

Investment for the Sustainability of Digital Health Systems in Bangladesh

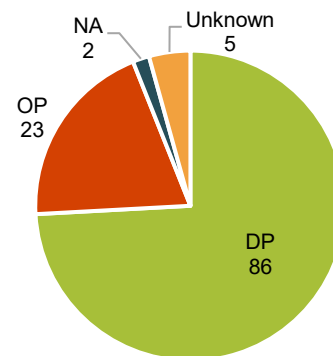
Digital health systems and tools have the capacity to radically transform the health sector and improve access to quality data for decision making. Development Partners (DPs) have often facilitated the development of digital tools in lower- and middle-income countries (LMICs). However, in order to ensure sustainability of DP-funded digital health systems and tools, DPs and governments need to consider the entire data ecosystem, interoperability issues, and start managing transition from early stages of development. Key areas to consider are long-term government commitment and investments in human resources, capacity strengthening, and management, development and maintenance of systems that includes both hardware and software.

The Ministry of Health and Family Welfare (MOHFW) in Bangladesh has introduced digital tools to improve the routine health information system (HIS) and streamline management of information. These efforts have been supported to a great extent by development partners (DPs). Sustaining these tools requires investment from the organizations using these tools. This brief examines the issues of investment to ensure sustainability of digital systems in Bangladesh.

Digital Initiatives of the MOHFW

The government of Bangladesh has a Digital Bangladesh vision. Accordingly, digital health¹ has continued to be a focus area for the MOHFW. The digital footprint of the MOHFW has increased over the years. An inventory of HIS tools prepared in 2021 revealed that a total of 114 HIS tools/systems were in use across the organizations under the MOHFW (Kabir & Kibria, 2021). The MOHFW follows a sector-wide approach² where DPs participate through a pool funding mechanism. Some funding is also channeled through non-pool mechanisms or directly by the DPs due to the funding modalities

Support for developing digital systems in Bangladesh



preferred by some DPs. The inventory shows that support from DPs was crucial in developing/introducing digital systems. Out of the 114 tools inventoried, initial funding for 86 tools/systems was provided by the DPs. Funding for a total of 23 tools/systems came from MOHFW Operational Plans (OPs), which are funded mainly by the DPs through technical assistance. The source of funds for five tools could not be ascertained.

¹ Digital health is defined as “the use of information and communications technology in support of health and health-related fields. More recently, the term digital health was introduced as “a broad umbrella term encompassing eHealth (which includes mHealth), as well as emerging areas, such as the use of advanced computing sciences in ‘big data’, genomics and artificial intelligence (WHO, 2019).

² The current sector program is called 4th Health, Population and Nutrition Sector Program (4th HPNSP). It started in July 2017 and was scheduled to end in June 2023 but has been extended to June 2024. The Sector program is organized into 31 Operational Plans (OP) under a Program Implementation Plan (PIP).



The DPs overwhelmingly provided support for developing digital tools. DP support comes through projects, and by design and definition, those are short-term in nature or end at the completion of the project. Most of the tools have gone from pilot to production and have been scaled up nationally. This scale-up implies that the organizations owning the tools (e.g., Directorate General for Family Planning [DGFP]) have shown long-term commitments for maintenance of the systems or are ready to invest in human, technical, and financial requirements. System development is not a one-off activity. Digital systems require continuous maintenance and regular system maintenance, including continued development which becomes the responsibility of the organization.

Software development is specialized and requires skills usually not available within government organizations. Therefore, third parties (local or international firms with capacity for software development) are engaged to develop software programs. Maintaining the system also requires third parties. Third parties are selected through procurement processes and skills are required to ensure that what is intended is indeed delivered to them. That could translate to Information and Communication Technology (ICT) procurement skills or contract management skills which are often in short supply in public sector organizations.

The HIS inventory conducted by Kabir & Kibria revealed that the management information system (MIS) of the Directorate General for Health (DGHS) and the DGFP are responsible for most of the HIS tools. Thus, these two organizations are also responsible for maintaining the digital tools that include, among others, allocation of budgetary resources. The implementation of the electronic management information system (eMIS) by the DGFP provides a lens allowing for an examination of

how resources are allocated and how they relate to the issue of sustainability in the longer term.

Financing the Scale-Up of the DGFP eMIS

The pilot implementation of eMIS started in two upazilas of two districts of Bangladesh under the DGFP in January 2015 by two implementing partners (IPs) of the United States Agency for International Development (USAID). The IPs were: MEASURE Evaluation (later Data for Impact [D4I]) in partnership with the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) and Save the Children (SCI)/MaMoni HSS (now MaMoni MNCSP). The former supported development of community systems and the latter supported facility systems³. The eMIS was conceived as a digital routine health information system aimed at replacing paper-based service delivery registers used in community/domiciliary or facilities settings. Mobile apps and web-based applications linked to cloud servers and databases were developed to address the needs of rural community-level health workers and their supervisors as well as their managers⁴. One of the initial activities of community-level workers is to conduct a population registration in their catchment areas. The eMIS facilitates both vertical and horizontal integration of data generated at different hierarchical levels and facilities.

The eMIS was introduced during the MOHFW's third sector-wide program known as the Health, Population, and Nutrition Sector Development Program (HPNSDP). The pilot implementation was assessed as being successful, which led to a national rollout beginning with five additional districts in the 4th Health, Population and Nutrition Sector Program (HPNSP) which started in 2017 and continues until June 2024. The eMIS has been scaled up in 40 out of 64 districts across Bangladesh, where over 13,000 users of DGFP perform their responsibilities using eMIS apps or web-based tools. The DGFP

³ The community systems are used by domiciliary workers of DGFP and the facility systems are used in the Union Health and Family Welfare Centers managed by the DGFP in rural areas.

⁴ Separate apps have been developed for specific category of community level workers, their supervisors, subdistrict managers, such as, FWA eRegister for Family Welfare Assistants; FPI eSupervision System for Family Planning Inspectors; FP eRegister for Sub-Assistant Community Medical Officers, Family Welfare Visitors and Community Skilled Birth Attendants; UFPO eManagement System for Upazila Family Planning Officers.



has declared 14 districts with eMIS as paperless, and it is planned that all districts with eMIS will become paperless during the 4th HPNSP, gradually allowing field workers to perform all their responsibilities exclusively using digital devices. The eMIS allows data sharing with other government organizations, such as Civil Registration and Vital Statistics (CRVS).

Total transformation from a manual to a digital system is not easy nor straightforward. It means planning strategically; bearing costs for equipment such as tablets, server/database hosting, and internet connectivity; initiating procurement processes for goods and services; allocating funds for training; and most importantly, ensuring the smooth development and maintenance of software systems. The DGFP also needed to manage the process of change. There were employees who lacked digital literacy, and those who were near the end of their professional careers were not particularly interested in learning new skills.

One area in which continued support was made available by the IPs was software development and software management (SD&SM). Until now, the DGFP did not have the capacity to manage or develop software solutions. This is a key technical area as software systems lie at the heart of any digital development. The digital environment changes rapidly. Even if they are available, catching up with new technologies may require renewing staff skills which is difficult for organizations in the public sector.

For eMIS, D4I provided support for the development and maintenance of community systems through June 2021. Subsequently, the USAID-funded Research for Decision Makers (RDM) Project, implemented by icddr,b, extended support from July 2021 to March 2022⁵. The DGFP took over from that point and awarded a contract to icddr,b for SD&SM for the period of April 2022 to June 2022, which was

not renewed. No other third party has been engaged to date for those tasks. Support for facility systems continues through SCI/MaMoni but will end in April 2023.

The IPs also provided support for implementing District Health Information Software, version 2 (DHIS2) in the DGFP to replace their legacy system called Service Statistics. In eMIS districts, monthly data are submitted electronically to DHIS2.

Investment through the Sector Program

A key strategy for the Management Information System Operational Plan (MIS OP) of DGFP, as outlined in the Strategic Investment Plan (SIP) of the 4th HPNSP, is to strengthen digitalization of data collection and compilation (Planning Wing, 2016). Accordingly, the DGFP set a priority activity for the MIS OP to “collect all service delivery data through an electronic system using e-register at field and community and facility level” to be implemented by the procurement of tablets, provision of training, etc. (DGFP, 2017). The performance of all the OPs was assessed during the Mid-Term Review (MTR) of the 4th HPNSP led by a team of independent consultants where the achievements of the MIS OP in terms of digitization were highlighted (Independent Review Team, 2020). The MTR led to the preparation of a Revised Operational Plan (ROP). The ROP included specific objectives based on the eMIS scale-up (DGFP, 2022). The preamble of the MIS ROP mentions that the main commitment of the MIS OP is to implement eMIS systems all over the country by providing the required devices and all other associated costs. Allocations were included for purchasing tablets, software development, training, and internet bandwidth costs. Table 1 shows the allocations in the OP and the ROP against different ICT related activities.

⁵ During this period the UKAID/UNFPA also provided support for SD&SM. UNFPA support was also extended to the DGFP for continuing monitoring activities by a team formerly employed by icddr,b.

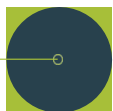


Table 1: Allocations made in the original and revised Operational Plan of MIS (approved in February 2022)

	Item*	# of units		Cost in Taka/Mil		Increase/ decrease
		OP	ROP	OP	ROP	
1.	Tablets (Procurement)	12,074	20,274	300	439	46%
2.	eMIS & DHIS2 System and Database upgradation & Maintenance			-	47.5	
3.	Individual Consultant support for eMIS	-	-	-	5.63	
4.	10 IT personnel for DGFP MIS Systems	-	10	-	14.4	
5.	Training	12,700	17,360	67.5	147.10	118%
6.	Internet	-	-	250.0	235.56	-6%

When the proposal for the revised MIS OP was placed before the Planning Commission (PC), a question was raised by the PC regarding the exit strategy for eMIS following the end of DP financial support. In response, the DGFP

highlighted the role of troubleshooters as a mechanism in the exit plan. The MIS ROP also considered future needs for more skilled human resource in eMIS districts. The MIS ROP targets also contain eMIS activities as shown in Table 2.

Table 2: MIS ROP indicators (all but one directly relates to eMIS)

	Item	2017	Mid Term targets July 2020	Achievements June 2021	ROP June 2023 target
1.	Collection of population data (million)	0 ⁶	24	33.4	60
2.	Number of UHFWCs under eMIS	30	800	1701	2438
3.	Number of upazilas with eMIS	2	250	248	379
4.	Number of paperless districts	0	2	6	32
5.	Reporting in DGFP DHIS2	2	40	36	64

Declaring 32 districts as paperless is also included as a result framework indicator of the 4th HPNSP.

The DGFP planned and executed eMIS by utilizing resources from the sector program for equipment and other activities. It remains to be seen how they manage the critical components like software development and system management in the future.

Observations

All countries are committed to achieving the Sustainable Development Goals (SDGs) by

2030. The overarching goal for the health sector is universal health coverage (UHC), and investing in digital health can contribute to achieving that goal. The benefits of ICTs were derived by the developed world first. But ICT developments have been rapid and have opened up opportunities for developing countries that initially lagged behind with leapfrogging. Health systems are very complex. Investing in digital technologies in the health sector requires sufficient awareness of many associated issues⁷ (Asian Development Bank et al., 2018). Increasing human capacity for management of

⁶ Taken from ROP. Corrected figure for population registered would be more than 500,000.

⁷ Besides technology, investments are required for other components, e.g., human capacity, governance, standards, architecture, usability, etc.



digital resources could be a challenge for a public sector organization. Failures could also result from failing to address the needs of managing critical technical components.

In 2006, a WHO report noted that the obstacles to implementation of electronic health records (a digital intervention) may not lie in the availability of technology, but rather in technical support and the cost of changing to an electronic system coupled with insufficient healthcare funding (WHO, 2006). In the health sector, support from DPs helped the MOHFW expand its digital footprint. However, there are uncertainties in the provision of development assistance for health (DAH) in the future as it is projected that there will be substantially slower growth of DAH than in the previous years (Dieleman et al., 2016). In addition, Bangladesh is soon going to graduate from less-developed country status to low- and middle-income country status, which might have implications for DAH. A draft Digital Health Strategy prepared for the MOHFW suggested to allocate sufficient budgetary provisions to meet the objectives prioritized in the strategy and also to strengthen digital health program management capacity of the MOHFW (MOHFW, 2022). Sustaining digital resources with additional national investments and increasing technical capacities to manage digital resources should receive priority in the current and next health sector program in Bangladesh.

References

Asian Development Bank, Drury, P., Roth, S., Jones, T., Stahl, M., & Medeiros, D. (2018). *Guidance for Investing in Digital Health*. Asian Development Bank. <https://doi.org/10.22617/WPS179150-2>

DGFP. (2017). *Management Information Systems: Operational Plan*. Directorate General of Family Planning.

For more information

D4I supports countries to realize the power of data as actionable evidence that can improve programs, policies, and—ultimately—health outcomes. We strengthen the technical and organizational capacity of local partners to collect, analyze, and use data to support sustainable development. For more information, visit <https://www.data4impactproject.org/>

DGFP. (2022). *Management Information Systems: Revised Operational Plan*. Directorate General of Family Planning.

Dieleman, J. L., Schneider, M. T., Haakenstad, A., Singh, L., Sadat, N., Birger, M., Reynolds, A., Templin, T., Hamavid, H., Chapin, A., & Murray, C. J. L. (2016). Development assistance for health: Past trends, associations, and the future of international financial flows for health. *The Lancet*, 387(10037), 2536–2544. [https://doi.org/10.1016/S0140-6736\(16\)30168-4](https://doi.org/10.1016/S0140-6736(16)30168-4)

Independent Review Team. (2020). *4th Health, Population and Nutrition Sector Program (HPNSP) 2017-2022: Mid-Term Review (MTR) 2020*.

Kabir, Md. H., & Kibria, M. G. (2021). *HIS Mapping: An Inventory of Digital Tools in Use by the Ministry of Health and Family Welfare in Bangladesh* [Policy Brief]. Data for Impact (D4I) Project, UNC at Chapel Hill.

<https://www.data4impactproject.org/publications/his-mapping-an-inventory-of-digital-tools-in-use-by-the-ministry-of-health-and-family-welfare-in-bangladesh/>

MOHFW. (2022). *Digital Health Strategy (Draft)*. Ministry of Health and Family Welfare, Government of Bangladesh.

Planning Wing. (2016). *Health, Nutrition and Population Strategic Investment Plan (HNPSIP)*. Ministry of Health and Family Welfare.

WHO. (2006). *Electronic health records: A manual for developing countries*. World Health Organization Western Pacific Region.

WHO. (2019). *WHO guideline: Recommendations on digital interventions for health system strengthening*. World Health Organization. <http://www.ncbi.nlm.nih.gov/books/NBK541902/>