

A Comparison Between Syndromic Surveillance 911/EMS and Emergency Department Data

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OBJECTIVE

To examine data from 911/Emergency Medical Services (EMS) and determine whether these data provide a useful addition to syndromic surveillance (SS) when used with emergency department (ED) chief complaint (CC) data.

BACKGROUND

Evaluation of data sources is a key step to identify best practices for increasing the specificity and timeliness of SS. Most studies have addressed SS systems that use ED data [1]. The literature suggests that collection and analysis of information from multiple sources may enhance the utility of SS [2].

METHODS

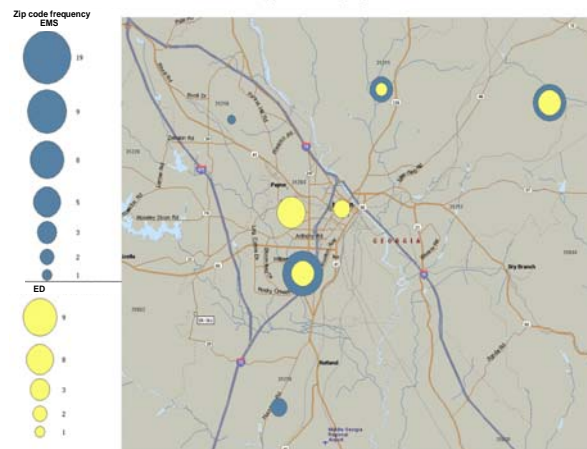
In collaboration with a regional hospital and its affiliated EMS service, a Public Health District in central Georgia deployed a proprietary early warning system (FirstWatch®) during July, 2004 to simultaneously collect and analyze data from 911/EMS calls and CCs from ED visits. We focused on the “neurologic syndrome” because this syndrome was most amenable to comparison between the two data sources. Definitions for “neurologic syndrome” using the 911/EMS criteria for mapping calls to the neurologic syndrome were designed and applied to the patient CC for ED visits occurring from July 1 through December 31, 2005. Data were transferred into the State Electronic Notifiable Disease Surveillance System (SendSS)—Georgia’s Web-based surveillance platform, and subsequently analyzed using the Centers for Disease Control and Prevention Early Aberration Reporting System (EARS - CUSUM) [3]. When flags were identified (defined as any C1, C2, or C3 EARS alert) from one source, a concurrent flag in the other system was defined as occurring within ± 1 day. Kappa statistics were used to measure the level of agreement between 911/EMS- and ED-based flags [4].

RESULTS

During the study period, 16,685 911/EMS calls or transports and 23,515 ED visits total were registered. Seventy-two zip codes were registered as points of origin for patients in the 911/EMS data and 594 for residence of patients in the ED data (Figure). For ED patients, the median age was 36 years (range: <1 to 103 years); 50% were female, 44% male, and 6% had no reported gender. Data for age and gender were not available for 911/EMS patients. For ED and

911/EMS encounters, 5.9% and 7.3%, respectively, were mapped to the neurologic syndrome. During the study period, 14 911/EMS and 8 ED flags were generated. Of these, four flags from each were concurrent ($\kappa=0.33$, 95% CI 0.06-0.59).

Figure. 911/EMS and ED patient zip code frequencies for flagged neurologic syndrome



CONCLUSIONS

For the neurologic syndrome, the agreement of flag timing in the two data sources was fair. This study could not compare many demographic characteristics contributing to flagged events. Further investigation is needed to determine whether concurrent flags in the two data sources represent the same patients or different patients who are epidemiologically related and part of an event of public health significance. A study of longer duration that links individual patient records from 911/EMS and ED data sources and examines other syndromes is needed to gauge the utility of combining these data sources.

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The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.