

Postdisaster surveillance following the Tsunami in Japan: BioSense 2011

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Objective

To demonstrate the utility of the BioSense Program for postdisaster response surveillance.

Introduction

The CDC's BioSense Program receives near real-time health care utilization data from a number of sources, including Department of Defense (DoD) healthcare facilities from around the globe and nonfederal hospital emergency departments (EDs) in the United States, to support all-hazards surveillance and situation awareness. Following the tsunami in Japan on March 11, 2011, the BioSense Program modified its surveillance protocols to monitor: (1) injuries and possible radiation-associated health effects in Japan-based DoD facilities and (2) potential adverse health effects associated with the consumption of potassium iodide (KI), a salt used to prevent injury to the thyroid gland in the event of radiation exposure, among persons attending participating EDs in the US. We present the findings from that enhanced surveillance.

Methods

The BioSense Program monitored healthcare activity in 20 DoD facilities located in Japan from March 17 through April 11, 2011. In Japan-based outpatient DoD facilities, we monitored 10 health conditions, which are associated with injuries, and possible syndromic presentations of radiation exposure, which included nausea/vomiting, diarrhea, headache, hypotension, rash, convulsion, dyspnea, dizziness and anemia. We also searched for radiation exposure-specific International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) 990, 508.0, 558.1, E926 and E926.9. There was a 2- to 5-day lag time between the time of patient visit and time when ICD-9-CM-coded final diagnoses were available.

To monitor healthcare utilization for potential adverse effects associated with KI exposure in the United States, we searched ED chief complaint (CC) data from all 635 nonfederal BioSense hospitals for the following keywords indicating a KI-related visit: (1) potas*, pottas*; (2) iodine, iodide; (3) KI; (4) radiation, radeation; (5) nuclea*; (6) Japan. A given ED visit was considered a match if the content of the CC met the following keyword inclusion criteria: 1 and 2, 3, 4 and 5 or 6. Perl Regular Expressions were used to take into account upper- and lower-case letters and word boundaries. CC data were updated within 0–2 days following the visit date.

To identify clusters of patient visits of interest, we used a modified version of the early aberration reporting system (EARS) C2 statistic (1). For both surveillance efforts, this signal detection method was run upon the data for individual facilities.

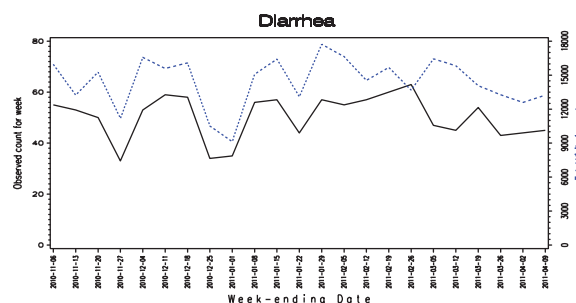


Fig. 1. Weekly diarrhea and total visits for 20 Japan DoD facilities, (11/2010 – 04/2011).

Additionally, visit data from all 20 DoD facilities were analyzed as a group.

Results

From March 17 through April 11, 2011, the BioSense Team created daily reports for the CDC's Emergency Operation Center and DoD counterparts. Reports included time series graphs for each of the 10 health conditions. Fig. 1 shows an example of a time series for diarrhea and total visits in the 20 DoD facilities. During this surveillance period, no clusters or radiation exposure coded visits were detected in Japan-based DoD facilities. In the United States, no ED-visit clusters associated with KI intoxication were found in nonfederal US EDs.

Conclusion

BioSense is an adaptable electronic all-hazards public health surveillance system that can provide near real-time health situational awareness during large-scale natural disasters.

Keywords

BioSense; disaster surveillance; radiation; potassium iodide; syndromic

Reference

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