

Syndromic Surveillance in Boston: Validating the Detection of Small Events and Integrating Response from a Local Health Department

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OBJECTIVE

The interpretation of aberrations detected by syndromic surveillance is critical for success, but poses challenges for local health departments who must conduct appropriate follow-up and confirm outbreaks. This paper describes the response of the Boston Public Health Commission (BPHC) to a cluster of emergency department (ED) visits in children detected by syndromic surveillance.

BACKGROUND

The BPHC syndromic surveillance system receives daily data from 10 Boston hospital EDs. Chief complaint and demographic data are received for each visit; chief complaints are then grouped into eight syndrome groups, and CUSUM is used to detect signals of potential interest. All signals are reviewed daily by BPHC communicable disease staff. Follow-up of a signal varies widely depending on the nature of the chief complaints and strength of the signal. Investigation typically involves obtaining medical records for the group of patients in question and examining supporting data sources for confirmation or additional characterization.

METHODS

12 children (≤ 20 years old) were seen at Boston-area emergency departments on April 9, 2005 for complaints in the "hemorrhagic" syndrome group; six presented with chief complaints of vomiting blood (hematemesis). BPHC conducted follow-up surveillance by contacting the EDs and obtaining ED visit charts. Patient or parent interviews were conducted for each patient in the observed cluster. Initial findings prompted enhanced surveillance via a survey sent to all Boston emergency departments, neighborhood health centers, infection control departments, and pediatric hospital services, requesting reports of any children (≤ 16 years old) evaluated between April 1 and 15, 2005 for vomiting with subsequent hematemesis for which no etiology could be identified.

RESULTS

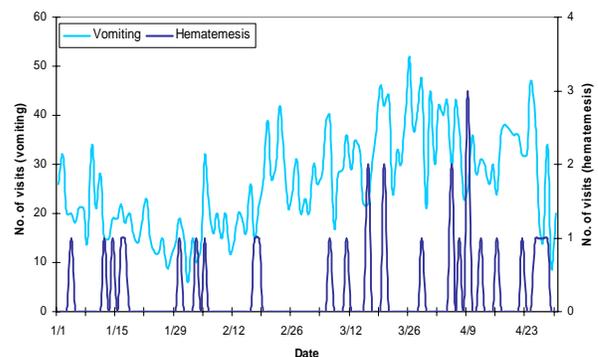
Physician's notes on the six initial patients indicated a shared preliminary diagnosis of GI bleeding secondary to Mallory-Weiss Syndrome in previously healthy children. Review of medical records and

interview data showed no commonalities in food or social histories, however, two of the initial six were ruled out as part of the potential cluster due to other risk factors that explained their illness. Four additional cases were identified by the survey at separate institutions; 16 sites replied that no such cases were seen. ED physician interviews and a concurrent rise in vomiting suggested that illness was most likely due to an unidentified virus. Available lab tests did not identify any pathogens.

CONCLUSIONS

The utility of syndromic surveillance depends on timely identification of unusual clusters of disease and integration with traditional public health response. In this instance, syndromic surveillance detected a cluster of illness in children who presented similarly at different sites throughout the city in relatively small numbers that was not detected by traditional surveillance methods. However, more traditional surveillance methods played a key role in understanding the syndromic surveillance signal. ED charts provided a quick and readily available assessment tool for clinical and contact information. The ability to build a working case definition and survey providers is critical for follow up of syndromic signals too small to be detected by traditional surveillance.

FIGURE. Trend graph of emergency department visits for vomiting and hematemesis in children*: January-April, 2005. A signal was detected by syndromic surveillance on April 9, 2005, prompting the investigation.



*Age < 16 years old