



**NORTHERN KENTUCKY**  
INDEPENDENT DISTRICT  
**HEALTH DEPARTMENT**

# **Shigella in Northern Kentucky**

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Manager



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HEALTH DEPARTMENT**

# *Shigella sonnei*

- Gram negative non-spore forming rod
- Human is the only reservoir
- Transmitted via fecal-oral route
- Highly infectious, it has a very low infective dose, in some cases as few as 10 cells.
- Produces Shiga toxins similar to those produced by some strains of *E.coli*

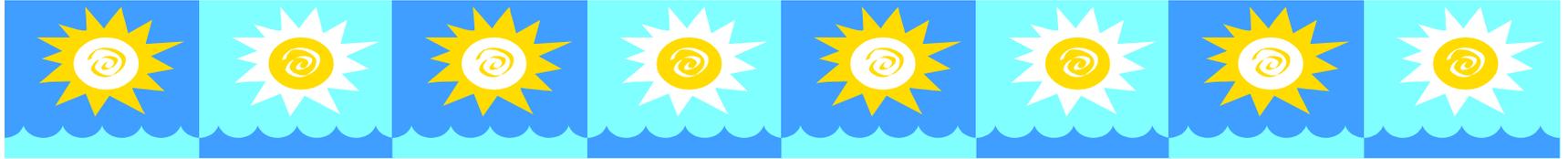


# Shigellosis

- **Identification and Epidemiology**

- Incubation Period: Incubation period is usually 1-3 days but can be as short as 12 hours and as long as 4 days
- Communicability:
  - Acute symptomatic carriers
  - Asymptomatic carriers
  - From food contaminated by an ill food handler
  - From contaminated drinking or recreational water
- Susceptibility: Everyone is susceptible, but elderly people, children and those with poor health and nutritional status are at higher risk for severe illness.





**It Was a Long**



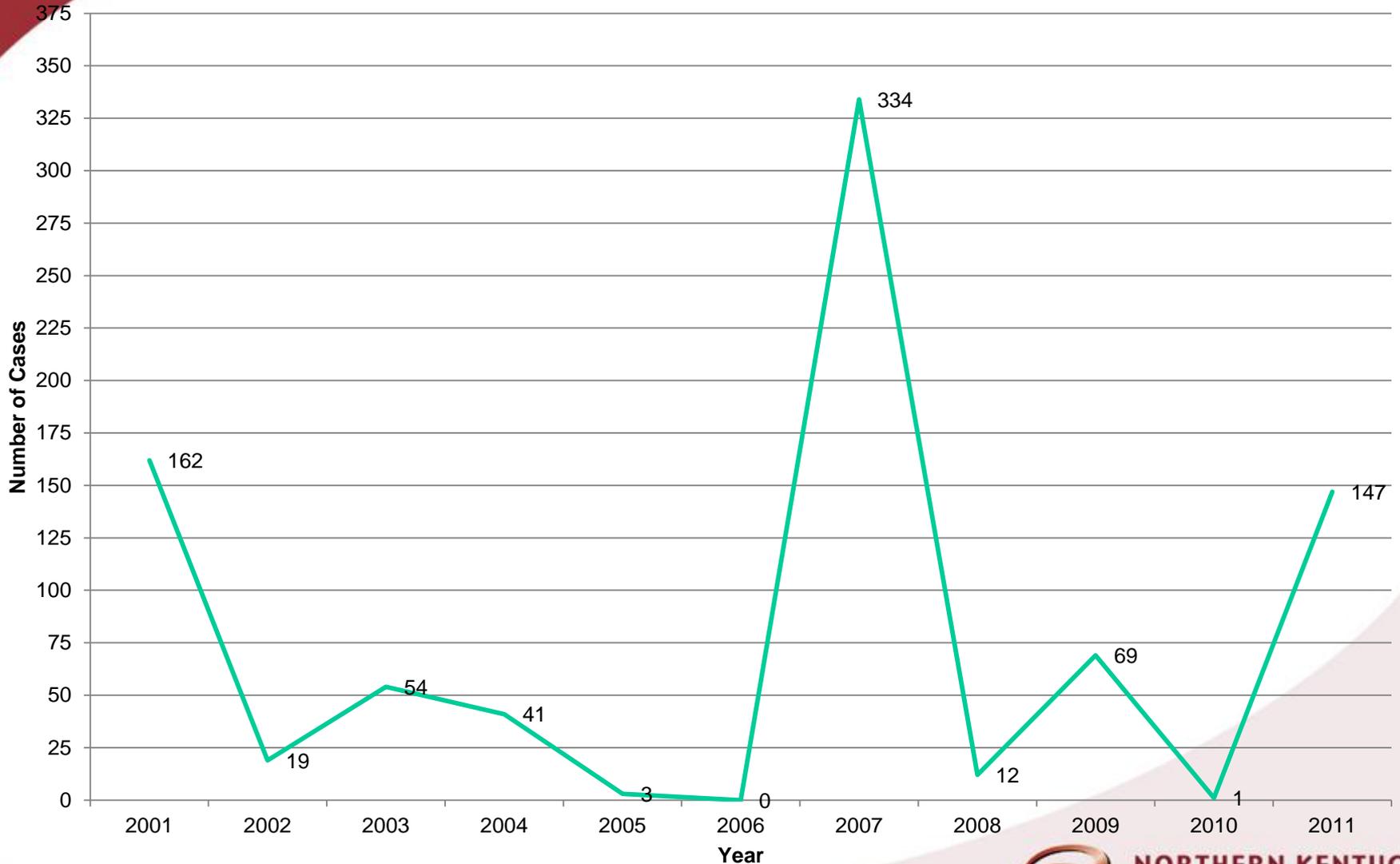
**Summer**



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## Shigella Cases in Northern Kentucky Distributed by year



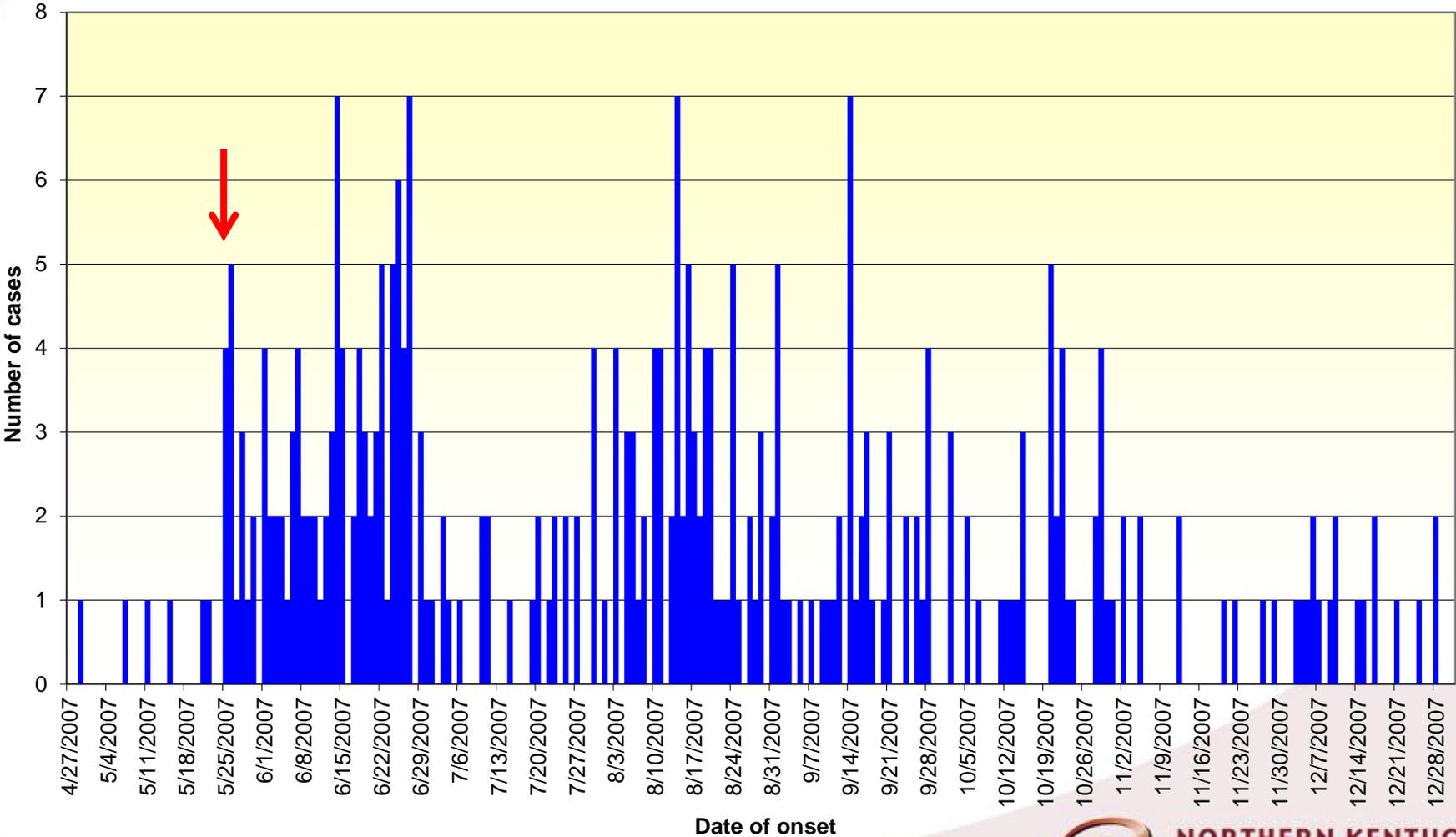
# Shigella Outbreak 2007

## A brief review





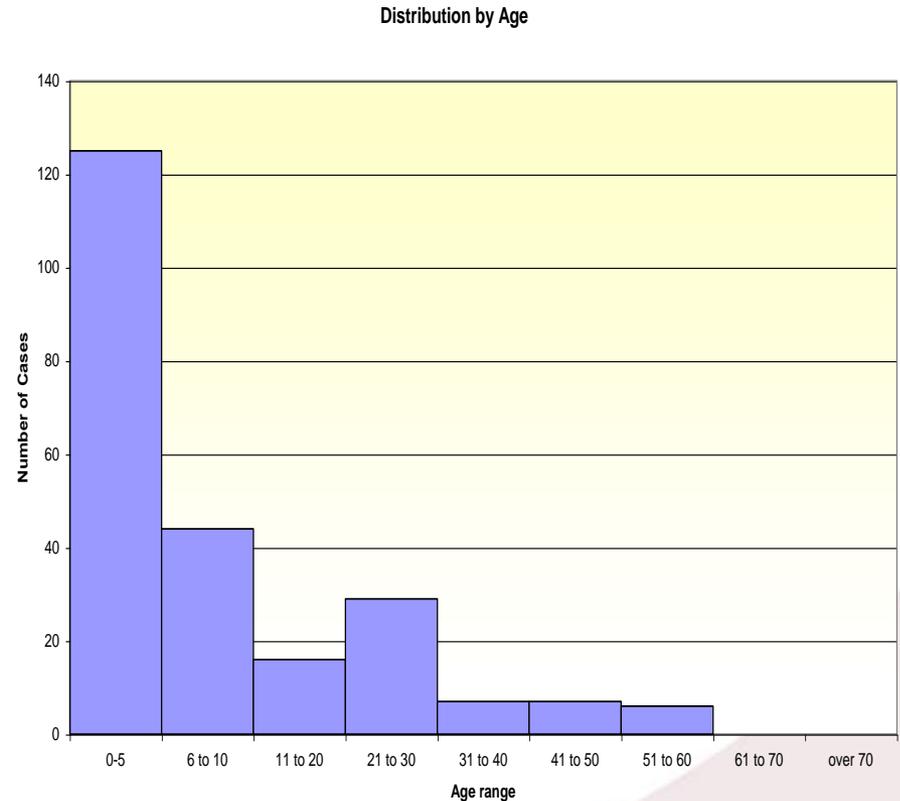
# Northern Kentucky 2007 Shigella Epi Curve



# 2007 Shigella outbreak

## Distribution by Age

- Age range 3 months to 58 years, median of 5 and a mode of two
- 79% under 21 years of age
- 54% Female
- 36% were associated with swimming pools
- 61% related to childcare
  - Attendee or contact of attendee



**Fast Forward.....2011**

**It's Baaaack.....**



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# Fast Forward....2011

- Index Case: April 3, 2011 date of onset
  - 2 other family members became ill
- April 6, 2011, 1 year old became ill, (no connection found to the first case) attends a Child Care facility.

Just the beginning....



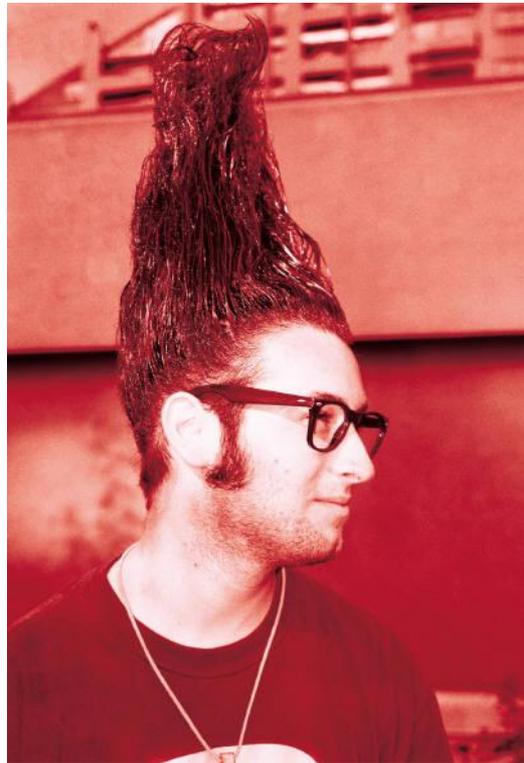
Normal Shigella Levels:

**0-3 Cases per 2<sup>nd</sup> Quarter**

**We began to see several cases**



- Three cases in a short time period...



- First Child Care Center (CCC)....

**26 Cases!!**

- Second CCC...7 cases
- Third CCC...7 cases
- Rest CCC's ranged 1-9 cases
  - Ave 3 cases per CCC

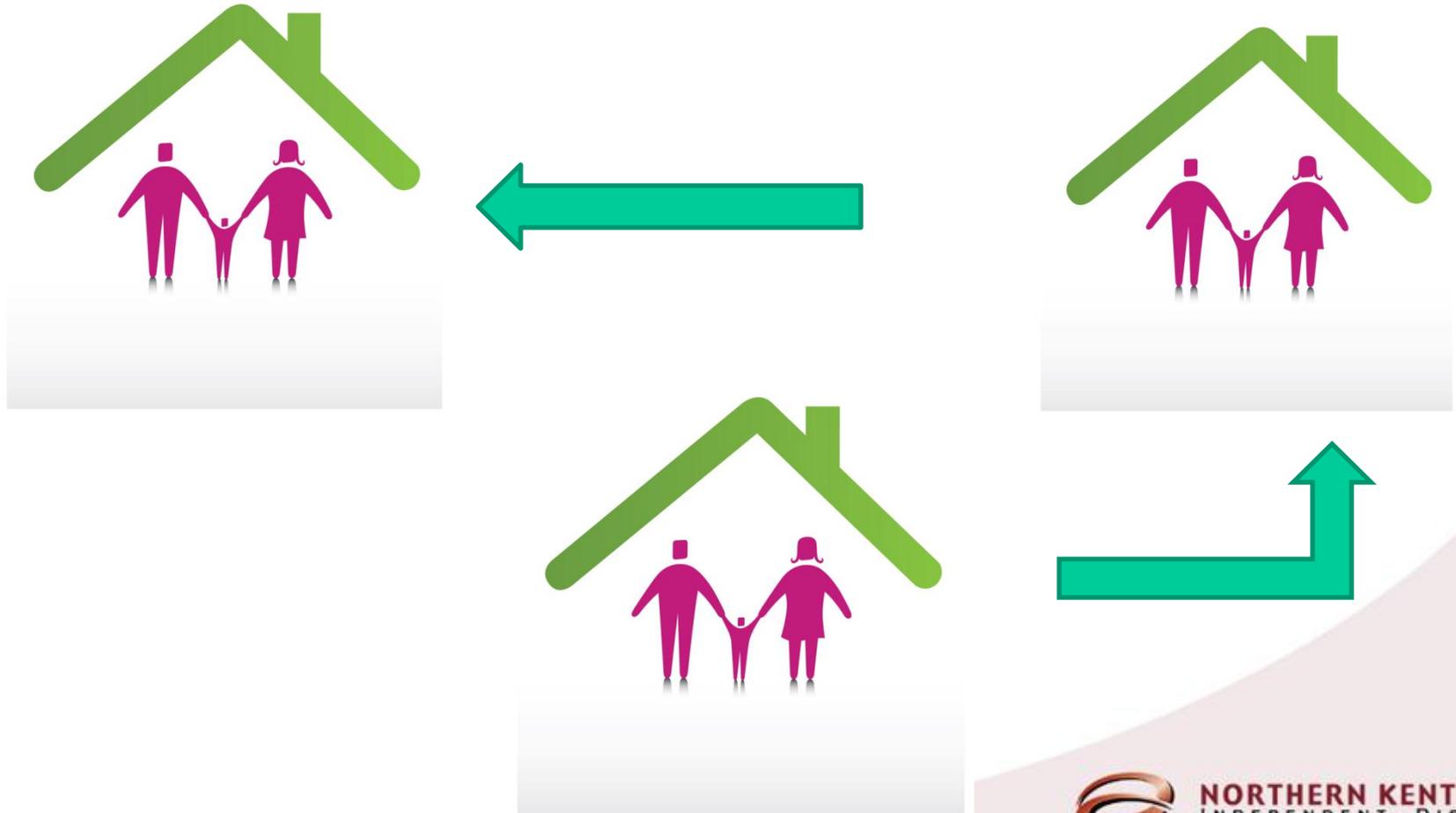


## Case Definition:

- **Confirmed Case:** A Northern KY resident experiencing diarrhea on or after April 3, 2011 and has a stool culture positive for Shigella
- **Probable Case:** A Northern KY resident experiencing diarrhea on or after April 3, 2011 and is an epidemiological link to a lab confirmed case of shigellosis.

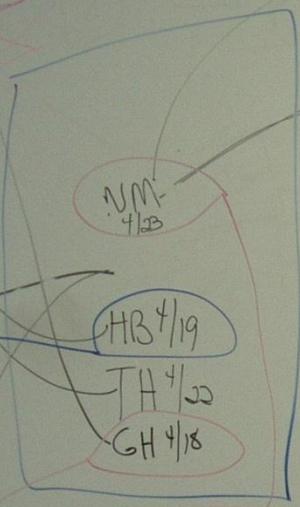


# Linking Cases: No KY is a small place!!



CC  
 PC 4/14  
 \*WB 4/5  
 KB 4/19  
 TA 4/16  
 MW 4/27  
 CF 4/16  
 CN 4/28  
 CB 4/20  
 \*AR 4/5  
 JM 4/11  
 KR 4/14  
 LH 4/21  
 DN 4/20  
 NS 4/12  
 CV 4/18  
 HH 4/18  
 CM 4/19

\*Schwan



KK  
 Wok F  
 4/6 NF  
 BW 4/27  
 DM 4/19  
 HM 4/20

Child's Inc. (4/11)  
 CR 06/07  
 S.M.  
 JS 05/28

EA Shells  
 A.A. 5/4 - One Resident

RSH  
 LM suspect  
 JP 4/17  
 HM 4/27  
 AD 5/09  
 CI 05/21  
 EM 5/20

SS Baptist  
 SB 05/16  
 RP 05/16  
 AH 05/19  
 B.D.  
 (M.S) OH Res. 05/31  
 CM 06/02  
 CC 05/21  
 Also Affair

GO 5/19  
 CO 5/16  
 TS 05/21

NPAS Resched  
 LR 5/5  
 ND 4/17  
 NC 4/19

Romper R.  
 AD 05/10

Redwood  
 KM 5/6

Unknown  
 1st  
 ZW  
 KN 4/11

MD 5/10

Abby's  
 KS 5/10

Campbell Ridge  
 EH 4/11

Grandview  
 CD 5/17

James Bross  
 JW 4/15

Mayer  
 HR 4/27 - contact

Latoria E.  
 AD 05/10

Conner HS  
 LS 4/16

AM Yealy (Grant 05)  
 CB 5/14

Newport primary

DM 5/15  
 LV 4/11  
 MS 05/28

Mother Hubbard  
 JH 5/31  
 mm 5/31  
 cm 5/27

Collins

EA 5/19  
 CM 5/14  
 AM 5/19

DS 06/07



CC  
 \*WB 4/17  
 KB 4/19  
 TA 4/16  
 MW 4/27  
 CF 4/16  
 CN 4/28  
 CB 4/20  
 \*AR 4/5  
 JM 4/11  
 \*KR 4/14  
 LH 4/21  
 SN 4/20

\*Schwan

VM- 4/23  
 HB 4/19  
 TA 4/20  
 GH 4/18

Unknown  
 1st  
 ZW  
 KN 4/11

KK  
 4/10  
 NF  
 4/10  
 BW 4/27  
 DM 4/18  
 HM 4/20  
 S.M  
 JS 05/28  
 Child's Inc. (W/V)  
 CR 06/07  
 TC

INDIST  
 VM 4/23

Abby's  
 KS 5/10

Campbell Ridge  
 EH 4/17

Grandview  
 CD 5/17

JANE BRSS  
 JW 4/15

Mayer  
 AR 4/27 - contr cl

Latonia El.  
 AD 05/10

Conner HS  
 LS 4/16

Day

AM Yealy (Grant  
 05)  
 CB 5/14

LRSH  
 LM suspect  
 JD 4/17  
 HM 4/27  
 AO 5/09  
 CI 05/21  
 EM 5/20

SS Baptist  
 SB 05/16  
 RP 05/16  
 AH 05/19  
 B.D  
 (M.S) OH Res. 05/31  
 CM 06/02  
 CL 05/31  
 Also  
 Attend

Sib  
 Babysat  
 DS 06/07

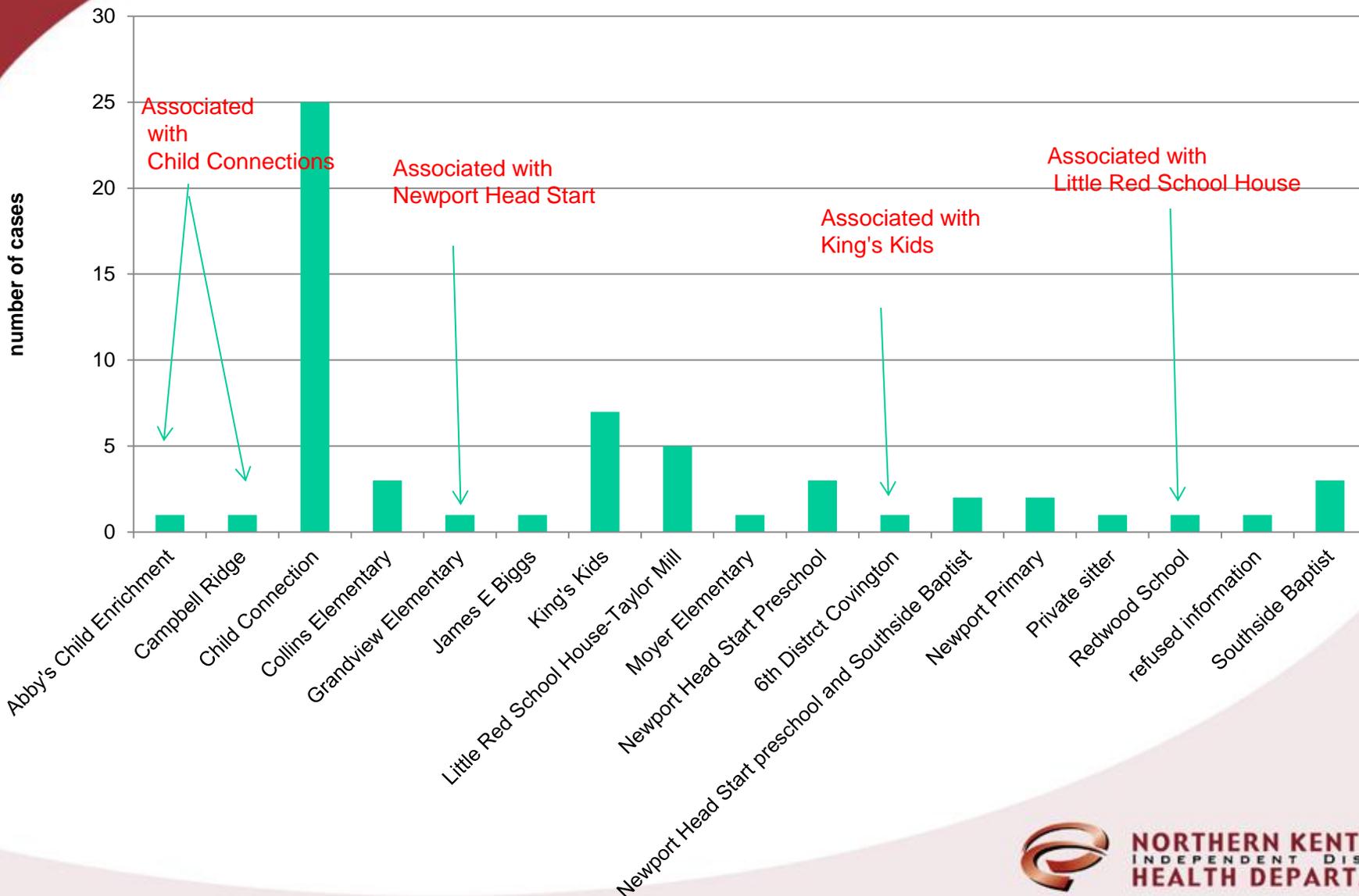
Romper R.  
 AD 05/10

Newport primary  
 DM 5/15  
 LV 4/11  
 MS 05/28

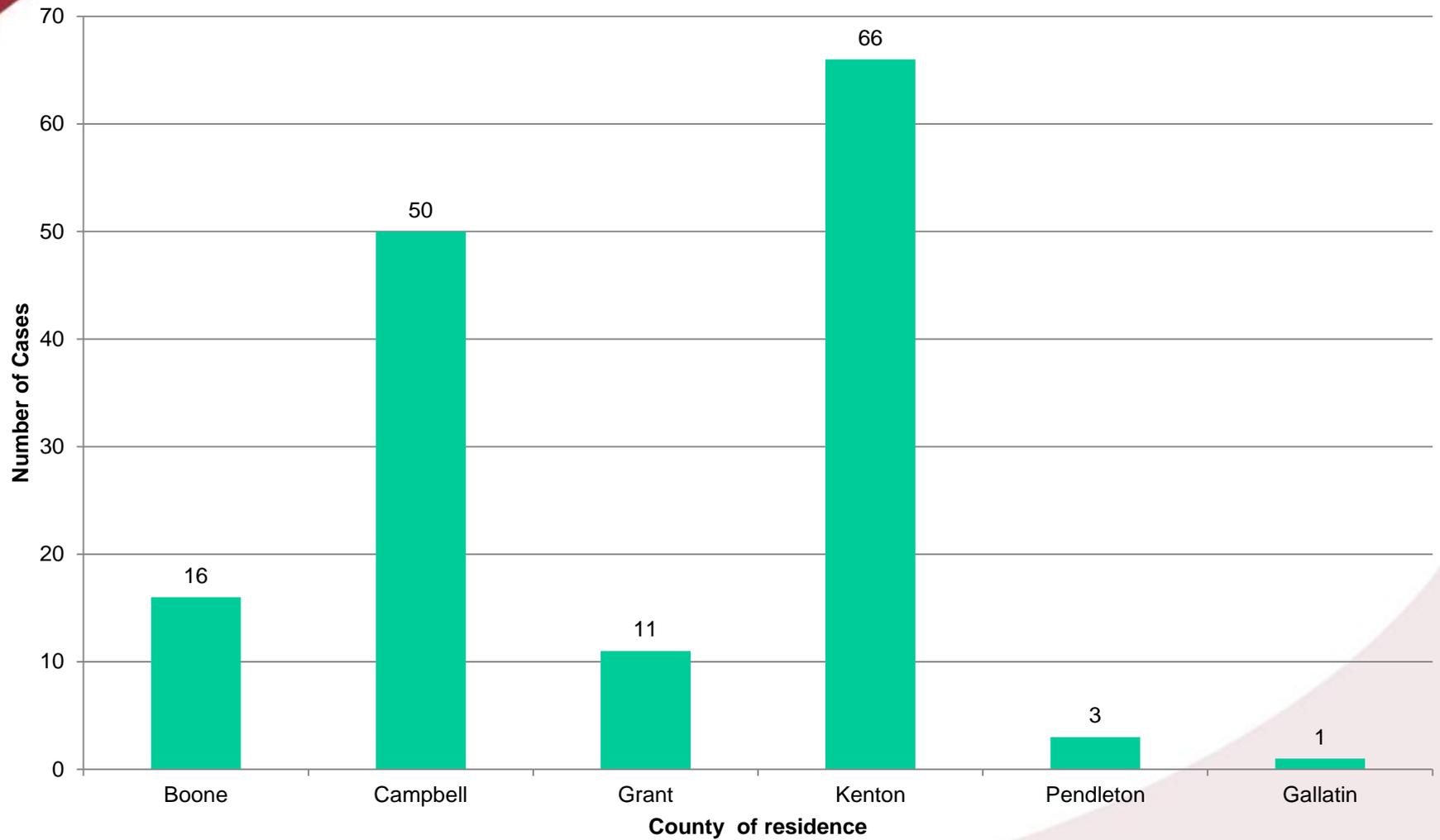
Mother Hubbard  
 JH 5/31  
 mm 5/31  
 CM 5/27

Collins  
 EA 5/17  
 CM 5/12  
 AM 5/17  
 Epi linked to case 10/20  
 confirmed

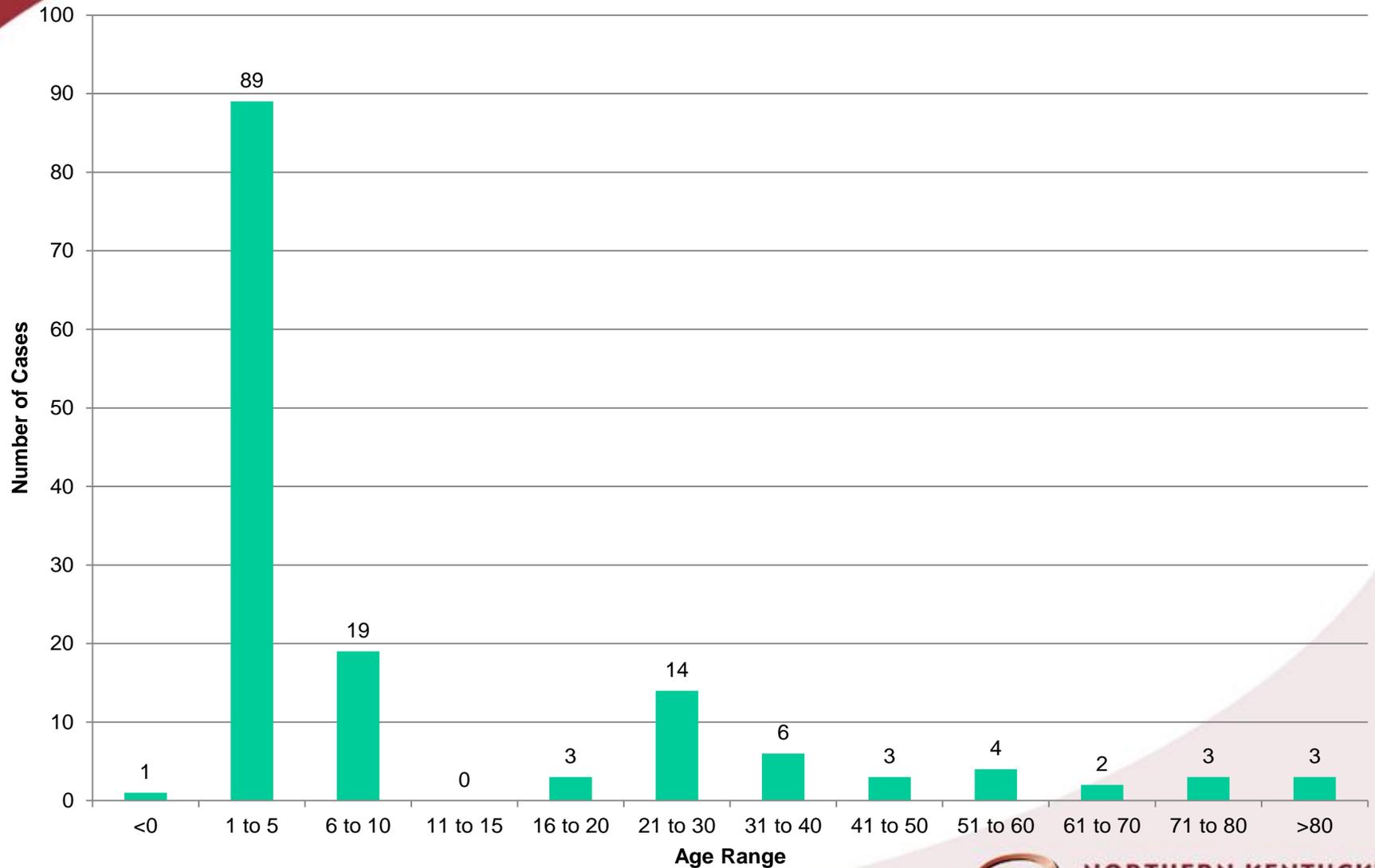
# Shigella cases in Childcare Centers and Schools



## Shigella Cases In Northern Kentucky Distributed by County of Residence



# Shigella Cases In Northern Kentucky Distributed by Age Range



# Teamwork

- Epidemiologist
- Environmentalist
- Child Care Coordinator
  
- “Poo Crew” Weekly Review Meetings
  - All of the above plus HD Director, PIO, State Epi’s (by phone)



# Interventions

- Alerts to Healthcare Providers
  - Weekly update via blast fax and email
- Letters to Childcare facilities
  - Via email
- Letters to school nurses and/or Principals
  - Via email

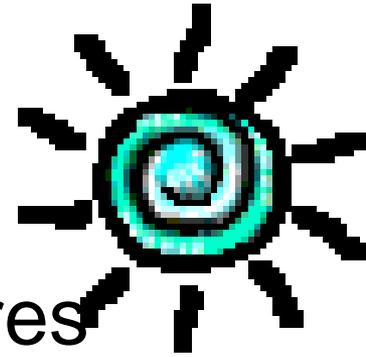


# Interventions

- Hand washing, diapering procedures reviewed with Staff
- In childcare centers letters were sent home to parents
- H2O tables Filled with Sand
- Walk Through CCC's
  - Initially those with cases...
- Environmental Health Inspected CCC Kitchens



# More Interventions.....



- Fact Sheets & Hand washing brochures
  - Libraries
  - Park and Recreation Offices
  - Extension Centers
  - Churches for VBS
  - Media:
    - TV, Radio, Newspapers
    - Twitter Account to update followers
    - Health Dept website updated Weekly



# Interventions for Childcare Centers

- Recommended Sending Children & Staff home after **1 episode** of diarrhea
- Require a **Neg stool test** on children/staff with diarrhea before they return
- Any **Pos.** stool test requires:
  - Asymptomatic
  - **2 neg. Stool tests**
  - 24 hrs apart
  - 48 hrs after antibiotics completed or symptoms resolved

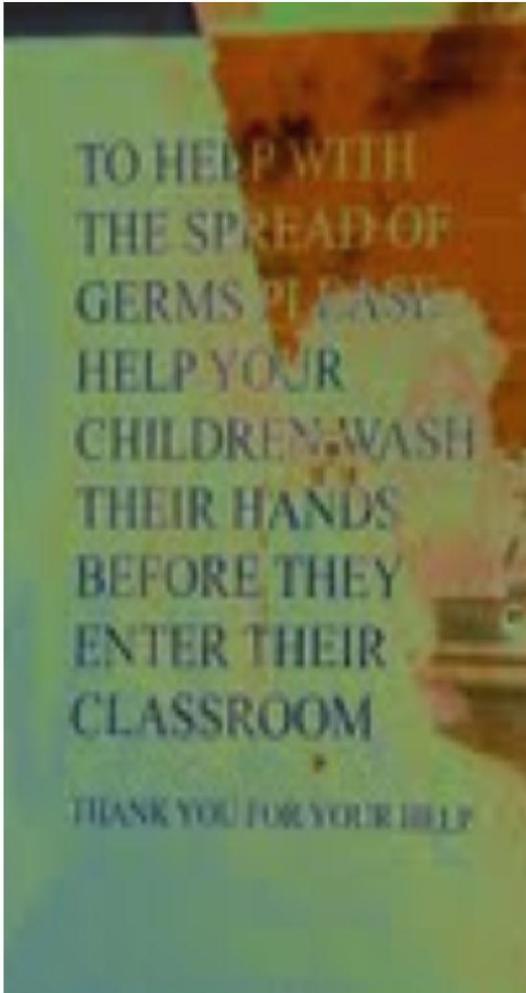


## Shigellosis

Shigellosis is an infection of the intestines that occurs most often in young children. Epidemics have occurred in child care settings where there are children in diapers.

<b>CAUSES:</b>	<i>Shigella</i> bacteria
<b>SYMPTOMS:</b>	Diarrhea (may be watery), fever, stomach cramps, nausea or vomiting. Stools may contain blood or mucus. Illness usually lasts four to seven days. Children may show mild symptoms or they could be infected and show no symptoms
<b>SPREAD:</b>	<i>Shigella</i> leaves the body through the stool of an infected person and enters another person when hands, food or objects (such as toys) contaminated with stool, are placed in the mouth. Spread can occur whether or not a person has symptoms
<b>INCUBATION:</b>	It takes one to seven days (usually one to three days) from the time a person is exposed until symptoms develop
<b>CONTAGIOUS PERIOD:</b>	As long as <i>Shigella</i> is present in the stool - may be up to four weeks after illness
<b>EXCLUSION:</b>	<p>Until symptoms have resolved and two consecutive stool cultures at least 24 hours apart and at least 48 hours after antibiotic treatment is completed are negative</p> <p>-----or-----</p> <p>Until symptoms have resolved and two consecutive stool cultures at least 24 hours apart are negative if no antibiotics are used</p>
<b>REPORTABLE:</b>	<p><i>Provider:</i> This disease is <i>reportable</i> to the local or state health department.</p> <p><i>Parent/guardians:</i> Inform your child care provider if your child has this illness.</p>

Child Care Centers  
with cases posted  
signs on their doors.



TO HELP WITH  
THE SPREAD OF  
GERMS PLEASE  
HELP YOUR  
CHILDREN WASH  
THEIR HANDS  
BEFORE THEY  
ENTER THEIR  
CLASSROOM  
THANK YOU FOR YOUR HELP



# Child Care Coordinator

- Put together a folder for each facility:
  - Review Diapering
  - Review Handwashing
  - Cleaning and Sanitizing Solutions
    - Soap Solution or Bleach
    - $\frac{1}{4}$  cup/gal H<sub>2</sub>O
    - 1 tablespoon/quart H<sub>2</sub>O
  - Daily Health Check



# Daily Communication Was Important!

- \* How many were ill,
- \* Staff and Children
- \* Who was healthy
- \* Answer questions, concerns
- \* Work Together!



# Onset of Summer

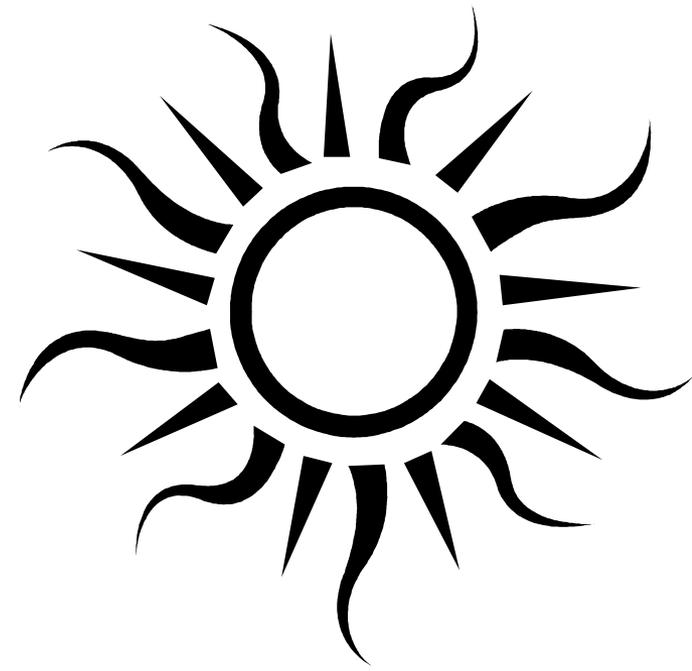
Concern: Diapered children  
in pools (Remember 2007)

Decision: Close the Pools to  
Diapered Children!!

Team Decision: HD Director,  
Director Environmental &  
Epidemiology Manager

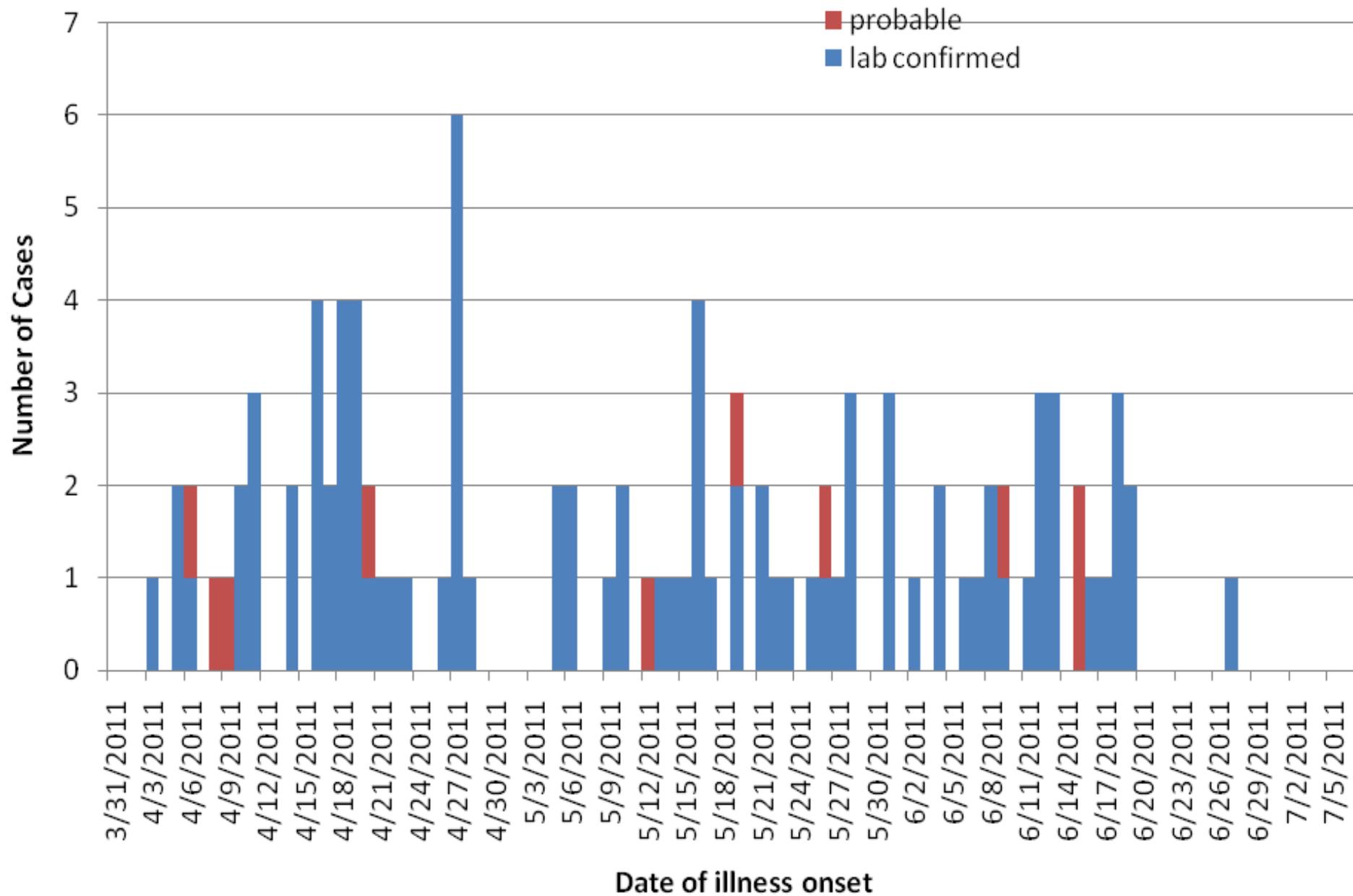


**We Were Not Popular!**



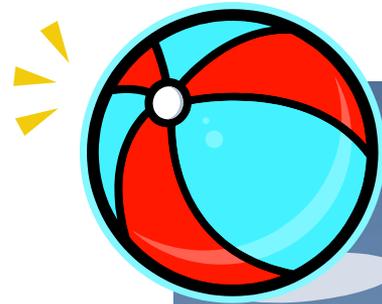
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# Epi Curve for Shigella in Northern KY



# Pool Restrictions Lifted July 1, 2011

- June data indicated no spike in cases
- Although Cases Continued, few had reported being in a pool while infectious



# August Concerns...



Increase seen in the past

Spoke to School Nurses at  
Annual Immunization Conference

Letter from District Director sent  
to Superintendents

Environmental Staff hand out info.  
Sheets during School Cafeteria  
inspections

Attend School Readifests



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# Sink or Swim: Help Prevent Shigella

*A bacterium called Shigella is making people in Northern Kentucky ill. Let's stop its spread!*

- Wash your hands **before** you prepare or eat food, treat a cut or wound, care for someone who is sick.
- Wash your hands **after** you use the restroom, change a diaper, or care for someone who is sick.
- Rub hands together for at least 20 seconds. Use soap. Wash between fingers, under fingernails, and on the backs of your hands. Use a towel to dry hands and turn off the sink.

## SINK



## SWIM

- Anyone who has had diarrhea in the last two weeks should not swim—even if feeling better.
- Don't swallow the pool water.
- Shower before swimming and wash your hands after using the toilet or changing diapers.
- Change diapers in a bathroom and not at poolside.



*Symptoms of Shigella are: diarrhea, fever, stomach cramps, nausea or vomiting. If you think you have it, contact your health care provider and stay home from school or work.*



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***PLEASE** help  
prevent recreational  
water-borne diseases like  
Shigella, Crypto and Giardia*

Northern Kentucky Health Department Encourages:

All Swimmers

**Please** don't swim when you have diarrhea, especially kids in diapers. Germs can spread in the water and make other people sick.

**Please** don't swallow the pool water. Even avoid getting water in your mouth.

**Please** practice good hygiene. Take a shower before swimming and wash your hands after using the toilet or changing diapers. Germs on your body end up in the water.

Parents of Young Kids

**Please** take your kids on bathroom breaks or check diapers often. Waiting to hear "I have to go" may mean that it's too late.

**Please** change diapers in a bathroom and not at poolside. Germs can spread to surfaces and objects in or around the pool spreading illness.

**Please** wash your child thoroughly (especially rear ends) with soap and water before swimming to remove invisible amounts of fecal matter on their bottoms that end up in pools.

Pool Operators

**Please** properly maintain your facility's water quality and disinfection level at all times.

**Please** disinfect hard surfaces such as deck chairs and tables as well as restrooms.

**Please** report all fecal accidents and follow CDC protocol for disinfection.

<http://www.cdc.gov/healthywater/pdf/swimming/pools/fecal-incident-response-recommendations.pdf>

For additional information go to [www.nkyhealth.org](http://www.nkyhealth.org) or call 341-4151.



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# Communications

- Weekly “Poo Crew” Meetings
- Weekly updates to Providers:
  - Case Numbers
  - Symptoms
  - Cases Demographics: Ages, Counties, Etc.
  - Antibiotic Resistance Info
  - Reminder: stay out of pools for 2 weeks!
- Weekly Reports to State

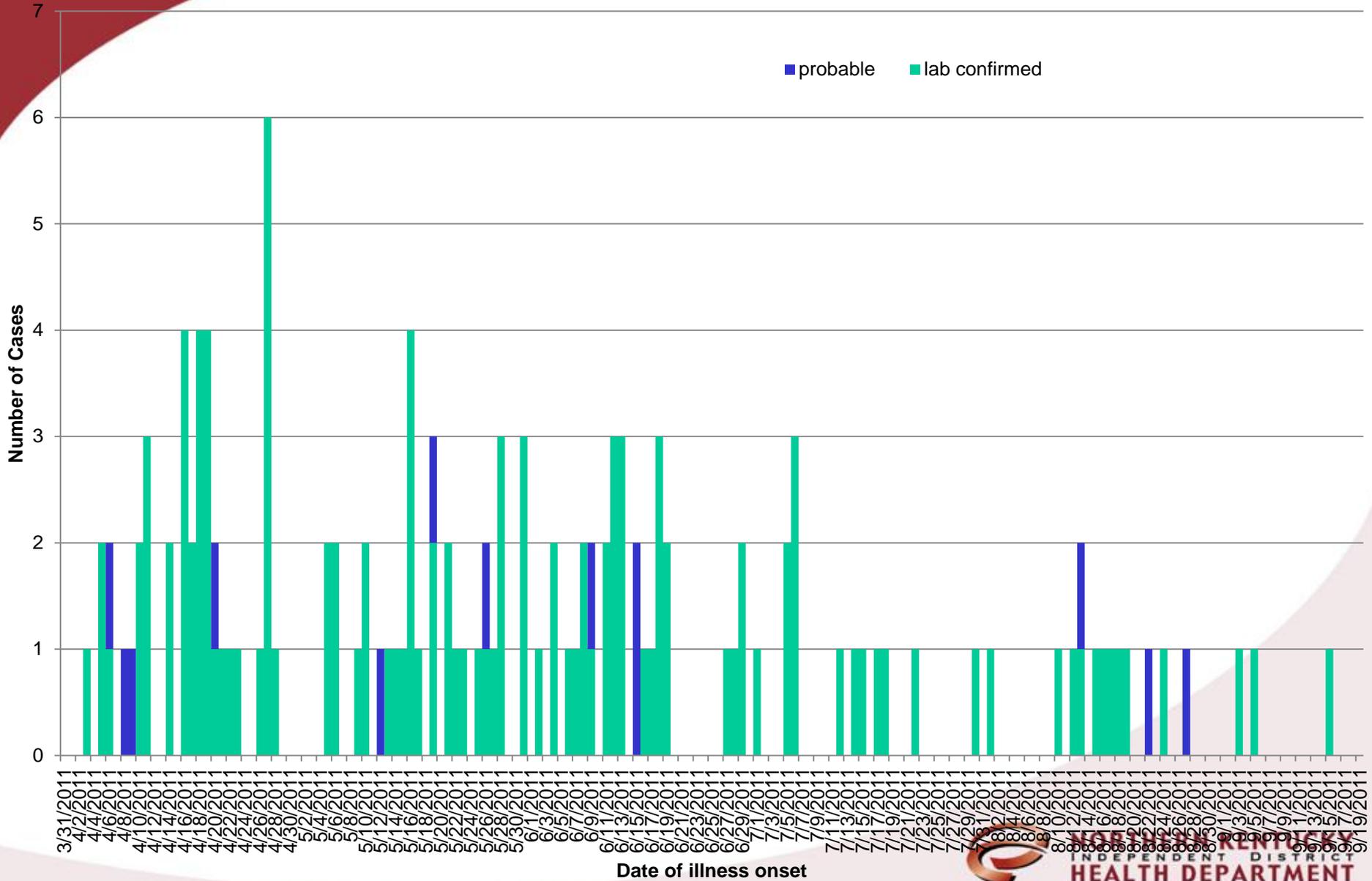


# Totals

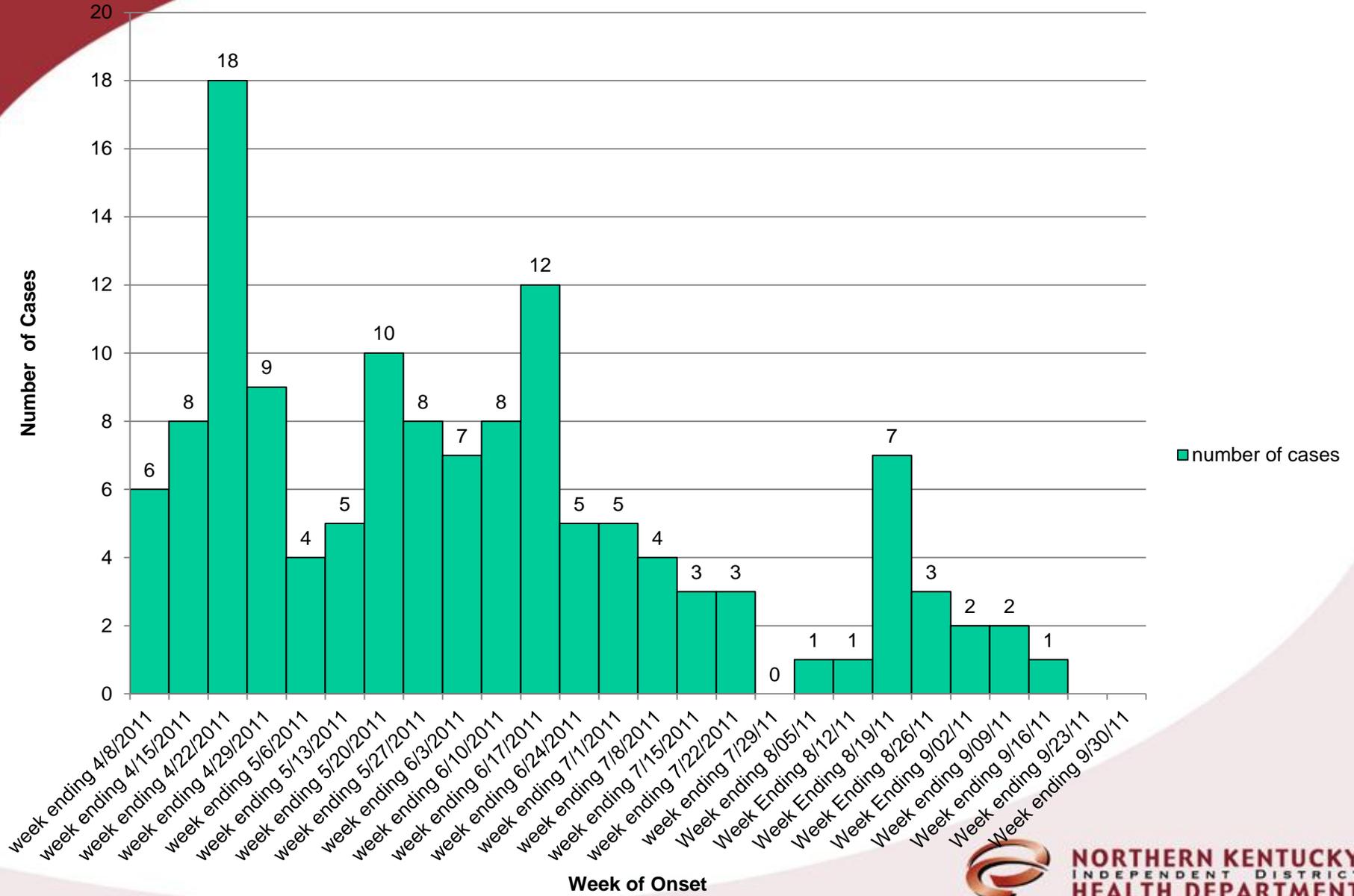
- 147 Cases
  - 133 Lab Confirmed; 13 Epi-linked
- 64% Were associated with Child Care Ctrs
- 18 Child Care Centers
- 13 Schools
- Cases Range 5 months old - 84 yrs
  - Median age: 4
  - Mean Age: 13
- 6 Counties



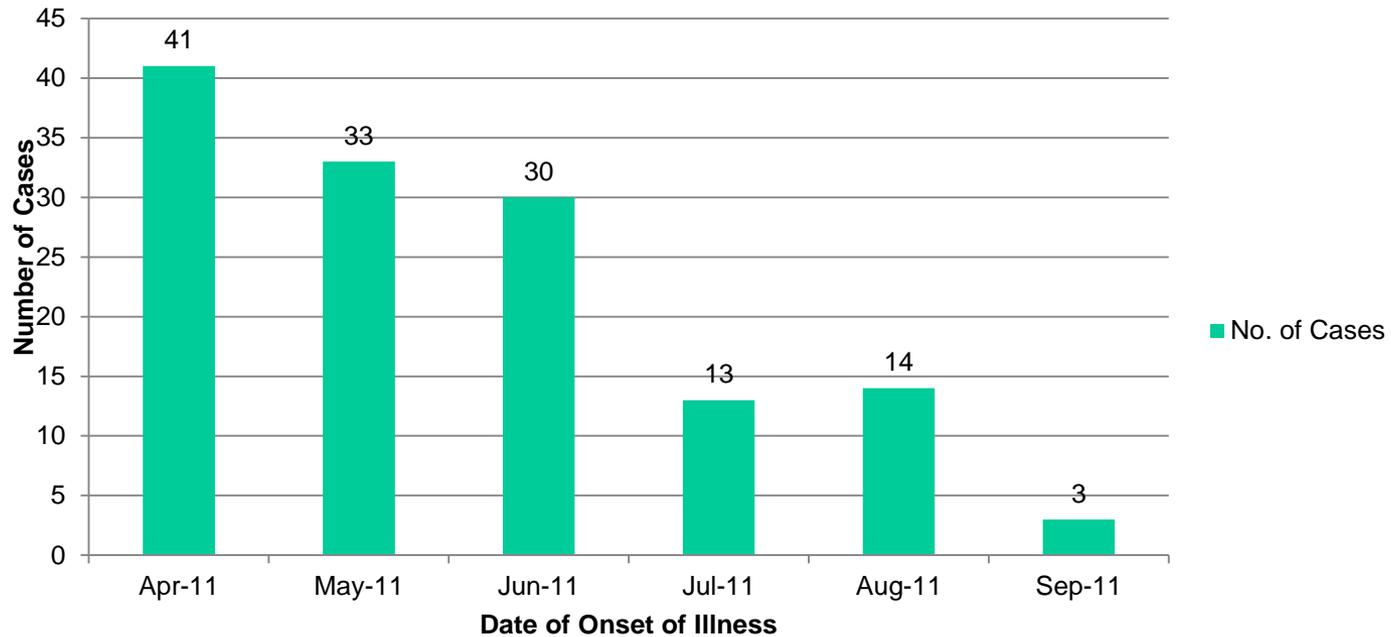
# Epi Curve for Shigella in Northern KY



## Shigella Epidemiology Curve by Week of Onset



## No. of Cases of Shigella in Northern Kentucky by Month of Onset



# Impact

- Lost Work Days
  - Staff
  - Parent of Ill Children
  - Hospitalizations
- First day care had 26 cases, some out for several weeks



# What Worked

- Childcare Centers must report early
- Act early!
- Work as a Team
- Don't be afraid to restrict pools
- Communicate:
  - Media: Keep the public Informed!
  - Providers Update
  - Child Care Centers:
    - If diarrhea: Go home!
    - Neg Cultures to return



# Conclusions

- Started out in Child Care Centers, mostly in Diapered children
- Ended up in the community
- No spread through food or pools documented
- Early aggressive interventions helped



# Thank You!

## Any questions?



"Mr. Osborne, may I be excused? My brain is full!"

“Mr Osborne, may I be excused? My brain is full.”



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May all your summers be  
Shigella free!



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