

Evaluation of the Michigan Emergency Department Syndromic Surveillance System

Katherine D. Sheline, M.P.H., CDC/CSTE Applied Epidemiology Fellow
Michigan Department of Community Health, Communicable Disease Division

OBJECTIVE

This work describes key characteristics of Michigan's Emergency Department Syndromic Surveillance System (MSSS) and reports on its evaluation.

BACKGROUND

Efforts have been made to standardize and prioritize the description and evaluation of syndromic surveillance systems [1,2,3]. Systematic information on the performance of existing systems can be used to assess and compare the value of these systems, and inform decisions regarding their use.

The MSSS is an implementation of an early version of the Real-time Outbreak and Disease Surveillance (RODS) system developed by the University of Pittsburgh, which collects patient chief complaint data from emergent care facilities in real time [4]. At the Michigan Department of Community Health (MDCH) the system has been in use since 2003. Alterations to the system and recruitment of data contributors have been ongoing. The primary stated purpose of the MSSS is earlier detection of outbreaks of severe illness, enabling a more rapid public health response and intervention to reduce the impact of public health threats.

METHODS

CDC guidelines were used to structure the evaluation [1,3]. Key information was gathered through interviews with stakeholders. An electronic survey of system users (MDCH regional epidemiologists, n=8, 100% response) was also performed. Data characterization was conducted using a random sample of 1,000 system records from the week of April 16, 2007.

RESULTS

Of an estimated 177 acute care hospitals in Michigan, 62 of them (35%) are currently system participants. Participation is variable by geographic region, affecting system usefulness in some regions.

Data collection involves automated transfer of existing data, requiring minimal time investment by participating emergent care facilities, and thus contributing to system acceptability. Automated algorithm analysis occurs every two hours, and the MSSS sends e-mail alerts to regional epidemiologists when registrations exceed expected levels by at least three standard deviations. The system generated approximately 64 alerts per month in 2006. So far in

2007, it has been generating approximately 79 per month. Alert investigation and response is conducted according to an MDCH protocol. Timeliness of response to alerts varies by the timing of signal occurrence. Regional epidemiologists spend a median of 5.75 hours per week using the system. Based upon a survey of regional epidemiologists, a roughly estimated 7% of alerts indicate a situation of public health significance.

Reported uses of the system go beyond outbreak detection to include supplementing seasonal influenza and gastrointestinal illness trend monitoring, exploring the occurrence of conditions such as heat-related illnesses and potential rabies exposure through use of the ad hoc query, and improving situational awareness during high-profile events.

CONCLUSIONS

The MSSS is in a state of ongoing growth and development. Additional rigorous evaluation and prospective data collection is recommended to better characterize the system's current detection capabilities and project future system capacity given continued growth. It may be valuable to further explore and assess broadening use of the system beyond the stated purpose of timely outbreak detection.

REFERENCES

- [1] CDC. Updated guidelines for evaluating public health surveillance systems: recommendations from the guidelines working group. *MMWR* 2001;50(No. RR-13).
- [2] Sosin DM, DeThomasis J. Evaluation challenges for syndromic surveillance – making incremental progress. In: *Syndromic Surveillance: Reports from a National Conference, 2003*. *MMWR* 2004;53 (Suppl):[125-129].
- [3] CDC. Framework for evaluating public health surveillance systems for early detection of outbreaks; recommendations from the CDC Working Group. *MMWR* 2004;53(No. RR-5).
- [4] Tsui F et al. Technical Description of RODS: A Real-time Public Health Surveillance System. *JAMIA* 2003;10(5):399-408.

Further Information:

Katie Sheline, shelinek@michigan.gov
or Jim Collins, collinsjim@michigan.gov

Note: This study/report was supported in part by an appointment to the Applied Epidemiology Fellowship Program administered by the Council of State and Territorial Epidemiologists (CSTE) and funded by the Centers for Disease Control and Prevention (CDC) Cooperative Agreement U60/CCU007277.