USAID Health Finance and Governance Activity

Health Technology Management at the Ministry of Health Assessment Report

September 2019

Introduction

The USAID Health Finance and Governance (HFG) Activity is working with the Government of Jordan (GOJ) to increase spending efficiency of public resources for health in support of the government's universal health coverage (UHC) goal. Currently, the Directorate of Biomedical Engineering (DBE) within the Ministry of Health (MOH), in collaboration with the Royal Scientific Society (RSS) has made significant strides in streamlining Health Technology Management (HTM) best practices to increase financial efficiency and improve quality of health services.

The World Health Organization (WHO), defines HTM as "*an area of biomedical engineering, which comprises the domains of planning, needs assessment, selection, procurement, donations, inventory, installation and maintenance of medical equipment, training for safe use and finally decommissioning. Each of these domains encompasses a wide range of activities, including providing technical advice, planning and costing work, monitoring contracts, supply chain, decommissioning and disposal, managing workshop facilities, managing staff, record-keeping, managing the inventory, stock control of parts, consumables, managing waste, and implementing safety protocols".*

When health technology is managed properly it leads to better patient satisfaction and treatment outcomes, as well as better control and efficiency in health technology expenditure and allocation of resources. Properly implemented HTM practices have a plethora of implications on the health sector including:

- Heath centers and hospitals, as well as decision makers, are given reliable information on the utilization levels and functional capacity of equipment.
- When health equipment is matched to the health needs of the health center or hospital, the large financial investment in health equipment is justified as it leads to more effective healthcare services.
- When regular maintenance is performed and staff are properly trained of equipment use the equipment remain properly utilized, maintained and safeguarded ensuring maximum use prior to decommissioning.
- Written procedures allow staff to utilize maintained equipment to maximum efficiency levels.

Objective

The objective of this study was to assess HTM implementation and practices within the MOH in Jordan. The study will serve as a baseline assessment which will illustrate a general overview of HTM in the public health sector. Initial recommendations and policy developments will be suggested based on interviews and data collection.

HTM in the Ministry of Health

The Directorate of Biomedical Engineering (DBE) is responsible for all issues related to medical equipment and HTM for MOH facilities since 2001. When DBE was first institutionalized, it faced an issue with employee retention, as the trained engineers and maintenance staff would leave to seek external opportunities. To solve this issue, the DBE resorted to two strategies. 1) The DBE signed a cooperative agreement with the Royal Scientific Society (RSS) to bridge the expertise gap, engineering, technical, and administrative staff are comprised of both MOH and RSS employees. 2) The DBE deployed an incentive scheme to reward staff based on performance.

The DBE aims to streamline the Ministry's HTM process to ensure optimal use of resources in order to improve health outcomes. To do so, the DBE has seven main departments in support of HTM processes as described below:

1- **Studies and Projects Department:** The Studies and Projects Department is responsible for the technical assessment and reporting for medical equipment needed in the public health sector. The department assesses and updates technical specifications for medical equipment as well as the study of the medical equipment needs of MOH facilities.

2- **Contracts Department:** The Contracts Department oversees all procurement and maintenance contracts as well as supervising the process of receiving the medical equipment. Any matters related to the maintenance of medical equipment during the warranty period are also handled by the department. Contracts made with agents also includes an annex stating the price of spare parts and maintenance for out of warranty repairs.

3- **Quality Control Department:** The Quality Control Department oversees both internal and externals quality measures. The department controls and audits all functions, activities, and performance levels of DBE departments to ensure the process is seamless and effective. Externally the department supervises technical quality control of the medical equipment. The department schedules visits as well as ad hoc visits to check the workings of medical devices in governorates across the Kingdom.

4- **Procurement Department:** The Procurement Department is responsible for managing approvals, financial guarantees, and purchase decisions. The procurement department has an agreed upon guideline for device requirements and assess equipment based on the approved criteria. The department works closely with the contracts department to purchase new equipment and order spare parts and medical equipment supplies. Upon completion of the process, the department evaluates the vendor and local agent on their quality and performance for future decision making. Lastly, the department manages the central store which is responsible for the receival, storage, and dispersal of spare parts and medical equipment.

5- **Information Technology and Human Resources Department:** The IT and HR Department establishes and develops computerized systems in accordance with DBE needs. The department supervises and updates all software, systems, and website for access to real time and up to date information. The DBE uses a Clinical Engineering Management System (CEMS), which automates the HTM process. Requests for new equipment and maintenance are all recorded on CEMS. In parallel to CEMS, the directorate has another automated system referred to as "computerized maintenance management system" (CMMS) that records the status maintenance request. The HR

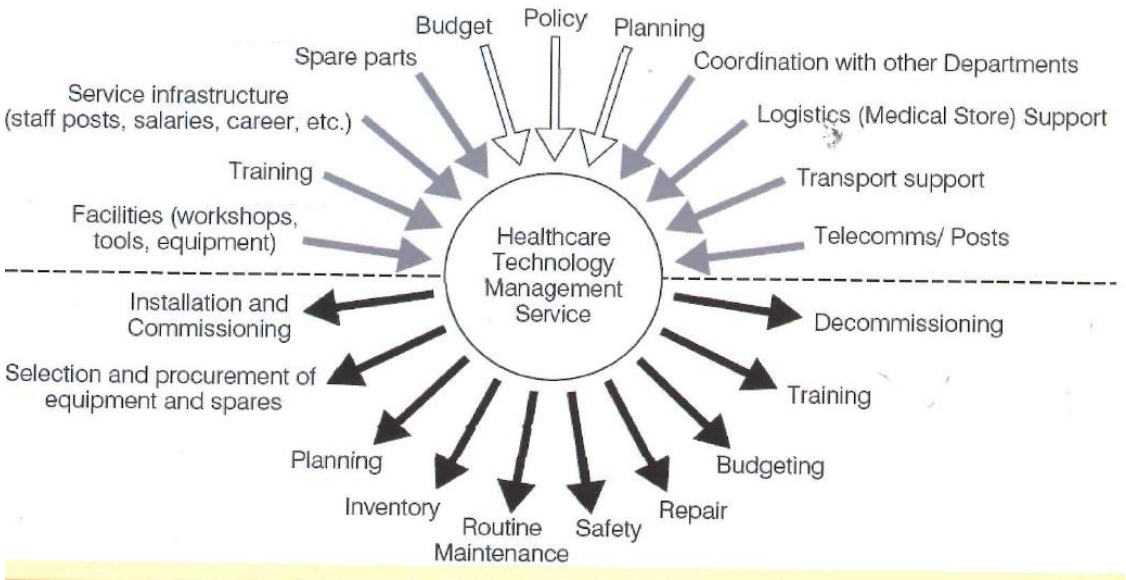
component of the department focuses on the technical training of all DBE staff and their continuous professional development to better serve the directorate.

6- **Central Workshops:** There are 10 technical working groups within the Central Workshop where each specialized working group has 5-7 engineers. Each workshop inspects specialized medical equipment and is responsible for corrective maintenance of the equipment. The Central Workshop is responsible for first line maintenance of medical equipment as well as the training medical staff at the pilot workshops. There are
7- **Peripheral Workshops:** The Peripheral Workshops conduct inspections and preventative maintenance of medical equipment based on their workshop classification. There are 28 workshop classifications and each workshop classification focuses on certain types of equipment. Both the Central and Pilot Workshops meet on a monthly basis to discuss challenges and lessons learned.

When equipment is donated, the DBE has a committee representative of the 7 directorate departments. On a case by case basis, the committee evaluates the donated equipment and assesses if there is a need for it within MOH facilities. The DBE reserves the right to deny equipment donation if the medical device is not in demand or has a high running cost/ expensive maintenance costs. This decision is made after a cost benefit analysis by the committee. However, the directorate does receive large monetary donations to purchase equipment. Funds received follows a process through the MOH's General Supplies Department as well as the internal HTM process set by the DBE.

The DBE follows the below HTM process, where the top half of the process is within the directorate, and the bottom half are activities done with MOH health facilities.

HTM Life Cycle within the DBE



Challenges

By the establishment and institutionalization of an independent medical device directorate and highlighting the importance of HTM through providing it with resources and authority, the MOH has already begun the journey towards improvement of economic efficiency in the health sector. However, due to the involvement of multiple entities there are still challenges related to HTM that the BDE faces. These challenges include:

- With the move towards decentralization, the DBE began to face issues due to the fragmentation of budget and the increased number of decision makers. As the MOH gave more decision-making authority and budgets to the governorates, it increased the requests for the purchase of unnecessary medical equipment for health facilities in their area. Upon further investigation, the requests for unnecessary medical equipment were made due to the lack of information gathering and needs assessments as well as a method for decision makers to gain political and social acceptance from the community. The purchased equipment through the direct request of the governorates did not match the priority medical device list of the DBE, which is based on evidence and needs assessments.
- The DBE operates a computerized system for maintenance requests and requests for medical equipment. The automated system allows for higher degrees of transparency and accountability when responding to purchase and maintenance requests. However, facilities enter multiple applications/requests for the same purpose which causes duplication and a back log in the system.
- Due to the large load of patients in certain MOH hospitals there is a high use of particular medical equipment causing a strain on the device leading to frequent mechanical issues or malfunctions.
- After the DBE concludes the needs assessment and the selection of the needed equipment, the external entities that are responsible for the procurement process, including the tender announcement along with the release of funds, can take up to 8 months. This delay effects the HTM process and impacts health service delivery in the related governorate.
- Justifying the decommissioning of the medical equipment and devices was deemed a challenge for the DBE, due to the frequent update to devices and safety measures.
- Although the DBE has an incentive package, many engineers leave the DBE to pursue careers elsewhere, this leaves a demand for trained staff on HTM procedures.
- For the correct implementation of HTM practices there is a gap when looking at the holistic landscape of the directorate especially when it comes to implementing Health Technology Assessment best practices.
- There have been a few cases when international organizations donate medical equipment directly to MOH facilities without the involvement of the DBE.

Recommendations

In support of HTM practices, HFG launched a resource planning tool to provide decision makers with information on medical equipment. Factors such as medical equipment distribution, operational age, and utilization rate for two high cost equipment (CT Scan and MRI) were examined. Throughout the year, this tool was introduced to different health directorates and governorate health councils across the Kingdom to provide decision makers with insight on how to effectively manage health technologies. To help the BDE and MOH make impactful decisions on a national scale, it would be useful to map the technologies across all governorates which will provide evidence and identify key gaps such as the demand vs supply in each governorate, efficient utilization of equipment, as well as the referral process of patients to the nearest equipped facility. To continue this work, HFG worked with the DBE to develop a prioritized set of actions, whereby the following was recommended:

1. Providing data for strategic planning through mapping health technologies by governorate across Jordan. This data will provide detailed insights on efficiency, cost, and demand of health technology in the health sector for decision makers.
2. Setting the landscape for improved governance practices by defining clear roles and responsibilities between central government and the governorates.
3. HFG will support the MOH and DBE with challenges due to fiscal decentralization through modifying processes and build capacity of relevant stakeholders to better meet health technology needs and priorities in governorates.
4. Improving the joint development of policies around resource allocation (monetary and technology), through a participatory approach of all relevant actors.
5. Introducing international best practices such as health technology assessments and strategic purchasing for improved cost effectiveness of health resources.
6. Conducting awareness sessions for MOH staff in different governorates around the use of the DBE's automated system and justify the reason behind singular requests rather than repeated ones.
7. Training of DBE staff and government health staff on up to date HTM practices. By developing the skills of both high-level public officials and hospital-based health professionals, implementing change within the HTM system would be a much more responsive process.
8. Reviewing and institutionalizing best practice decommissioning procedures.
9. Collaborating with the JFDA on an updated approved medical technology list, along with an alert system notifying the DBE on any safety recalls.