

Evaluation of *Salmonella* Cluster Detection and Investigations in NYC

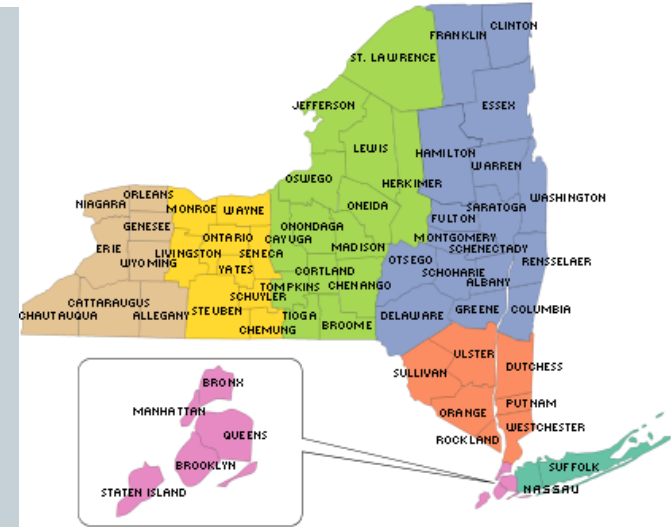


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New York City Department of Health and Mental Hygiene



- **Population is 8 million**
 - 43% of NY State's population
 - 321 square miles
- **Significant burden of illness due to foodborne pathogens each year**
 - Approximately 1200 salmonellosis, 80 STEC, and 40 listeriosis cases
- **26,000 food establishments**
- **13,000 food retail establishments**
 - Supermarkets, delis “bodegas”, big box wholesale stores



Salmonella Surveillance in NYC

Prior to FoodCORE Funding



- **Epidemiologic activities**
 - Interviewed salmonellosis cases only if -
 - ✦ Case-patient was identified as part of a cluster
 - ✦ Case-patient was identified as a daycare attendee/worker, healthcare worker, foodhandler)
- **Public Health Laboratory activities**
 - Performed serotyping on 100% of isolates
 - Performed pulsed-field gel electrophoresis (PFGE) typing on ~ 40% of isolates

Enhanced *Salmonella* Surveillance in NYC Following FoodCORE Funding



- **Epidemiologic activities**

- Hired a team of 6 student interns
- September 1, 2009 began performing hypothesis generating interviews of all salmonellosis cases

- **Public Health Laboratory activities**

- Hired 2 technologists
- April 2011 began PFGE-typing all *Salmonella* isolates (except *S. Enteritidis*)
- January 2012 began PFGE-typing all *Salmonella* isolates
- March 2012 began preparing a weekly cluster report

Cluster Detection in NYC



- **Weekly *Salmonella* serotype analysis**
 - Looks at serotype specific increases citywide by comparing:
 - ✦ 4 week (previous, comparable, & subsequent) period from the past 5 years
 - Serotype signals if increase is > 2 SD above the mean
- **PulseNet Laboratory – PFGE matched clusters**
 - Searches for local or multi-state clusters of salmonellosis when:
 - ✦ Local clusters identified by PFGE clustering in time
 - ✦ NYC isolate matches a multi-state cluster
- **CDC or department of health outside NYC**

Objectives and Methods



- **To evaluate improvements in cluster detection and investigations following FoodCORE funding**
- **Compared *Salmonella* clusters identified during a 12 month period prior to FoodCORE funding (pre-enhanced surveillance) to clusters identified during a 12 month period following FoodCORE funding (enhanced surveillance)**

Methods



- **Pre-enhanced surveillance:**
 - September 1, 2008 – August 31, 2009
- **Enhanced surveillance:**
 - April 1, 2011 – March 31, 2012
- **Salmonellosis clusters:**
 - 2 or more cases with indistinguishable PFGE occurring within 60 days
 - Cases with indistinguishable PFGE to a multi-state cluster and a CDC outbreak code was designated
 - Cases associated with a marked increase of a specific serotype through weekly serotype analysis

Methods



- **Confirmed vehicle source:**
 - Clusters of infection where *Salmonella* has either been cultured from the vehicle or the vehicle has been statistically implicated in an analytic study.*
- **Suspect vehicle source:**
 - Clusters of infection where investigational and/or laboratory data indicate a likely source/vehicle of infection without confirmation: vehicle is a known risk factor, established errors in food preparation, or reported consumption by a high proportion of cluster-associated cases. *

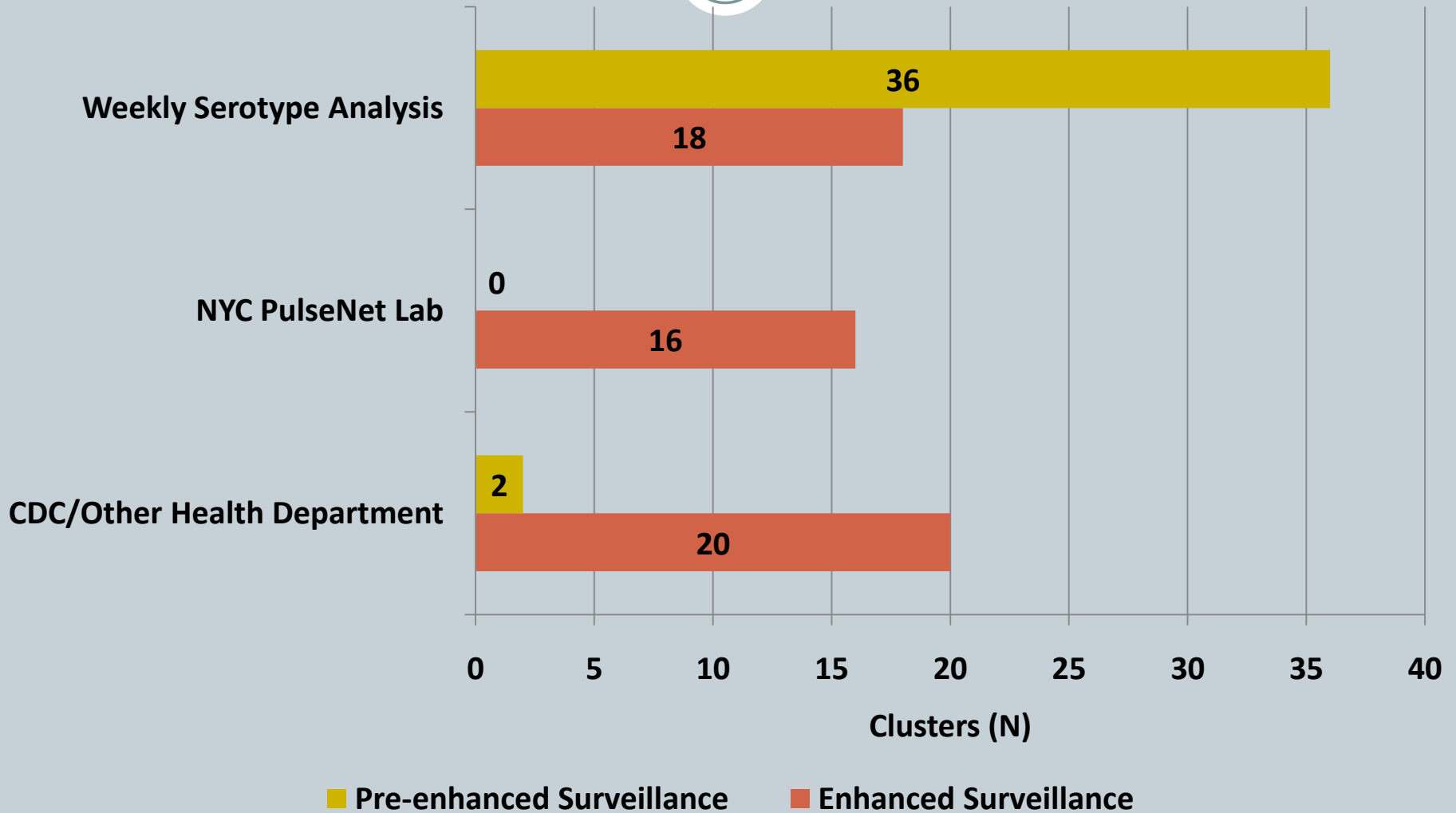
*Definitions based on FoodCORE metrics: <http://www.cdc.gov/foodcore/ssl-metrics.html#definitions>

Identified *Salmonella* Clusters and Investigations



	Pre-enhanced Surveillance	Enhanced Surveillance
Clusters identified N	38	54
Cluster investigations N (%)	9 (24%)	54 (100%)

First to Report *Salmonella* Cluster to the NYC DOHMH



Salmonella Cluster-Associated Cases and Case Investigations



	Pre-enhanced Surveillance	Enhanced Surveillance
Identified clusters N	38	54
Cases associated with clusters N	249	307
Interviews of cluster associated cases N (%)	61/249 (24%)	255/307 (83%)
Interviews with complete food history N (%)	9/61 (15%)	159/255 (62%)
Median days from case report to interview date	18.5 Days	2 Days

Salmonella Clusters with a Confirmed/Suspect Source Identified



	Pre-enhanced Surveillance	Enhanced Surveillance
Identified clusters N	38	54
Clusters with a confirmed/suspect source identified N (%)	0	10 (19%)
Clusters where a recall was initiated N (%)	0	6 (11%)

Conclusion



- **Enhanced surveillance**
 - Number of clusters identified increased and a greater number were identified through PFGE subtyping
 - Cluster-associated cases
 - ✦ **More interviews**
 - ✦ **Interviews were more timely and complete**
 - A greater proportion of clusters had a confirmed/suspect source identified and had a recall initiated

Limitations



- **Cluster data prior to 2010 were retrospectively entered into a database**
- **Multiple people managing clusters in the database which can affect data quality**

Future



- **Detect clusters faster**
 - Reduce *Salmonella* serotyping turn-around times
 - Reduce PFGE turn-around times
- **Refine cluster definitions**
 - Create methods for identifying PFGE patterns that are above baseline in a particular time period

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