

Surveillance for Influenza Using the Emergency Department Syndromic Surveillance and Hospital Admissions Syndromic Surveillance Systems, Connecticut, 2004-2007

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OBJECTIVE

To evaluate the performance of the hospital admissions syndromic surveillance (HASS) and emergency department syndromic surveillance (EDSS) systems in reflecting seasonal influenza activity in Connecticut and, thus, their possible utility during a pandemic.

BACKGROUND

In Connecticut, several syndromic surveillance systems have been established to detect and monitor potential public health threats: 1) the HASS system in 2001; and 2) the EDSS system in 2004. For the HASS, hospitals manually categorize unscheduled admissions into 11 syndrome categories and report these aggregate counts through an internet-based system daily to DPH; all 32 hospitals participate [1]. For the EDSS, hospitals electronically report de-identified emergency department chief complaint data to DPH, and using a computerized algorithm, DPH categorizes this data into 8 syndrome categories; currently 17 hospitals participate [2]. As part of pandemic influenza planning, there has been an increased focus on situational awareness at the state and national level; Connecticut would likely rely on these two systems for this purpose.

METHODS

Four syndromes were assessed as potential predictors of influenza activity: pneumonia admissions reported through HASS, and fever/flu, respiratory, and cold syndromes reported through EDSS. Weekly totals of pneumonia admissions and weekly percentage of ED visits for the months October through May due to each syndrome were compared to weekly totals of laboratory confirmed influenza reports for the past three influenza seasons (2004/2005, 2005/2006, and 2006/2007) using correlation coefficients. Additional correlation analysis was performed for EDSS visits with children ≤ 12 years excluded.

RESULTS

During the 2004/2005 and 2005/2006 seasons, all syndromes showed a significant positive correlation with influenza reports; excess pneumonia admissions were most highly correlated ($r=0.88$, $p<0.0001$) in 2004/2005, and percent increase in fever/flu ($r=0.91$, $p<0.0001$) and excess pneumonia admissions ($r=0.80$,

$p<0.0001$) had the highest correlation in 2005/2006. In 2006/2007, percent increase in fever/flu was the only syndrome with a significant correlation ($r=0.62$, $p<0.0001$). During all three seasons, excluding children ≤ 12 years from EDSS syndrome visits improved their correlation with laboratory reports, particularly in the 2006/2007 season (fever/flu $r=0.89$, $p<0.0001$). The relative severity of influenza seasons based on total positive influenza lab reports progressively declined during the 3 years (3,470 to 3,161 to 2,135). Of note, in both 2005/2006 and 2006/2007 there was a late December-early January peak in activity in both systems that was independent of influenza activity, although the magnitude of this peak is reduced with the exclusion of children ≤ 12 years. This peak appeared to be due to respiratory syncytial virus activity.

CONCLUSIONS

The HASS and EDSS systems both have syndromes that correlate well with seasonal influenza during seasons with relatively high activity, thereby providing timely measures of the changing and overall burden of influenza. These systems did not perform as well during the milder 2006/2007 influenza season during which other seasonal respiratory diseases may have been as important contributors to these syndromes as influenza. It is expected that these syndromes would perform well in a pandemic during which higher influenza attack rates and more severe disease are expected. However, continued evaluation of these syndromes for seasonal influenza is needed. Implementation of expanded influenza vaccine recommendations could make mild influenza seasons the future norm.

REFERENCES

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