Establishing a Syndromic Surveillance System Using Chief-Complaint Data at Emergency Department of One Regional Hospital in Taipei City to Detect Infectious Disease Outbreaks

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OBJECTIVE

The aims of this study are to set up a syndromic surveillance system (SSS) for detecting newly emerging infectious diseases (EID) outbreaks early using more standardized information of triage chief complaints (CoCo) of hospital emergency department (ED) in metropolitan Taipei City to (1) break through Chinese language barrier; (2) investigate its feasibility to detect influenza like illness (ILI) outbreaks using integrated clinical and epidemiological information installed within information technology (IT) system; and (3) compare the sensitivity, specificity, and kappa value of ILI between *International Classification of Diseases, Ninth Revision (ICD-9)* & CoCo.

BACKGROUND

Facing public health threats of bioterrorism and EID, the traditional passive surveillance system is not efficient and outmoded. Evidences reveal that several newly developed SSS in different countries can provide an active, powerful, timely, and effective epidemiological investigation. Using this SSS, we can find non-specific symptoms, and set up baseline clinical data and epidemic threshold. Due to English barriers and standardized language problem in the past, we initiated to develop an emergency department-based syndromic surveillance system (ED-SSS) using clinical data involving both check-list format CoCo and *ICD-9* that best fit the situations in Taiwan.

METHODS

We gathered commonly used CoCo from ED physicians and nurses, and then developed a predefined CoCo check list for ED triage nurses to use. These CoCo plus *ICD-9*, body temperature and demographical data (gender, zip code, birth year and month, admission date, etc.) were collected from the ED of one regional hospital in Taipei City. From Oct. 1 to May 31, 2006, there have been 126,675 ED visit data stored in the data base. We categorized ED patients into different syndromic groups using CoCo and *ICD-9* as criteria.

RESULTS

We identified 30,452 and 29,780 ILI patients using CoCo and *ICD-9,* respectively with similar patterns, particularly the increasing 1.53 folds on weekends compared to week-
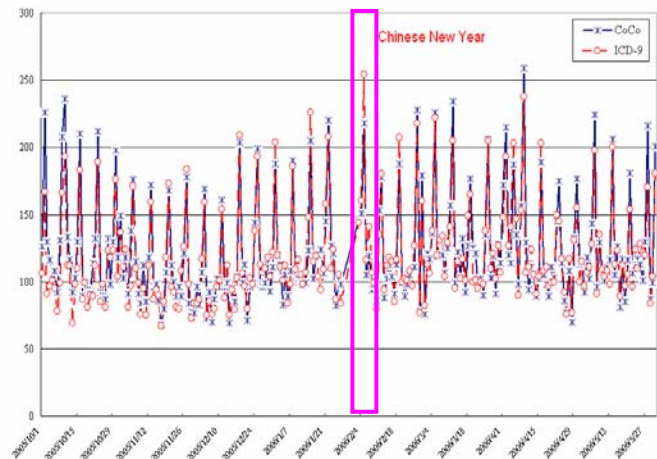

Figure 1 –Comparison ILI patients selected by different syndrome groups using CoCo and ICD-9 from ED of one Regional Hospital in Taipei, Oct. 2005 to May 2006

days (mean±SD = 66.2±44.8 vs 108.8±37.4, p<0.01) **[Fig. 1]**. During Chinese Lunar New Year, the case counts exploded to almost 2.21 times higher than others (mean±SD = 269.7 ±101.1 vs 121.7±39.3, p=0.02). The age groups of most ILI patients were between 0-9 (41.8%) and 20-29 (10.0%) years old. Interestingly, 30-39 year-old male ILI cases started to increase firstly by ICD-9 at initial phase whereas 70-79 year-old female ILI cases initiated the increasing trend by CoCo. Agreement between ICD-9 and CC was 0.58 kappa.

CONCLUSIONS

Our finding on the increasing case numbers in Chinese Lunar New Year implied advanced statistical methods are needed. Monitoring on special age groups can provide the most important information on possible emerging novel animal influenza viruses.

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