

How Bad Is It?

Using Biosurveillance Data to Monitor the Severity of Seasonal Flu

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OBJECTIVE

We sought to evaluate the validity of pneumonia and influenza hospitalizations (PI) data gathered by our biosurveillance system.

BACKGROUND

In an effort to enhance our surveillance for seasonal influenza and prepare for a potential influenza pandemic, we employ automated reporting of PI hospital admissions from King County hospitals. The data elements we collect include hospital name, date and time of visit, date of discharge, age, sex, home zip code, chief complaint, disposition, admission and discharge diagnoses, whether or not the patient was intubated or was in the ICU, and a patient and visit key. Data are transmitted daily, but due to delays in establishing diagnoses, may lag by up to one month for some hospitals. At the present time, only a subset of hospitals (n=13 of 17) are routinely sending data on PI hospitalizations; complete data for 10 hospitals are available for 2004-2007. The purpose of this evaluation was to describe the validity of monitoring PI hospital admissions using our biosurveillance system.

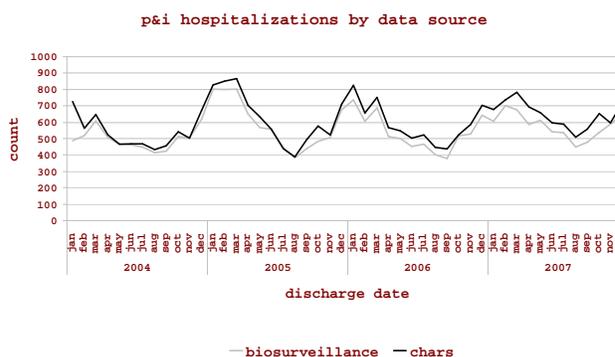
METHODS

The Washington Comprehensive Hospital Abstract Reporting System (CHARS) includes discharge data for every patient hospitalized between 1987 and 2006 [1]. The database is used to collect information such as the age, sex, zip code and billed charges of the patient, as well as the hospital name and codes for each patient's diagnoses and procedures. We classified diagnostic codes 480-487 as PI. We compared counts of PI admissions captured by CHARS with counts captured by our biosurveillance system by month, and calculated Pearson correlation coefficients to evaluate the strength of the relationship between data sources. For purposes of this analysis, the comparison was restricted to 2004-2006, when complete data were available for 10 hospitals in both CHARS and our biosurveillance system.

RESULTS

There was a strong seasonal trend in the number of PI hospitalizations over time. Among patients hospitalized with PI, there was also a strong seasonal trend in the number of patients who were intubated or were in the ICU. Roughly 30% of patients were discharged within 24 hours of admission, and 75% were discharged within 5 days. Overall, there was a

high degree of correlation between CHARS and our biosurveillance system for counts of PI diagnoses ($r=0.99$). The Pearson correlation between the two data sources over time was greater than 0.95 across all age groups, and was highest among adults. The mean and median length of stay was comparable across the two data sources.



CONCLUSIONS

Data on inpatient discharge diagnoses of PI are available from CHARS for examining trends in Washington, but cannot be obtained in real time and are available only with a one-year delay. In contrast, inpatient admission diagnoses gathered by our biosurveillance system are captured daily for visits that occurred up to just one month earlier. We found a strong correlation between the two data sources for describing overall counts of PI hospital admissions. However, discrepancies between the two systems were observed disproportionately among 5-17 year-olds, where our system identified more patients with PI diagnoses compared with CHARS. We were unable to examine whether influenza virus activity was associated with an increase in hospitalizations for a broad range of cardiopulmonary diagnoses, and not just primary PI discharges. However, findings from this analysis demonstrate the validity of our approach for monitoring the severity of seasonal influenza.

REFERENCES

[1] Center for Health Statistics Hospital Data. <http://www.doh.wa.gov/ehsphl/hospdata/chars.htm> Accessed July 8, 2008.

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