

Can Syndromic Surveillance Data be Useful for Monitoring Respiratory Illness Activity?

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OBJECTIVE

The purpose of this paper is to describe the value of outbreak and syndromic surveillance data from the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) syndromic surveillance system to monitor respiratory illness activity in Maryland.

BACKGROUND

A significant amount of resources and effort have been recently invested in syndromic surveillance systems. However, how these systems complement or compare with traditional public health surveillance systems, such as outbreak reporting, is not clear.

METHODS

Depending on how the data are analyzed, ESSENCE may generate many alerts on any given day. To incorporate the additional interpretive experience of epidemiologists familiar with syndromic surveillance systems, criteria were developed to determine when to further evaluate statistical aberrations or alerts. ILI/pneumonia alerts for which further investigation was indicated were compared to the number of ILI/pneumonia outbreaks reported to the state health department during that same time period. Agreement was defined as selected alerts for which a reported outbreak occurred prior to or within 2 weeks of the alert. A kappa statistic was calculated to show the degree of agreement between the 2 systems as monitors of respiratory illness activity.

RESULTS

The influenza season was defined as October 1 to May 31. There were 243 days under observation. Using the criteria established, 8 alerts warranted further investigation. 6/8 (75%) of these alerts identified were in agreement with an outbreak reported during the appropriate timeframe, however these selected alerts only detected 6/12 (50%) reported outbreaks. For negative signals, the ESSENCE and outbreak reporting systems were in agreement 229/231 (99%) days during the study period. Overall, the 2 systems show moderate agreement ($K=0.58$), and mostly influenced by days when neither system indicated influenza activity.

CONCLUSIONS AND RECOMMENDATIONS

Agreement between the ED syndromic surveillance and outbreak reporting was only moderate, suggesting that these systems do not measure the same aspects of influenza activity. A recognized limitation for the use of syndromic surveillance data is the inability to quickly link: laboratory diagnoses to chief complaint and discharge diagnoses; and cases reported from outbreaks to those in the community. A limitation of outbreak reporting is bias related to reporting sources, since over 50% of all outbreaks reported are from a long term care facility (LTCF). As a susceptible population because of their immune status, it may be that those who reside in LTCFs may be the first indicators of an increase in respiratory illness occurring in the community or general population. The 2006-2007 flu season was relatively mild. In the absence of large numbers of influenza infection in the general population, it may be that the first signs of an increase in flu activity can be indicated by those who are most susceptible. As a tool for monitoring respiratory illness, combining ESSENCE and outbreak reporting may be useful to detect increases in community-wide influenza activity so that timely interventions can be implemented. Future recommendations are to continue evaluation of these systems and compare to other types of influenza surveillance systems, such as the sentinel provider network, and reporting of lab-confirmed influenza and hospitalizations.

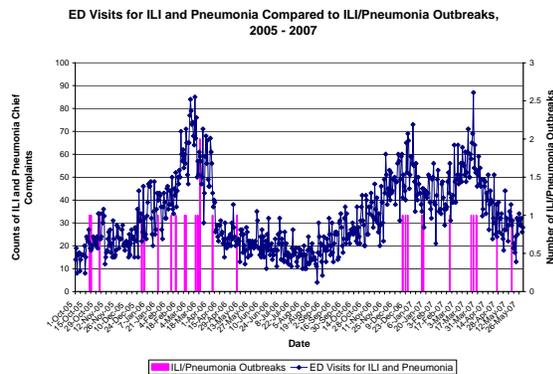


Figure 1 – ED Visits for ILI and Pneumonia Compared to Number of ILI/Pneumonia Outbreaks, 2005 – 2007

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