

# Operational Considerations and Early Successes with a Statewide Public Health Surveillance System

Michael Wade, M.P.H.<sup>1</sup>, Joseph Gibson, M.P.H, Ph.D.<sup>2</sup>, Shandy Dearth, M.P.H.<sup>2</sup>, Shaun Grannis, M.D., M.S.<sup>3</sup>

<sup>1</sup>Epidemiology Resource Center, Indiana State Department of Health; <sup>2</sup>Marion County Health Department; <sup>3</sup>Regenstrief Institute, Indiana University School of Medicine

## OBJECTIVE

This paper describes how local and state stakeholders interact with Indiana's operational public health emergency surveillance system (PHESS), including resources allocated to syndromic surveillance activities and methods for managing surveillance data flow. We also describe early successes of the system.

## BACKGROUND

In 2004, the Indiana State Department of Health (ISDH) partnered with the Regenstrief Institute to begin collecting syndromic data from 14 ED's to monitor bioterrorism-related events and other public health emergencies. Today, Indiana's PHESS receives approximately 5,000 daily ED visits as real-time HL7 formatted surveillance data from 55 hospitals. The ISDH analyzes these data using ESSENCE and initiates field investigations when human review deems necessary.<sup>1</sup> The Marion County Health Department (MCHD), located in the state's capitol and most populous county, is the first local health department in Indiana using ESSENCE.

## METHODS

A full-time ISDH syndromic surveillance epidemiologist oversees operation of the PHESS and reviews surveillance data daily. Further, a portion of other epidemiology and information technology staff time supports PHESS functions including quality assurance and IT operations. Data delivery is monitored 24/7. ESSENCE alerts and automated query results are reviewed at regular intervals throughout the day. Follow-up with hospitals and local health departments is initiated by the ISDH syndromic surveillance epidemiologist and carried out by local field epidemiologists in a "tiered urgency" fashion.

ESSENCE is reviewed at least once each weekday by an MCHD epidemiologist and a communicable disease nurse. Follow-up with hospitals is initiated based on the MCHD staff's assessment of the data supporting the alert. It requires less than 3 hours per week to review the data and perform initial inquiries, and initiate a field investigation approximately once each month.

## RESULTS

In eight months use, two events were detected by ESSENCE that were unknown through other sources: a case of carbon monoxide exposure and a food borne disease outbreak. The system also demonstrated appropriate performance during a natural disaster.

In December 2005, the PHESS identified an unusually high number of neurological cases in southern Indiana. Local field epidemiologist follow-up

with the hospital revealed that a family had been exposed to carbon monoxide in their home. While this finding did not uncover a widespread public health threat, it did provide the first empirical evidence that Indiana's PHESS could detect a valid syndromic signal.

One week later the system detected a similar elevation in gastrointestinal cases. Both the ISDH and the MCHD detected the alert and the MCHD conducted a field investigation. Although laboratory testing did not identify a causative organism, investigation by environmental health specialists revealed two possible cross contamination issues at the retail food outlet that sold the food item in question. Store management was informed of the violations, which were corrected on site at the time of the inspection. The health care provider who treated the affected patients did not notify public health officials of the outbreak. We believe it is unlikely this event would have been detected and acted upon in the absence of the PHESS.<sup>2</sup>

Finally, a deadly tornado struck southern Indiana in 2005. As the ED visit volumes climbed, no false alerts were triggered for the eight syndrome categories (Figure 1). This suggests that the system has the ability to maintain specificity in the face of increased activity related to natural disasters.

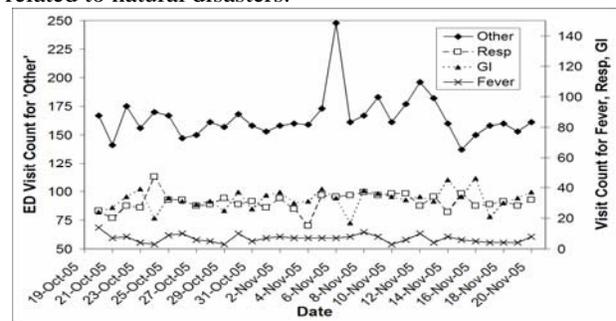


Figure 1: No false positive signals with increased volume

## CONCLUSIONS

Indiana's surveillance system demonstrated the ability to detect relatively few true alerts amidst much background noise, and augmented traditional public health surveillance. Future plans include adding new data sources and providing local health departments and hospitals direct access to the PHESS.

## REFERENCES

1. Lombardo, JS, The ESSENCE II Disease Surveillance Test Bed for the National Capital Area. Johns Hopkins APL Technical Digest, vol 24(4):2003:327-34.
2. Marion County Health Department Food Service Establishment Inspection Report, 0311G96243, Dec. 30, 2006.

Further Information:

Michael Wade, [mwade@isdh.IN.gov](mailto:mwade@isdh.IN.gov)