

Variation of Chief Complaint-Based Respiratory Symptom Data in One Hospital's Nurse Advice Call Center and Emergency Department

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Objective: The objective of this report is to describe the variation of symptoms being detected as respiratory or influenza-like illness (ILI) syndrome using nurse advice call center (NACC) data and emergency department (ED) chief complaint data compared to laboratory data from one hospital.

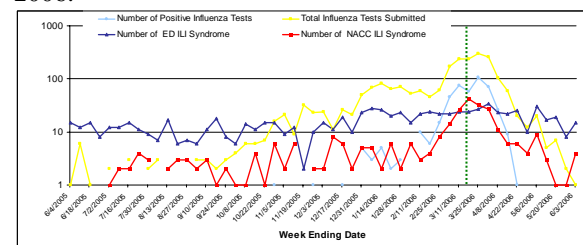
Background: Previous reports have demonstrated that NACCs provide an effective source of data for syndromic surveillance to detect patterns of disease (Roberts 2004). Potential advantages include that the data exists in a real-time, electronic format, a medical professional interprets the patient information and the data entry of chief complaints is consistent by using canned drop-down lists (Magruder 2004). By comparing the North Dakota Department of Health (NDDoH) syndromic surveillance program to influenza laboratory testing data, we found NACC chief complaint data follows ILI trends more closely than data obtained from the ED for one facility during the 2005-2006 influenza season.

Methods: The NDDoH receives daily electronic files from one hospital's NACC and ED utilizing the commercial software RedBat® (ICPA Inc., Austin, TX). The natural language translation tool SympTran® (ICPA Inc.) translates free text from the complaint field into symptoms. An ILI syndrome is scored (0 to 100) based on symptom groupings; the cutoff value is determined by frequency distribution of non-zero scores for each syndrome and calculated at the highest five percent of distributed scores (the top 1/20). Frequency of symptom groupings translated from NACC and ED chief complaint data were analyzed. We then compared trends in weekly ILI detected by NACC and ED data from this facility by correlating the ILI syndrome in a time series against positive rapid influenza and total rapid influenza tests from June 1, 2005 to May 31, 2006. Using RLinkPlus®, we matched NACC and ED data from June 25, 2005 to May 31, 2006 to rapid influenza tests occurring within 14 days of NACC call or ED visit by patient first name, last name and date of birth. We then calculated the sensitivity and specificity of each data source in its ability to detect rapid influenza tests.

Results: We found six symptom groupings scored as ILI syndrome among NACC data compared to 13 among ED data. A total of 68% of NACC and 0.18% of ED chief complaint data contained the term

“influenza.” Visual comparison of ILI to number of total rapid influenza laboratory tests submitted at the same hospital suggest a closer correlation to NACC data when compared to ED data. (Figure 1) We detected fewer total rapid influenza tests using NACC data compared to ED data (sensitivity of 14.2% vs. 26.5% respectively); however, ED data was less specific than NACC data (specificity of 92.7% vs. 97.2% respectively). Furthermore, when compared to ED data, NACC was equally sensitive as and more specific than ED data in detecting positive rapid influenza tests during the peak outbreak period.

Figure 1 – Positive and Total Rapid Influenza Tests Compared to ILI Chief Complaint Data in One Facility, North Dakota – June 1, 2005 – May 31, 2006.



..... Peak Influenza Week Ending March 18, 2006.

Discussion: Our analysis suggests that the NACC (vs. the ED) may offer a more consistent and specific source of ILI syndromic surveillance data for this facility. Increasing the accuracy and consistency of terms used to translate chief complaints into symptoms may increase the usefulness of this syndromic surveillance system (i.e. training staff to collect and enter specific terms among chief complaint data). One limitation of our study was that we could not conclusively determine that non-ILI persons were not tested for influenza because they did not exhibit signs of influenza (e.g. influenza was not high on the physician's differential diagnosis or for some other reason). Additionally, further study could include methods (e.g. ICD-9 or ICD-10 codes) to confirm detection of all ILI conditions when evaluating these systems. These methods may provide an approach to establish and evaluate syndromic surveillance for other syndromes in this facility or for ILI surveillance in other North Dakota jurisdictions.

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