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A Sustainable, Multi-Organizational Model for Decision Support During Public Health Emergencies

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Abstract

In an effort to provide decision support during times of public health emergencies, Regenstrief Institute, Inc. and the Indiana University School of Medicine, in partnership with the county and state health departments, created a sustainable model to deliver information to health care providers and public health personnel. The model leverages extant systems and processes, including active disease monitoring through electronic laboratory reporting and syndromic surveillance, delivery of health information via the Indiana Health Information Exchange, and evidence based utilities and blog technology to create a public health utility with disease-specific information and epidemiologic reporting requirements.

Keywords:

disease outbreaks; bioterrorism; information dissemination; decision support systems, clinical

Introduction

Just-in-time knowledge at the point of decision making is critical to improving health care outcomes. This is especially true when crucial public health decisions must be made in response to a bioterrorist event or an emerging pandemic. However, the ability to access needed information has been extremely problematic because of the different levels of connectivity and training available to public health workers and health care providers across large areas.

To address this issue a partnership was formed among the Indiana State Department of Health and the Marion County Health Department, the Indiana University School of Medicine Libraries (IUSML) and the Indiana Health Information Exchange to establish a cost-effective model for both alerting health care providers and public health workers to developing threats and providing them the needed information for both treatment and reporting.

Methods

The model, predicated on an earlier construct [1], was built on three existing programs. The Regenstrief Institute, Inc. in conjunction with the Indiana Network for Patient Care and the Indiana State Department of Health developed an automated electronic system for reporting notifiable conditions [2] and a state-wide syndrormic surveillance system [3]. I3, the Indiana IAIMS (Integrated Advanced Information Management Systems) Initiative, through the Indiana Health Information Exchange and its DOCS4DOCS utility, provided a framework to notify health care providers about real or suspected public health emergencies. [4] The IUSML offered evidence based decision support using Web technologies.

The goals of the project were to insure rapid notification of public health problems to a large yet targeted group of health care providers and to provide access to quality filtered knowledge supporting treatment guidelines and reporting requirements. Because the eventual objective was to operationalize the model for long term adoption, it was essential to develop sustainable methods.

Automated electronic laboratory reporting of notifiable conditions uses LOINC test codes and HL7 messaging to provide timely information to local and state health departments regarding the potential for a public health event. Notifiable conditions from laboratories around the Indianapolis metropolitan statistical area are reported to the health departments. The enhancement model facilitates provider notification and the creation of decision support information.

The Indiana Health Information Exchange maintains a master list of clinical contact information in the central Indiana region. This “master physician index” enables the rapid notification of health care providers about emerging public health threats, and communications can be targeted to specific locations and/or clinical conditions. This insures a higher level of relevance of the warning for the provider. Simultaneously, the IUSML is contacted about the suspected problem and receives information concerning proposed optimum treatment and management guidelines and the required reporting of the specified condition.

The IUSML is responsible for searching for current evidence about management of the condition and creating a web presence containing this information in a format effective for users. In addition, reporting requirements and links to the health department web sites are included. To insure sustainability, a blog utility was chosen because the technology facilitates document creation and maintenance, is familiar to most users, and provides built-in searching functionality.

In addition to the reporting and management information for health care providers, a listserv is maintained for notification of public health workers. The health departments have their own systems for notifying their affiliated sites, however the notification of access to knowledge-based information is handled by the IUSML once the Blog site has been updated and approved.

While much of the information about emerging public health events comes from the electronic surveillance functionality, the public press also reports events of public health significance. Although press accounts commonly describe incidents in specific locations with little potential to spread, decision support may be beneficial for these events and the web site is updated as the need presents itself.

Results

As of November 2006, there were thirteen public health events that prompted creating knowledge support on the web site. The mechanism for the notification of health care providers has been developed using extant resources but has as yet to gain widespread adoption, not because of the technology but because of organizational issues.

The process for the notification of public health workers was implemented with the second public health event posted and, as a result, the utility has achieved wide spread use. Anecdotal responses to the initiative have indicated that the Web site has provided critical information managing both health care conditions and epidemiologic reporting.

Discussion

By using three extant processes, active surveillance through electronic laboratory reporting, DOCS4DOCS delivery of information to health care providers, and the evidence-based medicine services of the IUSML, a sustainable model was developed to deliver decision support information to targeted health care providers and public health workers during instances of public health events.

The technology and processes were easily adapted to meet the needs of the health departments and system users. However, organizational issues regarding the health care provider notification component have precluded the full operationalization of the system. It is anticipated that these issues will be resolved within the next year and that the system will be fully implemented. However, the public health worker notification and the creation and use of the Blog utility have proven to be an effective means to providing decision support during times of emerging infectious diseases and bioterrorism events.

Conclusion

Emerging public health crises require coordination of information from a variety of sources and targeted provision of quality filtered knowledge to a wide range of health care workers. Access to evidence is critical to the management of the events for both the population and individual patients; collecting information to monitor the impact of the occurrences contributes to the knowledge base and helps mitigate future occurrences. Using extant technology and promoting organizational partnerships can offer a sustainable model to enhance responsiveness to these events.

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References

[1] Kay BA, Timperi RJ, Morse SS, Forslund D, McGowan JJ, and O'Brien T. Innovative information-sharing strategies. Emerg Infect Dis 1998: 4(3): 465-6.

[2] Overhage JM, Suico J, and McDonald CJ. Electronic laboratory reporting: barriers, solutions and findings. J Public Health Manag Pract 2001: 7(6): 60-6.

[3] Grannis S, Wade M, Gibson J, Overhage JM. The Indiana Public Health Emergency Surveillance System: Ongoing progress, early findings, and future directions. Am Med Inform Assoc Symp Proc. 2006.

[4] McGowan JJ, Overhage JM, Barnes M, and McDonald CJ. Indianapolis I3: the third generation Integrated Advanced Information Management Systems. J Med Lib Assoc 2004: 92(2): 179-87.

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