

**Hickory Dickory Dock
Shigella worked us around the clock
The clock struck four
The nurse said, "There's more?"
Hickory Dickory Dock**





BACKGROUND

Cluster Identification

- In Oct 2013, CHA nurses noticed an increase in reported Shigella cases.
- Investigations revealed a common link...an elementary school.
- ??Shigella outbreak?? DPH immediately notified.

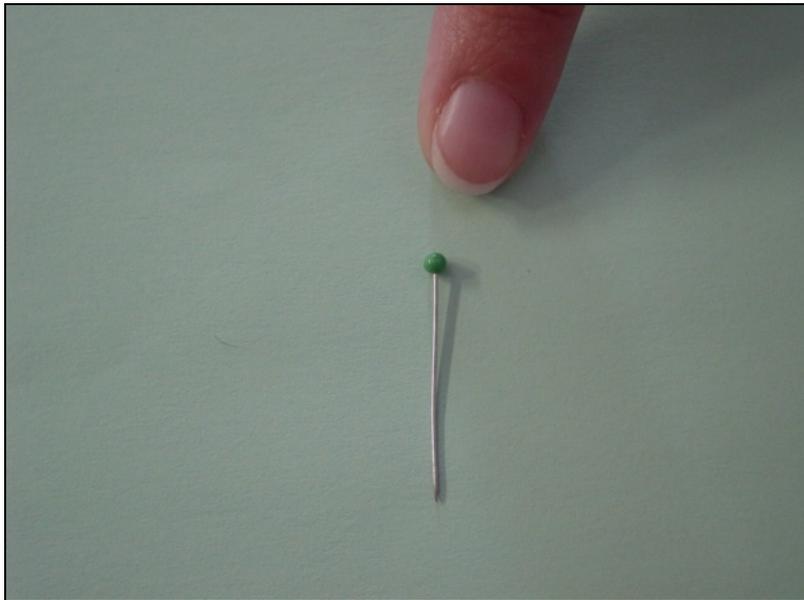


WHAT IS SHIGELLOSIS?

CLINICAL PICTURE

- Variable severity of diarrhea, fever, nausea, cramps, and tenesmus. Asymptomatic infections may occur.
- Typically 1-4 day incubation; 48-72hr duration (*Shigella sonnei*)
- Most infections with *S. sonnei* are self-limiting (48-72 hours)

HIGHLY CONTAGIOUS



400 organisms can fit
on the head of this pin

As little as 10 can
produce symptoms



NOW, BACK TO THE OUTBREAK...



BACKGROUND

- CHA given instructions for maintaining a line list.
- Conference calls conducted.
- Case definition created by DPH.

CASE DEFINITION (10/17/13)

Diarrhea (3+ loose stools in a 24 hour period) and fever or nausea or cramps or tenesmus in a resident of Cabarrus County or adjacent counties (Iredell, Rowan, Stanly, Union or Mecklenburg) since 9/1/2013 with illness meeting either of the following descriptions:

CASE DEFINITION (10/17/13)

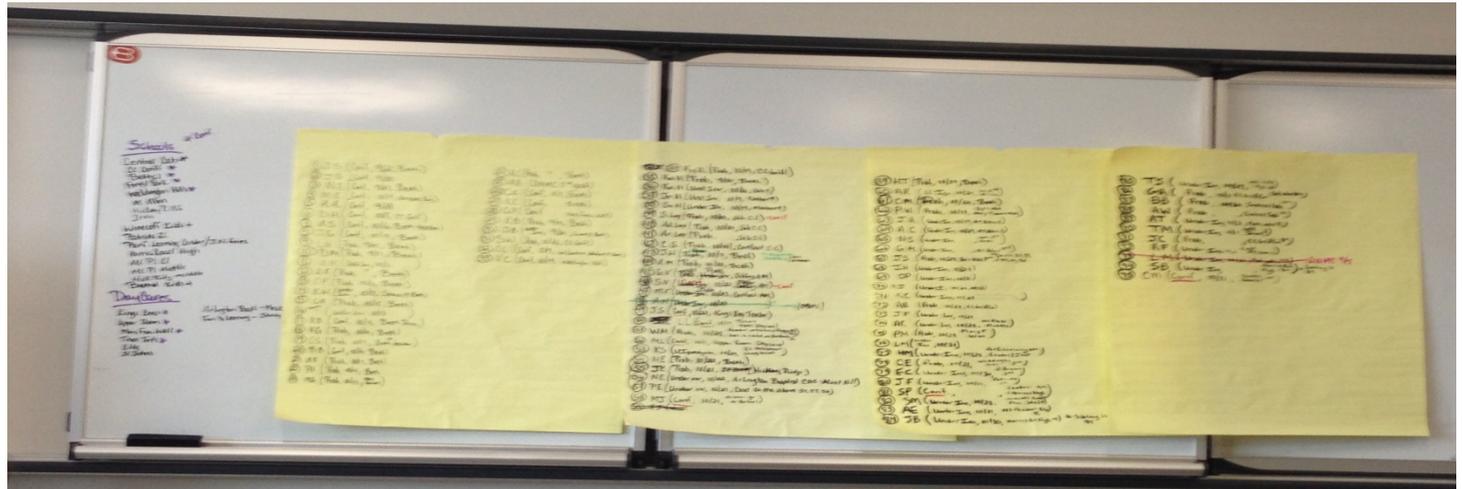
- **Confirmed:** Shigella positive culture
- **Probable:** Clinically compatible illness and epi-linked to a confirmed case or to an institution where an outbreak has been recognized and lab confirmed.
- **Under Investigation:** Clinically compatible illness with no lab result AND no epi-link.

METHODS

CHA Nurses

- Maintained a line list
- Collaborated with School Health Supervisors
- Coordinated Environmental Health and Childcare Consultant visits.
- Interview of case suspects
- Collected stool samples
- Communicated with Community Providers and DPH.

METHODS



METHODS

School Health Nurses

- Notified schools about Shigella in staff meetings.
- Conducted surveillance on all students and staff.
- Referred symptomatic individuals to PCP or LHD for stool cultures.
- Demonstrated proper handwashing techniques.



METHODS

Environmental Health

- Site visits conducted.
- Control measures enforced.
- Educated on proper disinfection.



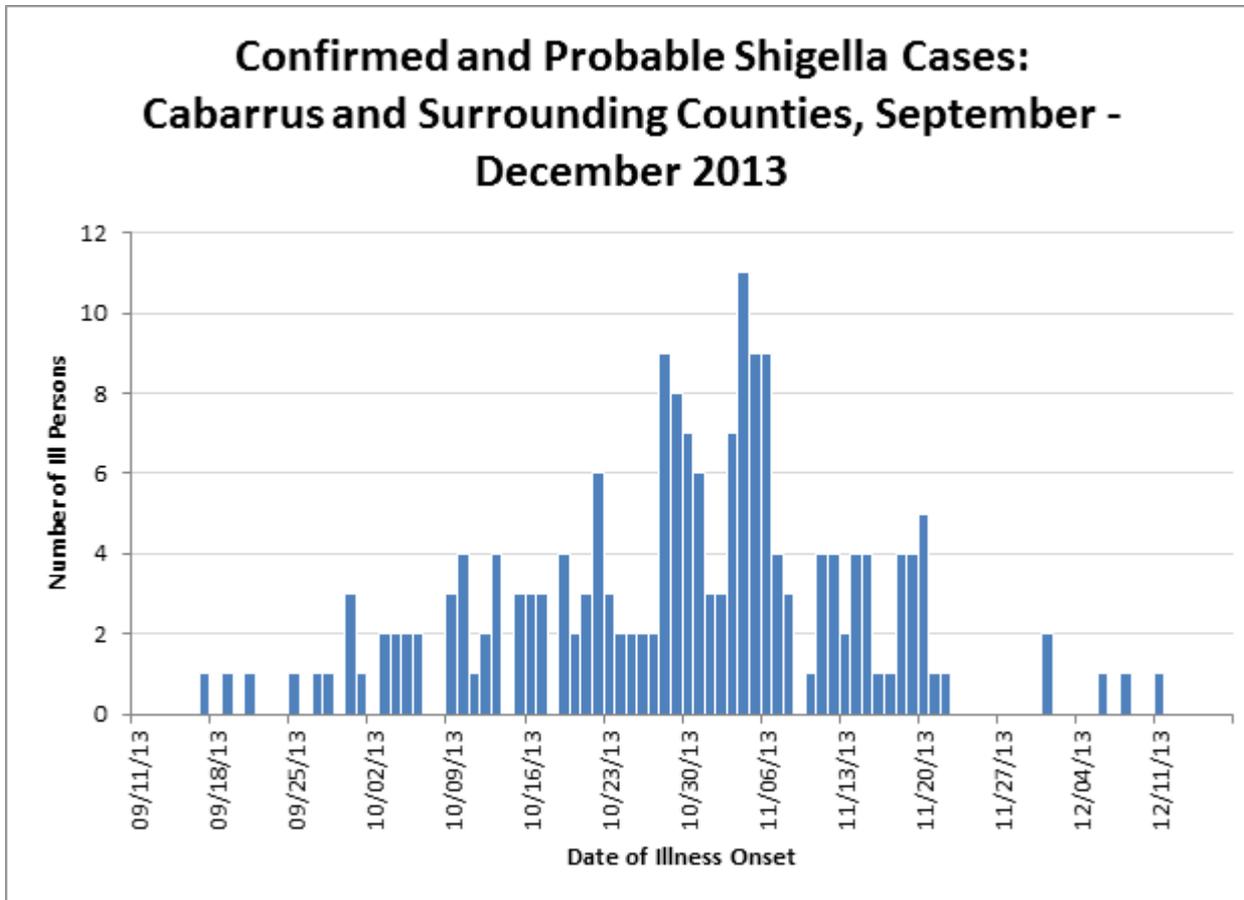
METHODS

Child Care Consultants

- Reinforced control measures.
- Educate about Shigella prevention.
- Observe proper handwashing.
- Conduct a symptoms screen for all children and staff.
- Assisted the centers in notifying parents of the guidelines to control and prevent Shigella.

RESULTS

**Confirmed and Probable Shigella Cases:
Cabarrus and Surrounding Counties, September -
December 2013**



RESULTS

Schools Involved

- Elementary-17 (4 confirmed cases)
- Middle School-7 (2 confirmed cases)
- High School-6 (1 confirmed case)
- Private School- (0 confirmed case)

RESULTS

Daycare Centers

- 12 (6 confirmed cases)

Food Establishments

- 2 (0 confirmed cases)

RESULTS

FINAL COUNT

Total Cases-202

Confirmed-39

Probable-64

Under Investigation-93

Does not meet criteria-6



LESSONS LEARNED

- Utilize your resources.
- Consistent Communication is key
- Do not assume.
- People do not know how to properly wash their hands!

RESULTS

Shigellosis Control Measures for Childcare Centers and K – 12 Schools

Information for Local Health Departments

Provided by the NC Division of Public Health
March 2014

- Section 1: Introduction to *Shigella* infection and control measures
- Section 2: Control measures for childcare centers
- Section 3: Control measures for K – 12 schools
- Section 4: Testing protocol and templates
- Section 5: References

Section 1: Introduction to *Shigella* infection and control measures

Introduction

Shigellosis is a gastrointestinal illness that is caused by species of bacteria in the genus *Shigella*. There are four species of *Shigella* including *S. dysenteriae*, *S. flexneri*, *S. boydii*, and *S. sonnei*. Almost all cases reported in North Carolina are caused by *S. sonnei*. According to the Centers for Disease Control and Prevention, there are approximately 14,000 laboratory confirmed cases of shigellosis and an estimated 450,000 total cases (72% due to *S. sonnei*) that occur in the United States each year.

Transmission

Shigella bacteria are shed from the intestinal tracts of infected people and are transmitted when ingested by another person (fecal-oral transmission). While contamination of food (or water) by an infected food handler (or infected bather) can happen, the vast majority of case reported in NC are caused by person-to-person transmission. Humans are the reservoir for *Shigella* bacteria; there is no animal reservoir. The infectious dose for shigellosis is very small; less than 200 organisms. As a result even seemingly minor breaches in hygiene can result in outbreaks.

Clinical signs and symptoms

Infection with *S. sonnei* (the most common cause of shigellosis in the US) and *S. boydii* usually cause relatively mild illness in which diarrhea may be watery or bloody. While mild and asymptomatic infections do occur, the signs and symptoms of shigellosis typically include abdominal cramping,

Updated Shigella Guidance

March 2014

Surveillance

Outbreak

GUIDANCE UPDATES

(SHOWN IN RED)

Case Classification

- Confirmed
 - Isolation of Shigella (culture)
- Probable
 - Clinically compatible + epi-link
- Suspect
 - Identification of Shigella from non-culture method



One Confirmed Case

Exclude from

- Child care
- Health care
- Food handling

until asymptomatic AND negative stool culture



Return to Childcare/ High Risk Occupations

- Return when asymptomatic AND...
- 1 negative stool culture or PCR (child care attendee)
- 2 negative stool cultures (child care worker, health care worker, food employee)



Recognizing and Responding to an Outbreak



Outbreaks

Previous Guidance

- No specific setting
- Trigger = 2 or more cases

Updated Guidance

- Setting specific
 - Childcare
 - K-12
 - Community outbreak
- Trigger = 1 case

One (1) Conf Case in Child Care

Recognition

One case is not an outbreak,
but could be an early warning

Response

Swift and thorough before
things get out of hand.

Exclusion of Ill
Increased hand washing
Environmental cleaning
No new admissions



Two (2) Conf Case in Child Care

Recognition

This is an outbreak!

Response

Swift, thorough, and hold people accountable.

Exclusion of Ill

Increased hand washing

Environmental cleaning

No new admissions

Letter home to parents

Testing of case's direct contacts



Community Outbreak

Recognition

Cases in multiple facilities in
the county
(i.e. child care, schools)

Response

Swift, thorough, and hold
people accountable.

**Same as previous, even for a
single case of diarrhea with
no alternative diagnosis**



Summary

- 1 negative for childcare attendees' return
- Kindergartener return to school
 - Based on hand hygiene
- PCR vs Culture
- School specific guidance

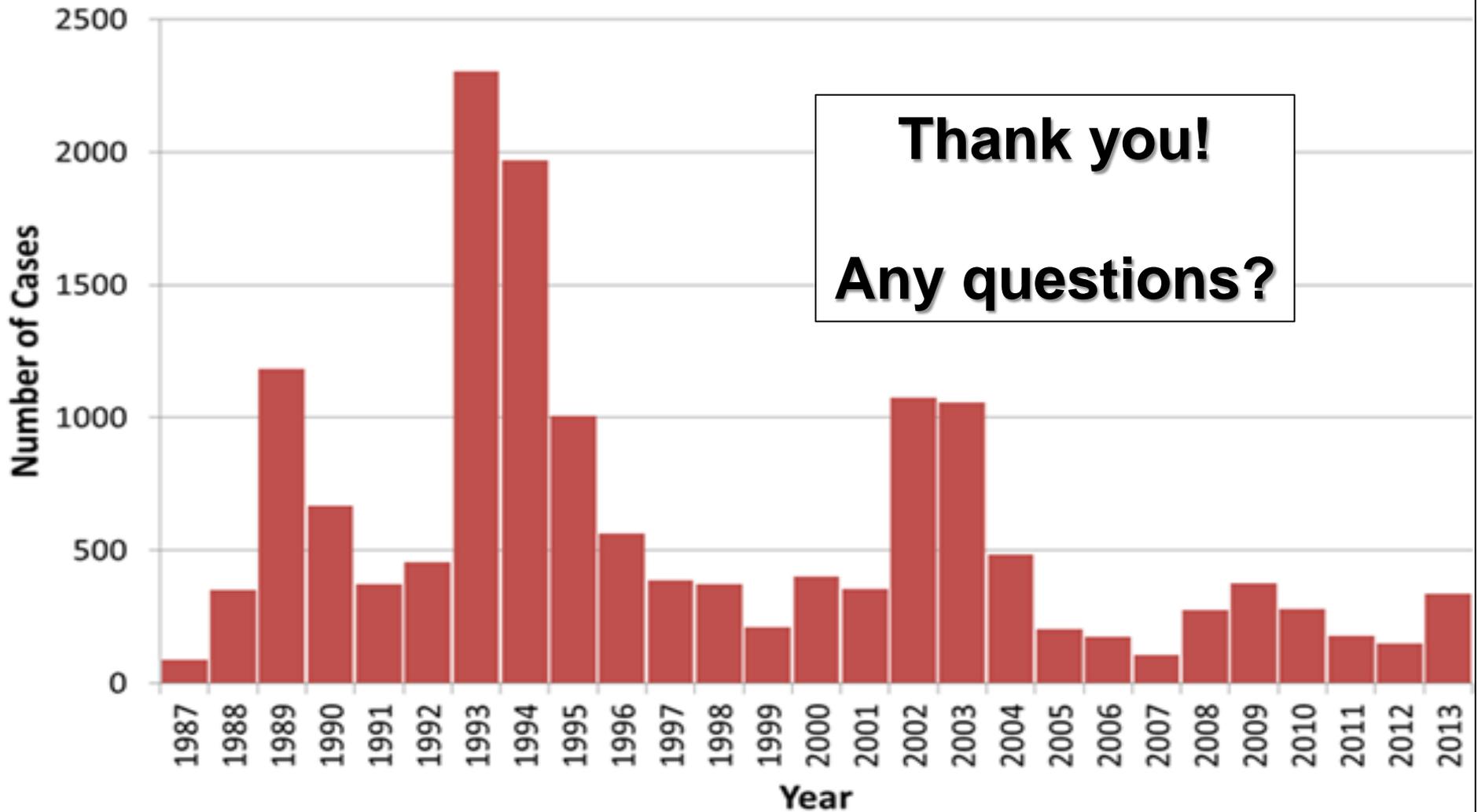
Resources

2013 Shigella Toolkit

- Location: Online NC CD Manual
- Content: Investigation steps; Control measures; Guidance for child care and schools; Template letters; Parent/child/staff questionnaires;



Confirmed and Probable Shigellosis Cases, North Carolina 1987 - 2013 (n=15,382)



Thank you!
Any questions?