Chapter 2
Application of Digital Technologies to Enhance Public Health Surveillance in Tanzania: Current Status, Challenges, and Future Perspective

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ABSTRACT

There is limited literature on the application of digital technology applications for disease surveillance in Tanzania. This chapter reviewed digital application technologies, existing challenges, and future perspectives in Tanzania. The data collection process involved searching for peer reviewed articles from databases such as Web of Science, Google Scholar, Scopus, and PubMed. Stakeholder consultation was also conducted through interviews of healthcare officials who were directly involved in disease surveillance process in Tanzania. Findings from this chapter showed that digital public health data in Tanzania is mainly collected through the HMIS monthly reports from IDSR. The main challenges affecting implementation of digital surveillance are poor internet, unreliable power supply, lack of integration between the existing and newly developed digital technologies, limited financial resources, and inadequate ICT personnel. The government of Tanzania should improve e-health apps funding and reporting of mobile health interventions for infectious diseases and NCDs using the WHO mERA checklist.

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BACKGROUND

Public health surveillance is important towards prevention and control of infectious/emerging disease, and involves the systematic collection, analysis, interpretation and use of data by various players in the health system to enhance human health (World Health Organization, 2018). Public health disease surveillance helps to provide early warning to the public on emergency/re-emergence of diseases of national and global threat. Surveillance also assists individual nations and global health authorities to monitor the trends of endemic and pandemic diseases, and evaluate the impacts of implemented intervention. Disease surveillance also assist in monitoring the progress made towards elimination and eradication of priority diseases (World Health Organization, 2018). Disease surveillance can be either active or passive, which is generally less expensive and involves use of data reported by health providers to the higher authorities as part of their routine activities. Passive surveillance will be the main focus of this proposed book chapter. The World Health Organization (WHO) recommends integrating digital health (e-health) technologies in disease surveillance process (WHO, n.d.-a). The term digital health refers to the use of mobile devices; mobile phones, tablet computers and personal digital assistants, as well as other information and communication technologies, Internet of things, artificial intelligence, big data and robotics, for health-related purposes (*GSMA_MobileEconomy2021_3 (1)*, 2021).

The application of e-health technologies in disease surveillance has several benefits, including; assisting timely disease detection, investigation and response to outbreaks, fast data sharing across actors, safe storage and easy access of data, minimization of errors caused by manual data entry and results into quality data, cost effectiveness and can automatically produce alerts and reports (WHO, n.d.-b). In addition, the e-health digital applications can improve timeliness and completeness of the reports which are important element of the successful surveillance system (Kastner et al., 2021).

In Tanzania, digital health technology has also gained huge recognition and digital technologies and applications are used to facilitate patient registration, diagnosis and treatment, payment of hospital bills and revenue collection, keeping of pharmacy records, provision of health education, monitoring of patients progress and promoting treatment adherence, management of human resources and collection and storage of health information (GSMA Intelligence, 2014).

There are two platforms used for obtaining surveillance data, such as integrated disease surveillance and response system and routine health management information system (HMIS), (Francois, 2021). The disease surveillance is basically conducted by following the World Health Organization Africa region (WHO/AFRO) Integrated Disease Surveillance and Response guideline of 2011. In this guideline, the WHO emphasizes on continuous surveillance and response to 34 priority diseases, conditions or events, which by their nature require special reporting and response mechanisms compared to other diseases (WHO, n.d.-b). Following the adaptation of this guideline, Tanzania included 34 priority diseases, conditions or events in its public health surveillance process, and they are classified into epidemic prone diseases, diseases targeted for elimination or eradication, diseases of public health importance, non-communicable diseases and public health emergencies of international concern (Force, 2016).

Inclusion of e-health technology in the disease surveillance process has been advocated by the Tanzanian Ministry of Health in several guidelines including; United Republic of Tanzania Digital Health Strategy 2019-2024, Tanzania national eHealth strategy June, 2013-July, 2018, and Tanzania digital health investment roadmap 2017-2023. Moreover, numerous articles have been published regarding disease surveillance and application of e-health applications in Tanzania. However, the available information still remains exceedingly disperse. This book chapter can thus assist in reviewing and updating