

**REPORT OF EVALUATION PLANNING WORKSHOP for DEPUTY DIRECTOR  
OF HEALTH SERVICES, SIVAGANGA DISTRICT, TAMIL NADU, INDIA**

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## 1. Introduction

As part of “Real Time Biosurveillance Program (RTBP) – A pilot project”, one-day evaluation-planning workshop was conducted for the Deputy Director of Health Services (DDHS) and was attended by 10 participants, this workshop was jointly organized by IITM’s Rural Technology and Business Incubator, Chennai, India and LIRNEasia, Colombo, Sri Lanka on 18<sup>th</sup> December 2009 at Hotel Subhalakshmi Palace, Karaikkudi, Sivaganga district, Tamil Nadu. The participants were from district level DDHS office and four Primary Health Centres (PHC) of Thiruppathur block and they actively participated in the workshop (Details of participants are given in the Annexure 1). The main objective of the workshop was to reiterate the RTBP pilot’s research goals and to describe an overview of the information communication technologies like mobile phone health data analysis using T-Cube Web Interface (TCWI).

## 2. Inauguration

Ms. Suma Prashant, Project Manager of RTBI, welcomed the participants. This was followed by a session on inaugural speech by Dr. N. Raghupathy, DDHS, who mentioned that Sivaganga is one of the backward districts located in southern part of Tamil Nadu and most of the people in this district migrate to big cities/towns and abroad for seeking employment opportunities. The following statistics pertaining to Sivaganga district were highlighted:



- Literacy rate (Male 56.7% and Female 43.8%)
- 47 PHCs and 275 HSCs are functioning
- The PHC and HSC cover a population of about 20,000 and 3000 to 5000.

Dr. Raghupathy indicated that though many of the Thiruppathur block PHC staffs were sensitized with the RTBP project goals, other staffs

like Health Inspectors (HI) were not aware of this pilot project. He suggested that these staff should also be created awareness as they have similar kind of responsibilities. The Village Health Nurses (VHNs) working in HSCs are meeting only limited number of patients daily on minor ailments as the village people would prefer to go to PHCs rather than HSC. Hence, we should focus more on PHC level data where patients' inflows are high. In addition, higher numbers of people are visiting Government Hospital and other private hospitals. Considering the present scenario, he had earlier suggested to project team to capture data from PHC level also. His suggestion was gladly accepted and volunteers were appointed by project and are presently collecting the data. He ascertained that we should also work out the strategy of capturing the data at Government Hospital in the next phase of the project.

Integrated Disease Surveillance Programme (IDSP) was initiated in this district in 2004 and disease wise data from each PHC was collected regularly through paper-based system. After three years since the IDSP inception, PHCs in this district were given a computer with Internet connectivity and all the morbidity data are being entered. We are now able to retrieve data from District Surveillance Unit on the computer to respond immediately. However, this was not possible from PHCs located in remote rural area where Internet connectivity was poor. It was observed that mobile phones are highly penetrating to the nooks and corners of the district and it is also available for cheap rate. Mobile phones are becoming one of the important communication tools in day today activities. Dr. Raghupathy concluded his talk by affirming that if RTBP were successful, it would be replicated to other blocks in the same district and in the state of Tamil Nadu. Finally, he wished the RTBP project team members for successful completion of project.

### **3. RTBP Pilot Project Goals**

Ms. Suma made a presentation on project goals and objectives through power point and had a detailed discussion with the participants. She mentioned that RTBP is a multi-partner's pilot project, which is being simultaneously pilot tested both in India and Sri Lanka and is currently in the final stage. In her presentation, the following sub headings

were discussed in detail and suitable example was given at the appropriate time that was mainly on the aspects of information and communication technology (ICT).

- Implementing organizations (IITM's RTBI in India and LIRNEasia in Sri Lanka)
- Background of the project
- Information and Communication Technology
- Objectives of the project
- Village community participation at every stages of the project



While discussing about ICT, swine flue was cited as suitable example, which has to be detected early so that it could be prevented from spreading to more areas. Train ticket booking and mobile banking could be accessed using the Internet on computer and mobile phone systems, which were also cited as appropriate example related to ICT. Overall the participants were highly sensitized about utilization pattern of mobile phone particularly on health data collection. In the RTBP pilot project, we have been collecting health data through mobile phone since June 2009 and it has been analyzed and it will be presented to you in the form of graphs/charts. This will give you the clear idea on how we could capture PHC and HSC level patient data through mobile phone.

#### 4. Analysis of RTBP data

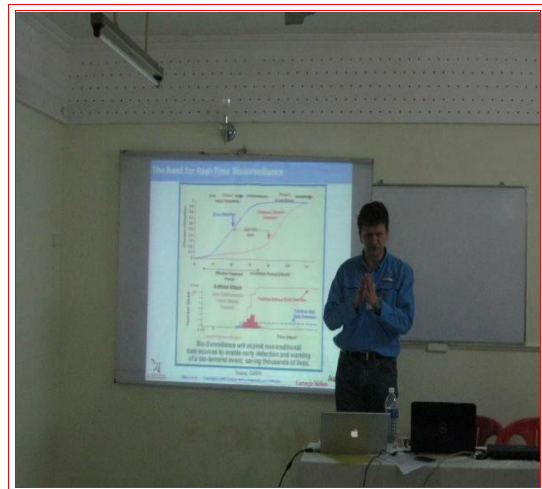


Dr. Ganesan of RTBI showcased the analysis of RTBP data that was collected from June 1, 2009 to November 30, 2009. He pointed on the personnel in-charge of data entry in the respective location of our pilot sites. The total number of records that were collected during this period was 25,955 and continuing. The data analysis on PHC wise showed that Thirukostiyur recorded highest number of records followed by

Keelasevalpatty and Sevanipatti PHCs when compared to Nerkuppai PHC. From the number of patient records submitted, there were more number in the female records than the male records and that can be due to the factor all the VHNs are female and also that the VHNs usually visit the villages during the day so the working male population data might not have been captured. Common cold, fever and body-pain were the most commonly reported symptoms, also these symptoms was found occurring more frequently during the October to November '09 but that can also be due to the fact that PHC records were beginning to get captured by project volunteers, so there we see an increase in the number of data coming in. A suggestion was given to get the actual numbers reported and compare it to the number that was entered using mHealthSurvey application; this should give us an insight on quality of data and accurate analysis.

## 5. T-Cube Web Interface for data analysis

After distributing the T-Cube manual among the participants, Prof Artur Dubrawski, Director of Auton Lab, shared the presentation that he had made in a recent conference held in Miami, USA. This presentation covered the T-Cube Web Interface for data analysis, however the representations were made using Sri Lanka data as only that was available in sufficient number to run the T-Cube analysis.



Prof. Artur elaborated on the benefits of collecting data and transmitting the same, most importantly it is to enable sooner detection, effective containment and mitigation. He elicited that early detection will decrease social, monetary and moral burden to the society. The tool's benefits include,

- Decrease in time-lag
- Avoid adverse effects on society
- Potential of use for early detection and real-time monitoring
- Situational awareness

Other than patient information, the pharmacy records can also be tapped to get information of symptomatic surge in an area. In this regard the participant group suggested by means of getting the number of long distance placed by students in hostel to track an out break in an institutional set-up. Prof Artur highlighted that when one gets data about same processes independently from different sources it adds value and intensity to data.

In the current system of the tool, it is built on epidemiological data that is collected on a weekly basis, encapsulates nine diseases and covers about 17 districts. Dr. Raghupathy mentioned that it takes one week in Tamil Nadu to do a comprehensive coverage of the epidemiological data from all of its districts. Using a technology such as the one we are using in the project, latency can be eliminated and also, since we are adding more number of fields in the T Cube Analysis, it offers a unique solution as current system has only aggregated data. There is a possibility that we could collect more than just reportable diseases.

While running the actual analysis, Prof Artur showed the audience how early detection is possible using the tool. Taking the example of Leptospirosis, by using T-Cube, it could have been detected as early as October 2007 while the actual event detected by the traditional government methods was as late as September 2008 – early 2009.

Cyclic trends and progressive trend predictions can be used by officials that can assist them to better monitor seasonal trends of certain diseases. All the various options that can be chosen from the tool to help in customized data analysis were explained. Methods on aggregation effects, moving average method, temporal scan, massive screening using multiple parameters, spatial scan and pivot table were elaborated. There was a bug that was found which will need to be fixed; scrolling by month on the panel was not functional.

## 6. CAP SMS/Email Sahana messages

Mr. Nuwan Waidyanatha, Research Director of LIRNEasia, presented on SMS and response to alert using RTBP online Biosurveillance module. At DDHS, currently they are sending messages' using the downstream module, as in DDHS sends messages to PHCs and HSCs. The audience suggested possibly in the next phase one could incorporate sending messages upstream, flag symptoms when they start appearing in the villages. The message template was given a demo and was sent to three participants from the audience, it was not delivered immediately – there was a seven-minute lag. There was another bug found during the demo – message alert/template in alerting module was not refreshing. One of the Medical Officer from the audience felt that this is a process intensive with more number of fields of information. For which Mr. Nuwan clarified that “this is just a broad framework and will need to evolve as user friendly tool”

## 7. Evaluation methodology



Mr. Nuwan discussed a questionnaire consisted of nine questions with multiple answers through RTBP website that was designed to evaluate the usability and utilization of the T-Cube Web Interface (TCWI). Each of the nine questions was discussed thoroughly and feedback was obtained to improve further on the question designing aspects. During the discussion, he pointed out that the participant's feedback on the assessment questionnaire would help the project team to make TCWI tailor made usability pattern according to the requirement of the local condition. The participants mentioned that some of the questions seem to be repetitive and it was suggested that it should be removed. Their feedbacks were kindly accepted and it would be incorporated in the structure of the questions. When we were discussing about evaluation interval, it was decided among the participants that the

TCWI assessment could be done on every Friday starting from January 2010 until the project is complete in June 2010.

Apart from TCWI assessment, we observed in the discussion that on daily basis the average number of patients per PHC is about 130 out of which 70 cases are old patients. We came to know through the Medical Officers that RTBP volunteers at the PHC level are not entering the old patient information. It is because old patient information is not available in the registry maintained by the officials at PHC. In the mHealthSurvey, there should be an option of capturing the old patient's information also, which is currently not available. It was thus concluded that it should be taken into consideration when we redefine the mHealthSurvey in future.

## 8. Concluding Session

Mr. K. Raghavendran, District Health Educator of DDHS, concluded the planning evaluation workshop by stating that mobile phone data collection is an important step in health related project. The RTBP pilot project will definitely support the IDSP activities. It was fully understood by the participants from the workshop that the TCWI would help to reduce the latencies beginning from data collection to data analysis.



This will also help to detect disease outbreak status to forecast for prevention of particular disease from spreading to other areas. Finally he proposed vote of thanks on behalf of all other participants. At the end of the workshop, Prof. Artur was requested to present momentum to all the participants.

**Annexure I. List of Participants**

<b>Sl. No.</b>	<b>Name of the participant and Designation</b>	<b>Name of Organization and Place</b>
1.	Dr. N. Raghupathy Deputy Director	Deputy Director of Health Services, Sivaganga district
2.	Mr. K. Raghavendran District Health Educator	Deputy Director of Health Services, Sivaganga district
3.	Mr. U. Ravi Data Entry Operator	Integrated Disease Surveillance Programme Unit, Deputy Director of Health Services, Sivaganga district
4.	Dr. C. Rajkumar Medical Officer	Primary Health Centre Thirukostiyur
5.	Dr. B. Bagyalakshmi Medical Officer	Primary Health Centre Keelasevalpatty
6.	Dr. P. Sudha Medical Officer	Primary Health Centre Sevanipatti
7.	Dr. Mohammed Aziza Medical Officer	Primary Health Centre Nerkuppai
8.	Ms. S. Kaliasammal Sector Health Nurse	Primary Health Centre Thirukostiyur
9.	Ms. K. Amutha Sector Health Nurse	Primary Health Centre, Nerkuppai
10.	Ms. C. Renuka Sector Health Nurse	Primary Health Centre, Sevanipatty

**Annexure II. List of Project Team members**

<b>Sl. No.</b>	<b>Name and Designation</b>	<b>Name of Organization and Place</b>
1.	Prof. Artur Dubrawski Director of Auton Lab	Carnegie Mellon University, Pittsburgh PA 15213-3815
2.	Mr. Nuwan Waidyanatha Research Director	LIRNEasia, Sri Lanka
3.	Ms. Suma Prashant Project Manager (Rural Health Initiatives)	IITM's Rural Technology and Business Incubator, Chennai, India
4.	Dr. M Ganesan Senior Project Officer	IITM's Rural Technology and Business Incubator, Chennai, India
5.	Ms. Vincy Pushpa Marry Project Associate	IITM's Rural Technology and Business Incubator, Chennai, India
6.	Mr. N. Janakiraman Field Coordinator	IITM's Rural Technology and Business Incubator, Thiruppathur, Sivaganga district, India
7.	Mr. S. Balamurugan Project Technician	IITM's Rural Technology and Business Incubator, Thiruppathur, Sivaganga district, India

**Annexure III. List of Project Volunteers**

1.	Mr. T. Nagarajan RTBP Volunteer	IITM's Rural Technology and Business Incubator, Thiruppathur, Sivaganga district, India
2.	Ms. C. Kasthuribai RTBP Volunteer	IITM's Rural Technology and Business Incubator Thiruppathur, Sivaganga district, India

#### Annexure IV. Programme Schedule

1000-1015	Welcome comments & self introduction	Ms. Suma Prashant (IITM's RTBI)
1015-1030	Inaugural speech	Dr. N. Raghupathy (DDHS)
1030-1045	RTBP pilot project goals	Ms. Suma Prashant (IITM's RTBI)
1045-1100	Demonstration of m-HealthSurvey	Ms. Vincy Pushpa Marry Mr. N. Janakiraman (IITM's RTBI)
1100-1115	Analysis of RTBP data	Dr. M. Ganesan (IITM's RTBI)
<b>1115-1130</b>	<b>Tea/Coffee</b>	
1130-1300	T-Cube Web Interface for data analysis	Prof. Artur Dubrawski (Auton Lab, Carnegie Mellon University)
<b>1300 - 1400</b>	<b>Lunch</b>	
1400-1430	CAP SMS/Email Sahana messages	Mr. Nuwan Waidyanatha (LIRNEasia)
1430-1500	Project Evaluation methodology	Mr. Nuwan Waidyanatha (LIRNEasia)
1500-1530	Concluding session	Mr. K. Raghavendran (DDHS)
<b>1530-1600</b>	<b>Tea/Coffee</b>	

## Annexure V. Abbreviations

DDHS	Deputy Director of Health Services
HI	Health Inspector
HSC	Health Sub Centre
ICT	Information and Communication Technology
IDSP	Integrated Disease Surveillance Programme
IITM	Indian Institute of Technology Madras
mHealth	Mobile Health
PHC	Primary Health Centre
RTBP	Real Time Biosurveillance Program
SMS	Short Message Service
TCWI	T-Cube Web Interface
USA	United States of America
VHN	Village Health Nurse

**Annexure VI. Glimpses of participants actively involved in planning workshop**

