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Abstract

Following the successful Electronic Medical Records Systems (EMRS) review exercise that traversed various health facilities in Kenya seeking to find out the degree of functional compliance of the different target EMRS to the *Standards and Guidelines for EMRS in Kenya* document, a report shall be released by the Ministry of Health (MoH) on the findings. In addition the report shall provide information towards evidence based selection of EMRS that the MoH shall recommend for adoption and implementation at the various MoH facilities.

Health facilities develop and adopt different clinical workflows in the process of providing health services. In the process of health facilities transiting from paper based records to EMRS, among the greatest determinants of a successful process is the harmonization of the existing clinical workflow with the EMRS workflow. For best results, the existing clinical workflow ought to be analyzed to eliminate bottlenecks and ensure optimal operation. The resultant clinical workflow then guides the customization of the recommended EMRS during the implementation at the health facilities.

To ensure relevance in a given setup, target health facilities ought to be indentified for assessment of their clinical workflows. This then forms a basis for analysis and modeling of the workflows towards the realization of an optimized generic clinical workflow which guides the customization of EMRS at implementation to ensure harmony between the clinical workflow and the EMRS functional and usability design. This would ensure a shorter period in training the EMRS end users on the system use, easy automation of the existing clinical processes and a structured path towards future EMRS improvement.

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Introduction

The Ministry of Health (MoH) in Kenya has a mandate to ensure that existing Electronic Medical Record Systems (EMRS) meet the established Standards and Guidelines for EMRS in Kenya. At the same time, MoH has been in the process of identifying EMRS that it can deploy and support at public health facilities. This decision is pegged on the results from a countrywide EMRS review exercise that sought to gauge EMRS level of compliance to the standards document and from which a selection criteria would be developed to identify the EMRS to recommend for countrywide implementation at public health facilities. For purposes of achieving desired MoH results from the EMRS implementation, there exists a need for a common and generic clinical workflow. This would provide a reference point to each vendor in customizing the EMRS during implementation to meet the needs in a specific health facility.

Background

> *EMRS are increasingly being adopted in Kenya to improve medical records management, health program management, and the quality of patient care. However, the development and implementation of these systems has not been coordinated, resulting in multiple EMR systems with varying objectives, functionality, and without the ability to share patient information with other systems, programs, and the Government (ESG, 2010).*

To fill this gap, MoH developed the Standards and Guidelines for EMR systems in Kenya, which among other things defined six key functionalities that all EMRS must meet.

Beyond that, the Standards document guided the development of a tool used for the reviewing target existing EMRS countrywide to gauge their level of compliance. The EMRS review report is in its final stages before release to the public domain. The findings of the report will inform MoH to recommend default EMRS for implementation at public health facilities which it will support (MoH, 2010). Before the identified EMRS implementation, MoH in collaboration with its development partners will identify health facilities to act as model sites to demonstrate EMRS implementation, derive best practice in EMRS implementation and cost EMRS implementation at different health facilities levels.

Currently, every health facility adopts its own clinical workflow and it would be impractical to use the diverse clinical workflows to guide EMRS implementation both at the model sites and in the roll out to the public health facilities, hence necessitating the need for a generic clinical workflow.

Clinical Workflows

Introduction of EMRS at health facilities always affect the workflow at every department whose functions are automated (Ouvry, 2002). As such, it is paramount to understand the flow of information within a health facility to understand the process. Besides, this will create the opportunity to identify tasks that will be lost to automation e.g. filing of records which will now be performed automatically by the EMRS. At the stage of identifying such tasks, the management should identify how the affected employees will be redeployed within the health facility. This would be important to reduce chances of sabotage of the new system in the fear of job losses.

While the EMRS technical team may understand how to automate each function in a health facility, they will need to have the understanding of the business rules that dictate the movement of information from one department to another. Hence, the health care personnel at the health facility ought to be brought on board. These include the doctors, nurses, therapists, pharmacist, laboratory technicians among others. According to (D. Morgenstern, page 10) the health care providers should help establish processes that no longer work to avoid automating dysfunctional processes. This will ensure that the end product is optimized for better output from the EMRS.

The defined workflow (figure 1) shall list the tasks that must be performed in providing health care to patients, the order in which the tasks must be performed and the activities involved in performing each task (D. Morgenstern, page 24). For ease of understanding the clinical workflow, the EMRS technician should model the entire clinical workflow as per the narration of the personnel at each stage of health care provision within a health facility. The model will clarify the information flow and allow for its analysis to identify any bottle necks i.e. dysfunctional processes to ensure an optimal clinical workflow model.

MoH in Kenya has grouped health facilities into 6 levels (figure 2) which is based on the services a health facility provides (NHSSP II, page 13). Clinical workflows come in different flavors depending on the level of a health facility. As such there will be a need to identify the different clinical workflows found at the health facilities in Kenya. However, majority of the health facilities implementing EMRS are at level 4 and 5. This is because health facilities at this level tend to receive higher volumes of patients and have established infrastructure. Facilities at these levels also have definite clinical workflows and provide a good base to developing a guide for EMRS implementation. Historically, facilities at lower levels tend to borrow from these two levels in defining their clinical workflows. This provides a good base for developing a clinical workflow that would guide the implementation of EMRS in Kenya.

The Guidelines model

This information facilitates the realization of guiding model (figure 3) that could be adopted by other developing countries in realization of their own generic clinical workflow that corresponds to the clinical business rules in their respective countries.

1. Workflow identification

The reference workflow in the implementation of EMRS can be developed from scratch or adopted from those in use at the respective health facilities. The downside

to developing one from scratch is that it will be more time and resource intensive. It will require pilot testing at health facilities to identify that if facilitates the realization of the desired health care level of quality. This may call for extended timelines as clinical workflows tend to mature with time given the dynamic nature of health care needs.

In considering use of the existing clinical workflows, MoH or an organ responsible for overseeing the provision of health care services at the national level should decide on one or a combination of clinical workflows depending on which option provides the best mix of the desired features in ensuring provision of quality health care.

2. Selection of departmental representatives for narration of clinical workflow process

The respective employees at the different departments stand the best position of enlightening the EMRS technical team on the process of information flow and the factors that dictate the movement of information. This will guide the system logic for EMRS implementation.

Involvement of the employees on the ground is advantageous since they will identify with the process and create a sense of ownership in return leading to easier buy in while adopting the electronic based records.

3. Developing a workflow model

The technical team should then summarize the narration given at the departmental levels into an integrated work flow model that they should revisit with the respective representatives of the health facility's departments. This will then be analyzed to identify processes that are no longer effective and define replacement processes.

4. Seeking endorsement of developed generic clinical workflow

The resultant clinical workflow should be presented to the decision makers at the national level for endorsement. Its endorsement will give it a green light for its use and following the preparation of necessary policy documents for its use, the final product of the generic clinical workflow shall then inform vendors implementing EMRS at public health facilities.

Conclusion

The development of a generic clinical workflow allows for modeling and analysis of the existing workflows which ensures that any bottlenecks are eliminated leading to optimized processes. It also provides a definite system structure allowing for easy automation of processes, besides easing the process of conducting EMRS end user skill audit that will guide on an organization's training needs. Further studies should be conducted in finding out other confounding factors that could inhibit the adoption of EMRS.

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Appendices

Figure1. Default Workflow Process

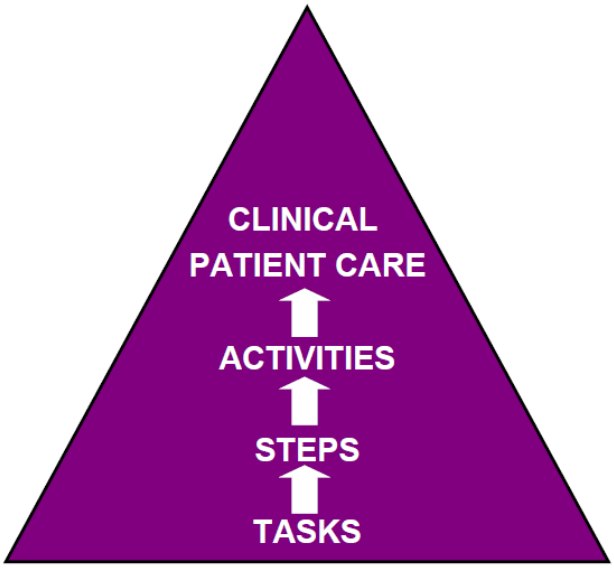

Figure 2: Services available at different levels of health facilities in Kenya

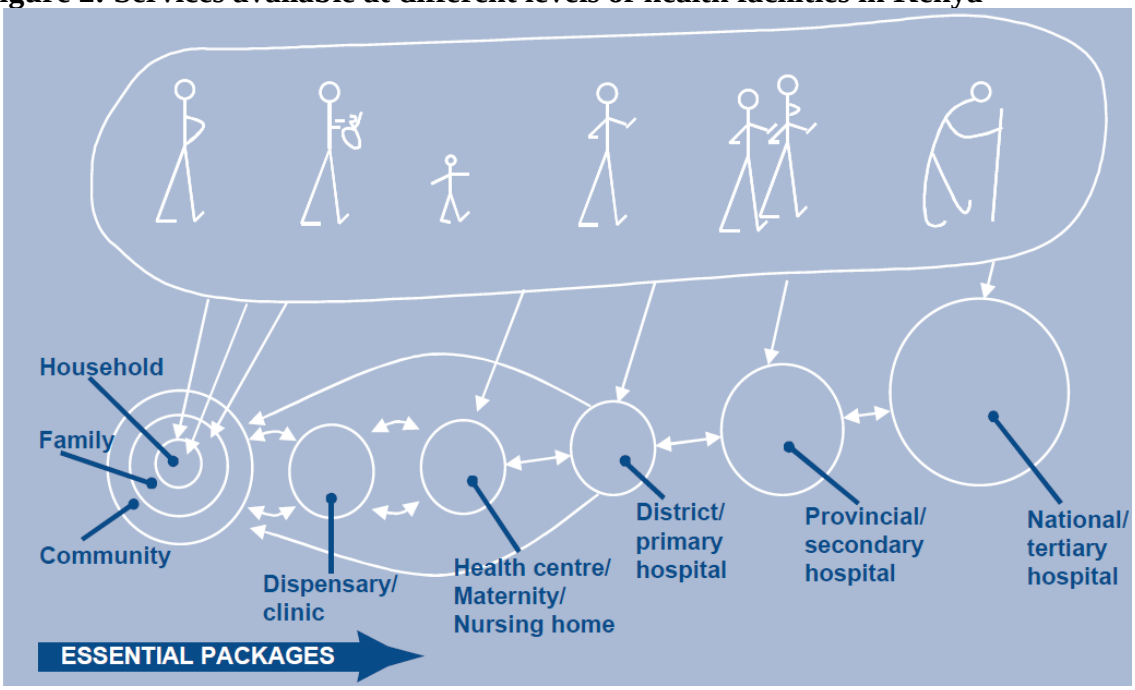

Figure 3: Generic Clinical Workflow Development Guidelines