

Using syndromic surveillance to assist in a meningitis outbreak investigation

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Objective

To describe the complementary usage of electronic emergency department (ED) data, coroner deaths and 911 dispatch call center data in a bacterial meningitis outbreak.

Introduction

Beginning on March 13, 2011, ACDC experienced an unusual increase in reported bacterial meningitis cases in Los Angeles (LA) County. Early in the investigation, there were few epidemiological links between the cases. Three cases were homeless; two resided at the same Skid Row shelter in downtown LA. ACDC assessed its syndromic surveillance databases to help gauge the scope of the outbreak and detect potentially overlooked cases.

Methods

Electronic ED chief complaints (CC) from January 1, 2011, to April 10, 2011, were queried from eight EDs within an 11-mile radius of Skid Row. Only visitors with resident zip codes that corresponded to Skid Row or that were blank to account for homelessness were included. Visits were reviewed if CC included keywords based on common meningitis symptoms and also those of confirmed cases.

Coroner deaths from the same time period were reviewed for location of death and homeless status. Real-time LA City emergency dispatch calls were also reviewed if they were made from the same homeless shelter in which the two confirmed cases resided.

Results

Two hundred and thirty-eight ED visits met the meningitis syndrome definition; however, there was no substantial increase (Fig. 1). Within the same zip code catchment area, there were no ED visitors with mention of homelessness or shelter residence in their CC.

There was no overall increase in the total number of homeless coroner deaths. Two of 45 deaths took place in shelters—one death in January from ‘cardiomyopathy’ that occurred at the homeless shelter of interest, and another nonspecific shelter death in March from ‘strep pneumonia’.

Forty-one 911 ambulance calls were made from the homeless shelter associated with the confirmed meningitis cases. While there was no overall increase in call volume, one call matched a confirmed case fatality.

Conclusions

One limitation of ED data in this investigation is that they do not contain patient resident addresses, making restriction to the homeless or shelter residents impossible. While no additional cases were found, the absence of an increase provides validation that a large countywide outbreak had not occurred.

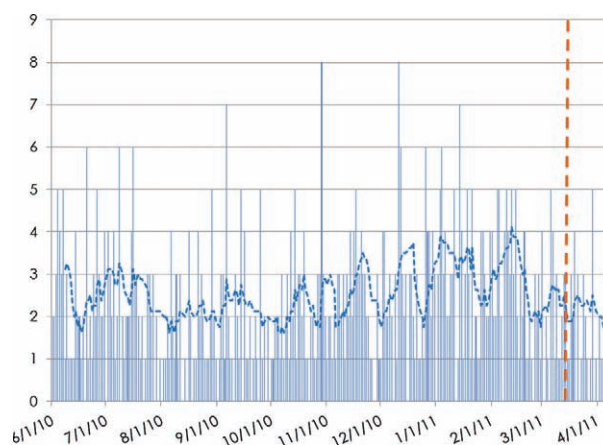


Fig. 1. ED visits per day in customized meningitis syndrome category. Dotted vertical line indicates date of first confirmed case.

Both coroner and 911 call databases were more flexible than ED data, containing fields facilitating focused queries on the key epidemiological links of homelessness and shelter residence. Coroner data are limited, however, in that there is a 2-day reporting lag. While many homeless deaths were found, few had precisely reported death locations.

Many 911 calls were reported from the shelter of interest. While medical information was vague, additional details enabled ACDC to match one call to a confirmed case. Follow-up for diagnosis information is possible when ED transportation information is present. Precise caller locations make 911 calls particularly useful for investigations with a strong emphasis on location such as point source outbreaks. Querying preestablished ED visit, coroner death, and 911 call feeds can provide a relatively quick supplement to traditional outbreak investigations.

Keywords

Coroner; 911 call; dispatch; emergency department; outbreak

Acknowledgments

The authors would like to thank Van Ngo for details regarding the confirmed cases in the outbreak.

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