Mutual Benefits in Partnerships between Hospital-based and Public Health Department Syndromic Surveillance Systems in Outbreak Detection and Investigation

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Objective: Demonstrate the utility of collaboration between hospital-based and public health syndromic surveillance systems in disease investigation. Demonstrate the ability of syndromic surveillance in identification and evaluation of process improvements.

Background: Syndromic surveillance has traditionally been used by public health in disease epidemiology. Partnerships between hospital-based and public health systems can improve efforts to monitor for disease clusters. Greenville Hospital System operates a syndromic surveillance system, which uses EARS-X to monitor chief complaint, lab, and radiological data for the four emergency departments within the hospital system. Combined, the emergency departments have approximately 145,000 visits per year. During March 2007 an increase in invasive group A Streptococcus (GAS) disease in the community lead to the use of syndromic surveillance to determine if there was a concomitant increase in Scarlet Fever within the community.

Methods: An initial investigation in February 2007 of four consecutive alerts in the rash complaint set identified a possible trend in diagnosis of Scarlet Fever. Positive rapid strep tests (RSTs) performed in the ER and analyzed by EARS-X showed a five day period of alerts which overlapped with alerts in the rash complaint set. Four weeks after the alerts, a cluster of invasive GAS infections was identified via traditional infection control surveillance methods. This cluster, along with the syndromic surveillance data of rash and positive RSTs led to a focused investigation of all cases of disease related to GAS. The number of cases with a diagnosis of Scarlet Fever for the previous three months was obtained, and showed a marked increase when compared to the same time period for the previous two years (figure 1). The hospital system communicated their findings with the Department of Health and Environmental Control (DHEC).

Results: DHEC conducted a chart review of all patients with a diagnosis of Scarlet Fever for the period of January 1 - March 23, 2007. Of the 90 identified cases, 14 met the clinical definition of positive strep test and rash for Scarlet Fever (figure 2). From this review, DHEC identified that 68 of the 90 cases were made by a single physician, of which only five met the clinical definition of Scarlet Fever. Findings suggest physician misdiagnosis as a possible cause for increased reporting of Scarlet Fever. Further investigation conducted by the hospital infection control practitioner determined that the root cause was not related to physician misdiagnosis, but instead due to incomplete code mapping of the condition: Scarlet Fever. The data terminals used by the ER physicians were automatically populating the final diagnosis field for disposition, and the diagnosis could not always be removed or replaced. The Information Services Department corrected the code mapping as part of the response to this issue. Final diagnosis of Scarlet Fever was monitored for a four-week period after the intervention to validate the corrective action taken. No further cases related to the incomplete code mapping were identified.

Conclusions: Partnerships between hospital systems and public health departments can aid disease surveillance by identifying localized outbreaks not recognized by traditional public health methods. Syndromic surveillance can have institutional benefits by identifying process improvement issues and facilitate needed corrections.

Figure 1. Comparison of Physician Diagnosis to Clinical Definition of Scarlet Fever 1/1/07-3/23/07

	2007	2006	2005
MD Diagnosis	90	9	12
Clinical Definition	14	4	5

Figure 2. Comparison of ER Diagnosis to Clinical Definition of Scarlet Fever 1/8/06-3/24/07