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Research Paper

Site readiness assessment preceding the implementation of a HIV care and treatment electronic medical record system in Kenya

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ABSTRACT

Introduction: Electronic medical record (EMR) systems can yield many benefit; however, facilities need to meet certain requirements before they are able to successfully implement an EMR. We evaluated the feasibility and utility of conducting EMR readiness assessments (ERAs) to assess readiness of public facilities in Kenya for deployment of an EMR.

Method: I-TECH supported the Ministry of Health to deploy KenyaEMR, an HIV/AIDS care and treatment EMR developed using the OpenMRS platform, at over 300 healthcare facilities in Kenya. The ERA tool was designed to assess site readiness for KenyaEMR deployment. The assessments measured health facility internal environment in terms of available resources, security, technical infrastructure, and leadership buy-in and support from MOH and stakeholders for EMR implementation.

Results: From September 2012 to September 2014, a total of 381facilities received at least one ERA. Of these, 343facilities were rated as highly or moderately prepared to adopt an EMR system and proceeded to EMR deployment. 61% of these sites were set up to implement KenyaEMR at point of care, while 39% were set up to implement KenyaEMR for retrospective data entry. Across 38facilities not implemented with an EMR, common reasons that prevented the implementation were lack of reliable power, security issues such as lack of grills on the windows and un-lockable doors, and existence of another EMR system at the site.

Conclusions: ERAs conducted in a single day site visit were feasible and were instrumental in determining facilities' EMR implementation decision. Performing ERAs stimulated engagement of facility-level personnel to cultivate a fertile environment for EMR adoption and ownership. The assessments further assisted in resource mobilization, remediation of barriers to deployment, and increased buy-in from Ministry of Health leadership to support EMR implementation work.

1. Introduction

Electronic medical records (EMRs) have the potential to increase the quality and accessibility of patient data [1–3], improve clinical processes and patient safety through clinical decision support [4–9], and create efficiencies in health care delivery [5,9–11]. EMR implementation requires significant up-front investments in software design and development, implementation and training, clinic-level operating costs, and information technology support [12]. Failures–where providers or patients reject a system–can be extremely costly [13,14]. A critical step to maximize the potential for successful implementation is to assure site readiness prior to EMR deployment [15].

Readiness has been defined as "the extent to which individuals are cognitively and emotionally inclined to accept, embrace, and adopt a particular plan to purposefully alter the status quo" [16]. Researchers and practitioners have defined multiple domains of EMR readiness including: sound technical architecture and infrastructure [15,17–19], alignment of the technology platform with needs and professional interests [16,20], support from leaders and champions [15–18], sense of ownership [20], financial support [15,17,18,21], organizational values and culture [15,17], organizational flexibility to accommodate change [16], preparatory workflow redesign and staffing realignment [17], adoption of EMR-specific policies and procedures [17,21], as well as self-efficacy, favourable attitudes, and skills of system users

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[15,16,20–22]. Most of the determinants of EMR readiness are also determinants of successful on-going system use [23].

This manuscript evaluates the feasibility and utility of using ERAs to assess site readiness for implementation of KenyaEMR, an EMR system for HIV care and treatment. EMR readiness assessments (ERAs) were developed as the primary tool for evaluation of site readiness for KenyaEMR implementation. We describe outcomes of administering ERAs on a large scale in Kenya, identify lessons learned in transitioning leadership of the ERA process to the Ministry of Health (MOH), and provide recommendations on efficient use of ERAs for large-scale EMR implementation in low-resource settings.

2. Methods

2.1. KenyaEMR

Since 2009, the Kenya MOH has embraced large-scale deployment of EMRs in public sector hospitals and clinics to support improved patient health outcomes. In September 2012, the International Training and Education Centre for Health (I-TECH) received United States President's Emergency Plan for AIDS Relief (PEPFAR) funding through the US Health Resources and Services Administration and the US Centers for Disease Control and Prevention (CDC) to develop and deploy an EMR for integrated care and treatment of HIV. This led to the development of KenyaEMR, which was developed using the OpenMRS platform (http://openmrs.org/). I-TECH was tasked to implement KenyaEMR at 300facilities within four geographic regions of Kenya (Nyanza, Western, Central and North Rift).

2.2. KenyaEMR deployment strategy

The process for KenyaEMR deployment included three phases: pre-implementation, implementation, and post-implementation (Fig. 1). The pre-implementation phase included the process of engagement with MOH leadership and relevant stakeholders, site selection and evaluation of site readiness for KenyaEMR implementation. These activities required MOH leadership and engagement with HIV/AIDS service delivery implementing partners. The implementation phase involved "upgrading of sites" ranked as ready or almost ready to proceed with EMR adoption. The activities conducted during this phase included security reinforcements, hardware procurement, setting up of the local area network, installation of KenyaEMR, training of system users on KenyaEMR navigation and use, legacy data migration, and data quality assessments. The post-implementation phase involved support and maintenance of the system. Through all three phases, I-TECH prioritized system sustainability by transitioning KenyaEMR implementation leadership to the MOH to ensure that the MOH has the capacity to sustain EMR deployments in the future. Additionally, I-TECH established partnerships with local organizations including academic institutions to orient graduates with the knowledge and skills needed to use and support the system as they join the job market.

2.3. Site selection

County Health Records Information Officers (CHRIOs) and other MOH personnel, in collaboration with partners supporting HIV/AIDS care and treatment programs within health facilities (hereafter referred to as service delivery implementation partners [SDIPs]), spearheaded the site selection process and identified sites suitable for KenyaEMR implementation. The selection of sites was guided by criteria

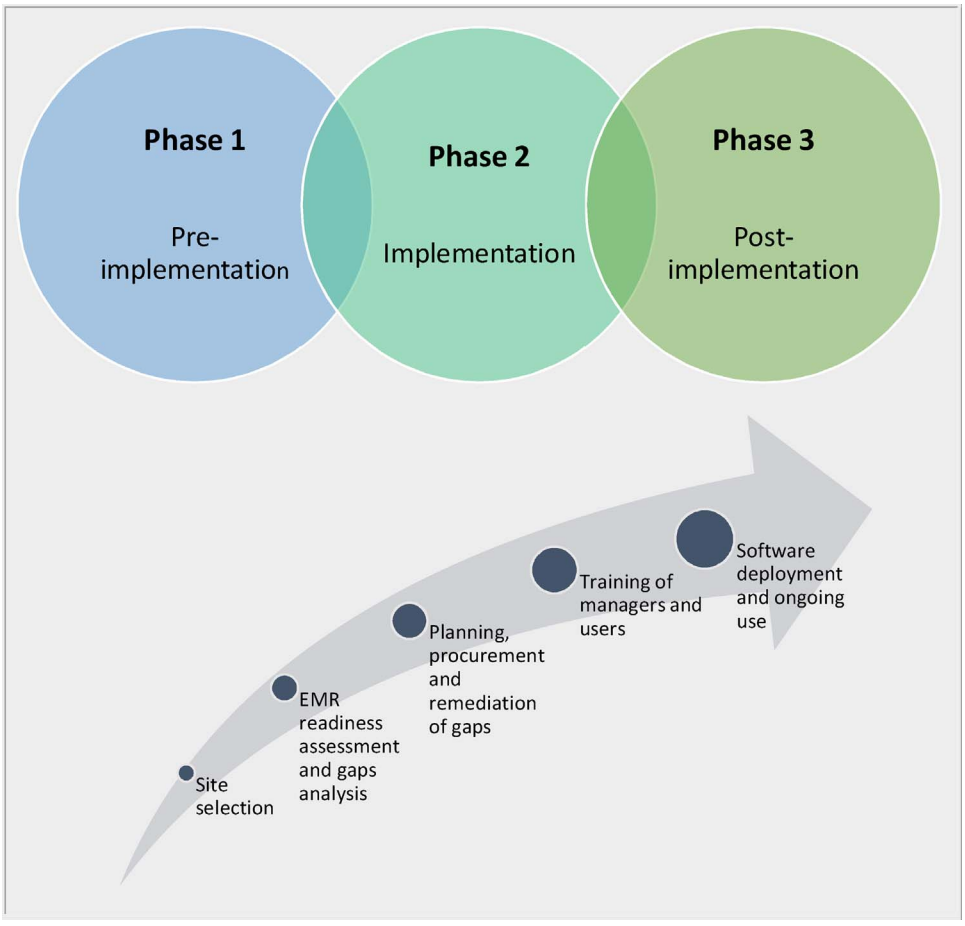

Fig. 1. KenyaEMR implementation phases.