

Improving Agreement between Two Existing Methods for Biosurveillance of Respiratory Syndrome: Chief Complaint and ICD9 Diagnosis Code

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Introduction

ICD9 diagnosis code (ICD9) and patient's chief complaint (CC) have both been advocated for surveillance of emergency department (ED) visits to detect or mitigate a bioterror attack. However, few studies exist comparing these two methods. Emergency Medical Associates (EMA) uses an electronic medical record system which includes both the CC and ICD9 diagnosis code for each patient. This made it possible to compare which patients were identified by each method.

Protocol: The ESSENCE project supplied a then-current version of their ICD9 algorithm. The NY State Department of Health extended the CC algorithm originally developed by the NY City Department of Health, and also made modifications to the ESSENCE ICD9 codes.

In order to examine similarities in seasonal patterns identified by the two existing methods before modification, we generated a time-series graph and calculated a correlation coefficient using a larger version of the database.

We then used a smaller version of the database to examine the effects of modifications to the chief complaint and ICD9 methods. We examined agreement between the two methods in three stages:

- (1) the initial CC and ICD9 algorithms.
- (2) after modifying the algorithms to match more closely, mainly by including URI complaints in the CC algorithm.
- (3) after expanding both algorithms to include fever.

We used the kappa statistic to measure agreement.

We also calculated sensitivity and specificity of CC using ICD9 as the criterion standard.

Objective

The objective of this study was to determine if two existing ICD9 and CC respiratory algorithms identified similar patterns of illness. We also wished to determine whether equalizing and expanding the syndromic definitions improved the level of agreement of patient visits selected using the two techniques.

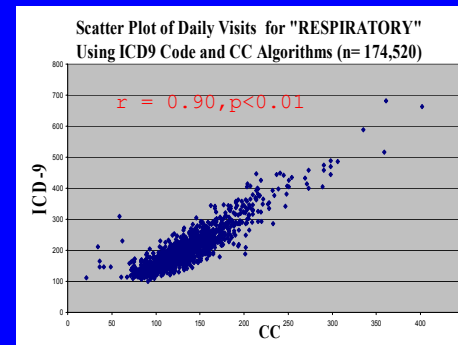
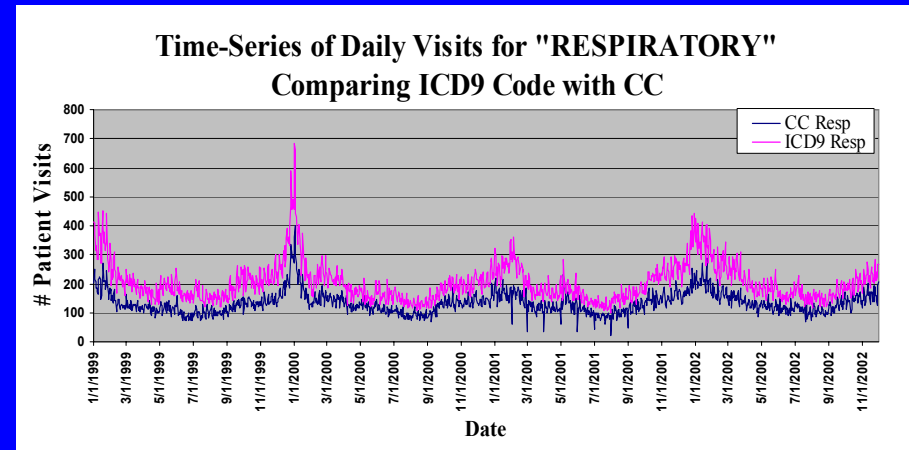
Methods

Design: Retrospective analysis of a computerized database of ED visits.

Setting: 15 New Jersey EDs.

Participants: Consecutive non-trauma patients seen by ED physicians.

Results



Stage (n=174,520)	Kappa	Sensitivity	Specificity
1	0.28	0.31	0.94
2	0.42	0.53	0.91
3	0.56	0.71	0.90

Conclusions

Two existing respiratory algorithms (ICD9, CC) identified similar patterns with high correlation. However, the initial agreement based on the kappa statistic was only fair. The level of agreement was improved by equalizing the syndromic definitions. Agreement was further improved by expanding the syndromic definitions to include fever.