



TECHNICAL HIGHLIGHT

FEBRUARY 2019

DEVELOPING AN ELECTRONIC MEDICAL RECORD SYSTEM IN TANZANIA

BACKGROUND

The Joint United Nations Programme on HIV/AIDS (UNAIDS) recently implemented a surveillance-based approach to define the success of its 95-95-95 by 2030 HIV care and treatment framework—that is, 95% of people living with HIV knowing their status, 95% of people who know their status on treatment, and 95% of people on treatment with suppressed viral loads.

Further, the US President's Emergency Plan for AIDS Relief (PEPFAR) supports the Government of Tanzania in developing and implementing national HIV policies and a health-sector strategic plan to meet the UNAIDS 95-95-95 goals.¹

Measuring progress toward these benchmarks requires comprehensive surveillance and data capture. These approaches depend on consistent and accurate identification of the consumers of these health care services to optimize their care. In response, the Government of Tanzania, through its Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC), is developing an integrated national health information system (HIS) that includes an electronic medical record (EMR) program. Central to this vision is having systems that:

- Streamline workflow
- Provide seamless integration among specialized health services for tuberculosis/leprosy, HIV/AIDS, and maternal and newborn health so that an integrated, up-to-date view of the client's health and treatment status is available for all services
- Improve the availability of medicines and other medical supplies
- Enable client tracking to improve continuity of care
- Identify emerging health priorities and improve quality of client care

The Tanzania Technical Support Services Project (TSSP), which is funded by PEPFAR through the Centers for Disease Control and Prevention (CDC), supports and strengthens Tanzania's MoHCDGEC and key public health institutions to achieve HIV epidemic control and sustain HIV-related health systems and services. Management Sciences for Health (MSH) is leading the project by providing technical support on establishing client-level data systems, including an EMR system.

¹ Tanzania Country Operational Plan (COP) 2018 Strategic Direction Summary, March 2, 2017.

PROBLEM STATEMENT

Despite making good progress toward digitizing client-level data, the Government of Tanzania is still working to meet the latest global guidelines for HIV/AIDS programs. One major reason is that the country's data collection and HIS do not efficiently deliver the quality information required for effective monitoring and planning. As in many developing countries, patient records in Tanzania are captured in a labor-intensive, paper-based system that can be unreliable, making retrieval difficult and putting patient confidentiality and privacy at risk.

STRATEGIC APPROACH

In the current national health information exchange conceptual model, the EMR is an external system under the health information management domain. A health information mediator will allow various data registries and aggregators, such as DHIS2, to be interoperable.

SUMMARY OF INTERVENTION

MSH is supporting the development and implementation of an EMR system in Tanzania. The work involves engaging key stakeholders through a newly formed care delivery technical working group; developing an approach; outlining a detailed work plan with partner roles and responsibilities; gathering iterative system requirements; and managing the system development lifecycle, including planning for sustainability.

A UNIFIED EMR SYSTEM

While the MoHCDGEC is responsible for technical leadership in Tanzania's health sector, it owns less than 5% of the country's health facilities. The President's Office Regional Administration and Local Government (PoRALG) owns more than 70% of all public health facilities. The two ministries had separate initiatives for developing HIS solutions, each with different priorities: MoHCDGEC is focused on health outcomes, while PoRALG is focused on health facility sustainability and revenue collection. Before TSSP started, PoRALG had begun developing the Government of Tanzania Hospital Management Information System (GoTHOMIS) system, and the MOHCDGEC was in the process of developing an electronic Family Management System (eFMS).

TSSP played a key role in coordinating the work of the two ministries, culminating in an agreement to develop an end-to-end system. It derives administrative modules from GoTHOMIS, while clinical and programmatic modules are inherited from the eFMS.

AN INTEGRATED HEALTH FACILITY ELECTRONIC MANAGEMENT FRAMEWORK

The EMR was built and developed to adhere to existing and planned HIS guidelines, creating a comprehensive, integrated health facility management system. The resulting framework suggests the following points of business processes integration.

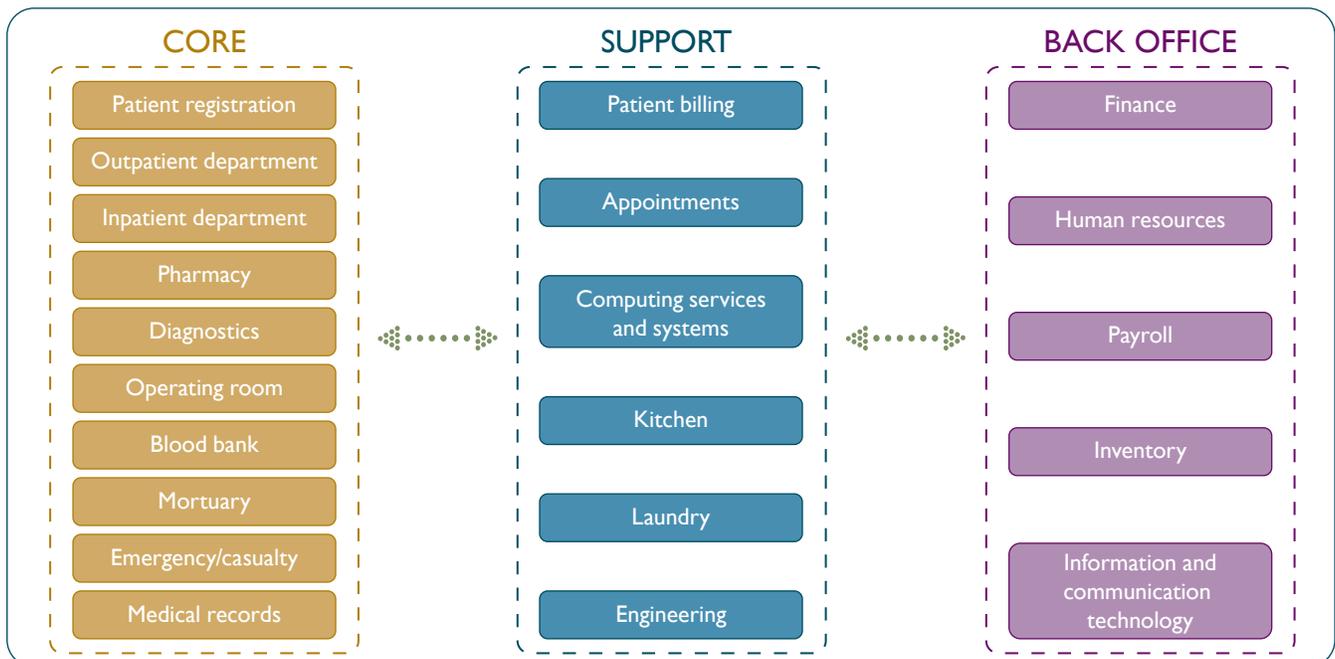


Figure 1. The health facility business process framework

ITERATIVE USER REQUIREMENTS

The EMR developers adopted an agile development methodology to ensure that the system can accommodate changes in the health care delivery environment. Before beginning development, MSH led iterative requirement gathering sessions, project management, and system testing and oversaw infrastructure implementation as well as system deployment and roll out.

PRELIMINARY RESULTS

Mirembe Hospital in Dodoma reported the following results after piloting the EMR system:

- Better stock management, which supports appropriate prescribing and consistent medicines availability
- Improved case management due to the ability to cross-check diagnoses and case history



An OPD physician and her pre-EMR paper-based medical files at Mirembe Hospital in Dodoma. She now stores and retrieves information on a hospital computer.

In addition, HIV care and treatment clinic staff value how the system automatically transfers patient testing information, if an HIV test is positive, directly to the clinic.

CHALLENGES

An EMR system can improve data quality, accuracy, and access. However, there are barriers and obstacles to deploying and using it.

BEHAVIOR CHANGE

Studies² have shown that the biggest threat to any health information system is staff either not using it or using it incorrectly. TSSP supports behavioral change by conducting workshops to help hospital administration and other system users buy into the idea prior to implementers deploying it on site.

INADEQUATE INFRASTRUCTURE

Health facilities often do not have the necessary systems and hardware for a functional information system. An end-to-end system requires input devices (computers, connected medical devices, and tablets) at most service point plus a reliable network. The EMR system supports modular usage with scale up as devices and systems are added to the facility.

HUMAN RESOURCE CAPACITY

Hospitals often have limited human resource capacity, and health workers are already tasked with caring for patients. In the early stages of adoption, a new working routine increases the length of time for patient appointments. MSH works with implementing partners to make sure that there is local capacity to support system users to manage hospital expectations, monitor results, and ensure that health facility staff adopt the system.

UNRELIABLE POWER AND NETWORK CONNECTIVITY

Power outages are not uncommon in the country and can lead to a total stall or force staff to revert to a paper-based system. The project supports the facilities and implementing partners by developing checklists and procedures for troubleshooting and protecting the network and hospital data, including backup strategies.

STORAGE SPACE

Most health facilities are already crammed with utilities and storage equipment, so the network cabinets, uninterruptible power supplies, and desktop computers that the EMR system needs can create a bottleneck. TSSP found strategic areas where such equipment could be placed with minimal interference.

CHANGE MANAGEMENT

A typical health facility will occasionally lose trained staff to another workplace and have to onboard and train new staff. An in-house information communications and technology (ICT) support unit helps retain knowledge in the facility. MSH has been involving staff from these support units in workshops on the EMR to ensure sustainability.

2 Kim, M.O. et al. Problems with health information technology and their effects on care delivery and patient outcomes: a systematic review. <https://academic.oup.com/jamia/article/24/2/246/2723147>

LESSONS LEARNED

During EMR development and implementation, it became evident that standardizing the steps comprising hospital patient case management among health facilities is important for optimal system use. In addition, there has to be a strong vision from stakeholders, backed by sustainable use cases, prior to development. Finally, EMR implementation is a resource-intensive undertaking. Where resources are limited, the system can be implemented gradually through functional areas to achieve value early.

CONCLUSION

The EMR system is key to increased data quality and granularity, integration and automation for next-generation data management, and informed decision making at the case management and central levels to stem the HIV epidemic and achieve the 95-95-95 targets. The system will enable technological advances such as systems interoperability, accommodate programmatic priorities such as HIV case surveillance and data security and confidentiality, and be a significant step toward overall health system strengthening for Tanzania by promising more cohesive and effective services.

The Government and key stakeholders should work together to roll out the EMR system in all health facilities and continue aligning system requirements with national health priorities. While Phase I implementation has made tangible gains, efforts should be made to support the system's long-term sustainability by building the capacity of health facility and ICT personnel as well as program managers and planners who will use the system.



TANZANIANS AND AMERICANS
IN PARTNERSHIP TO FIGHT HIV/AIDS



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