Dengue SMS Surveillance Project in the Philippines

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Background

• In 2007, JHU/APL was funded by AFHSC to evaluate the utility of syndromic surveillance in resource-poor countries.

• Visited facilities in Peru and Laos that were using variations on the EWORS system developed in SE Asia by Naval Medical Research Unit (NAMRU).
Also invited to the Republic of the Philippines (RP) by the Philippines office of the Armed Forces Research Institute for Medical Research (AFRIMS) and the RP National Epidemiology Center (NEC).

NEC was preparing to introduce a new electronic surveillance system (PIDSR).
Background

• JHU/APL and PAVRU, with funding from AFHSC, proposed a collaborative effort to identify, develop and pilot surveillance activities and tools that would be useful in the RP.
Background

- Project was funded by AFHSC and begun in 2008.
- Field work has been done in conjunction with the Cebu City, RP Health Office (CHO).
• Dengue fever is a serious health threat in the RP.

• 1,260 cases of dengue fever were reported in Cebu City in 2008, with 52 deaths (CFR=4.1%).

• An increase in case fatality rate from 2007 to 2008, suggests an increase in or late identification of cases.
Background

• A recent assessment showed that there was a minimum 2 week delay between illness and reporting of the case to the Cebu City Barangay Council.

• As in most of the world, dengue surveillance in the RP is hospital based, and intended to produce annual disease rates.

• More timely data is needed to inform rapid and logical community intervention programs to stop transmission.
Background

• Few Barangay Health Centers (BHC) have a working computer or an internet connection.

• Interactive Voice Response (IVR) was suggested, but phoning is expensive.

• *But* SMS texting is cheap and everyone has a cell phone.
Original Objective

- To pilot an active surveillance reporting system for dengue fever in Cebu City, RP using a simple, standardized SMS texting protocol.
- The timeliness, sensitivity and representativeness of the SMS system will be compared to the current surveillance process at the end of the traditional dengue season.
Methods Summary

- Identify clients with suspect dengue fever.
- Record information on each of these clients on the Dengue SMS Log sheet.
- Text suspect cases to CHO each day.
Methods
Pilot Site, Cebu City, RP

Pilot BHCs
• Guadalupe/Banawa
• Lorega
• Labangon
• Kamputhaw
Methods
Dengue Case Definition

• Age ≥6 months
• Fever or history of fever in the past 7 days and any two of the following:
  – Headache
  – Pain behind the eyes
  – Rash
  – Muscle or joint pain
  – Loss of appetite
  – Nausea or vomiting
  – Hemorrhagic manifestation
Methods
Data Collection

- Information for all patients meeting the case definition is recorded on the DSMS Log Book.

<table>
<thead>
<tr>
<th>DSMS Daily Log #</th>
<th>Sitio Code</th>
<th>Family Serial Number</th>
<th>Last Name</th>
<th>First Name</th>
<th>MI</th>
<th>Age</th>
<th>Sex</th>
<th>Address</th>
<th>Date of Onset (dd/mm/yy)</th>
<th>Symptoms (sx1-sx2-sx3)</th>
</tr>
</thead>
<tbody>
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<td>1</td>
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</tbody>
</table>
Methods
Texting Data

**SMS Texting Format Definition**

<table>
<thead>
<tr>
<th>Date</th>
<th>Barangay Code</th>
<th>Sitio Code</th>
<th>Family Serial Number</th>
<th>Last Name, First Name, MI.</th>
<th>Age</th>
<th>Sex</th>
<th>Date of Onset</th>
<th>Sx1-Sx2-Sx-3 etc.</th>
</tr>
</thead>
</table>

- Each case is sent in an individual SMS text message.
- The logbook format is maintained.
- Periods, commas and dashes are used as delimiters.
Methods
Texting Data

• A code was assigned to each Barangay to simplify analysis.

• Standardized abbreviations suggested, and generally adopted for symptoms:
  – fev = Fever
  – nb = Nosebleed
  – ha = Headache
  – stool = Brown/coffee stool
  – joint = Joint Pain

• Messages are sent from BHC → CHO at the end of the day or saved and sent overnight.
Methods
Data Download Application

- Custom SQL application automatically downloads the data from the CHO phone SIM card.
Methods
Ongoing Dengue Surveillance
Results
If A Little is Good...

• Agreed to pilot protocol at 5 BHC in March 2009.

• Expanded in June 2009 to include all ‘fever’ cases seen in all BHCs in Cebu City.
  – Dovetailed with a pre-existing fever surveillance program.

• August 2009, 75/85 BHCs have replaced their fever logbook with the DSMS log sheet and are recording all clients with fever, including those with dengue.
Results
If A Little is Good...

• As August 15, 2009
  – ~ 30% of BHC text all fever cases to the CHO daily
  – ~25% of BHCs bring a hard copy of the logbook to the CHO daily.
  – ~40% Send hard copy to the CHO weekly.
  – ~5% Send hard copy to the CHO monthly.
Results
If A Little is Good...

• JHU/APL & PAVRU provided technical and logistical support for the project.
  ─ Joint development of the original proposal.
  ─ PAVRU presented, and got approval for the protocol from the CHO.
  ─ PAVRU helped the CHO implement the system.

• Financial support for texting and additional work was provided for only 5 pilot sites.

• At the other BHCs, daily texts are sent by BHC personnel using their personal cell phones.
Results
Preliminary Surveillance Data
Results
Preliminary Surveillance Data
Conclusions

• Created the first near real-time syndromic (fever) surveillance system in the RP.

• Adoption and adaptation by the Cebu City CHO suggests that the system will be sustainable.

• Adaptation from dengue to fever surveillance increases the utility of the system.

• Caveats
  – Still being expanded into all BHCs.
  – Only limited results currently available.
Future Work

• Data collection began incrementally in July 2009, so data needs to accrue before further analysis.

• Proposal under consideration to expand this system to collect data on other syndromes, such as gastrointestinal illness.
Philippines Project Team

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