

GASTROINTESTINAL PCR: A MOLECULAR CASE STUDY



By: Tyler Radke, MLS(ASCP)

Patient 1: 20yo Female

⦿ Signs & Symptoms

- Symptomatic for 6 days before seeking medical attention
- Multiple episodes of watery diarrhea
- Nausea
- Bloating
- Severe stomach pain
- Fatigue

⦿ No history of recent travel

⦿ No known sick contact

⦿ Orders: BMP, CBC w/ Diff, GI PCR

- No notable chemistry or hematology results

Patient 2: 38yo Female

⦿ Signs & Symptoms

- 9 days symptomatic
- Diarrhea, especially after eating
- Waves of abdominal discomfort/grumbling
- Nausea
- Initial fever of 105°
- Initial vomiting, has subsequently passed
- Nonspecific pain along upper abdomen, transverse colon

⦿ No history of recent travel

⦿ Orders: BMP, CBC, UA, GI PCR

- No notable chemistry or hematology results
- UA shows 15-20 WBC's

Patient 3: 69yo Male

⦿ Signs & Symptoms

- Symptomatic for 6 days
- Recurrent diarrhea of a few months – Restarted again
- Abdominal pain and distention
- Negative for nausea, vomiting, or blood in stool

⦿ No recent travel history

⦿ No known sick contact

⦿ Orders: CMP, CBC w/ Diff, GI PCR

- Potassium 3.3, no hematological concerns

Patient 4: 59yo Male

⦿ Signs & Symptoms

- Symptomatic for 8 days
- Episodic diarrhea
- Fever, nausea, and vomiting
- Negative for blood in stool

⦿ No recent travel history

⦿ Orders: CMP, CBC w/ Diff, Blood Cultures, UA, GI PCR

- Chloride 98, Calcium 8.6, ALT 60, Left Shift with increased bands, UA had trace protein and trace leukocyte esterase

Patient 5: 34yo Female

⦿ Signs & Symptoms

- Symptomatic for 9 days
- Severe diarrhea, especially after eating
- Bloating, gassy
- “Uncomfortable feeling in abdomen”
- Odorous stool
- Negative for blood in stool, nausea, and vomiting

⦿ No recent travel history

⦿ Orders: CMP, CBC w/ Diff, GI PCR

- Albumin 3.3, MCHC 31.8, Left Shift

Patient 6: 37yo Female

⦿ Signs & Symptoms

- Symptomatic for 3 weeks (patient thought viral illness)
- Severe Diarrhea
- Abdominal pain and body aches
- Initial fever
- Nausea
- Negative for blood in stool and vomiting

⦿ No recent travel history

⦿ No known sick contact

⦿ No recent antibiotic use

⦿ Orders: CMP, CBC w/ Diff, GI PCR

- Elevated ALT and AST, no hematological concerns

Patient 7: 67yo Female

⦿ Signs & Symptoms

- Symptomatic for 2 weeks
- Diarrhea
- Abdominal cramping and bloating
- Nausea
- Odorous diarrhea
- Negative for blood in stool

⦿ Recent trip to Haiti

⦿ Orders: GI PCR

Patient 8: 50yo Female

⦿ Signs & Symptoms

- Symptomatic for 2 months
- Severe Diarrhea for past 4 weeks
- Negative for abdominal pain, blood in stool, and vomiting

⦿ No recent travel history

⦿ No known sick contact

⦿ Orders: CMP, CBC w/ Diff, GI PCR

- Potassium 3.2, MCHC 31.4

The Common Ground?

All Patients	All but 1 Patient	Most Patients	Some Patients
Diarrhea	No Recent Travel	Nausea	Vomiting
No blood in stool	No Sick Contact	Abdominal Pain	Bloating
Long duration			Fever
			Abnormal Chem
			Abnormal Heme

What is the Causative Agent?

- ⦿ A – Cryptosporidium
- ⦿ B – Cyclospora cayetanensis
- ⦿ C – Enterotoxigenic *E. coli* (ETEC)
- ⦿ D – Norovirus GI/GII

What is the Causative Agent?

- ⦿ A – Cryptosporidium
- ⦿ B – Cyclospora cayetanensis
- ⦿ C – Enterotoxigenic *E. coli* (ETEC)
- ⦿ D – Norovirus GI/GII

Indicating Factors

All Patients	All but 1 Patient	Most Patients	Some Patients
Diarrhea	No Recent Travel	Nausea	Vomiting
No Blood in Stool	No Sick Contact	Abdominal Pain	Bloating
Long Duration			Fever
			Abnormal Chem
			Abnormal Heme

All patients recently ate at a restaurant being supplied with fresh produce from Puebla, Mexico.

Date of Onset and Diagnosis

Diagnosis	Symptom Onset
6/2/2015	5/21/2015
6/3/2015	5/24/2015
6/4/2015	5/26/2015
6/5/2015	5/28/2015
6/10/2015	5/30/2015
6/11/2015	6/1/2015
7/17/2015	6/7/2015
8/7/2015	6/24/2015

The Suspected Vehicle of Transmission?

- Ⓐ – Cilantro
- Ⓑ – Cucumbers
- Ⓒ – Raspberries
- Ⓓ – Eggs

The Transmission Vehicle



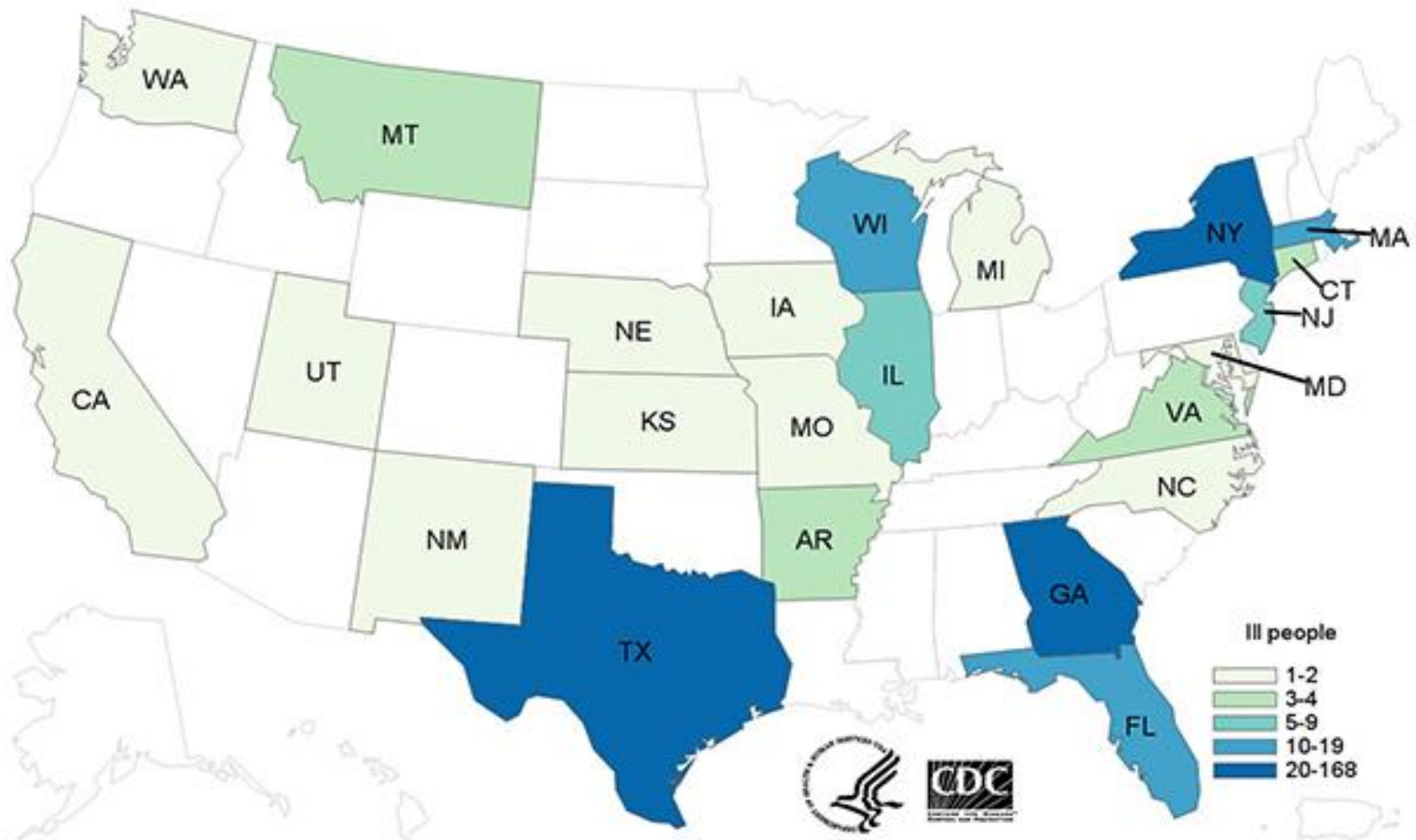
News Headlines

- **“Cilantro Cyclospora Outbreak Sickens 218 in Texas, Wisconsin”**
- **“Puebla, Mexico fresh cilantro ‘suspect’ in Texas cyclospora outbreak and Wisconsin cluster”**
- **“Feces-contaminated cilantro could be linked to up to 384 cases of cyclosporiasis”**
- **“Mexican cilantro blamed for stomach virus outbreaks in Texas and Wisconsin after human feces and toilet paper are found in growing field”**

- “The Centers for Disease Control and Prevention (CDC) and state public health officials have identified annually recurring outbreaks (in 2012, 2013, and 2014) of cyclosporiasis in the United States which have been associated with fresh cilantro from the state of Puebla, Mexico. There is currently (in July 2015) another ongoing outbreak of cyclosporiasis in the United States in which both the Texas Department of State Health Services and the Wisconsin Department of Health Services and the Wisconsin Department of Agriculture, Trade and Consumer Protection have identified cilantro from the Mexican state of Puebla as a suspect vehicle with respect to separate illness clusters.”

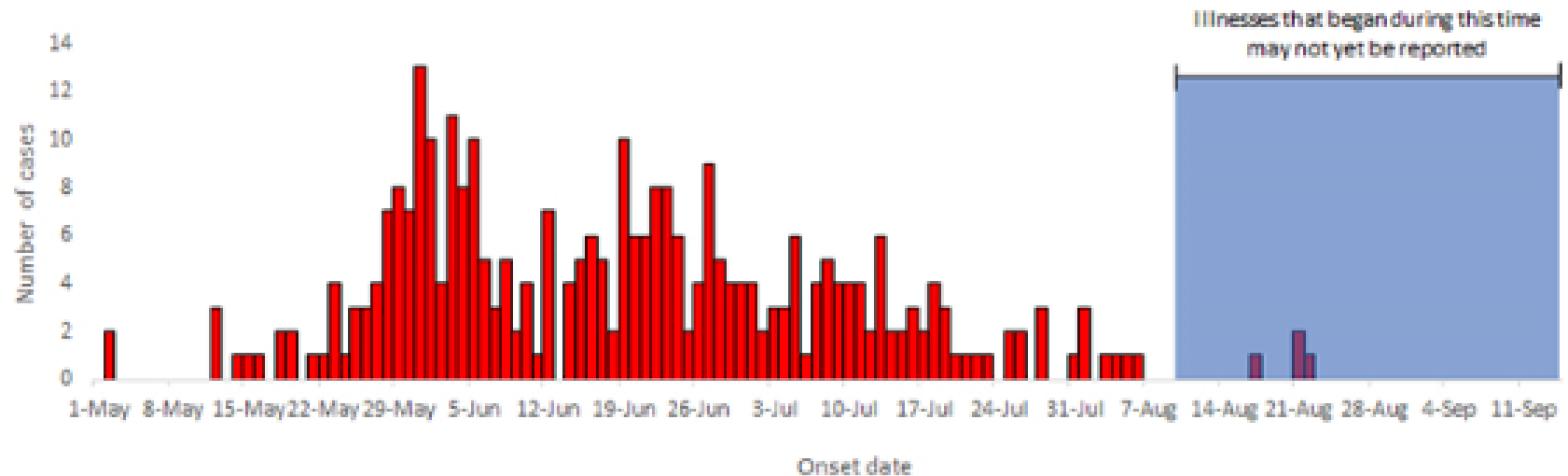
Reported U.S. cases of laboratory-confirmed, domestically acquired cyclosporiasis in persons with onset of illness since May 1, 2015*

September 16, 2015



Reported U.S. cases of laboratory-confirmed, non-travel-associated cyclosporiasis in persons with onset of illness since May 1, 2015*

September 16, 2015



*N=315. Data are current as of 9/14/15 (3pm EDT). Data are preliminary and subject to change. These cases occurred in persons with no history of travel outside of the United States or Canada in the 14 days before onset of illness. Illnesses that began after 8/10/15 might not have been reported yet due to the time it takes between when a person becomes ill and when the illness is reported. It is not yet known whether all reported cases are part of the same outbreak.

Date of Onset and Diagnosis

Diagnosis	Symptom Onset
6/2/2015	5/21/2015
6/3/2015	5/24/2015
6/4/2015	5/26/2015
6/5/2015	5/28/2015
6/10/2015	5/30/2015
6/11/2015	6/1/2015
7/17/2015	6/7/2015
8/7/2015	6/24/2015

Thank You