Public Health Informatics Tools for Electronic Disease Surveillance in Resource-Limited Settings

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Background

Establishing early event detection capabilities in resource-limited settings is critically important given the rapidity of disease spread. While the development of these capabilities is challenging, it is not impossible. Many efforts are underway to address specific, locally-based public health informatics needs such as training, data collection, or traditional surveillance analyses. Most of these tools are independent and not easily integrated into a single system. The current efforts of JHU/ APL, in collaboration with public health authorities in several countries and at the US Department of Defense Global Emerging Infections Surveillance and Response System (DoD GEIS), aim to develop a suite of tools that could be employed to establish an end-to-end electronic disease surveillance system. This flexibility allows public health authorities to develop an inexpensive, customized system that uses commercial hardware and meets their specific needs.

Methods

The tools within the surveillance suite can be categorized into four areas:

- Data Acquisition
- Data Analysis & Visualization
- Communications
- Modeling & Simulation

Each area provides options for a broad spectrum of public health infrastructure, from industrialized areas with robust internet connectivity to remote settings with minimal or unreliable internet access.

Concept

Goals:
- Improve the timeliness and accuracy of health data collection and analysis in resource limited countries
- Implement and evaluate low cost technology solutions appropriate for the target user community

Design Objectives:
- Maximize the use of Open-source and free software components
- Minimize recurring costs
- Minimize licensed and proprietary elements
- Design for sustainability

Results

First installation of the IVR and OpenESSENCE software will occur at NMRCD in Lima, Peru in early 2009.

First installation of CDES and EDE software will occur in Cebu City, Philippines in early 2009.

Discussion

With these two pilot activities, combined with existing capabilities for automated data capture, web-enabled analysis, outbreak modeling, and information sharing, JHU/ APL has begun the development of a suite of tools that enable a country to customize an end-to-end surveillance system that meets their requirements while operating within the constraints of their infrastructure. Additionally, these tools will be Open-Source so that a system can be self-hosted, maintained, and modified by health authorities for minimal recurring cost.

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This effort was conducted under NHGRI Contract No. HHSN271200800006C, Task Order 0003. The views expressed in this poster are not to be construed as official or as representing the views of the U.S. Department of the Navy or Department of Defense.