

Death Certificate Surveillance in New Hampshire

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Learning Objectives:

1. Discuss the value of death certificate surveillance in detecting communicable disease
2. Explain the death certificate review process
3. Describe how death certificate surveillance can be automated.

Background:

The Death Certificate Surveillance was implemented in October 2001 [1] to enhance New Hampshire's ability to monitor for bioterrorism and other public health threats, such as communicable diseases and chemical exposures. In 2003, this surveillance system was automated. Death certificates become available for review by disease surveillance staff within 24 hours of filing

Method:

A reference table able is used to store up to one gigabyte of keywords, and associated conditions is created. This table is used to power the data-mining engine that searches causes of death descriptions for more than 400 clinical keywords associated with bioterrorism, chemical terrorism, and reportable disease.

Once deaths containing keywords are identified, post-processing rules are used to further evaluate death certificates and determine which ones require human review. Death certificates requiring human review are organized and evaluated by disease surveillance staff. Should additional information be required, the complete death certificate is available at the click of a button.

Automated cluster analysis is performed using 15 different geospatial and temporal groupings using modified Shewhart Control Charts [2]. Drill down access to complete death certificate information is available instantly from any system-identified cluster.

When diseases, or disease agents representing threats to population health are identified, disease control investigations are initiated.

Results:

>40,000 death certificates were electronically scanned since 2003. 3,500 of these death certificates (less than 9%) were identified by software as needing human review. >600 possible clusters of disease activity were detected [3]. 500 reportable disease cases were identified. Automation is estimated to have saved ~975 epidemiologist hours annually while reducing the opportunity for human error and increasing detection capacity [4]. Deaths identified through this system that were not reported through traditional means include *E.coli* O157:H7, Creutzfeldt-Jacob Disease, and hepatitis

Conclusions:

Identification of deaths that may have a public health impact is viable in near real-time. Collaboration with the Office of Chief Medical Examiner, Bureau of Vital Records, and hospital infection control staff has been enhanced through the use of this system.

The time delay between the identification of deaths of public health interest and the commencement of disease control interventions has been greatly reduced, and surveillance productivity has substantially increased since the implementation of an automated approach to monitoring death certificate activity.

References and Notes:

- [1] Kim Fallon. Bioterrorism Specialist. New Hampshire Department of Health and Human Services.
- [2] Traditional Shewhart Control Charting assumes a standard normal distribution. For this application, a Poisson Distribution is used to adjust for small numbers.
- [3] Possible clusters are defined as any incidence of a disease or condition that falls outside of the 95% confidence interval of the historic mean.
- [4] Prior to implementing this system, 20 hours per week were devoted to death certificate surveillance. After implementation, the same work is performed with reduced error in 1.25 hours.