

HEALTH INFORMATION SYSTEM eHEALTH and MBT

Path set for an automated national health system and futuristic technology

In 2011, the Government of Bangladesh approved the 5-year long Health, Population and Nutrition Sector Development Program (HPNSDP) 2011-2016 for the Ministry of Health and Family Welfare (MoHFW). The HPNSDP 2011-2016 comprises 32 operational plans, of which one is the Health Information System and eHealth (HIS and eHealth). This is planned to be implemented by Management Information System (MIS) of the Directorate General of Health Services (DGHS). This operational plan has three components, namely HIS, eHealth, and MBT (medical biotechnology).

It is well-recognized that the MIS made significant progress with respect to improvement of HIS and eHealth in the last few years. However, the progress was made within a limited budget through a revision of the original plan done in 2009, which was initiated during the Caretaker Government in 2008. Therefore, the plan could not accommodate the full eHealth activities expected for the Digital Bangladesh Vision 2021 of the present government. This new operational plan is a blueprint that describes how the national health system of Bangladesh will reach an automated (almost paperless) environment by 2016, covering both national, subnational and grassroots levels. The operational plan also incorporates appropriate activities to launch and promote medical biotechnology in the country. Biotechnology will foster innovation, economic development, and livelihood improvement. This chapter describes what progress has already been made and what more is going to be accomplished by 2016.

19 September of the year 2011 was a remarkable day for Bangladesh for receipt of the United Nations ICT Award titled "Digital Health for



New York, 19 September 2011: Honorable Prime Minister of Bangladesh Sheikh Hasina is seen receiving the United Nations "Digital Health for Digital Development" Award. Dr. Hamadoun Ibrahîm Toure, Secretary-General of the International Telecommunication Union, is seen handing over the Award to the Bangladesh PM

Digital Development" by our Honorable Prime Minister during the 66th United Nations General Assembly. The award came as recognition of MIS's contribution to the country's health sector in improving health, particularly maternal and child health.

Dr. Hamadoun Ibrahîm Toure, Secretary-General of the International Telecommunication Union, visited Bangladesh from 1 to 4 March 2010 when he witnessed our progress in eHealth. He was so impressed that he commented: "Bangladesh should teach digital health to the whole world." A landmark publication by the World Health Organization, titled "mHealth—New horizons for health through mobile technologies" based on the findings of the second global survey on eHealth, probably created a good ground for giving due recognition to the achievements of Bangladesh in digital health. The publication covered detailed story about the activities of MIS in digital health,

particularly in mHealth and included a case study on “Pregnancy care advice by SMS.”

Health Information System

The Health Information System of MIS is involved in the collection of data from various sources and cleaning, analyzing, and summarizing the data to generate and distribute information through routine administrative reports, website, health bulletin, newsletter, etc. Data are collected electronically, covering all health facilities and health administrative points, starting from the national to the upazila level. There are many online databases. Expansion of the Internet connectivity to as low as union health facilities and community clinics has been started and is expected to be completed by the next fiscal year.

Data Center

To attain the 2016 HIS and eHealth Vision, the MIS required a robust, highly-secured and never-sleep data center with plenty of electronic storage space. Such a world-class data center was established at the MIS office. The data center has RAID servers, firewalls, underground cable system, automatic fire protection and humidity control, four tiers of power supply system, spying system to prevent unauthorized entry, remote monitoring system, and text alerts by mobile phone. Local real-time data backup system already exists. Development of the data backup system in remote geographic locations is underway.



The Data Center of MIS

Excerpts in Health Bulletin 2012

Health Bulletin 2012 excerpted data from the electronic data warehouse of MIS and produced quite a number of reports. Following are worth mentioning: (a) Information on health facilities (Chapter 4 and 5), (b) Health facility utilization (Chapter 6), (c) Morbidity profile (Chapter 7),

(d) Mortality profile (Chapter 8), (e) Emergency obstetric care profile (Chapter 4), (f) Statistics of Integrated Management of Childhood Illness (Chapter 4), and (g) Information on health personnel (Chapter 16).

Local Health Bulletins

Most remarkable achievement in fiscal 2011-2012 is the publication of local health bulletins 2012 by about 550 health organizations (national and subnational down to upazila level) in our public sector. Available on our website (www.dghs.gov.bd), these health bulletins were created online just in one month's efforts. Local organizations filled in online forms, and the health bulletins were automatically created in uniform design. The organizations then printed the health bulletins and distributed those locally. The software also enables creation of aggregated and dynamic comparison reports on the fly to make available online. This project was undertaken to create a local information culture through collection of quality data, analyze those to generate evidence and use the data for local planning and decision-making. All the local health managers and associated personnel were invited to Dhaka in the Annual MIS Conference 2012 where they presented their local health bulletins and responded to questions from the audience.

Human Resource Information (HRM) System

On 7 February 2012, there was a debate in the National Parliament about placement of medical doctors in various public-health facilities. It was observed that they were not distributed equitably and rationally throughout the country. In response, the Honorable Minister for Health and Family Welfare Professor Dr. AFM Ruhul Haque, MP, assured the House that he would examine the situation and would take necessary measure for redistribution if anything is found wrong anywhere. As per instruction given by the Honorable Health Minister, the MIS developed the basic structure of a Human Resource Management (HRM) System in only 3 days for capturing data and, in next 10 days, completed data-entry for almost all doctors and local staff through engaging each individual organization. This database was used for understanding the distribution of human resources in various public-health facilities and for taking decision for the need of redistribution. Subsequently, this database has been further developed for automating the human resource management process. The HRM System is an additional database parallel to PDS (Personal Data Sheet) database. The latter database feeds

detailed data to the HRM System and to another new database "Leave Management" developed by the MoHFW.

Field Staff Information System

The Ministry of Health and Family Welfare recruited 13,500 Community Health Care Providers to serve for the community clinics. The DGHS has field workers called Health Assistants, Assistant Health Inspectors, and Health Inspectors. The DGFP has field workers called Family Welfare Workers and Family Planning Inspectors. The MIS felt the need to gather the mobile phone numbers of all those staff members. Therefore, a smart solution was developed to capture the data quickly from across the country. Software for the database was developed and put in place at the data center. The local health managers were asked to invite all field staff in a meeting, demonstrate to their staff how to send text message to a particular MIS mobile number following a specific format. They are also asked to instruct all staff members to send the SMS from their own mobile phones. With this very simple technique, we captured basic information of all field staff; the information is used for many purposes, like analysis of staff profile and bulk messaging, etc.

Ministry of Health Procurement Portal and Logistics Information System

The USAID is supporting the MoHFW to develop a procurement portal for streamlining and speeding up the procurement processes and management. The Management Sciences for Health (MSH), a US-based non-profit company, has been assigned to the job. The further development of the tool will end up also in a logistic management database system to maintain online inventory system for each health facility.

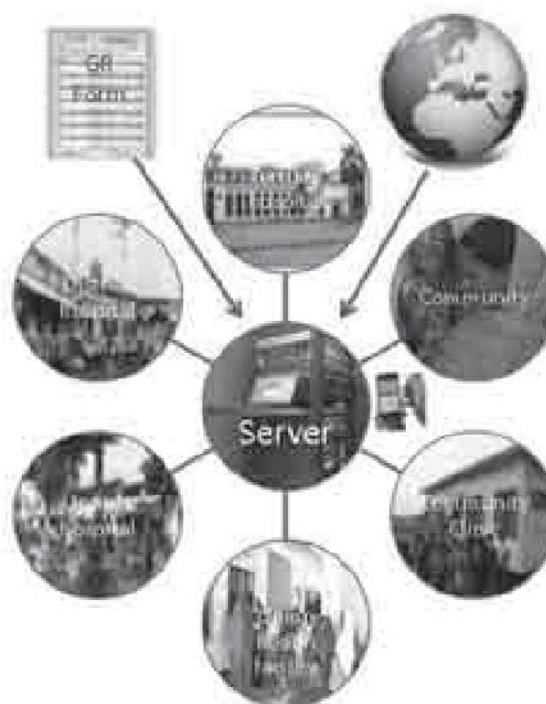
Monthly and Annual Reporting for Cabinet Division

The Cabinet Division of the Government of Bangladesh requires routine reporting from each ministry each month and publication of an annual report in July each year on many management issues relating to the respective ministries. The items to be reported by the DGHS contain an exhaustive list. MIS-Health has to carry out this function each month and annually, on behalf of the DGHS. The job is now better done than ever.

Population Information

In a continuous quest for population-based health data routinely, MIS is silently progressing towards implementing an electronic population

health registry, with basic electronic health record on each citizen. Data have been collected using machine-readable form in all upazilas and for population living in rural areas (covering 75% of the population). A process is ongoing to outsource the data-entry job to develop an online national population health registry database. Data will be updated from community clinics and by health workers routinely as and when profiles of citizens



The thematic diagram of the future integrated HIS in Bangladesh

are changed. To enable community clinics and health workers retrieve and update data online, laptops and handheld devices are being supplied. The database will be synced with hospital and health facility database systems with an ultimate aim to develop a national electronic health record (EHR) system. The system will help in local and national health situation analysis and evidence-based decision-making.

Data from Other Health Programs and Organizations

Data have been gathered, analyzed, and included in this Health Bulletin 2012 from a number of organizations. These include program data from community clinics (CC); essential service delivery (ESD); maternal, neonatal, child and adolescent health (MNCAH); communicable disease control (CDC), non-communicable diseases (NCD); national

nutrition service (NNS); national tuberculosis control program (NTP); and organizations, like the Institute of Epidemiology, Disease Control and Research (IEDCR); Institute of Public Health (IPH); National Institute of Preventive and Social Medicine (NIPSOM); Institute of Child and Mother Health (ICMH); Directorate General of Family Planning (DGFP); Directorate General of Drug Administration (DGDA); and Directorate of Nursing Services (DNS).

Geographical Information System (GIS) for Mapping of Health Service and Disease Pattern

Locations with basic information on health facilities in Bangladesh are available on Google map. To initiate the use of geographical information system in health sector of Bangladesh, MIS provided GPS (global positioning system) to each divisional and district health office in 2009. The respective divisional and district information personnel were given training. The geospatial data found on Google map are the outcome of this intervention. In fiscal 2011-2012, an initiative has been undertaken to gather geospatial data for all health facilities existing beyond union and ward levels to enrich GIS resources. Starting in 2012, health workers will be given gradually handheld tablets with in-built GPS camera, wi-fi and 3G technologies to collect household locations of citizens and track service-delivery instances.

Dissemination of Information and Publications

Several seminars and discussions were held to disseminate information and progress. Annual MIS Conference 2012 was a large event with over 1,500 managers and participants from across the country. News media featured our success a number of times. The website of MIS-Health was a vibrant platform for information dissemination as a focal point for the DGHS. New social medial interfaces, viz., Facebook, Twitter, YouTube Channel, Interactive Voice Response (IVR) System, etc. are in the pipeline. The routine publications, like Health Bulletin, IMCI Newsletter, EOC Newsletter (Voice of MIS), etc. have been continued. Added to these was the introduction of online local health bulletins.

eHealth

The operation plan on "HIS and eHealth" is a tool to deliver health service to citizens or otherwise to connect citizens with health system through the use of ICT. Last year, the eHealth services have been further strengthened, and new services have been added. These are briefly described here.

Mobile phone health service

All the government-run upazila health complexes and district hospitals (grand total 482) have mobile phones to act as a local call center accessible round-the-clock by all. Local communication channels were used for making people aware of the mobile phone numbers (also available in our website (www.dghs.gov.bd)). People living in the catchment area of each facility may call, and a doctor on duty answers and gives appropriate medical advice. The service is provided free of charge. The service has a number of benefits, viz. wider coverage that reaches everybody everywhere, simplicity of use, and a better option for people to avoid unqualified healers. This service also helps patients avoid unnecessary visits to health centers, which indirectly benefits the health centers to provide better attention and supplies to the patients who physically visit the health centers. Being local, the service is also culturally responsive and customizable to local situations. It has been planned to expand such services up to the community clinics. In 2010, a monitoring cell has been established in MIS-Health to randomly call several hospitals and check the quality of mobile phone health service. The service received recognition through ICT4 Development Award (2010) and special mention in Manthan India Award (2011).

Telemedicine

Telemedicine service is now in operation in 8 hospitals (2 tertiary hospitals, 3 district hospitals, and 3 upazila hospitals) equipped with high-



Dhaka, 6 July 2011: Hon'ble Prime Minister Sheikh Hasina inaugurating the telemedicine service of MIS-Health at the Digital Innovation Fair 2011, organized by the Access to Information Program of Prime Minister's Office. The Hon'ble Minister for Health and Family Welfare Professor A.F.M. Ruhai Haque and Professor Dr. Abul Kalam Azad, Additional Director General (Planning & Development) and Director-MIS, DGHS, were present

quality video-conferencing devices. The service will be expanded to 10 new hospitals in 2012. The Honorable Prime Minister of Bangladesh Sheikh Hasina formally inaugurated the telemedicine service on 6 July 2011 from the National Digital Innovation Fair held in Bangabandhu Novo-theater. To further expand the telemedicine service in all hospitals, web-cameras were also provided to all upazila hospitals. Telemedicine can explore a new horizon of expanding medical consultation to rural areas where there is no doctor. From 2012, telemedicine service will be initiated in several thousand community clinics and be implemented by 2013. For this purpose, we are distributing long batter hours Internet-enabled mini-laptops to the community clinics. The laptops in the community clinics will be used for multiple purposes, viz. telemedicine, updating community health data, health education for people, training of health staff, communication, and Internet-browsing. The telemedicine project of MIS-Health received the National ICT4 Development Award in 2011.

Telemedicine in Union Information and Service Centers (UISC)

With support from Access 2 Information project of the Prime Minister's Office, the Ministry of Local Government, Rural Development and Cooperatives started Telemedicine in Union Information and

Service Centers (UISCs) in all 4,501 unions. These centers are run by local young entrepreneurs on pay-for-service basis. They sell computer- and Internet-based services to citizens at nominal fees. The services are like composing and printing, email checking, faxing, and video-conferencing, etc. In 22 UISCs, the entrepreneurs started telemedicine service. They take some nominal fees from the clients, and MIS doctors provide medical advice free of charge, using Skype platform. The service appears very popular and most wanted among the people of those localities. A Google discussion group among the organizers, created for this purpose, reveals how effective the service is.

Complaint-suggestion box

An SMS-based complaint-suggestion box run by MIS created opportunity for ensuring more accountability of the government hospitals in Bangladesh. In each of about 800 public hospitals, a display board has been mounted, which describes how to send complaints about quality of service(s) or suggestions for service improvement. A web-server located at MIS receives the complaints-suggestions. Responsible personnel at MIS check the complaints and suggestions instantly on the web portal and then talk to the SMS senders to know more about the message. The staff members talk to the local authority to solve the problems or work on the suggestions.

No.	Organization	Date Time	Message	Sender	Action	Details
1	Civil Surgeon Office, Gazipur	15-05-2012 @ 12:43:07am	need 24 hours electric system. all bed are not usable	01670710499	No Action	Click
2	Ayurved & Tibbia College, Sylhet	14-05-2012 @ 12:43:07pm	system is not clear	01710093025	Action	Click
3	District Hospital, Panchagarh	14-05-2012 @ 09:03:52am	toilet not usable situation plz take action	01723044854	Action	Click
4	Upazila Health Complex, Raninagar, Haogon	13-05-2012 @ 12:35:22pm	when load shedding occurs in hospital, here starts dinamia machine and produces huge sound. we think it disturbs the patients and all people now. we hope that !	01835222828	Action	Click
5	District Hospital, Dinabur	13-05-2012 @ 10:57:39am	patients suffering for gathern medicine representative from begiving service	01730726736	Action	Click

Figure 17.1. Screenshot from complaint-suggestion box displayed in web portal

Office Attendance Monitoring System Is Rolling Out the Use of Biometric Devices

Governments in all countries face difficulty in delivering health services to citizens living in the rural or remote areas. The healthcare providers often do not prefer work in those areas. In developing countries, absenteeism of the clinical staff from the health stations is another serious problem. Bangladesh also faces similar difficulties. MIS has adopted innovative approaches to improve office attendance of health staff. The system uses combination of (i) Telephone-based monitoring; (ii) Surveillance by web-camera; (iii) Web-based attendance monitoring; and (iv) Remote Biometric Time Attendance System.

The system works in the following way: A Monitoring Cell works at MIS office from 9:00 am to 5:00 pm every working day with about 8 to 10 MIS staff. They randomly choose any hospital or health center and make phone calls to check staff attendance, particularly of doctors. They use both land-phones and mobile phones. The web-camera surveillance works in conjunction with telephone-based monitoring system. While telephone-monitoring continues, the staff members are often asked to show up in front of the web-camera to confirm the presence of staff. Most commonly, the web-camera platform is Skype. The Skype is a free video-conferencing solution. Staff members found absent unauthorized are recorded, and the information is reported to the Ministry which takes actions, including punishment. For the web-based monitoring, a simple web-based form has been designed. On each working day, the office heads ensure filling-up of the web-based form by 9:00 am. The form can only be accessed with a specific user's name and password. The form requires entering information on the number of sanctioned posts, filled-up posts, and the number of staff members absent authorized or unauthorized on a particular day. The form also requires providing names of those staff members absent unauthorized. The Ministry checks the information from central level and takes necessary actions against defaulters to bring discipline.

Currently, the Remote Biometric Time Attendance System is being gradually rolled out across various public-health facilities. Low-cost fingerprint biometric system has been placed in several institutions. Biometric reading of all 10 fingers of each staff member has been taken. Job profile of staff has also been recorded. Staff members need to touch the sensor of the machine during check-in and check-out. The machine itself can keep in memory 30,000 encounters. It is connected to

a local computer through USB. When the local computer is switched on, the machine transfers the data to the software for time attendance system. At MIS office, a locally-developed web-server captures the attendance data whenever the server finds the local computers. Predefined web-based reports can be generated on the server-side, which can be accessed through web-browser from anywhere. In 2012, biometric devices will be placed in all upazila and district hospitals under the Government.

SMS Advice for Safe Pregnancy

This service was launched in March 2010. On registration via cellphone SMS, pregnant mothers receive appropriate periodic antenatal, safe delivery and postnatal care advices through SMS. This service is expected to contribute to achievement of MDG 4 and 5 through improving neonatal and maternal health. Currently, the mobile-operator TeleTalk is operating this service. The MIS received allocation of a short code 16263 from Bangladesh Telecommunication Regulatory Commission (BTRC) to introduce interactive voice response (IVR) system for providing various types of eHealth service to citizens using mobile phones. We expect to launch the services soon. The Ministry of Health and Family Welfare is carrying out a partnership program with D.Net to provide an mHealth service called MAMA (Mobile Alliance for Maternal Action) through IVR system. The USAID provided initial seed-money.

Bulk SMS

The innovative bulk SMS system of MIS-Health introduced in 2009 remained an effective solution even as of now to disseminate quick and urgent messages to health staff. The use of bulk SMS was frequent and demand-driven. To further expand the reach of the bulk SMS system, we collected mobile phone numbers of the grassroots-level workers, like community health workers, health assistants, assistant health inspectors, health inspectors, family welfare workers, family planning inspectors, etc.

Digital Training Facility

The digital training facility created by MIS-Health in 2009 was efficiently used over the past years. Its attraction as one of the best meeting and seminar places continues to increase. Equipped with state-of-the-art gadgets, such as digital podium and sound system, interactive board, wireless presentation, wi-fi network, video-conferencing, etc., the facility attracts the organizations to hold their workshops, meetings, etc.

A Well-connected Health System

MIS was the hero in the entire public sectors of Bangladesh that first created the Internet connectivity across all health-points down to the upazila level (about 800 places) by April 2009. By the next year, this network is going to be expanded to all the grassroots-level health facilities in Bangladesh, including 18,000 community clinics. This network will also be the largest video-conferencing and telemedicine network.

Hospital Automation

In fiscal 2011-2012, automation of three public hospitals has been started. These include National Institute of Kidney Diseases and Urology (NIKDU), Government Employees' Hospital and Mohammadpur Mother and Child Hospital (well-known as Mohammadpur Fertility Center). Earlier, the Bangladesh Secretariat Clinic was automated. In the next fiscal, two more hospitals will be automated. For all hospitals, OpenMRS (open-source) hospital management software has been chosen as the common software for automation for inter-operability and data sharing. MIS is also working silently to introduce two modules of OpenMRS (viz., patient registration and discharge modules) in all upazila and district hospitals as soon as possible.

Human Resource of MIS-Health

The Government has sanctioned 32 new positions in MIS head office of DGHS. This will add to the existing 773 sanctioned posts of statistical staff throughout the country, of which 91 posts were in MIS head office. Fig. 17.2 shows the distribution of their sanctioned posts by type of organization.

It reveals that the number of sanctioned posts is quite inadequate, with many organizations lacking sanctioned posts for statistical staff. Many posts remain vacant. The overall vacancy rate is 28.85%. Organization-wise, the vacancy rate is as follows: 200-bed and 250-bed hospitals (Narayanganj, Khulna, and Noakhali): 72.22%; DGHS: 33.33%; District: 44.17%; Division: 12.50%; Medical college hospitals: 69.23%; MIS: 63.74%; Postgraduate institutes (IPHN, NIPSOM, NICVD, NIDCH, NIKDU, NICRH, NCCRFH): 38.46%; TB Clinic (Chankhar Pul): 0.0%; and Upazila: 16.32%.

Fig. 17.2 shows the distribution of sanctioned posts of statistical staff by class. The vacancy rate among the different classes is as follows: Class I: 71.67%; Class II: 59.26%; Class III: 18.99%, and Class IV: 40.00%.

The limitation of the MIS-Health throughout the country, including its head office, is serious lack of

A = Medical college hospital, 13, 2%
 B = Postgraduate Institute, 13, 2%
 C = 200 & 250-bed hospital, 18, 2%
 D = TB Clinic (Chankharpul), 1, 0%
 E = MIS-Health, 91, 12%
 F = DGHS, 9, 1%
 G = Division, 24, 3%
 H = District, 120, 16%
 I = Upazila, 484, 62%

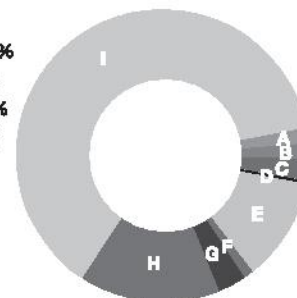


Figure 17.2. Sanctioned posts and staff by type of organization (n=773)

A = Class I, 122, 16%
 B = Class II, 33, 4%
 C = Class III, 808, 79%
 D = Class IV, 10, 1%

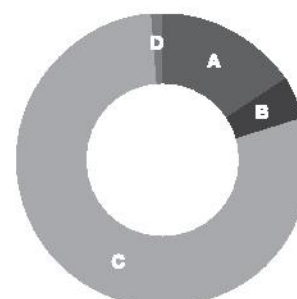


Figure 17.3. Sanctioned posts of statistical staff by class (n=773)

appropriate technical persons both for information technology as well as for statistical analysis and interpretation. The available statistical staff members have graduation and/or higher secondary-level education and not in statistical discipline. To meet the current and future challenges of MIS-Health, it is very essential to create adequate number of positions for competent persons in all relevant areas. As an interim measure, the need for manpower or services should be met by outsourcing.

Capacity-building and Maintenance Support

MIS continued capacity-building through training, supply of ICT equipment, computer stationeries, payment of Internet bills, and also repair and maintenance support.

Training

Seventeen types of training courses/workshops of different durations were held in 2011-2012 both at MIS office in Dhaka as well as local hospital/health offices. A total of 18,889 officers and staff members participated in the training courses/workshops held under HPNSDP 2011-2016. In the UNICEF-supported training program, another 2,700

personnel participated. Table 17.1 summarizes the training and workshop events, which also include a partial list of WHO-supported training courses/workshops where 184 personnel participated.

Table 17.1. Training courses/workshops held in fiscal 2011-2012

Division	Batch (N)	Duration	Participants (N)
Under HPNSDP 2011-2016			
eHealth Advocacy Seminar	6	1 day	240
Young Software Development Showcase and eHealth Innovation Workshop	1	2 days	8
Consultative Workshop to Review Community Clinic (CC)-based HIS and eHealth System	1	2 days	20
Consultative Workshop for Developing Training Manual and Module for Training of CHCP	1	4 days	10
TOT for Community Health Care Providers (CHCP's) Training	64	2 days	1,920
Training of CHCPs on HIS and eHealth	482	2 days	12,500
Computer Training for Doctors	14	14 days	420
Computer Training for Staff	19	14 days	570
Monitoring Workshop for GR (CS and Div. Director)	1	1 day	69
Monitoring Workshop for GR-UHFPO	8	1 day	482
Consultative Workshop for Improving GR	3	2 days	30
Dissemination Seminar on Health Bulletin	1	1 day	160
TOT for Training of Health Workers on PDA (or Mobile Device) and Health Worker's Diary	15	2 days	450
Annual MIS Conference	16	2 days	1,520
Consultative Workshop on HIS	3	1 day	90
Steering Group (National Oversight Body for HIS and eHealth) Consultative Workshop	8	1 day	280
Training for Head-office Staff	4	5 days	120
Total Types of Courses and Participants under HPNSDP 2011-2016	17		18,889
Under HPNSDP 2011-2016			
Training on Integrated Management of Childhood Illness and Emergency Obstetric Care			
Training on IMCI and EmOC Customized Software for Statistical Assistant and Upazila Statisticians	23	2 days	459
Orientation on IMCI Web-based MIS in Upazila Level	12	1 day	521
MIS Data Validation Training for MNCS NGO Supervisors at Upazila Level	5	1 day	998
Orientation on IMCI Monthly Reporting Format for UH & FPO, UFPO, MO-MCH, RMO, IMCI-trained MO at District Level	15	2 day	466
Divisional Review Meeting on IMCI Performance and MIS reporting	7	1 day	132
Training on EmOC and IMCI Reporting, Customized Software for Statisticians, Statistical Assistants, Record keepers, Data-entry Operators, and Assistant Chiefs	7	2 day	124
		Total (UNICEF)	2,700

Table 17.1 Continued

Division	Batch (N)	Duration	Participants (N)
Training/Workshop under WHO (partial list)			
GIS-based Analysis and Presentation	1	4 days	30
Workshop for District-level Health Personnel	4	2 days	112
Workshop for Training Hospital Personnel	1	2 days	42
Total (WHO)			184

Supply of ICT Equipment and Computer Stationeries

In 2010-2011, a total of 570 laptops, 312 mini-laptops, and 100 UPSs have been procured and distributed to different health facilities and health

offices. Table 17.2a and 17.2b summarize the distribution list. In fiscal 2010-2011 and 2011-2012, a large number of ICT materials were bought for distribution throughout the health facilities and organizations.

Table 17.2a. Number of laptops, mini-laptops, and UPSs procured and distributed from MIS in fiscal 2010-2011

Name of institution	Laptop	Mini-laptop	UPS
Upazila Health Complex	482	-	54
Civil Surgeon Office	64	-	5
MIS-DGHS	24	21	23
Divisional Health Office	-	-	2
District Hospital	-	-	3
Directorate General of Health Services	-	-	8
Other institutions	-	-	5
Climate Change and Health Promotion Unit	-	57	-
Community Clinic, Jessore district	-	100	-
Community Clinic, Mohadevpur, Naogaon	-	38	-
Community Clinic, Kalliganj, Satkhira	-	13	-
Waiting for distribution	-	83	-
Total	570	312	100

Table 17.2b. Lists of equipment procured in fiscal 2011-2012

Name of goods with specification	Quantity
Computer and accessories	
Laptop computer	3,300
Laser printer	3,300

Table 17.2b Continued

Name of goods with specification	Quantity
Personal Digital Assistant (PDA)/ Mobile device	3,500
Wireless modem	5,000
Machinery and other equipment	
Telemedicine	
Multi-point camera	2
Single point camera	8
LCD TV 42"	10
2 Mbps data connectivity (3 years)	10
Telemedicine software	1
Telemedicine peripherals	
Tele-stethoscope	20
Tele-ECG	20
Tele-Ophthalmoscope	20
Tele-probes	
Electronic non-invasive blood pressure measuring device	20
Pulse oximeter	20
Electronic thermometer	20
Tele-spirometer	20
Tele-ultrasound	20
Tele-camera to be fitted with the microscope	20
Tele-glucometer	20
Scanner	460
Tertiary hospital automation	1 (NIKDU Hospital)

Repair and Maintenance of Computers, Printers, and Other Accessories

Experience shows that even in divisional or district towns, there is lack of appropriate private firms for fixing computers and related

accessories. So, an innovative solution was found out. Under this approach, the respective health facilities or health offices having trouble with computers or related accessories are told to first try locally to fix the problems or seek advice over phone from the MIS-Health offices.

Table 17.3. Number of computers, monitors, printers, and UPSs repaired in fiscal 2011-2012 by MIS

Name of institution	Computer	Monitor	Printer	UPS
Directorate General of Health Services	48	6	14	0
Specialized institutes	6	0	0	0
Civil Surgeon Office	20	0	7	0
District Hospital	18	8	6	0
Upazila Health Complex	107	25	46	28
Total	199	39	73	28

If it is not possible within this period to fix the problems locally, they are asked to send the troubled machine to MIS head office. MIS head office, with the help of a repairing vendor in Dhaka, tries to solve the problems. By this time, MIS head office has acquired in-house capacity to repair computers. In 2011-2012, MIS fixed 199 computers, 39 monitors, 73 printers, and 28 units of UPS. Table 17.3 shows the list.

Medical Biotechnology

From fiscal 2011-2012, introduction of medical biotechnology in the country has been included as a responsibility of MIS under HPNSDP 2011-2016 through its operational plan (OP) "HIS and eHealth." The objectives of medical biotechnology, as described in the OP, are: (a) achievement of the short- and medium-term deliverables mentioned in the National Guidelines on Medical Biotechnology; and (b) creation of conditions for achieving the long-term deliverables of the National Guidelines on Medical Biotechnology. It is stated in the OP that the following measures will be taken for implementing short- and medium-term deliverables of the National Guidelines on MBT by 2016: (i) Center for Medical Biotechnology will be established; (ii) Situation analysis of medical biotechnology will be carried out, and medical biotechnology plan will be developed; (iii) Sensitization/orientation training/workshops, updating medical curriculum, with focus on medical biotechnology, will be held, medical biotechnology resources in medical libraries will be developed, postgraduate and technologist courses and career group for medical biotechnology will be identified gradually, orientation of the core group members and concerned officials on medical biotechnology will be given; (iv) Institutional capacity will be built through development of lab facilities, clinical services, and epidemiological surveillance for medical biotechnology; (v) R&D environment will be created through supporting related research projects; (vi) Steps will be taken to open Department of Medical Biotechnology in the National Institute of Biotechnology and to establish a Center of Excellence for Medical Biotechnology; (vii) Appropriate communication programs, with potential entrepreneurs of medical biotechnology, will be carried out; (viii) Appropriate public awareness programs will be

Introduction of medical biotechnology in the country has been included as a responsibility of MIS under HPNSDP 2011-2016 through its operational plan (OP) "HIS and eHealth" ...

conducted; (ix) Measures will be taken to develop and enforce standards, codes of practice, and regulatory framework for medical biotechnology.

It is also stated in the OP that conditions will be created for achieving the following long-term vision (25 years or more) of National Guidelines on MBT: (i) Attain medical biotechnology initiatives and infrastructure at globally-competitive level; (ii) Make medical biotechnology industries, laboratories, and services capable to compete globally and keep pace with global development trends; (iii) Produce high-quality medical biotechnology products and services for local market as well as for export to the global market; (iv) Make available a world-class higher education and research base to serve the rapidly-growing needs for medical biotechnology both at home and abroad; and (v) Ensure effective leadership, monitoring, and supervision.

Of the above-mentioned directives, some were already achieved. These include establishment of the Center for Medical Biotechnology in the Institute of Public Health; situation analysis and development of MBT plan. Many workshops and training programs (Table 17.4) were organized for sensitization, awareness-building, assessment, and plan development. Efforts are underway to include MBT contents in undergraduate medical curriculum. Public awareness campaigns were carried out through newspaper advertisements. Several features were also published or broadcast in the media. In the next fiscal, laboratory capacity will start to be strengthened in selected institutions. Substantial progress has been made in developing communication programs with appropriate agencies.

Table 17.4. Workshop and training programs in 2011-12 on MBT

Name of workshop or training program	No. of batches	Duration (days)	Total participants
Consultative Workshop on MBT	2	2 days	35
Training of Data Collector for Baseline Survey	1	1 day	15
Data Collection and Report Writing Baseline Survey	1	30 days	4
Consultative Workshop on Baseline Survey Report	1	1 day	15
Core Group Consultative Workshop	1	1 day	40
Consultative Workshop of National Technical Committee on Medical Biotechnology (NTCMB)	1	1 day	30
Training Workshop for Journalists	1	2 days	20
Consultative Workshop for Development of MBT Plan	10	1 day	150
MBT Plan Development Consultative Workshop	1	2 days	15
Consultation on Draft MBT Plan	1	2 days	20
Consultative Workshop of Selection Board for Identifying a Group of Potential Young Health Professionals for Building Career in MBT	1	1 day	10
Sensitization Workshop	10	2 days	150
Total types of courses and participants	13	-	504

Medical biotechnology is being introduced as part of the Government's policy decisions for rapid deployment of biotechnology in the country. The medical biotechnology will help the country face the country's future health, nutrition and livelihood challenges. The Government constituted a National Taskforce on Biotechnology with Honorable Prime Minister as chair and adopted National Biotechnology Policy and several sector-specific National Biotechnology Guidelines,

including National Guidelines on Medical Biotechnology. The latter has been published as government gazette and spells out MoHFW's deliverables in the next 25 years. The objectives of the MBT program under the OP "HIS and eHealth" are the exact reflections of the directives given in the national guidelines on MBT. The progress so far made gives a great hope that the aspirations for MBT will be truly materialized during the targeted period.