# *Real-Time Biosurveillance Program*
# Sri Lanka Healthcare Worker planning meeting Report

The scope of this report is to share the notes from the two meetings held in Sri Lanka on 7th and 8th October 2008: *healthcare worker planning meeting* and *technology design meeting*. This is the second workshop, related to the pilot project: Evaluating a Real-Time Biosurveillance Program (RTBP), since the project started in July this year. The first meeting was the "partner planning meeting[1]" held in Chennai, India during the month of August this year.

**Key Words:** Community, m-Health, Disease, Epidemiology, Surveillance, Mobile Phone, Statistical Data Mining, Alerting, Information, Communication, Technology, Sri Lanka

## Healthcare worker planning meeting

The full day meeting was organized by Sarvodaya Shanthi Sena in collaboration with LIRNE*asia* and was held at the Medical Officer of Health (MOH) office auditorium in the town of Kuliyapitiya, Kurunegala District, Sri Lanka, on 7th October 2008.

Attendees:

*Figure 1: Attendees from Villages, Government, and Sarvodaya*

[1] A blog of the partner planning meeting with report can be found here - http://lirneasia.net/2008/08/rtbp-partner-meetingrepot/

- Four MOH officers from Wariyapola, Kuliyapitiya, Pannala, and Udubedewa overseeing the four MOH divisions, in Kurunegala District, where the RTBP is to be pilot tested
- Sixteen Sarvodaya Shanthi Sena Community Healthcare Volunteers from the same MOH divisions attached to sixteen "Suwadana" Centers (i.e. Comprehensive Community Healthcare Program Centers)
- Four Sarvodaya Divisional Coordinators, supervising the selected RTBP villages, and the Kurunegala district Coordinator
- Resource persons including the Director Sarvodaya Shanthi Sena and Executive Director Sarvodaya from the Sarvodaya Head Office in Moratuwa
- Technology partner representatives from the Post Graduate Institute of Medicine, Lanka Software Foundation, and Rural Technology and Business Incubator
- LIRNEasia RTBP Project Director

The objectives of the meeting:

- Bring together the Medical Officer of Health, Community Healthcare Workers, and other Experts to discuss the RTBP research objectives
- Demonstrate the concept of using ICT for disease surveillance and notification through a community based approach
- Provide an opportunity for participants to give feedback on the research design, specific objectives, and hypothesis
- Agree on the tasks, deliverables, and time-lines
- Conduct a survey through a questionnaire to understand the disease surveillance and notification competency levels and technology readiness of the Community Healthcare Workers

Summary of the speaker presentations:


*Figure 2 Event speakers and Medical Officer of Health*

**Sarvodaya comprehensive community healthcare program** (*Vinya Ariyaratne, Sarvodaya*):

- Healthcare is more than absence of disease; it is a combination of physical, psychological, social, and spiritual well-being; in practical terms can be defined as happiness and fitness. Health challenges are due to demographic alterations, malnutrition, epidemiological patterns, violence/injury, child abuse, war related problems, mental health, and substance abuse.
- An assessment of low birth weight, infant mortality, and food insecurity show that the distribution of healthcare services in Sri Lanka is not uniform and it is biased along the urban-rural divides.
- State of health in the communities is attained by developing the ability to think and understand, being free to decide and act, and act through social organized groups. A holistic approach goes beyond medical care to encompass social, environmental, economical, emotional, and spiritual aspects of health.
- Establishing of a village Suwadana Centers to provide comprehensive community healthcare programs through an holistic approach, supervised by Sarvodaya Shanthi Sena, is part of the mandate for a village to become a self governing community.

**Current Disease Surveillance and Notification System** (*Roshan Hewapathirana, Post Graduate Institute of Medicine*):

- Present day disease surveillance and notification system in Sri Lanka what was established in 1897 under the "quarantine and prevention of disease surveillance ordinance", which is purely a paper based system with a few improvements that have happened over the decades.
- Communication focus is on established notifiable diseases that are grouped as A and B.
- Suspected disease, without delay, at the time of first detection is communicated to the relevant medical authorities; where the personnel and institutions notified for group A and group B are different.
- Upstream communication process, with the use of the national postal system, can take up to 3 weeks. The notification uses a series of forms: H544, H399, H700, H411, and H411a. These forms are handed up and down between the Medical Officers of Health (MOH), Public Health Inspectors (PHI), Director General of Health Services (DGHS), Deputy Director General of Public Health Services (DDG), Chief Epidemiologist, etc.
- Summary of the diseases are reported by the National Epidemiology Unit through a report called the "Weekly Epidemiology Report".

**RTBP research objectives** (*Nuwan Waidyanatha, LIRNEasia*):

- Entire sequence of communication links between all actors involved in communicating disease information for surveillance and notification, the researchers of the RTBP have identified the process of communicating the H544, H411, and WER are the major drawbacks in the current paper based system.
- Proposed mobile phone based data collection, computer based statistical analysis, and mobile phone based notification system will eliminate the latencies and consistencies of communicating health information both upstream and downstream.

- Specific objectives of the RTBP is to evaluate – 1) effectiveness of the mobile phone advocated e-Health system for detection 2) latencies of communicating diseases 3) contribution of community and gender 4) developing a tool kit for assessing RTBPs.
- Research matrix comprising thirty two villages uniformly covering four MOH divisions has been proposed; where the Community Healtcare Workers in the villages will be given mobile phones to submit health data for analysis and reporting.
- Research matrix is further divided in to those villages that are exposed to the RTBP and those that are not; where the ones that are not exposed will play the roll of the control space. The research is driven by 6 hypothesis used as a guide to assess the outcome of the introduced Information Communication Technology disease surveillance and notification system.

**J2ME screen shots – Healthcare Application** (*Geetha G., Rural Technology and Business Incubator, IITM*):

- Main menu comprises two options – 1) Healtcare worker screens and 2) Provider screen. Healthcare workers are the personnel collecting the health data and receiving notification reports.
- Providers are the hospitals, clinics, dispensaries, maternity homes, general practitioner, etc that provide healthcare services.
- Mobile application will store profiles of all the healthcare providers of each healthcare worker's area. The data submitted will be linked to each provider.
- Healthcare worker's work-flows will begin with a login screen; upon successful entry will navigate to the health data capture screen. The health data capture screen will requires that the user enter the diagnosis, syndrome, age group, gender, and number of cases. The data is first stored and later submitted to a central database via GPRS or SMS connections for analysis.

**T-Cube web interface demo – time series panel and map panel** (*Michael Knight, Auton Lab, CMU*):

- Demo was based on 6.6 million medical records, from 1818474 locations, 222 hospitals, 8 diseases, 4 age groups, and 3 genders.
- Time series panel allows the user to filter the data by postal-code, hospital, disease, age-group, or gender. The time series graph shows the trends for a selected time period which contains the counts and the p-value.
- Graph also displays the baseline, which can be used to identify anomalies in the current set of data. Temporal Scan highlights the sections with adverse events.
- Map panel marks areas with disease outbreaks using a series of circles. The area of the circle is proportional to the geography and population densities infected and the number of circles in a given area illustrates the propagation intervals with respect to time.
- Spatial scan algorithm paints the areas with interesting events such as going from a period with a few results to a significantly large amount of results, which may insinuate a disease outbreak.

**Sahana disease surveillance and messaging modules** (*Roshan Hewapathirana, LSF & PGIM*):

- Inputs to the disease surveillance module are in par with the H544 form, which captures the diagnosis, syndrome, location, gender, and age information among others.
- Once the form is completed the user can send a report to the relevant personnel such as the MOH, DGS, Epidemiology Unit, etc. Upon submission the relevant recipients are alerted via an SMS message.
- Recipients can access the web based interface via the internet to review the entire set of information. The user can also produce a WER which summarizes the disease counts by district. If needed the user can drill in to the data to view a particular district's data or even drill further to a particular hospital in that district.
- Data collected through the mobile apps will be stored in the Sahana DS database. The subsets of data required for analysis will be queried from the same Sahana DS database.

**General Discussion** (*Chaired by Nuwan Waidyanatha, LIRNEasia*):

- Volunteers expressed concerns on collecting data from government facilities. Although proper approval is received from the national level through the Ethical Review Committee of the Colombo University of Medicine, it is questionable whether the hospitals, clinics, dispensaries, etc would share the data. In most cases the data is not properly recorded and archived. On the other hand the healthcare workers at the facilities may be burdened with requesting data, an added task to their daily routine.
- English language competency; especially in vocabulary in relation to health, is rather weak among the Suwadana Center volunteers. Therefore, they will need a table which contains the local language translations of the necessary health field terminology. Even with the translations, we anticipate difficulties in entering the correct information. This dilemma will be taken into consideration in the design of the mobile app; where by all known values will be made available as look ups or in drop down fields.
- Volunteers would require a rigorous training in the field of disease surveillance and technology use.

**Closing Remarks** (*P. V. Ariyawansa, Sarvodaya, Kurunegala*): The importance and the uniqueness of the project were highlighted, which is an endeavor to provide rural communities with means for health security. All project actors (mainly the healthcare workers) need to work in collaboration with the government institutions; especially the MOH in their respective areas. The success of the ICT system is highly dependent on the availability of data. It is uncertain at this point as to whether the data is available and if available can be retrieved without a problem. The current practice is for a practitioner to examine the patient diagnose and prescribe treatment without any documentation. The Bed Head Ticket (BHT), which is the document that carries each patients information, which may not be available as there is no hard rule forcing practitioner to provide these details.

**Healthcare worker questionnaire**: A questionnaire was prepared to get a feel for the competency levels and technology readiness. A copy of the questionnaire can be found in the appendix. A summary of the questionnaire results will be published after the assessment and analysis is complete, anticipated to be in 2 – 3 weeks.

Suwadana Center visit

*Figure 3: Sarvodaya Suwadana Center*

The workshop participants traveled to a nearby Sarvodaya Suwadana Center in Kuliyapitiya. A few of the healthcare services provided are – pre/ post maternity care, simple laboratory services (i.e. scrutinizing stools, blood, pressure, etc), first aid care, child care, so on and so forth. This center is 10 years old belonging to a stage 5 Sarvodaya village with other community services such a preschool and micro finance bank. Unlike the government healthcare facilities, the volunteers at the Suwadana Centers maintain strict records of the patients.

## Technology design meeting

A meeting between the RTBI, LSF, and LIRNE*asia* team was held at the LSF lab on 8th October 2008. The aim of the meeting was to discuss the customer attributes, functional requirements, and design parameters. Both LK and IN healthcare systems have similarities in communicating disease information, which capture the diagnosis, syndrome, gender, age group, and number of cases. The common census was that the mobile application should 1) be capable of storing the provider (hospital, clinic, general, practitioner, etc) profiles with name, address, and contact information 2) be capable of capturing the diagnosis, syndrome, gender, age group, and location information. The Sahana DS database will provide the tables and fields to store the mobile application captured data. The technology team will complete the user requirement specifications based on the LK and IN studies already completed. Thereafter, begin work on developing the software requirement specifications. The target date for completing the beta release has been set for mid December.

## Remarks

The workshops (meetings) held in Sri Lanka helped the project identify the possible and impossible tasks and developments. Based on these lessons learned from the meetings the project will design the software as well as develop the standard operational procedures and training regime. The parallel meeting to be held in India has been postponed as a result of delays in obtaining government approvals. The meetings are anticipated to be held in early or late November of this year.

# APPENDIX - Healthcare Worker Planning Meeting Questionnaire

This questionnaire is intended for Healthcare Workers participating in the Real-Time Biosurveillance Program: Pilot Project workshop in the District of Kurunegala. The information gathered through this exercise is for the purpose of the RTBP project and is not to be distributed without the consent of Sarvodaya Shanthi Sena Sansadaya.

Each participating Healthcare Worker should complete this questionnaire to the best of your knowledge. Thereafter, submit this form with your answers to Shanthi Sena Sansaday, 98 Rawathawatta road, Moratuwa. If you have any questions related to this questionnaire, please contact Mr. Ravindra Kandage, Director, Shanthi Sena; telephone 0112 655049 or email: sarvoshanthi@sltnet.lk .

Through this exercise the project aims to understand the background of the healthcare workers (i.e. the users of the ICT system) and their working environments as a precursor to defining the user requirements and studying the design challenges before developing the ICT system.

**Mandatory Information [you must answer all the questions]**

**[A]** ***Personal Information:***

| | | | |
|---|---|---|---|
| Your name | | Telephone No | |
| Title | | Email | |
| Town/Village | | MOH Division | |

**[B]** ***Demographic Information:***

***(1)*** Write the name of the villages you will be working and the basic demographic information

| | Village Name | Population | No. of Families |
|---|---|---|---|
| Suwadana Center | | | |
| Other | | | |

***(2)*** Indicate the number of government and private health facilities and General Practitioners that are accessible to the people in the villages mentioned in (1) and the average number of patients visiting each *type* of facility and the average serves per week. Example, if there are 3 Clinics in your area: A, B, & C and the average number of cases served by A=35 B=45, and C=60, then the answer you should write in the box below, corresponding to the row: "*Average Visits*" is 70.

| | Hospitals: | | | | | Other facilities: | | | | Individuals |
|---|---|---|---|---|---|---|---|---|---|---|
| *Type* | General | Base | District | Peripheral Unit | Rural | Clinics | Dispensaries | Healthcare Centers | Maternity Homes | General Practitioner |
| *Number of facilities:* | | | | | | | | | | |
| *Avg weekly Visits* | | | | | | | | | | |

**[C]** ***Knowledge on Disease Surveillance:***

***(3)*** Have there been disease outbreaks in the communities mentioned in (1)? ("***CIRCLE***" one of the boxes with your choice for an answer)?

| YES | NO |
|---|---|

| If yes, explain what they were, when they happened, and number people infected. |
|---|
| If the answer is No, explain. |

***(4)*** Are you aware of the national disease notification system? ("***CIRCLE***" one of the boxes with your choice for an answer)

| YES | NO |
|---|---|

| If yes, explain how the system works. |
|---|
| If the answer is No, explain. |

***(5)*** Name 5 of the diseases considered to be notified under the national disease notification system?

| |
|---|
| 1. |
| 2. |
| 3. |
| 4. |
| 5 |

| |
|---|
| |

***(6)*** Give examples of 5 communicable diseases and 5 non communicable diseases.

| Communicable diseases | Non Communicable diseases |
|---|---|
| 1. | 1. |
| 2. | 2. |
| 3. | 3. |
| 4. | 4. |
| 5 | 5 |

**[D]** ***Technology Readiness:***

***(7)*** Do you use a mobile phone? ("***CIRCLE***" one of the boxes with your choice for an answer)?

| YES | NO |
|---|---|

***(8)*** In the past 3 months, have you used any of the following, non voice based, technologies on your mobile phone to send or receive information? ("***CIRCLE***" the boxes that apply to you)

| SMS | MMS | Email | Internet | Other |
|---|---|---|---|---|

***(9)*** In the past 3 months, have you used any of the following technologies on your mobile phone to send or receive health related information? ("***CIRCLE***" all the boxes that apply to you)

| Voice | SMS | MMS | Email | Internet | Other |
|---|---|---|---|---|---|

***(10)*** In the past 3 months, have you used a personal computer to send or receive health related information via email or the Internet? ("***CIRCLE***" one of the boxes with your choice for an answer)

| YES | NO |
|---|---|

***(11)*** Using a mobile phone to send and receive health information would make my job easier? ("***CIRCLE***" one of the boxes with your choice for an answer)

| STRONGLY agree | AGREE | DISAGREE | STRONGLY disagree |
|---|---|---|---|

| Comments: |
|---|

***(12)*** Using a mobile phone to send and receive health information would improve the healthcare service provided in my community ("***CIRCLE***" one of the boxes with your choice for an answer)?

| STRONGLY agree | AGREE | DISAGREE | STRONGLY disagree |
|---|---|---|---|

| Comments: |
|---|

**[E]** ***Strengths and Weaknesses of the technology demos:***

***(13)*** What attributes would you add or delete in the mobile phone software data entry form?

| Add | Delete |
|---|---|
| Comments: | |

***(14)*** What feature or information would you like to add or delete from the analysis software displays?

| Add | Delete |
|---|---|
| Comments: | |

***(15)*** What information would you like to add or delete from the weekly disease surveillance reports and the disease detection notification alerts?

| Add | Delete |
| --- | --- |
| Comments: | |