Using mHealth to strengthen real-time disease surveillance and response in Kenya

DATA COLLECTION

Implementation date: 2013

In many resource-constrained countries, there are barriers to reporting real-time, accurate and comprehensive information when outbreaks occur. In Kenya, health facilities used paper forms, non-structured SMS and other means to report suspected priority diseases weekly to the sub-counties, while sub-counties used unstructured SMS, phone calls and an electronic web portal system for weekly reporting to the Ministry of Health (MOH). However, it could not be ensured that data moved up to appropriate levels and response to outbreaks all occurred in real-time.

In order to address this critical gap, the MOH, in partnership with Japan International Cooperation Agency (JICA), Japan Science and Technology Agency (JST), Kenya Medical Research Institute (KEMRI) and Nagasaki University Institute of Tropical Medicine (JICA-JST SATREPS project), and in collaboration with Strathmore University Faculty of Information Technology, commissioned the development of mSOS, a mobile SMS-based disease outbreak alert system.

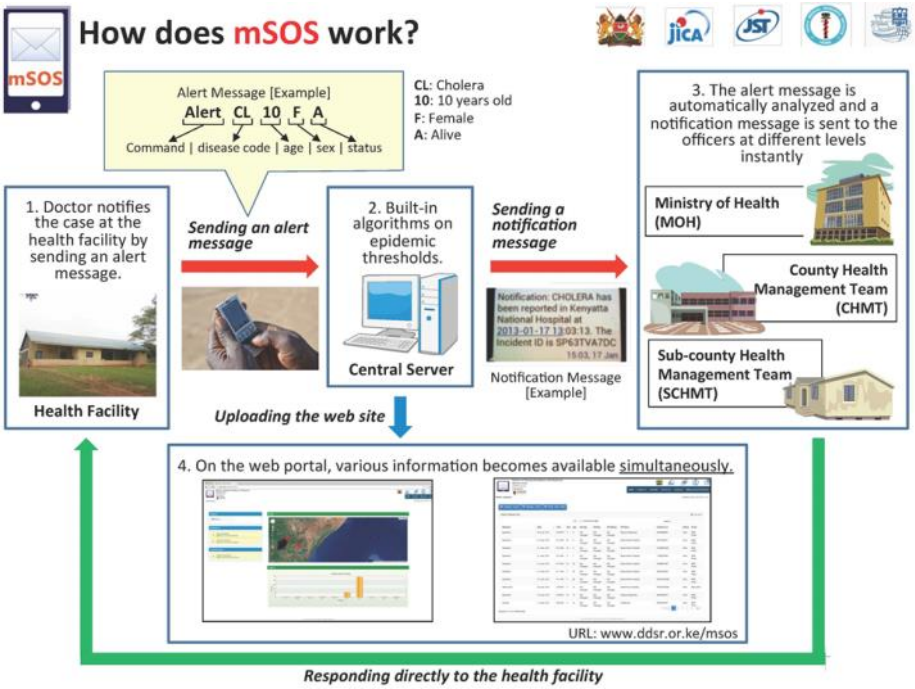
About mSOS

mSOS is a SMS-based disease notification system where health care workers immediately relay information on suspected priority diseases to sub-county, county and national MOH officials by sending structured SMS messages to a toll-free number. The system can be used on both basic mobile phones and smartphones.

mSOS is also equipped with a password-protected web portal where maps, epidemic graphs and tables of suspected incidences (based on SMS notifications sent via mSOS) and response actions (based on reports by the MOH, county and sub-county disease surveillance coordinators) are displayed on the web portal in real-time. All information is displayed and reviewed in real-time, and all data is stored at a server owned by the MOH. MOH officials use these tools to map incidences and plan outbreak containment measures.

Priority diseases are mainly classified into three categories: epidemic prone diseases, diseases targeted for elimination or eradication, and diseases/conditions and events of public health significance. For example, if a physician sees a patient with symptoms consistent with Ebola, he/she can use mSOS to notify the designated MOH officers in real-time so they are equipped with information to take immediate action.

mSOS also sends mass SMS to relay important disease surveillance and response information, such as case definitions and isolation measures, to mSOS-registered users.



Evaluation and Results

A cluster randomized control study was conducted to assess the effectiveness of mSOS. In-depth interviews and documents reviews (clinical registers, surveillance reports, etc.) were conducted at 127 health facilities and 11 sub-county health management offices. The health facilities included public, private and faith-based facilities representing various levels in the Kenya health system, including dispensaries, health centers, district and sub-district hospitals, medical clinics, maternity homes and nursing homes.

In the six-month pilot period (November 2013 to April 2014), 58 out of 127 health facilities were randomly selected to use mSOS. A total of 380 notifications were sent using mSOS. According to the in-charge interviews, 72.4 percent (42) of those who used mSOS thought the system was easy to use and 72.4 percent (42) thought mSOS was helpful in reducing reporting challenges. In addition, 55.2 percent (32) thought mSOS was helpful in triggering a response action. Lastly, 79.3 percent (46) suggested that mSOS should be rolled out nationally. More results will be released in 2015.

The system and has targeted 14 priority diseases since November 2013. To date, mSOS is operating in Kenya in seven sub-counties in Busia County and five sub-counties in Kajiado County. The Kenyan MOH has also expressed interest in national scale-up.

Lessons Learned

- mSOS allowed opportunities to strengthen data collection and research on disease surveillance in Kenya
- The system provided a platform for capacity enhancement, supportive supervision and sensitization of health workers on surveillance activities
- mSOS ensured sustainability by promoting the use of local technology, which enabled modification and system integration to suit various platforms and local needs
- The system enabled student mentorship (students in IT, public health and epidemiology) and learning through engagements with a local university on system development and programming

Conclusion

mSOS, a mobile SMS-based disease outbreak alert system, has revolutionized the approach to disease surveillance and response by making data available real-time. mSOS has the potential to help control the spread of diseases and protect the Kenyan people. Through a wider rollout, there is potential to enhance notification, detection and containment of potential disease outbreaks.

Geographic Coverage: Busia and Kajiado Counties, Kenya

Implementation Partners: AJICA-JST SATREPS Project: Japan International Cooperation Agency (JICA), Japan Science and Technology Agency (JST), Ministry of Health Kenya, Kenya Medical Research Institute (KEMRI), Nagasaki University Institute of Tropical Medicine

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