

# Use of CAP for Disease Notification: *Real Time Biosurveillance Program*

World Meteorological Organization

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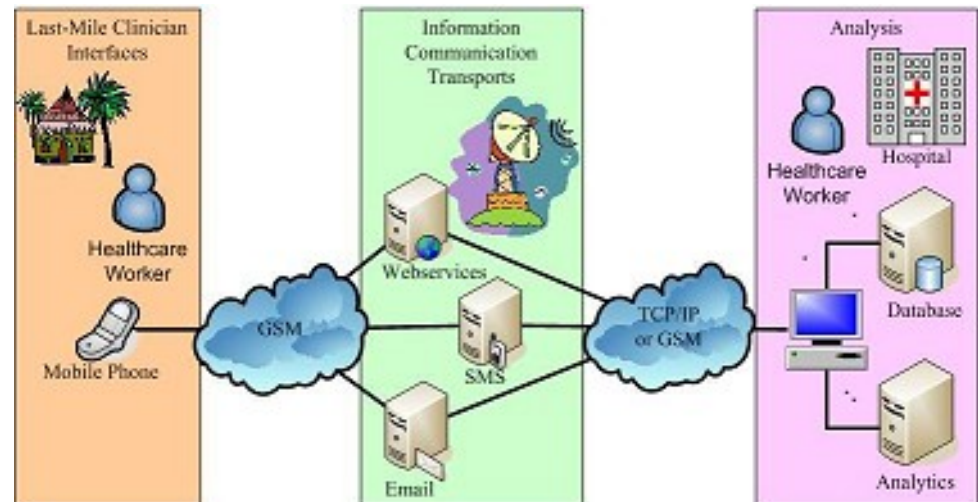


# Objective of the research:

**Research Question:** “Can software programs that analyze health statistics and mobile phone applications that send and receive the health information potentially be effective in the early detection and notification of disease outbreaks?”

## Specific Objectives:

- Evaluating the effectiveness of the m-Health RTBP for detecting and reporting outbreaks
- 2) Evaluating the latencies of communicating disease information
  - 3) Contribution of community organization and gender participation
  - 4) Developing a Toolkit for assessing m-Health RTBPs



# Pilot to be tested in two Countries: Sri Lanka and India



23 Government Village Healthcare Nurses  
in Public Health Centers -  
"Sivaganga" District, state of Tamil  
Nadu, India

16 Sarvodaya Volunteers in  
Sarvodaya Suwadana  
Centers - Kurunegala District,  
North Western Province, Sri  
Lanka



# Research Matrix

		Exposed to RTBP				Unexposed to RTBP			
		Division 1		Division 2		Division 3		Division 4	
+		C01	C05	C09	C13	C17	C21	C25	C29
		H01	H03	H05	H07	H09	H11	H13	H15
-		C02	C06	C10	C14	C18	C22	C26	C30
+		C03	C07	C11	C15	C19	C23	C27	C31
		H02	H04	H06	H08	H10	H12	H14	H16
-		C04	C08	C12	C16	C20	C24	C28	C32

- Hxx denotes Community-Healthcare-Worker
- Cxx denotes Community.
- cells with “magenta” background has a presence of a Community-based Healthcare facility (+)
- cells with “orange” background do not have a formal Community-based Healthcare facility (-).
- Community-Healthcare-Worker (“yellow” cells)



# Health data collection

form: Case Data

Date: 2008/12/05

Location: Kuliyaipitiya

Diagnosis: Cholera

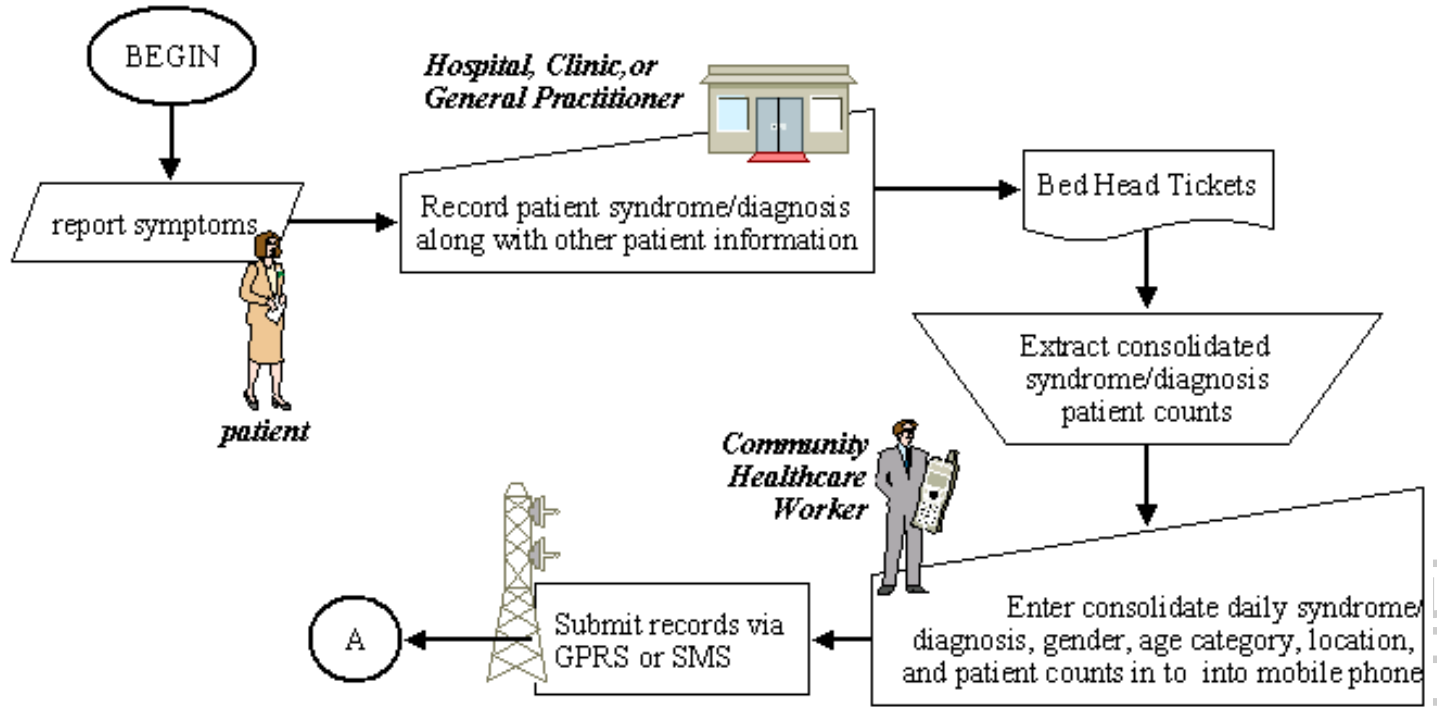
Symptoms:  
Watery diarrhoea, Nausea, Vomiting, Muscle cramps, Thirst

Signs:  
Dehydration, Tachycardia, Drowsiness

Age Grp: Adult

Gender: Male: Female: Unknown:

Back Options

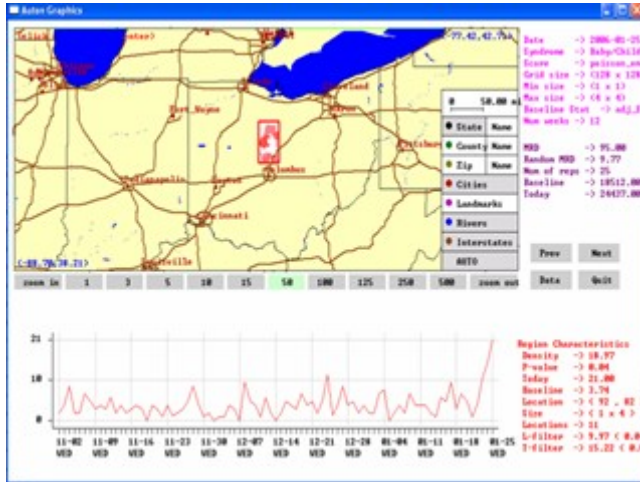


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5

# Analyze health data to detect diseases



**Geospatial**

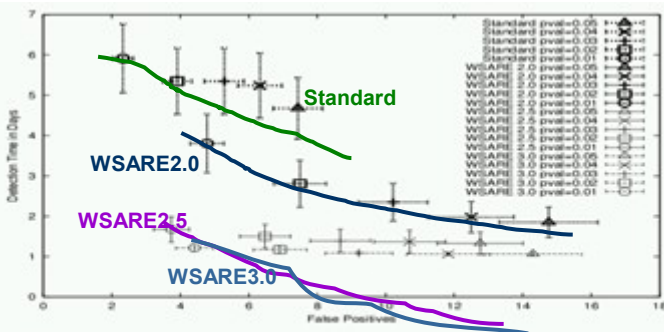
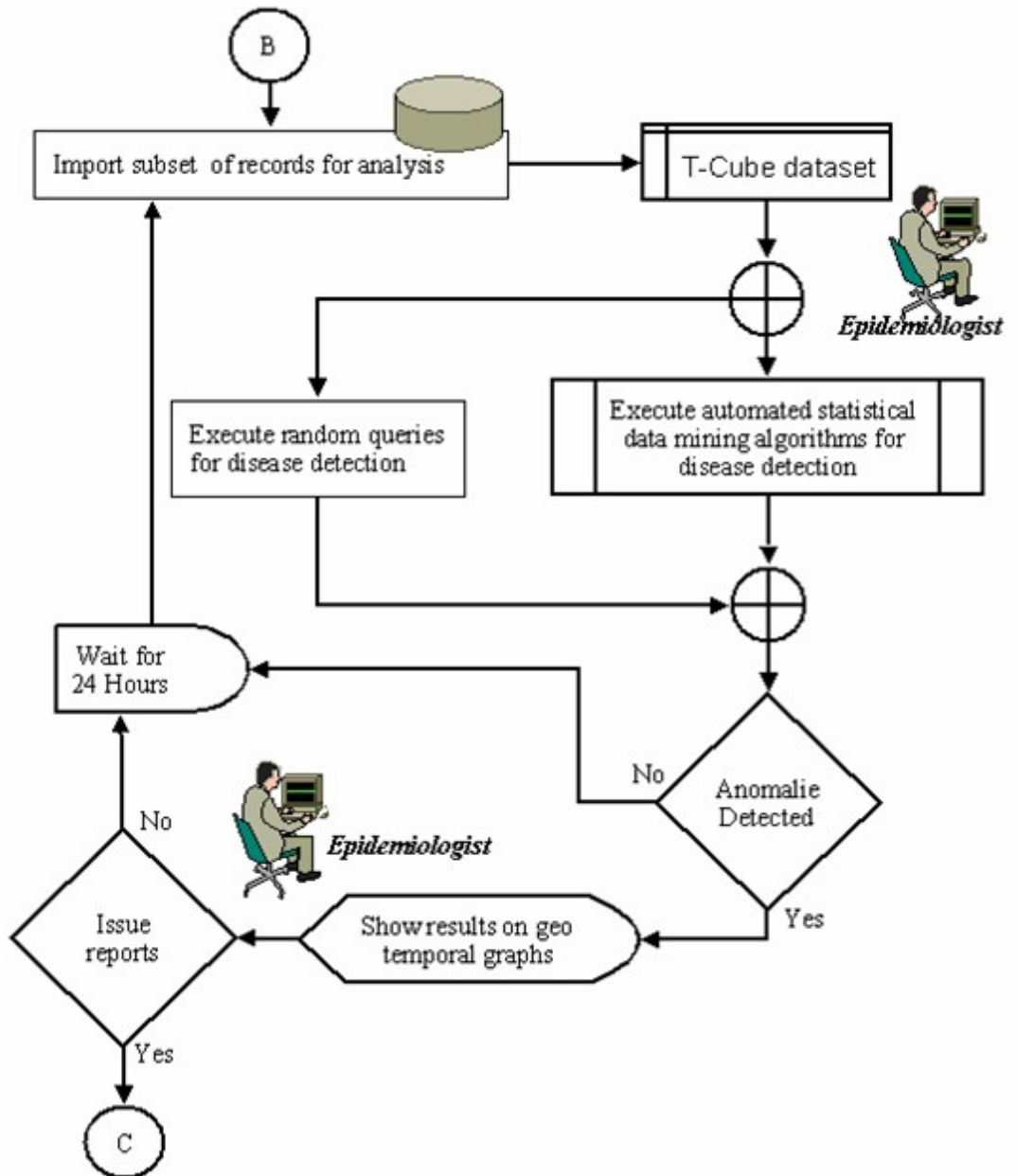


Figure 5: Scatterplot of Detection Time versus False Positives with Error Bars for Simulated Data

**Time series**

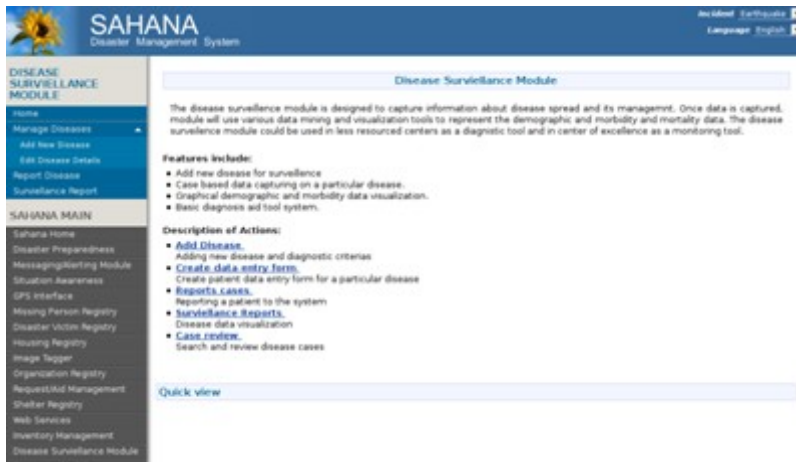
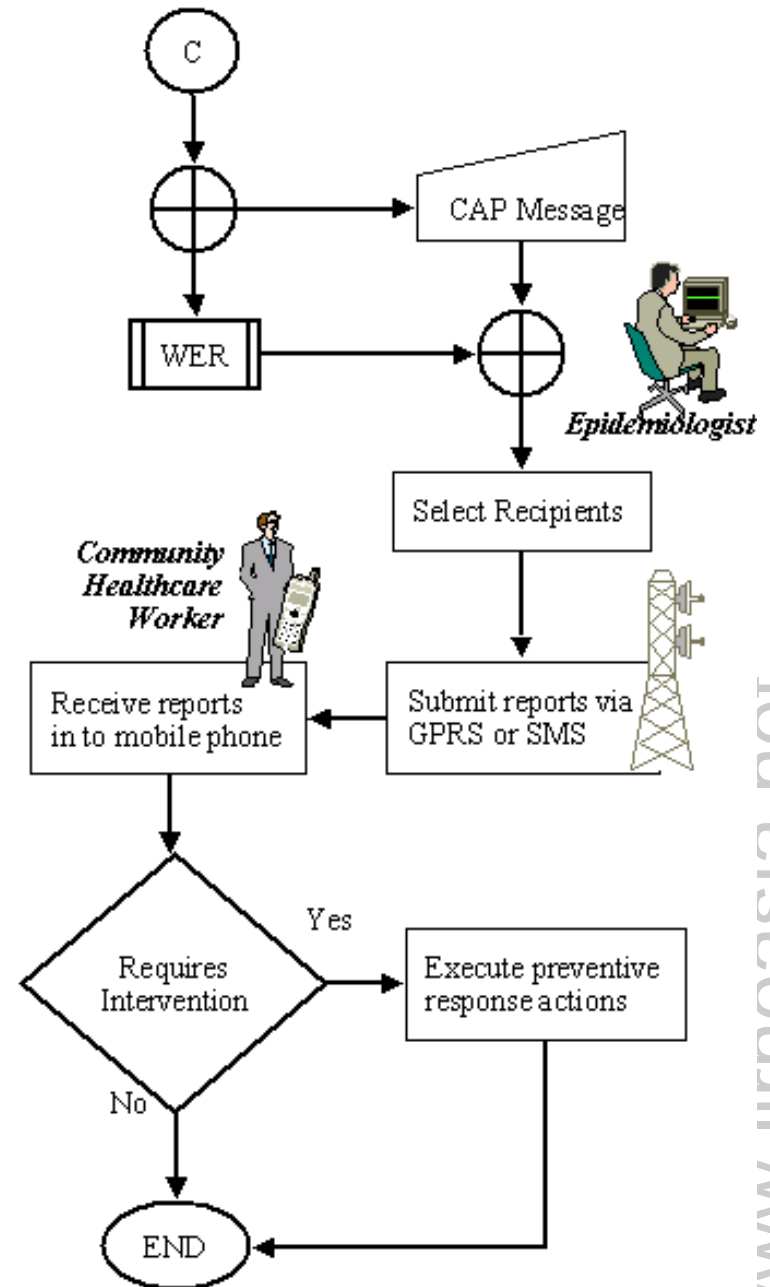


# Disease information reports

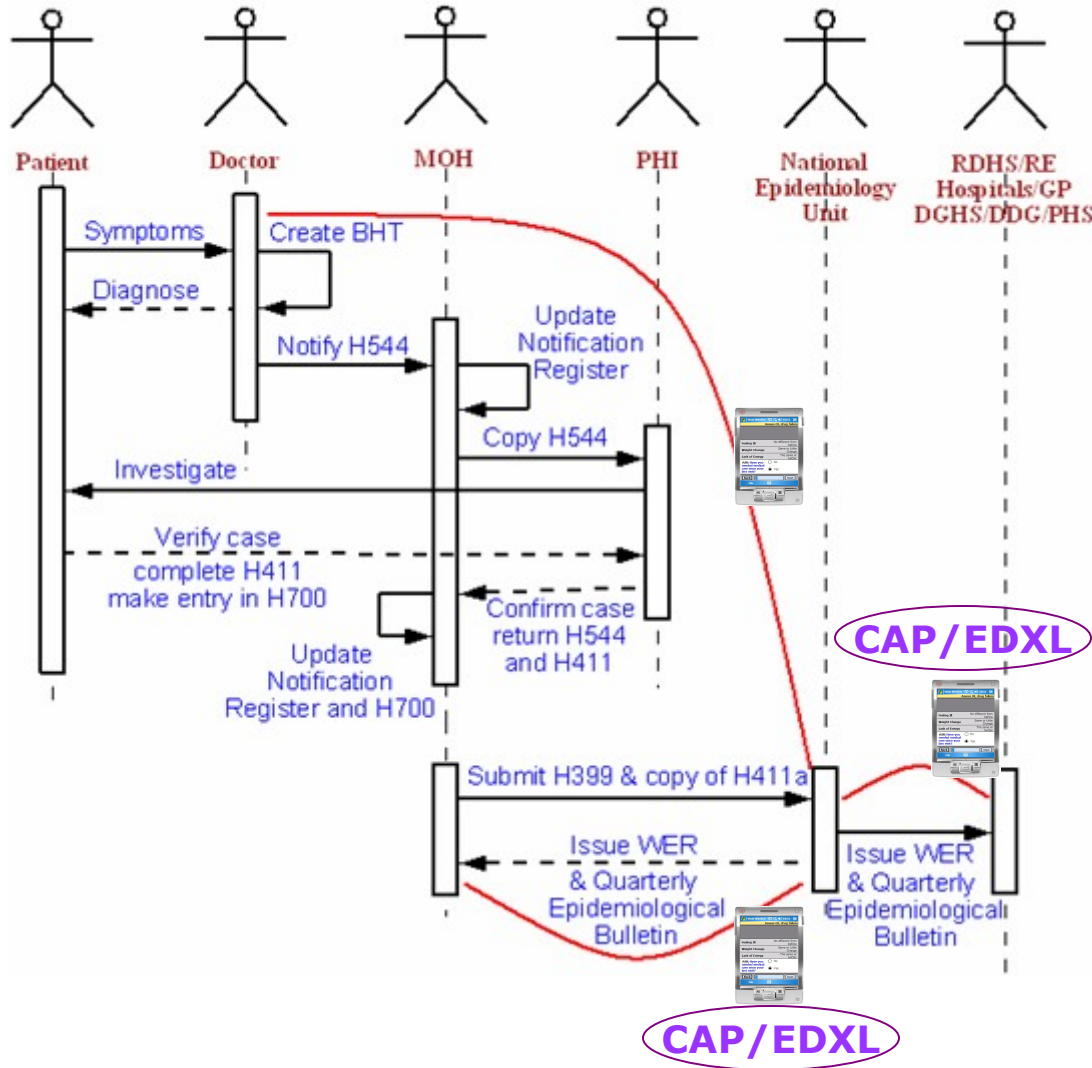


## Common Alerting Protocol Reports:

- 1) Instant Alerts
- 2) Weekly Epidemiological Reports (WER)



# Evaluation Method:



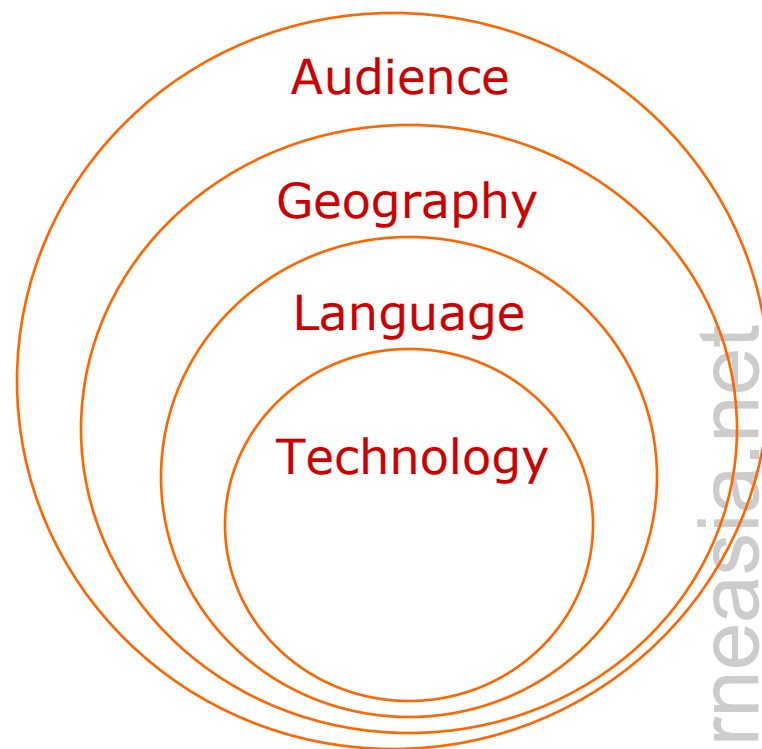
## Study the –

- ❑ Performance and Cost benefits of paper/postal vs technology communication
- ❑ Human Computer Interface aspects, interoperability, social acceptance
- ❑ Policy implications of introducing RTBP into present working systems

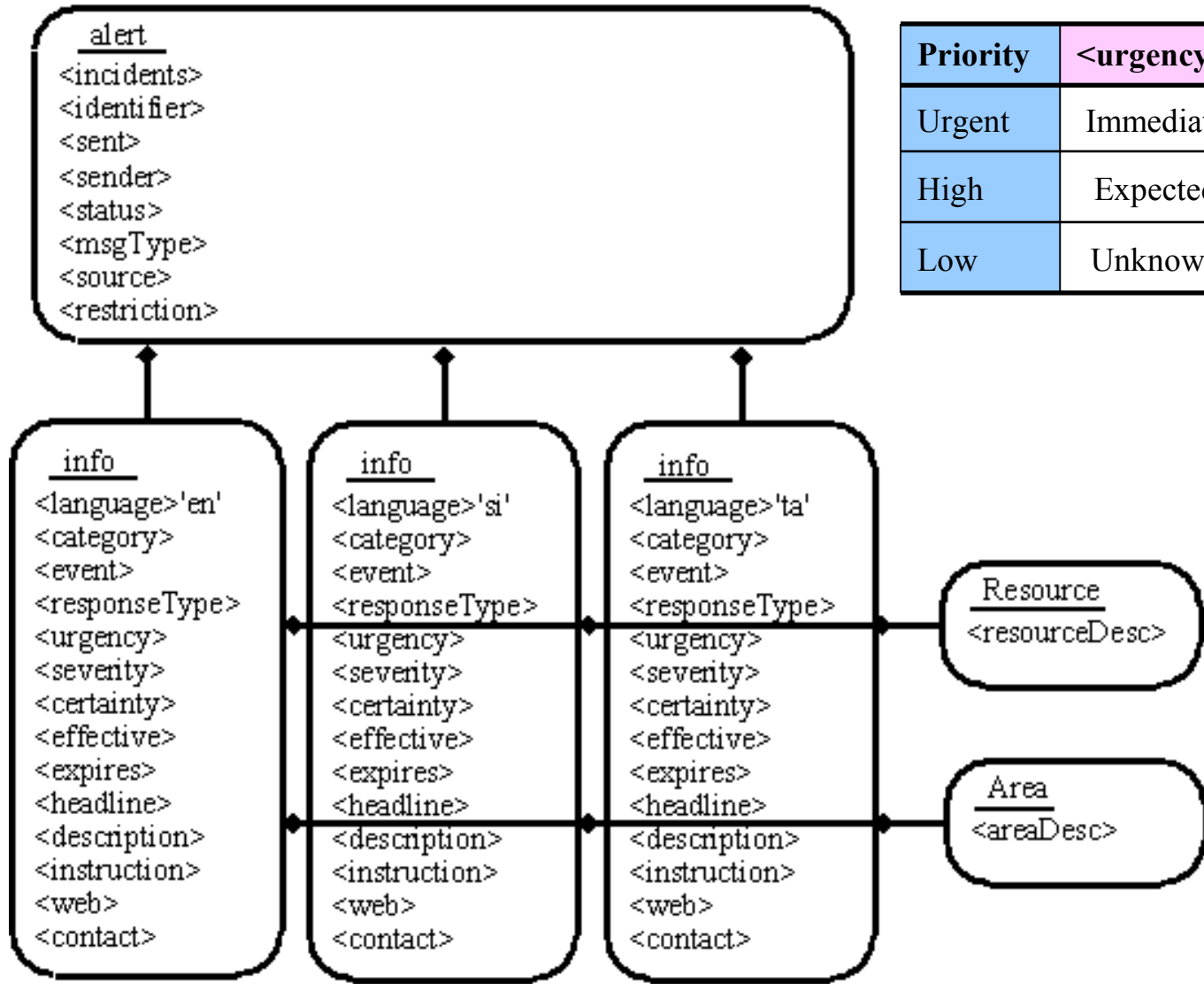
- **Black arrows:** current manual paper/postal system for health data collection and reporting
- **Red lines:** RTBP mobile phone communication system for health data collection and reporting

# Steps for setting up a CAP Profile

- **Audience <Scope>**
  - Health Care Workers
  
- **Geographical Descriptions <Area>**
  - National
  - Epidemiological Region
  - District Public Disease Health Services
  - Medical Officer of Health Divisions
  - Public Health Inspector Areas
  
- **National <Languages>**
  - Sinhala, Tamil, English
  
- 4. Communication Technology?**
  - Mobile Phones (SMS, GPRS)
  - Personal Computers (DSL, UMTS)



# Draft of CAP Profile for Sri Lanka



Priority	<urgency>	<severity>	<certainty>
Urgent	Immediate	Extreme	Observed
High	Expected	Severe	Likely
Low	Unknown	Moderate	Possible

*Acknowledgement: Gordon Gow (PhD), University of Alberta, ggow@ualberta.ca  
For working on developing the CAP Profile for the RTBP project*



# Weekly Epidemiological Report published on the web

WER Sri Lanka - Vol. 35 No. 42

11<sup>th</sup> - 17<sup>th</sup> October

Table 4: Selected notifiable diseases reported by Medical Officers of Health  
4<sup>th</sup> - 10<sup>th</sup> Oct 2008 (41<sup>st</sup> Week)

DPOHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Received
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Colombo	23	1372	01	216	00	14	10	124	00	91	30	813	00	03	02	96	00	00	69
Gampaha	11	832	05	176	01	20	02	49	02	103	29	667	00	07	03	154	00	06	86
Kalutara	04	409	10	268	00	11	02	59	06	26	27	515	00	03	02	41	00	02	92
Kandy	06	233	05	256	00	07	01	55	02	97	23	409	01	89	00	111	00	02	76
Matale	07	133	01	177	00	04	05	48	00	13	08	661	00	02	00	25	00	00	100
Nuwara	01	25	09	230	00	03	08	235	00	166	03	51	00	36	04	104	00	01	92
Galle	01	92	06	163	01	18	01	17	00	43	09	329	01	14	00	08	00	03	71
Hambantota	00	85	00	88	00	03	00	07	00	12	01	90	05	84	00	14	00	01	91
Matara	05	271	06	181	00	13	00	35	00	06	13	415	03	199	00	14	00	01	94
Jaffna	00	54	00	135	00	04	00	238	00	16	00	00	00	151	00	35	00	00	00
Kilinochchi	00	00	00	35	00	09	00	01	00	04	00	02	00	00	00	01	00	00	00
Mannar	00	25	00	21	00	06	00	135	00	00	00	00	00	01	00	14	00	00	00
Vavuniya	00	12	01	58	00	02	00	13	00	19	00	05	00	01	00	05	00	00	75
Mullaivu	00	00	00	15	00	00	00	15	00	13	00	00	00	01	00	09	00	01	00
Batticaloa	00	85	00	129	00	07	03	25	00	29	00	08	00	00	00	89	00	07	55
Ampara	00	30	00	249	00	00	01	08	00	283	00	22	00	00	01	12	00	00	29
Trincomalee	00	177	03	97	00	01	00	13	00	14	00	30	00	16	00	13	00	00	70
Kurunegala	05	302	04	198	00	14	00	52	00	23	10	589	01	29	02	67	01	06	89
Puttalam	00	276	05	90	00	08	00	148	01	27	02	56	00	37	00	29	00	04	67
Anerachapuz	00	117	02	97	00	10	00	12	00	09	00	236	00	11	01	14	00	03	79
Poimannaraw	00	62	03	119	00	01	02	24	00	21	05	64	00	01	00	19	00	00	71
Badulla	00	81	07	413	00	05	01	119	01	96	03	60	01	106	01	132	00	01	73
Monaragala	01	53	01	319	00	03	03	39	02	119	00	90	02	97	00	44	00	00	48
Ratnapura	03	248	08	336	00	32	02	49	00	68	09	178	00	78	02	50	00	00	72
Kegalle	06	383	03	270	00	26	03	70	00	11	19	439	02	63	01	474	00	01	73
Kaimanai	00	36	01	241	00	02	00	09	00	16	00	03	00	03	00	24	00	00	31
<b>SRI LANKA</b>	<b>72</b>	<b>5393</b>	<b>81</b>	<b>4577</b>	<b>02</b>	<b>216</b>	<b>44</b>	<b>1619</b>	<b>14</b>	<b>1325</b>	<b>191</b>	<b>5742</b>	<b>16</b>	<b>1032</b>	<b>19</b>	<b>1598</b>	<b>01</b>	<b>39</b>	<b>70</b>

Source: Weekly Returns of Communicable Diseases (WRCD).

\*Dengue Fever / DHF refers to Dengue Fever / Dengue Haemorrhagic Fever.

\*\*Timely refers to returns received on or before 18October, 2008 Total number of reporting units =136. Number of reporting units data provided for the current week: 215

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Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail to [chepid@isnet.lk](mailto:chepid@isnet.lk).

ON STATE SERVICE

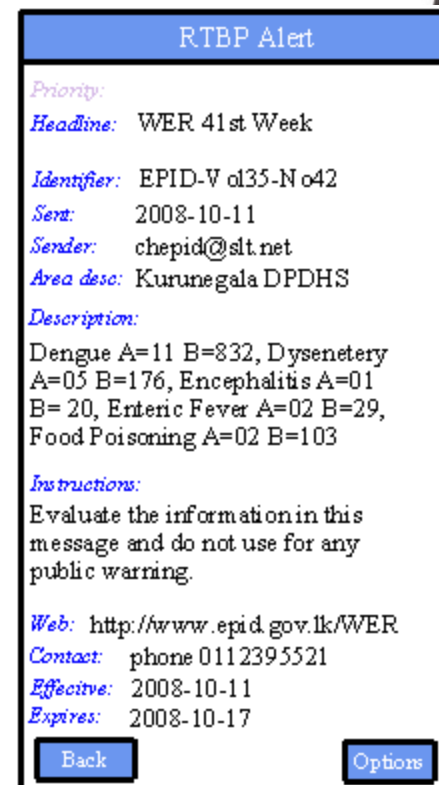
Dr. M. R. N. ABEYSINGHE  
EPIDEMIOLOGIST  
EPIDEMIOLOGICAL UNIT  
291, DE SARAM PLACE  
COLOMBO 10



# Weekly Epidemiological Report ALERT

```
<alert>
  <!--cap:alert-->
  <identifier>EPIDVol-35-No42</identifier>
  <sender>chepid@slt.net</sender>
  <sent>2008-10-11T00:00:00.0000000+06:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <source>Weekly Returns of Communicable Diseases</source>
  <scope>Restricted</scope>
  <restriction>DPDHS, MOH, PHI</restriction>
  <info>
    <language>en-US</language>
    <category>Health</category>
    <event>Disease Outbreaks</event>
    <responseType>Assess</responseType>
    <urgency>Unknown</urgency>
    <severity>Minor</severity>
    <certainty>Possible</certainty>
    <effective>2008-10-11</effective>
    <expires>2008-10-17</expires>
    <headline>Weekly Epidemiological Report</headline>
    <description>DPDHS division:Kurunegala0 diseases:Dengue Fever A=11 B=832, Dysentery A=05
    B=176, Encephalitis A=01 B=20, Enteric Fever A=02 B=49, Food Poisoning A=02
    B=103</description>
    <instructions>Evaluate the information in this message and do not use for any public warning.
    </instructions>
    <web>http://www.epid.gov.lk/WER</web>
    <contact>phone 0112395521</contact>
    <area>
      <areaDesc>Kurunegala DPDHS Div</areaDesc>
    </area>
  </info>
</alert>
```

12/11/08



RTBP Alert

*Priority:*

*Headline:* WER 41st Week

*Identifier:* EPID-V ol35-No42

*Sent:* 2008-10-11

*Sender:* chepid@slt.net

*Area desc:* Kurunegala DPDHS

*Description:*

Dengue A=11 B=832, Dysentery A=05 B=176, Encephalitis A=01 B=20, Enteric Fever A=02 B=29, Food Poisoning A=02 B=103

*Instructions:*

Evaluate the information in this message and do not use for any public warning.

*Web:* <http://www.epid.gov.lk/WER>

*Contact:* phone 0112395521

*Effective:* 2008-10-11

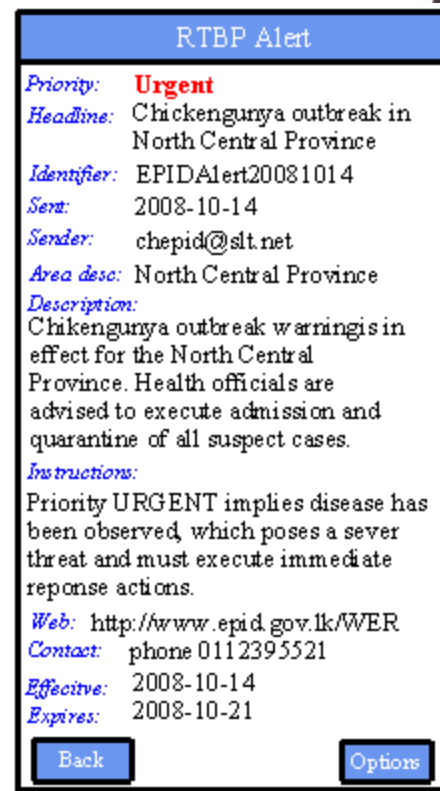
*Expires:* 2008-10-17

Back Options



# Epidemiological instant ALERT

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  <!--cap:alert-->
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  <sender>chepid@slt.net</sender>
  <sent>2008-10-14T00:00:00.0000000+06:00</sent>
  <status>Actual</status>
  <msgType>Alert</msgType>
  <source>Epidemiological Unit</source>
  <scope>Restricted</scope>
  <restriction>DPDHS, MOH, PHI</restriction>
  <info>
    <language>en-US</language>
    <category>Health</category>
    <event>Disease Outbreaks</event>
    <responseType>Execute</responseType>
    <urgency>Immediate</urgency>
    <severity>Severe</severity>
    <certainty>Observed</certainty>
    <effective>2008-10-14</effective>
    <expires>2008-10-21</expires>
    <headline>Chickengunya outbreak in North Central Province</headline>
    <description>Chickengunya outbreak warning is in effect for the North Central Province. Health officials
are advised to execute admission and quarantine of all suspect cases.</description>
    <instructions>Priority URGENT implies disease has been observed, which poses a severe threat and
must execute immediate response actions.</instructions>
    <web>http://www.epid.gov.lk/WER</web>
    <contact>phone 0112395521</contact>
    <area>
      <areaDesc>North Central Epidemiological Region</areaDesc>
    </area>
  </info>
</alert>
```



# Challenges and envisaged problems

- ❑ Educating the stakeholders of the importance of adopting CAP; i.e. CAP unheard of in Asia-Pacific
- ❑ Engaging the stakeholders in defining: the CAP profile, set of necessary and sufficient tags, and the respective values with message format
- ❑ Identifying other countries or organizations that have adopted CAP for Health alerts due to the novelty of CAP
- ❑ Uncertainty of user acceptance of CAP (capacity and capability issues)
- ❑ Dilemmas of issuing frequent alerts such as the Weekly Epidemiological Report and users neglecting URGENT priority alerts
- ❑ Designing alert messages adhering to HCI aspects for effectiveness
- ❑ Designing mobile handheld device GUIs for receiving complete CAP messages (another HCI problem)



*<End>* Do you have any questions or recommendations? *</End>*

Since I am not physically present I would appreciate if you could email your suggestions to [waidyanatha@lirne.net](mailto:waidyanatha@lirne.net)

Reference: “**Real-Time Biosurveillance Program**” -

<http://lirneasia.net/projects/2008-2010/evaluating-a-real-time-biosurveillance-program/>

