Practice, policy and advocacy reports:

Electronic Medical Record System as a Tool to Facilitate Oncology Care and Data Synthesis in Rural Rwanda

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Background

- Health systems in low and middle income countries (LMICs) often lack access to EMR systems
- Open Medical Record System (OpenMRS®) is an open-source EMR platform specifically for use in LMICs
- Butaro Cancer Center of Excellence (BCCOE) located in rural Rwanda uses OpenMRS
- Before OpenMRS, all patient data was recorded on paper forms only
- Data may be inaccurate or inconsistent; no capacity for error checks
- Monitoring and evaluation and research was challenging
Objective & Methods

- Objective: To describe the implementation and step-wise evolution of OpenMRS and to illustrate its support of cancer care delivery, data reporting, and research at BCCOE

- Methods: Retrospective review and description of step-wise establishment of electronic forms and EMR applications at BCCOE
Results

- An OpenMRS-based implementation plan began in January 2013
- Initially, OpenMRS focused on electronic collection of patient demographics, socio-economic data, and medical history (March 2013)
  - Allow for patient-level compilation of demographics and diagnoses
- Data was collected daily on paper clinical forms, then entered into the EMR, designed to mirror each form
  - Allows for data checks in real-time
• Disease-specific chemotherapy templates were 1\textsuperscript{st} direct-entry e-forms to be programmed (Jan 2014)
  — Printable treatment templates with auto-populated doses, medications, and dates based on preset regimen and patient information (eg., Body surface area)
  — Allowed for reporting of cumulative treatment plans and adherence to clinical protocols

• Next, clinical intake and routine encounter forms with follow up dates were created (April 2014)
  — Allowed for easy identification of lost to follow-up patients
• Disease-specific diagnosis, staging, and treatment (DST) forms created (July 2014)
  - Improved M&E and research capacity of initial management
• Exit form: referred out, death, LTFU, refusal of care (Feb 2015)
  – Allowed for compilation of cohort-level patient outcomes
• With OpenMRS, e-forms are easily updated as clinical protocols are adjusted and new treatment regimens are added
• As of March 2016, 4,893 patients have been registered in the OpenMRS oncology platform
BREAST CANCER

DISEASE WORK-UP
This is a follow-up DST for (select reason):
- Change in treatment intent
- Change in treatment plan because of surgery results
- Change in treatment plan because of other result (specify):

Pathology completed
- Yes
- No

FINAL DIAGNOSIS & STAGING
Confirmed Diagnosis Details (include a copy of pathology report in chart)
Right breast mass:
- Size: ______ X ______ cm
- mobile
- fixed

Left breast mass:
- Size: ______ X ______ cm
- mobile
- fixed

Skin changes:

Lymphadenopathy: level(s):
- Axillary level I/II
- Infracclavicular/axillary level III
- Supraclavicular
- Internal mammary

ipsilateral:
- mobile
- fixed/matted

Contralateral:
- mobile
- fixed/matted

Notes:

Confirmed Disease Stage
TNM Staging*:
- T: ______
- N: ______
- M: ______

Overall Stage*:
- 0  I  II  III  IV

Treatment Group:
- Early
- Locally advanced
- Metastatic
The way forward:

• Updating Routine encounter form

• Scale up OpenMRS platform to National level

• Applying OpenMRS as a National Cancer Registry tool
Conclusion

• Implementation of OpenMRS is feasible in the resource-constrained, rural setting of BCCOE

• This EMR system has directly supported the efficiency and quality of patient care, facilitated data quality improvement efforts, and streamlined research and M&E

• Supports production of routine M&E reports and publication of peer-reviewed manuscripts