January 2008 volume 05

Infectious Disease Outbreak Newsletter

Georgia Infectious Disease Outbreak Annual Summary –2007

Outbreaks or clusters of illnesses are dynamic events that may involve a variety of etiologies, settings, and populations. In 2007, 243 events were investigated by Division of Public Health epidemiologists (Fig 1). Of these, 160 (64%) were considered Georgia confirmed outbreaks defined as epidemiologically-linked cases with a known Georgia exposure. Ninety-two (58%) of confirmed outbreaks were laboratory-confirmed. The most common etiology of laboratory-confirmed outbreaks was norovirus with 37 (40%) reported outbreaks, followed by *Shigella* and *Salmonella*. Food was the probable vehicle in 24 (15%) outbreaks; 17 (71%) of the foodborne outbreaks were laboratory-confirmed. Sixty (24%) of the 243 reported events were defined as cluster investigations (laboratory or disease-linked cases without a known epidemiologic association). Thirty-nine (65%) of these clusters were detected through laboratory data with 17 (28%) clusters identified by PulseNet, 14 (24%) by the Georgia Public Health Laboratory (GPHL) and eight (13%) through notifiable disease surveillance.

In 2007, several high profile cluster investigations implicated nationally and internationally distributed food products contaminated with infectious organisms. Clusters are detected, reported, and investigated using the same steps as outbreak investigations, but require diligent communication and collaboration because of possible federal, state, and local jurisdiction involvement. As our population becomes more fluid and our food supply more global, relationships among food safety agencies and Public Health will be vital to preventing and minimizing foodborne disease outbreaks.

HOW ARE CLUSTERS DETECTED AND REPORTED?

Clusters are detected through multiple channels similar to outbreaks. Laboratory data such as etiology, serotype, and pulse field gel electrophoresis (PFGE) patterns are available to Public Health epidemiologists through GPHL and notifiable disease reporting. Notifiable organisms identified from hospital and reference laboratories across Georgia are sent to GPHL for further characterization. Demographic and clinical information including name, address, date of birth and laboratory date are obtained for patients diagnosed with notifiable conditions. Data are reported to Public Health under Georgia code §31-22-7 via phone, fax or the web and managed in the State Electronic Notifiable Disease Surveillance System (SendSS). Trends based on etiology, person, place, and time can then be evaluated and clusters recognized. Clusters of illnesses and syndromes, regardless of laboratory confirmation should still be reported and investigated.

PFGE patterns of *Salmonella, Shigella, Listeria*, and *E.coli* isolates tested at GPHL are uploaded to a shared national database called PulseNet. All 50 state public health departments participate in PulseNet as well as the US Department of Agriculture (USDA) and the Food and Drug Administration (FDA). PulseNet is a surveillance network made up of state and local public health laboratorians and federal food regulatory agency laboratories that performs DNA fingerprinting on bacteria. PulseNet started in 1995 with only 196 PFGE patterns; currently over 100,000 patterns can be queried in the shared database.[1] PFGE pattern information is sent directly from GPHL to GA Division of Public Health epidemiologists. Historical surveillance data and baseline counts are used to recognize unique Georgia serotypes or unusual trends. PulseNet is also monitored by CDC epidemiologists who notify officials of situations involving their states' residents.

In addition to detection of clusters by laboratory data, surveillance partners such as healthcare providers, federal and state food regulatory agencies, other states, and private citizens are often the first to alert Public Health to an unusual situation involving Georgia residents. Other states, CDC, USDA or FDA may be aware of contaminated products distributed to Georgia stores. Healthcare providers, in particular emergency department (ED) personnel, are suited to detect and notice unusual illness frequencies early in the course of an outbreak.

Syndromic surveillance, through the collection and analysis of pre-diagnostic and other disease indictors, can provide early event detection and augment traditional passive surveillance reports. Evaluation of electronic data sources including ED and urgent care center patient visits, laboratory testing orders, emergency medical service (EMS) dispatches, prescription and over-the-counter drug sales, and school or workplace absentee rates may allow for timelier public health response. [2,3] The Georgia Division of Public Health Syndromic Surveillance Program, collects "real-time" (once daily) electronically transmitted, prediagnostic health indicator data from participating

hospital EDs and classifies patient self-described symptoms into syndromes. The number of events occurring, by syndrome, is analyzed to detect statistical anomalies. The Epidemiology Branch provides the centralized, web-based data collection and analysis system, housed in the State's Electronic Notifiable Disease Surveillance System (SendSS), to participating Health Districts. Please contact Wendy Cameron (wpcameron@dhr.state.ga.us) for information on the Georgia Syndromic Surveillance Program.

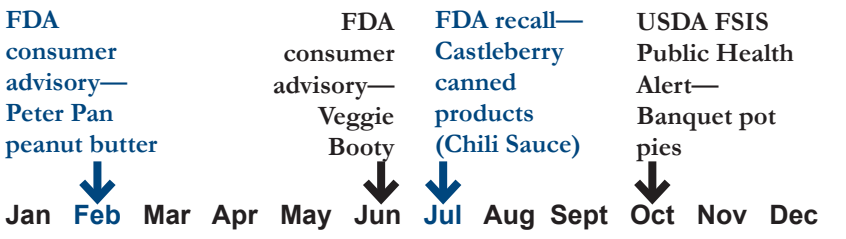
HOW ARE CLUSTERS INVESTIGATED?

Cluster investigations that involve cases from multiple states or countries are usually coordinated by CDC. Uncovering the epidemiologic link that connects the cases is challenging and is often not identified. In GA, only seven (12%) of 60 clusters investigated in 2007 were classified as confirmed outbreaks with an identified epidemiologic link. Outbreak investigations that implicate nationally distributed commercial products are complex and involve communication between multiple agencies. Lead investigators schedule regular conference calls with involved health departments and encourage data sharing. Clusters can take weeks to identify and months to explore. However, despite these challenges, such investigations are worthwhile because findings may result in policy and food processing procedures that prevent additional cases of illness.

OutbreakNet, coordinated by CDC is the name given to a network of Public Health officials at local, state, and federal levels who investigate disease clusters and outbreaks.[1] Members of OutbreakNet participate in quarterly conference calls to enhance communication, facilitate the exchange of data, and provide consultation on specific outbreak issues. Every year in conjunction with either the National PulseNet meeting or the Council of State and Territorial Epidemiologist (CSTE) meeting, OutbreakNet members assemble to exchange information and present novel outbreak investigations.

OUTBREAK SPOTLIGHTS — MULTI-STATE ILLNESS CLUSTER INVESTIGATIONS

Timeline of Major Events:



Public Health officials across the US were kept busy in 2007 investigating clusters of illnesses associated with nationally distributed commercial food products including peanut butter, vegetable-coated puffed snacks, hot dog chili sauce, and pot pies.

Peter Pan Peanut Butter

During November 2006, epidemiologists monitoring PulseNet data detected a noticeable increase in *Salmonella* serotype Tennessee isolates with indistinguishable PFGE patterns indicating a possible common source. States with cases (including Georgia) began conducting hypothesis-generating interviews. Early in 2007, enough information was obtained to launch a case-control study with specific food items of interest. FDA officials issued an advisory on February 14, 2007, supported by the CDC case-control study results, warning consumers not to eat Peter Pan and Great Value peanut butter purchased since May 2006. The outbreak strain of *Salmonella* was isolated from unopened jars of the implicated brands of peanut butter and found in the production plant. The plant, owned by ConAgra foods and located in Georgia, stopped production and recalled both brands of peanut butter. Approximately 628 patients were identified with the outbreak strain through PulseNet; the investigation involved 47 states. The source of contamination of the peanut butter is still unknown. After extensive cleaning and equipment replacement, Peter Pan and Great Value peanut butter are again being produced at the Georgia ConAgra plant.[4]

Veggie Booty Puffed Snack

In May 2007, OutbreakNet learned that more *Salmonella* serotype Wandsworth infections than expected were uploaded into PulseNet. The isolates had indistinguishable PFGE patterns and 91% of cases occurred in children aged 10 months to 3 years.[5,6] Lengthy interviews with the case-patients' parents revealed multiple hypotheses. A case-control study was performed across the US utilizing friend controls as the comparison group. An association was uncovered between illness and the consumption of Veggie Booty, a puffed snack with a vegetable coating. Two state health department laboratories (MN and NY) and a FDA laboratory isolated the outbreak strain of *Salmonella* from unopened bags of product. FDA notified the company; a voluntary recall was initiated on June 28, 2007. No new cases of *S.* Wandsworth with the outbreak PFGE pattern have been uploaded to PulseNet since the product recall. [5,6]

Castleberry Hot Dog Chili Sauce

In early July 2007, Texas and Indiana health officials notified CDC of four suspect foodborne botulism cases (two in each state). Interviews with the patients' families revealed that all four patients consumed Castleberry brand hot dog chili sauce before illness onset. FDA issued a consumer advisory on July 18, 2007, and the manufacturer of the product voluntarily recalled the implicated brand and other canned foods produced in the same set of retorts.[7] The term retort refers to a pressurized vessel used to sterilize canned or jarred food.[8] Castleberry's canning facility, located in Augusta, Georgia, underwent an extensive investigation by both FDA and USDA Food Safety Inspection Service (FSIS). Seventeen swollen cans of

Castleberry's hot dog chili sauce were tested and 16 cans were positive for botulinum toxin type A. Leftover chili sauce from an Indiana case-patient also contained botulinum toxin type A. The Castleberry Canning Company has closed its Augusta plant and has recalled product from approximately 8,500 retail stores.[7]

Banquet Pot Pies

In September 2007, increased *Salmonella* I 4,[5],12:i:- infections reported to the PulseNet database initiated a cluster investigation. Between January 1, 2007 and October 9, 2007, at least 272 isolates with indistinguishable PFGE patterns were collected from persons in 35 states.[9] Results of a CDC coordinated case-control study revealed an association between eating Banquet pot pies and illness. At least three pot pies recovered from patients homes cultured the *Salmonella* I 4,[5],12:i:- outbreak strain. On October 11, ConAgra, the manufacturer of Banquet pot pies, issued a voluntary recall of all frozen pot pie products related to their Banquet brand.[9] CDC is evaluating the possible relationship between microwave oven use and inadequate cooking temperatures. Cooking directions and labeling on products that are fully cooked then frozen may need to be changed to ensure food items are heated to high enough temperatures.

[1]Centers for Disease Control and Prevention PulseNet and OutbreakNet. http://www.cdc.gov/about/stateofcdc/everyday/pulseNet.htm

[2]Buehler JW, Berkelman RL, Hartley DM, et al. Syndromic surveillance and bioterrorism-related epidemiology. *Emerg Infect Disease*. 2003;9(10):1197–1204.

[3]Georgia Division of Public Health, Epidemiology Branch. Georgia syndromic Surveillance Program White Paper. February 2007.

[4]Centers for Disease Control and Prevention. Multistate outbreak of *Salmonella* serotype Tennessee infections associated with peanut butter—United States, 2006–2007. *MMWR Morb Mort Weekly Rep*;56(21):521–524.

[5]Centers for Disease Control and Prevention. Salmonella Wandsworth outbreak investigation, June–July 2007. http://www.cdc.gov/salmonella/wandsworth.htm

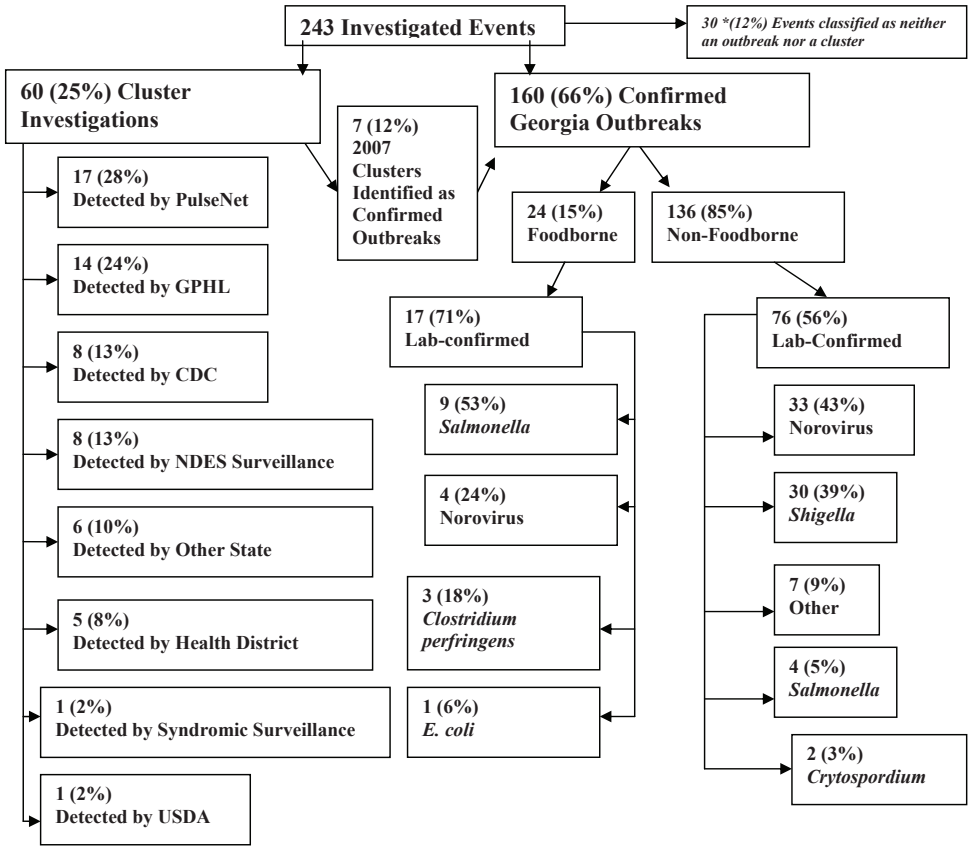
[6]Ewald G, for the S. Wansworth OutbreakNet Investigation Team; PulseNet. Multistate outbreak of *Salmonella* serotype Wandsworth and Typhimurium infections associated with consumption of a spray-coated vegetable snack food—United States, 2007. Presented at IDSA, San Diego, Oct 5, 2007.

[7]Centers for Disease Control and Prevention. Botulism associated with commercially canned chili sauce — Texas and Indiana, July 2007. *MMWR Morb Mort Weekly Rep Dispatch*. July 30, 2007;56:1–3.

[8]Wikipedia Encyclopedia. http://en.wikipedia.org/wiki/Retort. Accessed February 22, 2008

[9]Centers for Disease Control and Prevention. Investigation of outbreak of human infections caused by Salmonella I 4,[5],12:i:-. http://www.cdc.gov/salmonella/4512eyeminus.html

Figure 1. 2007 Infectious Disease Outbreaks and Clusters Reported in Georgia



Rates of Reported Georgia Outbreaks per 100,000 Population, 2007

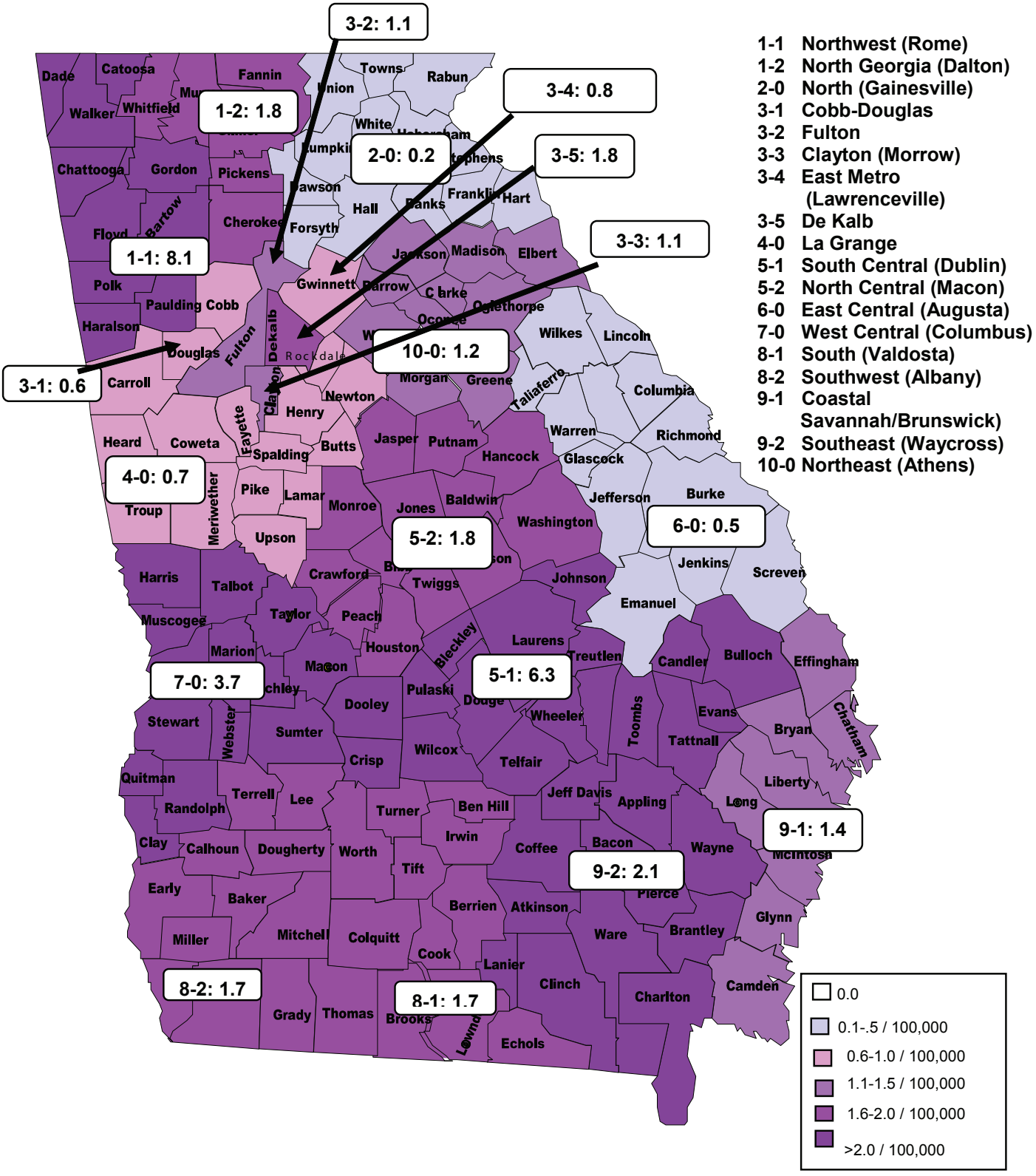


Table 1. Reported Infectious Disease Outbreaks* by Health District—Georgia, 2006 and 2007

Health District	Number of Georgia Outbreaks		Number of Laboratory-Confirmed Outbreaks		Number of Reported Foodborne Outbreaks		Number of Norovirus Outbreaks	
	2006	2007	2006	2007	2006	2007	2006	2007
1.1: Rome	10	47	5	35	0	0	5	17
1.2: Dalton	3	7	2	3	1	1	1	5
2.0: Gainesville	3	1	1	0	0	0	2	0
3.1:Cobb-Douglas	1	5	1	1	0	1	1	2
3.2: Fulton	3	10	1	4	2	2	1	6
3.3: Clayton	4	3	0	1	2	1	2	1
3.4: Gwinnett	11	8	3	4	6	3	6	4
3.5: DeKalb	12	12	7	4	5	3	8	7
4.0: LaGrange	9	5	6	3	2	2	4	4
5.1: Dublin	5	9	5	7	0	0	4	8
5.2: Macon	5	9	5	5	1	1	2	8
6.0: Augusta	4	2	1	1	0	0	2	1
7.0: Columbus	8	13	6	5	1	0	6	10
8.1: Valdosta	3	4	2	1	1	1	1	2
8.2: Albany	1	6	1	5	0	1	1	3
9.1: Coastal	3	7	2	4	0	1	1	3
9.2: Waycross	7	7	5	4	1	4	5	0
10.0:Athens	7	5	4	5	1	3	6	2
Total	99	160	57	92	23	24	58	83

*Does not include vaccine-preventable diseases, tuberculosis, sexually-transmitted diseases, environmental or injury outbreaks.
†Includes both laboratory-confirmed and probable norovirus infection outbreaks

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