CO/\CTION

Mobile technology systems for surveillance in low resource settings

Donna Medeiros[1]*, Ray Ransom[2] and John Boos[1]

[1]RTI International, Raleigh, NC, USA; [2]Centers for Disease Control and Prevention, Atlanta, GA, USA

Objective

To present the prevailing global public health informatics landscape in developing countries highlighting current mobile system requirements and usage for disease surveillance and revealing gaps in the technology.

Introduction

Mobile technology provides opportunities to monitor and improve health in areas of the world where resources are scarce. Poor infrastructure and the lack of access to medical services for millions have led to increased usage of mobile technology for health-related purposes in recent years. As adoption has increased, so has its acceptance as a viable technology for health data collection. The ability to provide timely, accurate and informed responses to emerging outbreaks of disease and other health threats makes mobile technology highly suitable for use in surveillance data collection activities and within the arena of global health informatics overall. The American Public Health Association (APHA) defines global health informatics as the application of information and communication technologies to improve health in low-resource settings, which include the following:

- linking disparate sources of data together through natural language processing;
- use of mobile health technologies for disease surveillance;
- use of telemedicine to manage chronic disease;
- use of digital libraries to increase knowledge and awareness of public health events.

Methods

Based on donor-funded global health projects, systems requirements were gathered and existing mobile systems were evaluated for use in surveillance in low-resource settings. In advance of the tools evaluation, literature reviews were performed, and informatics experts at the Centers for Disease Control and Prevention (CDC), the World Health Organization (WHO) and various global nongovernmental organizations (NGOs) and associations were consulted and then recommendations were formulated. Systems were evaluated based on minimum requirements, which included maturity, usage, scalability, interoperability, functional features related to data collection and attributes that enable country ownership and generate high data quality.

Results

In our evaluation, no single system was found to meet the needs of all the surveillance requirements. Mobile technology standards and guidelines were searched for, with none being found. An open-source, end-to-end software solution that is readily available and able to meet the needs of health surveillance was not identified, although several systems were deemed promising and have garnered significant use. Key features of an end-to-end mobile surveillance system would include the following:

- easily adoptable;
- open source or public domain;
- able to support multiple mobile platforms;
- form design environment;
- enumeration, case selection and case management;
- multilingual and Unicode functionality;
- client-server deployment (local and cloud based);
- SMS enabled;
- rational database system data storage;
- data extraction to statistical file formats;
- embedded analysis and report capability;
- GIS/GPS enabled, with global mapping capability;
- geospatial analytic capability;
- data visualization.

Conclusions

Mobile technology has emerged as a key component of global health informatics. With the expansion of this technology, a plethora of tools and systems have materialized. With so many systems, it is difficult to know which tools to apply. To add to the confusion, no standards or guidelines currently exist. Additionally, there is a clear need for an end-to-end, open-source, scalable mobile system that incorporates functionality for questionnaire design, data management, analysis and reporting.

These gaps must be addressed in order for mobile surveillance technologies adoption to advance adequately.

Keywords

Mobile technology; informatics; open source; low resource settings; surveillance systems

*Donna Medeiros
E-mail: donna_d_medeiros@yahoo.com

Citation: Emerging Health Threats Journal 2011, **4**: 11193 - DOI: 10.3402/ehtj.v4i0.11193

101

(page number not for citation purpose)