RRRC office from long time.</p>
<p>2. Supporting "Red Zone" ward</p>	<p>6 months</p>	<p>31.10.2021</p>	<p>Specific Objectives: Support implementing services connection of Oxygen to the 43 bed "red</p>

<b>Name of Active Project (s)</b>	<b>Project Duration (Months)</b>	<b>Project End Date (DD.MM.YYYY)</b>	<b>Scope of Work</b>
			zone" ward Provision of medical equipment to " Red zone"
3. Construction of 78 room OPD complex in the Sadar hospital	15 months	31.03.2022	Specific objective: Rehabilitation Construction of the 78 room OPD complex

**Name of Organization: ICRC**

<b>Name of Active Project (s)</b>	<b>Project Duration (Months)</b>	<b>Project End Date (DD.MM.YYYY)</b>	<b>Scope of Work</b>
Emergency Department Support	6 months	31.12.2021	Specific Objectives: improving standards of emergency medical and nursing care through implementing clinical guidelines, formal and bedside training sessions, ICRC courses (BEC, ERTC, MCIT, Helping the Helpers, etc)
			Support with drugs, consumables and equipment
			Funding incentives for clinical and non-clinical staff in the ED
			Covid 19 surge capacity planning
			Water and habitat support for renovating sanitation system in the hospital

**Name of Organization: Green Hill/ Community Partners International**

<b>Name of Active Project (s)</b>	<b>Project Duration (Months)</b>	<b>Project End Date (DD.MM.YYYY)</b>	<b>Scope of Work</b>
Health Systems Support	11 Months	31/12/2021	Specific objective for HSS (1): Human Resource Support

<b>Name of Active Project (s)</b>	<b>Project Duration (Months)</b>	<b>Project End Date (DD.MM.YYYY)</b>	<b>Scope of Work</b>
			Funding 4 Medical Doctors at Sadar Hospital Emergency Department under ICRC management
			Funding 18 support staff at Sadar Hospital Red Zone under hospital management
			Specific objective for HSS (2): Medical Logistics Support
			Provide medical logistics to Upazilla Health Complexes (including Sadar Hospital) based on identified gaps in medical supplies for the COVID 19 isolation units.

**Name of Organization:** IOM-UN Migration Agency

<b>Name of Active Project (s)</b>	<b>Project Duration (Months)</b>	<b>Project End Date (DD.MM.YYYY)</b>	<b>Scope of Work</b>
Health Gender Support Programme of the MOHFW supported by the World Bank	29 months	6/30/2023	Rehabilitation of Sadar hospital- - Renovation of walls and floors by tiles - Renovation of doors and windows - Establish hand wash facilities - Painting, renovate hospital kitchen, and generator room. - Solar system for all lights (Ext, Ent, & OT) - Connection of main building with annex building. - Necessary repair for electrical and sewer system.
			Procurement and delivery of essential medicines, medical consumables and medical equipment (Procurement will be made biannually and supply to Sadar Hospital quarterly)
			Human Resource Support Psychiatrist-1; Medical Officers- 63; Nurses-62; Biomedical Engineer-1; Radiographer-2;

<b>Name of Active Project (s)</b>	<b>Project Duration (Months)</b>	<b>Project End Date (DD.MM.YYYY)</b>	<b>Scope of Work</b>
			Lab Technician-2; Sonologist-2; Echocardiography technician-2 OT assistant/Boy-9; Ward boy/Aya-30; Lift operator-6; Cleaners 78 Security Guard-25; Gardener-3; Electrician-4; Plumber-4; Carpenter-2

**Name of Organization:** World Health Organization (WHO)

<b>Name of Active Project (s)</b>	<b>Project Duration (Months)</b>	<b>Project End Date (DD.MM.YYYY)</b>	<b>Scope of Work</b>
1. Supporting COVID-19 Vaccination	03 Months	31.07.2021	Specific Objective 1: Build capacity
			HR support: funding 03 Medical Officers at COVID-unit, 02 Nurses at vaccination center
			Specific Objective 2: Rehabilitations
			Renovate OPD
			Renovate Emergency Unit
2. Strengthening CEmONC	12 Months	30.06.2022	HR Support: funding 03 midwives in the maternity unit
			Referral: Providing 2 ambulance services: drivers and fuel
			Medical Supplies: providing assorted OT consumables

## Annex 2: List of Community Clinics in Cox's Bazar District

### Upazila: Chakaria

	Union	Name of the CC	Remarks	Remarks
1	Badarkhali	Azam Nagar CC		14 CC will be reconstructed through IOM and funded by WHO and 1 CC already reconstructed by JICA.
2	Badarkhali	Satdaliya Para CC	IOM	
3	Badarkhali	Tecchi Para CC		
4	Bamo Bilchari	Pukhuriya CC		
5	Bamo Bilchari	Purba Para CC		
6	Baraitali	Paharchanda Sabujpara CC		
7	Baraitali	Santi Bazar CC		
8	Baraitali	Engineer Abdul Aziz		
9	Baraitali	Uttar Baraitali Hindupara CC		
10	Bheola Manik Char	Chhai Number Ghona CC		
11	Bheola Manik Char	Paharia Para CC		
12	Chiringa	Charan dip CC	IOM	
13	Chiringa	Palakata CC		
14	Chiringa	Saodagar Ghona CC	IOM	
15	Demushia	Gandipara CC		
16	Demushia	Mucharpara CC		
17	Dulahazara	Ringvong CC		
18	Dulahazara	Ulubaniya CC		
19	Fasiakhali	Dakshin Fasiyakhali CC	IOM	
20	Fasiakhali	Dakshin Ghuniya CC	IOM	
21	Fasiakhali	Hajiyan CC		
22	Fasiakhali	Uchitarbil CC	IOM	
23	Harbang	Brindabanthil CC		
24	Harbang	Rakhine para CC		
25	Harbang	Uttar Paharcanda CC	IOM	
26	Kaiarbil	Ali Nur CC		
27	Kaiarbil	Islam Nagar CC		
28	Kakhara	Purba Kakra CC	IOM	

29	Kakhara	Shaker Mohammad CC		
30	Khuntakhali	Hari Khola CC		
31	Khuntakhali	Kutubdia para CC		
32	Khuntakhali	Modhom Medha Kacchipiya CC	IOM	
33	Khuntakhali	Uttar Fulchari CC	JICA	
34	Konakhali	Konakhali CC	IOM	
35	Konakhali	Palan Para CC	IOM	
36	Lakhyarchar	Mandal Para CC		
37	Lakhyarchar	Purba Majher Para CC	IOM	
38	Manikpur - Surajpur	Dakshin Sorajpur CC		
39	Manikpur - Surajpur	Manikpur CC		
40	Manikpur - Surajpur	Monowar Ahmed CC		
41	Paschim Bara Bheola	Chourfarri Sayra Begum CC		
42	Paschim Bara Bheola	Darbes Kata CC		
43	Purbo Bara Bheola	Sikander Para CC		
44	Purbo Bara Bheola	Sikder Para CC		
45	Saharbil	Koralkhali CC	IOM	

### Upazila: Cox's Bazar Sadar

	Union	Name of the CC	Remarks	Remarks
1	Bharuakhali	Bara Chowdhuripara CC	IOM	3 CC already reconstructed by JICA. 19 CC will be reconstructed by IOM and funded by WHO.
2	Bharuakhali	Hajipara CC	IOM	
3	Bharuakhali	Saodagar Para CC	IOM	
4	Chaufaldandi	Maz para CC	IOM	
5	Chaufaldandi	Notun Mahal CC	IOM	
6	Chaufaldandi	Paschim Para CC		
7	Chaufaldandi	Sagor Para CC		
8	Idgaon	Bhomariya Ghona CC	IOM	
9	Idgaon	Meherghona CC	IOM	

10	Islamabad	Satzola Kata CC		
11	Islamabad	Tetultali CC	IOM	
12	Islampur	Baskata CC	IOM	
13	Islampur	Dharmerchara CC	IOM	
14	Islampur	Napitkhali CC	IOM	
15	Jalalabad	Faraji Para CC	IOM	
16	Jhilwanja	Khuruliya CC		
17	Jhilwanja	Muhuri Para CC		
18	Jhilwanja	Shikdar Para CC	JICA	
19	Khurushkul	Dailpara CC	IOM	
20	Khurushkul	Gajirdail CC	IOM	
21	Khurushkul	Mamunpara CC		
22	Patali Machhuakhali	Chankhola CC		
23	Patali Machhuakhali	Jumchari CC	JICA	
24	Patali Machhuakhali	Machuya Khali CC	JICA	
25	Patali Machhuakhali	Patali CC	IOM	
26	Patali Machhuakhali	Totakkhali CC	IOM	
27	Pokkhali	Dighirpar CC	IOM	
28	Pokkhali	Gomatali CC	IOM	
29	Pokkhali	Notun Bazar CC	IOM	

### Upazila: Ramu

	Union	Name of the CC	Remarks	Remarks
1	Chakmarkul	Dakshin Chakmarkul (Miajir Para) CC		3 CC already reconstructed by JICA. 18 CC will be reconstructed by IOM and funded by WHO.
2	Chakmarkul	Master Enamul Hoque CC	IOM	
3	Chakmarkul	Mohammadapur CC	IOM	
4	Dakshin Mithachhari	Fakira Mura CC		
5	Dakshin Mithachhari	Umkhali CC	IOM	
6	Fatekharkul	Badsha Miah Nurjahan CC		



7	Fatekharkul	Purba Dip Fatekharkul CC	IOM	
8	Fatekharkul	Taccipul CC	IOM	
9	Fatekharkul	Uttar Fatekharkul CC	IOM	
10	Garjania	Majhirkata CC	JICA	
11	Garjania	Thimchari CC	IOM	
12	Idgar	Barabil CC	IOM	
13	Idgar	Chagirkata CC		
14	Joarianala	Mowlavi Rustam Sufia CC	IOM	
15	Joarianala	Nandakhali Murapara CC	IOM	
16	Dakshin Mithachhari	Rafique Noor CC		
17	Joarianala	Varachararkul CC	IOM	
18	Kachhapia	Dakshin Kachhapia CC	IOM	
19	Kachhapia	Titarpara CC	IOM	
20	Kauarkhop	Manirjhil CC	IOM	
21	Kauarkhop	Ukhiyar Ghona CC	IOM	
22	Khuniapalong	Dariyardighi CC	IOM	
23	Khuniapalong	Doapalong CC	JICA	
24	Khuniapalong	Goyalipalong CC	JICA	
25	Rajarkul	Sucharu Madhubi CC		
26	Rajarkul	Forest Office CC	IOM	
27	Rashid Nagar	Kahatiyapar CC		
28	Rashid Nagar	Lamar Para CC	IOM	

### Upazila: Pekua

	Union	Name of the CC	Remarks	Remarks
1	Barbakiya	Puraton Baghguzara CC		10 CC will be reconstructed by IOM and funded by WHO.
2	Barbakiya	Baraiyakata CC	IOM	
3	Barbakiya	Kutubpara CC	IOM	
4	Magnama	Fultala CC	IOM	
5	Magnama	Satghar Para CC	IOM	
6	Pekuya	Ciradiya CC	IOM	

7	Pekuya	Taliakhata CC	IOM	
8	Pekuya	Dilruba Kashem CC (U construction)		
9	Rajakhali	Matbarpara CC	IOM	
10	Rajakhali	Palakata CC		
11	Silkhali	Jarulbaniya CC	IOM	
12	Silkhali	Jonota Bazar CC	IOM	
13	Silkhali	Sabuj Para CC		
14	Taitang	Godikata CC	IOM	
15	Ujantiya	Fakirpara CC		
16	Ujantiya	Ghodarpara CC		

#### Upazila: Moheskhali

	Union	Name of the CC	Remarks	Remarks
1	Bara Maheskhali	Barodeil CC		18 CC will be reconstructed by IOM and funded by WHO.
2	Bara Maheskhali	Fakir Ghona CC		
3	Bara Maheskhali	Jagir Ghona CC	IOM	
4	Bara Maheskhali	Jura Pukurpar CC	IOM	
5	Bara Maheskhali	Munshir Deil CC		
6	Chhotamohes Khali	Lomba Ghona CC		
7	Chhotamohes Khali	Sepahir Para CC	IOM	
8	Chhotamohes Khali	Uttarkul CC (under construction )	IOM	
9	Dhalghata	Mahuri Ghona CC		
10	Dhalghata	Begungunia (under construction )		
11	Hoanak	Chanakhola Para CC	IOM	
12	Hoanak	Kerantali CC	IOM	
13	Hoanak	Morakata CC	IOM	
14	Hoanak	Panirchara CC	IOM	
15	Hoanak	Rajuyarghona CC		
16	Gorokghata	Putibila CC		

17	Kalarmarchhara	Adharghona CC	IOM	
18	Kalarmarchhara	Chiknipara CC	IOM	
19	Kalarmarchhara	Nunachari (Kalarmarchara) CC		
20	Kalarmarchhara	Uttar Narbila CC	IOM	
21	Kutubjom	Gatibangha CC	IOM	
22	Kutubjom	Pashchim Para CC	IOM	
23	Kutubjom	Purba Para CC	IOM	
24	Matarbari	Maijpara CC	IOM	
25	Matarbari	Manhajir Para CC		
26	Matarbari	Sairardail CC		
27	Matarbari	Sikdarpara CC	IOM	
28	Saflapur	J. M. Ghat CC	IOM	
29	Saflapur	Nunachari (Shaplapur) CC	IOM	

#### Upazila: Kutubdia

	Union	Name of the CC	Remarks	Remarks
1	Ali Akbar Deil	Fateh Ali Shikdar Para CC	IOM	12 CC will be reconstructed by IOM and funded by WHO (No scope to renovate the CC).
2	Ali Akbar Deil	Tablorchor CC	IOM	
3	Baraghop	Dakshin Amjarkhali CC	IOM	
4	Baraghop	Miyarghona CC	IOM	
5	Dakshin Dhurung	Ali Fakir Dail CC	IOM	
6	Dakshin Dhurung	Suklal Para CC	IOM	
7	Kaiyabil	Binda Para CC	IOM	
8	Kaiyabil	Nojor Ali Matbor Para CC	IOM	
9	Lemsikhali	Dhupi Para CC	IOM	
10	Lemsikhali	Thanda Choukidar Para CC	IOM	
11	Uttar Dhurung	Bakh Khali CC	IOM	
12	Uttar Dhurung	Monsur Ali Hazir para CC	IOM	

#### Upazila: Ukhia

SL	Union	Name of the CC	Remarks	Remarks
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1	Haldia PalongC168:C184	Dakshin Haludiya Palong CC	IOM	17 CC will be reconstructed by IOM and funded by WHO.
2	Haldia Palong	Kulal Para CC	IOM	
3	Haldia Palong	Mohajon Para CC	IOM	
4	Haldia Palong	Pagalirbil CC	IOM	
5	Jalia Palong	Painyasiya CC	IOM	
6	Jalia Palong	Sonar Para CC	IOM	
7	Jalia Palong	Imamer deil- Mohammed Ullah Member CC	IOM	
8	Palong Khali	Nalbaniya/Palongkhali CC	IOM	
9	Raja Palong	Bagan Pahar CC	IOM	
10	Raja Palong	Dikaliya Palong CC	IOM	
11	Raja Palong	Hati Mura CC	IOM	
12	Raja Palong	Kutupalong CC	IOM	
13	Raja Palong	Uttar Pukuriya CC	IOM	
14	Ratna Palong	Coat Bazar CC	IOM	
15	Ratna Palong	Matabar Para CC	IOM	
16	Ratna Palong	Ruhullar Deba CC	IOM	
17	Ratna Palong	Chakboitha/ Adv. Mohammed Ayobul Islam CC	IOM	

### Upazila: Teknaf

	Union	Name of the CC	Remarks	Remarks
1	Baharchhara	Jabbaria Lalo Sharif CC		8 CC will be reconstructed by IOM and funded by WHO and 3 CC JICA (already completed and rest of 2 CC under process/ to explore update).
2	Baharchhara	Jahaz Para		
3	Baharchhara	Kacchapia (Under construction)		
4	Hnilla	Ali Akbar para CC	IOM	
5	Hnilla	Leada CC	JICA	
6	Hnilla	Rangikhali CC	IOM	
7	Sabrang	Koyainchari CC	IOM	
8	Sabrang	Uttar Para CC	IOM	
9	Teknaf	Kacubaniya CC	JICA	

10	Teknaf	Mitha Panir Chora CC		
11	Teknaf	Najir Para CC	IOM	
12	Whykong	Amtali CC	IOM	
13	Whykong	Dainga Cata CC	JICA	
14	Whykong	Mahes Khaliya Para CC	IOM	
15	Whykong	Minabazer CC	IOM	
16	Baharchhara	Jahajpura CC		
17	Baharchhara	Kocchopiya Nurbanu CC		

## Annex 2: List of Community Clinics in Cox's Bazar District

### Upazila: Chakaria

	Union	Name of the CC	Remarks	Remarks
1	Badarkhali	Azam Nagar CC		14 CC will be reconstructed through IOM and funded by WHO and 1 CC already reconstructed by JICA.
2	Badarkhali	Satdaliya Para CC	IOM	
3	Badarkhali	Tecchi Para CC		
4	Bamo Bilchari	Pukhuriya CC		
5	Bamo Bilchari	Purba Para CC		
6	Baraitali	Paharchanda Sabujpara CC		
7	Baraitali	Santi Bazar CC		
8	Baraitali	Engineer Abdul Aziz		
9	Baraitali	Uttar Baraitali Hindupara CC		
10	Bheola Manik Char	Chhai Number Ghona CC		
11	Bheola Manik Char	Paharia Para CC		
12	Chiringa	Charan dip CC	IOM	
13	Chiringa	Palakata CC		
14	Chiringa	Saodagar Ghona CC	IOM	
15	Demushia	Gandipara CC		
16	Demushia	Mucharpara CC		
17	Dulahazara	Ringvong CC		
18	Dulahazara	Ulubaniya CC		
19	Fasiakhali	Dakshin Fasiyakhali CC	IOM	
20	Fasiakhali	Dakshin Ghuniya CC	IOM	
21	Fasiakhali	Hajiyan CC		
22	Fasiakhali	Uchitarbil CC	IOM	
23	Harbang	Brindabanthil CC		
24	Harbang	Rakhine para CC		
25	Harbang	Uttar Paharcanda CC	IOM	
26	Kaiarbil	Ali Nur CC		
27	Kaiarbil	Islam Nagar CC		
28	Kakhara	Purba Kakra CC	IOM	

29	Kakhara	Shaker Mohammad CC		
30	Khuntakhali	Hari Khola CC		
31	Khuntakhali	Kutubdia para CC		
32	Khuntakhali	Modhom Medha Kacchipiya CC	IOM	
33	Khuntakhali	Uttar Fulchari CC	JICA	
34	Konakhali	Konakhali CC	IOM	
35	Konakhali	Palan Para CC	IOM	
36	Lakhyarchar	Mandal Para CC		
37	Lakhyarchar	Purba Majher Para CC	IOM	
38	Manikpur - Surajpur	Dakshin Sorajpur CC		
39	Manikpur - Surajpur	Manikpur CC		
40	Manikpur - Surajpur	Monowar Ahmed CC		
41	Paschim Bara Bheola	Chourfarri Sayra Begum CC		
42	Paschim Bara Bheola	Darbes Kata CC		
43	Purbo Bara Bheola	Sikander Para CC		
44	Purbo Bara Bheola	Sikder Para CC		
45	Saharbil	Koralkhali CC	IOM	

### Upazila: Cox's Bazar Sadar

	Union	Name of the CC	Remarks	Remarks
1	Bharuakhali	Bara Chowdhuripara CC	IOM	3 CC already reconstructed by JICA. 19 CC will be reconstructed by IOM and funded by WHO.
2	Bharuakhali	Hajipara CC	IOM	
3	Bharuakhali	Saodagar Para CC	IOM	
4	Chaufaldandi	Maz para CC	IOM	
5	Chaufaldandi	Notun Mahal CC	IOM	
6	Chaufaldandi	Paschim Para CC		
7	Chaufaldandi	Sagor Para CC		
8	Idgaon	Bhomariya Ghona CC	IOM	
9	Idgaon	Meherghona CC	IOM	

10	Islamabad	Satzola Kata CC		
11	Islamabad	Tetultali CC	IOM	
12	Islampur	Baskata CC	IOM	
13	Islampur	Dharmerchara CC	IOM	
14	Islampur	Napitkhali CC	IOM	
15	Jalalabad	Faraji Para CC	IOM	
16	Jhilwanja	Khuruliya CC		
17	Jhilwanja	Muhuri Para CC		
18	Jhilwanja	Shikdar Para CC	JICA	
19	Khurushkul	Dailpara CC	IOM	
20	Khurushkul	Gajirdail CC	IOM	
21	Khurushkul	Mamunpara CC		
22	Patali Machhuakhali	Chankhola CC		
23	Patali Machhuakhali	Jumchari CC	JICA	
24	Patali Machhuakhali	Machuya Khali CC	JICA	
25	Patali Machhuakhali	Patali CC	IOM	
26	Patali Machhuakhali	Totakkhali CC	IOM	
27	Pokkhali	Dighirpar CC	IOM	
28	Pokkhali	Gomatali CC	IOM	
29	Pokkhali	Notun Bazar CC	IOM	

**Upazila: Ramu**

	Union	Name of the CC	Remarks	Remarks
1	Chakmarkul	Dakshin Chakmarkul (Miajir Para) CC		3 CC already reconstructed by JICA. 18 CC will be reconstructed by IOM and funded by WHO.
2	Chakmarkul	Master Enamul Hoque CC	IOM	
3	Chakmarkul	Mohammadapur CC	IOM	
4	Dakshin Mithachhari	Fakira Mura CC		
5	Dakshin Mithachhari	Umkhali CC	IOM	
6	Fatekharkul	Badsha Miah Nurjahan CC		



7	Fatekharkul	Purba Dip Fatekharkul CC	IOM	
8	Fatekharkul	Taccipul CC	IOM	
9	Fatekharkul	Uttar Fatekharkul CC	IOM	
10	Garjania	Majhirkata CC	JICA	
11	Garjania	Thimchari CC	IOM	
12	Idgar	Barabil CC	IOM	
13	Idgar	Chagirkata CC		
14	Joarianala	Mowlavi Rustam Sufia CC	IOM	
15	Joarianala	Nandakhali Murapara CC	IOM	
16	Dakshin Mithachhari	Rafique Noor CC		
17	Joarianala	Varachararkul CC	IOM	
18	Kachhapia	Dakshin Kachhapia CC	IOM	
19	Kachhapia	Titarpara CC	IOM	
20	Kauarkhop	Manirjhil CC	IOM	
21	Kauarkhop	Ukhiyar Ghona CC	IOM	
22	Khuniapalong	Dariyardighi CC	IOM	
23	Khuniapalong	Doapalong CC	JICA	
24	Khuniapalong	Goyalipalong CC	JICA	
25	Rajarkul	Sucharu Madhubi CC		
26	Rajarkul	Forest Office CC	IOM	
27	Rashid Nagar	Kahatiyapar CC		
28	Rashid Nagar	Lamar Para CC	IOM	

### Upazila: Pekua

	Union	Name of the CC	Remarks	Remarks
1	Barbakiya	Puraton Baghguzara CC		10 CC will be reconstructed by IOM and funded by WHO.
2	Barbakiya	Baraiyakata CC	IOM	
3	Barbakiya	Kutubpara CC	IOM	
4	Magnama	Fultala CC	IOM	
5	Magnama	Satghar Para CC	IOM	
6	Pekuya	Ciradiya CC	IOM	

7	Pekuya	Taliakhata CC	IOM	
8	Pekuya	Dilruba Kashem CC (U construction)		
9	Rajakhali	Matbarpara CC	IOM	
10	Rajakhali	Palakata CC		
11	Silkhali	Jarulbaniya CC	IOM	
12	Silkhali	Jonota Bazar CC	IOM	
13	Silkhali	Sabuj Para CC		
14	Taitang	Godikata CC	IOM	
15	Ujantiya	Fakirpara CC		
16	Ujantiya	Ghodarpara CC		

#### Upazila: Moheskhali

	Union	Name of the CC	Remarks	Remarks
1	Bara Maheskhali	Barodeil CC		18 CC will be reconstructed by IOM and funded by WHO.
2	Bara Maheskhali	Fakir Ghona CC		
3	Bara Maheskhali	Jagir Ghona CC	IOM	
4	Bara Maheskhali	Jura Pukurpar CC	IOM	
5	Bara Maheskhali	Munshir Deil CC		
6	Chhotamohes Khali	Lomba Ghona CC		
7	Chhotamohes Khali	Sepahir Para CC	IOM	
8	Chhotamohes Khali	Uttarkul CC (under construction )	IOM	
9	Dhalghata	Mahuri Ghona CC		
10	Dhalghata	Begungunia (under construction )		
11	Hoanak	Chanakhola Para CC	IOM	
12	Hoanak	Kerantali CC	IOM	
13	Hoanak	Morakata CC	IOM	
14	Hoanak	Panirchara CC	IOM	
15	Hoanak	Rajuyarghona CC		
16	Gorokghata	Putibila CC		

17	Kalarmarchhara	Adharghona CC	IOM	
18	Kalarmarchhara	Chiknipara CC	IOM	
19	Kalarmarchhara	Nunachari (Kalarmarchara) CC		
20	Kalarmarchhara	Uttar Narbila CC	IOM	
21	Kutubjom	Gatibangha CC	IOM	
22	Kutubjom	Pashchim Para CC	IOM	
23	Kutubjom	Purba Para CC	IOM	
24	Matarbari	Maijpara CC	IOM	
25	Matarbari	Manhajir Para CC		
26	Matarbari	Sairardail CC		
27	Matarbari	Sikdarpara CC	IOM	
28	Saflapur	J. M. Ghat CC	IOM	
29	Saflapur	Nunachari (Shaplapur) CC	IOM	

#### Upazila: Kutubdia

	Union	Name of the CC	Remarks	Remarks
1	Ali Akbar Deil	Fateh Ali Shikdar Para CC	IOM	12 CC will be reconstructed by IOM and funded by WHO (No scope to renovate the CC).
2	Ali Akbar Deil	Tablorchor CC	IOM	
3	Baraghop	Dakshin Amjarkhali CC	IOM	
4	Baraghop	Miyarghona CC	IOM	
5	Dakshin Dhurung	Ali Fakir Dail CC	IOM	
6	Dakshin Dhurung	Suklal Para CC	IOM	
7	Kaiyabil	Binda Para CC	IOM	
8	Kaiyabil	Nojor Ali Matbor Para CC	IOM	
9	Lemsikhali	Dhupi Para CC	IOM	
10	Lemsikhali	Thanda Choukidar Para CC	IOM	
11	Uttar Dhurung	Bakh Khali CC	IOM	
12	Uttar Dhurung	Monsur Ali Hazir para CC	IOM	

#### Upazila: Ukhia

SL	Union	Name of the CC	Remarks	Remarks
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1	Haldia PalongC168:C184	Dakshin Haludiya Palong CC	IOM	17 CC will be reconstructed by IOM and funded by WHO.
2	Haldia Palong	Kulal Para CC	IOM	
3	Haldia Palong	Mohajon Para CC	IOM	
4	Haldia Palong	Pagalirbil CC	IOM	
5	Jalia Palong	Painyasiya CC	IOM	
6	Jalia Palong	Sonar Para CC	IOM	
7	Jalia Palong	Imamer deil- Mohammed Ullah Member CC	IOM	
8	Palong Khali	Nalbaniya/Palongkhali CC	IOM	
9	Raja Palong	Bagan Pahar CC	IOM	
10	Raja Palong	Dikaliya Palong CC	IOM	
11	Raja Palong	Hati Mura CC	IOM	
12	Raja Palong	Kutupalong CC	IOM	
13	Raja Palong	Uttar Pukuriya CC	IOM	
14	Ratna Palong	Coat Bazar CC	IOM	
15	Ratna Palong	Matabar Para CC	IOM	
16	Ratna Palong	Ruhullar Deba CC	IOM	
17	Ratna Palong	Chakboitha/ Adv. Mohammed Ayobul Islam CC	IOM	

### Upazila: Teknaf

	Union	Name of the CC	Remarks	Remarks
1	Baharchhara	Jabbaria Lalo Sharif CC		8 CC will be reconstructed by IOM and funded by WHO and 3 CC JICA (already completed and rest of 2 CC under process/ to explore update).
2	Baharchhara	Jahaz Para		
3	Baharchhara	Kacchapia (Under construction)		
4	Hnilla	Ali Akbar para CC	IOM	
5	Hnilla	Leada CC	JICA	
6	Hnilla	Rangikhali CC	IOM	
7	Sabrang	Koyainchari CC	IOM	
8	Sabrang	Uttar Para CC	IOM	
9	Teknaf	Kacubaniya CC	JICA	

10	Teknaf	Mitha Panir Chora CC		
11	Teknaf	Najir Para CC	IOM	
12	Whykong	Amtali CC	IOM	
13	Whykong	Dainga Cata CC	JICA	
14	Whykong	Mahes Khaliya Para CC	IOM	
15	Whykong	Minabazer CC	IOM	
16	Baharchhara	Jahajpura CC		
17	Baharchhara	Kocchopiya Nurbanu CC		

**Annex 3: List of Development Partners and Bangladesh Organization in Cox's  
Bazar District**

	<b>Types of Organizations</b>	<b>Name of Organization</b>
1	UN	United Nations High Commissioner for Refugees
2	UN	United Nations Children's Fund
3	UN	International Organization for Migration
4	UN	World Health Organization
5	UN	United Nations Population Fund
6	INGO	Save the Children
7	NNGO	Friendship
8	INGO	International Rescue Committee
9	INGO	Relief International
10	NNGO	BRAC
11	INGO	Handicap International / Humanity & Inclusion
12	INGO	CARE Bangladesh
13	NNGO	Community Development Association
14	INGO	Médecins du Monde
15	INGO	Peace Winds Japan
16	INGO	Health and Education for All
17	INGO	Food for the Hungry International
18	INGO	Terre des Hommes - Lausanne
19	NNGO	Green Hill
20	NNGO	Light House Organization
21	INGO	MedGlobal
22	INGO	Action Against Hunger
23	NNGO	Reaching People in Need
24	INGO	ACT Alliance / Christian Aid
25	INGO	ORBIS International
26	INGO	Sonne International
27	NNGO	ASEAB
28	NNGO	DSK
29	Red Cross / Red Crescent	ICRC
30	NNGO	MDS (Moon light Development Society)
31	NNGO	PHD

32	NNGO	Prantic
33	NNGO	GK
34	NNGO	AWARD
35	NNGO	GUSS
36	INGO	MSF/OCBA
37	INGO	MSF/OCP
38	INGO	MSF/OCA
39	NNGO	HMBDF
40	NNGO	BDRCS
41	NNGO	RTMI
42	INGO	United Purpose
43	INGO	Global One
44	NNGO	DCHT
45	INGO	MSI
46	INGO	MSF/OCB
47	NNGO	DBC
48	INGO	World Concern
49	NNGO	AMAN
50	INGO	Basmah
51	INGO	Qatar Charity
52	INGO	CBM International
53	INGO	Plan International
54	Academic	REACH
55	Academic	ACAPS
56	INGO	Mercy Malaysia
57	NNGO	HOPE
58	Others	BBC Media Action
59	INGO	MOAS
60	INGO	Medair
61	Academic	Yale University
62	Donor	World Bank
63	Donor	GAVI
64	Donor	ADB
65	Donor	DDFP
66	Donor	DFAT

67	Donor	ECHO
68	Donor	Embassy - Australia
69	Donor	Embassy - Canada
70	Donor	Embassy - Netherlands
71	Donor	Embassy - Sweden
72	Donor	Embassy - Switzerland
73	Donor	Embassy - Thailand
74	Donor	Embassy- Japan
75	Donor	Embassy- Norway
76	Donor	Embassy - Turkey
77	Donor	FCDO
78	Donor	IEDCR
79	Donor	JICA
80	Donor	SDC
81	Donor	USAID



# **Annex 4:**

## **Detailed design document for PoC of ICT utilization plan**



*Prepared by:*

**mPower Social Enterprises Ltd.**

## Revision History

<b>Date</b>	<b>Version</b>	<b>Description</b>	<b>Author</b>	<b>Designation, Organization</b>
28/06/2021	1.0.1		1. Abu Saeem Arif	1. Head of Solution Design & Analytics, mPower Social Ent. Ltd.
			2. Eumna Basree Huda	2. System Analyst mPower Social Ent. Ltd.
			3. Zaki Anan	3. Manager, PMO & Solution Design

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## Introduction:

Bangladesh achieved remarkable progress in-terms of maternal and child health and received acknowledgements from the global communities for its success in health. Bangladesh has showed impressive success in improving maternal and child health through establishing and strengthening community-based service delivery through trained skilled and lay community health workers at the door step.

The Health Assistant (HA) is one of the frontline health cadres who is playing a key role in improving health of the people of their community. This cadre visits household for health service delivery and health information gathering. Also, they conduct the immunization programmed in the root level of Bangladesh.

Because of the hard work and efforts of the HA, the vaccination coverage has increased up to the level to achieve herd immunity from different deadly diseases for the children of Bangladesh. Even though the coverage is very high, now it is time to increase timely vaccination among children to ensure desired efficacy and effectiveness from the national Extended Program for Immunization (EPI).

The Government of Bangladesh is also pushing forward the agenda to implement health ID for the people and to create a digital population data base to establish longitudinal tracking of health services. For which, efforts are made to digitalize the facility level service points to prepare them for future scopes of longitudinal tracking. In cases, the ID from the Shared Health Record (SHR) system is considered as health ID. It is very important for Bangladesh as there are no single identification system which can identify all nationals uniquely. National ID is provided to 18+ people and everyone doesn't have a Birth Registration ID. As a result, having a unique health ID is very important for Bangladesh in order to maintain longitudinal health record.

To utilize the current scopes and to ensure support the government initiatives, there is a need for a solution at the domicile level which can be used to create the digital population data base with health IDs, as the domicile health workers conduct routine household visits to update population information. Also, there is a need for a solution for this level which will act as a decision support tool for these layers of health care providers which will help them ensure timely vaccination and accurate reporting and to generate evidence for the managers and policy makers for real-time planning.

## Scope

Using emerging mHealth best practices — automated reminders and reporting, decision support, multimedia counseling — OpenSRP (Open Smart Register Platform is an open source mobile health platform that allows frontline health workers to electronically register and track the health of their entire client population) builds on existing robust mobile technologies to

deliver a powerful and dependable application to skilled health workers, empowering them to more effectively deliver and account for the care they provide to their clients.

The OpenSRP-vaccination application will be integrated with Government DHIS-2 system, so that the digitize vaccinated information will be available in DHIS-2 system. The system shall be functionality to integrate with another renown Open-Source SMS Platform (“RapidSMS is a free and open-source framework for rapidly building mobile SMS services for scale”) for sending SMS reminder to the woman, mother and child caregiver for effective vaccination coverage.

This solution will enable the following benefits:

- Introduce SHR Health ID for beneficiaries to enable longitudinal tracking
- Auto follow-up schedule generation contextualized to beneficiary
- Auto immunization schedule generation for ensuring timely vaccination
- Reminder SMS for re-enforcing adherence to immunization service protocol at the beneficiary level
- DHIS 2 integration
- Realtime report generation for effective and efficient decision making

## Definitions:

**Health ID:** An ID provided by government to track individual person with their health record. It is called Shared Health record (SHR) ID by government.

**NID:** National Identity. Each Bangladeshi citizen over 18 years of age has/should have an NID.

**BRID:** Birth Registration Identity. Each child born in Bangladesh are given a Birth registration ID.

**Household:** According to government of Bangladesh, people who eat from one pot are called a household. In our solution, we register a household and provide it a system generated ID. We can cover the whole population through this process except for some floating people in urban area with no fixed place to live and no formal work.

**Member:** People in a household are called members. Each person is called a member. In our solution, we register members under household and call them member of that household. Each member is given a system generated ID, linked with HH ID, and provided with a unique SHR health ID.

**HA:** Health Assistant (HA) are the community health workers for DGHS.

## Stakeholders and Users

There are different types of stakeholders involved in this project. The following table outlines the key stakeholders of the Measuring Health Outcome system who have a vested interest in this project and whose interests need to be considered throughout the proposed It system.

User-Type	User Role
Health Assistant (HA)	Android device users who will register and collect household members health surveillance and vital data form regular door to door visit. Whenever a new member is registered, s/he will be assigned a new Health ID (SHR ID) along with system generated ID.
Managers/Supervisor (DGHS and supervision units)	Web User who will able to view and export data, report, dashboard etc.
System Admin	Web user who will manage entire system to create user, manage aces control of the system

## System Overview:

The system will have both Tab based application and web portal for running the entire process. Information collected using this system will be kept on the Health Assistant/Health worker Mobile Application as well as in a cloud-based database. The data can be collected both online/ offline, and stored in the cloud database once online.

The system will design an application with the following main objectives:

- System shall facility to capture patient Household information with GIS/GPS co-ordinates, and assign a system generated ID to the HH.
- Register all the members of the Household and assign unique health IDs and system generated IDs to each member.
- Collect and manage vaccination data for women of child bearing age (15-49 years) and children under 5 years.
- Generate auto schedules for immunization based of date of birth (DoB) of each beneficiary.

- Send SMS reminders to caregivers/females when the vaccine is due according to the schedule specified.
- Generate colored notification to identify priority population group
- General disease surveillance, such as- diarrhea, pneumonia, etc., as per DGHS protocol
- The system shall allow Health Assistants to refer patients to the relevant health facility
- System integration with
  - DHIS 2 – Push data to DHIS2 for dynamic reporting and centralized data repository. (what integration- explained)
  - SHR system – Pull Health ID from SHR to assign beneficiaries. (what integration- explained)
- Allow user to sort data
- Allow user to find data using
  - Barcode from Health Card (HID)
  - HID number
  - Mobile number
  - NID number
  - BRID number
- System Management & Access control (User Management, Role Management & User Access control.)



## Security and Privacy Management:

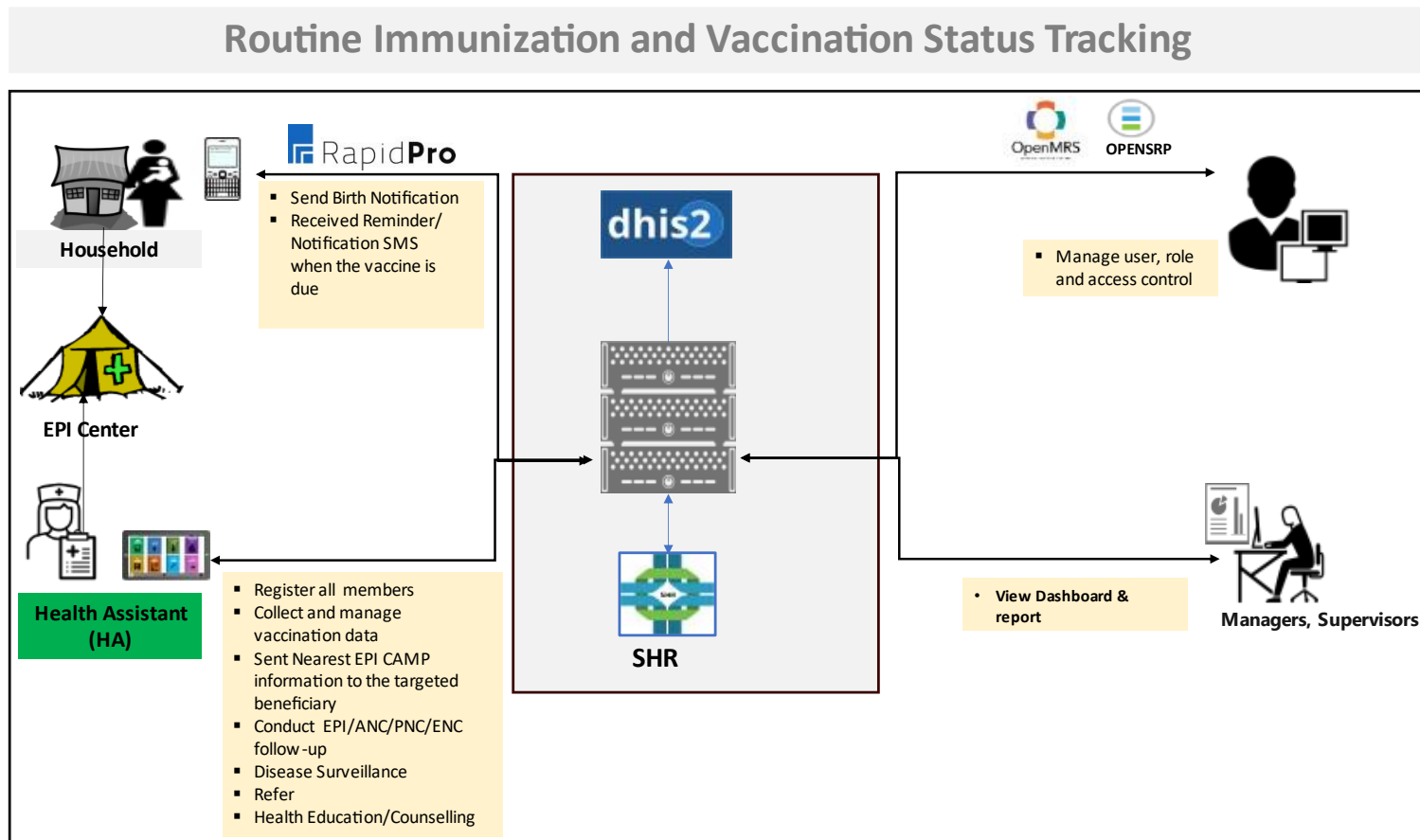
As per government regulation and laws, the systems developed with the DGHS are directly deployed in the government premises. The DGHS MIS unit manages the server and the security features as per the government protocol. The vendor is provided with authentication tokens, specific credentials, dedicated access for a single device and access through VPN only to ensure security of the system and the server. Only the Lead of Infrastructure team has access to the GoB servers to minimize security risks.

Additionally, system developed under such conditions, for web platform access is approved through the human resource information system of the DGHS to ensure only authorized employees can access the system. For mobile application, the DGHS MIS provides the user information for user credential creation to ensure authorized platform utilization only.

Solutions where large volume of population data are stored in central server, mPower prefer the solutions to be deployed in GoB servers to avoid data privacy related breach or complications.

## OpenSRP Vaccination Application System Overview

(Try to enlarge the letters/font) - enlarged



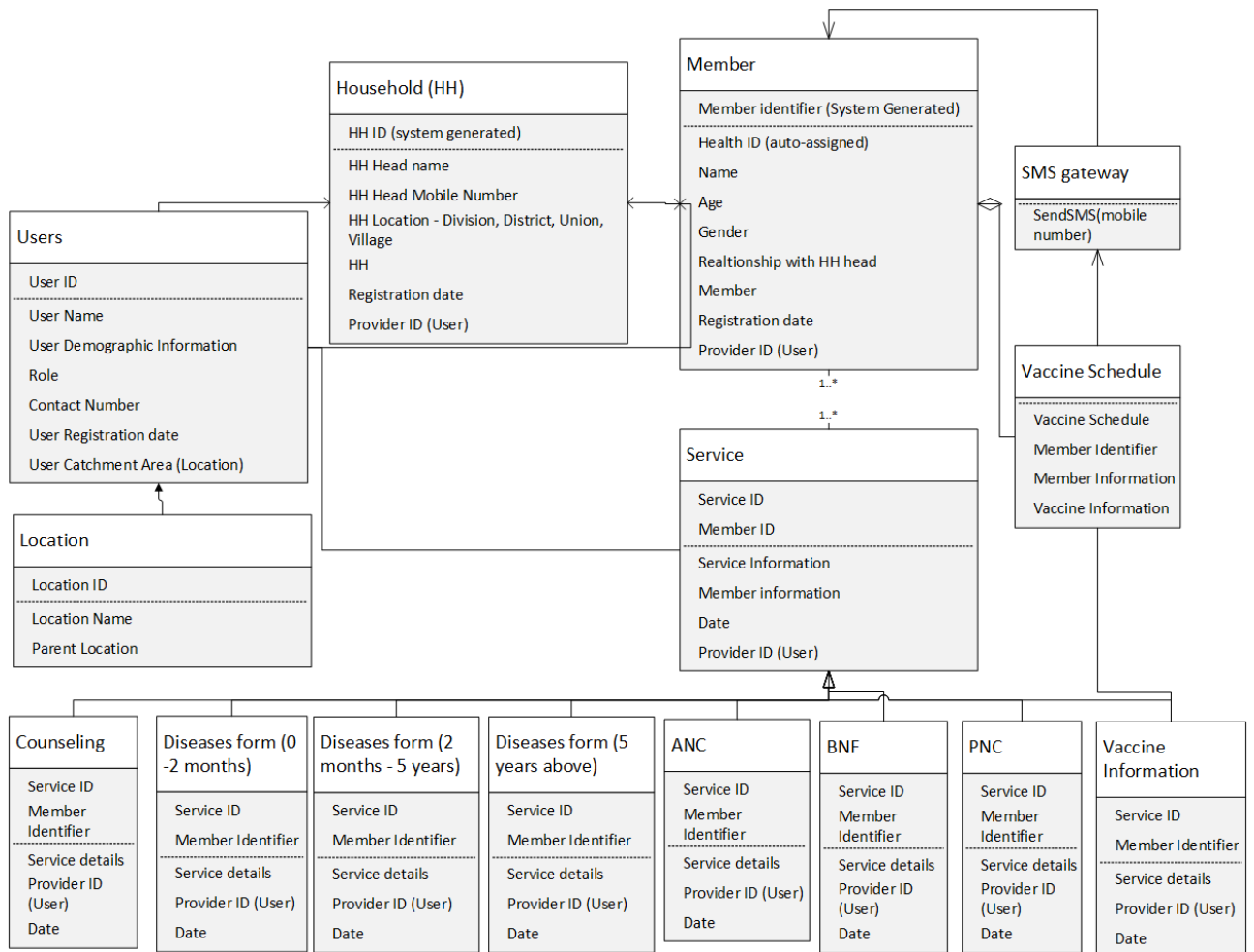
There are mainly 3 types of users who will be using the system

- Health Assistant
- Mangers / Supervisors
- System Administrator

Health Assistant/ Health Worker will register household with Child (0-5), Eligible Female Members (15-49) and Adolescent in the system from using “OpenSRP” application by during the time of regular Household visit or EPI Camp Day. Based on certain biological information, the beneficiary registration information will be recorded and stored in different registers of the android application such as Household Register, Woman Register, Child Register. There will be a SMS sending option integrated in the openSRP app, so that System can notify the beneficiary regarding vaccination reminder and vaccination camp information. The HA can be also send ‘Announcement SMS’ to all the registered members who are supposed to visit the camp on this date. Mother & Caregiver can also notify the system regarding any live birth outcome. All necessary notifications are generated using data from the database and sent to the system user. Any beneficiary (Mother, Child, Adolescent) may registered in the system from any service point (Household, EPI center, Community Clinic Upazila Health Complex) by using “OpenSRP” application in that Case the beneficiary has no need to do register again. Updated service information will be automatically synced with beneficiary profile

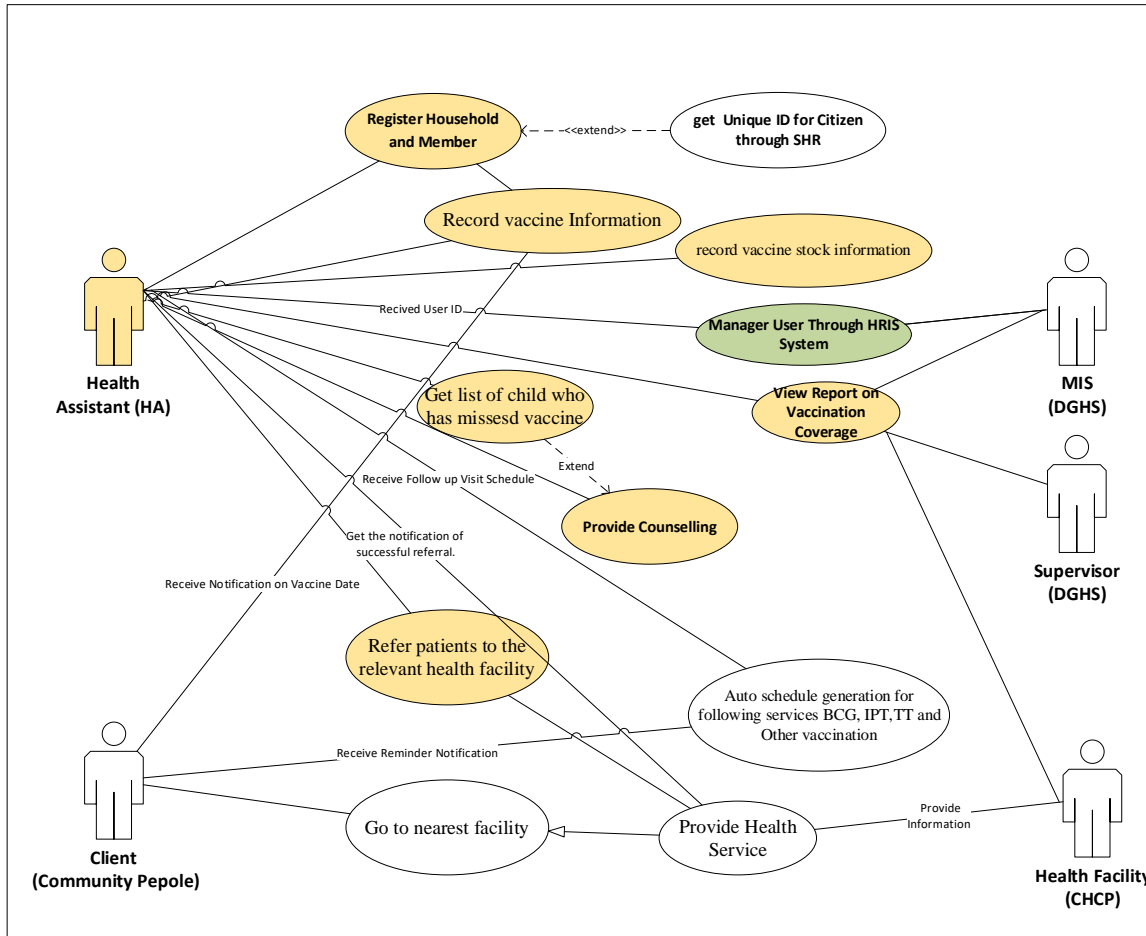
System administrator will be responsible for all types of user/role management, data management and access control. The system will have automated reporting functions to summarize vaccination status by geography area, worker wise. Any Web users such as Supervisor, Manager, visiting the web portal will be able to view permitted reports and dashboard.

## Class diagram of the System:

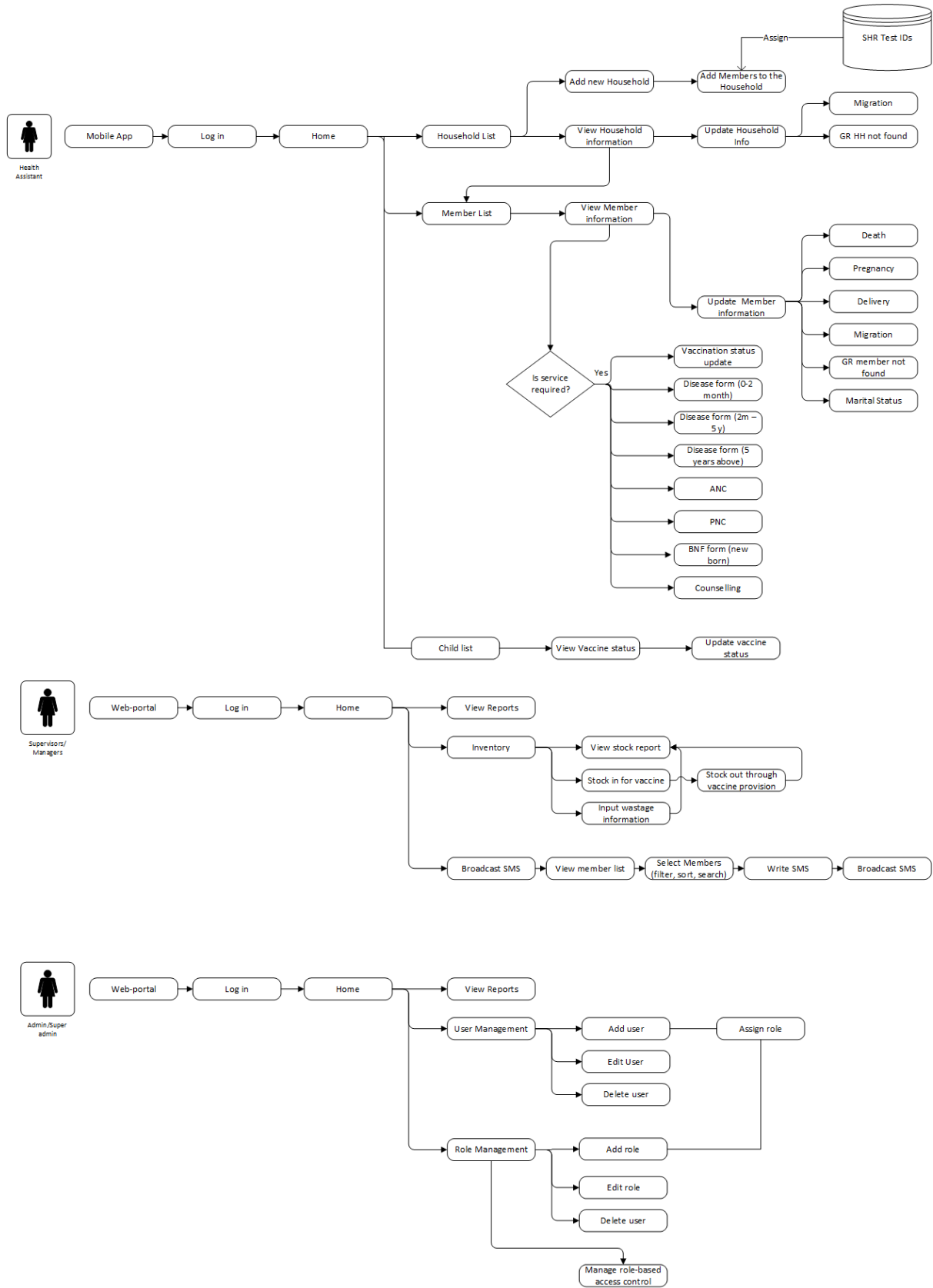


Use Case Diagram:

Register everyone. Make sub use cases if possible.



# Details Description of the System



A Health Assistant will be given a user name and password at the beginning of his job. Admin will be able to create the account using web application. When a Health Assistant logs in to the system, he will be able to view registered Household list in the home screen.

### Registration

HA will visit his assigned areas and register all households of his catchment area into the system. He'll register members of the households and revisit their regular scheduled time to add if there are any new members in the household or update information.

### Beneficiary ID Assign:

Once any member will be registered via the OpenSRP Application, System will be generated 8-digit numeric ID for each woman & child from OpenMRS and it will be shown in the app for beneficiaries. This ID will be written by HA on the Vaccination Card and will be used to track a beneficiary in the OpenSRP app for subsequent visits. In the backed his Id will be mapped with the beneficiary NID/BRN.

### Vaccination Schedule & Notification

After successful registration of Woman & Child "Vaccination schedules" will be automatic generated in respective registers for both women and children based on 'vaccination Schedule'. System will generate different notification alerts (highlighted colored rows on the User interface of the application) in both Woman and Child registers which will help the Health Assistants to identify Due, Post Due, Expired vaccination schedules.

### SMS System:

There will be 3 types of SMS systems in the overall system:

#### System generated SMS Before/on the Day of vaccination

An SMS reminding the date of vaccination will be sent from the system to all the registered members before the day of vaccination and on the day of vaccination. Schedule SMS will be sent to the beneficiaries based on the Camp/Session date and vaccine eligibility date of the beneficiary) which will be pre-defined from the web portal.

#### Broadcast SMS from HA to All Registered Members

HA can see the list of beneficiaries who are supposed to appear in the camp on the 'Camp Opening Day'. The HA will click on the 'Announcement' button on the 'Camp Opening Day' and bulk SMS will be sent to all the woman and Parents/Caregiver who have due vaccines on that day. This SMS will notify the scheduled beneficiaries about the Health Camps that are to

take place near their area. After seeing the SMS, the beneficiary will visit the Camp and get vaccinated.

### SMS Schedule

Name	Trigger Event	Trigger Date	Gap from trigger	Pre-Condition
Penta1 Reminder	Enrollment	Birthdate	06 weeks	Child has enrolled with BCG vaccine
Penta 2 Reminder	Penta 1	Penta 1 date	04 weeks	Child has received Penta1 vaccine
Penta 3 Reminder	Penta 2	Penta 2 date	04 weeks	Child has received Penta2 vaccine
OPV 1 Reminder	Enrollment	Birthdate	06 weeks	Child has received BCG vaccine
OPV 2 Reminder	OPV 1	OPV 1 date	04 weeks	Child has received OPV1 vaccine
OPV 3 Reminder	OPV 2	OPV 2 date	04 weeks	Child has received OPV2 vaccine
IPV Reminder	OPV 3	OPV 2 date	05 weeks	Child has received OPV2 vaccine
PCV 1 Reminder	Enrollment	Birthdate	06 weeks	Child has received BCG vaccine
PCV 2 Reminder	PCV 1	PCV 1 date	04 weeks	Child has received PCV1 vaccine
PCV 3 Reminder	PCV 2	PCV 2 date	04 weeks	Child has received PCV2 vaccine
M1 Reminder	Enrollment	Birthdate	39 weeks	Child is 9 months old
M2 Reminder	M1	M1 date	26 weeks	Child has received M1 vaccine
TT 2 Reminder	TT 1	TT 1 date	04 weeks	Woman has received TT 1 vaccine
TT 3 Reminder	TT 2	TT 2 date	26 weeks	Woman has received TT 2 vaccine
TT 4 Reminder	TT 3	TT 3 date	52 weeks	Woman has received TT 3 vaccine
TT 5 Reminder	TT 4	TT 4 date	52 weeks	Woman has received TT 4 vaccine

\*\* There will be no reminder SMS for BCG, OPV-0 and Penta-0

### Vaccine Schedule Validation:

- Vaccine Schedule-
- BCG & OPV-0-
- Due-Date\_of\_BCG\_OPV\_0
- PostDue-DoB+7days



- Expired-DOB+14days
- OPV-1 & Penta-1-
  - Due-Date\_of\_OPV\_Penta\_PCV\_1
  - Past Due- Date\_of\_OPV\_Penta\_PCV\_1+14days
  - Expired-DOB+10months
- OPV-2, PENTA-2 & PCV-2
  - Due-Date\_of\_OPV\_Penta\_PCV\_2
  - Past Due- Date\_of\_OPV\_Penta\_PCV\_2+14days
  - Expired-DOB+11 months
- OPV-3, PENTA-3 & IPV
  - Due-Date\_of\_OPV\_Penta\_3\_IPV
  - Past Due- Date\_of\_OPV\_Penta\_3\_IPV+14days
  - Expired-DOB+12 months
- PCV-3
  - Due-Date\_of\_PCV\_3
  - Past Due- Date\_of\_PCV\_3+14days
  - Expired-DOB+12 months
- MR
  - Due-Date\_of\_MR
  - Past Due- Date\_of\_MR+1month
  - Expired- DOB+12 months
- Measle-2
  - Due- Date\_of\_Measle
  - Past Due- Date\_of\_Measle+1month

## Woman

### VaccineSchedule-

- TT1-
  - Due-HHMemberReg->If IS\_TT1=1, then 'Date\_of\_TT1'
- TT2-
  - Due-HHMemberReg->If IS\_TT1=1, then 'Date\_of\_TT2'
- TT3-
  - Due-HHMemberReg->If IS\_TT1=1, then 'Date\_of\_TT3'
- TT4-

- Due-HHMemberReg->If IS\_TT1=1, then 'Date\_of\_TT4'
- TT5-
- Due-HHMemberReg->If IS\_TT1=1, then 'Date\_of\_TT5'
- Measles-MemberInfo->if IS\_MEASLES=1, then 'Date\_of\_Measles'

Expired- DoB+18months

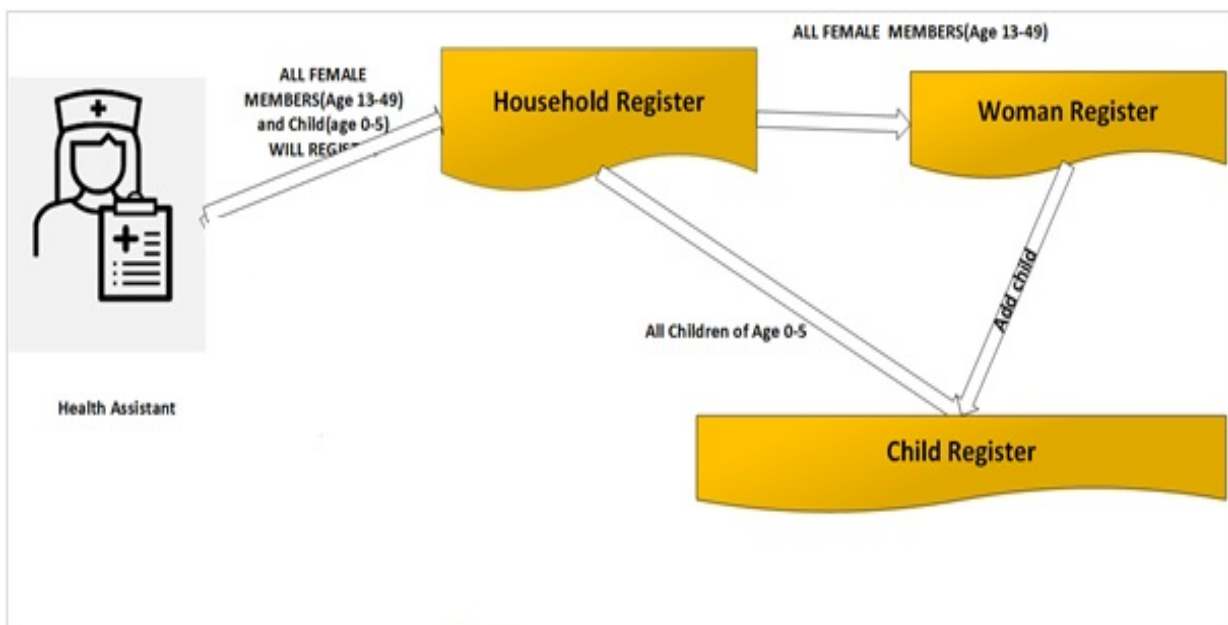
'Green' color indicates that the woman the vaccination date is due.

'Yellow' color indicates that the woman the vaccination date is Overdue.

'Red' color indicates that the woman the vaccination date is Expired.

### Data Flow in Registers:

// Need to change the age. HA will/can register all the members in HH. Match it with Use case diagram. Use the Use case diagram to show the registers.



Beneficiary flow from one register to another will process in the following way-

All new members/beneficiary will be listed in household register and then segregated in other registers as per the following described rules (in the image show above). Any new household member can also be added at any period of the system, and thus will follow the same way to get included into the registers-

Even if a new member arrives in the household (through birth/marriage/adaptation), he/she will also be added to the same household as a new member. HA will fill up “ADD Woman or Child” for adding new member the Household members. After being registered, the members are segregated into different registers according to conditions.

- If the household members include any woman married woman from 15-49 years old, eligible for child birth and fulfills all conditions of child birth, she will be automatically moved to Women Register.
- And if the household members include any child from 0-5 years old, she will be automatically moved to Child Register.
- A pregnant mother is regularly followed up through Follow Up visits. If child birth occurs, then the new child will be added to Child Register.
- Any children of age 0-5 years old will be included into “Child Register”.

## Registers & Forms

Registers	Form Name	Description
<b>Household Register</b>	<ol style="list-style-type: none"> <li>1. Household Registration Form</li> <li>2. ADD Woman</li> <li>3. Add Child</li> <li>4. Vital Event Form</li> </ol>	When a health worker visits a household, he registers member Woman (Age15-49) and child (0-5) beneficiary of that household in the system, in the household register. Any new beneficiary Household should be first registered in the system through household register. Then he will be added in the system through “ADD Woman” Form or “ADD Child” Form. Even if a new member arrives in the registered household (through birth/marriage/adaptation), he/she will also be added to the same household as a new member.
<b>Woman Register</b>	<ol style="list-style-type: none"> <li>1. ADD Child Form</li> <li>2. Woman Vaccination Form</li> </ol>	<ol style="list-style-type: none"> <li>1. Add child form will be used for registering child of woman.</li> <li>2. Recorded Vaccination information.</li> </ol>

<b>Child Register</b> 'Child Register' keeps records of all children (0-5 years) with a unique ID.	1. Child vaccination Form 2. Birth Registration Status	1. The Pregnancy Surveillance Form tracks pregnancy identification of woman in specific time intervals. 2. Recorded Vaccination information.
---	---	---

### New Household Registration Form:

[https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z\\_puAgo/edit#gid=506821029](https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z_puAgo/edit#gid=506821029)

### Woman Registration Form:

[https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z\\_puAgo/edit#gid=1922262260](https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z_puAgo/edit#gid=1922262260)

### Woman vaccination FORM:

[https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z\\_puAgo/edit#gid=1802835853](https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z_puAgo/edit#gid=1802835853)

### CHILD Registration Form:

[https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z\\_puAgo/edit#gid=15598920](https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z_puAgo/edit#gid=15598920)

### CHILD Vaccination Form:

[https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z\\_puAgo/edit#gid=204760225](https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z_puAgo/edit#gid=204760225)

### Vital Status form

[https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z\\_puAgo/edit#gid=2007356661](https://docs.google.com/spreadsheets/d/1g0UgvrTfEjVLbB5D6Xm387OazFktZ250BW04z_puAgo/edit#gid=2007356661)

## User Stories

As A	I want to	So that
Health Assistant	Log in to OpenSRP application using my User Name and Password	I can access to my work space to view and recorded data.
	Fill up "New Household Form for adding new Household.	I can record vaccination information the members
	Fill up "ADD Woman" & Child form for adding HH members	I can register Household information the members
	Will be able to search and filter for my own registered members	For the ease of finding a specific person under my catchment area.

	Will be able to search for registered members of other HA's catchment area	If a registered member of another catchment area visits my catchment area for vaccination, I can search her, check her vaccination history and give her vaccination if she's eligible.
Beneficiary	Get reminder SMSs before and on due date	I can visit the camp and get myself/my child vaccinated
	Get announcement SMS when the camp opens	I don't have to visit the camp if the camp is cancelled.
Admin	Create User for each HA & Supervisor	They can login to the system
	Can view Beneficiary data	Track a Beneficiary
	Edit Beneficiary/users data	I can update their Mobile Number, Location and other basic information
Manager/Supervisor	View Reports/Dashboard based on different filter criteria	Generate customized reports
	Export Data- Date wise, Form wise, Location wise, User wise	Can use the data further analysis & reporting

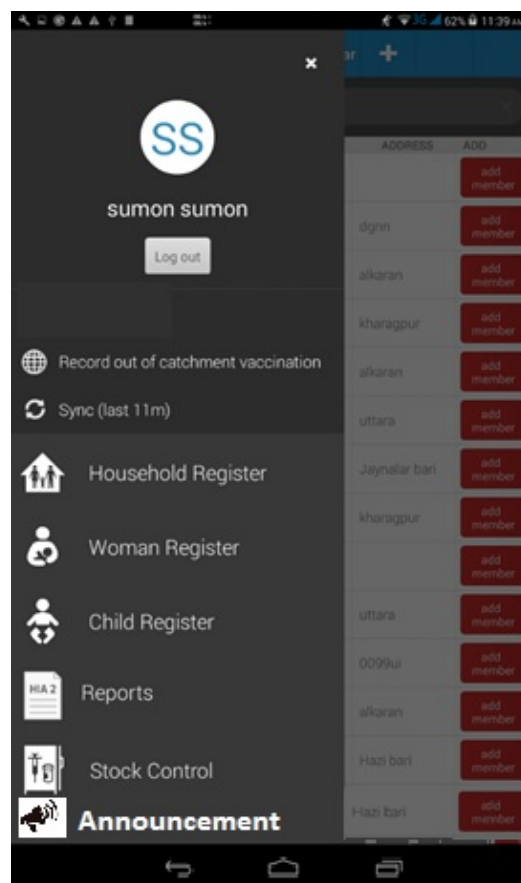
## Understanding the System through detailed mock-ups:

### Mobile Application Interface:

When a HA click in to the app of “Vaccination OpenSRP”, he will get a log-in screen to enter the application. The log-in screen’s proposed view is as follows-

#### Log-in Screen:

- After clicking the icon of the “JICA Vaccination App” the log in page will be appear
- Any frontline health worker will have to enter his username and password to log-in to the system.
- The username and password of the frontline health worker will be provided by System Administrator.
- If any of the information is incorrect/missing, user won’t be able to log in. He can click on the “forgot password” option to retrieve his user name & password through phone number from the system by a receiving a sms containing user name & password.
- If any of the log in information is incorrect/missing, user won’t be able to log in.



#### Menu Screen:

The apps must contain following icon to perform the application

1. Household List: It will show all the households registered in the catchment area of the user. The list can be filtered and searched.
2. Members List: It will contain all the households registered in the catchment area of the user. The list can be filtered and searched.
3. Women List: Women of reproductive age will be shown in this menu.
4. Child List: Child (0-5) will be shown in this menu.
5. Inventory: It will show the products and their current stock.
6. Reports: It will show the reports for the user.

7. Announcement: It will show the announcement broadcast for the user from admin/manager.
8. Profile icon of the user who has logged into the system.
9. “Settings” option at the top right corner.
10. “Sync” sign beside the settings button.

### Household Register:

After clicking on the “HH Register” button on the Side menu page, user will redirect to household list page. The page will contain following things

- A listed view of all the households registered can be viewed in this screen.
- Any new Household registered into the system by clicking on the “+” sign on the top of the screen.
- Any Household can be searched in the register through “Search HH” option at the top right corner: Search By: HH head Name, Unique ID, Mobile No, Member Type.
- The list view can also be filtered by clicking on the “Filter” option to the left of the “+” button. Filter By: Gender, Ward, Block
- Data can also be sorted, Sort By: HH Name, Last Visit Date, Member no
- Any new Household Member can have registered into the system by clicking on “ADD member” button form the list.
- When user click the Household icon the page redirect to Household details Page.

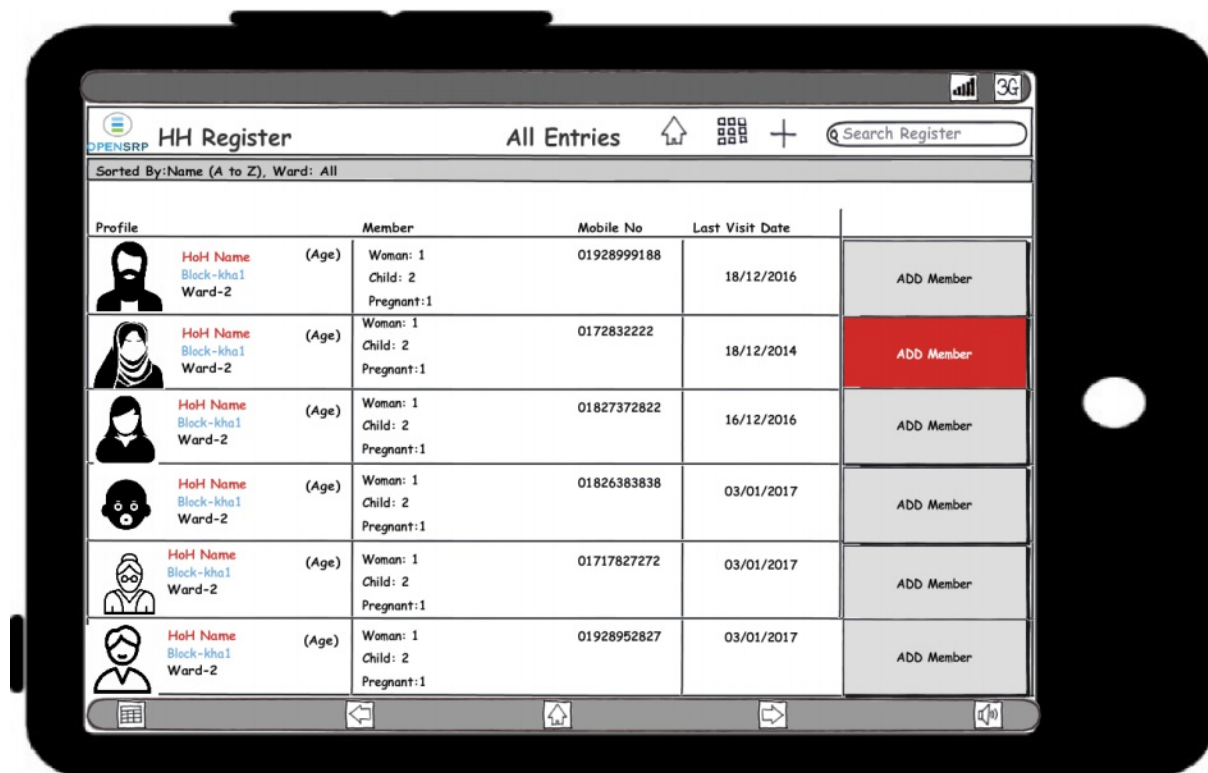


Figure 1:Household List view

## HH Profile:

- After clicking on one specific “HH profile” on the “HH details Page” will appear.

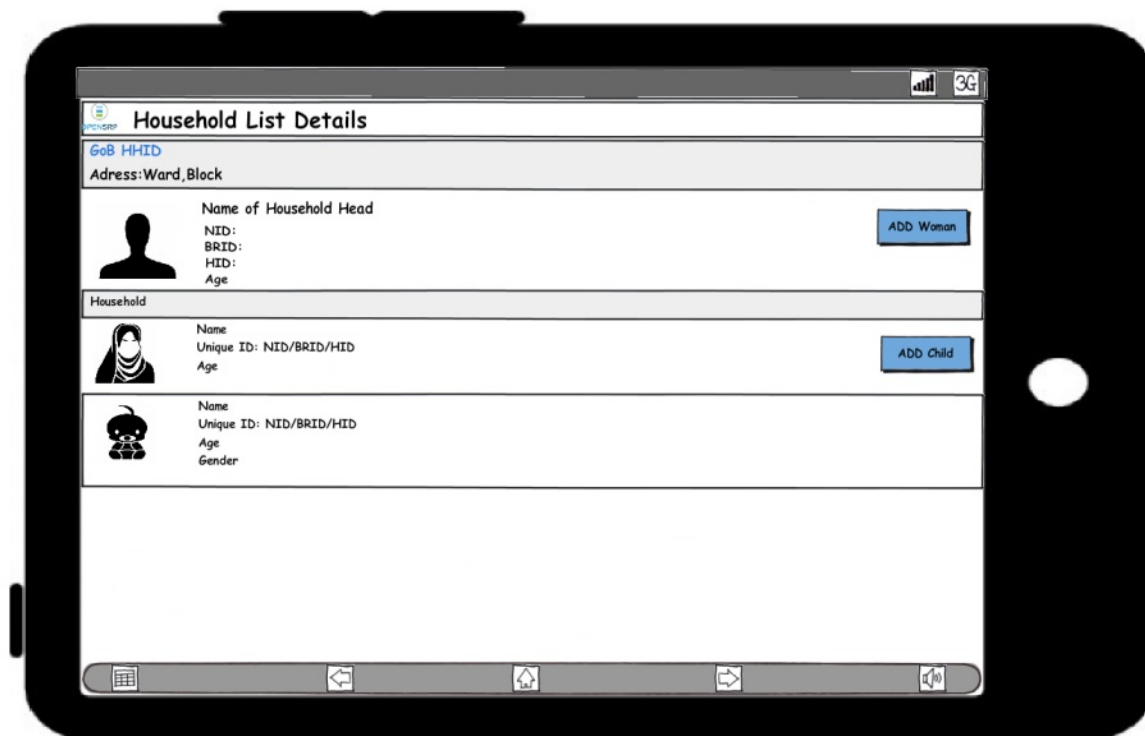


Figure 2:Households member details page

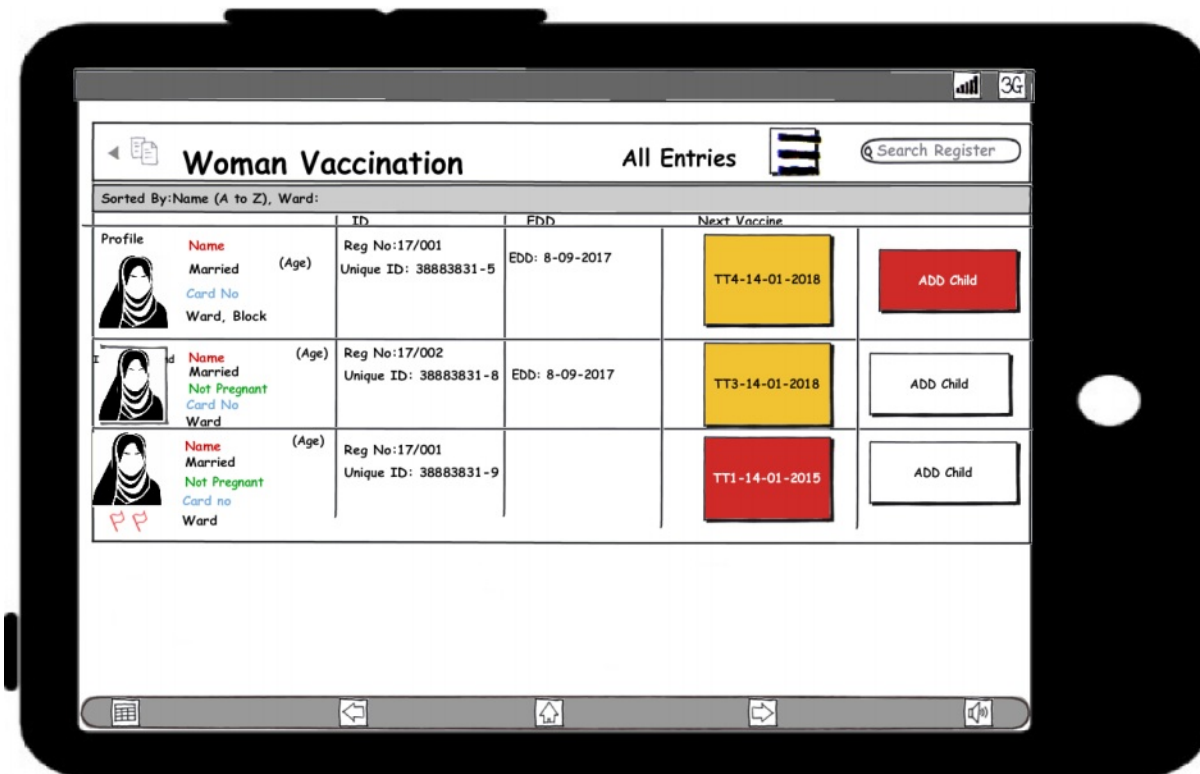
- Any new Woman can have registered into the system by clicking on “ADD Woman” button form the list.
- Any new Child can have registered into the system by clicking on “ADD Child” button form the list.
- When user click the individual Household Profile icon the page redirect to respective household members details Page.



## Woman Register:

- After clicking on the “Woman Register” button on the Home page, this page will appear.

Figure 3: Woman List view



## Work flow:

- A list view of all the women registered can be viewed in this screen.
- Data can have viewed By: Name, Age, Address, Reg No, ID Marital Status, and No of child registered in the system, Pregnancy Status/EDD status, Last vaccine date and upcoming vaccination due status.
- Any new Woman can be added via “Household Member Registration”.
- Click on ' ADD child button” for registering new child.
- Any Woman member can be searched in the register through “Search Register” option at the top right corner: Search By: Name, Unique ID, Geographic Location,
- The list view can also be filtered by clicking on the “Filter” option to the left of the “Search” button. Filter By: Marital Status, Pregnancy Status, Ward, Vaccination Status.

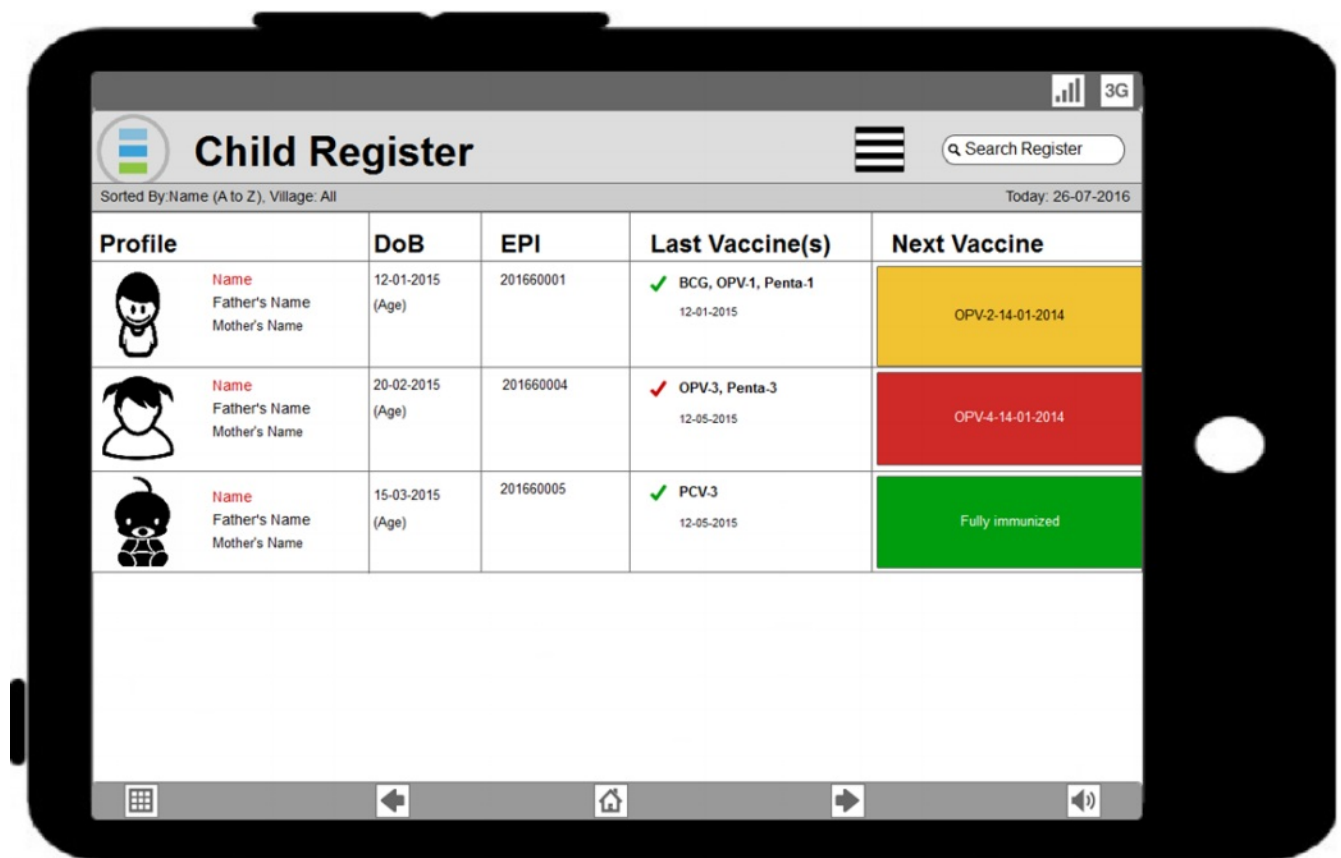
- Data can viewed also be sorted, Sort By: Name, Age, Reg/EPI Card No, Marital Status, Pregnancy Status, EDD status and upcoming vaccination due status
- System will generate different notification alerts (highlighted colored rows on the User interface of the application) in both Woman and Child registers which will help the Health Assistants to identify Due, Post Due, Expired vaccination schedules.
- If the beneficiary misses last one/two/three session the application will mark the beneficiary in Woman/Child register. The HA will see this flagged beneficiary and call him/her directly by touching the 'Mobile Number' link which will be available in the detail view of the register.
- When a mother will have missed multiple epi session system will mark red flag icon under the woman profile.

#### Woman Profile Details:

- After clicking on one specific "Woman" on the "Woman Register's List", this page will appear.
- Basic detailed information of the Woman can be viewed.
- The Vaccination Summary and Pregnancy details of the woman can also be viewed in separate boxes.
- Tap to the image and take the picture of the Woman.

## Child Register:

All the children at or under the age of 5 will be enlisted in this register



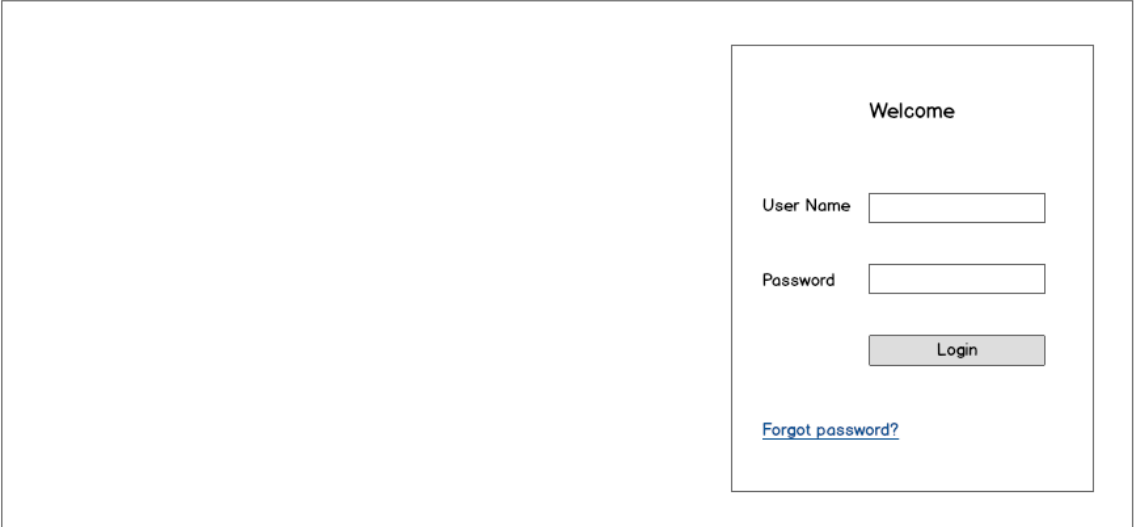
- After clicking on the “Child Register” button on the Home page, this page will appear.
- A list view of all the children registered can be viewed in this screen.
- Any new child can be added via “ADD New Child Registration” form the Mother register’.
- Any child member can be searched in the register through “Search Register” option at the top right corner: Search By: Name, Age, Reg/EPI Card No, Birth Date, and No of child registered in the system, Last vaccine and upcoming vaccination due status.
- ‘Green’ button indicates that the child is up-to-date with the vaccination.
- Click on 'Red'/'Yellow' button to launch 'Vaccine Enrollment' form
- Data can view by: Name, Age, Reg/EPI Card No, Birth Date, and No of child registered in the system, Last vaccine and upcoming vaccination due status.
- The list view can also be filtered by clicking on the “Filter” option to the left of the “Search” button. Filter By: Name, Age, Reg/EPI Card No, Birth Date, and No of child registered in the system, Last vaccine and upcoming vaccination due status.

- Data can also be sorted, Sort By: Name, Age, Reg/EPI Card No, Birth Date, Last vaccine and upcoming vaccination due status.

## Web Application:

### Log-in Screen:

#### **Work flow:**



The screenshot shows a login interface with the following elements:

- Header: Welcome
- Form fields: User Name (text input), Password (text input)
- Button: Login
- Link: [Forgot password?](#)

1. This is the landing page of the web-view of “JICA vaccination Apps mHealth”.
2. Any frontline health worker will have to enter his username and password to log-in to the system.
3. The username and password of the User will be provided by System Administrator. If any of the information is incorrect/missing, user won't be able to log in.
4. Users will login to the system by giving User Name, password and clicking the “Login” button.
5. After that the logged in user will be redirected to the Patient List page.
6. User can view patient list, Patient profile, register new patient to the system, add different test registrations, different test information and test results.
7. If user forgets his/her password, he/she will change his/her password by clicking “Forgot password?”. After clicking “Forgot password?” he/she will change/ retrieve his/her password by using his/her email or contact no.

Question name	Question type	Mandatory / Optional	Remarks
User Name	Text	M	
Password	Alphanumeric	M	

## Data View & Edit:

- All the data that are prevailing in the system can be viewed in the data section.
- There will be some filtering options through which, specific range of data can be searched and viewed.
- The details of the data can also be viewed by clicking on the “Details” button.
- Only assigned user can able to edit and delete data. The update information will be sync when the HA application will be sync with the server.

## WEB Reports:

### Project Dashboard:

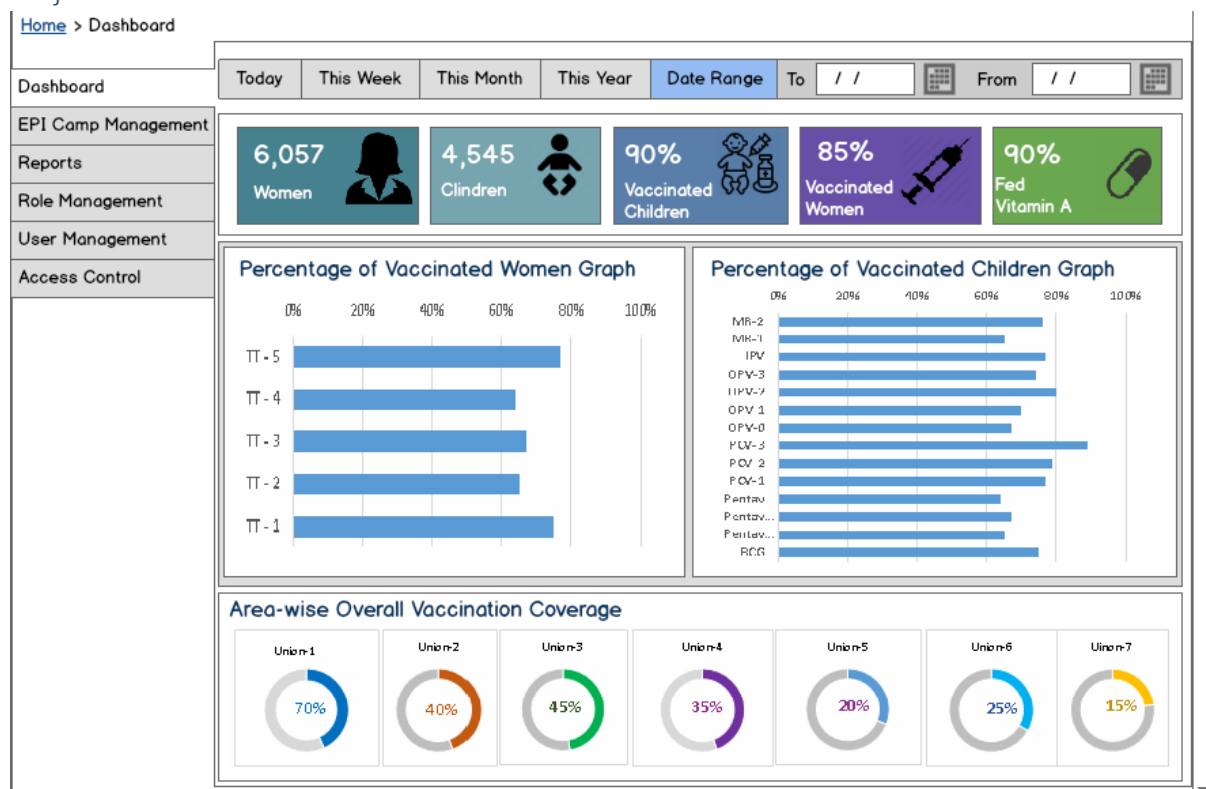


Figure 4: Indicative Project Dashboard

### Work Flow:

1. This is the dashboard page of the web application.
2. User can view the information by filtering the dashboard using “Today”, “This Week”, “This Month”, “This Year” and “Date Range”.
3. If “Date Range” is selected user have to input the “To Date” and “From Date”.
4. By Default the “Today” button will be selected.

Parameter Name	Data Source	Calculation Logic
No. of Women	Woman Registration Form	Count of Registered Women

No. of Children	Child Registration Form	Count of Registered Children
Percentage of Timely Vaccinated Children	Child Vaccination Form	(No. of Timely Vaccinated Children / No. of Children) * 100
Percentage of Timely Vaccinated Women	Woman Vaccination Form	(No. of Timely Vaccinated Women / No. of Women) * 100
Percentage of fed Vitamin A	Child Registration Form	(No. of fed Vitamin A / No. of children) * 100
Percentage of each Vaccine	Woman Vaccination Form	(No. of Women Timely Vaccinated each vaccine / No. of Women)
Percentage of each Vaccine	Child Vaccination Form	(No. of Children Timely Vaccinated each vaccine / No. of Children)
Area-wise Overall Vaccination Coverage	Child Registration Child Vaccination Woman Registration Woman Vaccination	(No. of Children Timely Vaccinated in one Union + No. of Women Timely Vaccinated in that Union / No. of Children in that Union + No. of Women in that Union)

## Child Vaccination Report Worker-wise:

### Work Flow:

1. User clicks on “Child Vaccination Report Worker-wise” from “Reports” tab to view the report.
2. Latest user information will be on the top and the oldest user information will be on the bottom.

Home > [User Management](#) > Child Vaccination Report Worker-wise Logout

Dashboard

EPI Camp Management

Reports

Child Vaccination Report Worker-wise

Child Vaccination Report Ward-wise

Child Vaccination Report Union-wise

Woman Vaccination Report Worker-wise

Woman Vaccination Report Ward-wise

Woman Vaccination Report Union-wise

Role Management

User Management

Access Control

### Child Vaccination Report Worker-wise

District ▼
Upazila ▼
Union ▼
Ward ▼

1D
1W
1M
3M
1Y

SI	Worker Name	BCG # %	Penta-1 # %	Penta-2 # %	Penta-3 # %	PCV-1 # %	PCV-2 # %	PCV-3 # %	IPV # %	MR # %	MR-2 # %
001	AA	75	80	85	90	95	90	85	80	75	70
002	BB	75	80	85	90	95	90	85	80	75	70
003	CC	75	80	85	90	95	90	85	80	75	70
004	DD	75	80	85	90	95	90	85	80	75	70
005	EE	75	80	85	90	95	90	85	80	75	70

Total Pages: No of Pages Go To Pages

First
Prev
Next
Last

3. Admin can filter user information by selecting different filter options and press “Search” button to filter user list or can search by entering any text field in the search field.
4. In one page, there will be at most 20-user’s user information.
5. User can go to a page by entering the page number and clicking the “Go To Pages”.
6. User can go to the first page by clicking “First” button, go to the last page by clicking “Last” button.
7. User can go to the previous page by clicking “Prev” button, go to the next page by clicking “Next” button.
8. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.



## Child Vaccination Report Ward-wise:

### Work Flow:

1. User clicks on “Child Vaccination Report Ward-wise” from “Reports” tab to view the report.

Home > User Management > Child Vaccination Report Ward-wise Logout

Dashboard

EPI Camp Management

Reports

Child Vaccination Report Worker-wise

Child Vaccination Report Ward-wise

Child Vaccination Report Union-wise

Woman Vaccination Report Worker-wise

Woman Vaccination Report Ward-wise

Woman Vaccination Report Union-wise

Role Management

User Management

Access Control

### Child Vaccination Report Ward-wise

District ▼
Upazila ▼
Union ▼
Search

1D
1W
1M
3M
1Y

Sl	Ward No.	BCG # %	Penta-1 # %	Penta-2 # %	Penta-3 # %	PCV-1 # %	PCV-2 # %	PCV-3 # %	IPV # %	MR # %	MR-2 # %
001	Ward-15	75	80	85	90	95	90	85	80	75	70
002	Ward-16	75	80	85	90	95	90	85	80	75	70
003	Ward-07	75	80	85	90	95	90	85	80	75	70
004	Ward-0	75	80	85	90	95	90	85	80	75	70
005	Ward-0	75	80	85	90	95	90	85	80	75	70

Total Pages: No of Pages Go To Pages

First
Prev
Next
Last

2. Latest user information will be on the top and the oldest user information will be on the bottom.
3. Admin can filter user information by selecting different filter options and press “Search” button to filter user list or can search by entering any text field in the search field.
4. In one page, there will be at most 20-user’s user information.
5. User can go to a page by entering the page number and clicking the “Go To Pages”.
6. User can go to the first page by clicking “First” button, go to the last page by clicking “Last” button.
7. User can go to the previous page by clicking “Prev” button, go to the next page by clicking “Next” button.
8. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

## Child Vaccination Report Union-wise:

Home > [User Management](#) > Child Vaccination Report Union-wise Logout

Dashboard

EPI Camp Management

Reports

Child Vaccination Report Worker-wise

Child Vaccination Report Ward-wise

Child Vaccination Report Union-wise

Woman Vaccination Report Worker-wise

Woman Vaccination Report Ward-wise

Woman Vaccination Report Union-wise

Role Management

User Management

Access Control

### Child Vaccination Report Union-wise

District

Upazila

Search

1D
1W
1M
3M
1Y

Sl	Union Name	BCG # %	Penta-1 # %	Penta-2 # %	Penta-3 # %	PCV-1 # %	PCV-2 # %	PCV-3 # %	IPV # %	MR # %	MR-2 # %
001	Pubail	75	80	85	90	95	90	85	80	75	70
002	Boali	75	80	85	90	95	90	85	80	75	70
003	Baria	75	80	85	90	95	90	85	80	75	70
004	Mirzapu	75	80	85	90	95	90	85	80	75	70
005	Fulbaria	75	80	85	90	95	90	85	80	75	70

Total Pages: No of Pages Go To Pages

First
Prev
Next
Last

### Work Flow:

1. User clicks on “Child Vaccination Report Union-wise” from “Reports” tab to view the report.
2. Latest user information will be on the top and the oldest user information will be on the bottom.
3. Admin can filter user information by selecting different filter options and press “Search” button to filter user list or can search by entering any text field in the search field.
4. In one page, there will be at most 20-user’s user information.
5. User can go to a page by entering the page number and clicking the “Go To Pages”.
6. User can go to the first page by clicking “First” button, go to the last page by clicking “Last” button.
7. User can go to the previous page by clicking “Prev” button, go to the next page by clicking “Next” button.
8. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

## Woman Vaccination Report Worker-wise:

### Work Flow:

1. User clicks on “Woman Vaccination Report Worker-wise” from “Reports” tab to view the report.
2. Latest user information will be on the top and the oldest user information will be on the bottom.
3. Admin can filter user information by selecting different filter options and press “Search” button

[Home](#) > [User Management](#) > Woman Vaccination Report Worker-wise Logout

### Woman Vaccination Report Worker-wise

District  Upazila  Union  Ward  Search

1D 1W 1M 3M 1Y

Sl no.	Worker Name	TT-1 # %	TT-2 # %	TT-3 # %	TT-4 # %	TT-5 # %
001	AA	75	80	85	90	80
002	BB	75	80	85	90	80
003	CC	75	80	85	90	80
004	DD	75	80	85	90	80
005	EE	75	80	85	90	80

Total Pages: No of Pages  Go To Pages

First Prev Next Last

to filter user list or can search by entering any text field in the search field.

4. In one page, there will be at most 20-user's user information.
5. User can go to a page by entering the page number and clicking the “Go To Pages”.
6. User can go to the first page by clicking “First” button, go to the last page by clicking “Last” button.
7. User can go to the previous page by clicking “Prev” button, go to the next page by clicking “Next” button.
8. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

## Woman Vaccination Report Ward-wise:

### Work Flow:

1. User clicks on “Woman Vaccination Report Ward-wise” from “Reports” tab to view the report.
2. Latest user information will be on the top and the oldest user information will be on the bottom.
3. Admin can filter user information by selecting different filter options and press “Search” button to filter user list or can search by entering any text field in the search field.

Home > User Management > Woman Vaccination Report Ward-wise Logout

### Woman Vaccination Report Ward-wise

District ▼ Upazila ▼ Union ▼ Search

1D 1W 1M 3M 1Y

Sl no.	Ward No.	TT-1 # %	TT-2 # %	TT-3 # %	TT-4 # %	TT-5 # %
001	Ward-15	75	80	85	90	80
002	Ward-16	75	80	85	90	80
003	Ward-08	75	80	85	90	80
004	Ward-07	75	80	85	90	80
005	Ward-07	75	80	85	90	80

Total Pages: No of Pages

First Prev Next Last

4. In one page, there will be at most 20-user's user information.
5. User can go to a page by entering the page number and clicking the “Go To Pages”.
6. User can go to the first page by clicking “First” button, go to the last page by clicking “Last” button.
7. User can go to the previous page by clicking “Prev” button, go to the next page by clicking “Next” button.
8. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

## Woman Vaccination Report Union-wise

### Work Flow:

1. User clicks on “Woman Vaccination Report Union-wise” from “Reports” tab to view the report.
2. Latest user information will be on the top and the oldest user information will be on the bottom.
3. Admin can filter user information by selecting different filter options and press “Search” button to filter user list or can search by entering any text field in the search field.
4. In one page, there will be at most 20-user’s user information.
5. User can go to a page by entering the page number and clicking the “Go To Pages”.
6. User can go to the first page by clicking “First” button, go to the last page by clicking “Last” button.

Home > User Management > Woman Vaccination Report Union-wise Logout

### Woman Vaccination Report Union-wise

District  Upazila  Search

1D 1W 1M 3M 1Y

Sl no.	Union Name	TT-1 # %	TT-2 # %	TT-3 # %	TT-4 # %	TT-5 # %
001	AA	75	80	85	90	80
002	BB	75	80	85	90	80
003	CC	75	80	85	90	80
004	DD	75	80	85	90	80
005	EE	75	80	85	90	80

Total Pages: No of Pages  Go To Pages

First Prev Next Last

7. User can go to the previous page by clicking “Prev” button, go to the next page by clicking “Next” button.
8. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

## Admin Panel:

System Admin can log-in to the web interface and access the system. An admin can-

- Determine the access control of the system,
- Manage users through user management
- View/edit/export data through Data management of the system
- View Reports generated for data

## Create Role:

### Work Flow:

1. User clicks on “Create Role” from “Role Management” tab to add a new role into the system.
2. User types the role name, and clicks on “Submit” button and the user will be redirected to the

The screenshot shows a web application interface for creating a role. On the left is a sidebar menu with items: Dashboard, EPI Camp Management, Reports, Role Management (containing 'Create Role' and 'View Role'), User Management, and Access Control. The main content area is titled 'Create Role' and contains a form with a text input field for 'Role Name', a red 'Cancel' button, and a green 'Submit' button. A 'Logout' button is located in the top right corner of the page.

view role page under user management.

3. User clicks on “Cancel” button if don’t want to save it.
4. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

Question name	Question type	Mandatory / optional	Remarks
Role name	Text	M	

## View Role:

### Work Flow:

1. User can see the “Role List” by clicking on “View Role” from “Role Management”.

Serial no.	Role Name		
0001	HW	Edit Info	Delete
0002	Supervisor	Edit Info	Delete
0003	Manager	Edit Info	Delete

2. Latest role information will be on the top and the oldest role information will be on the bottom.
3. From this list user, can edit or delete the role by clicking on respective “Edit Info” or “Delete” button.
4. In case of deletion a warning pop-up will appear saying “Are you sure you want to delete” then after pressing “yes” deletion operation will be done if “no” is pressed the deletion operation will be cancelled.
5. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

## Create User:

Home > User Management > Create User Logout

Dashboard	<b>Create User</b>		
EPI Camp Management	Name	<input type="text"/>	
Reports	Designation*	<input type="text"/>	
Role Management	Contact No.*	<input type="text"/>	
User Management	Email	<input type="text"/>	
Create User	User Name*	<input type="text"/>	
Edit User	Password*	<input type="text"/>	
View User	Confirm Password*	<input type="text"/>	
Access Control	Role*	<input type="text"/>	
	GEO Location	Division <input type="text"/>	District <input type="text"/>
		Union <input type="text"/>	Ward <input type="text"/>
		Upazila <input type="text"/>	
		<input type="button" value="Cancel"/>	<input type="button" value="Submit"/>

### Work Flow:

1. The Admin will click on “Create User” button which will take the Admin to a new page where a form will appear to enter data about the new User Account.
2. The Admin will enter the user data in both text input-box and numeric input-box where applicable.
3. After rechecking, admin will then “Submit” the “User Account” and will get a confirmation that a new account has been created successfully and admin will be redirected to the user information page under user management.
4. User can also cancel the user creation by clicking “Cancel” button and will be redirected to the user information page under user management.
5. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

Question Name	Question Type	Mandatory / Optional	Remarks
Name	Text	M	
Designation	Single select	M	Use Combobox
Contact Number	Integer	O	At least 11 digits long User must input either email or contact no.



Email	Alphanumeric	O	Check for '@' and '.com' User must input either email or contact no.
User Name	Alphanumeric	M	
Password	Alphanumeric	M	At least 5 digits
Confirm Password	Alphanumeric	M	Have to be Same as 'Password'
Role	<b>Single Select</b>	M	Will come from role list
Division	<b>Single Select</b>	M	User DropDown
District	<b>Single Select</b>	M	User DropDown
Upazila	<b>Single Select</b>	M	User DropDown
Union	<b>Single Select</b>	M	User DropDown
Ward	<b>Single Select</b>	M	User DropDown

[View User List:](#)

### Work Flow:

Home > [User Management](#) > User Info Logout

**User Information**

Division  District  Upazila

Union  Ward  Role  Search

Sl no.	Name	Designation	UserID	Role	Edit Info	Delete
001	AA	BB	CC	DD	Edit Info	Delete
002	AA1	BB1	CC1	DD1	Edit Info	Delete
003	AA2	BB2	CC2	DD2	Edit Info	Delete
004	AA3	BB3	CC3	DD3	Edit Info	Delete
005	AA4	BB4	CC4	DD4	Edit Info	Delete

Total Pages: No of Pages  Go To Pages  1

First Prev Next Last

1. Admin can 'Edit' user's information by clicking on 'Edit info' button from the user list.
2. Individual user also can only view and edit only his/her information by clicking "edit info".
3. Admin can 'Delete' user's by clicking on 'Delete' button from the user list.
4. Latest user information will be on the top and the oldest user information will be on the bottom.

5. Admin can filter user information by selecting different filter options and press “Search” button to filter user list or can search by entering any text field in the search field.
6. In case of deletion a warning pop-up will appear saying “Are you sure you want to delete” then after pressing “yes” deletion operation will be done if “no” is pressed the deletion operation will be cancelled.
7. In one page, there will be at most 20-user’s user information.
8. User can go to a page by entering the page number and clicking the “Go To Pages”.
9. User can go to the first page by clicking “First” button, go to the last page by clicking “Last” button.
10. User can go to the previous page by clicking “Prev” button, go to the next page by clicking “Next” button.
11. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

Edit User:

**Work Flow:**

1. After clicking “Edit info” admin will see this page in edit mode, he/she can then edit user info.
2. Clicking “submit” button will save the changes and clicking the “cancel” button will cancel the changes.
3. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

Access Control:

### Work Flow:

1. Admin user will click on “Access Control” tab from the side menu, from where he/she will

	Admin	HW	Supervisor	Manager
Create Role	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Edit Role	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Delete Role	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Create User	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Edit User	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Delete User	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

manage the access permission of different roles.

2. User selects/deselects relevant check box to manage access permission of different roles.
3. User can logout from the system by clicking the “Logout” button and redirected to the Login Page.

### Integration with GOVT System:

System will be integrating with DHIS-2 System.

### Access Control



Admin will click on ‘**Access Control**’ menu and will be able to see the list of registered roles with available features of the system, for which he/she can allow permission access to a role of the system.

### Language of the Application:


The app will be available Bangla language.

Annex:


1. Child Vaccination Card

<div style="text-align: center;">  <b>ইপিআই টিকাদান কার্ড (শিশু)</b>  </div> <p style="text-align: center; background-color: red; color: white; padding: 5px;"><b>টিকাদান সময়সূচি অনুযায়ী সবগুলো টিকা দেয়া প্বেব করুন।</b></p> <p>রেজিস্ট্রেশন নং _____ রেজিস্ট্রেশনের তারিখ _____</p> <p>নাম _____ হেপে/মেজা _____</p> <p>অনু তারিখ (ইং) _____ দিন _____ মাস _____ বছর _____</p> <p>মাতার নাম _____</p> <p>পিতার নাম _____</p> <p>বাড়ি/জিলা/জেলা/পোস্টাফিস নং _____ থানা/মহল্লা/পাড়া _____</p> <p>উপজেলা/সীমান্ত/সিটি করপোরেশন _____</p> <p>জেলা _____ ইউনিয়ন/জেলা _____ ওয়ার্ড নং _____</p> <p>বেস্বের নাম _____ সাক-ব্লক _____</p> <p style="text-align: center; background-color: red; color: white; padding: 5px;"><b>টিকার এই কার্ডটি বন্ধ করে রাখুন। ভবিষ্যতে শিশুকে ছুঁলে ভর্তি করার সময়, বিশেষে গমনের সময় এই কার্ডটির প্রয়োজন হবে।</b></p>	<div style="text-align: center; background-color: red; color: white; padding: 5px;"><b>শিশুকে সবগুলো টিকা দেয়ার জন্য কমপক্ষে ৫ বার টিকা কেন্দ্রে নিয়ে আসতে হবে</b></div> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th rowspan="2">টিকার নাম</th> <th colspan="5">যদি ঘরে টিকা এনারের তারিখ ও কর্মীর সাক্ষর</th> </tr> <tr> <th>১ম বার</th> <th>২য় বার</th> <th>৩য় বার</th> <th>৪র্থ বার</th> <th>৫ম বার</th> </tr> </thead> <tbody> <tr> <td>বিসিডি</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>পেন্টা (ডিপিটি, হেপা-বি, হিব)</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>পিপিডি</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>ওপিডি</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>এমআর (হেম ও কলেগ)</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>হাম (২য় ডোজ)</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <div style="text-align: center; background-color: red; color: white; padding: 5px;"><b>যেকোনো ধরনের অনুস্থতার স্বাস্থ্যকর্মীকে খবর দিন এবং শিশুকে নিকটস্থ স্বাস্থ্য কেন্দ্রে নিয়ে আসুন।</b></div>	টিকার নাম	যদি ঘরে টিকা এনারের তারিখ ও কর্মীর সাক্ষর					১ম বার	২য় বার	৩য় বার	৪র্থ বার	৫ম বার	বিসিডি						পেন্টা (ডিপিটি, হেপা-বি, হিব)						পিপিডি						ওপিডি						এমআর (হেম ও কলেগ)						হাম (২য় ডোজ)					
টিকার নাম	যদি ঘরে টিকা এনারের তারিখ ও কর্মীর সাক্ষর																																															
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<div style="text-align: center; background-color: red; color: white; padding: 5px;"><b>ইপিআই কর্মসূচিতে শিশুদের টিকা নিয়ে প্রতিরোধযোগ্য রোগ সমূহ</b></div> <p>১। সময়সূচি অনুযায়ী সবগুলো টিকা নিলে আপনার শিশু নিম্নের মারাত্মক সংক্রামক রোগ হতে রক্ষা পাবে:</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="background-color: red; color: white; padding: 5px;">১। বস্বা</td> <td style="background-color: red; color: white; padding: 5px;">২। পোলিও</td> <td style="background-color: red; color: white; padding: 5px;">৩। ডিফথেরিয়া</td> </tr> <tr> <td style="background-color: red; color: white; padding: 5px;">৪। হপিং কাশি</td> <td style="background-color: red; color: white; padding: 5px;">৫। বদুইংকার</td> <td style="background-color: red; color: white; padding: 5px;">৬। হেপাটাইটিস-বি</td> </tr> <tr> <td style="background-color: red; color: white; padding: 5px;">৭। ডিম্বাকবীপাস ইনডুয়েক্স-বি</td> <td style="background-color: red; color: white; padding: 5px;">৮। হাম</td> <td></td> </tr> <tr> <td style="background-color: red; color: white; padding: 5px;">৯। কলেগ</td> <td style="background-color: red; color: white; padding: 5px;">১০। নিউমোকোকাল নিউমোনিয়া</td> <td></td> </tr> </table> <p>২। বিসিডি টিকার নির্দিষ্ট জোড়টি অনুষ্ঠের পর পরই দেয়া যায়। টিকা দেয়ার পর বিসিডি টিকার স্থানে (বাম বাহুতে) স্বাভাবিকভাবে যা হবে এতে ভ্রান্তার কিছু নাই।</p> <p>৩। শিশুর বয়স ৬ সপ্তাহ/৬২ দিন হলেই পেন্টাভ্যালেট (ডিপিটি, হেপাটাইটিস-বি, হিব), পিপিডি এবং পোলিও টিকার ১ম ডোজ দিতে হবে। তারপর কমপক্ষে ৪ সপ্তাহ/২৮ দিনের ব্যবধানে এ সকল টিকার ২য় এবং ৩য় ডোজ দিতে হবে।</p> <p>৪। ১০ মাসে পড়লেই/২৭০ দিন পূর্ণ হলেই শিশুকে ১ জোজ এমআর (হেম ও কলেগ) টিকা দিতে হবে।</p> <p>৫। শিশুর বয়স ১৫ মাস পূর্ণ হলেই হামের ২য় জোজ টিকা দিতে হবে।</p> <p>৬। অনুস্থ শিশুকে টিকা দেয়া যাবে না।</p> <p>৭। টিকা নিলে স্বাভাবিকভাবে সাধারণ জ্বর, টিকার স্থানে ব্যথা এবং সাময়িকভাবে টিকা দেয়ার স্থান শক্ত হয়ে যেতে পারে, এতে ভয়ের কিছু নাই।</p> <div style="text-align: center; background-color: red; color: white; padding: 5px;"><b>সম্প্রসারিত টিকাদান কর্মসূচি (ইপিআই), স্বাস্থ্য অধিদপ্তর স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রণালয়</b></div>	১। বস্বা	২। পোলিও	৩। ডিফথেরিয়া	৪। হপিং কাশি	৫। বদুইংকার	৬। হেপাটাইটিস-বি	৭। ডিম্বাকবীপাস ইনডুয়েক্স-বি	৮। হাম		৯। কলেগ	১০। নিউমোকোকাল নিউমোনিয়া		<div style="text-align: center; background-color: red; color: white; padding: 5px;"><b>প্রতিটি শিশুর রয়েছে সবগুলো টিকা পাওয়ার অধিকার</b></div> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>জোজ অনুযায়ী শিশুকে টিকাকেন্দ্রে নিয়ে আসুন</th> <th>টিকা পাওয়ার তারিখ</th> </tr> </thead> <tbody> <tr> <td>১। ১ম বার শিশুর বিসিডি, পেন্টা-১, পেন্টা-২ এবং পিপিডি-১ টিকা পাওয়ার তারিখ (পেন্টা-১, পিপিডি-১, এমআর এবং হামের কার্যকর হতে)।</td> <td></td> </tr> <tr> <td>২। ২য় বার শিশুর পিপিডি-২, পেন্টা-২ এবং পিপিডি-২ টিকা পাওয়ার তারিখ (সেপন গ্রান থেকে)।</td> <td></td> </tr> <tr> <td>৩। ৩য় বার শিশুর পিপিডি-৩, পেন্টা-৩ এবং পিপিডি-৩ টিকা পাওয়ার তারিখ (সেপন গ্রান থেকে)।</td> <td></td> </tr> <tr> <td>৪। ৪র্থ বার শিশুর পেন্টা-৪ এবং এমআর টিকা পাওয়ার তারিখ (পেন্টা-১, পিপিডি-১, এমআর এবং হামের কার্যকর হতে)।</td> <td></td> </tr> <tr> <td>৫। ৫ম বার শিশুর হামের টিকা পাওয়ার তারিখ (পেন্টা-১, পিপিডি-১, এমআর এবং হামের কার্যকর হতে)।</td> <td></td> </tr> </tbody> </table> <p>মহাকর্ষ রেজিস্ট্রেশনের সময় শিশুর জন্ম তারিখ অনুযায়ী ১, ৪, ৫ নং ঘরে "পেন্টা-১, পিপিডি-১, এমআর এবং হামের কার্যকর হতে" থেকে পেন্টা-১, পেন্টা-২, পিপিডি-১, এমআর এবং হামের টিকা দেয়ার তারিখ লিখে দিবেন। ২য় ঘরে ১ম জোজ টিকা এনারের পর সেপন গ্রান অনুযায়ী ২য় জোজ টিকা দেয়ার জন্য টিকাকেন্দ্রে আসার তারিখ লিখে দিবেন। একইভাবে ৩য় ঘরে ২য় জোজ টিকা এনারের পর সেপন গ্রান অনুযায়ী ৩য় জোজ টিকা দেয়ার জন্য টিকাকেন্দ্রে আসার তারিখ লিখে দিবেন।</p> <div style="text-align: center; background-color: red; color: white; padding: 5px;"><b>আপনার এলাকার মস্তুর ২৮ দিনের মধ্যে কোনো শিশুর মৃত্যু হলে অর্থবহ কোনো শিশু হলে আক্রান্ত হলে অর্থবহ ১৫ বছরের কম বয়সের কোনো মেয়েদের এক বা একাধিক হাত অর্থবহ পূর্ণ স্বাস্থ্য বন্দনলে পারাপাইবিন হলে নাথাবে নাথবে নিকটস্থ স্বাস্থ্য কেন্দ্রে অথবা স্বাস্থ্যকর্মীকে খবর দিন।</b></div>	জোজ অনুযায়ী শিশুকে টিকাকেন্দ্রে নিয়ে আসুন	টিকা পাওয়ার তারিখ	১। ১ম বার শিশুর বিসিডি, পেন্টা-১, পেন্টা-২ এবং পিপিডি-১ টিকা পাওয়ার তারিখ (পেন্টা-১, পিপিডি-১, এমআর এবং হামের কার্যকর হতে)।		২। ২য় বার শিশুর পিপিডি-২, পেন্টা-২ এবং পিপিডি-২ টিকা পাওয়ার তারিখ (সেপন গ্রান থেকে)।		৩। ৩য় বার শিশুর পিপিডি-৩, পেন্টা-৩ এবং পিপিডি-৩ টিকা পাওয়ার তারিখ (সেপন গ্রান থেকে)।		৪। ৪র্থ বার শিশুর পেন্টা-৪ এবং এমআর টিকা পাওয়ার তারিখ (পেন্টা-১, পিপিডি-১, এমআর এবং হামের কার্যকর হতে)।		৫। ৫ম বার শিশুর হামের টিকা পাওয়ার তারিখ (পেন্টা-১, পিপিডি-১, এমআর এবং হামের কার্যকর হতে)।																								
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## 2. Woman TT Vaccination Card



### ইপিআই টিকাদান কার্ড (কিশোরী/মহিলা)



**টিটি টিকা নিয়ে নবজাত শিশু ও নিজেস্ব  
ধনুইংকরের হাত থেকে রক্ষা করুন**



রেজিস্ট্রেশন নং \_\_\_\_\_ রেজিস্ট্রেশনের তারিখ \_\_\_\_\_  
 নাম \_\_\_\_\_  
 বয়স \_\_\_\_\_ সপ্তাহ \_\_\_\_\_ তারিখ (ইং) \_\_\_\_\_ দিন \_\_\_\_\_ মাস \_\_\_\_\_ বছর \_\_\_\_\_  
 মাতার নাম \_\_\_\_\_  
 স্বামী/পিতার নাম \_\_\_\_\_  
 বাড়ি/খিয়ার/হোমিং নং \_\_\_\_\_ গ্রাম/মহল্লা/পাড়া \_\_\_\_\_  
 উপজেলা/সৌদিলাল/সিটি করপোরেশন \_\_\_\_\_  
 জেলা \_\_\_\_\_ ইউনিয়ন/জেমা \_\_\_\_\_ ওয়ার্ড নং \_\_\_\_\_  
 কেন্দ্রের নাম \_\_\_\_\_ সাব-গ্রুপ \_\_\_\_\_

**১৫ বছর বয়স হলেই প্রাপ্ততা অনুযায়ী টিটি টিকার সাথে ১ ডোজ এনআর  
টিকা দিন এবং পরবর্তীতে ৫ ডোজ টিটি টিকার সময়সূচি অনুযায়ী অবশিষ্ট  
টিটি টিকা নোয়া শেষ করুন।**

**কার্ডটি বন্ধ করে রাখুন। বন্ধনই স্বাস্থ্য কেন্দ্র/সিলাখন  
কেন্দ্রে বাবেন টিকার কার্ডটি সাথে নিবেন।**

টিকার ডোজ	টিকা শুরু করার সঠিক বয়স	টিকা পাওয়ার তারিখ	টিকা গ্রহণের তারিখ ও কর্মীর স্বাক্ষর
এনআর (হাম ও লকোপ)	১৫ বছর বয়স হলেই		-----
টিটি-১	১৫ বছর বয়স হলেই		-----
টিটি-২	টিটি-১ পাওয়ার কমপক্ষে ২৮ দিন পর		-----
টিটি-৩	টিটি-২ পাওয়ার কমপক্ষে ৬ মাস পর		-----
টিটি-৪	টিটি-৩ পাওয়ার কমপক্ষে ১ বছর পর		-----
টিটি-৫	টিটি-৪ পাওয়ার কমপক্ষে ১ বছর পর		-----

**টিকা পাওয়ার তারিখ :** রেজিস্ট্রেশনের সময় মার্ককর্ষী কিশোরীর বয়স অনুযায়ী প্রাপ্ত এনআর ও টিটি-১ টিকা পাওয়ার তারিখ নিবে নিবেন এবং পরবর্তী টিটি টিকা পাওয়ার তারিখগুলো টিটি টিকার সময়সূচি টিকা রেবে ইপিআই সেশন গ্রাম অনুযায়ী নিবে নিবেন।

**টিকা গ্রহণের তারিখ ও কর্মীর স্বাক্ষর :** কেন্দ্রে টিকা গ্রহণের পর টিকাদানকর্মী তারিখ নিবে স্বাক্ষর নিবেন।

**আপনার এলাকার জনস্বাস্থ্য কেন্দ্রের ২৮ দিনের মধ্যে কোনো শিশুর মৃত্যু হলে অথবা  
কোনো শিশু হামে আক্রান্ত হলে অথবা ১৫ বছরের কম বয়সের কোনো  
মেয়েমেয়ে এক বা একাধিক হাত অথবা পা হঠাৎ ধপধপে পড়ারলাইন  
হলে সাথে সাথে নিকটস্থ স্বাস্থ্য কেন্দ্রে অথবা মার্ককর্ষীকে ধরুন।**

**সম্প্রসারিত টিকাদান কর্মসূচি (ইপিআই), স্বাস্থ্য অবিলম্বে  
স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রণালয়**

3. Vaccination Schedule:

# ইপিআই ভ্যাক্সিন শিডিউল

রোগের নাম	টিকার নাম	টিকার ডোজ	ডোজের সংখ্যা	ডোজের মধ্যে ন্যূনতম বিরতি	টিকা দেয়ার সঠিক সময়	টিকাদানের স্থান	টিকার প্রয়োগ পথ
যক্ষা	বিসিজি	০.০৫ মিলি	১	-	জন্মের পর	বাম বাহুর উপরের অংশে	চামড়ার মধ্যে
ডিফথেরিয়া ছপিং কাশি ধনুষ্ঠঙ্কার হেপাটাইটিস বি হেমোফিলাস ইনফ্লুয়েঞ্জা বি	পেন্টাভ্যালেন্ট (ডিপিটি, হেপাটাইটিস বি, হিব)	০.৫ মিলি	৩	৪ সপ্তাহ	৬ সপ্তাহ ১০ সপ্তাহ ১৪ সপ্তাহ	বাম উরুর মধ্যভাগের বহিরাংশে	মাংসপেশী
নিউমোকোকাল নিউমোনিয়া	পিসিডি	০.৫ মিলি	৩	৪ সপ্তাহ	৬ সপ্তাহ ১০ সপ্তাহ ১৪ সপ্তাহ	ডান উরুর মধ্যভাগের বহিরাংশে	মাংসপেশী
পোলিওমাইলাইটিস	বিওপিডি	২ ফোঁটা	৩	৪ সপ্তাহ	৬ সপ্তাহ ১০ সপ্তাহ ১৪ সপ্তাহ	মুখে	মুখে
	আইপিডি (ফ্র্যাকশনাল)	০.১ মিলি	২	৮ সপ্তাহ	৬ সপ্তাহ ১৪ সপ্তাহ	ডান বাহুর উপরের অংশে	চামড়ার মধ্যে
হাম ও রুবেলা	এমআর	০.৫ মিলি	২	৬ মাস	৯ মাস ১৫ মাস	ডান উরুর মধ্যভাগের বহিরাংশে	চামড়ার নিচে

## Future Integrations:

1. Integration with government's other systems, like- GR, HRIS, OpenMRS+ (used for facility health care), OpenCRVS (used by cabinet ministry)
2. Micro planning for EPI
3. Send Announce SMS about Nearest EPI (Expanded Program on Immunization) camp information to the targeted beneficiary.
4. Advance monthly work planning
5. Camp specific contextualized SMS for mothers and caregivers
6. Generate auto vaccine requirements to regional level. From the registered households and members, the number of vaccination needs can be generated.
7. Auto stock management from vaccine provision
8. The system shall allow Health Assistants to refer patients to the relevant health facility and tracking and auto generation of reports for referred cases.



# **Annex 5:**

## **Prototype for PoC of ICT utilization plan**



*Prepared by:*

**mPower Social Enterprises Ltd.**



## Table of Contents

<b>1. Background</b> .....	2
<b>2. Developed Solutions</b> .....	2
<b>3. System Flow</b> .....	2
<b>4. System Information</b> .....	3
<b>4.1. Mobile Application Download Link</b> .....	3
<b>4.2. Web Dashboard Details</b> .....	3

## 1. Background

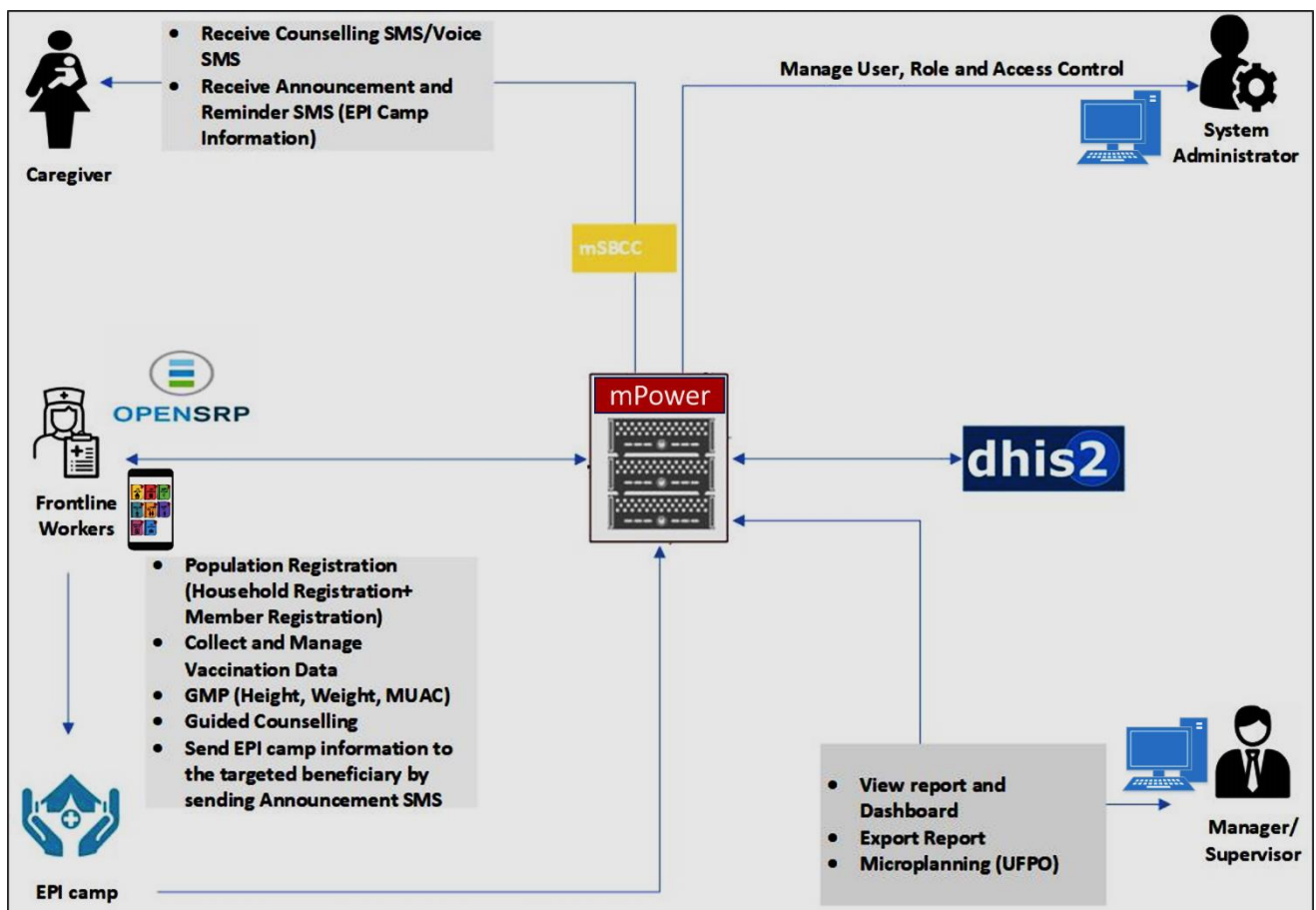
After post selection of the ICT solution for the PoC by the stakeholders, the design team got on board to start developing the System Requirement Specification (SRS) Document. For the SRS, the design team consulted with the key stakeholders and developed the initial design. Once the SRS was approved by the client, the development team took handover of the document and developed the solution. The solution went through QA, demonstration, and crosscheck by the mPower technical team, GoB stakeholders, and the Client.

## 2. Developed Solutions

Two solutions were developed under the current initiative:

- Mobile Application: An android application to be used by the frontline health workers (Health Assistants), for service delivery at the household level.
- Web Platform: For the supervisors, managers, and the system admins.

## 3. System Flow



The solution is deployed in the mPower central server in the mPower premises. For the solution, industry standard security protocol is deployed. The solution can be accessed by the system users using private internet connections. The application for the frontline health workers will be accessible by the frontline health workers using their tablet devices. The web platform can be accessed using any browser using the provided URL and credentials.

## 4. System Information

The mobile application and web platform access can be achieved using the following details:

### 4.1. Mobile Application Download Link

[https://mpowersocial-my.sharepoint.com/:u:/g/personal/mahamudur\\_mpower-social\\_com/EadYwxSTJBInkfLAOQvUCiQBJ3qkMas7O0TI8MVENcJZNQ?e=V64gaG](https://mpowersocial-my.sharepoint.com/:u:/g/personal/mahamudur_mpower-social_com/EadYwxSTJBInkfLAOQvUCiQBJ3qkMas7O0TI8MVENcJZNQ?e=V64gaG)

User: [km@gmail.com](mailto:km@gmail.com)

Password: mis@1234

### 4.2. Web Dashboard Details

<http://opensrpha.mpower-social.com:8080/opensrp-dashboard/login>

User: admin

Password: admin



# Annex 6:

## User manual for mobile application for PoC ICT Utilization Plan mService

*Population Registration and Information Management Application*



1

### Contents

- Logging in the application and Introduction to the Home Screen**
  - ☞ Logging in the application
  - ☞ Introduction to the home screen
- Procedure to register new households/add members in households**
  - ☞ Registering household
  - ☞ Registering members in the household
- Changing information of the households and members**
  - ☞ Changing information of the household
  - ☞ Changing information of the members
- How to view information of households and members**
  - ☞ Household information
  - ☞ Member information
- How to search for information of households or members**
- Updating basic information of Households and Members**
  - ☞ Updating basic information of the households
  - ☞ Updating basic information of the members

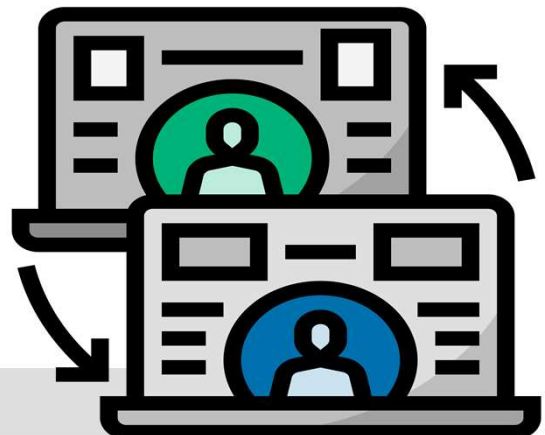
2

## Contents

- ❑ How to follow up members
- ❑ Updating information regarding vaccination of the mothers
- ❑ Updating information regarding vaccination of children
- ❑ Growth Monitoring and MUAC Recording
- ❑ Menu Bar and how to use it
  - ☞ Menu bar
  - ☞ Announcements and Sync
  - ☞ Household Registration
  - ☞ Child list, Member list and adding members
  - ☞ Viewing reports
  - ☞ Report- Growth faltering trend
  - ☞ Updating block
- ❑ Introduction to Different Icons in the Application
- ❑ How to Logout

3

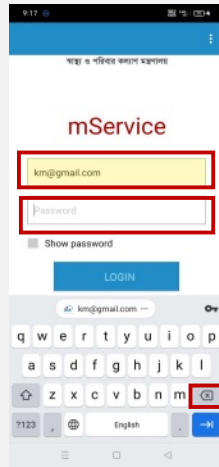
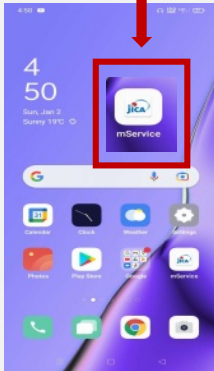
Logging in the application  
and Introduction of the  
Home Screen



4

## Logging In the Application

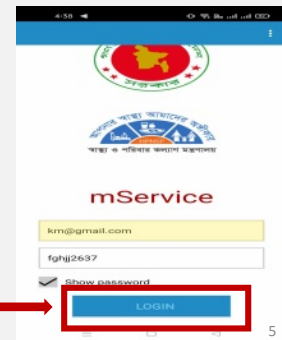
To run the app, tap on the logo



Type User Name and Password

Tap on the "X" in terms of any mistake while typing

Tap on the "Log In"



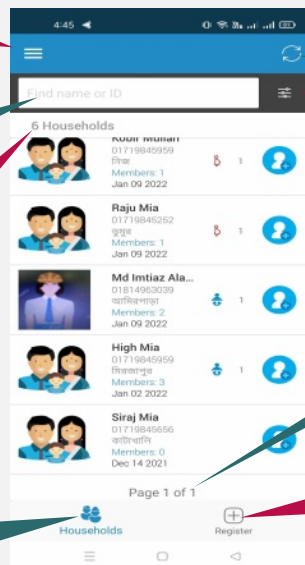
## Introduction to the Home Screen

Tap on this Icon to see the Menu

Type Name, Mobile Number or ID to search for members

Number of the registered households

When this icon is bold or colored, it will show the list of the households



Tap on the icon to sync data

Tap on the "Filter" to search for information based on specific criteria

Shows the number of pages

Tap on this icon to register new households

## Introduction of the Home Screen (after household & member registration)

Name of the representative of each household

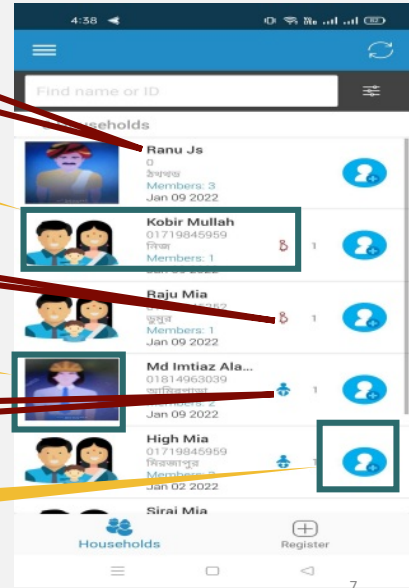
Tap on the name or photo to see the profile or change information of the household or members

This icon represents households where pregnant women are living

Shows the image of the representative of the households

This icon represents households where children below 5 years are living

Tap the icon to add members in the households



## Procedure to register new households/add members in households

## Registering Household

1 Tap on this to register new household

2 Tap on each field to provide answer

3 Tap to select the address of the household

4 Tap on "Bangladesh" and select district, upazila, union, ward and block

5 Use keyboard to write the answer

9

## Registering Household

6 When dropdown list appears, tap any answer to select

7 Write the ID of the household

8 If necessary tap ?123 to change keyboard

Write your first name

10



## Registering Household

9

Type your mobile number which must be in 11 digits

Make sure to scroll downwards to answer questions by following previous procedure

খানা নিবন্ধন SAVE

পরিবারের গুরুত্বপূর্ণ মোবাইল নম্বর  
017

Number must begin with 011, 3 / 1-11  
012, 013, 014, 015,  
016, 017, 018 or 019 and must  
be a total of 11 digits in  
length

আপনার বাসস্থানের ধরণ কি? \*

1 2 3 -  
4 5 6 ,  
7 8 9 ✖  
0 English ←

10

Tap here to select the campaign type from the drop down menu

খানা নিবন্ধন SAVE

ক্যাম্পেইন টাইপ নির্বাচন করুন \*

Outreach 1  
Outreach 2  
Outreach 3  
Outreach 4  
Outreach 5  
Outreach 6  
Outreach 7  
Outreach 8

খানার সদস্যগণ কি ধরনের  
ল্যান্ডফ্রিন ব্যবহার করেন? \*

11

## Registering Household

খানা নিবন্ধন SAVE

পরিবারের প্রধানের নাম এর প্রথম অংশ  
Salam

পরিবারের প্রধানের নাম এর শেষ অংশ  
Talukdar

খানার মোট সদস্য সংখ্যা  
3

আপনার বাসস্থানের ধরণ কি?  
শেদি পাকা

খানার সদস্যগণ কি ধরনের ল্যান্ডফ্রিন ব্যবহার করেন?  
কাচা

খানা নিবন্ধন SAVE

আপনার পরিবারের প্রধান খাবার পানির উৎস  
টিউবওয়েল (সবুজ)

আপনার পরিবারের আর্থিক অবস্থা কি?  
আম-বায় সমান

পরিবারের আনুমানিক মাসিক খরচ কত  
6000

নিকটবর্তী স্বাস্থ্য সেবা কেন্দ্র কোন্টি?  
কমিউনিটি ক্লিনিক

নিকটবর্তী স্বাস্থ্য সেবা কেন্দ্রের আনুমানিক দূর  
৫০০ মিটার থেকে ১ কিলোমিটার

খানা নিবন্ধন SAVE

নিকটবর্তী স্বাস্থ্য সেবা কেন্দ্র কোন্টি?  
ইউনিয়ন উপস্বাস্থ্য কেন্দ্র

নিকটবর্তী স্বাস্থ্য সেবা কেন্দ্রের আনুমানিক দূর  
৫০০ মিটার থেকে ১ কিলোমিটার

পরিবারের সদস্যগণ সাধারণত কোন স্বাস্থ্য সে  
ইউনিয়ন উপস্বাস্থ্য কেন্দ্র

আপনার নিকটবর্তী কমিউনিটি ক্লিনিক  
cc

নিকটবর্তী কমিউনিটি ক্লিনিকের আনুমানিক দূ  
১ কিলোমিটার থেকে ২  
কিলোমিটার

খানা নিবন্ধন SAVE

নিকটবর্তী স্বাস্থ্য সেবা কেন্দ্র কোন্টি?  
ইউনিয়ন উপস্বাস্থ্য কেন্দ্র

আপনার নিকটবর্তী কমিউনিটি ক্লিনিক  
Kumarpara CC

নিকটবর্তী কমিউনিটি ক্লিনিকের আনুমানিক দূ  
১২ / 100  
৫০০ মিটার থেকে ১ কিলোমিটার

অন্য প্রদানকারীর নামঃ  
Salam

পরিবারের প্রধানের ছবি তুলুন\*

\* marked questions must be answered, otherwise data won't be saved

Other questions have to be answered according to the previous procedure

12

## Registering Household

1 Tap here to click the photo

2 If you are satisfied with the frame, tap here

3 Tap here

4 Tap this button To retake the photo tap "c" or "x"

5 Click here to save the photo

6 When saved, the picture will look like this

## Registering Household

7 Tap "Record Location" to enable GPS

8 Wait for a while. If the accuracy is more than 5, press "OK". If it shows 5, data will be saved automatically

9 By scrolling, all the answers can be viewed. After viewing, tap "Save"

10 If any answer is wrong or not provided, a red colored message will appear. Follow the instructions to rewrite the answer and then tap "save"

11 If any household is done registering, the name will appear like this

Accuracy can be viewed like this

## Adding members in the Household & registration

**1** Tap on this icon to add members in any household

**2** More than one option can be selected here. Tap on the checkbox to select the answers

Based on this answer next question will appear

**3** Select the relationship between the members and representative of the household here

**4** Select day, month and year by scrolling. Then press "Done"

15

## Registering members in the Household

**5** Type the first letter of the district in the place of birth field

Tap it

Based on one answer, other questions will appear

**6** Tap on the district of birth

Select the name of the district

Based on the type of disease, different names of the diseases will appear. Select one or more from here

**7** If your answer to having any disease is yes, then there will be a question regarding the type of the disease

Select one or more options, for the types of diseases

**8**

**9**

16

# Registering members in the Household



10

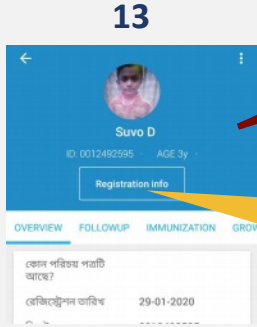
After filling up the form according to the previous instructions, tap "Save"

To see the members, tap on the name of the representatives of each household



11

Number of the members can be viewed after the information is saved



13

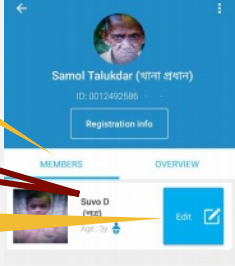
Member's profile can be seen like this

To change information of any member, tap "Registration"

Added members can be viewed here

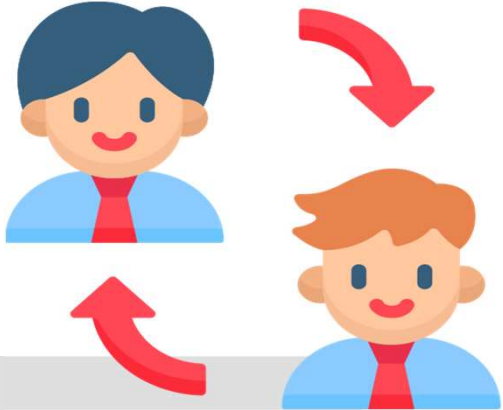
Tap on the name of the members to see their profiles

Tap on the "Edit" option to change information of any member.

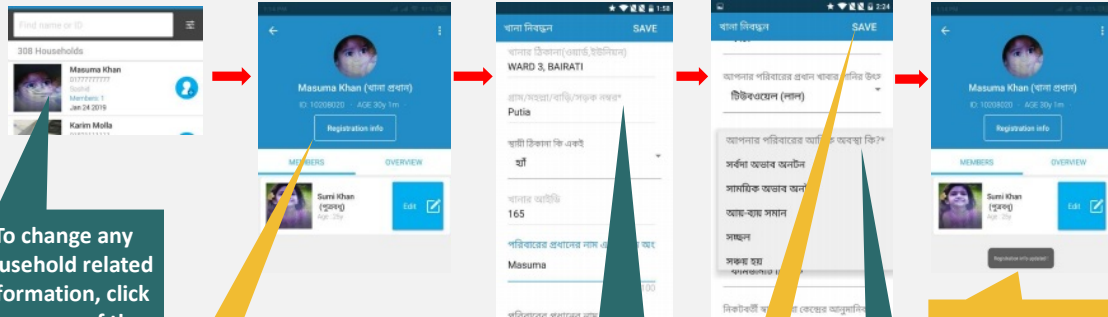


12

## Changing information of the households and members



## Changing the information of the Household



To change any household related information, click the name of the household representative

Tap on the "Registration Info"

In terms of any wrong or unanswered question, it won't be updated or saved until correction

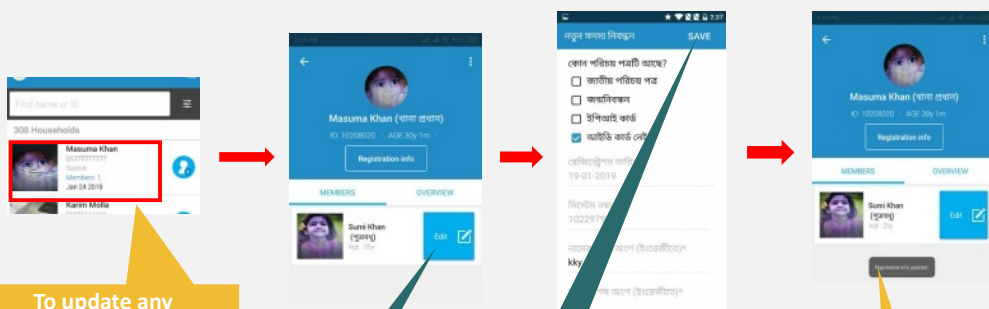
To change any answer, tap on it

Tap "Save"

Tap any answer to select it

When this message arrives, it ensures that the information is updated

## Changing information of Members



To update any information of a member, tap on the household representative's name

Tap on the "Edit" option of the specific name

To save information, tap "Save"

Any information can be changed according to the previous instruction

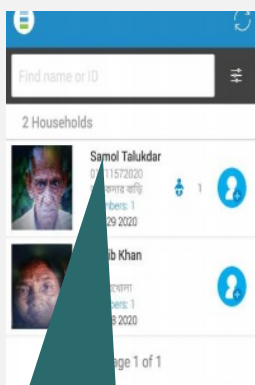
This message indicates, information is updated/saved



## How to view information of households and members

21

### How to view information of Households



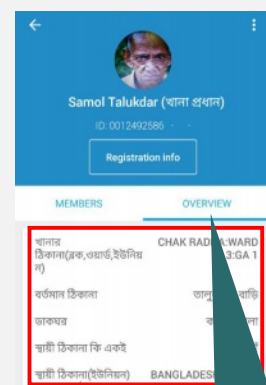
To see information of any household, tap on the name of the representative

Here prevail 2 pages. Since "Members" is selected, information of the members can be viewed

To see the information, tap "Overview"



Saved information can be viewed here

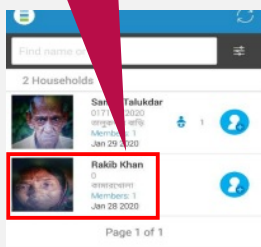


Here prevail 2 pages. Since "Overview" is selected, household information can be viewed

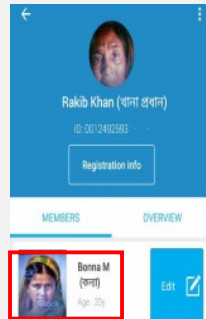
22

## How to view information of Members

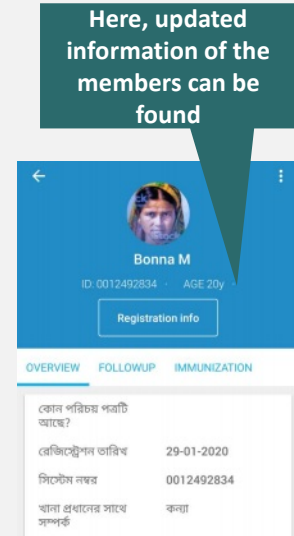
To see information of members, tap on the name of the household representative



Tap on the name of the member



By following the previous instructions, member's information can be viewed



23

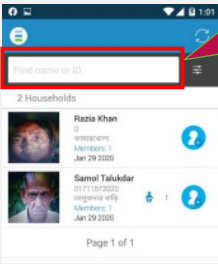
## How to search for information of households or members



24

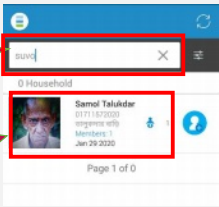
## How to find specific Member or Household

**1**



Here information can be searched by typing name, ID or mobile number


**2**



To search, use the keyboard to type

To search for members, tap on the name of the representative

**3**



The member's name will appear like this

25



Updating basic  
information of  
Households and Members

26



## Updating the basic information of a Household

**1** To change the basic information of a household, tap on the name of the household

**2** Tap on the menu bar

**3** Tap on this option to add new member in the household

If the household is transferred or cannot be found, tap on this option depicting the location of the household

**4** If the household is transferred to another area, tap on this option

**5** Provide the information and tap "Save"

If the household is not found, tap here

27

## Updating the basic information of Members

At first, tap on the name of the particular household

Then tap on the name of the particular member

Tap the Menu

Depending on the age, sex, and marital status, the options will appear to update the information

To change mobile number, tap on the Mobile Number option

Information regarding the options showed here, can be changed

28

## Updating the basic information of Members



Tap on the Menu

If a woman gives birth to a child, then her information must be updated. The new born (alive) baby must be registered as a member in that household

This option will appear under the name of the woman to give birth

+ Add Child 1

Through this icon, the newborn baby must be registered. However, while doing this, the mother's name has to be searched

29

## How to follow up members



30

## Follow-up of Members

To follow up any member, tap on the name of the household

Tap on the name of the particular member

To follow up, click "Follow up"

If the member is older than 5 years, then forms for general diseases based on the gender will appear. In terms of children, forms will appear according to their age

To visit the member, tap on the name of the form and fill it up. Then save it.

If the certain member is a married man/woman, then family planning form will appear. If the member is a pregnant woman, then certain form will appear indicating the before and after period of pregnancy.

31

## Follow-up of Members

If the woman is pregnant, this option will appear

After giving birth, "Family Planning" form will appear.

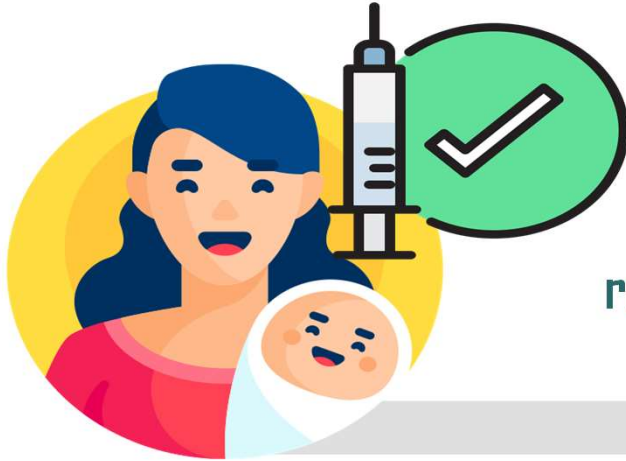
If the woman have already given birth, this postpartum option will appear

If the child is less than 5 years old, this option will appear.

If the child is less than 2 months old, this form will appear.

After filling up the postpartum form, "Child" option will appear beside the name of the mother. By tapping here, the child can be registered

32



## Updating information regarding vaccination of the Mothers

33

### Updating information about vaccination of mothers

**To update information of vaccination, tap on the household name**

**Tap the specific name**

**After tapping on the "Immunization", this screen will appear**

**Tap on the name of vaccine, which you want to update**

**Date will be selected like this**

**If any mistake is done, tap "Undo"**

**After setting up the date, tap "Set"**

**If the vaccination is done today, tap "Today"**

**If it was done earlier, tap "Earlier"**

34

# Updating information regarding vaccination of Children



## Updating information about vaccination of children

**To update information about vaccination of child, tap on the household name**

**Tap on the name of the child**

**Tap "Immunization" to update**

**Tap on the name of the vaccine to update**

**If the vaccine is given today, tap "Today"**

**Select the date by scrolling and tap "Set"**

**If the vaccination was done earlier, tap "Earlier"**

## Updating information about vaccination of children

**In terms of any mistake, tap "Undo"**

**Tap "Yes"**

**Previous page will be shown**

**Tap according to the previous instructions**

**Select the date and tap "Set"**

**Tap "Record All" to select one date for more than one vaccine**

**Date will be selected like this**

37



## Growth Monitoring and MUAC Recording

# Growth Monitoring

**Tap on the name of the household for growth monitoring**

**Tap on the name of the child**

**Tap "Growth"**

**Provide the earlier date and tap "Growth taken today"**

**Type height and weight with the keyboard**

**If the information is taken today, tap this option**

**Tap "Record Growth"**

**If it was taken earlier, tap this**

# Growth Monitoring

**When saved, growth monitoring reading will be shown like this**

**Type MUAC Reading**

**If the information is taken today, tap this**

**If it was taken earlier, tap this**

**Provide the earlier date and tap this field**

**Weight record can be viewed**

**Height record can be viewed**

**To see the growth graphics, tap here**

**To view the height record, tap here**

## Menu Bar and how to use it



41

## Menu Bar

**Tap on the Menu Bar**

**Tap here to sync**

**Here contains the list of children**

**Tap to view report page**

**The version number of the application be viewed here**

**Tap here to view any announcement**

**Tap here to view the household registration draft or to register a household**

**The member list can be viewed here. New members can be registered here as well**

**Tap here to update user block**

**Tap here to log out**

The menu bar includes the following items: Sync, HH Register, Child Register, OCA Child Register, Report, Update Block, Version 1.1.1, Built on: 21 Dec 2021, and Logout.

42



## Menu Bar-Announcements and Sync

Tap here to sync

To view any announcements, tap here

Alert can be seen here. Tap "Ok".

When sync is completed, it will be shown here

43

## Menu Bar-Household Registration

By tapping here, household registration draft will be shown provided that it was there before. Besides, new households can also register through it

Open the draft of the household to complete the registration

By tapping here, new household registration can be done

To register new household, tap here

To remove this page, tap here

To delete any information in the draft, tap here

If there isn't any draft, form will directly open like this

44

## Menu Bar- Child List, Member List and how to add members

Tap to see child list

Child list can be viewed here

Tap here to open it

Member list can be viewed here

Tap here to open member list page and to add new members

Tap here to add members

45

## Menu Bar- Viewing Report

To open the report, tap here

Report can be viewed here

To see the report below, scroll down

To see the growth faltering trend, tap here

Report can be seen like this

46

## Menu Bar- Report (Growth Faltering Trend)

Tap here to see the Growth Faltering Trend

MUAC Report can be seen here

Tap here to see the reports

“Weight” report can be seen here

“Stunting” report can be seen here

47

## Menu Bar- Blocking and Updating

Tap here to update user block

Tap here to select if necessary

Tap here to submit

Tap here to unselect if necessary

Tap here to submit

48



## Introduction to Different Icons in the Application

49

### Icon/Option

### Introduction of Icons



Icon of the application



New household/family registration option



Registering new member in the household



Household information icon (if there is no photo, this icon remains)



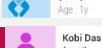
Male member icon (if there is no photo, this icon remains)



Female member icon (if there is no photo, this icon remains)



Male child icon (if there is no photo, this icon remains)



Female child icon (if there is no photo, this icon remains)



Filter option to look for specific information within the registered households



Sync option












Search option: Use name, ID, mobile number to search for information

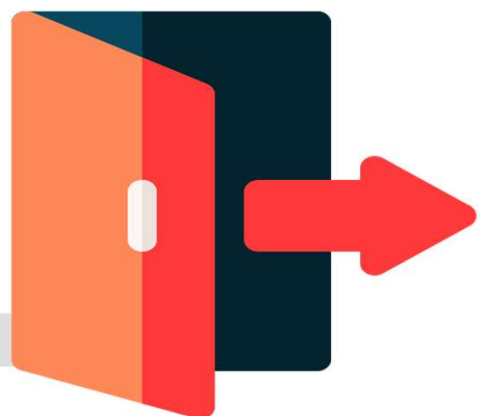


Number of pregnant woman in a household

50

	Household profile. Name, mobile number, area, last visit etc. can be viewed here
	Log out option
	Total number of the household
	Updating/changing household information
	Updating/changing member information
	Menu: adding new members, transferring households, household cannot be found
	Menu: member visit, all the forms regarding visit
	Registering new member in the household
	Back option

## How to Logout



## Logging out

Tap here to log out

Tap here to log out. However, to login again, internet is not necessary

After logging out the page will look like this. Type the password to login again

53

# Thank You

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## Annex 7:

# User manual of web application for PoC ICT Utilization Plan mService Dashboard

*Population Registration and Information Management Application*

January-2022



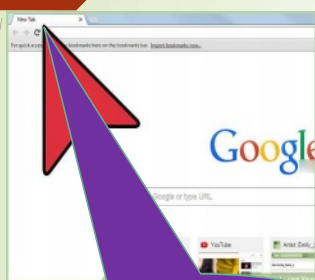
**mPower**  
Amplifying Impact

## সূচীপত্র

- ❑ **Dashboard login and Introduction to Home Screen**
  - ☞ Logging in the dashboard
  - ☞ Home page of the dashboard
  - ☞ Home page of the dashboard – How to export data
- ❑ **REPORT**
  - ☞ Report Page
  - ☞ Household Member Aggregate
  - ☞ GMP & EPI Summary – Vaccination
  - ☞ GMP & EPI Summary - GMP
  - ☞ Child EPI Vaccination Utilization Report
  - ☞ Child EPI Vaccination Status Report
  - ☞ Women TT Vaccination Utilization Report
  - ☞ Child GMP Status Report
  - ☞ Indicator Wise GMP Achievement
  - ☞ Flw Performance – GMP COVERAGE Report
- ❑ **OUTREACH**
  - ☞ OUTREACH Page – Upload Outreach
- ❑ **How to Logout**

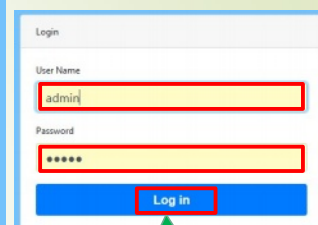
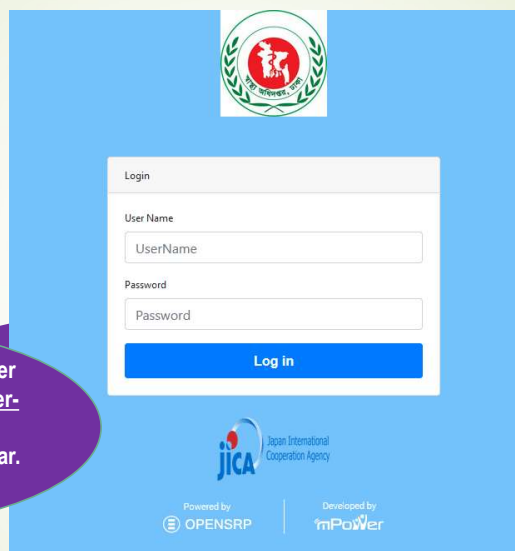
# Dashboard login and Introduction to Homepage

## Logging in the Dashboard



Use Google chrome from computer and type (<http://opensrpha.mpower-social.com:8080/opensrp-dashboard/login>) in the address bar. Then press "Enter"

URL/IP  
Changeable



Type user name and password and click "Log in"

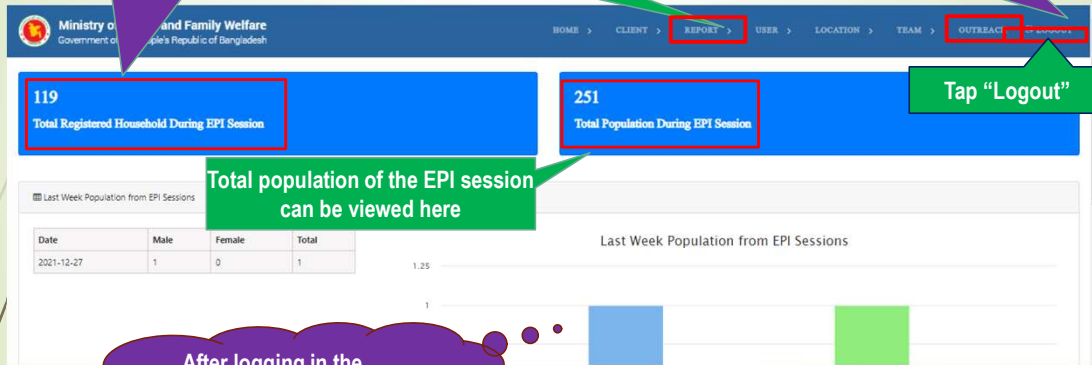


## Home page of the Dashboard

You can view the registered household number in the EPI session

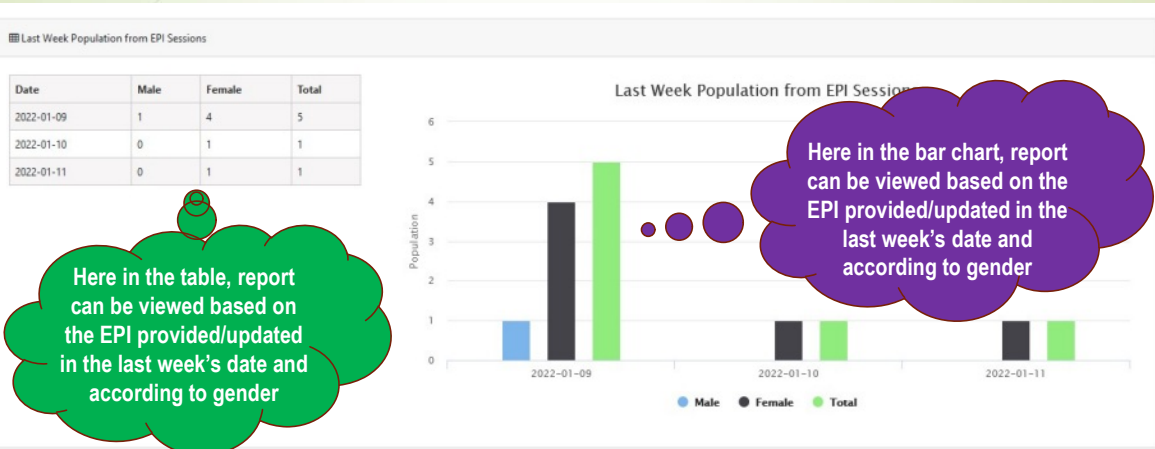
Tap "Report" to see different reports

Tap "Outreach" to view and upload different lists



After logging in the application, the home page can be viewed like this.

## Home page of the Dashboard



## Home page of the Dashboard

The total number of households and population of the upazilla can be seen based on the last week's date

Type upazilla name or number to search for information

To export data, click "Export"

Total number of upazilla or entities can be seen here

Household and population can be viewed according to districts and upazilla

Type district or upazilla name or number to search for information

Click here to download CSV, Excel or PDF file

Click here to select information

The screenshot shows the dashboard interface. At the top, there's a section for 'Last Week Data by Upazilla from EPI Sessions' with a table of data for dates from 2022-01-05 to 2022-01-11. Below this is a 'District Wise Data from EPI Sessions' section with a table listing districts and upazillas along with collected households and populations. Callouts point to various features: an 'Export' button, search fields for upazilla and district, and table headers.

Upazilla	2022-01-05	2022-01-06	2022-01-07	2022-01-08	2022-01-09	2022-01-10	2022-01-11
	Household	Population	Household	Population	Household	Population	Household
PIRGACHHA	0	0	0	0	2	5	0

District	Upazilla	Collected Household	Collected Population
CUMILLA	DAUDKANDI	8	13
HABIGANJ	MADHABPUR	5	9
JHALOKATHI	NALCHITY	30	53
KHULNA DISTRICT	DACOPE	29	41
MYMENSINGH DISTRICT	MUKTAGACHA	15	21

## Home page of the Dashboard- How to export data

To export data, click "Export"

"Tap "Save file" and "Ok" to save file

Report can be viewed like this in the excel file

This section illustrates the export process. It shows the 'District Wise Data from EPI Sessions' table with the 'PDF' export button highlighted. A dialog box titled 'Opening Admin Dashboard.xlsx' is shown with 'Save File' selected. Below, an Excel spreadsheet displays the data from the dashboard table.

District	Upazilla	Collected Household	Collected Population
CUMILLA	DAUDKANDI	8	13
HABIGANJ	MADHABPUR	5	9
JHALOKATHI	NALCHITY	30	53
KHULNA DISTRICT	DACOPE	29	41
MYMENSINGH DISTRICT	MUKTAGACHA	15	21
NATORE	SINGRA	12	66
PABNA		0	0
RANGPUR DISTRICT	PIRGACHHA	22	40

# REPORT

## Report Page

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

HOME > CLIENT > **REPORT** > USER > LOCATION > TEAM > OUTREACH > LOGOUT

119  
Total Registered Household During EPI Session

251  
Total Population During EPI Session

Click this option to see different reports

Click on the information you want to view

- HOUSEHOLD MEMBER AGGREGATE
- GMP & EPI SUMMARY
- CHILD EPI VACCINATION UTILIZATION REPORT
- CHILD EPI VACCINATION STATUS REPORT
- WOMEN TT VACCINATION UTILIZATION REPORT
- CHILD GMP STATUS REPORT
- INDICATOR WISE GMP ACHIEVEMENT
- FLW PERFORMANCE – GMP COVERAGE

Date	Male	Female	Total
2021-12-27	1	0	1

Last Week Population from EPI Sessions

1.2  
0.75

Last Week Population

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## Report - Household Member Aggregate

HOUSEHOLD MEMBER AGGREGATE

Tap to see households or members related report

To search for area related data, select from date, district to ward

Search Area

Start Date:  End Date:

Division:  District:  Upazila:  Union:  Ward:

HA Wise Report Status

After selecting, tap "Search"

Information can be viewed according to the searched data

mPower Powered by mPower

## Report - Household Member Aggregate

According to the household, here the members can be viewed according to their gender

Number can be seen here

120	222	68.47	30.63
Total Registered Household	Total Population	Total Female Percentage	Total Male Percentage

Show 10 rows

User Name	Name	HA Phone No	Household	Population	Female Percentage	Male Percentage
afroza@gmail.com	Afroza Khanom .	1771534863	9	15	73.33	26.67
ahshan@gmail.com	Md. Ahshan Howlader .	1750130330	1	0	0	
asgha@gmail.com	Most. Alfi Shirin Gayra .		10	10	60	
enayetullah93@yahoo.com	Md Enayet Ali .				100	
fa.ha@gmail.com	Md. Faruk Ahammid .				83.33	16.67
fatemaakter.33@gmail.com	Fatema Akter .		13	46.15	38.46	
km@gmail.com	Khan Md . Samsuddoha .		14	71.43	28.57	
kohinur@yahoo.com	Kohinur Akther .	1720299378	3	4	75	25
lablee@yahoo.com	Lablee Akter .	1781432943	10	19	63.16	36.84
mdfazlurrahman96@gmail.com	Md. Fazlur Rahman .	1725085796	10	55	50.91	49.09

Showing 1 to 10 of 22 entries

Previous 1 2 3 Next

Use it to search for information

After filtering, information can be viewed like this

Report will appear here according to HA

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## Report - GMP & EPI Summary – Vaccination

**For EPI data, tap here**

**For GMP data, tap this option**

**To filter data, use these options**

- Women (0):** Total female number can be viewed
- Child (1):** Total number of registered child can be seen here
- EPI Vaccinated Children (0%):** Percentage of EPI taken children can be viewed here
- TT Vaccinated Women (0%):** Percentage of TT vaccinated women will be shown here
- Fed Vitamin A (0%):** Percentage of vitamin a fed children will be shown here

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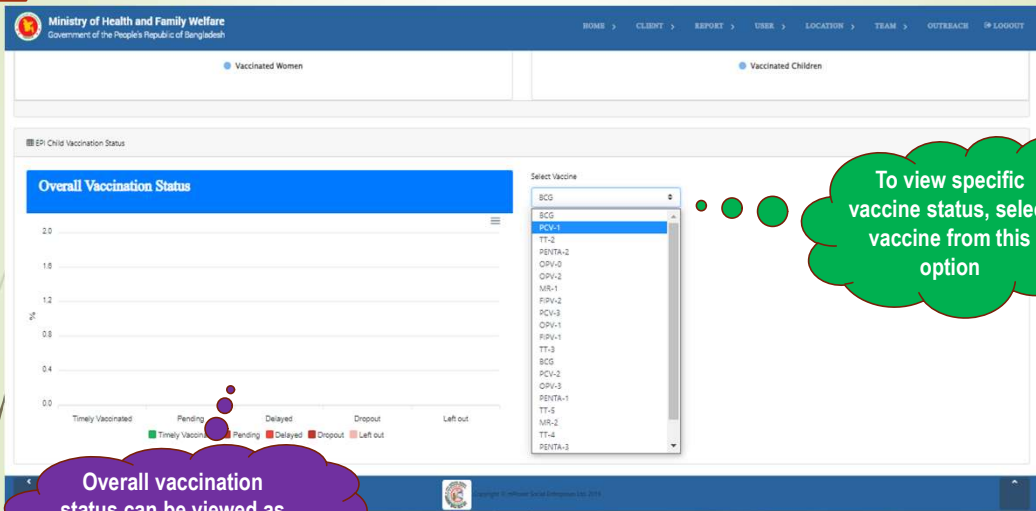
## Report - GMP & EPI Summary – Vaccination

**Percentage of TT vaccinated woman can be viewed as a graph here**

**Percentage of EPI vaccinated children can be seen here**

mPower Powered by mPower

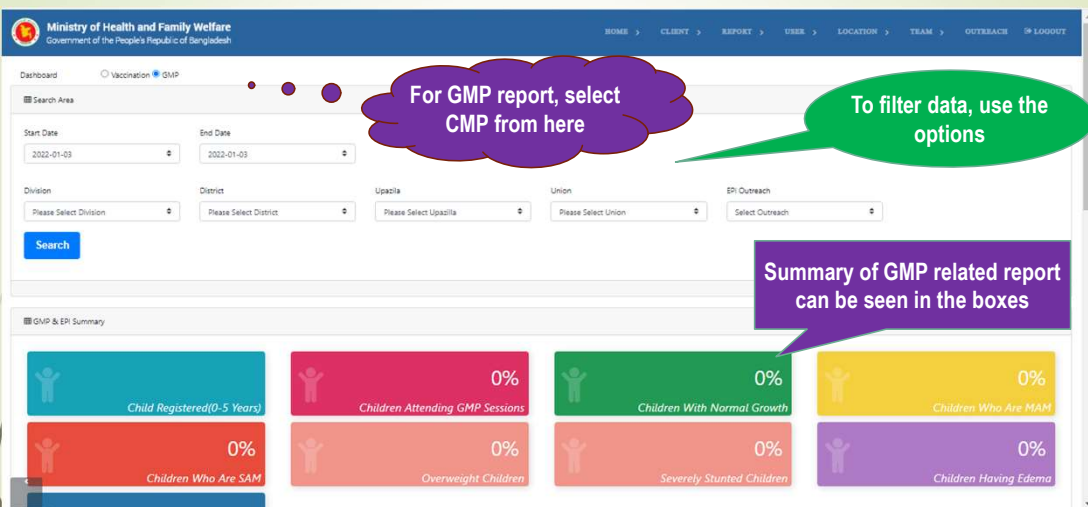
## Report - GMP & EPI Summary - Vaccination



To view specific vaccine status, select vaccine from this option

Overall vaccination status can be viewed as a graph

## Report - GMP & EPI Summary - GMP

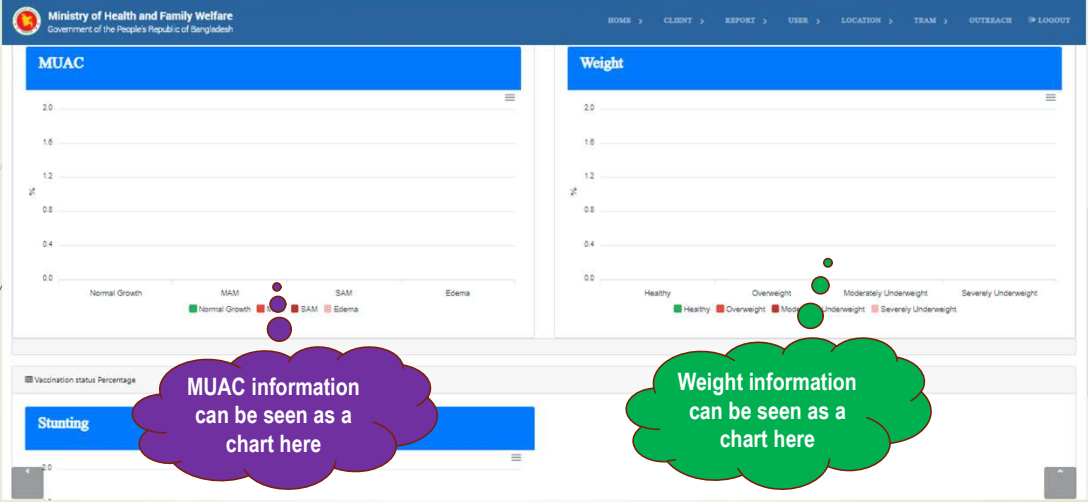


For GMP report, select CMP from here

To filter data, use the options

Summary of GMP related report can be seen in the boxes

## Report - GMP & EPI Summary - GMP



MUAC information can be seen as a chart here

Weight information can be seen as a chart here

## Report - Child EPI Vaccination Utilization Report

Search Area

Start Date: 2022-01-11 | End Date: 2022-01-11

Division: Please Select Division | District: Please Select District | Upazila: Please Select Upazilla | Union: Please Select Union | Ward: Please Select Ward

FLW Designation: Select Designation | User Name: Select FLW | EPI Outreach: Select Outreach

**Search**

Child EPI Vaccination Utilization Report

Show 10 rows | CSV | Excel | PDF

SL no.	FLW Name	Designation	Outreach	BCG	OPV-0	OPV-1	OPV-2	OPV-3	IPV-1	IPV-2	Penta-1	Penta-2	Penta-3	MR-1	MR-2	PCV-1	PCV-2	PCV-3
1	Khan Md. Samsuddoha	Provider	Outreach 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Khan Md. Samsuddoha	Provider	Outreach 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Use the options to filter data

To export Child EPI Vaccination Utilization Report, click here. CSV, Excel and PDF file can be found here

## Report - Child EPI Vaccination Status Report

Search Area

Start Date: 2022-01-11 End Date: 2022-01-11

Division: Please Select Division District: Please Select District Upazila: Please Select Upazilla Union: Please Select Union Ward: Please Select Ward

FLW Designation: Select Designation User Name: Select FLW EPI Outreach: Select Outreach Vaccination Status: Select status

**Search**

**Use the options to filter data**

**To export child EPI Vaccination Status Report, click here. CSV, Excel and PDF file can be found here.**

Child EPI Vaccination Utilization Report

Show 10 rows CSV Excel PDF Search:

SL no.	Child Name	Sex	Mobile Number	Health ID	Father Name	Mother Name	Vaccination Due Date	Vaccinated Date	Vaccination Status	Vaccine Name
1	Tania Ka	F	0	91141824456	Tsilsk		2020-01-11		Dropout	BCG
1	Tania Ka	F	0	91141824456	Tsilsk		2020-01-11		Left out	BCG
2	Tania Ka	F	0	91141824456	Tsilsk		2020-01-11		Dropout	OPV-0
2	Tania Ka	F	0	91141824456	Tsilsk		2020-01-11		Left out	OPV-0

## Report - Women TT Vaccination Utilization Report

Search Area

Start Date: 2022-01-11 End Date: 2022-01-11

Division: Please Select Division District: Please Select District Upazila: Please Select Upazilla Union: Please Select Union Ward: Please Select Ward

FLW Designation: Select Designation User Name: Select FLW EPI Outreach: Select Outreach

**Search**

**Use the options to filter data**

**To export Women TT Vaccination Utilization Report, click here. CSV, Excel and PDF file can be found here.**

Women TT Vaccination Utilization Report

Show 10 rows CSV Excel PDF Search:

SL no.	FLW Name	Designation	Outreach	TT-1(%)	TT-2(%)	TT-3(%)	TT-4(%)	TT-5(%)
1	Khan Md. Samsuddoha .	Provider	Outreach 1	0	0	0	0	0
2	Khan Md. Samsuddoha .	Provider	Outreach 3	0	0	0	0	0
3	Khan Md. Samsuddoha .	Provider	Outreach 4	0	0	0	0	0
4	Khan Md. Samsuddoha .	Provider	Outreach 5	0	0	0	0	0



## Report - Child GMP Status Report

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

HOME > CLIENT > REPORT > VIEW > LOCATION > TEAM > OUTREACH > LOGOUT

Search Area

Start Date: 2022-01-03 End Date: 2022-01-03

Division: Please Select Division District: Please Select District Upazila: Please Select Upazila Union: Please Select Union Ward: Please Select Ward

F/W Designation: Select Designation User Name: Select F/W EPI Outreach: Select Outreach

Search

Use the options to filter data

To export GMP Report, click here. CSV, Excel and PDF file can be found here.

GMP Report

Show 10 rows CSV Excel PDF

Child Name	Age	Sex	Muac	Edema	Weight	Stunting	Total number of GMP sessions
No data available in table							

Showing 0 to 0 of 0 entries

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## Report - Indicator Wise GMP Achievement

Search Area

Start Date: 2022-01-11 End Date: 2022-01-11

Division: Please Select Division District: Please Select District Upazila: Please Select Upazila Union: Please Select Union Ward: Please Select Ward

Search

Use the options to filter data

To export Indicator Wise GMP Achievement Report, click here. CSV, Excel and PDF file can be found here.

Child EPI Vaccination Utilization Report

Show 10 rows CSV Excel PDF

Indicator	Success Rate
%of Caregiver received counselling	0
%of Children measured height	0
%of Children measured muac	0
%of Children measured weight	0
%of Children attended GMP sessions	0
%of Children measured height, weight and MUAC	0

List of different indicators

Success Rate

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## Report - Flw Performance – GMP COVERAGE Report

The screenshot shows the 'Flw Performance Report' interface. At the top, it displays the Ministry of Health and Family Welfare logo and navigation links: HOME, CLIENT, REPORT, USER, LOCATION, TEAM, OUTREACH, and LOGOUT. Below the header is a 'Search Area' with several filters: Start Date (2022-01-03), End Date (2022-01-03), Division (Please Select Division), District (Please Select District), Upazila (Please Select Upazila), and Union (Please Select Union). There are also dropdowns for 'FLW Designation' and 'User Name'. A 'Search' button is present, and a red box highlights the 'In Percentage' checkbox. A purple callout bubble points to the search area with the text: 'By clicking here, percentage or number can be seen'. Another purple callout bubble points to the filter dropdowns with the text: 'Use the options to filter data'. Below the search area is the 'Flw Performance Report' section, which includes a search bar and a table. A red box highlights the 'Show 10 rows', 'CSV', 'Excel', and 'PDF' buttons. A blue callout bubble points to these buttons with the text: 'To export Flw Performance Report click here, CSV, Excel and PDF file can be found here'. The table has columns for 'FLW Name', 'Designation', 'Mobile number', 'Upazila Name', 'Attended GMP Sessions', 'Referral', and 'Counselling Done'. The table is currently empty, displaying 'No data available in table'. At the bottom, it says 'Showing 0 to 0 of 0 entries' and has 'Previous' and 'Next' navigation links. The footer of the page features the 'mPower' logo and the text 'Powered by mPower'.

**OUTREACH**

## OUTREACH Page

**Click OUTREACH**

**By clicking here, Outreach list can be uploaded**

**Outreach list can be viewed by clicking here**

**By selecting filter option, data can be searched here**

Sl	Provider	Outreach Name	Outreach date	Outreach Center name	Union	Actions
1	mdfazlurrahman96@gmail.com	Outreach 3	2022-01-14	Redresment matresodon Jangalia	LAUDUBI	Edit
2	km@gmail.com	Outreach 3	2022-01-27	Redresment matresodon Jangalia	LAUDUBI	Edit
3	km@gmail.com		2022-02-28	Jangalia CC Jangalia		Edit
4	mdfazlurrahman96@gmail.com		2022-02-28	Jangalia CC Jangalia		
5	mdfazlurrahman96@gmail.com		2022-03-28	Mojnu Gajir B...		

**Outreach list can be seen here**

**To filter data, use the options to select and search for information**

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## OUTREACH Page – Upload Outreach

**To upload Outreach list, click here**

**By clicking here, attach the excel file**

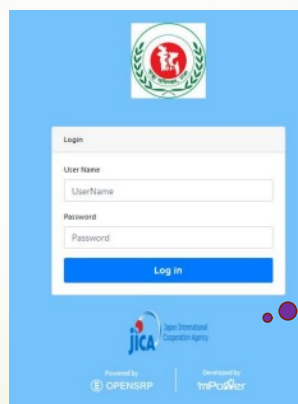
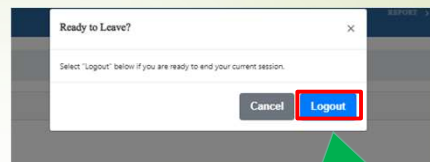
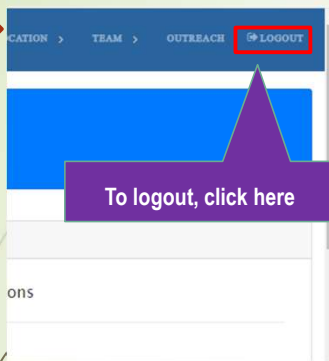
**After adding file, file name will be shown like this**

**After the attaching the excel file, click submit**

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# How to Logout

## Logging out



By typing user name and password, user can log in again



**Thank You**



# **Annex 8:**

## **Training report for Prototype introduction and operation**



*Prepared by:*

**mPower Social Enterprises Ltd.**

## Table of Contents

<b>1. Background</b>	2
<b>2. Objective</b>	2
<b>3. Training and Capacity Development Activities</b>	2
<b>3.1. Training Materials</b>	2
<b>3.2. Training Agenda</b>	3
<b>3.3. Training Process</b>	5

## 1. Background

The Government of Bangladesh (GoB) is committed to achieving the Sustainable Development Goals (SDGs) by ensuring the Universal Health Coverage (UHC) for its population 2030. On the way to achieving the goals, along with the improvement of other related issues, the country must strengthen its health information system (HIS) including improving the efficiency as well as effective use of the information and communication technology (ICT). Japan International Cooperation Agency (JICA) is helping the government of Bangladesh for health system strengthening through various supports. The current initiative of JICA aims to analyze the situation of existing HIS of Bangladesh in both public and private health services sectors, their issues, ICT aid for the primary health care (PHC) services, the potential of ubiquitous-related ICTs that have become familiar to the population as well as their feasibility to propose ICT utilization plans in potential technical cooperation projects in the future.

## 2. Objective

1. Identify user-friendliness of the platform
2. Identify and test the functionality of the platform
3. Assess the need of the developed platform
4. Identify further requirements to strengthen the initiative

## 3. Training and Capacity Development Activities

### 3.1. Training Materials

For the training the following materials were used to make the training more interactive and effective:

- a. Training Presentation: A PowerPoint presentation was developed by the trainer to be used during the training session as a visual aid.
- b. Printed Training Manual: The PowerPoint presentation was printed in hard copies to be distributed among the trainees so that they can use the material for reading and self-orientation purposes after training.
- c. Case Story: For practices during lectures and service-based training, the trainer will use case stories for helping the trainees to connect with the field scenarios so that they comprehend the practical usage in a better way.
- d. Dummy Data for Practice: For self practices after the end of the training, population-specific dummy data are shared with the trainees to practice application usage and different service utilization.
- e. Attendance Sheet: To take attendance of trainees for documentation purposes.



### 3.2. Training Agenda

Time	Activity	Method	Facilitator
Date: 9 <sup>th</sup> February 2022			
10:00 am – 10:30 am	Registration	Attendance Sheet	mPower
10:30 am – 10:40 am	Welcome Speech	Speech	UH&FPO Sir
10:40 am – 10:50 am	Inauguration	Speech	CS Sir
10:50 am – 11:00 am	Project and Training Brief	Speech	mPower
11:00 am – 11:15 am	Application Installation	Apk Transfer	mPower
11:15 am – 11:30 am	Health Break		
11:30 am – 12:00 pm	Application orientation and Login	Hands-on Training	mPower
12:00 pm – 1:00 pm	Household & Member Registration	Hands-on Training	mPower
1:00 pm – 2:00 pm	Lunch Break		
2:00 pm – 2:40 pm	Vital Update and Follow-up Services	Hands-on Training	mPower
2:40 pm – 3:00 pm	Practice Session	Case Story	mPower
3:00 pm – 3:30 pm	Vaccination Module	Hands-on Training	mPower
3:30 pm – 4:00 pm	QA Session followed by Day 1 Closure		mPower

<b>Time</b>	<b>Activity</b>	<b>Method</b>	<b>Facilitator</b>
Date: 10 <sup>th</sup> February 2022			
10:00 am – 10:30 am	Recap of Day 1	Demonstration	mPower
10:30 am – 10:45 am	Health Break		
10:45 am – 11:15 am	GMP Module	Hands-on Training	mPower
11:15 am – 12:00 pm	Dummy Data Practice	Dummy Data	mPower
12:00 pm – 1:00 pm	Web Dashboard Orientation	Hands-on Training	mPower
1:00 pm – 2:00 pm	Lunch Break		
2:00 pm – 2:30 pm	Web Dashboard Orientation	Hands-on Training	mPower
2:30 pm – 3:00 pm	QA Session		mPower
3:00 pm – 3:30 pm	Data Collection	Survey Tool	mPower
3:30 pm – 4:00 pm	Event Closure		

### 3.3. Training Process

To make training sessions interactive and attractive the following pedagogy is used:

- o **Lectures followed by discussion:** Lectures are given to users by the trainer in the classroom format with the aid of training PPTs. After delivering each lecture, participants are given a platform to ask questions. Specific time slots are given to conduct each session.
- o **Demonstration:** Demonstration sessions are conducted so that trainers can demonstrate the content that is covered in the lecture session. This is a continuous process. Sometimes, one or two participants are invited to demonstrate as well.
- o **Demo practice:** A set of case studies are prepared for demo practice on application usage. Case studies based on the smart register books question. Trainees are asked to fill out the forms along with the trainer's instructions and responses. It takes about one hour to complete 5 case studies for practice.
- o **Role play:** Role playing sessions are arranged to create scenarios that HAs are likely to face. Where HAs are asked to play the role of a participant while another HAA is asked to collect data from the demo participants. Typically, after the completion of a register training, two pairs of participants are asked to role play scenarios in front of their peers. Each role-playing session lasts for approximately 15 minutes. After each role-playing session, feedback is collected from the participants; the training supervisors also provide feedback.
- o **Peer training:** Here, HAs are asked to assist their colleagues to understand the features of the application and device so that HAs can learn the topics in their own language. The process is repeated, as one or two participants are requested to explain a component of the lecture to the other participants.
- o **QA session:** At the end of the day the MIS/training supervisors conduct a briefing session on the content of the lectures and conducts a 30 minutes long QA session.