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Rapidly Adapting Flexible Surveillance Systems for Emergent Event Response

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Objective

To describe how flexible surveillance systems can be rapidly adapted and deployed, and increase the efficiency and accuracy of surveillance, during responses to outbreaks and all hazard emergent events.

Introduction

Georgia Department of Public Health (DPH) epidemiologists have responded to multiple emergent outbreaks with diverse surveillance needs. During the 2009 H1N1 influenza response, it was necessary to electronically integrate multiple reporting sources and view population-level data, while during the 2014–2015 West African Ebola epidemic, it was necessary to easily collect and view individual level data from travelers to facilitate early detection of potential imported Ebola disease. DPH in-house information technology (IT) staff work closely with epidemiologists to understand and accommodate surveillance needs. Through this collaboration, IT created a robust electronic surveillance and outbreak management system (OMS) to accommodate routine reporting of notifiable diseases and outbreak investigations, and surveillance during emergent events.

Methods

OMS was created within the State Electronic Notifiable Disease Surveillance System (SendSS); a secure, HIPAA-compliant, Oracle and web-based platform which collects data on all notifiable diseases in Georgia. This flexible platform has multi-functionality including dynamic web-based surveys that link to case records or outbreaks, online case reporting, electronic laboratory reporting, contact tracing, visual dashboards summarizing outbreak data, electronic alerts, and individual accounts for users with varying privileges to limit access to specific modules. These features can be customized for any emergent event.

Results

SendSS and OMS are widely used by state and district epidemiologists. Individual case and outbreak management activities include but are not limited to: notifiable disease and condition cases; all disease clusters; animal bites surveillance including bite investigation and laboratory results; and syndromic surveillance data automatically collected from 90 emergency facilities. OMS has been rapidly modified to facilitate efficient epidemiologic responses to emergent events such as: integrating multiple reporting sources during the H1N1 outbreak; shelter surveillance during hurricanes Katrina and Rita in 2005; active monitoring of >2,500 travelers in Georgia during the Ebola response; tracking cases investigations during the Zika response, and future monitoring of poultry workers if highly-pathogenic avian influenza occurs in Georgia.

Conclusions

The flexible and customizable features of SendSS and OMS accommodate the changing needs of epidemiologists to monitor a variety of diseases. Rapid implementation has enabled DPH epidemiologists to respond efficiently to emergent events using limited human resources, achieving immediate situational awareness by incorporating multiple data sources into user friendly dashboards and notifications, and easily sharing information among state and federal stakeholders to facilitate rapid risk assessment and response as needed. The success of these systems illustrates the return on DPH's preparedness investment in retaining technical staff to work with epidemiologists to meet urgent surveillance needs.

Keywords

informatics; Surveillance; Emergency response; Outbreak response; Surveillance system

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