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## Electronic Medical Record System Improves Antiretroviral Treatment Data Quality and Use: Experience from 111 Health Facilities in Ethiopia

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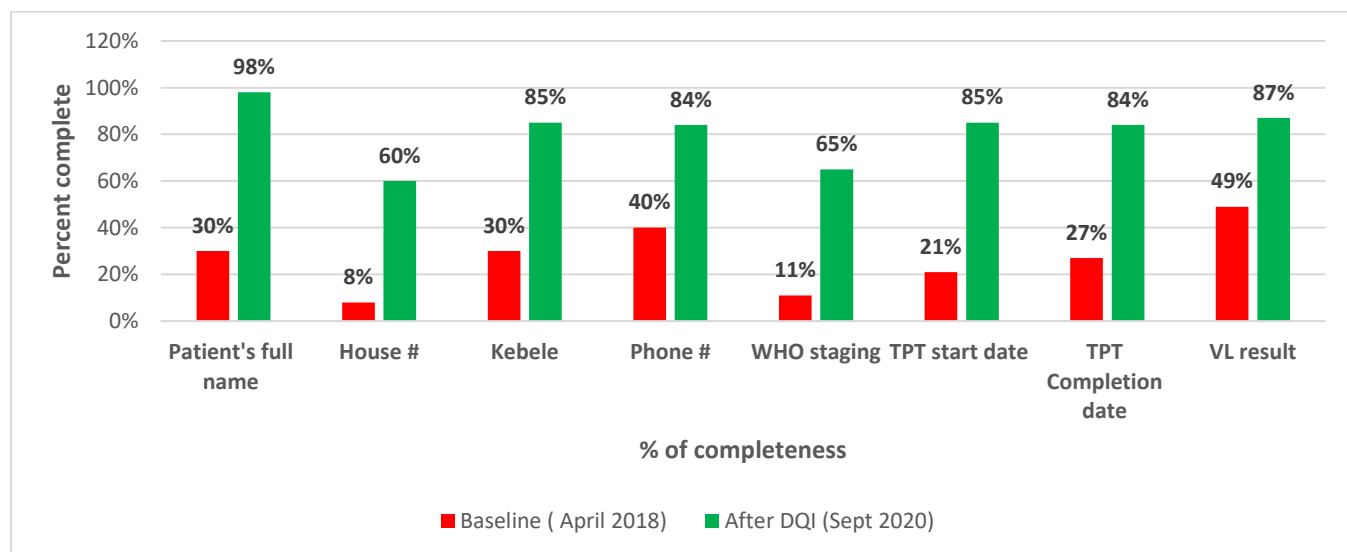
**Background :** Data quality and data use were major gaps in HIV/AIDS program implementation in Ethiopia. An enhanced electronic medical record antiretroviral treatment (EMR-ART) system was instituted in more than 470 health facilities in the country during the period from March 15, 2018, to September 30, 2020. An integrated and standardized HIV data quality improvement and data use initiative was implemented at 111 of the high HIV patient load health facilities in five regions during April 2019-September 2020. Experience gained in designing and implementing the system is presented with the results achieved through this newly introduced system.

**Intervention:** The Ministry of Health (MOH), Regional Health Bureaus (RHBs), ICAP at Columbia University (ICAP) and the U.S Centers for Disease Control and Prevention (CDC) deployed an EMR-ART based data quality improvement (DQI) and information use initiative using multi-pronged and synergistic approaches to continuously identify and solve longstanding data quality and use issues and challenges. Standard operating procedures (SOPs), and monitoring tools including tools for data entry verification, mentorship, and online reporting, and innovative approaches for communication and monitoring such as Telegram group and Google Drive were developed and utilized. A multidisciplinary team was trained on DQI procedures. The team conducted pre- and post-initiative assessments and supported health facilities through onsite and virtual mentorship. Patient information was entered by the clinician into a paper chart and, after the visit, a data clerk enters the information into EMR-ART database. A baseline data quality audit was conducted using 2,109 randomly selected patient charts to assess the level of data completeness and accuracy of both paper and electronic records. In addition, a total of 422,529 active charts were identified from all 111 facilities and the EMR-ART system and ART registers were updated. The EMR-ART system was enhanced to meet ART service-related DQA and reporting requirements.

**Results:** The baseline audit found that data completeness was <50% for demographic data such as district [39%], telephone number [49%], and house number [8%]; <20% for WHO staging at enrolment; 21% for tuberculosis preventive therapy (TPT) start date and 27% for completion date; and 49% for HIV viral load (VL) test results. Overall, 264,289 (63%) of the charts reviewed had gaps in demographic and/or clinical data completeness. After the intervention, a remarkable improvement was observed in data completeness in the assessed variables, including patient name, residential address, VL results and TPT start date (**Figure 1**). Additionally, the system significantly reduced the discrepancy in the number of patients currently on treatment in paper and Data for Accountability, Transparency and Impact (DATIM, the PEPFAR-specific web-based information system for data entry, Data Collection & Analysis) reports. The data reported through DATIM was higher than that reported through EMR-ART, but the difference

progressively declined from a baseline of 4,544 in quarter 2 (January-March of 2019) to 405 in quarter 1 (October-December) of 2020. There was no disparity in the count between the two sources during the subsequent quarters.

**Lessons learned:** The implementation of EMR-ART system in Ethiopia created a framework for collecting and analyzing ART data. It provided a platform for data analytics, which should yield long-run gains in health care quality and efficiency. The implementation of EMR-ART and DQI initiative has improved ART data quality and data use, which will have a significant effect on the quality of ART services. It is also currently serving as the sole source of data for ART related reports. The use of innovative online monitoring and mentorship approaches help in monitoring and provision of support in implementing an EMR system. The EMR-ART system improved collaboration between service providers and data personnel. Involvement of various local stakeholders in the establishment and use of the system, and ownership by the host institutions have a positive impact on the utilization and maintenance of the system.



DQI: Data quality and improvement, TPT: Tuberculosis preventive therapy WHO – World Health Organization

**Figure 1.** Data completeness on selected variables before and after EMR-ART based data quality and use initiative implementation at 111 high HIV client load health facilities in five regions, Ethiopia, April 15, 2018, to September 30, 2020.

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