
County of Los Angeles • Department of Health Services
Public Health
Acute Communicable Disease Control
Special Studies Report 2000

**DEMOCRATIC NATIONAL CONVENTION - BIOTERRORISM SYNDROMIC
SURVEILLANCE**

Domestic threats of bioterrorism cannot be ignored. Advances in technology allow terrorists to disseminate bioterrorist agents, while at the same time the public has become more aware of bioterrorism. Effective public health response to a bioterrorist event needs timely surveillance because after such an event there may be only a short window of opportunity, sometimes only hours or days, to provide treatment, prophylaxis, or implement other control measures.

Traditionally, disease surveillance by public health is done by following reports of confirmed cases of disease. However, this surveillance may not be timely enough to allow for effective public health response after a bioterrorist attack.

Syndromic surveillance follows reports of clinical symptoms before confirmed diagnoses are made. An increase in syndrome reporting may be an indicator of an increase in disease which can immediately lead to an epidemiologic investigation.

Since high-profile gatherings of people may be targets of bioterrorist attacks, the Centers for Disease Control and Prevention (CDC), with the Acute Communicable Disease Control Unit of the Los Angeles County (LAC) Department of Health Services, developed a short-term syndromic surveillance project for the Democratic National Convention held in Los Angeles in August 2000. The project, called the Democratic National Convention-Enhanced Surveillance Project (DNC-ESP), was modeled on a joint short-term surveillance project of the CDC and Seattle and King County Public Health that was used for the World Trade Organization meeting in December 1999.

The main objective of the DNC-ESP was timely detection of a bioterrorist event or other infectious disease outbreak using syndromic surveillance of patients presenting to emergency departments in LAC. A long-term objective was the development of partnerships with non-traditional surveillance sources.

After preliminary discussions in April 2000, during May through July, local, state, and CDC personnel recruited hospital emergency departments to be the surveillance sites. Project personnel trained emergency department staff in the implementation of the project in early August.

Although the DNC was only 4 days long from August 14-17, the surveillance period stretched from August 7-22 to allow for data collection before the DNC to establish baseline disease reporting. The surveillance period continued for 5 days after the DNC to cover the most common incubation periods for bioterrorist agents.

METHODS

We approached 11 hospital emergency departments and an airport clinic to be part of the project and all agreed. We chose both community and academic hospitals to capture a broad range of the

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population, and selected emergency departments that were geographically dispersed throughout LAC but were close to the DNC convention site or to DNC delegate hotels.

Several critical bioterrorism agents selected for syndromic surveillance included anthrax, tularemia, plague, smallpox, viral hemorrhagic fevers, botulism, and various other potential threats. Seven clinical syndromes were chosen to represent the clinical manifestations of these bioterrorism agents: respiratory infection with fever, rash with fever, sepsis or non-traumatic shock, diarrhea/gastroenteritis, meningitis/encephalitis, botulism-like syndrome, or unexplained death with history of fever. The last three were designated rare syndromes based on past surveillance experience.

A form was attached to the chart of each patient upon registration to the emergency department (ED) and the following information was collected: age, gender, if the patient had any connection to the DNC (loosely defined to include being a delegate, journalist, protester, first responder, etc), and the date and time of registration to the ED. After evaluating the patient, the health care provider would check off a box on the form with one of the 7 clinical syndromes under surveillance or a box "all other syndromes."

Hospital personnel were asked to enter data from the forms as soon as possible after the doctor evaluated the patient. The data were submitted to a database on a secure internet site where an automatic date/time stamp was placed on the data upon receipt.

DATA ANALYSIS

The data were monitored hourly from 8:00 AM to 5:00 PM Monday through Friday and every four hours between 6:00 PM and 8:00 AM and on the weekends. The data were monitored visually for overall trends in syndrome reporting and for individual reports of any of the three rare syndromes. At 10:00 AM daily, all data were downloaded from the database and quantitatively analyzed by outbreak detection methods.

For the traditional outbreak detection method, we used 2 by 2 tables to detect an increase or unusual activity in syndrome reporting. We calculated prevalence ratios of individual syndromes by comparing the proportion of reports received in the previous 24 hours of a given syndrome to the proportion of reports received of that syndrome in all the other days combined. We did this everyday, for each syndrome, by hospital and by all hospitals combined. We used chi-square tests of significance in our calculations.

ACTIONS TAKEN

We followed up on the data in 3 ways:

Individual reports of the rare syndromes (meningitis/encephalitis, botulism-like syndrome and unexplained death) were immediately followed up with a telephone call to the ED. We investigated selected statistically significant increases of syndrome prevalence ratios with visits to the hospitals

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and chart review. Finally, we faxed daily reports to each hospital of the number of patient visits reported to us and their syndromes.

EVALUATION

We evaluated the DNC-ESP in three ways:

We calculated the timeliness of reporting by subtracting the date and time of patient ED registration from the date and time of the electronic submission of the data. We calculated the completeness of reporting by comparing the number of ED patient visits reported to us over the internet to the number of ED admissions recorded by the hospitals in their official records. Finally, we solicited feedback from emergency department directors with a structured survey.

RESULTS

Over the 16-day surveillance period, we received reports of 11,645 patient hospital visits, of which a total of 11,219 were unique. One hundred and forty-one visits, or 1.3%, were associated with the Democratic National Convention.

The overwhelming majority of visits to the ED were for “all other syndromes” (82.3%); only 6.7% were for the clinical syndromes under surveillance. No syndrome information was submitted for 11% of ED visits. The most common clinical syndromes reported were diarrhea/gastroenteritis (3.6% of the visits reported) and respiratory disease (2.2%). None of the other clinical syndromes accounted for more than one percent of ED visits.

We followed up on 2 cases of unexplained death, 2 cases of botulism-like syndrome, and 8 cases of meningitis/encephalitis. None of these cases were clustered in person, time, or place.

We recognized a total of 32 statistically significant increases in syndrome reports by the outbreak detection method. However, 16 of the 32 increases were due to reports of only 1-3 new cases of a given syndrome because the baseline incidence of disease reporting was so low for some of the syndromes. There were 10 increases due to 4-9 new reports, and 6 increases due to 10 or more new reports. We investigated 5 of the increases. None of the 5 investigations yielded evidence of an outbreak.

The median and mean time lag between admission time and date, and the time of electronic data submission was 14.3 and 21.6 hours, respectively. Sixty-nine percent of ED visits were reported.

Eleven of 12 ED directors responded to our survey. Ten of 11 felt that the DNC-ESP was a valuable tool to detect a potential bioterrorist attack and that participation in the project led to improved communication with public health that will continue into the future. All 11 would do it again if the threat of bioterrorism was increased in their community.

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CONCLUSIONS

This was a successful joint CDC-LA County syndromic surveillance project. Reporting was timely compared to traditional surveillance methods. The project was comprehensive in terms of the number of hospitals involved, the number of different syndromes reported, and the completeness of reporting. However, it was time and resource intensive, and it required extensive preparation and the work of many people. No bioterrorist event or infectious disease outbreak was detected. Relationships with non-traditional surveillance partners were strengthened.

Future directions for syndromic surveillance include refinement of outbreak detection methods; refinement of the system so that it can be rapidly deployed in the event of a bioterrorist attack, and development of ongoing electronic data collection from EDs for routine syndromic surveillance.