ICD-9 CM Based Sub-Syndrome Distributions in BioSense Hospital Data

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Objective

To examine sub-syndrome distributions among BioSense emergency department (ED) chief complaint and final diagnosis based data and to observe patterns by hospital system, age, and gender.

Background

In April 2006, real-time hospital data, including ED chief complaints, ICD-9 CM diagnoses, and patient demographic data (with obvious identifiers removed), became available to public health and hospital users through the BioSense application. BioSense medical expert staff developed a mapping schema for free text and ICD-9 CM coded data to 78 sub-syndrome categories. Sub-syndromes represent more granular disease indicator categories than the broad syndrome categories also used in BioSense. They provide surveillance capabilities for non-infectious conditions, such as injuries, heat-related illness, and chronic conditions.

Methods

The study period included March 1, 2006 through August 31, 2006. Data included ED chief complaints and final diagnoses from 34 hospitals in 11 states and the District of Columbia. Overall sub-syndrome distributions, as well as distributions by hospital system, gender, and age group were examined. Chief complaint and ICD-9 CM based sub-syndrome distributions were compared.

Results

Across all hospital systems, the 5 most common ED chief complaint-based sub-syndromes were abdominal pain, injuries, nausea and vomiting, chest pain, and fever (Figure 1). Among these facilities, the 5 most frequent ED ICD-9 CM based sub-syndromes included mental disorders, sprains and strains, abdominal pain, falls, and upper respiratory infections (Figure 2). Among the 20 most frequent chief complaint based sub-syndromes, 11 were also among the 20 most frequent ICD-9 CM based sub-syndromes. The proportion of visits contributing to the 20 most common ED chief complaint and ICD-9 CM based sub-syndromes varied by age group (Figures 1 and 2). With the exception of abdominal pain and pregnancy, there were few differences among the proportions of males and females among the 20 most common sub-syndromes; there was some variation among sub-syndrome distributions by hospital system (data not shown).

Figure 1. Twenty most frequent ED chief complaint based sub-syndromes by age group, all hospital facilities, 3/1/2006 to 8/31/2006

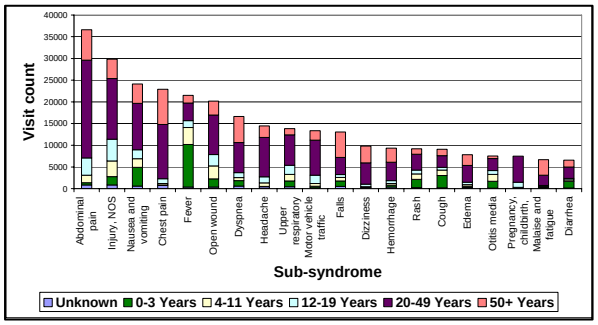
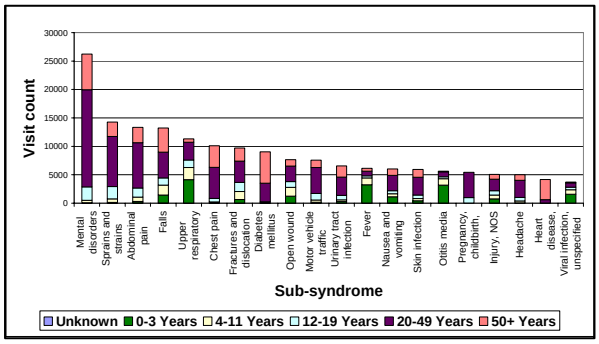


Figure 2. Twenty most frequent ED ICD-9 CM based sub-syndromes by age group, all hospital facilities, 3/1/2006 to 8/31/2006



Conclusions

Sub-syndromes provide surveillance capabilities for a variety of disease indicators of public health interest. As expected, ED chief complaint and final diagnosis based sub-syndrome distributions varied. Statistical analyses that combine data across age categories may mask potentially important sub-syndrome activity among certain age groups. Additional metadata are needed to more fully understand the characteristics of the hospitals from which BioSense receives data. In collaboration with our users, BioSense will add to and refine the sub-syndrome categories to maximize utility for surveillance. Further study is needed to examine the sensitivities and specificities of sub-syndromes versus more broad syndromes.

Further information:
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