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Assessment of the effect of an EHR system in developing countries (Uganda) on data quality and staff satisfaction, as an indirect contributor to the reduction of maternal mortality
A qualitative and quantitative comparative study

<u>Case study</u>**: Mother and Child Health (MCH), Tororo District Hospital, Uganda**

<u>Excursus</u>**: Brief evaluation of the role of traditional birth attendants (TBAs) in Tororo district in enhancing the referral mechanism to increase skilled attendance at birth.**

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The primary motivation of this research is to contribute to the reduction of maternal mortality in sub-Saharan Africa. The objective was to assess if electronic health record systems in developing countries can improve timeliness, availability and accuracy of health reports, compared to the paper-based alternative. When we have complete accurate reports in time, we can identify problems and improve processes and structures. Furthermore, staff satisfaction with the newly introduced (electronic) system was assessed. An evaluation of the role of traditional birth attendants (TBAs) was also performed in order to suggest possible ways of integrating them in the health service delivery referral mechanism in an effort to increase skilled attendance at birth.

The research was conducted in Tororo district, with hospital staff in Tororo District Hospital, staff at the office of the Director District Health Services (DDHS) and TBAs around the district. A comparative intervention study with qualitative and quantitative methods was used to compare the paper-based (pre-test) to the electronic system (post-test) focusing on accuracy, availability and timeliness of monthly routine reports about mothers visiting the hospital; and staff satisfaction with the electronic system as outcome measures. A baseline survey with the help of

an open-ended questionnaire coupled with statistical analysis of raw routine health reports at the DDHS' office were used to analyze the role of TBAs and factors hindering pregnant mothers from accessing skilled attendance at birth.

Timeliness: In pre-test phase, for 13 of 19 months routine reports were delivered to the district timely, delivery dates for six months could not be established. In post-test 100%. Availability: In pre-test 79% of reports were present at the DDHS' office; post-test 100%. Accuracy: In pre-test 73.2% of selected reports could be independently confirmed as correct; post-test 71.2%. Data on accuracy are of limited value for conclusion. Only 7 of required 222 cases for pre-test and 111 of required 341 cases for post-test could be found for inclusion in the investigation, because tremendous difficulties were encountered in finding enough mothers through direct follow up to inquire on accuracy of information recorded about them. Staff satisfaction: Staff interviews showed that the electronic system is appreciated by the majority of the hospital staff. Remaining obstacles include structural, organizational and managerial challenges, specifically staff workload, power shortages, network breakdowns and parallel data entry (paper-based and electronic). The role of TBAs: Main challenges noted as hindering mothers from accessing skilled attendance at birth are quality of service at health facilities, the cost of health service, transport, distance, and communication barrier. These demand- and supply-side challenges stretch beyond the role of TBAs.

The use of electronic health records in developing countries can indirectly contribute to the reduction of maternal mortality, if demand- and supply-side hindrances are identified and addressed to increase access to skilled attendance at birth and challenges associated with such systems are addressed to enable them to generate reliable data necessary for monitoring relevant process indicators in a timely manner, thus inform decision making with regard to maternal mortality.