Use of Final Diagnosis Data for Surveillance of Respiratory Syncytial Virus

Colleen Martin, MSPH, Jerome Tokars, MD, MPH, Ashley Fowlkes, MPH, Catherine Panozzo, MPH

Centers for Disease Control and Prevention (CDC)

Objective

To analyze final diagnosis data available to BioSense and determine its potential utility for surveillance of respiratory syncytial virus (RSV) illness.

Background

The BioSense system receives patient level clinical data from > 370 hospitals and 1100 ambulatory care Departments of Defense (DoD) and Veterans Affairs (VA) medical facilities. Visits are assigned as appropriate to 78 sub-syndromes, including RSV. Among infants and children < 1 year of age, RSV is the most common cause of bronchiolitis and pneumonia; 0.5% to 2% require hospitalization.[1] Increasingly, RSV is also recognized as a major cause of pneumonia in elderly adults.[2]

Methods

We identified patient visits meeting the final diagnosis-based RSV sub-syndrome definition [free text diagnosis of RSV or RSV ICD-9 codes of 466.11 (RSV acute bronchiolitis), 079.6 (RSV), or 480.1 (RSV pneumonia) and no associated RSV vaccination code (V04.82)] in VA and DoD data from 7/01/04 to 4/31/07 and hospital data from 7/1/06 to 4/31/07. We could not de-duplicate DoD patient visits due to lack of a longitudinal patient identifier. We analyzed ICD-9 code frequencies, patient demographics, and temporal trends. Among hospital patients, we also examined emergency department (ED) chief complaint and inpatient reason for admission sub-syndromes. Temporal trends in BioSense data were compared to trends in percent positive RSV laboratory antigen detection and virus isolation tests from the CDC National Respiratory and Enteric Virus Surveillance System (NREVSS).[3]

Results

During the study period, 69 hospital, 94 VA, and 267 DoD facilities provided 2985 hospital patients, 201 VA patients, and 13,214 DoD visits with RSV diagnoses to BioSense from 49 states and 2 US territories. The most frequent RSV ICD-9 code for each source was 466.11; the proportion of 480.1 was higher among VA patients. Children < 1 year of age comprised 62% of hospital patients and 71% of DoD visits with RSV diagnoses. Among hospital patients, 48% were diagnosed while inpatients, 39% in the ED, and 13% as outpatients. ED chief complaints for RSV diagnosed patients included dyspnea, fever, and cough; inpatient reasons for

admission included bronchitis/bronchiolitis and pneumonia. DoD and hospital RSV diagnosis rates exhibited seasonal trends similar to NREVSS. Rates were low during summer, increased during fall, peaked during winter, and declined during spring; DoD rates began to increase slightly earlier than hospital rates. Peak winter rates in the DoD, hospital inpatient, and hospital ED were about 50 to 75 times higher than summer rates (Figure 1). Due to low counts, VA RSV rates did not demonstrate prominent seasonal trends.

Figure 1. Hospital Emergency Department, Inpatient, and DoD RSV final diagnosis rates per 1000 visits by data source and week, 7/1/2004 to 4/31/2007
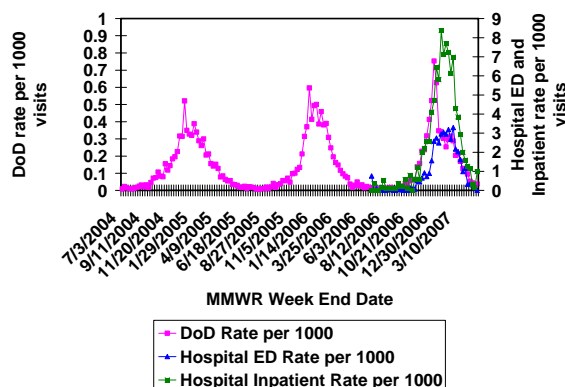
Discussion

Temporal trends in hospital and DoD data were highly seasonal and similar to trends observed in CDC NREVSS laboratory-based RSV surveillance. VA data do not demonstrate seasonal trends, but offer an opportunity for surveillance for severe RSV-associated respiratory illness in older adults. ICD-9 codes are often associated with a period of latency between the time of the patient visit and when the data are available to BioSense; however, these are no longer than reporting delays in CDC NREVSS.[3] We conclude that final diagnosis data in BioSense could be a useful adjunct for surveillance of RSV.

References

1. CDC. Respiratory Syncytial Virus. Available from: http://www.cdc.gov/ncidod/dvrd/revb/respiratory/rsvfeat.htm. Accessed July 11, 2007.
2. Falsey A.R., et al. Respiratory Syncytial Virus Infection in Elderly and High-Risk Adults. *N Engl J Med* 2005;352:1749-59.
3. CDC. National Respiratory and Enteric Virus Surveillance System (NREVSS). Available from: http://www.cdc.gov/ncidod/dvrd/revb/nrevss/. Accessed July 11, 2007.