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Barriers to digitization of health information in Kenya and Laos

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ABSTRACT

Introduction: Throughout the COVID-19 global pandemic, the need for improved coordination between patients, clinics, and healthcare authorities has become apparent toward up-to-date evidence-based public health decisions. The digitization of medical records has been transformative to clinical workflows and medical data management enabling seamless exchange of health information. Although low-to-middle-income countries(LMIC)' health systems would benefit from higher adoption of electronic medical records(EMRs), they have experienced low adoption in many communities. Thus, we sought to identify these barriers to digitization of medical records in Sub-Saharan African and Southeast Asian clinical settings.

Method: We designed a custom cloud-based EMR system based on local patient-held mother and child booklets. Our Women and Infant REgistration System(WIRE) was used in rural public-sector clinics in Kenya and Laos by healthcare workers during routine visits.

After 31 months, we conducted in-depth interviews with the healthcare workers and analyzed quantitative measures to elucidate WIRE's impact to clinical workflows and identify barriers to digitization of health information.

Results: The 20 healthcare workers reported positive impressions of WIRE's features and usability. Furthermore, they highlighted five barriers: 1) mother's resistance, 2) need for training of staff, 3) double work between paper and digital records, 4) need for improvements of working environment and technical infrastructure such as power and internet in clinics, and 5) need for resources. These reported barriers were reflected in the logistic regression model for performance and motivation.

Conclusions: The digitization of medical records around the globe will improve medical record management for healthcare workers and officials and enable better coordination between healthcare systems and their patients. Proper implementation of digital health systems influences healthcare workers' satisfaction and patients' empowerment. In order to further digitize health information toward an inclusive global healthcare eco-system, EMR system design and implementation must also focus on improving patient and community engagement and clinical infrastructure.

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BIOGRAPHY

Daniel Toshio Harrell is a medical researcher and IT project coordinator at the University of Texas at Austin – Dell Medical School (USA). His research focus, as a Ripple fellow, is exploring uses of blockchain technology and health information exchanges toward creating a more patient-centric healthcare record and improving interoperability in a fragmented healthcare environment. He aims to design and manage healthcare and data-acquisition solutions to help patients better interact with their healthcare providers and systems.

Daniel completed his doctorate in 2018 from Nagasaki University-Graduate School of Biomedical Science (Japan), where he studied the genetic causes of inherited arrhythmia such as short QT syndrome. Through his research at Nagasaki University-Institute of Tropical Medicine (Japan) and UT-Dell Medical School, he led and managed the research projects related to the design and implementation of electronic health information systems and epidemiological tools. These projects include subject matters relating to maternal and child health, mild-cognitive impairment and dementia, and HIV antiretroviral drug management with unique cultural and geographic requirements found in Kenya, Laos, Egypt, and the United States. As a project coordinator at UT-Health Austin (USA), he managed the technical implementation and adaption of WHO's Go.Data platform for COVID-19 case and contract tracking on the University of Texas campus.