

Norovirus Outbreak Detected by Emergency Department Syndromic Surveillance using RedBat[®]

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OBJECTIVE

This abstract describes the use of syndromic surveillance at a regional health department to detect an outbreak of norovirus in a nursing home facility.

BACKGROUND

The Texas Department of State Health Services (DSHS) Health Service Region 8 (HSR 8) encompasses 28 counties in South Central Texas. Of these, 5 counties are covered by a local health department syndromic surveillance system while the remaining counties fall under HSR 8 syndromic surveillance coverage. Of the 23 counties covered by HSR 8, 15 have hospitals with emergency departments. HSR 8 began receiving emergency department data from 3 hospitals for RedBat[®] syndromic surveillance monitoring in May of 2006. Four syndromes are monitored daily; Influenza-like Illness, Gastrointestinal Illness (GI), Rash-Illness, and Neurologic-Toxicologic Illness.

Aberrations are detected by the Gustav algorithm using RedBat's 'Automatic Threshold Alert' feature. The Gustav algorithm [patent pending], developed by ICPA, Inc., is an advanced variation of the cumulative sum method commonly used for aberration detection. The Gustav algorithm does not require an extended baseline level of illness and is very sensitive to small outbreaks; the algorithm also adjusts for weekly periodicity of medical visits.

METHODS

On December 5, 2006 a Red Flag in the daily Automatic Threshold Alert report for GI syndrome indicated a high probability of a 'significant' outbreak. Seven patients with greater than threshold level GI syndrome scores were seen between 12/02/2006 and 12/03/2006 in 1 of the 3 participating hospitals, representing an increase of 71% over expected. The infection control practitioner from the hospital retrieved the patient information and discovered that 4 of these 7 patients resided in Nursing Home A (NH-A). On the same day, a report of a possible outbreak of gastroenteritis was received from an infection control practitioner collecting surveillance from Nursing Home B (NH-B) in a different county. Ill residents in NH-B had symptoms and duration of illness similar to the NH-A residents identified through syndromic surveillance.

Investigations of the two nursing homes began on 12/07/06. Interviews were conducted; fecal specimens collected and nursing homes' administrations were asked to complete a line list tracking ill residents and staff.

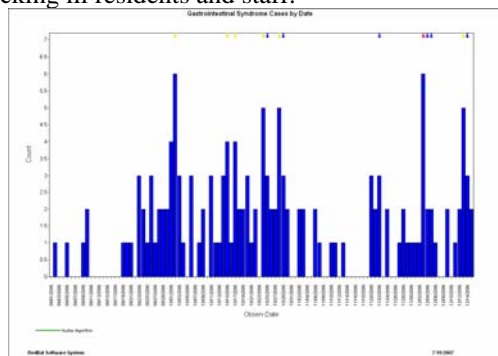


Figure 1. Automatic Threshold Alert Report, Above Threshold GI Syndrome Cases by Date, 09/01/2006 to 12/15/2006.

RESULTS¹

From 12/03/2006 to 12/11/2006, there were 43/148 cases (29%) of gastroenteritis in 8(19%) staff and 35(81%) residents. Seven cases were identified through syndromic surveillance. One resident was hospitalized. The predominant symptom was diarrhea (75%) followed by vomiting (52%) and nausea (25%) with a mean illness duration of 31 hours. Of the 6 fecal specimens submitted (1 from NH-A, 5 from NH-B) to the DSHS laboratory for testing, one was positive for norovirus. On December 8, 2006 a viral gastroenteritis health advisory was distributed to health care providers in HSR 8 with recommended control measures for enteric virus infection. The advisory resulted in self-reporting of similar outbreaks by at least two other regional residential facilities.

CONCLUSIONS

Viral gastroenteritis is not a notifiable condition in Texas and would likely have been undetected by traditional surveillance techniques. Syndromic surveillance monitoring through RedBat allowed us to successfully identify an institutional outbreak of viral gastroenteritis, which was an indicator of a larger trend of illness occurring in the region.

¹ Results are from the investigation of NH-A only.