Regional Epidemiologist Update

MDHHS
Michigan Department of Health & Human Services

Michigan Department of Health & Human Services
Surveillance & Infectious Disease Epidemiology
Communicable Disease Division

Regional Epidemiologists

Region	Name	Telephone/Cell Phone	E-mail	Counties
1	Meghan Weinberg	517.887.4615 517.749.2153 (Cell)	WeinbergM1@michigan.gov	Clinton, Eaton, Gratiot, Hillsdale, Ingham, Jackson, Lenawee Livingston, Shiawassee
2N	Nicole Parker-Strobe	586.469.5849 517.930.6906 (Cell)	ParkerStrobeN@michigan.gov	Macomb, Oakland, St. Clair
2S	Joyce Lai	734.727.7204 517.930.6958 (Cell)	LaiJ@michigan.gov	Detroit City, Monroe, Washtenaw, Wayne
3	Tim Bolen	989.832.6690 517.930.6910 (Cell)	BolenT1@michigan.gov	Alcona, Arenac, Bay, Genesee, Gladwin, Huron, Iosco, Lapeer, Midland, Ogemaw, Oscoda, Saginaw, Sanilac, Tuscola
5	Bethany Reimink	269.373.5293 517.719.0407 (Cell)	ReiminkB@michigan.gov	Allegan, Barry, Berrien, Branch, Calhoun, Cass, Kalamazoo, St. Joseph, Van Buren
6	Fatema Mamou	616.632.7245 517.204.6086 (Cell)	MamouF@michigan.gov	Clare, Ionia, Isabella, Kent, Lake Mason, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, Osceola, Ottawa
7	Roger Racine	231.995.6106 517.930.6914 (Cell)	RacineR@michigan.gov	Alpena, Antrim, Benzie, Charlevoix, Cheboygan, Crawford, Emmet, Grand Traverse, Kalkaska, Leelanau, Manistee, Missaukee, Montmorency, Otsego, Presque Isle, Roscommon, Wexford
8	Scott Schreiber	906.643.1100 x208 517.930.3089 (Cell)	SchreiberS@michigan.gov	Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, Schoolcraft

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Regional Epidemiologist Functions

- Liaise between the state and local health departments
- Support outbreak investigations
- Perform bioterrorism surveillance and emerging infectious disease epidemiology
- Conduct data analysis
- Provide technical support and training for disease reporting
- Attend local meetings and deliver situation updates

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The Three-legged Stool

- Laboratory
- Environmental Health
- Epidemiology

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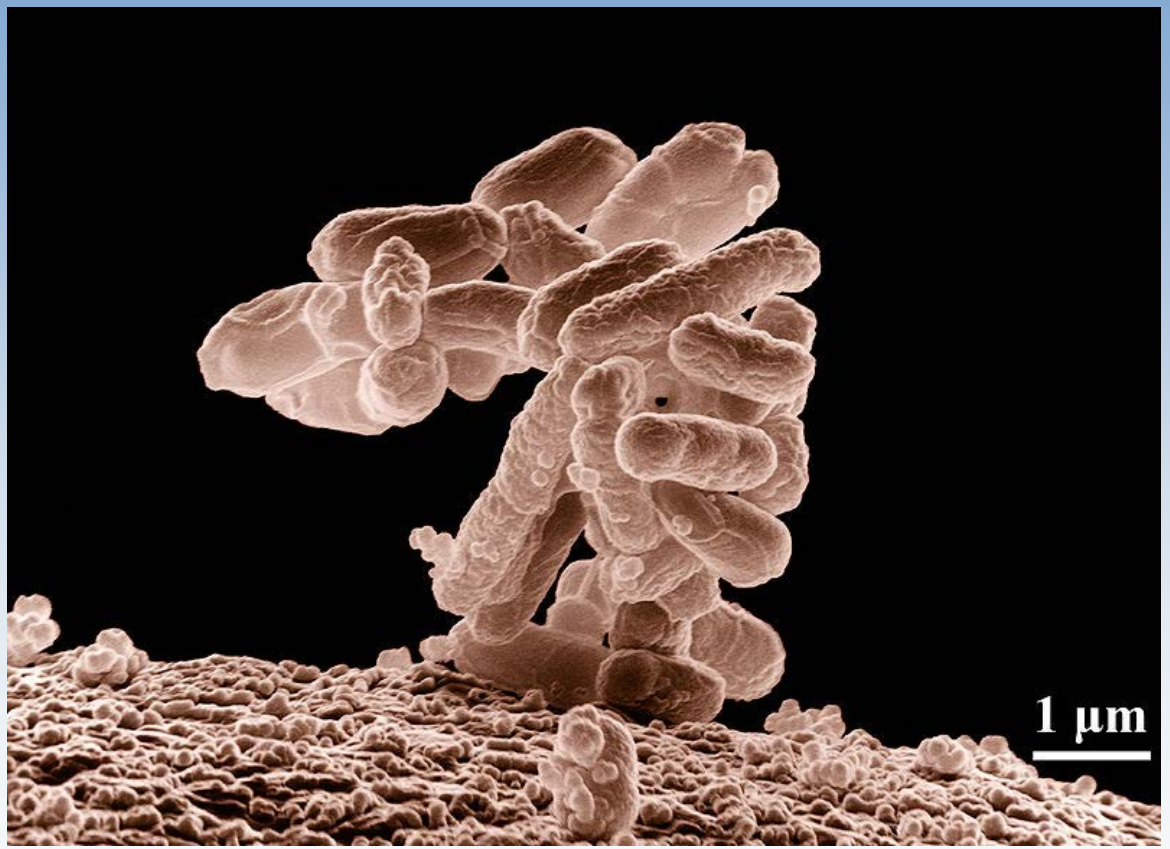
Example Outbreak Investigation
E. Coli



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Outbreak - Initial Notification

- Day 1 - Local Health Department (LHD) contacted by Hospital A
  - 1 lab-confirmed *E. coli* O157:H7
  - 1 suspect with bloody diarrhea
- Day 2
  - Call from WI resident to LHD reporting *E. coli* O157:H7 illness after eating at area restaurant
  - Michigan Department of Health and Human Services (MDHHS) notified

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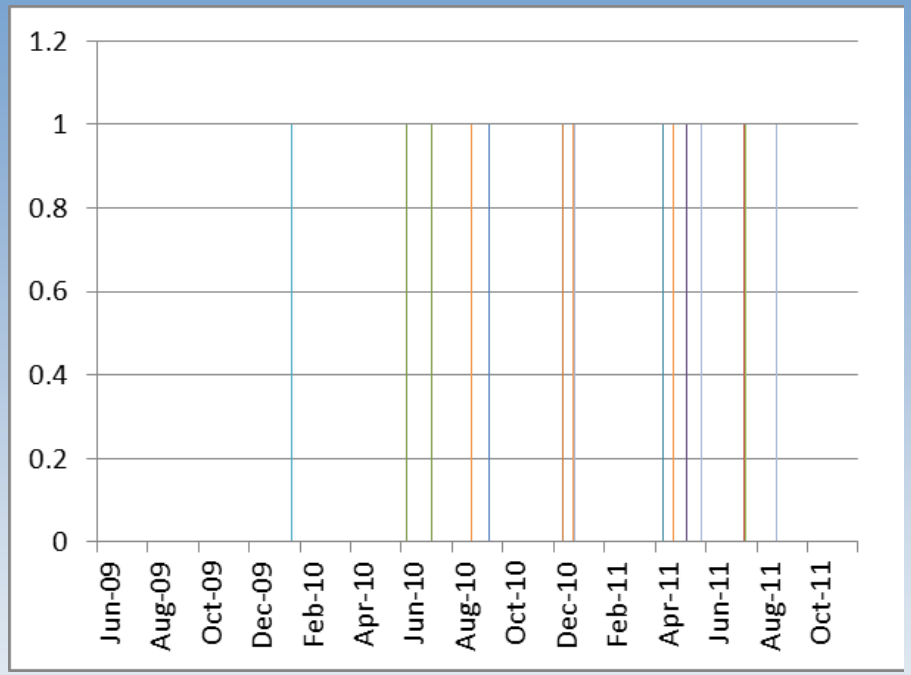
Outbreak - First Steps

- Are 3 cases unusual for the area?
  - data review



- Any other cases in surrounding counties?
  - One other case recently reported

    Michigan Disease Surveillance System (MDSS)

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Interviewing Cases

- Direct case follow-up is typically done by local health department (LHD) staff
- Challenges
  - Reaching case during work hours
  - Cooperation
  - Recall
    - Incubation period

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MDSS Case Detail Forms

Epidemiologic Information

High Risk Potential
Yes No Unknown

If Yes, (Check all that apply)
Contact with Confirmed Case | Contact with Suspected Case | Daycare Attendee
Food Handler | Direct Patient Care Worker | Resident of Institutional Facility
Daycare Worker | Animal Handler | Other

Travel (in/out state or international) in the past month?
Yes No Unknown

If Yes, Location:

If Yes, Date:

Case ID | First Name | Last Name | Gastrointestinal Illness Case Investigation rev 10/01/2010 | Page 3

Epidemiologic Information cont.

Swimming in the past month?
Yes No Unknown

If Yes, Location:

If Yes, Date:

Drinking Water Source

Home:
Municipal Well Bottled Other

Work:
Municipal Well Bottled Other

Animal Contacts

Type of Animal	Contact? (Y=Yes N=No UNK=Unknown)	Specify
Reptiles (snake, turtle, lizard, etc.)		
Livestock (cattle, sheep, etc.)		
Birds/Poultry (chicks, ducks, geese, etc.)		
Other Animal Contacts		
Aquatic pets (fish, frogs, salamander, etc.)		
Domestic pets (cats, dogs, hamster, etc.)		

Location of Animal Contact(s) (check all that apply)
Petting Zoo Animal Exhibit Fair Farm Home Other

High Risk Food Exposure

Ask about the following specific food exposures for the 7 days prior to onset. If multiple exposures are identified, list additional details in other food history or comments sections.

Any ground beef eaten at your home or another home?
Yes No Unknown Typically eats

If Yes, Was the ground beef eaten raw, bloody, or pink?
Yes No Unknown Typically eats

If Yes, Product details (bulk/patties, package size, grind):

If Yes, Where purchased:

If Yes, Date purchased:

If Yes, Date consumed:

Any raw ground beef handled? Yes No Unknown	**If Yes, Describe (brand, type, etc):**	**If Yes, Where and when purchased:**
Any ground beef at a restaurant? Yes No Unknown Typically eats	**If Yes, Describe (brand, type, etc)**	**If Yes, Where and when purchased:**
Any other beef? Yes No Unknown Typically eats	**If Yes, Describe (brand, type, etc):**	**If Yes, Where and when purchased:**
Any other raw or undercooked meat? Yes No Unknown Typically eats	**If Yes, Describe (brand, type, etc):**	**If Yes, Where and when purchased:**
Any raw sprouts (alfalfa, bean, etc)? Yes No Unknown Typically eats	**If Yes, Describe (brand, type, etc):**	**If Yes, Where and when purchased:**
Any raw or unpasteurized milk or cheese? Yes No Unknown Typically eats	**If Yes, Describe (brand, type, etc):**	**If Yes, Where and when purchased:**
Any raw or unpasteurized juice or cider? Yes No Unknown Typically eats	**If Yes, Describe (brand, type, etc):**	**If Yes, Where and when purchased:**
Any leafy greens or lettuce? Yes No Unknown Typically eats	**If Yes, Describe (brand, type, etc):**	**If Yes, Where and when purchased:**
Any lettuce on sandwiches or burgers? Yes No Unknown Typically eats	**If Yes, Describe (brand, type, etc):**	**If Yes, Where and when purchased:**
Any raw spinach? Yes No Unknown Typically eats	**If Yes, Describe (brand, type, etc):**	**If Yes, Where and when purchased:**

7 Day Food History

List all foods/beverages 7 days prior to onset (prompt for typical foods if unable to recall). For those patients who have poor recall of their 7- day food history, please be sure to obtain responses to the Special Diet and High Risk Food Exposure questions.

Day 1/Date

Meal	Food/Beverage Consumed	Location
Breakfast		
Lunch		
Dinner		
Other/Snacks		

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Outbreak – Days 3-4

- Up to 6 cases – tightly clustered onsets
  - 2 MI counties + 1 WI case
- 5 cases had travel or residence in area
- 3 reported eating at the same restaurant
- 3 reported shopping at same grocery store
- 1 case seems to be an outlier
- Mother/Daughter both ill, travelled to area and ate at several restaurants

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Outbreak – Days 3-4

- Now involved: 2 LHDs, MDHHS Epi and Laboratory, WI State/Local/Lab
- Notified: MDARD, CDC
- Blast fax from LHD to area Healthcare Providers
  - Overview of situation
  - Be on lookout for STEC cases
  - Test if clinical presentation fits

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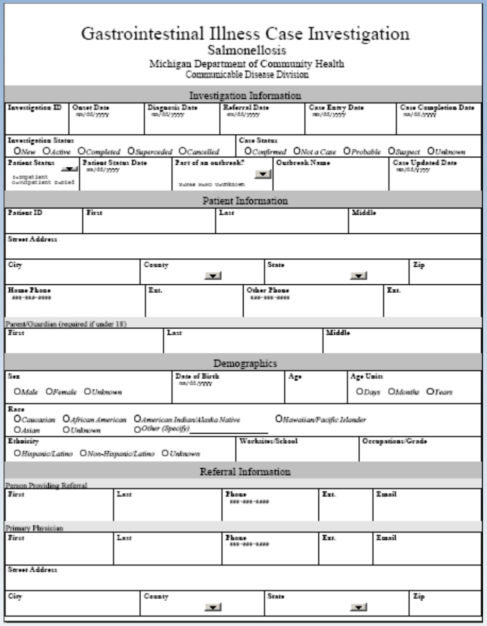
Supplemental Questionnaire

- Cases to be re-contacted



Gastrointestinal Illness Case Investigation
Salmonellosis
Michigan Department of Community Health
Communicable Disease Division

Investigation Information

Investigation ID	Onset Date mm/dd/yyyy	Diagnosis Date mm/dd/yyyy	Referral Date mm/dd/yyyy	Case Entry Date mm/dd/yyyy	Case Completion Date mm/dd/yyyy

Investigation Status: ○New ○Active ○Completed ○Superceded ○Cancelled
Case Status: ○Confirmed ○Not a Case ○Probable ○Suspect ○Unknown

Patient Status	Patient Status Date mm/dd/yyyy	Part of an outbreak?	Outbreak Name	Case Updated Date mm/dd/yyyy

Patient Information

Patient ID	First	Last	Middle

Street Address

City	County	State	Zip

Home Phone ###-###-####	Ext.	Other Phone ###-###-####	Ext.

Parent/Guardian (required if under 18)

First	Last	Middle

Demographics

Sex: ○Male ○Female ○Unknown
Date of Birth mm/dd/yyyy
Age
Age Units: ○Days ○Months ○Years

Race: ○Caucasian ○African American ○American Indian/Alaska Native ○Hawaiian/Pacific Islander ○Asian ○Unknown ○Other (Specify) ____

Ethnicity: ○Hispanic/Latino ○Non-Hispanic/Latino ○Unknown
Worksites/School
Occupations/Grade

Referral Information

Person Providing Referral

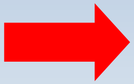
First	Last	Phone ###-###-####	Ext.	Email

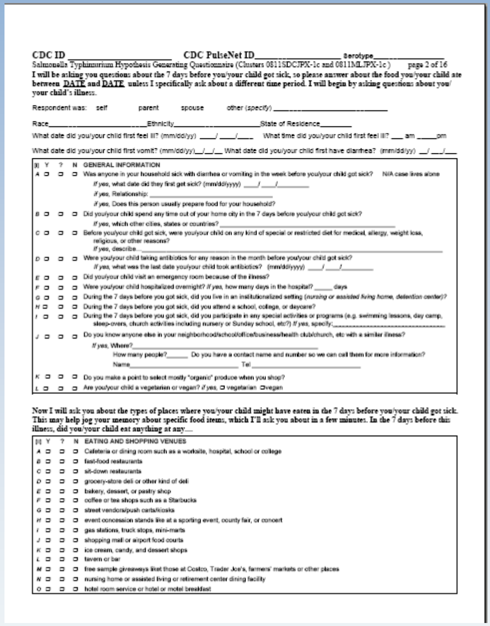
Primary Physician

First	Last	Phone ###-###-####	Ext.	Email

Street Address

City	County	State	Zip





CDC ID ____ CDC PulseNet ID____ Serotype____
Salmonella Typhimurium Hypothesis Generating Questionnaire (Clusters 0811SDCJPX-1c and 0811MLJPX-1c) page 2 of 16

I will be asking you questions about the 7 days before you/your child got sick, so please answer about the food you/your child ate between DATE and DATE unless I specifically ask about a different time period. I will begin by asking questions about you/your child's illness.

Respondent was: self parent spouse other (specify) ____

Race____ Ethnicity____ State of Residence____

What date did you/your child first feel ill? (mm/dd/yy) ___/___/___ What time did you/your child first feel ill? ___ am ___pm

What date did you/your child first vomit? (mm/dd/yy)__/__/__ What date did you/your child first have diarrhea? (mm/dd/yy) __/__/__

[i] Y ? N GENERAL INFORMATION

- A ☐ ☐ ☐ Was anyone in your household sick with diarrhea or vomiting in the week before you/your child got sick? N/A case lives alone
  - *If yes*, what date did they first get sick? (mm/dd/yyyy) ___/___/___
  - *If yes*, Relationship: ____
  - *If yes*, Does this person usually prepare food for your household?
- B ☐ ☐ ☐ Did you/your child spend any time out of your home city in the 7 days before you/your child got sick?
  - *If yes*, which other cities, states or countries? ____
- C ☐ ☐ ☐ Before you/your child got sick, were you/your child on any kind of special or restricted diet for medical, allergy, weight loss, religious, or other reasons?
  - *If yes*, describe ____
- D ☐ ☐ ☐ Were you/your child taking antibiotics for any reason in the month before you/your child got sick?
  - *If yes*, what was the last date you/your child took antibiotics? (mm/dd/yyyy) ___/___/___
- E ☐ ☐ ☐ Did you/your child visit an emergency room because of the illness?
- F ☐ ☐ ☐ Were you/your child hospitalized overnight? *If yes*, how many days in the hospital? ___ days
- G ☐ ☐ ☐ During the 7 days before you got sick, did you live in an institutionalized setting (*nursing or assisted living home, detention center*)?
- H ☐ ☐ ☐ During the 7 days before you got sick, did you attend a school, college, or daycare?
- I ☐ ☐ ☐ During the 7 days before you got sick, did you participate in any special activities or programs (e.g. swimming lessons, day camp, sleep-overs, church activities including nursery or Sunday school, etc?) *If yes*, specify: ____
- J ☐ ☐ ☐ Do you know anyone else in your neighborhood/school/office/business/health club/church, etc with a similar illness?
  - *If yes*, Where? ____
  - How many people? ___ Do you have a contact name and number so we can call them for more information?
  - Name ____ Tel ____
- K ☐ ☐ ☐ Do you make a point to select mostly "organic" produce when you shop?
- L ☐ ☐ ☐ Are you/your child a vegetarian or vegan? *If yes*, ☐ vegetarian ☐vegan

Now I will ask you about the types of places where you/your child might have eaten in the 7 days before you/your child got sick. This may help jog your memory about specific food items, which I'll ask you about in a few minutes. In the 7 days before this illness, did you/your child eat anything at any…

[i] Y ? N EATING AND SHOPPING VENUES

- A ☐ ☐ ☐ Cafeteria or dining room such as a worksite, hospital, school or college
- B ☐ ☐ ☐ fast-food restaurants
- C ☐ ☐ ☐ sit-down restaurants
- D ☐ ☐ ☐ grocery-store deli or other kind of deli
- E ☐ ☐ ☐ bakery, dessert, or pastry shop
- F ☐ ☐ ☐ coffee or tea shops such as a Starbucks
- G ☐ ☐ ☐ street vendors/push carts/kiosks
- H ☐ ☐ ☐ event concession stands like at a sporting event, county fair, or concert
- I ☐ ☐ ☐ gas stations, truck stops, mini-marts
- J ☐ ☐ ☐ shopping mall or airport food courts
- K ☐ ☐ ☐ ice cream, candy, and dessert shops
- L ☐ ☐ ☐ tavern or bar
- M ☐ ☐ ☐ free sample giveaways like those at Costco, Trader Joe's, farmers' markets or other places
- N ☐ ☐ ☐ nursing home or assisted living or retirement center dining facility
- O ☐ ☐ ☐ hotel room service or hotel or motel breakfast

- Link to specific restaurant and lettuce consumption

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Environmental Health Investigation

- Focused on Restaurant + Lettuce
  - Check suppliers / employee health status
  - Review food preparation and storage

- Determine any…
  - Employees working while ill ?
  - Issues with handling / washing produce ?

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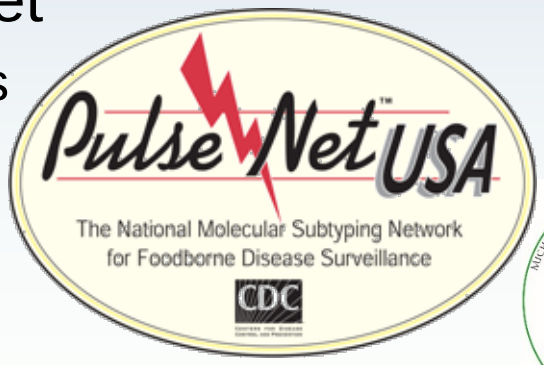
Laboratory Testing

- Mandatory submission of certain clinical isolates to MDHHS lab
  - Including *Salmonella, Shigella, Listeria,* shiga-toxin producing *E. coli* (STEC)
  - Serotyping
  - Pulsed-field Gel Electrophoresis (PFGE)
    - Results uploaded to PulseNet
      - Enables national comparisons



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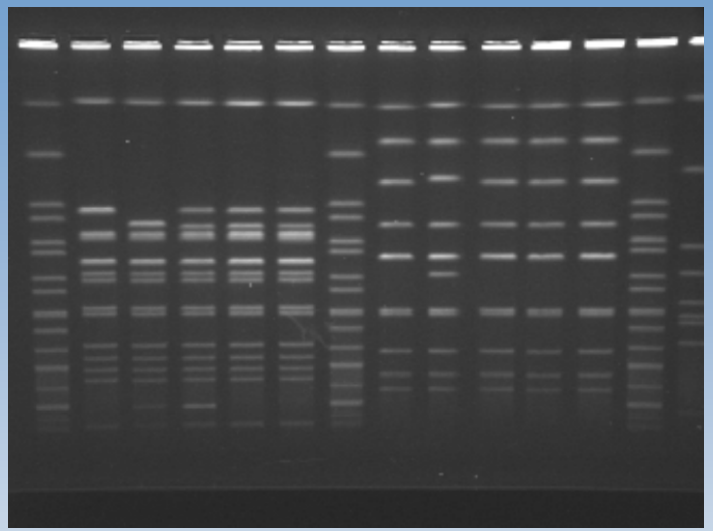
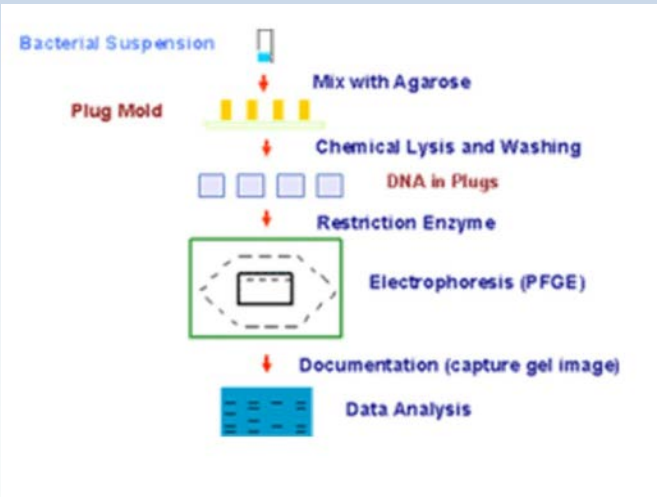
PulseNet

- National Database of (PFGE) patterns
- *Salmonella, E.coli, Listeria, Shigella*
- Each year, PulseNet IDs
  - ~1,500 clusters @ local/state level
  - ~10-15 multistate outbreaks
  - Most would not have been identified previously





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Infectious Disease Epidemiology
Communicable Disease Division

Summary

- 6 confirmed, 4 probable, and 12 suspect cases
- Three Legged Stool
  - Epidemiology
    - Epidemiologic analysis indicated an association between illness and consumption of shredded lettuce at the suspected food service establishment
  - Environmental Health
    - During the course of the investigation, it was discovered that an employee (also a case) was processing lettuce while symptomatic and without gloves
  - Laboratory
    - All positive E. coli isolates from the confirmed cases were indistinguishable by PFGE, further supporting a common source of infection

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Epidemiology Update

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National Outbreaks of Interest

- Multistate Outbreaks of Human *Salmonella* Infections Linked to Live Poultry in Backyard Flocks, 2017
  - CDC and multiple states are investigating 10 separate multistate outbreaks of *Salmonella* infections in people who had contact with live poultry in backyard flocks
  - These outbreaks are caused by several DNA fingerprints of different *Salmonella* bacteria
  - 961 cases in 48 states
    - 215 hospitalizations; 1 death
    - Onset dates ranging from January 4, 2017 to July 31, 2017
  - 498 (74%) of 672 ill people reported contact with live poultry in the week before illness started

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National Outbreaks of Interest, cont.

- Cyclosporiasis
  - On August 8, 2017, the CDC reported an investigation into an increase in reported cases of cyclosporiasis
  - As of September 27, 2017, CDC has been notified of 1,054 laboratory-confirmed cases of cyclosporiasis in persons who became ill in 2017
    - This number includes persons who reported international travel as well as persons who did not report travel
    - The reports have come from 40 states
  - At least 592 (56%) did not report international travel (i.e., likely were infected in the United States) and became ill on or after May 1, 2017
  - At this time, no specific vehicle of interest has been identified, and investigations to identify a potential source (or sources) of infection are ongoing

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National Outbreaks of Interest, cont.

- Novel Influenza A Virus
  - As of September 29, 2017, 34 variant virus infections have been reported in the United States during 2017
    - Four states have reported human infections with H3N2v (Maryland: 13, Ohio: 15, Delaware: 1, North Dakota: 1, Pennsylvania: 1, Texas: 1)
    - Additionally, there were two reported human infection with H1N2v in Ohio
  - Three of the 20 infected persons were hospitalized; no deaths
  - All variant virus infections have been associated with swine exposure in fair settings and no human-to-human transmission has been identified
  - On October 6, 2017 there was a case of H3N2v confirmed in an Allegan County resident
    - In 2016, Michigan confirmed 12 human cases of variant influenza infection associated with swine exposure at three different county fairs

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Current Outbreaks in MI

- Hepatitis A
  - Since August 1, 2016 Southeast (SE) Michigan has seen an increase in Hepatitis A cases
  - From August 1, 2016 to October 6, 2017 there have been 376cases of Hepatitis A*
    - 303 (86.1%) hospitalizations
    - 14 (4.0%) deaths
    - 27.8% coinfected with Hepatitis C
    - 48.3% documented substance abuse
    - 12.5% homeless or transient living situation
  - No common sources of infection have been identified
  - Within the last three months ~40% of cases have no reported substance abuse or homeless/transient living
  - Updates about this outbreak can be found at www.michigan.gov/hepatitisaoutbreak

*Confirmed Hep A Cases for Detroit City, Macomb, Monroe, Oakland, St. Clair & Wayne referred from 8/1/16-10/06/17 meeting the SE MI Hep A outbreak definition

Current Outbreaks in MI, cont.

- Legionellosis in SE MI
  - MDHHS is coordinating with LHDs in SE MI* following the identification of an increase in the number of cases of Legionnaires' disease in SE MI this summer
  - In June and July of 2017, 73 cases were identified in this region
    - 143% increase from average total cases in June and July from 2014-2016 (30 cases)
  - Legionellosis cases are most common in the summer and early fall
  - This increase is higher than expected for southeast Michigan for this time of year
  - To date, no common source of infection has been identified

*Macomb County Health Department, Oakland County Health Division, City of Detroit Health Department, and Wayne County Department of Health, Veterans, and Community Wellness

Current Outbreaks in MI, cont.

- Influenza
  - This month was the start of the 2017-2018 influenza season.
    - Already there has been an influenza associated death reported in a senior citizen from Oakland County
  - Prior to the start of the 2017-2018 Michigan was seeing pre-season flu activity which is atypical
  - Several other states have seen activity as well
    - Other states are reporting outbreaks in universities
    - Growing outbreaks of influenza A on campuses
  - SE MI had seen majority of pre-season cases, but cases are being reported from all over the state
    - Mostly influenza A/H3 but some influenza A/H1 and influenza B
    - One university in SE MI has an increase in cases
      - Most are in campus housing
      - Influenza A/H3

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Current Outbreaks in MI, cont.

- MERS-CoV and Hajj 2017
  - The annual Hajj took place August 30 - September 4, 2017 in Saudi Arabia
    - Michigan has seen an increase in patients under investigation (PUIs) for MERS 2-3 weeks following the completion of Hajj as travelers return to the US
  - HCPs should routinely ask patients about their travel history when an infectious disease is suspected, AND evaluate patients for MERS-CoV infection if they have both clinical features and an epidemiologic risk for being a PUI
  - Providers should immediately contact their state or local health department about any patient who meets the criteria for a PUI
  - Since September 2012, 2,066 laboratory-confirmed cases of MERS-CoV infection have been reported, 720 of which have resulted in death
    - There have only been two confirmed cases reported in the US since the disease emerged in 2012

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Current Outbreaks in MI, cont.

- West Nile Virus (WNV)
  - MDHHS confirmed the state's first human cases of WNV for 2017 on August 31, 2017
  - As of October 6, 2017
    - 35 confirmed and probable human cases of WNV
    - 8 viremic blood donors
  - 234 WNV+ birds
  - 14 WNV+ horses
  - 145 WNV+ mosquito pools

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Current Outbreaks in MI, cont.

- Zika Virus
  - *Aedes albopictus* (Asian Tiger) mosquitoes have been found in Wayne County
    - First documentation of this mosquito in the state
    - Is capable of spreading Zika but there is no evidence of Zika virus-infected mosquitoes in Michigan or entire Midwest
  - In 2017, 7 confirmed cases in Michigan; all travel-associated; 3 pregnant women
    - In 2016, 67 confirmed cases were reported
  - Additional information can be found at www.michigan.gov/zika or at www.cdc.gov/zika

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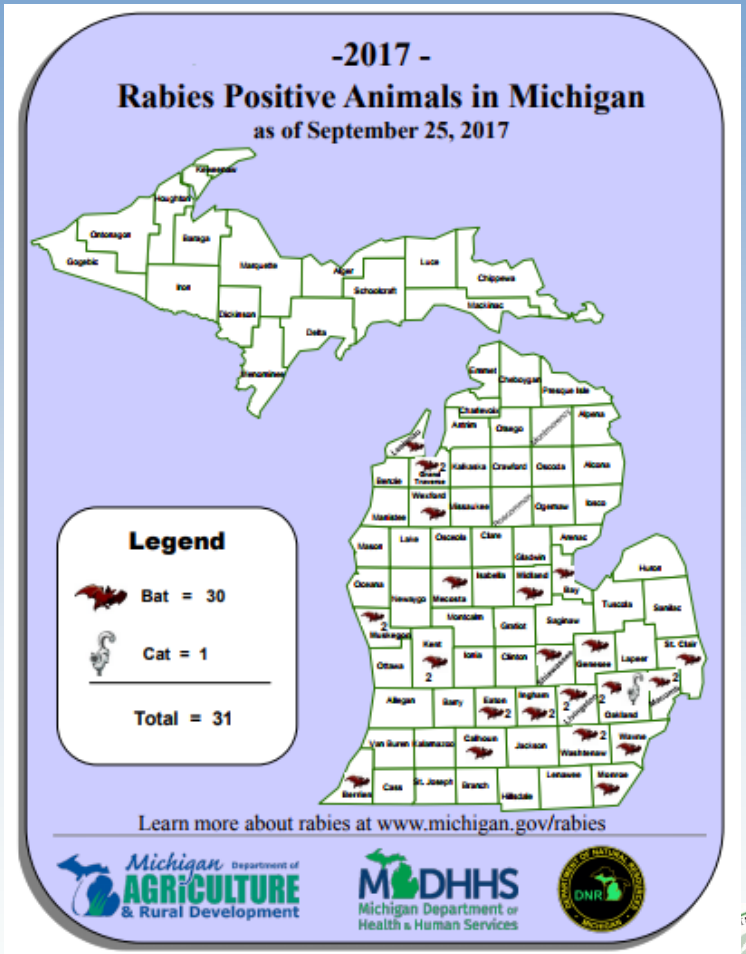
Current Outbreaks in MI, cont.

- Rabies
  - A total of 31 rabies positive animals have been detected so far in 2017
    - 30 bats
    - 1 cat
  - Testing volumes were high as expected during the late summer months



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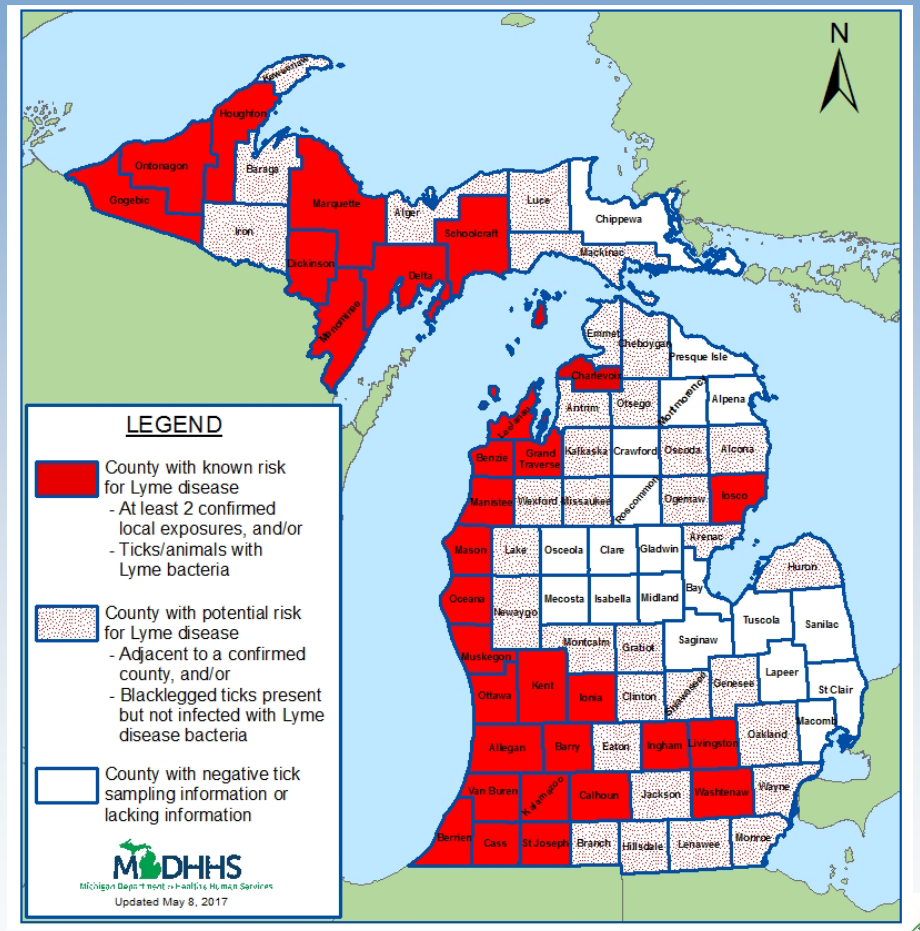
Current Outbreaks in MI, cont.

- Prior to 2002, No local populations of blacklegged ticks had been identified in the Lower Peninsula
- Prior to 2006, UP cases were primarily associated with Menominee county



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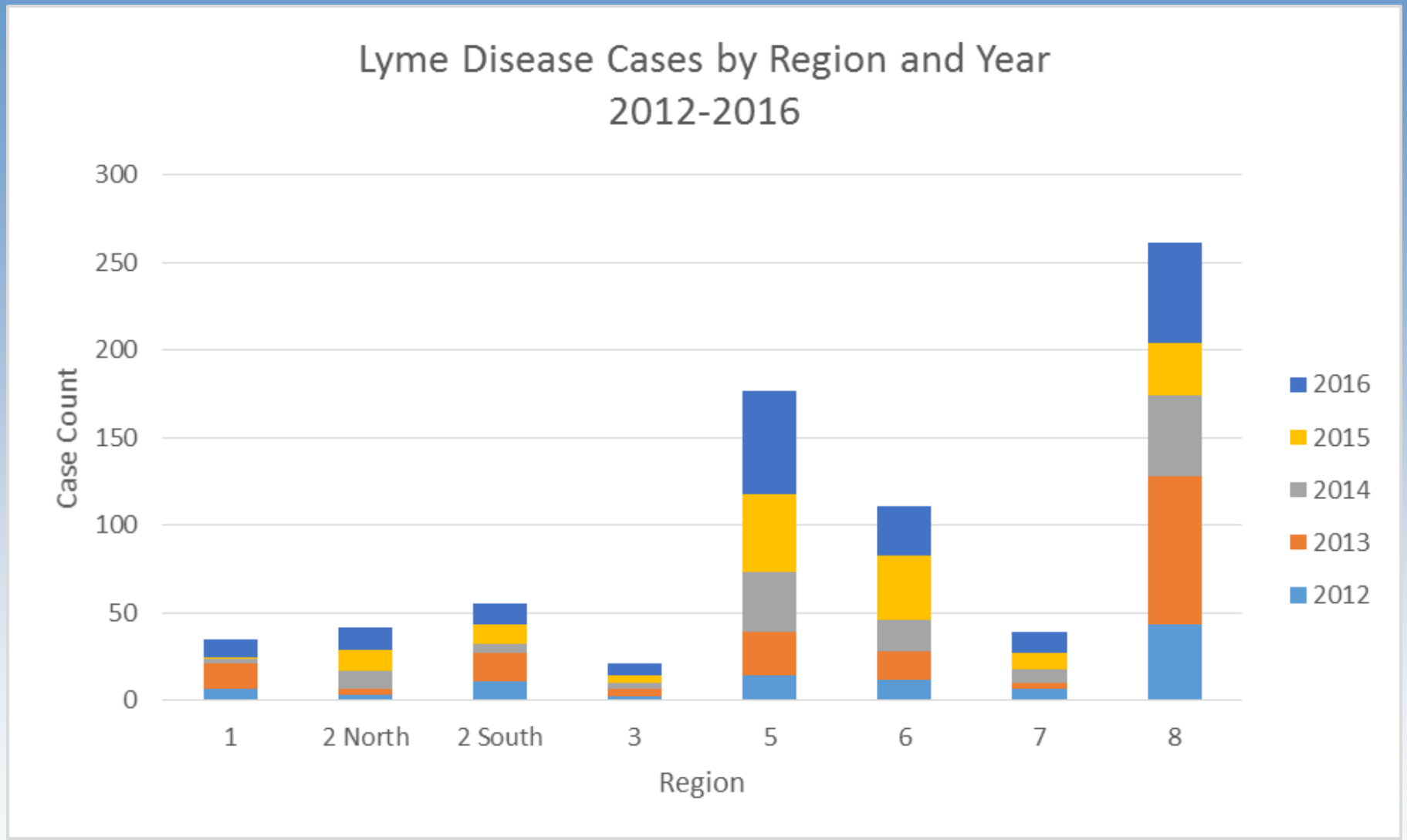

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Michigan Department of Health & Human Services

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