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ICD90CM Claims Data are Insufficient for Influenza Surveillance

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Abstract and Objective

Influenza and Influenza like illness are representative of a class of epidemic infectious diseases that have important public health implications. Early detection via Biosurveillance can speed life saving public heath responses. In the United States Biosurveillance is typically conducted using ICD9 coded visit diagnoses and uncoded chief complaint data. To determine the accuracy of ICD9 diagnoses using laboratory confirmed cases as the gold standard. We determined the sensitivity and specificity of ICD9 in detecting laboratory confirmed vs unconfirmed Influenza. ICD9-CM had a low 66.2% Positive Predictive Value (precision) for Influenza and a low 45.6% Sensitivity (recall) for Influenza.ICD9-CM proved insufficient alone for use in biosurveillance.

Keywords:

Biosurveillance, Influenza, Public Health, Health Informatics, ICD9-CM

Introduction

ICD9-CM is a variant of WHO's International Classification of Diseases 9th Edition created for administrative purposes by the US National Center for Health Statistics at the Centers for Disease Control and Prevention. For the last more than a decade most research data in the US has used ICD9-CM for codifying diagnoses. Biosurveillance of Influenza and Influenzalike Illnesses are an important area of Informatics research focusing on protecting the safety of our public health. Early notification and public health response can decrease the morbidity and mortality of an Influenza epidemic. In this research we focused on determining the sensitivity (Recall) and positive predictive value (precision) of ICD9-CM diagnosis assignments in determining true cases of influenza as determined by PCR or viral culture laboratory testing.

Methods

A six-year retrospective cohort study. Cases came primarily from Minnesota, Wisconsin, North Dakota, South Dakota, and Iowa. The setting was a tertiary referral center. All 3,825 patients with an ICD9-CM diagnosis of Influenza (ICD9-CM codes 487 and its sub-codes 487.XX) between October 2000 and March 2006 and all 1455 patients with laboratory confirmed Influenza.

Results

Of the 3,828 patients assigned ICD9-CM visit codes indicating a diagnosis of Influenza, 2,825 were not confirmed by laboratory testing and 1,003 patients under went laboratory testing. Only 664 (66.2%) tested positive for Influenza. Of the 1,455 patients who tested positive for Influenza 45.6% were identified by ICD9-CM code.

Table 1- Precision and Recall of ICD9-CM for the Diagnosis

Oj Injtuenza			
Influenza Surveil-	Tested	Tested	
lance	Positive	Negative	
ICD9-CM Positive	664	339	PPV –
			66.2%
ICD9-CM Negative	791	Unknown	
	Sens –		
	45.6%		

Conclusions

ICD9-CM had a low 66.2% Positive Predictive Value (precision) for Influenza and a low 45.6% Sensitivity (recall) for Influenza. ICD9 coded visit diagnoses / claims data are insufficient alone to serve as the basis for Influenza Surveillance.

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