Implementation of KenyaEMR: Direct costs and efficiencies

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Background: Implementation of electronic medical records systems is essential to facilitate longitudinal monitoring of patients in HIV/ AIDS care. The Government of Kenya developed standards and guidelines to facilitate EMR implementation in HIV care and treatment settings. Four existing systems were identified as meeting the majority of guidelines. Implementing partners received funding to facilitate broad-scale implementation of two of these systems. We assessed direct costs and identified areas of efficiency associated with implementation of one of these systems by the International Training and Education Center for Health (I-TECH), KenyaEMR.

Methods: We reviewed I-TECH financial records to estimate overall direct costs of KenyaEMR implementation during development (April-September 2012), model site implementation (October 2012- March 2013) where I-TECH and MOH staff implemented all activities and early roll-out (April-September 2013) where many activities transitioned to implementing partners, as well as site-specific costs of implementation in a subset of 35 health facilities in the Western region. We reviewed programmatic records and conducted site visits to estimate the expected number of implementations achieved (proportional implementation was assigned to each site based on milestones achieved) and to identify areas of efficiency in implementation over time.

Findings: Overall, I-TECH direct costs were $3,803,810 during the observation period. Direct costs of KenyaEMR implementation declined from $52,854 per site during model site implementation to $16,926 during early roll-out. In the Western region, I-TECH site-specific direct costs of Kenya EMR implementation averaged $9,879. Site-specific costs of KenyaEMR implementation increased from an average of $8,079 for health centers and $9,696 for sub-district hospitals to $13,022 for district hospitals. However, cost per current HIV-infected patient enrolled declined as patient volume increased; KenyaEMR implementation in sites with under 700 patients averaged $62 per patient (range = $15-$183), while KenyaEMR implementation in sites with over 700 patients was uniformly less than $12 per patient (average = $6).

Interpretation: We observed substantial increases in efficiencies of KenyaEMR implementation over time and scale. Efficiencies were gained over time as trainings were shortened and activities were transitioned to HIV care and treatment implementing partners. EMR implementation may not be cost-effective in health facilities with fewer than 700 patients.

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A mobile phone application to collect real-time live witnessed birth data for rapid provider debriefing to drive quality improvement for maternal and newborn health in Bihar, India

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Program/Project Purpose: The state of Bihar in India has an estimated maternal mortality ratio of 208 deaths per 100,000 live births. UCSF and PRONTO International are using simulation and team training to improve obstetric and neonatal emergency care in Bihar. The aim is to improve maternal and neonatal health outcomes through midwife mentoring as a component of a broader quality improvement initiative being led by CARE India.

Structure/Method/Design: PRONTO International trained a cadre of 120 midwife mentors in Bihar on how to facilitate rapid debriefs after each observed live delivery with clinical staff at 320 primary health clinics and provided mentors with a debrief facilitation tool. In the first 9-month wave of the intervention, 50 mentors piloted a paper-based version of the debrief facilitation tool answering five broad categories of questions; 1. What went well? 2 What did not go well? 3. What should be done differently next time, 4. Supply availability and 5. Patient chart data. After the pilot, the tool was transformed into a mobile smartphone application now being used by 65 midwife mentors during the second 9-month wave of the project and to be implemented in the 3rd and 4th waves as well.

Outcome & Evaluation: Following a live witnessed birth, midwife mentors respond to a series of question prompts in the app. The responses are fed back in real-time to the mentor in a guided format to help facilitate a rapid debrief with clinic staff. At an aggregate level, the data provide an evidence base for quality improvement by enabling UCSF to analyze data to monitor trends in teamwork/communication as well as use of evidence-based clinical practices. UCSF uses these aggregate results to provide real-time feedback to midwife mentors in the field as well as CARE India management staff who can use the data to identify supply shortages. Over the course of the program we anticipate collecting data from 4000+ observed live births.

Going Forward: Mobile phone application data provides real-time results that are an effective tool used to guide the feedback loop with midwife mentors at primary health clinics for maternal and neonatal care quality improvement in Bihar, India.

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Maternal health as a model to train engineering students in global health innovation

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Program/Project Purpose: Global health educational programs have historically focused on students in public health, medicine and social sciences. Most have aimed at graduate training and not undergraduate education. Engineering and technology focused programs have been few, and have often lacked a multi-disciplinary