The Utility of Patient Chief Complaint and ICD 9 Classifiers for the Influenza Sub-syndrome

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BACKGROUND

In order to detect influenza outbreaks, the New York State (NYS) Department of Health emergency department (ED) syndromic surveillance system uses patients' chief complaint (CC) to assign visits to respiratory and fever syndromes. Recently, the CDC developed a more specific set of "sub-syndromes" including one that included only patients with a CC of flu or having a final ICD9 diagnosis of flu. Our own experience was that although flu may be a common presentation in the ED during the flu season, it is not commonly diagnosed as such. Emergency physicians usually use a symptomatic diagnosis in preference, probably because rapid testing is generally unavailable or may not change treatment. The flu subsyndrome is based on a specific ICD9 code for influenza. It is unknown whether patient visits that meet these restrictive criteria are sufficiently common to be of use, or whether patients who identify themselves as having the flu are correct.

OBJECTIVE

Our objective was to examine the CC and ICD9 classifiers for the influenza sub-syndrome to assess the frequency of visits and the agreement between the CC, ICD9 code and chart review for these patient visits.

METHODS

Design: Retrospective cohort Setting: Four NYS EDs Participants: Consecutive visits from 5-1-05 to 4-30-2007. Protocol: Since patients with the flu are a small percent of total ED visits, it was impractical to review enough charts to draw conclusions about the specificity and sensitivity of CC or ICD9 for the flu sub-syndrome using chart review as the criterion standard., We therefore determined an "enriched set" by including all visits identified as flu by either the CC or ICD classifier. This allowed us to examine the positive predictive value of the CC and ICD9 for the influenza sub-syndrome, For the chart review criterion standard, we adapted the CDC definition of influenza-like-illness to count patients into the flu subsyndrome who had fever and either cough or sore throat and had no other known cause. We then calculated the positive predictive value (PPV) for the CC and ICD9 classifiers. For the false positives, we determined whether they were due to a correctable deficiency in the classifier. We calculated 95% confidence intervals (CIs) using the Student's t-test.

RESULTS

Of the 238,547 charts in the database, only 380 (0.15%) were positive by CC and 151 (0.06%) by ICD9. Only 19 (0.007%) were positive by both CC and ICD9. Of the 512 visits in the "enriched set", 430 (84%) had a complete EMR. Positive predictive values are shown in the following table.

CLASSIFIER	CC	ICD
TOTAL POSITIVES	317	129
TRUE POSITIVES	72	76
PPV (95% CIS)	23% (18%-28%)	60% (51%-69%)
PPV CORRECTED (95% CIS)	31% (26%-36%)	79% (72%-86%)

False positive CC were usually due to the patient complaining of flu but on final diagnosis having a more specific other cause. False positive ICD9 were most often due to physicians assigning a flu diagnosis to patients not meeting the CDC definition of influenza-like-illness.

CONCLUSIONS

Visits identified as influenza sub-syndrome by ICD9 or CC were uncommon. There was poor agreement between the CC and ICD9 classifiers. Both classifiers could be improved, but much of the misclassification was due to lack of information in the CC and ICD9. Even after correcting the classifiers, patients who gave a CC of having the flu were incorrect two out of three times suggesting that the CC classifier may have limited usefulness in influenza surveillance. The ICD9 classifier performed better and may have some utility in influenza surveillance.