

Real-Time Biosurveillance Using an Existing Database

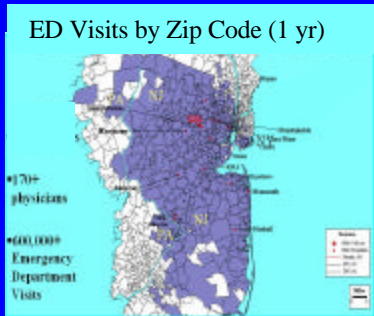
Department Electronic Medical Record Database

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Introduction

Events surrounding 9-11-2001 stimulated much interest in the use of available databases to perform biosurveillance. The Emergency Department (ED) is a particularly appropriate area for study.



Objective

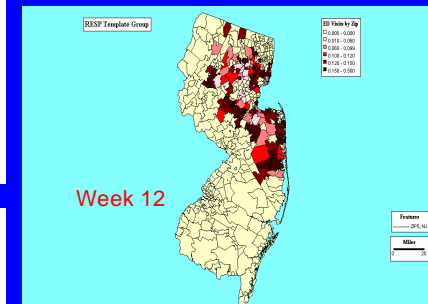
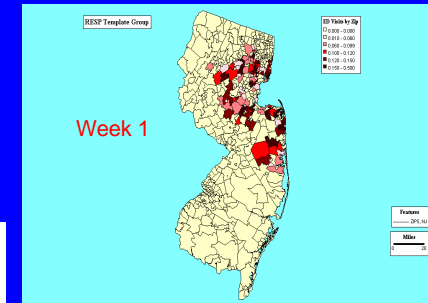
We wished to determine if the EMA data warehouse could be used to:

1. Detect seasonal illness peaks.
2. Function in real time.
3. Track a known seasonal epidemic in space and time.

Results

There were 3.2 million patient visits over the 4.5 year period in the database.

Results are displayed in the following graphs and maps.



Methods

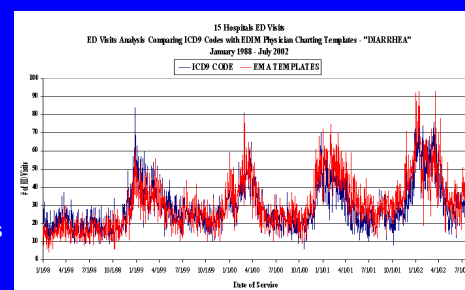
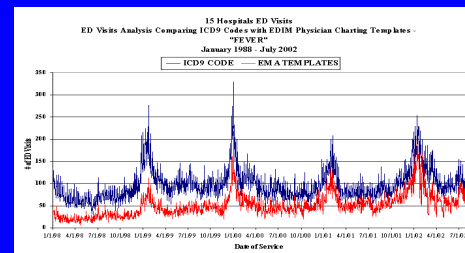
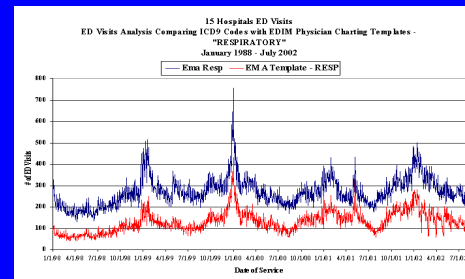
Design: Multi-year retrospective analysis of a computerized database of ED visits.

Setting: 15 New Jersey ED's.

Participants: consecutive patients seen by ED physicians Jan 1998 - July 2002.

Protocol: Syndromic groups were developed for the following categories based on ICD9 codes and physician's choice of charting template.

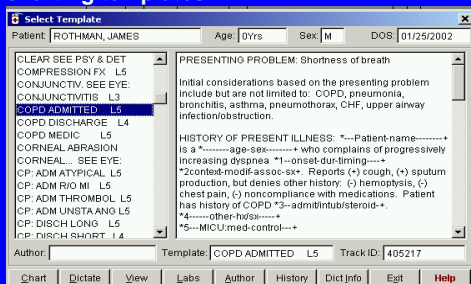
- | | |
|------------|-------------|
| Any GI | Headache |
| Asthma | Respiratory |
| Chest Pain | Skin |
| Diarrhea | Weakness |
| Fever | |



Conclusion

- This existing data warehouse identified seasonal illness peaks.
- The illness patterns identified by physicians' choice of charting template closely followed the patterns identified by ICD9 code. Thus charting template can be used to detect patterns in real time.
- We were able to use the database to track a winter flu epidemic in time and space.

EMA of NJ is an ED physician group which uses an electronic medical record system, capturing the patient's chief complaint and all patient demographics. The physician's note is based on a selection of one of 406 available charting templates.



Physicians' choice of template is available real-time, before the patient leaves the ED. Records are uploaded centrally into a data warehouse which could be used to evaluate a variety of filters and perform real-time surveillance.

We then generated daily counts by category and generated time-series graphs which displayed the incidence of disease for these syndromic groups over the 4.5 year period, both for the ICD9-based and template-based syndromic groups. We also plotted the results using zip-code maps to examine the time-space pattern of a winter flu epidemic.