

Utilizing a Patient Tracking System for Public Health Emergencies

Laura Williams, MPH¹, Justin Pendarvis, MPH², Julia Gunn, RN, MPH².
Boston Emergency Medical Services¹, Boston Public Health Commission²

OBJECTIVE

To describe the electronic patient tracking system configured by Boston Emergency Medical Services (Boston EMS) and the Boston Public Health Commission's Communicable Disease Control Division (BPHC CDC) to address information needs during public health emergencies.

BACKGROUND

In 2003, the need for a system to track and manage patient status and location was identified by Boston EMS and the Conference of Boston Teaching Hospitals. After consultation with EMS (municipal, fire based, and private), hospital, local and state public health and emergency management stakeholders, a core group from Boston EMS and BPHC developed guidelines for a Metro Boston Patient Tracking System. The goal was to provide a system to reunite family members and serve as a tool for managing short term/high impact mass casualty incidents and protracted disease outbreaks.

Since 2004, BPHC CDC has effectively managed several mass prophylaxis clinics in response to infectious disease outbreaks. However patient data was largely collected on paper based forms, limiting the availability of real-time clinic data to incident command. To address these challenges BPHC CDC began meeting with BEMS to define the business processes and information needs during public health emergencies.

METHODS

The patient tracking core group developed system requirements utilizing the PHIN functional requirements[1] as a reference point. Critical characteristics included the effective collection of essential information, allowing for field use, electronic data aggregation and real time reporting, while assuring data security and redundancy for infrastructure failures that may occur during a public health emergency. Business process analysis was conducted with stakeholders to further identify needs and ensure participation. Field testing was conducted to assess functionality and usability during several large Boston events.

RESULTS

Defining a shared set of data elements for the system took approximately 6 months; data selection for the public health emergency component was facilitated by the parameters set in

the PHIN document. Stakeholders worked closely with system developers to design a user-friendly web-based interface and select field components that would integrate with existing protocols for emergency response. The system utilizes four independent communication systems, including two cellular providers, 802.11, and satellite service, to ensure continuity during disaster situations. All data is sent to out of state servers and fed to a secure website, where it is then available to users according to role based access. As well, the records are concurrently transmitted to a local application residing on field deployable computers, allowing for access when offline.

To capture geospatial information for patient location, handheld units were selected to store GPS coordinates as well as named locations. Visualization of this information can provide a comprehensive geographic view of patient locations and status. Ongoing discussions with stakeholders identified additional target capabilities, including integration with hospital registration systems and a feed of summary data to WebEOC, Boston's web-based incident management tool. In addition, several data fields required by FEMA for disaster management were added. The system is currently operational and has been field tested during several large public events, including the Boston Marathon and two July 4th Celebrations. Between 100 and 600 true patients were seen at each event.

CONCLUSIONS

Critical to the success of the system has been the buy-in and active participation of each stakeholder group, largely achieved through business process analysis to define unique needs. Successful adoption will continue to require open communication and system tests involving all participants. Additionally, having at least one person take ownership of the project and ensure continual momentum has been essential to this project's success.

REFERENCES

[1] PHIN Preparedness: Countermeasure/Response Administration Functional Requirements. Center for Disease Control. Version 1.0. April 26, 2005.

Further Information: Laura Williams:
williams_la@bostonems.org