



# Strengthening Governance in Procurement in Bangladesh

The **Systems for Improved Access to Pharmaceuticals and Services (SIAPS)** program works to ensure access to quality pharmaceutical products and effective pharmaceutical services through systems strengthening approaches to achieve positive and lasting health outcomes. SIAPS is funded by the US Agency for International Development (USAID) and is implemented by Management Sciences for Health (MSH).

Despite being one of the most densely populated countries in the world, the overall health in Bangladesh has steadily improved over the last 30 years.<sup>1</sup> This success is due in part to targeted interventions to reduce maternal and child mortality<sup>1</sup> and increase the availability and use of family planning products, which has helped expand access to pharmaceuticals and health services.<sup>2</sup> While the Government of Bangladesh's efforts have resulted in impressive gains in public health, weaknesses in pharmaceutical management, including logistics and supplies, infrastructure, and the low performance of health care providers, remain obstacles to obtaining access to efficacious medicines and quality health services, particularly for the poor.<sup>3</sup>

Recognizing the deficiencies in the health system, the Government of Bangladesh called for action to improve the pharmaceutical system by strengthening the capacity and capabilities of human resources in procurement, continuing to expand access to family planning (FP) commodities, and improving the coordination of governance activities in the health system.<sup>4</sup> The US Agency for International Development (USAID)-funded Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program has been working closely with the Ministry of Health and Family Welfare (MOHFW) since 2011 to implement a series of systems strengthening interventions to support the government's health objectives. Using a systems-based approach, SIAPS catalyzes effective leadership, good governance, and evidence-based decision making to strengthen procurement and supply chain systems throughout the MOHFW.

i. In 2015, 5,500 maternal deaths occurred, which was half the number in 2005, at 11,000. The mortality rate of children under the age of five has decreased significantly, from 67 per 1,000 live births (2005) to 38 (2015). Bangladesh | Data. 2017. Available at: <http://data.worldbank.org/country/bangladesh>

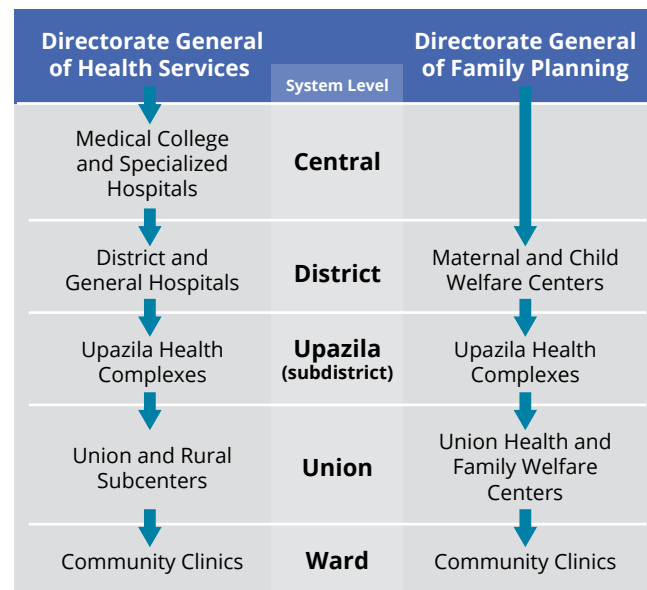
## Bangladesh Health System

The MOHFW is responsible for Bangladesh's public-sector health system. It is centralized and divided into 11 directorates, of which the Directorates General of Health Services (DGHS) and Family Planning (DGFP) oversee health services and family planning services, respectively, at all levels of the country's 64 districts and 488 upazilas (subdistricts). Figure 1 summarizes the health delivery structures for both the DGFP and the DGHS.

In alignment with the 2011–2016 Strategic Plan for the Health, Population and Nutrition Sector Development Program (HPNSDP), MOHFW activities were divided into 32 operational plans, each with a line director. During that time, each line director was responsible for finalizing and submitting procurement plans that anticipated the future demand of health commodities for health services nationwide. This responsibility necessitated accurate and comprehensive data that were not available prior to 2011. In addition, procurement staff in the DGHS and DGFP inconsistently applied good procurement practices.

International procurement for pharmaceuticals takes place through pooled funding from international partners, coordinated by the World Bank. However, line directors and other administrators did not adhere to World Bank guidelines and procedures, which caused major delays that

**Figure 1. DGHS and DGFP health service delivery organizational chart, 2011–2017<sup>ii</sup>**



led to frequent commodity shortages and stock-outs. These outcomes were highlighted by the HPNSDP, which included action items to improve the procurement process and increase procurement staff's capabilities as a crucial element in strengthening the health system.

## Strengthening Pharmaceutical Systems

In 2009, SIAPS' predecessor program, Strengthening Pharmaceutical Systems (SPS), began providing technical assistance to the DGFP to improve procurement management of FP and reproductive health (RH) commodities, enhance information systems, and build capacity in pharmaceutical management. SPS focused on reinforcing stakeholder coordination by establishing working groups dedicated to procurement management of FP/RH commodities; enhancing oversight of operational plans; building capacity in procurement and supply management; and updating inventory management systems, including institutionalizing a procurement tracker.

Highlights of achievements during SPS:

- Fewer stock-outs: Eliminated FP/RH commodity stock-outs at the national level by 2011
- Reduction in procurement lead time: Decreased procurement lead time from 78 weeks in 2009 to 58 weeks in 2011
- On-time procurement: Opened 100% of letters of credit<sup>iii</sup> for contraceptive procurement packages on time in each financial year (target: 85%)
- Improved the use of data for decision making: Improvements in information systems and reporting rates, coupled with capacity building efforts, enabled the MOHFW to critically review reports and identify opportunities to save money and reduce waste.
- National recognition for information tool: The procurement tracker received two prestigious awards in 2011—the National Digital Innovation Award and the National Digital Innovation Fair Award—in the categories of e-Health and e-Governance, respectively.

ii. The MOHFW was officially restructured in March 2017.

iii. A letter of credit is an interbank document stating that a certain sum of money is available for the seller to claim from its bank as soon as it ships a consignment and presents the required documents. Because it reduces the supplier's credit risk, a letter of credit can facilitate a better contract price offer.

Management Sciences for Health. 2012. MDS-3: Managing Access to Medicines and Health Technologies. Arlington, VA: Management Sciences for Health, 39.7. Service delivery points are frontline family planning workers and clinics

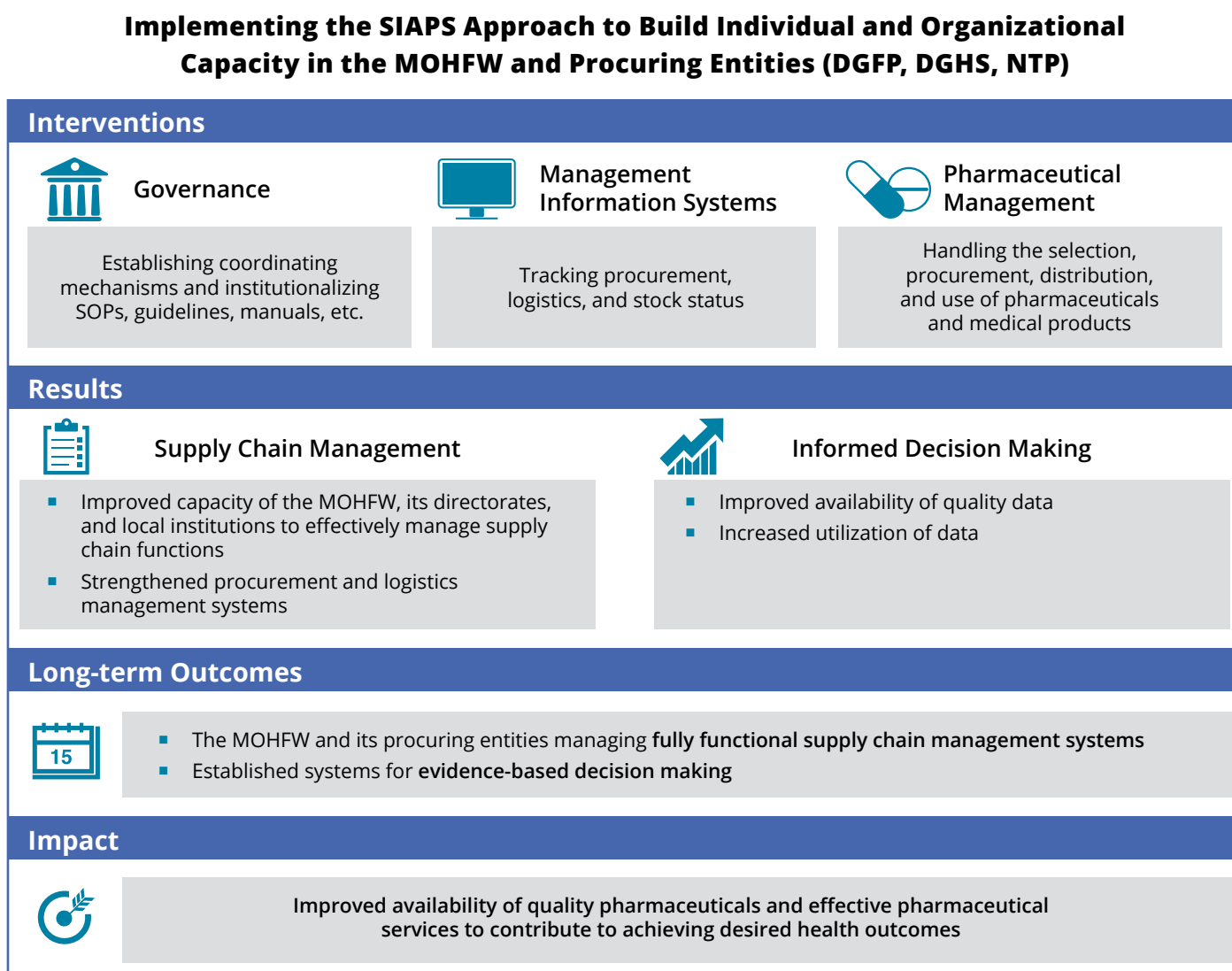
## Strategic Approach

Building on the successes of SPS' technical assistance in the DGFP procurement system, the MOHFW requested that SIAPS expand its technical assistance to strengthen procurement systems in other entities of the MOHFW. Consequently, when SIAPS began in 2011, the mandate included continuing assistance to the DGFP as well as technical assistance for the procurement systems in the DGHS—the Central Medical Stores Depot (CMSD) and the National TB Control Program (NTP). The mandate also included support to strengthen the medicine registration




systems, which enhances the procurement process, as well as embedding SIAPS technical advisors in the procurement entities of the MOHFW for regular, ongoing reinforcement.

The SIAPS approach shaped by this mandate centered on supporting and strengthening multiple components of the pharmaceutical system, specifically building individual and organizational capacity in governance and supply management, and using information systems to promote transparency and accountability and enable appropriate decision making.

Figure 2. The SIAPS approach to strengthening pharmaceutical systems in Bangladesh



**Figure 3. SIAPS interventions to improve supply chain system functionality****Improving Supply Management by Increasing Efficiency and Harmonizing Systems**

SIAPS Interventions	MOHFW	DGHS		DGFP
		CMSD	NTP	
 Establishing coordinating mechanisms to promote good governance and management practices	Procurement and Logistics Management Cell	Supply Chain Coordination Forum	Procurement Supply Management Working Group	Logistics Coordination Forum Forecasting Working Group
 Institutionalizing e-tools to enhance supply chain management	Supply Chain Management Portal	eLMIS Asset Management System	QuanTB TB WIMS	eLMIS UIMS WIMS SDP Dashboard
 Developing standards, guidelines, and procedures to promote best practices	Procurement operations manual Procurement guidelines Standard list of equipment	Warehouse management SOPs Inventory management tools	TB commodity SOPs	Procurement procedures manual Supply manual

## Implementation

### MOHFW-level Interventions

#### Developing Documents to Boost Procurement and Supply Chain Management Activities

Institutionalizing good governance practices that are based on improvements within Bangladesh's procurement and supply chain system will create an enabling environment for the success of pharmaceutical management functions. SIAPS used a capacity building approach to improve the skills of MOHFW staff as they worked together to produce standard operating procedures (SOPs), guidelines, and tools, all of which promote good management practices and streamline processes. Procuring entities, such as line directors, now have the appropriate tools to help them fulfill their responsibilities, including the Procurement Operations Manual, MOHFW Procurement Guidelines, a Framework Agreement bidding document, and the Standard Table of Organization and Equipment, all of which were written with SIAPS' support.

#### Establishing a Coordinating Body to Oversee all Procurement and Logistics Activities in the MOHFW

The health sector strategic plan called for establishing the Procurement and Logistics Management Cell (PLMC) in the MOHFW to oversee and coordinate all supply chain

management activities in key directorates, supervise the decentralization of supply management, and manage capacity building efforts. To lay the foundation, SIAPS conducted a comprehensive needs assessment of the procurement and logistics capabilities and led efforts in designing the PLMC governance structure, which officially launched in 2012. Two SIAPS senior technical advisors were seconded to the MOHFW to provide continuous technical assistance and capacity building for PLMC members.

#### Institutionalizing a Centralized Supply Management Information System

To enhance the PLMC's capabilities, SIAPS assisted in the design, implementation, and hand over of the Supply Chain Management Portal (SCMP), a comprehensive online procurement tracker and management dashboard that has been fully functional since 2011. The SCMP serves as the central platform to plan, approve, package, and track procurement status and through which all MOHFW line directors submit procurement plans. SIAPS provided regular trainings to PLMC staff, desk officers, and line directors, among others, on the use of the SCMP. As part of the sustainability plan for this system, SIAPS has held trainings with a broad group of the MOHFW's technical staff. The electronic logistics management information systems

(eLMIS) for both the DGFP and DGHS have been merged with the SCMP, increasing the opportunity for PLMC members, line directors, and other MOHFW staff to track pharmaceuticals throughout the supply chain continuum.

As a comprehensive monitoring dashboard and planning tool, the SCMP enables good governance throughout the MOHFW by improving oversight, transparency, and accountability. The SCMP is accessible to different entities within the MOHFW, as well as stakeholders and donors. Because it is prepopulated with the national medicines list and price guide, it simplifies the arduous procurement process and removes the ability to disregard required steps. In addition, descriptions of commodities and equipment are standardized, which eliminates the possibility of giving preference to any particular brand. Finally, the portal provides delay notifications and alerts, prompting managers to take appropriate action.

## DGFP-related Interventions

### Establishing and Reinforcing Coordinating Mechanisms

Stakeholder coordination is a critical component of supply management and requires good governance practices and leadership to facilitate agreement, achieve transparency and accountability among the MOHFW and partners, and improve program efficiency and effectiveness. Recognizing this need, the MOHFW established two coordinating mechanisms to improve the DGFP's functionality—the Logistics Coordination Forum (LCF) in 2005 and the Forecasting Working Group (FWG) in 2012.

The LCF's purpose is to prepare, revise, and update the national needs of FP/RH commodities and determine system improvements in the areas of procurement, storage, and supply. The LCF has wide representation by MOHFW staff, implementing partner agencies, and donors, all of which heavily rely on SCMP data to make informed decisions on the management of FP/RH commodities. SIAPS took on the secretariat role of the LCF after SPS ended and supports both managerial and technical activities.

The FWG is responsible for forecasting and quantifying the annual need for FP/RH commodities for the country. As with the LCF, SIAPS provides technical and management assistance to the FWG. The FWG uses data collected through the SCMP and conducts quantification exercises based on the consumption of FP/RH commodities.

### Developing e-Tools within the DGFP

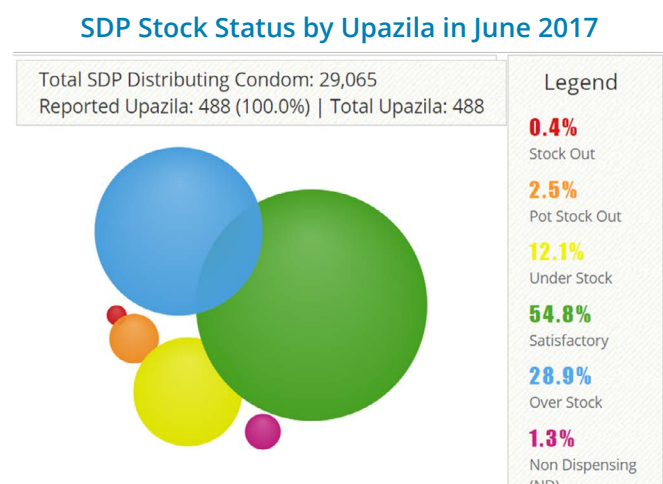
Functional information systems are essential to supply chain management to increase the ability to effectively predict and

coordinate commodities for uninterrupted availability. SIAPS developed an eLMIS to collect data on the consumption and availability of FP/RH commodities from all districts and upazilas. Information from the eLMIS feeds into the SCMP. Other directorates and partners can view this dashboard in real time, and FWG and LCF members can use the data for forecasting, quantification, procurement, and supply planning.

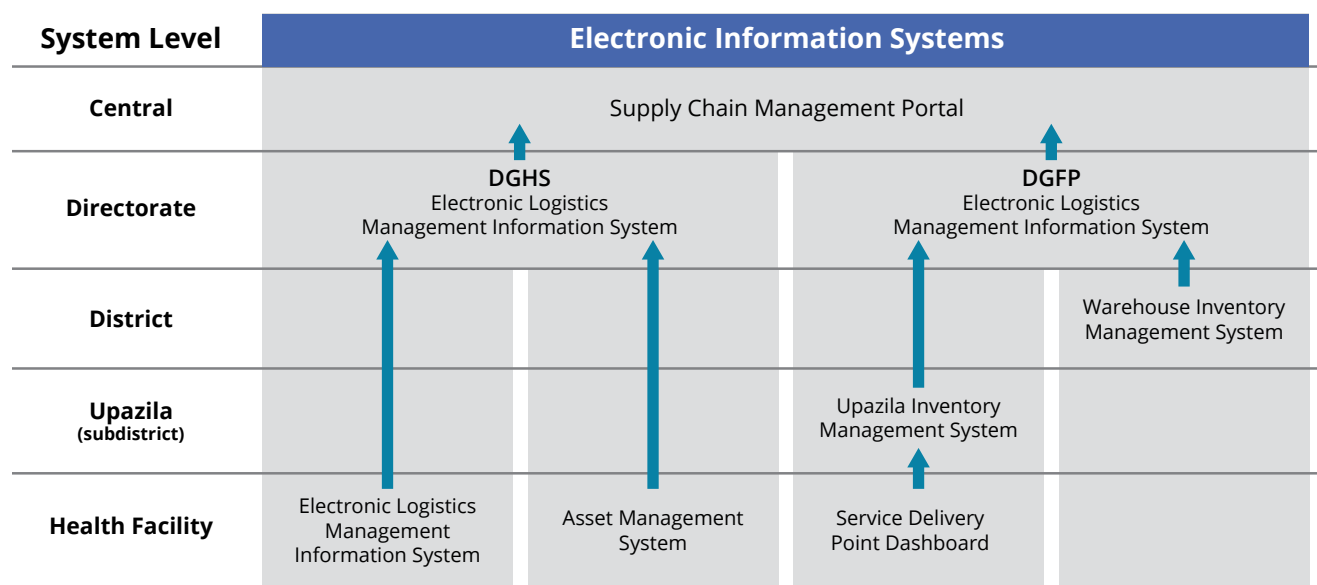
The eLMIS has two components: the Upazila Inventory Management System (UIMS) and the Warehouse Inventory Management System (WIMS). UIMS is a software program used in upazila family planning stores that enables staff to monitor commodity status at service delivery points (SDPs).<sup>iv</sup> WIMS is another software program for monitoring inventory at district-level FP warehouses. Both programs increase transparency and accountability, and regular reporting promotes better supply management by making it easier to proactively identify potential issues and make necessary changes. Because UIMS and WIMS data upload directly into the eLMIS, policymakers at the central level can use these data for decision making.

To reach the last mile of service delivery, SIAPS assisted the DGFP in developing an SDP dashboard to monitor stock levels and consumption at DGFP health facilities. This is the final link to providing real-time information for FP/RH products throughout the entire supply chain. The SDP dashboard includes simplified charts, maps, and tables for monitoring and has a Short Messaging Service (SMS) system for reminders and tracking report submissions; it can also alert staff to stock imbalances and impending stock-outs (figure 4). The dashboard uploads through UIMS software and funnels through the eLMIS to the SCMP.

**Figure 4. Screen shot of stock status as seen in the SDP dashboard**



iv. Service delivery points are frontline family planning workers and clinics.

**Figure 5. Interconnecting e-tools to promote better procurement and supply management**

### DGHS-related Interventions

When SIAPS began in 2011, the MOHFW requested that technical assistance in procurement and supply chain-related activities also extend to the DGHS, namely the CMSD and the NTP. SIAPS undertook interventions within the CMSD and NTP to raise staff's capacity to ensure the availability of quality products through an effective and efficient supply chain.

#### CMSD Activities

As the main procuring unit in the MOHFW, the CMSD is charged with acquiring medical equipment, medical supplies, and pharmaceutical commodities for the entire country, with the exception of FP/RH commodities. The health sector's strategic plan identified several areas for improvement within the CMSD, including increasing skills in procurement and supply management, streamlining procurement processes, reducing delays in installing and operating medical equipment, and establishing a database to track both pharmaceutical commodities and medical equipment and supplies.

#### Establishing and Reinforcing Coordinating Mechanisms

At the onset of the program, a SIAPS senior technical advisor was embedded in the CMSD to provide warehousing, distribution, and logistics management support. SIAPS' technical assistance for improved governance through increased stakeholder coordination led to establishing the Supply Chain Coordination Forum (SCCF) in 2013. The SCCF comprises all 17 DGHS line directors, donors, and partners and meets quarterly to address logistics and procurement issues to minimize obstacles and make collaborative decisions.

### Setting up Information Systems for Decision Making

To improve the capture of data from all levels for decision making, SIAPS helped develop an eLMIS for the DGHS, which merged with the SCMP. The DGHS has begun inputting medicines and products, beginning with priority maternal, newborn, and child health (MNCH) medicines. After the pilot was successfully completed, SIAPS assisted in training 2,624 health managers and scaling up the eLMIS to 11 districts.

#### Strengthening Warehouse Management

Through collaboration with the CMSD and other stakeholders, SIAPS developed and assisted in the dissemination of warehouse management SOPs. To further streamline warehouse management, the DGHS sought SIAPS' assistance in strengthening the inventory management system by reducing the variation in inventory management tools used across health facilities. SIAPS standardized inventory tools (e.g., stock registers, issue vouchers, indent and issue vouchers, bin cards) for use in health stores and assisted in the roll out phase by facilitating comprehensive logistics management trainings in 31 districts.

SIAPS has also provided technical assistance to the MOHFW to develop a proof-of-concept paper and pilot a web-based Asset Management System (AMS) to track information related to medical and nonmedical equipment. The AMS was successfully piloted at a district hospital in 2016 and will be implemented at three other district hospitals in 2017. Monitoring equipment improves transparency and financial accountability, minimizes loss and misuse, and enables the allocation of equipment where the need is greatest, ultimately improving the provision of and access to health services.

## NTP Activities

The success of any tuberculosis (TB) control strategy hinges on continuous access to TB diagnostics to identify those infected and secure medicines to treat patients and halt the spread of TB and drug resistance. The majority of TB commodities in the country are procured through the Global Drug Facility with funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund). As such, the NTP must adhere to procurement guidelines that differ from those of the DGHS and DGFP.

Weak capacity, coupled with poor adherence to the Global Fund's guidelines, resulted in the NTP regularly facing nationwide shortages of TB drugs and laboratory supplies. Those circumstances led to SIAPS and the NTP partnering to improve stakeholder coordination and strengthen the capacity of NTP staff on TB drug supply management and logistics management.

### Establishing a Coordinating Mechanism for TB Stakeholders

To promote collaborative decision making, and streamline supply management and service delivery, SIAPS and the NTP launched the Procurement Supply Management (PSM) working group in 2013 to collectively coordinate TB-related activities and supply planning. In 2014, the PSM working group began using QuanTB, an electronic forecasting, quantification, and early warning tool designed to improve procurement processes, ordering, and planning for TB treatment. Timely facility-level data collected by QuanTB are reported to the NTP on a quarterly basis and are a driving component when conducting forecasting and quantification exercises.

### Strengthening Warehouse Management

SIAPS worked closely with the NTP to improve warehouse management and storage conditions at the NTP central warehouse. In 2016, SIAPS and the NTP introduced the TB WIMS to improve stock management and increase data availability. To create additional space and improve storage conditions, the central warehouse was renovated to modify the building's structure and install electricity. SIAPS contributed shelving supplies, air conditioning units, equipment handling items, and cleaning and safety equipment. To ensure continued good storage practices in facilities, SIAPS also facilitated the purchase of 102 medicine refrigerators for Bangladesh's 94 TB treatment centers.

## Results

### Capacity Building

Throughout the life of the program, SIAPS has worked alongside the MOHFW, DGHS, DGFP, and NTP to develop guidelines, manuals, and SOPs to assist health workers and officials to improve procurement and supply chain management. By clarifying roles and procedures, health care providers, facility managers, and MOHFW officials have the knowledge and ability to effectively and efficiently manage their responsibilities and work collaboratively to increase access to high quality medicines.

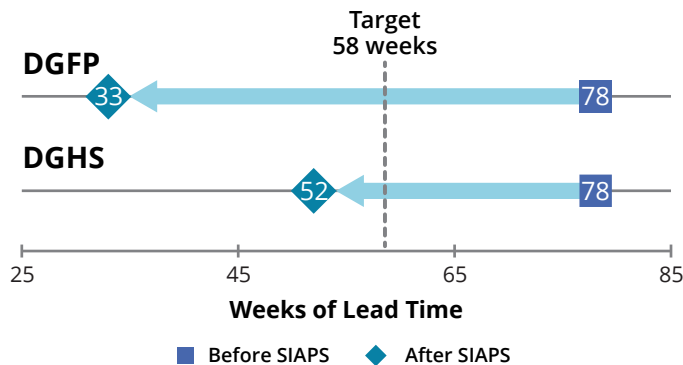
SIAPS has contributed to the sustainability of its interventions by training more than 18,400 government officials and health workers in different aspects of pharmaceutical management. Health workers, managers, and policy makers are using skills that address the recurring issues that had plagued in the pharmaceutical system in the past. To foster long-term success, SIAPS and the MOHFW formed groups of master trainers in the NTP, DGHS, and DGFP who are responsible for the continued training of government officials and health workers at all administrative levels in supply management beyond the life of SIAPS.

### Improved Oversight and Leadership Capacity

The successful partnership between SIAPS and government officials has led to several coordinating mechanisms throughout the MOHFW that regularly convene to manage and oversee various parts of the procurement and supply systems. Because stakeholders meet regularly, they can identify potential problems and collaboratively and proactively find solutions before the problems occur.

Through good governance practices and capacity building, coordinating mechanisms have successfully completed procurement packages over a shorter time period by using estimates based on consumption data, rather than unsubstantiated approximations, to increase the accuracy of procured products. In the DGFP, procurements have been completed on time since 2012, and DGFP and DGHS procurement packages that are on schedule have increased from 50% and 55% in 2011 to 75% and 70% in 2016, respectively. In addition, the time between preparing an order and receiving the shipment decreased for both DGFP and DGHS procurement orders, from 78 weeks (2010) to 33 and 52 weeks (2013), respectively (figure 6).

**Figure 6. Capacity building efforts in the DGFP and DGHS led to a reduction in time (weeks) for preparing an order and receiving the shipment of commodities between 2010 and 2013**



With assistance from SIAPS, the PLMC’s role in improving the procurement process spurred successful advocacy efforts to make the PLMC a permanent unit, which was approved in 2016. The permanent PLMC is now funded to have dedicated staff to continue overseeing procurement throughout the MOHFW. This is a milestone for the country’s health sector strategic plan.

**Information Systems Enhance Problem Solving Capabilities**

Through the institutionalization of information management systems, government officials and health care workers are no longer purely in a data producing role, but are also active users of those data. Line directors and coordinating bodies successfully analyze information captured in the SCMP to determine and prepare procurement packages. Because SCMP data are publically accessible, stakeholders can more easily work with MOHFW officials to routinely use data to identify where stock-outs and overstocks occur and jointly plan measures to make additional procurement orders or redistribute

commodities. The AMS is also expected to contribute to increasing efficiency by making it simpler for DGHS officials and hospital managers to monitor the status and use of medical equipment.

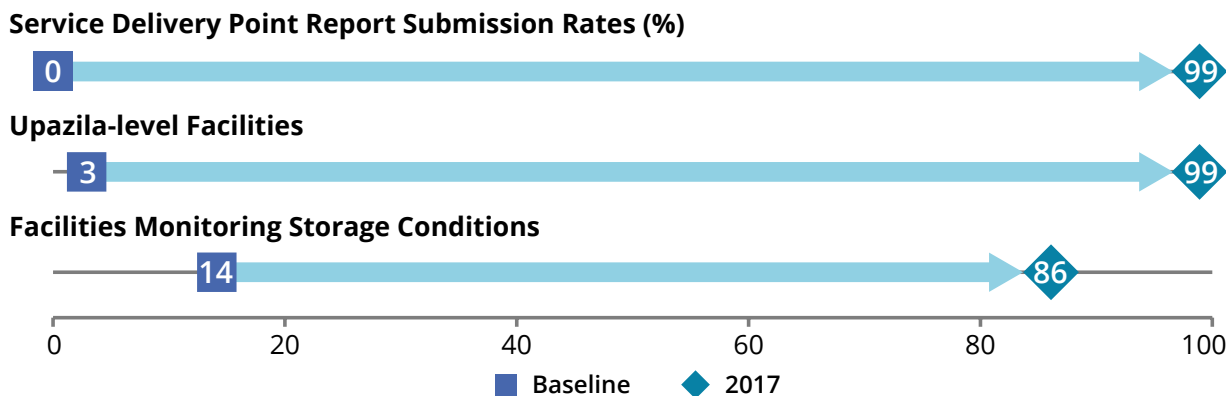
**Financial Savings**

Achieving efficiencies throughout the procurement process is a critical step in realizing financial sustainability in Bangladesh’s pharmaceutical system. SIAPS’ interventions provide evidence of the financial savings that can be attained by improving access to pharmaceuticals and products and reducing wastage through improved coordination, capacity building, institutionalization of information systems, and the promotion of transparency and accountability. SIAPS technical assistance contributed to the MOHFW saving USD 6.38 million from improved quantification of FP/RH, MNCH, and TB commodities (as of 2015), and its assistance with the Global Fund applications enabled the NTP to receive grants for TB medicines.

**Increased Access to Medicines and Health Products**

Reports are regularly sent, with 99% of SDPs reporting stock levels and 99% of upazila-level facilities submitting eLMIS reports in a timely manner in 2017, up from 3% in 2011. Having up-to-date stock status information has contributed to there being no countrywide stock-outs of FP/RH commodities since 2012. Facilities with stock-outs of select FP/RH commodities at the upazila level and SDPs decreased from 7% and 2% (2014) to 0% and .7% (2017), respectively. More health facilities are now using a standardized checklist to monitor storage conditions—86% in 2016 compared to 14% in 2014. Efforts to increase storage availability through the safe disposal of expired and unusable medicines and supplies have recovered 731,246 cubic feet in warehouse storage space for stocking incoming commodities.

**Figure 7. Increases in facilities submitting stock status reports and monitoring storage conditions from baseline to 2017**





## Lessons Learned

**Building and maintaining partnerships:** Forming and preserving relationships throughout the life of SIAPS has been vital in increasing political commitment among government officials and health workers, as well as increasing ownership of projects. SIAPS continued building on relationships with government officials and other stakeholders that began during SPS and actively maintained these relationships over the years, which ultimately became an essential factor in its continued success.

**Staff retention:** Desk officers and other MOHFW staff are frequently reassigned to other positions in the MOHFW, leading to a continual loss of institutional knowledge. In addition, resources are diverted to train new desk officers, many of whom might only be in the position for a short time. To address this impediment, SIAPS began advocating for better retention policies at the institutional level within the DGFP and CMSD to minimize quick staff turnover among desk officers and others supporting procurement.

**Sustaining political will:** Systems strengthening approaches hinge on long-term commitments from policy makers and require ongoing advocacy by stakeholders to avoid stops or delays in activities. A significant obstacle in implementing the SIAPS systems strengthening approach in Bangladesh has been the frequent turnover of high-level MOHFW staff. This can negatively affect the momentum of initiatives, as SIAPS interventions have experienced, due to the loss of a high-level champion. Anticipating this, SIAPS included capacity building among lower-level technical staff in its approach to retain continuity in ongoing activities and potentially advocate for future systems strengthening efforts.

**Systems changes require a long-term vision:** Strengthening a pharmaceutical system at multiple levels requires long-term investments and patience. Planning, designing, and implementing interconnected, systemic activities can take longer than anticipated to guarantee that the right pieces fall into the right place at the right time. Delays in implementation due to unforeseen circumstances, such as late approvals or malfunctions in technology, may also lead to extended timeframes. Unexpected time extensions also affect other planned activities by restricting the availability of technical staff to contribute to those interventions.

As a result of the success in the Procurement and Logistics Management Cell (PLMC) in overseeing procurement throughout the MOHFW, it has become a permanent unit in the ministry, with funding and dedicated staff.

**Cultivating a shared vision:** Having a shared vision and agreed priorities proved valuable in advocating for SIAPS' activities. In promoting information systems and automated tools, SIAPS successfully aligned its objectives with those of the MOHFW—in this instance with the government's commitment to the "Digital Bangladesh" vision of using technology to improve public wellbeing. Working toward the same goals resulted in support and trust from the MOHFW for SIAPS' role in the design and implementation of activities and increased the MOHFW's ownership of interventions.

**Thoughtful handover:** Transitioning ownership of activities requires extensive planning with government partners to create a strategic plan that details the requirements for establishing full country ownership of activities. This necessitates ensuring that capacity, resources, and assistance are available within the directorates to sustain achievements. In 2014, four years before the program's end, SIAPS began working with the MOHFW to organize a transition, advocacy, and policy plan to sustain the tools and seamlessly transfer operations, maintenance, and oversight to the MOHFW. Transition milestones, including technical, technological, organizational, and financial achievements, were identified, as were user and technical manuals. As a result of SIAPS' successful advocacy efforts, the PLMC is a permanent structure that fully manages the SCMP, and SIAPS has been able to gradually reduce its role in operating the SCMP.

## Conclusion

SIAPS applied a comprehensive approach to increasing access to medicines by addressing the human resource constraints that impede good governance practices at the individual and organizational levels. To further boost the capacity and efficiency of government officials, health care workers, and facility managers, SIAPS developed and streamlined numerous tools and information systems to enable decision making. By focusing on sustainably increasing human capacity and creating more harmonized systems, supply management has improved at all levels, culminating in increased access to high quality medicines throughout the country.

## Acknowledgements

Thank you to all of the staff from SIAPS/ Bangladesh for their support in the development of this technical brief.

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## References

- 1 Anwar I et al. Trends and inequities in use of maternal health care services in Bangladesh, 1991–2011. *PLoS one* 10.3 (2015): e0120309.
- 2 Ibid.
- 3 Ibid.
- 4 Health Population and Nutrition Sector Development Program (HPNSDP), 2011–16, 2011. Bangladesh Strategic Plan.