Multistate Outbreak Public Communication in the Age of Whole Genome Sequencing

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PulseNet/OutbreakNet Midwest Regional Meeting
March 6, 2019
Outline

- Review of 2018 outbreak communications
- New communications tools
- USDA-FSIS Update
- FDA-CORE Update
- Examples
  - What’s up with the birds?
  - Media-Driven Investigation
- Future implications
2018: A Busy Year for Outbreaks

Apparently nothing you eat is safe…
Challenging Year for Outbreak Communication

January:
Leafy Greens/E. coli O157:H7 in U.S./Canada

February:
Salmonella/Kratom

April:
Salmonella/200 million eggs recalled
Romaine/E. coli O157:H7

June:
Salmonella/Pre-cut melon

July:
Vibrio/Fresh crab meat
MDR Salmonella/Raw turkey products

August:
Salmonella/Kosher chicken

September:
E. Coli O26/Ground Beef

October:
Salmonella/Ground Beef
E. Coli O157:H7/Romaine Lettuce
Listeria/Country Deli Ham

November:
Salmonella/Tahini
“What’s going on with all of these outbreaks?”

- **2017**
  - 11 outbreak announcements (8 food, 3 animal contact)

- **2018**
  - 22 outbreak announcements (20 food, 2 animal contact)
2018: A Busy Year for Outbreak Communication

Kellogg’s Honey Smacks Recalled Amid Salmonella Outbreak Investigation

Guinea Pigs May Be Giving People Salmonella, the CDC Says

What Is The Latest Salmonella Outbreak? This Time It Is Pre-Cut Melons

Five deaths, 197 illnesses in ongoing E. coli outbreak tied to romaine lettuce

Kratom more firmly linked with salmonella outbreak

206 Million Eggs Recalled Over Salmonella Fears
Why CDC Communicates about Foodborne Outbreaks

#1 REASON:
Specific source identified & public can take action

Other reasons CDC may communicate include:
- State health department(s) communicate
- High risk group involved
- Deaths, high hospitalization rate
- Misinformation circulating
Questions to Consider before Communicating

- Is the outbreak ongoing?
- Is there a clear action step for people to take?
- What is the product shelf life?
- Where is the product distributed/sold?
- Is a vulnerable group at risk?
- Are illnesses more severe than expected?
- Is the germ drug-resistant?
- Is there strong evidence linking illness to the product?
We don’t make mistakes - we just have happy accidents.

Changes are coming...
Change #1: The Decision

- Since 2011, CDC and partners have relied on a communication framework to make decisions about *when* to post during an ongoing outbreak.
  - Process applied consistently, was defensible when challenged.

- We typically felt *most confident* communicating when there was *specific advice* to provide.
Change #1: The Decision

- We’re finding ourselves in new and challenging communication scenarios
  - WGS increasing data confidence
  - Outbreaks where regulatory action isn’t possible
  - Restaurant chain signal, but no ingredient identified

- We still need a framework and process to make communication decisions
  - Applied consistently and is defensible
  - Leads to stronger trust, credibility, transparency in our agencies

- Currently revising and updating the existing communication scenarios
Change #2: The Look

- ORPB has used the same outbreak web posting template since 2011 with only minor changes over the years

- Need arose to create two similar, but different, templates:
  - Investigation Notice
  - Food Safety Alert

- User Experience Team reviewed current outbreak web postings
  - Prioritize and shorten content on the index page with more graphics
  - Use terms people use (Timeline of Reported Illnesses vs. Epi Curve)
  - Adopt a more modern, clean layout optimized for mobile viewing
Change #2: The Look – Investigation Notices

- **When will this be used?**
  - Investigations lacking specific advice to consumers, but there is still a need to communicate
  - May be used for enteric zoonotic outbreaks
  - Likely to be used less frequently than Food Safety Alerts, but gives us flexibility
Investigation Notice

- **Possible scenarios:**
  - Fast moving investigations, before a food item is identified
  - Generic food item linked to illness but brand unknown
  - Regulatory action not possible
  - Protracted outbreaks
  - Reminder of general food safety practices for consumers and retailers

- **Likely to be used less frequently than Food Safety Alerts**
Change #2: The Look – Food Safety Alerts

- **When will this be used?**
  - Investigations with specific advice to consumers (often a product recall)

- **Main differences from Investigation Notices:**
  - Use of the orange alert symbol
  - Advice is the first section at the top of the page
Possible scenarios:
- Specific advice to consumers and retailers
- Product recall

“This outbreak of XXX infections is linked to Brand A XXX.”
Other Changes and Improvements

- Applying “Digital First”
  - Prioritized important content
  - Fewer pages
  - More icons and images
- Translating notices into Spanish
- Trying new tools
  - Facebook Live
  - Patient testimonial videos
- Focus groups project
Food Safety and Inspection Service
Protecting Public Health and Preventing Foodborne Illness
FSIS is sharing data!
What does this mean for you?

- Datasets are posted to the FSIS website
  - Includes microdata for users to perform their own analyses.

- Before release: draft dataset and data dictionary are posted on regulations.gov for public comment for six weeks.
Available Datasets:
Individual laboratory sampling results of pathogens tested on product by establishment
- Ready-to-eat Meat and Poultry Products
- Egg Products
- Raw Ground Beef
- Raw Beef Trim
- Raw Beef Components
- Raw Beef Follow-up
- Raw Chicken Carcasses
- Raw Turkey Carcasses
- Raw Chicken Parts
- Raw Comminuted Chicken

Import Inspection Results
- Import Refusals (updated monthly)
Food Safety and Inspection Service: Upcoming Datasets

- Raw Comminuted Chicken –
  Draft Dataset: November, 2018
  Final Dataset: February, 2019
- Raw Comminuted Turkey –
  Draft Dataset: February, 2019
  Final Dataset: April, 2019
- Residue (TBD) –
  Draft Dataset: May, 2019
  Final Dataset: July, 2019
- Residue (TBD) –
  Draft Dataset: August, 2019
  Final Dataset: October, 2019
Establishment Letters

- Letters are sent to the establishment after the quarter ends

- Comprehensive sampling results are summarized quarterly for the establishment for all products sampled on a rolling one year basis.

- Information on the establishment’s performance with respect to different FSIS pathogen and residue verification testing programs
  - *Salmonella* Categories for Chicken and Turkey Carcasses
  - All Sampling Results for the establishment
  - Industry Averages

- Notice 97-16 (Quarterly Establishment Information Letters about Sampling Results) issued 12/22/16
Food Safety and Inspection Service: Establishment Letters

02/23/2017

Kiryas Joel Poultry Processing Plant (M31727+P31727)
9 Dunev Road
Monroe, NY 10950

Dear Sir / Madam:

This report provides compiled sample results for the period 01/01/2016 to 12/31/2016 and informs you of your establishment’s performance with respect to different Food Safety and Inspection Service (FSIS) pathogen and residue verification testing programs. FSIS expects all establishments to consider the information presented in this letter to aid in the evaluation of their process control and any potential improvements to increase food safety.

Summary Results for your establishment for the Sampling Period 01/01/2016 to 12/31/2016

Table: Category Results

<table>
<thead>
<tr>
<th>Product</th>
<th>Analysis</th>
<th>Category</th>
<th>Categorization Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Young Turkey Carcasses</td>
<td><em>Salmonella</em></td>
<td>1</td>
<td>10/04/15 - 12/31/16</td>
</tr>
<tr>
<td></td>
<td><em>Campylobacter</em></td>
<td>NA***</td>
<td>10/04/15 - 12/31/16</td>
</tr>
<tr>
<td>Young Chicken Carcasses</td>
<td><em>Salmonella</em></td>
<td>3</td>
<td>10/04/15 - 12/31/16</td>
</tr>
<tr>
<td></td>
<td><em>Campylobacter</em></td>
<td>1</td>
<td>10/04/15 - 12/31/16</td>
</tr>
<tr>
<td>Chicken Parts</td>
<td><em>Salmonella</em></td>
<td>1</td>
<td>10/04/15 - 12/31/16</td>
</tr>
<tr>
<td></td>
<td><em>Campylobacter</em></td>
<td>NA***</td>
<td>10/04/15 - 12/31/16</td>
</tr>
</tbody>
</table>

***NA: FSIS did not collect or analyze the minimum number of samples to categorize the establishment and the establishment has not exceeded the maximum number of positives allowed under the standard.
### Food Safety and Inspection Service: Establishment Letters

**Table: Serotype, PFGE, and Antimicrobial Resistance Profile Results for the Positive Samples for the Sampling Period 01/01/2016 to 12/31/2016**

<table>
<thead>
<tr>
<th>Form ID</th>
<th>Collection Date</th>
<th>Project</th>
<th>Product</th>
<th>Analysis</th>
<th>Serotype/ Commonly Associated with Human Illness</th>
<th>PFGE Pattern (# Recurrences)</th>
<th>Antimicrobial Resistance Profile (Classification)</th>
</tr>
</thead>
<tbody>
<tr>
<td>101307421</td>
<td>02/16/2016</td>
<td>HC_CH_CARC01</td>
<td>Young Chicken Carcasses</td>
<td><em>Salmonella</em></td>
<td>Enteritis/Yes</td>
<td>JEGX01.0004 (2)</td>
<td>Pan-Susceptible</td>
</tr>
<tr>
<td>101409040</td>
<td>06/16/2016</td>
<td>HC_CPT_LBW01</td>
<td>Chicken Parts – Legs, Breasts, and Wings</td>
<td><em>Campylobacter</em></td>
<td>NA</td>
<td>DBRS16.0010 (0)</td>
<td>Pan-Susceptible</td>
</tr>
<tr>
<td>101432735</td>
<td>07/27/2016</td>
<td>HC_CH_CARC01</td>
<td>Young Chicken Carcasses</td>
<td><em>Salmonella</em></td>
<td>Heidelberg/Yes</td>
<td>JF6X01.0022 (0)</td>
<td>AUG, AMP, FOX, AXO (C)</td>
</tr>
<tr>
<td>101451837</td>
<td>08/08/2016</td>
<td>HC_CH_CARC01</td>
<td>Young Chicken Carcasses</td>
<td><em>Salmonella</em></td>
<td>Thompson/Yes</td>
<td>JP6X01.0001 (0)</td>
<td>Pan-Susceptible</td>
</tr>
</tbody>
</table>

*Primary Pulsenet PFGE pattern name/Secondary Pulsenet PFGE pattern name (number of recurrences in establishment samples over the past five years)
**Antimicrobial resistance profiles were calculated using clinical breakpoints established by the Food and Drug Administration and published by the Clinical Laboratory Standards Institute (CLSI) where available as published in the NARMS 2011 Executive Report.

The following chart shows the distribution of *Salmonella* serotypes in all positive raw chicken samples at your establishment.
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Changes to increase the frequency and quality of FDA communication on outbreaks:

- Redesign of CORE web postings – **A recent example**
• More frequent use of Commissioner’s statements
• More insight and explanation of process (traceback diagram and descriptions)
In terms of WGS, in recent years more communication on retrospective investigations:

- Protocols we use for coordinated communications:
  - Who collects/analyzes the info initiates or authorizes its release
  - Echo and supplement partner communications – expanding the scope/depth of message awareness
  - No speculation – if we cannot talk investigation specifics – we can talk process
Outbreak Example: What’s up with the birds?
**Salmonella Infantis Infections Linked to Raw Chicken Products**

- **Long protracted outbreak**
  - Illness onset dates: January 19, 2018 to September 9, 2018

- **Large outbreak: As of October 2018, 92 ill people reported**

- **Signal for chicken, no single type**
  - Ground chicken, chicken pieces, raw chicken pet food, whole chicken
  - Multiple brands reported or no brand

- **Communication Decision:**
  - Announced outbreak using Investigation Notice template on October 17, 2018
  - Reminder to handle chicken safely
  - Fostered discussion with industry
  - Pet food recalled
Salmonella Infantis Infections Linked to Raw Chicken Products

- **Epi in February 2019:**
  - Last reported illness onset: January 27, 2019
  - No traceback information available
  - Illnesses reported after initial Investigation Notice had raw chicken exposure

- **Communication Decision:**
  - Post final update on February 21
  - “This investigation is over. Illnesses could continue because this *Salmonella* strain appears to be widespread in the chicken industry.”
Salmonella Infantis Infections Linked to Raw Chicken Products

- Lessons Learned
  - Need to fine-tune how we explain general food safety practices in the context of an outbreak
  - Investigation notice is a useful tool for transparency
  - Need to determine how we close protracted outbreaks
    - How do we describe ending one aspect of the investigation?
Outbreak Example: Media-Driven Investigation
Listeria monocytogenes Investigation from Deli Sampling

- Consumer advocacy media outlet sampled deli meat from various delis
  - Identified *Listeria monocytogenes* in two samples of deli meat
  - No environmental testing
  - Reached out to health officials to respond, who conducted environmental assessment

- PulseNet review: 6 illnesses in 4 states
  - Clinical isolates collected *November 13, 2016 to February 27, 2018*
  - Ill people reported deli meat, no brand information available
  - Isolates highly related to historical food/environmental isolates from different states
Listeria monocytogenes Investigation from Deli Sampling

- **Outcome**
  - No ongoing risk, no common deli item/producer identified
  - Article coming soon? maybe? One day? Possibly?
  - CDC and state health officials answered media inquiries from outlet

- **Lessons Learned**

  WE ARE NOT ALONE
Future Implications
What does all of this mean??

- **Increased use of WGS may lead to more outbreak notices**
  - More notices about outbreaks that may not have been communicated before or MMWR
  - Communications about outbreaks identified through regulatory investigations
  - External stakeholders identifying outbreaks

- **Need to explain to external partners and public why they are hearing about more outbreaks**
  - Are there actually more outbreaks or are we better at finding the source?
  - WGS is an important clue, but still need epi to link outbreaks
THANK YOU

Responding to outbreaks is time intensive and requires a multifunctional team across states and disciplines. We appreciate you!
Questions?

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.