Comparison of Chief-Complaint vs ICD-9 Data Used in an Emergency Department-based Hospital Syndromic Surveillance System in Metropolitan Taipei, Taiwan

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OBJECTIVE

To face challenges of emerging infectious diseases (EID) and bioterrorism and to prepare for international collaboration without language barriers, we established a timely hospital emergency department-based syndromic surveillance system (ED-SSS) using both triage predefined check-list chief complaints (CoCo) and *International Classification of Diseases, 9th Revision* (ICD-9) in Taipei. The aims of this study are: (1) to monitor the patterns and trends of Taiwan's important infectious diseases using different syndrome groups [gastrointestinal (GI), respiratory, enteroviral infections, etc.]; (2) to integrate epidemiological attributes, syndrome groups and lab. findings for improving the sensitivity, specificity and timeliness of ED-SSS in detecting outbreaks; and (3) to compare the sensitivity, specificity, and kappa value of GI, respiratory, enteroviral and central nervous system (CNS) infections between CoCo and ICD-9.

BACKGROUND

The 2003 outbreak of severe acute respiratory syndrome (SARS) in Taiwan provided accelerated us to develop the most timely surveillance system[1]. Taipei, a metropolitan with many travelers annually, requires the earliest warning and immediate responses once novel agents would attack. Considering international exchanges of epidemiological information for travelers and possible cross-country spread of EID, we initiated an ED-SSS using clinical data involving checklist CoCo and *ICD-9* plus IT internally installed mechanism integrated with epidemiological information to increase the sensitivity and timeliness to detect unusual outbreaks.

METHODS

Since certain symptoms/signs are hard to be differentiated and classified initially, flexibility and accuracy in surveillance have been added into the system design. Both ICD-9 codes and ED-based triage pre-defined check list CoCo including body temperature, fever, GI, respiratory, flu, nephrological, skin, CNS, hematological, neuropsychological, rheumatological, (chest med., cardiovascular) plus demographical variables (age, gender, residential area code, admission date/time) were obtained in one pilot hospital in Taipei. We collected 110,833 ED visit data from Oct. 1 to April 30, 2006. Fundamental baseline data of different departments, weekdays, weekends, holidays were analyzed in details. Historical limits, cumulative sum charts and multivariate model ing to adjust important confounders were employed to investigate abnormal signals and trends.

RESULTS

Taipei ED-SSS had similar patterns as nation-wide ED-SSS using RODS system developed by University of Pittsburgh, with 1.29-fold increasing patient numbers on weekends vs weekdays, and 1.53-fold higher on Chinese lunar new year days and 1.21-fold higher weekly numbers of male patients vs females. Most patients came from ED-internal medicine. Chinese lunar new year days had almost doubled the daily numbers of GI, respiratory, and rash related patients. Young adults aged 20-29 years were the highest in Taipei ED patients.

In GI, CoCo & ICD-9 showed similar pattern (Fig. 1) with the same age (highest in 20-29 yrs then 0-9 yrs) and gender distributions (males: females = 53:47 in CoCo vs 54:46 in ICD-9). CoCo detected more GI patients than ICD-9. Agreement between the two was 0.67 kappa. In enteroviral infections, CoCo was also more sensitive and found the 2nd age group (20-29 yr).

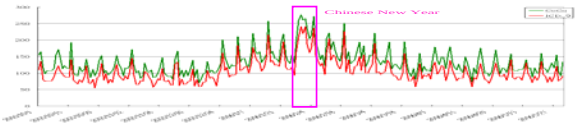

Fig. 1 –Comparison ILI patients selected by different syndrome groups using CoCo & ICD-9 from one Regional Hospital in Taipei, Oct. 2005 to May 2006

CONCLUSIONS

High quality of chief complaint data increased the sensitivity of detection in ED-SSS. Further trainings of hospital healthcare workers and local health personnel on public health spirit, specimen-taking, and two-way communication are currently operating to reach public health goals.

References

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