

Real Time EMS Events as Surrogate Events in Syndromic Surveillance

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OBJECTIVE

This paper describes how the surveillance of actual EMS real time events occurring during normal operations were analyzed using a syndromic surveillance system and how these events can be used as surrogate markers for how a bio-surveillance system would act if an actual covert or overt terrorist event or pandemic illness were to occur.

BACKGROUND

Pre-hospital EMS data is rarely mentioned in discussions surrounding syndromic surveillance for covert bio-terrorism attacks or for the monitoring of syndromic illness such as bird flu. However, EMS dispatch data may serve as the very first marker in such an event. EMS dispatch data has many useful advantages in syndromic surveillance. These include the ability to monitor across wide areas of geography and a single data collection source. Additionally, EMS dispatchers are a medically trained core group of individuals that use a single standardized set of interrogation questions and methods with specific dispatch codes regarding patient conditions. This data would arguably be a more reliable source of data than multiple different inputs from multiple individuals at various clinics and hospital emergency departments. EMS data is also able to look at a much broader group of individuals both by volume of calls and by geography, since they are instantaneously able to capture the location of the callers when dialing 911. EMS dispatch is also able to monitor patient movement to different accepting facilities.

METHODS

Using EMS industry surveillance software (FirstWatch, San Diego, CA), we analyzed past occurrences of actual EMS events involving a chemical exposure (pepper spray) and a natural woodland fire as surrogate markers for an overt terrorist event. The outcome measures were to see if the bio-surveillance system would discover the increase in volume of the specific complaint (respiratory symptoms) and the geographic relationship to the volume of calls.

RESULTS

During the chemical exposure at a single location, the surveillance system triggered on the increase in respiratory complaints as being statistically higher than normal call volume for this specific complaint as well as the increase in volume over a geographical area. (figure 1)

During the natural woodland fire, the surveillance system again triggered on the increase in volume of complaints related to the smoke generated from the fire. The surveillance system was also able to detect geographic clusters of respiratory complaints that patterned the air flow of the smoke generated by the fire, making predictions of where to better stage EMS resources for the expected increase in EMS calls.

In both scenarios, these triggers alerted local EMS officials of the statistical abnormality while the event was occurring.

CONCLUSIONS

Using actual EMS events as surrogates for overt terrorism attacks, EMS surveillance systems were able to identify and trigger on specific complaints and geographic proximity similar to what would be expected in an overt terrorism attack or pandemic respiratory event.

There are many advantages for including EMS syndromic surveillance as a first alert for such events, including an overall view of patient complaints throughout a geographic area, a reliable method of collecting data and the ability to geographically plot and track entire populations of patients. Local communities should reach out to their out of hospital partners to strengthen the relationships between what have historically been completely separate entities.

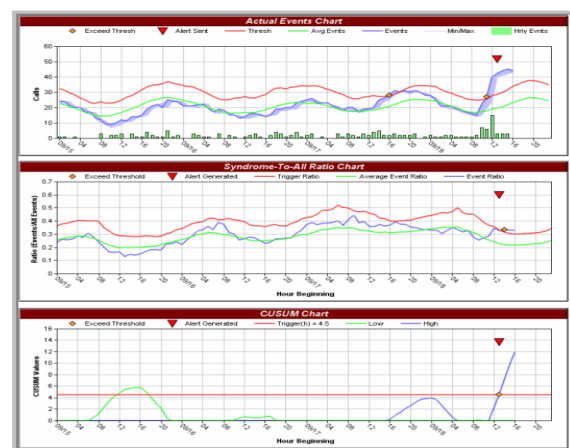


Figure 1 – trigger events using EMS dispatch data occurring during a chemical exposure event