

The Accuracy of Physician Billing Claims for Syndromic and ILI Surveillance

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OBJECTIVE

To assess the accuracy of community-based physician claims for identifying 5 syndromes: fever, gastrointestinal, neurological, rash, and respiratory, including influenza-like illness (ILI).

BACKGROUND

Several syndromic surveillance systems use ICD-9 diagnostic codes from administrative databases to monitor syndrome occurrence [1]. For this purpose, experts have generated lists of ICD-9 codes corresponding to conceptual syndrome definitions [2,3,4]. With the exception of ILI [4], the accuracy of the ICD-9 codes listed has yet to be assessed in community-based primary care, where a majority of patients with these syndromes would be expected to present, at least initially. ICD-9 coding differences between physicians are expected, because ICD-9 codes on physician claims are not audited by payers.

METHODS

In collaboration with the Quebec provincial health insurance agency (RAMQ), we selected a random sample of 3,600 community-based primary care physicians who practiced in the fee-for-service system from October 1, 2005 to September 30, 2007. For each sampled physician, we randomly selected 10 claims, stratifying on syndrome presence, type, and ICD-9 code, as well as visit month (to avoid seasonal bias). The RAMQ sent the list of sampled physicians and claims to the Quebec College of Physicians who, acting as a trusted third party, recruited physicians to our study. Double-blinded, physician-facilitated chart reviews were conducted by telephone with consenting physicians to obtain information on patient complaints, symptoms and signs for each sampled visit. The sensitivity, specificity, and positive and negative predictive values (PPV and NPV) of physician claims for identifying the 5 syndromes and ILI were estimated by comparison to the chart review. All estimates were adjusted for the sampling strategy.

RESULTS

As of September 7th 2009, a total of 1,029 (28.6%) physicians had completed the study. Of the 10,290 claims selected for review, physicians were able to access the corresponding patient medical record for 9,992 (97.1%). Of those, 9,876 (98.8%) had a visit recorded in the patient medical record on the corresponding date ± 3 days. Table 1 shows the accuracy of physician billing claims for identifying potentially infectious syndromes. The specificity and NPV of physician billing claims for identifying the 5 syndromes were high, the PPV was moderately high, and the sensitivity was low. Variation in accuracy was observed between syndromes (Table 1), and between ICD-9 codes within syndromes (not shown).

CONCLUSION

This study assessed the accuracy of community-based physician claims for identifying 5 syndromes: fever, gastrointestinal, neurological, rash, and respiratory, including ILI. The PPV and specificity of physician billing claims for identifying syndromes was high, but the sensitivity was low. To improve the sensitivity of physician billing claims for use in surveillance, physician, patient, and billing characteristics associated with greater sensitivity should be identified and taken into account through weighing or restriction.

REFERENCES

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Table 1. Accuracy of physician billing claims for identifying 5 syndromes and ILI (N=9,876 claim-chart pairs)¹

Syndrome	Prevalence per 1,000 visits ²	No. visits in validated claims	No. visits in validated charts	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)
Fever	18.7	982	793	0.20 (0.18, 0.22)	0.99 (0.99, 0.99)	0.47 (0.44, 0.51)	0.96 (0.96, 0.97)
Gastrointestinal	24.4	935	936	0.35 (0.33, 0.38)	0.99 (0.99, 0.99)	0.70 (0.67, 0.73)	0.97 (0.96, 0.97)
Neurological	5.6	930	652	0.23 (0.20, 0.27)	1.00 (1.00, 1.00)	0.59 (0.56, 0.63)	0.99 (0.99, 0.99)
Rash	17.6	939	877	0.29 (0.26, 0.32)	0.99 (0.99, 0.99)	0.66 (0.63, 0.69)	0.97 (0.97, 0.97)
Respiratory	128.3	1,074	1,711	0.52 (0.50, 0.54)	0.96 (0.96, 0.96)	0.76 (0.73, 0.78)	0.90 (0.89, 0.90)
ILI broad def. [4]	86.5	616	1,163	0.48 (0.46, 0.51)	0.98 (0.97, 0.98)	0.75 (0.72, 0.79)	0.92 (0.92, 0.93)
ILI narrow def. [4]	4.7	51	43	0.26 (0.16, 0.39)	1.00 (1.00, 1.00)	0.24 (0.12, 0.35)	1.00 (1.00, 1.00)

¹Preliminary results shown here, data collection is ongoing. ²According to all billing claims submitted by the 3,600 physicians during the study period.