The New York City Department of Health and Mental Hygiene Solves Foodborne Illness Outbreak Detected Using Software That Analyzes Infections in Space and Time

Stories FROM THE Field

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CATEGORY: Epidemiology and Laboratory Capacity (ELC)

CATEGORY: Partnership and Innovation

Whole genome sequencing improves the detection of foodborne outbreaks caused by contaminated products. However, outbreak detection can be delayed pending sequencing results, public health laboratory capacity limitations might preclude sequencing of all *Salmonella* isolates and isolates are not always available for laboratory-based subtyping, such as serotyping and sequencing.

The "What"

The New York City Department of Health and Mental Hygiene (NYC Health Department) uses space-time scan statistics to detect outbreaks of reportable communicable diseases, including salmonellosis. In May 2019, the NYC Health Department detected an unusual cluster of five patients with salmonellosis via automated spatiotemporal analysis, nine days before any laboratory-based subtyping results were available.

The "So What"

Rapid outbreak detection and interviews of the patients helped the NYC Health Department quickly identify a food establishment the patients had in common. This discovery allowed the NYC Health Department to facilitate food handler testing, conduct environmental assessments highlighting food handling deficiencies, prioritize patient isolates for sequencing and collect patients' leftover food for testing before it was thrown out.

The local investigation, which confirmed chicken as the outbreak source, was later incorporated into a multistate investigation of *Salmonella* Blockley cases associated with chicken. The NYC Health Department's automated communicable disease spatiotemporal cluster detection system received the 2022 NYC Hayes Innovation Prize. To learn more about the NYC Hayes Innovation Prize, visit **hayesprize.innovation.nyc**.

For more details on this investigation, visit https://www.cdc.gov/mmwr/volumes/69/wr/mm6926a2.htm

The "Now What"

Public health authorities should consider establishing automated spatiotemporal cluster detection analyses for salmonellosis and other reportable diseases to help detect geographically focused, community-acquired outbreaks before laboratory subtyping results are even available. Rapid outbreak detection can help epidemiologists prioritize case investigations and public health laboratory scientists prioritize subtyping patient isolates. The NYC Health Department has developed a tutorial on how to design and fine-tune a prospective spatiotemporal cluster detection system for reportable communicable diseases (https://preprints.jmir.org/preprint/50653/accepted). Additional analytic technical support for detecting and monitoring outbreaks would benefit state, tribal, local and territorial public health departments and the people they serve.