Cyclospora Outbreak in Florida, 2005

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Previous Cyclospora Outbreaks/Vehicles

• Florida
  – 1996 – Palm Beach County, multiple clusters, raspberries, part of multi-state outbreak
  – 1997 – Leon County – mesclun lettuce
  – 1997 – Orange County – mesclun lettuce
  – 1999 – Palm Beach County – undetermined (multiple fruits)
Background of 2005 Florida Outbreak

- April 2005 – private labs noticed 12 cases of cyclospora
- 3-year average for same reporting week: 1.67 (20% >)
- Total number of cases reported in 2004: 9
- Rapid increase of reported cases
- No initial apparent commonality
Case definition

- Probable or confirmed case of cyclospora infection, using surveillance case definition, with onset since 3/1/2005, in resident of or visitor to Florida.

- Surveillance case definition:
  - Confirmed: a clinically compatible case that is laboratory confirmed
  - Probable: a clinically compatible case that is epidemiologically linked to a confirmed case
Role of private laboratories

- Send case information on laboratory confirmations to designated outbreak case coordinator
- Send permanent slides from suspected and confirmed cases to the state laboratory
- Challenge:
  - Often the private laboratories did not send enough case information for follow up
  - Multiple contacts in each lab for this outbreak investigation
  - Absences of key laboratorians due to leave, sickness
  - Private labs sometimes sent case information directly to CHDs (as is normal, non-outbreak protocol)
Role of public laboratories

• Confirm private laboratory cases
  – Past experience in other cyclospora outbreaks with misidentification
  – Only one case of cryptosporidiosis misidentified as cyclospora during this investigation

• Liaison with outbreak case coordinator

• Public lab confirmation of cases often filled in missing gaps (no info from private labs or CHDs)

• Liaison with CDC laboratory on out-of-state confirmations

• Challenge:
  – Increased volume of cases (lab did have capacity, but it was an unusually large number)
Comparison of Cyclospora cayetanensis and Cryptosporidium parvum

A & D: Cryptosporidium parvum
B & E: Cyclospora cayetanensis

Oocysts in stool smears stained with modified acid-fast stain

Oocysts in stool smears stained with safranin stain
Multi-agency collaboration

- Florida Department of Health and DOH County Health Departments
  - epidemiology investigation
  - laboratory confirmations
- Private laboratories
  - case finding, case confirmation
- Florida Department of Business and Professional Regulation
  - outbreak-related restaurant inspection
  - traceback activities
- Florida Department of Agriculture and Consumer Services
  - traceback activities

Florida counties: 34
Other states (cases exposed in Florida): 28 states
Canada (cases exposed in Florida)

- CDC
  - epidemiology consultation
  - lab consultation
  - coordination of out-of-state/out-of-country cases
- FDA
  - formal traceback
  - farm investigation
Anatomy of the Outbreak

• Sporadic cases
  – single individuals associated with a variety of food sources

• Clusters
  – Pinellas County - chain restaurant
  – Flagler County - independent restaurant
  – Sarasota County # 1 – independent restaurant/caterer to several medical offices; sporadic cases linked to restaurant
  – Sarasota County # 2 – independent restaurant
  – Palm Beach County – independent restaurant
  – Orange County – upscale 5⭐ resort and tourist destination
Overall statewide summary of cases

- Total number of cases: 592
  - Laboratory confirmed cases: 365
  - Probable (epi-linked) cases: 227
- Florida residents: 493
- Out-of-state cases (exposed in Florida): 89
- Canadian cases (exposed in Florida): 10
- Range of dates of exposure: March 19 – May 6
- Range of dates of onset: March 24 – June 8
Overall Outbreak Demographics

- Age: over 75% cases over 40 years old
- Gender: 57% female, 43% male
- Race: 81% white
- Ethnicity: 79% non-Hispanic
Pinellas County Cluster

Chain restaurant A
- 42 cases (17 laboratory confirmed, 25 probable)
- Exposure: 4/1-4/2/05 (those included in case control study)
- Onset: 3/25-4/23/05
- Implicated menu item: bread dipping oil
  - Olive oil
  - **Fresh basil**
  - Italian parsley
  - Rosemary
  - Fresh garlic
- OR 52, 95% CI = 8.99-300.78

Chain restaurant B cluster (emerged during the outbreak investigation of A)
- 8 cases (4 confirmed, 4 probable)
- Implicated menu item: bread dipping oil with pesto

Both restaurants receive Italian parsley and fresh basil from the same distributor
Flagler County Cluster

Independent restaurant

- 20 cases (16 confirmed, 4 probable)
- Exposures: 4/1-4/12/05
- Onset: 4/19-4/21/05
- Implicated menu item: bread dipping oil
  - Olive oil
  - Fresh basil
  - Fresh garlic
  - Parmesan cheese

- OR = 27, 95% CI = 2.29-534.30, p-value = .002
Sarasota County 1st Restaurant Clusters

Independent restaurant

- 91 cases (16 laboratory confirmed, 75 probable)
- 5 separate medical groups ate catered meals provided by drug representatives
- Sporadic, community cases ate at the same restaurant
- Exposures: 3/19-4/17/05
- Onsets: 3/24-4/21/05
- No single statistically significant food item
  - Insufficient # controls
  - Suspected food item in multiple menu items
  - Lack of recall for food histories
Sarasota 1st Restaurant Clusters

- Meat wrap, veggie wrap and Greek salad all part of catered lunches
- Greek salad, Moroccan salad, mixed baby greens, all on menu available to sporadic cases
- However: meat wrap, veggie wrap and Greek salad all contained sun dried tomato vinaigrette:
  - Balsamic vinegar
  - Olive oil
  - Sun dried tomatoes
  - Fresh onions
  - Salt and pepper
  - Fresh basil
Data Collection and Analysis

• Use of spreadsheets, web based data collection systems and database generation software with the capability of statistical analysis

• Extremely complicated outbreak
  – Widely distributed food
  – Multiple clusters
  – “Stealth” ingredient

• Triangulating analysis of 3 primary clusters: Pinellas, Flagler, Sarasota

• Analysis results considered sufficiently significant by DOH, CDC and FDA to support a formal request to FDA for a formal traceback of the implicated product
Communications

- Frequent updates utilizing statewide and nationwide alert systems
- Use of agency internal and external distribution lists in email postings
- Press releases
- Newspaper articles
- Final report
- Possible article...
Expectations for further outbreaks

• Widely distributed foods – potential for very large and diffuse outbreaks

• Imported foods – lower sanitation standards (water quality, processing sanitation)

• Global market – expectations for out-of-season produce produced by other countries
Remember – Timely Communications are Critical in Food and Waterborne Outbreak Investigations

- Talk to each other
- County Health Departments are responsible for investigating food and waterborne disease outbreaks
- REEs are available to assist upon request
- Communications are critical:
  - Know whom to call and
  - Know when to call them
- Preparedness is the key to rapid and informed response
Food and Waterborne Outbreak Investigation Team Members
References


• Florida Department of Health, Bureau of Community Environmental Health, Food and Waterborne Disease Program Annual Reports, http://www.doh.state.fl.us/environment/community/foodsveillance/annualreports.htm and data.


References cont.


