

ANECDOTES OF INDIANA'S PUBLIC HEALTH EMERGENCY SURVEILLANCE SYSTEM

Although research demonstrates that data from emergency department encounters and hospital admissions can signal the onset and evolution of disease outbreaks earlier than traditional surveillance methods, there are few reports of active surveillance systems detecting real public health events.

That being said, the effectiveness of Indiana's Public Health Emergency Surveillance System and its impact is best demonstrated by point of care anecdotes.

Event #1

On December 21, 2005, in the early morning hours, seven individuals sought care at an Indiana hospital emergency department. All registered the same chief complaint—"dizziness". On that evening, the PHESS investigators observed a cluster of neurological syndrome cases (the category for "dizziness") among the surveillance data. Although it is not unusual to identify sporadic neurological syndrome cases, it was not typical to observe seven of them clustered this tightly. The Indiana State Department of Health (ISDH) Syndromic Surveillance Epidemiologist contacted the appropriate ISDH Field Epidemiologist and requested follow-up. Ultimately, the PHESS staff learned that the cluster was comprised of seven family members, who suffered effects of carbon monoxide exposure in their home while sleeping that night.

Event #2

A similar scenario appeared in the Indiana State Department of Health (ISDH) syndromic surveillance data on December 28, 2005. Epidemiologists observed data for a syndromic alert consisting of 22 gastrointestinal cases. Eight of the cases presented at the same hospital emergency department, at virtually the same time, from the same residential ZIP code, and expressed the same chief complaint—"vomiting". Thinking this type of data uniformity indicated a high probability that a significant relationship existed among the eight cases, the ISDH Syndromic Surveillance Epidemiologist contacted the appropriate ISDH Field Epidemiologist and local health department in the area of interest. The local health department followed up with the hospital emergency department and learned the group of eight cases actually represented a single family. Further investigation conducted by the local health department indicated the family members' vomiting may have been related to food they had all consumed during their previous evening meal.

Event #3

On November 6, 2005, a deadly tornado devastated Vanderburgh and Warrick Counties in southern Indiana, killing 24 and injuring many more. On that date, the PHESS reflected 328 emergency department visits from the affected counties. Of the total visits, 249 (76%) were classified as "other syndromes" because they did not fit in the eight syndromic categories that are primarily meant to trigger infectious disease alerts potentially linked to bioterrorism or other public health emergencies. Epidemiologists were easily able to leverage the sophisticated functionalities of the surveillance system to discern the syndromic disease cases of interest, versus the trauma cases related to the tornado and, therefore, did not respond to what would have been a false alarm from an infectious disease perspective.

While the syndromic cluster investigations summarized above did not pose a widespread public health threat, they did demonstrate the ability of the PHESS to identify illness clusters as small as a single family. Had the exposures involved larger numbers of people and potentially multiple hospitals, the PHESS would have detected those. A spatial (geographic) alert would appear in the syndromic surveillance data indicating that many individuals within a certain area had reported a similar chief complaint, thus producing a cluster. These spatial clusters are difficult to see from the perspective of a single hospital emergency department; however, the PHESS has a perspective which allows epidemiologists to observe data from multiple emergency departments simultaneously, thus enabling the recognition of relationships that may otherwise go undetected. Furthermore, the PHESS performed as designed during the November 2005 tornado: analysts were able to “see through” trauma data and view cases that were more likely to be related to infectious disease.