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ABSTRACT

Creating a fast and flexible syndromic surveillance reporting system

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Objective
The objective of this study was to create and evaluate a system that uses customized scripts developed for commercial off-the-shelf (COTS) statistical and GIS software to (1) analyze syndromic data and produce regular reports to public health epidemiologists, containing the information they would need to detect and manage an ILI outbreak, and (2) facilitate the generation more detailed analyses relevant to specific situations using these data.

Introduction
Syndromic surveillance systems significantly enhance the ability of Public Health Units to identify, quantify, and respond to disease outbreaks. Existing systems provide excellent classification, identification, and alerting functions, but are limited in the range of statistical and mapping analyses that can be done. Currently available COTS statistical and GIS packages provide a much broader range of analytical and visualization tools, as well as the capacity for automation through user-friendly scripting languages. This study retrospectively evaluates the use of these packages for surveillance using syndromic data collected in Ottawa during the 2009 pH1NI outbreak.

Methods
Four Ottawa area hospitals have been reporting chief complaint and demographic data to Ottawa Public Health using a RODS-based syndromic surveillance system (ASSET) since January 2009. (ASSET is based on the University of Pittsburgh's Real-time Outbreak and Disease Surveillance system (http://www.rods.pitt.edu)). During the 2009 pH1N1 pandemic, a team comprised of epidemiologists, health care researchers, and NRC HCI specialists recognized the need for an automated syndromic reporting system that would free epidemiologists for other tasks. The team designed specific reports by developing customized scripts using Stata and ArcGIS. Data from ASSET were parsed using an ILI classifier (NRC) and processed using these scripts.

Results
The resulting ILI Watch report automatically produces epicurves, exploratory data analyses, aberration detection graphs, and color-coded maps that replace daily reports, which previously had to be generated manually. The system also makes the syndromic data set easily available to epidemiologists, and facilitates follow-up analyses. The system is currently in production in the Ottawa area (Figure 1).

Conclusions
An automated system developed using state-of-the-art COTS software can reduce the time and resource burdens on epidemiologists and IT staff during an outbreak by

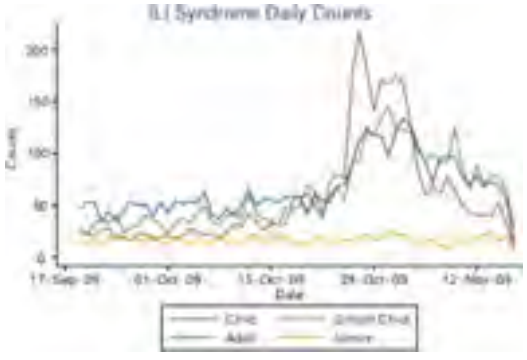

Figure 1 Sample data from the ASSET ILI Watch. Data is categorized by age group, and demonstrates both the high prevalence of ILI in children in general and school-aged children in particular, and the nominal infection rates seen in people aged ⩾60 years.

automatically producing customized reports. It also provides the flexibility needed to rapidly meet changing information needs by providing a user-friendly scripting template for ad hoc analyses.

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