

Interpretation of Foodborne Labs

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Wake AHEC requires all speakers to disclose any relevant financial conflicts of interest. Vanessa Greene has nothing to disclose.

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In this presentation we will:

- Examine common food borne case definitions
- Differentiate laboratory findings and classify foodborne events accordingly
- Describe appropriate control measures in relation to their classification

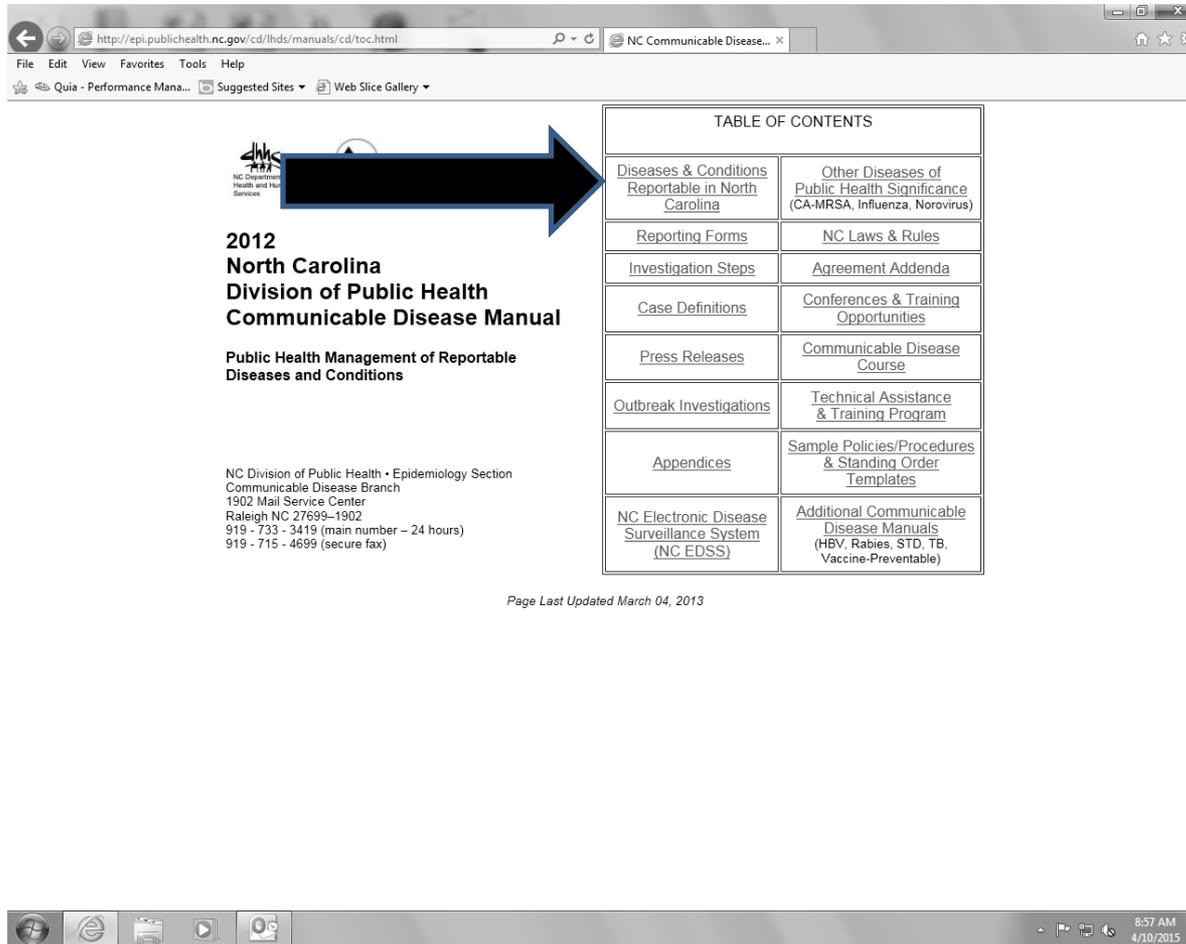
What is a case definition?

- “A standard set of criteria for deciding whether, in this investigation, a person should be classified as having the disease or health condition under study”

Importance of Case Definitions

- Framework
- Guidance
- Classification System
- Criteria

Where to Find Case Definitions



http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/toc.html

NC Communicable Disease...

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NC Department of Health and Human Services

**2012
North Carolina
Division of Public Health
Communicable Disease Manual**

Public Health Management of Reportable
Diseases and Conditions

NC Division of Public Health • Epidemiology Section
Communicable Disease Branch
1902 Mail Service Center
Raleigh NC 27699-1902
919 - 733 - 3419 (main number – 24 hours)
919 - 715 - 4699 (secure fax)

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NC Electronic Disease Surveillance System (NC EDSS)	Additional Communicable Disease Manuals (HEV, Rabies, STD, TB, Vaccine-Preventable)

Page Last Updated March 04, 2013

8:57 AM
4/10/2015

http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/reportable_diseases.html

NC Communicable Disease...

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North Carolina Communicable Disease Manual

Diseases & Conditions Reportable in North Carolina

[A-E](#) [F-I](#) [J-R](#) [S-Z](#)

<p>A - E</p> <ul style="list-style-type: none">• Anthrax<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase DefinitionDisease Report Form<ul style="list-style-type: none">Part 1Part 2• Botulism<ul style="list-style-type: none">• Botulism, foodborne<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase DefinitionDisease Report Form<ul style="list-style-type: none">Part 1Part 2• Botulism, infant (intestinal)<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase DefinitionDisease Report Form<ul style="list-style-type: none">Part 1Part 2• Botulism, wound<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase DefinitionDisease Report Form<ul style="list-style-type: none">Part 1Part 2• Botulism, other<ul style="list-style-type: none">Case Definition• Brucellosis<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase DefinitionDisease Report Form<ul style="list-style-type: none">Part 1Part 2• Campylobacter infection<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase Definition	<p>J - R</p> <ul style="list-style-type: none">• Legionellosis<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase DefinitionDisease Report Form<ul style="list-style-type: none">Part 1Part 2• Leprosy (Hansen's Disease)<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase DefinitionDisease Report Form<ul style="list-style-type: none">Part 1Part 2• Leptospirosis<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase DefinitionDisease Report Form<ul style="list-style-type: none">Part 1Part 2• Listeriosis<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase DefinitionDisease Report Form<ul style="list-style-type: none">Part 1Part 2• Lyme Disease<ul style="list-style-type: none">Disease NotesLHD Disease Investigation StepsCase DefinitionDisease Report Form<ul style="list-style-type: none">Part 1Part 2• Lymphogranuloma venereum<ul style="list-style-type: none">See Sexually Transmitted Disease ProtocolsCase DefinitionDisease Report Form• Malaria
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8:58 AM
4/10/2015

Salmonellosis (*Salmonella* spp.)

2012 Case Definition

CSTE Position Statement Number: 11-ID-08

Clinical Description

An illness of variable severity commonly manifested by diarrhea, abdominal pain, nausea, and sometimes vomiting. Asymptomatic infections may occur, and the organism may cause extraintestinal infections.

Laboratory Criteria for Diagnosis

Suspect = **Suspect**
Detection of *Salmonella* from a clinical specimen using a non-culture based method

Confirmed = **Confirmed**
Isolation of *Salmonella* from a clinical specimen

Case Classification

Suspect

A case that meets the suspect laboratory criteria for diagnosis

Probable

A clinically compatible case that is epidemiologically linked to a confirmed case, i.e., a contact of a confirmed case or member of a risk group as defined by public health authorities during an outbreak.

Confirmed

A case that meets the confirmed laboratory criteria for diagnosis. When available, O and H antigen serotype characterization should be reported.

Comment

Both asymptomatic infections and infections at sites other than the gastrointestinal tract, if laboratory confirmed, are considered confirmed cases that should be reported.

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Laboratory Criteria for Diagnosis

Suspect = **Suspect**
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Isolation of *Salmonella* from a clinical specimen

PCR or EIA

culture

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A case that meets the suspect laboratory criteria for diagnosis

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A clinically compatible case that is epidemiologically linked to a confirmed case, i.e., a contact of a confirmed case or member of a risk group as defined by public health authorities during an outbreak.

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A case that meets the confirmed laboratory criteria for diagnosis. When available, O and H antigen serotype characterization should be reported.

Comment

Both asymptomatic infections and infections at sites other than the gastrointestinal tract, if laboratory confirmed, are considered confirmed cases that should be reported.

Quick Tips for Classification

For salmonella, campylobacter and shigella remember:

- Culture=confirmed
- All other non-culture methods=suspect

Is this confirmed or suspect?

Mar. 11. 2015 2:28PM 0206020875 03/05/2015 140.126J#23F. 3001003

Culture Stool
* Final Report *

1098-3806

* Final Report *

Stool Culture

Report Campylobacter

PROCEDURE: Stool Culture
SOURCE: Stool
BODY SITE:
FREE TEXT SOURCE: stool

COLLECTED: 03/03/2015 08:30
STARTED: 03/03/2015 15:59

*** FINAL REPORT ***

Final Report
Verified: 03/05/2015 12:14

Positive for Campylobacter species by EIA
Sensitivity of this procedure is less than 100% therefore a negative result does not rule out infection.

*** PLEASE NOTE ***
NC law requires the communicable diseases be reported to the local health department by the attending physician.
In addition, this report has been released to the appropriate federal, state, or county health agency as dictated by law.
The following links can be utilized to assist with reporting
NC Reportable Diseases: http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/reportable_diseases.html
NC Health Departments by County: <http://www.ncelhd.org/county.htm>
NC DOH Communicable Diseases Site: <http://epi.publichealth.nc.gov/cd/report.html>
If the disease must be reported within 24 hours, the initial report shall be made by telephone to the local health department, and the written disease report be made within 7 days.
If unable to contact your local health department, call the 24/7 pager for North Carolina Communicable Disease Branch at (919) 733-3419.

Notified [redacted] at 16:26 03/03/2015 [redacted]

Abundant Yeast
Scant Normal fecal flora isolated
No Salmonella or Shigella isolated.
No Escherichia coli O157:H7 isolated
No Aeromonas or Plesiomonas isolated.
No enteric gram negative bacilli present

Printed by: [redacted]
Printed on: 3/6/2015 1:03 PM EST

Page 1 of 3
(Continued)

What do you think?

- What method of test was used?
- What can you do if you are unsure?
- When asking a laboratory if they performed a culture ask specifically did they “isolate an organism on a culture plate”.

What do you think?

- The lab slip said culture at the top but looking further on the lab slip you see the actual test was an EIA which stands for enzyme-immunoassay.

What do you think?

- This case would be classified as a suspect.

- Remember when it is salmonella, campylobacter or shigella, **if it is not a culture, it is a suspect case!**

Is this confirmed or suspect?

03/30/2015 07:26 7848244798 GWH MICROBIOLOGY PAGE 03/03 *10:51/127*

03/30/2015 07:29
[REDACTED]
[REDACTED] [REDACTED]
[REDACTED]

COMMUNICABLE DISEASE REPORT

MED REC # [REDACTED] AGE: 46Y SEX: F DOB: [REDACTED]
PT SS: [REDACTED] CAROMONT LOCATION: Nursing Station for ED MA
PT ADDR: [REDACTED] COMMUNICABLE DISEASE CONTACTS
Gaston Cnty HD Fax: 704-853-5240
NC State Communicable Reports
Phone: 919-733-7361
Fax: 919-733-1020
Alt Fax: 919-733-0490
Phys Phone: 704-834-2266

PHYSICIAN: [REDACTED]

LAB ID: F70326 COLL'D:03/27/2015 16:35 REC'D:03/27/2015 16:51 ORD BY: Emergency Room.Phys

STOOL: BACT CULTURE
Spec. Description
Cult/results

Stool
3+ Salmonella species, not S. typhi.
Confirmation and speciation from reference
laboratory to follow.
* CRITICAL VALUE * Called with readback to:
KEISHA WEST 3/29/15 1300
This result will be sent to the NC State
Communicable Disease Section or
Environmental Health as required of LABS by
NC law. The ordering physician may also
have reporting requirements to the Local
Health Department.

Report Status PENDING

DOB: [REDACTED] END OF REPORT
LOC: EMER CLIENT RPT PAGE: 1
MED REC #: [REDACTED]

RECEIVED 03-30-'15 07:31 FROM: 7848344798 TO: BHHS_CD Surv. Unit P0003/0003

Is this confirmed or suspect?

Duke Labs 3/16/15

10-3/4

Organism	CAMPYLOBACTER JEJUNI/COLI
Patient Last Name	[REDACTED]
Patient First Name	[REDACTED]
Age	55
Birthdate	[REDACTED]
Sex	M
Race	W
Soc Sec #	[REDACTED]
Patient Address	[REDACTED]
Patient Address2	[REDACTED]
Patient City	[REDACTED]
County	[REDACTED]
State	[REDACTED]
Zip	[REDACTED]
Drawn Date	3/4/2015
Accession	15HA-063M114
Source	STOOL
Test Name	CULTURE STOOL (BKR)
Test Component Result	See table below
Test Date	3/4/2015
Pos Result	Y - FINAL
Department	DUKE REGIONAL HOSPITAL EMERGENCY DEPARTMENT 3643 NORTH ROXBORO STREET DURHAM NC 27704-2702 919-470-4000
Ordering Dr	[REDACTED]
Dr Address	3643 North Roxboro Road
Dr Address2	[REDACTED]
Dr City	Durham
Dr Phone	[REDACTED]
Med Rec #	(00000)00G78501

Is this confirmed or suspect?

NOV 12 2015 12:12 PM No. 2398 P. 3/3

[REDACTED]

NAME: [REDACTED]	LOC: [REDACTED]
SEX: Female AGE: 45 years DOB: [REDACTED]	DR: [REDACTED]
MRN: [REDACTED]	FINR: [REDACTED]
ADM: 03/25/2015 12:09:00 EDT	DISC: [REDACTED]
Phone: [REDACTED]	Copy for: N/A
ACCC: [REDACTED]	

Microbiology

PROCEDURE: Stool Culture
SOURCE: Stool

COLLECTED: 03/25/2015 11:20 EDT
ACCESSION: 15-084-0219

*** PRELIMINARY REPORT ***

Preliminary Report
Verified: 03/26/2015 11:48 EDT
"Presence of *Campylobacter* antigen"
Results called to
Susan Collins / MHC, 3/26/2015 11:48:03 AM
Results read back
EP
Heavy growth Vancomycin-Resistant enterococci
Expected Report time extended due to the need for further isolation.
Identification and susceptibility to follow.
No Shiga Toxin 1 and Shiga Toxin 2 detected
More information to follow

Legend: L=Low H=High A=Abnormal C=Critical f=footnote @=Corrected I=Interp Data R=Ref Lab
Printed: 3/26/2015 12:26:25 PM
RPT ID: [REDACTED] NAME: [REDACTED] LOC: [REDACTED]
Page 1 of 1

Is this confirmed or suspect?

UNCLASIFIED CONFIDENTIAL EXEMPT FROM GDS PAGE 03

PATIENT: [REDACTED] MRN: [REDACTED] LOCATION: ED--
I.D.#: [REDACTED] DOB: [REDACTED] AGE: 29 SEX: M
DISCHARGED: [REDACTED] ORDERED BY: MRNVA, NIKHIL

SOURCE: STOOL COLLECTED: 03/12/15 09:46
ORDER#: J5120072 RECEIVED: 03/12/15 10:38
ANTIBIOTICS AT COLLECTION: ROUTINE
ORDER ENTRY COMMENTS:

[REDACTED]
GCRMC-Emergency Dept

STOOL CULTURE PRELIM 03/12/15 10:04
03/12/15 Campylobacter species: Positive by EIA
Fluoroquinolones are the drug of choice for the treatment of
Campylobacter infections.

RECEIVED
MAR 19 2015
MICROBIOLOGY

SET FOR RESULTS: [REDACTED] - NEW RESULT ** - RESULT WAS MODIFIED AFTER FINAL STATUS SET
ATT. PHYS.: [REDACTED] MRN: [REDACTED] LOCATION: ED--
ADM. DATE: 03/12/15 PATIENT: [REDACTED]
MICROBIOLOGY
PRINTED: 03/12/15 14:16 INSTANT PAGE: 1 of 1

Diatherix Reporting

What do you think the disease is below?

DIATHERIX Labs State Pathogen Report

Unless denoted by asterisk (*), all testing was performed using Target enriched multiplex Polymerase Chain Reaction (Tem-PCR).
Testing denoted by asterisk was performed by Kettering Medical Center, 3535 Southern Blvd, Kettering, OH 45429. CLIA number: 3822000548
Please call (568)327-0889 if you have questions.

[REDACTED]	Male	1213610124	Enteroinvasive E. coli/Shigella (EIEC)	[REDACTED]	12/16/2014	12/13/2014	RECTUM
------------	------	------------	----------------------------------------	------------	------------	------------	--------

11/5

RECEIVED
DEC 17 2014
CD

Diatherix Reporting

- Shigella (either *S. sonnei* or *S. exneri*) will be reported as Enteroinvasive *E. coli*/ Shigella (EIEC) since it is not possible in a multiplex platform to reliably differentiate between these genetically similar enteric pathogens.
 - http://www.diatherix.com/assets/pdf/updates/Technical_Update_New_Gastrointestinal_Panel_121914.pdf

Diatherix Reporting



Diatherix Laboratories, Inc.
601 Genome Way / Suite 2100 / Huntsville, AL 35806
Phone: 866.979.4242 / Fax: 256.327.0984 / CLIA ID: 01D1085737

PATIENT:				ORDERING PHYSICIAN:	
Gender:	Age:	DOB:	ID:	Name:	
			Ethnicity:	Phone:	
SPECIMEN:				CLIENT:	
Source:		Collected:		Name:	
Type:		Received:		Code:	
Specimen ID:		Reported:		Address:	
Accession ID:					

Gastrointestinal Panel:	DETECTED	NOT DETECTED	COMMENTS:
Adenovirus 40, 41			
Norovirus			
Rotavirus			
Enterohemorrhagic E. coli (EHEC)			
Shiga-like toxin gene (stx1)			
Shiga-like toxin gene (stx2)			
Enteropathogenic E. coli (EPEC)			
Enterotoxigenic E. coli (ETEC)			
Enteroinvasive E. coli/Shigella (EIEC)	<input checked="" type="checkbox"/>		Shigella
Salmonella enterica			
Campylobacter jejuni			
Vibrio parahaemolyticus			
Clostridium difficile (Toxin B gene)			
Cryptosporidium parvum			
Giardia lamblia			



Diatherix Reporting



Diatherix Laboratories, Inc.
 601 Genome Way / Suite 2100 / Huntsville, AL 35806
 Phone: 866.979.4242 / Fax: 256.327.0984 / CLIA ID: 01D1085737

<http://www.diatherix.com/assets/pdf/report-formats/Gastrointestinal-Panel-Report1.pdf>

PATIENT:		ORDERING PHYSICIAN:	
Gender:	Age:	DOB:	ID:
			Ethnicity:
Name:		Phone:	
SPECIMEN:		CLIENT:	
Source:	Collected:	Name:	
Type:	Received:	Code:	
Specimen ID:	Reported:	Address:	
Accession ID:			

Gastrointestinal Panel:	DETECTED	NOT DETECTED	COMMENTS:
Adenovirus 40, 41			
Norovirus			
Rotavirus			
Enterohemorrhagic E. coli (EHEC)			
Shiga-like toxin gene (stx1)			
Shiga-like toxin gene (stx2)			
Enteropathogenic E. coli (EPEC)			
Enterotoxigenic E. coli (ETEC)			
Enteroinvasive E. coli/Shigella (EIEC)			
Salmonella enterica			
Campylobacter jejuni			
Vibrio parahaemolyticus			
Clostridium difficile (Toxin B gene)			
Cryptosporidium parvum			
Giardia lamblia			

Shiga Toxin Producing *E. Coli* *STEC*

- Culture=Confirmed
- EIA=Suspect
- PCR=Does Not Meet Criteria

STEC

- What does a positive result on a culture, EIA and PCR test for STEC all have in common?

STEC

- The same control measures for all three!
- Also try to send stool for confirmatory testing to the SLPH for EIA and PCR tests but in the mean time enact control measures.

STEC Control Measures

IMPLEMENTING CONTROL MEASURES	
ATTEMPT TO IDENTIFY SOURCE OF EXPOSURE	<ul style="list-style-type: none"> Interview the patient (use the Part 2 Form). If potential environmental or occupational source of exposure is not evident in clinical information, obtain additional information including travel, exposure to livestock and other animals, consumption of raw/undercooked meat. If source of exposure is suspected to be livestock the North Carolina Department of Agriculture (NCDA) must be notified. The county agricultural extension agent may be an additional resource to consider. The state public health veterinarian can assist with contacting these agencies (919) 733-3419.
IMPLEMENT CONTROL MEASURES TO PREVENT DISEASE AND ADDITIONAL EXPOSURES	<ul style="list-style-type: none"> Food handlers, healthcare workers and child care workers – Due to the small infective dose, exclude from work until asymptomatic and 2 consecutive negative stool cultures collected 24 hours apart and not sooner than 48 hours after completion of antibiotic. Childcare centers (single case) – Exclude until asymptomatic and 2 consecutive negative stool cultures collected 24 hours apart and not sooner than 48 hours after completion of antibiotic. Outbreak (two or more cases in the same facility) Ill children should be excluded until asymptomatic and 2 negative stool cultures at least 24 hours apart and not sooner than 48 hours after completion of antibiotic. Strict hand hygiene should be followed. The child care center should be closed to new admissions during the outbreak. Also, prevent transfer of exposed children to other centers. Environmental health specialist should perform assessment of practices associated with diapering, hand washing and food handling. Childcare attendees or workers identified with E.coli O157 infection require immediate attention due to the potential life-threatening consequences of HUS in young children. If the source of exposure is suspected to be

restaurant, notify environmental health specialist to assess recent employee absence history, hand washing, food source, storage, preparation and handling practices.

- If long term care facility is involved, request that environmental health specialist perform assessment of practices associated with diapering, hand washing and food handling.
 - Work with environmental health specialist to ensure appropriate disinfection of contaminated areas of restaurant, child care center or long term care facility if involved.
 - Use the CDC website www.cdc.gov to teach at risk people about the disease.
-

Lessons Learned

- Classify the case based on lab results (and s/s in some cases)
- Investigate and apply the same control measures to suspect, probable, and confirmed cases.
- Labs can be challenging! Call the testing laboratory if you have questions
- Call the food borne team if you need assistance.
Nicole: 919-715-1162 Vanessa 919-715-3685