

Comparison of ICD-9-Coded Chief Complaints and Diagnoses for Identifying Gastrointestinal Syndrome Using ESSENCE

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OBJECTIVE

The purpose of this study was to determine if existing chief complaint and ICD-9 codes for detecting gastrointestinal syndrome correctly identify similar patterns of illness when applied to the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE IV).

BACKGROUND

Due to the threat of bioterrorism and the emergence of new infectious diseases, the Miami-Dade County Health Department (MDCHD) has been using an Emergency Department (ED) based syndromic surveillance system since January 2005 to identify bioterrorism-associated or natural disease outbreaks before specific diagnoses are made. The Center for Disease Control and Prevention (CDC) has classified bioterrorism agents into categories based on priority, with Category A and B agents having the highest priority, respectively. Many of these agents can have gastrointestinal-related symptoms, such as forms of enteric tularemia, anthrax, botulism, salmonellosis, shigellosis, typhoid fever, cholera and others [1].

METHODS

A retrospective review was conducted on the months of February, April, and June during the year 2005. These months were chosen as a random sample of the data received from one of the eight hospitals participating on the syndromic surveillance system. MDCHD creates daily reports based on the analysis of syndromic data through ESSENCE; the system automatically generates alerts or warnings due to observed increases in the number of ED visits. Gastrointestinal syndrome (GI) is one of the 11 syndrome categories monitored by ESSENCE in Miami-Dade participating hospitals. The GI syndrome category is composed of any combination of chief complaints of vomiting, diarrhea, nausea or abdominal pain. Miami-Dade has identified 73 ICD-9-coded diagnoses that correspond to the GI syndrome category. There were 24,522 emergency department visits reported during this time. Statistical Analysis System (SAS) was used to analyze the data. Duplicated classifications of complaints were deleted and cases in which a chief complaint or diagnosis was missing were excluded.

RESULTS

The sensitivity and specificity were calculated to be 83% and 87%. The positive predictive value was 49% while the negative predictive value was 97%.

The overall accuracy was 87%. GI syndrome represented 13.2% of all emergency department visits during the study period. Though it was expected that there would be a significant increase in visits on the day after weekends and holidays, only the day after holidays had a heightened number of visits.

Measurement	Value	95% CI
Sensitivity	0.83	0.81-0.84
Specificity	0.87	0.86-0.89
PPV	0.49	0.48-0.51
NPV	0.97	0.96-0.97
Accuracy	0.87	0.86-0.89

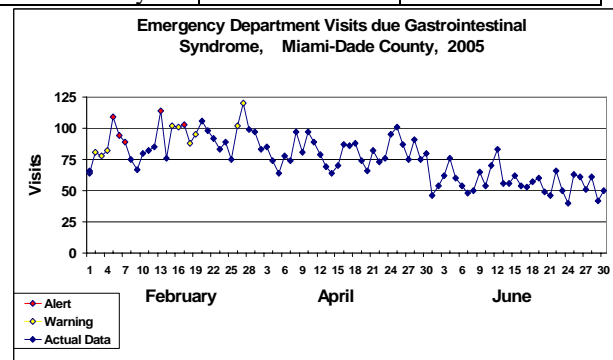


Figure 1. Daily plot of emergency department visits and alerts for gastrointestinal syndrome for one hospital in Miami-Dade County

CONCLUSIONS

Due to the high level of sensitivity and specificity, we concluded that the use of chief complaints data in syndromic surveillance yields similar results to the ones observed when utilizing ICD-9-coded diagnoses. Reports consistent with this observation have been generated by studies of respiratory illness and syndromic surveillance [2]. Since timeliness is a crucial factor in surveillance [3], the chief complaints for this system appear to be sufficient to detect a gastrointestinal outbreak before a final diagnosis and subsequent report to local health authorities are made.

REFERENCES

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