

# Mobiles in support of Sentinel Site Surveillance (mS-cube)

## PROJECT REPORT

for OpenRosa<sup>1</sup>,

by Nuwan Waidyanatha<sup>2</sup>

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## Abstract

The paper and labor intensive paper based activated passive disease surveillance and notification system in Sri Lanka is inefficient. Moreover, the district wise aggregated counts confined to only twenty notifiable disease, does not depict the comprehensive statistics of the entire public health status (i.e. chronic diseases and other communicable diseases are excluded). This project, following the success of the Real-Time Biosurveillance Program<sup>3</sup> (RTBP), investigated the RTBP scalability and institutionalization issues. It was pilot tested in the wayamba Province of Sri Lanka. The Infectious Disease Control (IDC) nurses, in the province, were given training on the “mHealthSurvey” mobile application and provided with mobile phones for submitting digitized all outpatient and inpatient health records. The findings are that the relatively older IDC nurses find it difficult to enter data with the mobile keypad and do not have an incentive to submit all patient records (i.e. reluctant to change). Nurses recommended that larger screens with a mouse or easy to scroll capabilities (e.g. Tablets PC) would be versatile and easier to use. Based on the RTBP findings, the policy recommendation were that each hospital should employ an assistant to digitize the health records. The incremental cost in hiring a new resource person does not affect the total cost of ownership<sup>3</sup>. During this project, the Wayamba Province Health Ministry hired hospital assistance. However, the recruitment was politically influenced, which resulted in hiring English illiterate persons that had no aptitude for digitizing health records. To strategically introduce an electronic version of disease surveillance and notification would be to align the RTBP with the existing Sentinel Site Surveillance (S3) programs. The S3 data collection, inferencing, and dissemination can be enhanced with the use of mobile technology. A technical annex to this report contains the recommended mS-cube Software Requirement Specifications (SRS) for developing such a mobile software suite for supporting the S3 programs. The SRS version 1.0 focus is purely on three components required for disease surveillance and alerting: collection of outpatient, inpatient, and special disease investigation data.

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1 This report is prepared for OpenRosa: <http://www.openrosa.org/> in relation to the Country In Code grant. The grant is managed by Dimagi, Inc. of USA (<http://www.bcorporation.net/dimagi>).

2 Nuwan Waidyanatha profile page: <http://www.lirneasia.net/profiles/nuwan-waidyanatha> and email: [nuwan@lirneasia.net](mailto:nuwan@lirneasia.net)

3 Real-Time Biosurveillance pilot in India and Sri Lanka - <http://tinyurl.com/24cpkry>

## Introduction

The present day paper based disease surveillance and notification system in Sri Lanka (Figure 1) takes as much as seven days before Public Health Inspectors receive information from health facilities to carry out investigations in relation to priority infectious diseases; then another fifteen to thirty days before Epidemiologist receive data for any kind of other outbreak detection analysis. The consequences of these inefficiencies have led to several deadly outbreaks such as Leptospirosis (2007/2008), Chikungunya (2006), and Dengue (2004 – present) killing several hundred people as well as affecting the household productivity and government health budgets. In addition to the cost associated with latencies, there is an immense cost associated with the labor and time intensive paper work resulting from excess travel for hand delivery of documents, inability to monitor progress and manual consolidation of records for upstream statistical reporting.

The Real-Time Biosurveillance Program (RTBP) that was made possible through a grant from the International Development Research Center of Canada, was a pilot project designed and led by LIRNEasia. It was carried out in a south Indian and northwest Sri Lankan district. The RTBP developed and tested the mHealthSurvey<sup>3</sup> mobile application for digitizing outpatient and inpatient health records.

Riding on the success of the RTBP, in January 2011, the Wayamba Provincial Director of Health Services received funds from the Government of Sri Lanka and mobile handsets from Dialog to prove the scalability of the RTBP. In addition to those funds, with the support of the OpenRosa Code In Country grant, the mS-cube mobile software product was designed to improve and replace the mHealthSurvey based on the RTBP findings as well as improve the acceptance of the mobile health application by integrating it in to the institutional S3 program.

## Project activities and outputs

The original objectives outlined in the OpenRosa CIC proposal had changed from developing and field testing the mobile applications to simply mapping the present disease surveillance and notification procedures in Sri Lanka and then deliver a set of design recommendations; namely the mS-cube SRS.

We conducted a literature survey of the present day Sri Lankan disease surveillance and notification system as well as the global S3 program. Based on the findings, the project used the IEEE template SRS as the basis to document the design recommendations for developing the mS-cube (see the technical annex).

S3 procedures<sup>4</sup> are a popular public health practice in many countries, including Sri Lanka<sup>5</sup>. We identified that health data communication, case site investigations, and static reporting are the key preliminary operations. From the S3 objectives list, the mS-cube SRS focused on supporting: quantitative estimates of the magnitude of a health problem, detecting epidemics, documenting the

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4 Routine and Sentinel Surveillance methods - <http://www.emro.who.int/publications/emhj/0201/06.htm>

5 Manual of Guidelines for Sentinel Site Surveillance in Sri Lanka - <http://tinyurl.com/2dbxok5>

distribution and spread of a health event (specifically public health events), monitoring changes in infectious agents, and planning. The design specifications position mS-cube as a tool to complement the present day S3 procedures by offering a mobile phone based technological approach to overcome the paper and labor intensive challenges.

## **Conclusion**

A country context customizable mS-cube software solution that works on, the more popular, Android and Symbian, mobile phone operating systems, as well as one that easily interconnects with other eHealth solutions can benefit developing countries in increasing efficiency gains and reduce transactional costs in relation to their S3 programs.