INVESTIGATION OF A MULTISTATE OUTBREAK OF *SALMONELLA* BAREILLY AND *SALMONELLA* NCHANGA

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Epidemiology Program

September 25, 2013

DPH Keeping Connecticut Healthy


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Connecticut Department of Public Health

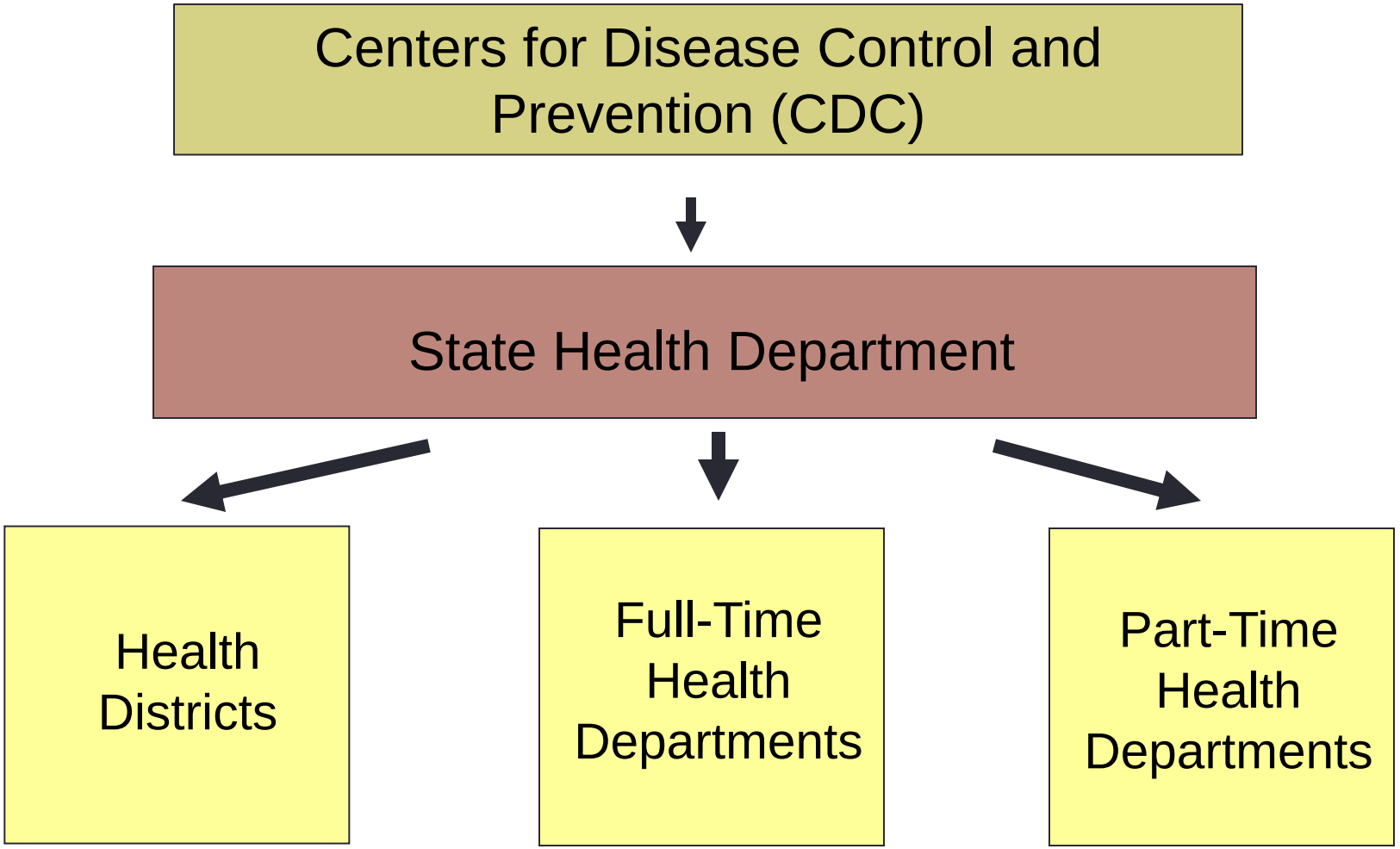
Gameplan

- Overview of Public Health
- Public Health Surveillance Activities
- Outbreaks in CT

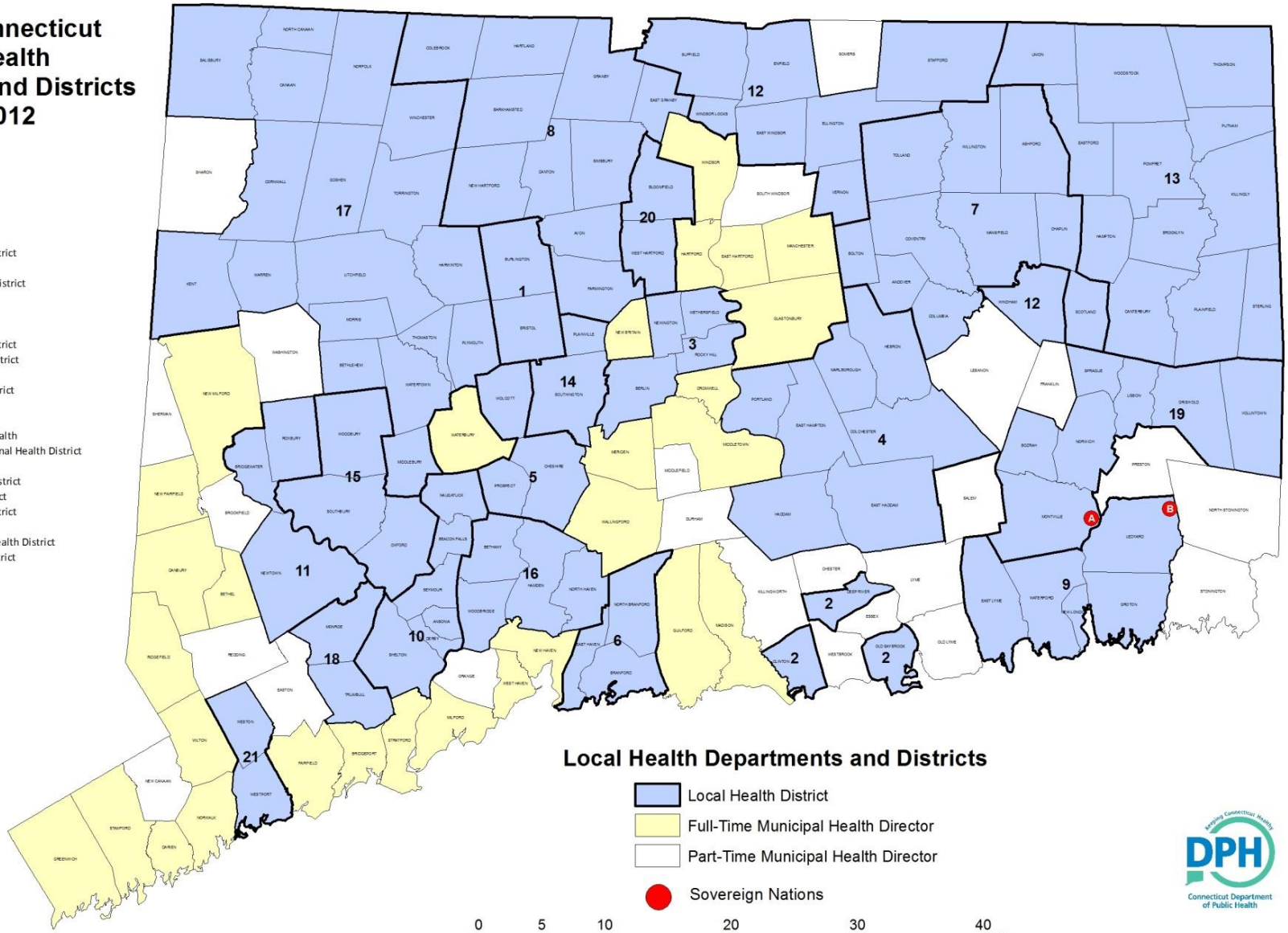
- Investigation of a Multistate Outbreak of *Salmonella* Bareilly and *Salmonella* Nchanga

PUBLIC HEALTH OVERVIEW

Public Health in Connecticut



State of Connecticut Local Health Departments and Districts July 2012



Health Districts[1]

1 Bristol-Burlington Health District
2 CT River Area Health District
3 Central Connecticut Health District
4 Chatham Health District
5 Chesprocott Health District
6 East Shore Health District
7 Eastern Highlands Health District
8 Farmington Valley Health District
9 Ledge Light Health District
10 Naugatuck Valley Health District
11 Newtown Health District
12 North Central Health District
13 Northeast District Dept of Health
14 Plainville-Southington Regional Health District
15 Pomperaug Health District
16 Quinnipiack Valley Health District
17 Torrington Area Health District
18 Trumbull-Monroe Health District
19 Uncas Health District
20 West Hartford-Bloomfield Health District
21 Westport Weston Health District

[1] Health Districts are defined as towns, cities, boroughs united to form district departments of health and have a full-time Health Director.

Sovereign Nations

A Mohegan Tribe
B Mashantucket Tribe

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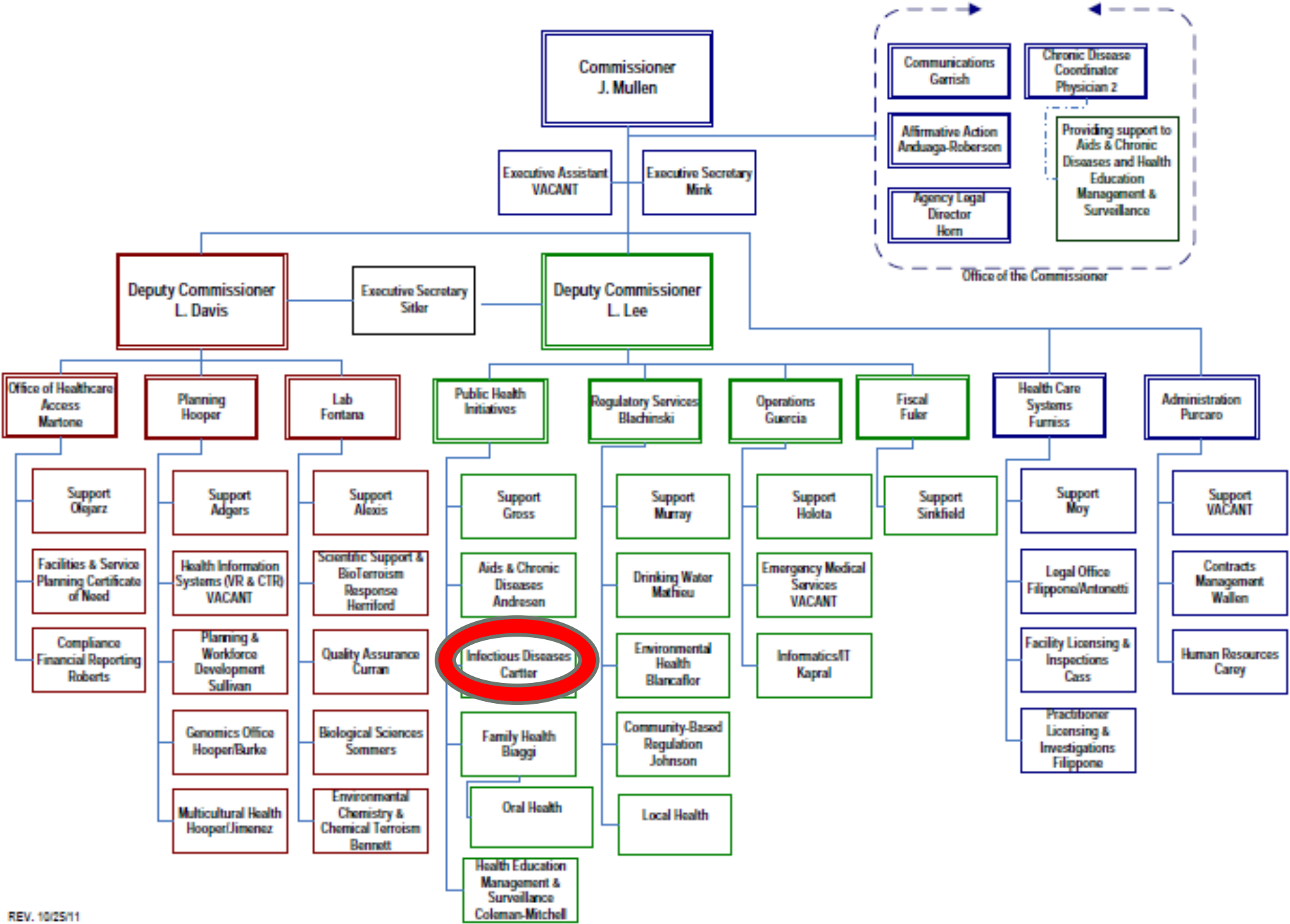
Connecticut Department of Public Health

October 15, 2012

Department of Public Health



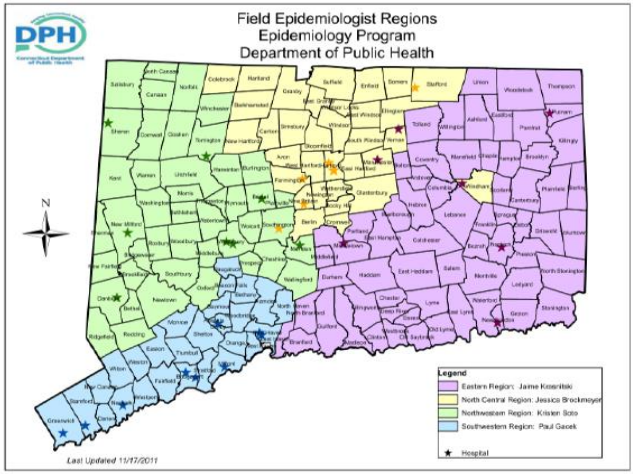
REV. 10/25/11

The Epidemiology Program

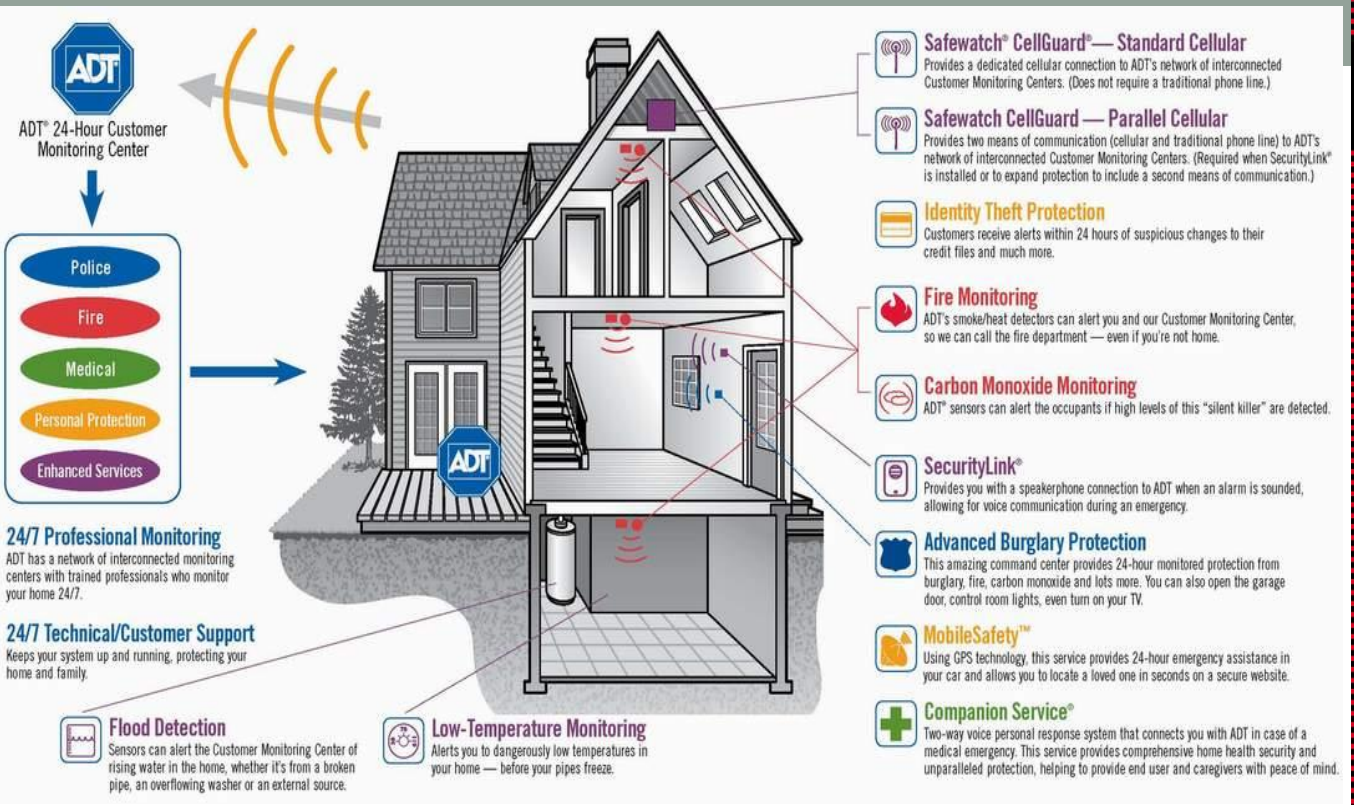
- Prevent illness, disability, and death due to infectious disease in Connecticut
- Functions:
  - Outbreak investigations
  - Disease surveillance
  - Epidemiological studies
  - Training
  - Education

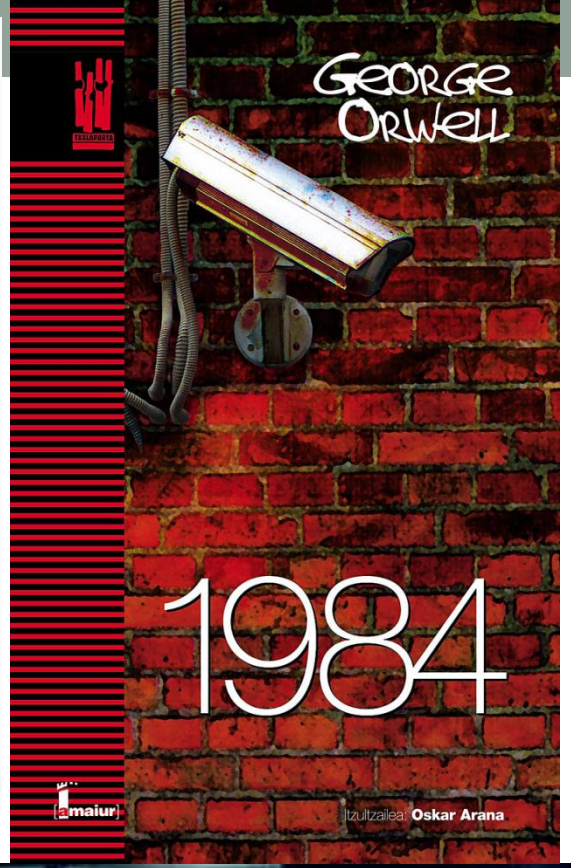
Field Epidemiologist Team

- Assist LHDs in the investigation of acute disease outbreaks;
- Assist LHDs in the investigation of illnesses that may be related to bioterrrorism;
- Maintain statewide surveillance systems for reportable infectious diseases;
- Participate in public health preparedness drills and exercises to provide epidemiologic expertise.
- “Other duties as assigned”



PUBLIC HEALTH SURVEILLANCE


ADT
ADT® 24-Hour Customer Monitoring Center
Police
Fire
Medical
Personal Protection
Enhanced Services
24/7 Professional Monitoring
ADT has a network of interconnected monitoring centers with trained professionals who monitor your home 24/7.
24/7 Technical/Customer Support
Keeps your system up and running, protecting your home and family.
Flood Detection
Sensors can alert the Customer Monitoring Center of rising water in the home, whether it's from a broken pipe, an overflowing washer or an external source.
Low-Temperature Monitoring
Alerts you to dangerously low temperatures in your home — before your pipes freeze.
Safewatch® CellGuard®— Standard Cellular
Provides a dedicated cellular connection to ADT's network of interconnected Customer Monitoring Centers. (Does not require a traditional phone line.)
Safewatch CellGuard — Parallel Cellular
Provides two means of communication (cellular and traditional phone line) to ADT's network of interconnected Customer Monitoring Centers. (Required when SecurityLink® is installed or to expand protection to include a second means of communication.)
Identity Theft Protection
Customers receive alerts within 24 hours of suspicious changes to their credit files and much more.
Fire Monitoring
ADT's smoke/heat detectors can alert you and our Customer Monitoring Center, so we can call the fire department — even if you're not home.
Carbon Monoxide Monitoring
ADT® sensors can alert the occupants if high levels of this "silent killer" are detected.
SecurityLink®
Provides you with a speakerphone connection to ADT when an alarm is sounded, allowing for voice communication during an emergency.
Advanced Burglary Protection
This amazing command center provides 24-hour monitored protection from burglary, fire, carbon monoxide and lots more. You can also open the garage door, control room lights, even turn on your TV.
MobileSafety™
Using GPS technology, this service provides 24-hour emergency assistance in your car and allows you to locate a loved one in seconds on a secure website.
Companion Service®
Two-way voice personal response system that connects you with ADT in case of a medical emergency. This service provides comprehensive home health security and unparalleled protection, helping to provide end user and caregivers with peace of mind.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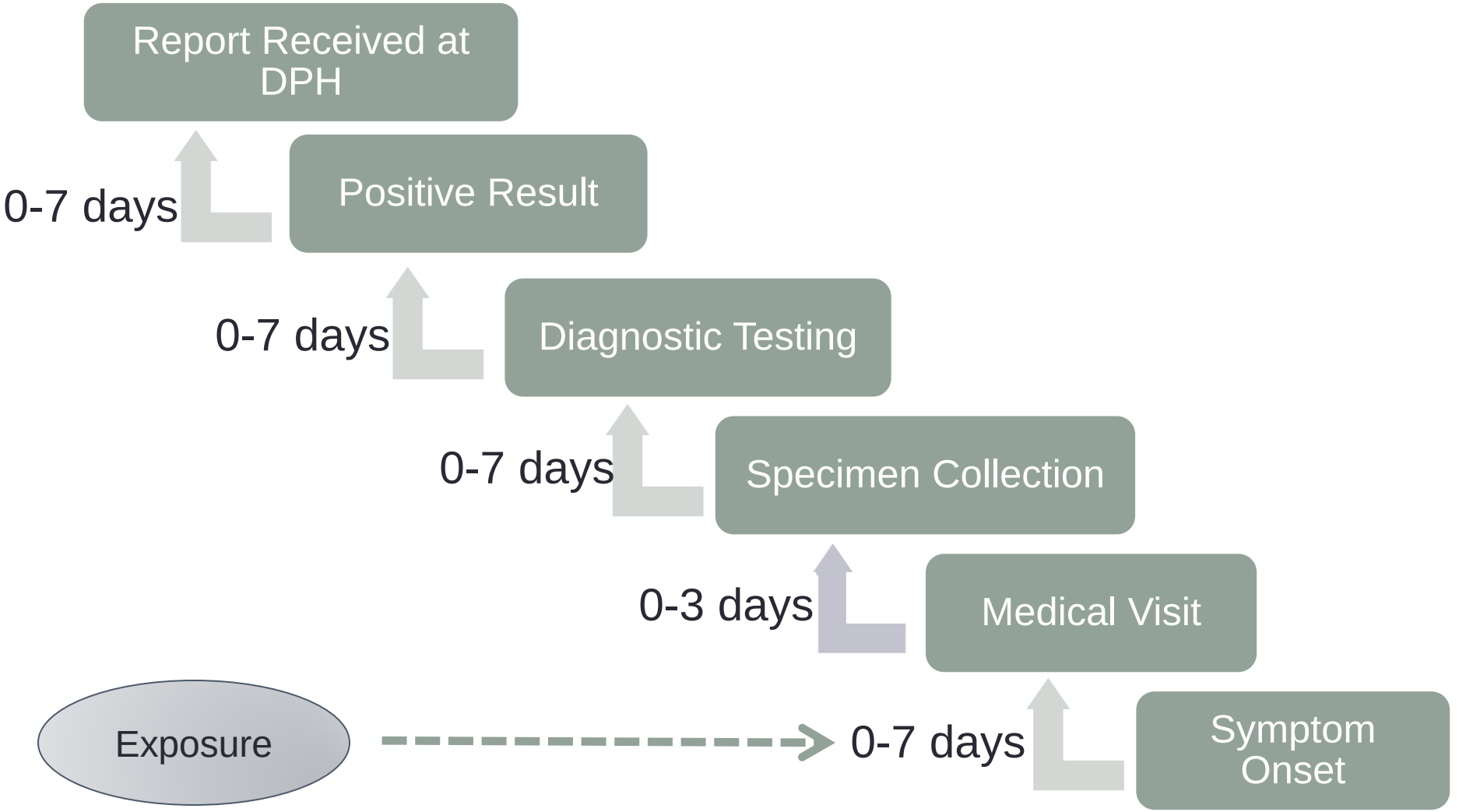
Definition

- Public health surveillance is the ongoing, systematic collection, analysis, and interpretation of health data, essential to the planning, implementation and evaluation of public health practice.

-CEA Winslow

Reportable Disease Surveillance



Surveillance in Connecticut

REPORTABLE LABORATORY FINDINGS 2012

The director of a clinical laboratory must report laboratory evidence suggestive of reportable diseases. The Laboratory Report of Significant Findings form (OL-15C) can be obtained from the Connecticut Department of Public Health (DPH), 410 Capitol Ave., MS#11EPI, P.O. Box 340308, Hartford, CT 06134-0308; telephone: 860-509-7994 or on the DPH website. The OL-15Cs are not substitutes for physician reports; they are supplements to physician reports, which allow verification of diagnosis. A listing of possible bioterrorism diseases is highlighted at the end of this list. Changes for 2012 are noted in **bold** and with an asterisk (*).

AIDS (report only to the State)
☐ CD4+ counts < 200 cells/µL _____ __< 14% _____
Arboviral infection
☐ California group virus (species) _____
☐ Dengue
☐ Eastern equine encephalitis virus
☐ St. Louis encephalitis virus
☐ West Nile virus infection
Babesiosis: ☐ IFA IgM (titer) _____ IgG (titer) _____
☐ Blood smear (1) ☐ PCR ☐ Other _____
☐ *microti* ☐ *divergens* ☐ *duncani* ☐ **Unspeciated***
Campylobacteriosis (species) _____
☐ **Culture** ☐ **EIA** ☐ **Other:** _____*
Carboxyhemoglobin ≥ 9%: _____% COHb
Chancroid
Chickenpox, acute ☐ Culture ☐ PCR
☐ DFA ☐ Other _____
Chlamydia (*C. trachomatis*) (test type) _____
Creutzfeldt-Jakob disease, age < 55 years (biopsy)
Cryptosporidiosis (method of ID): _____
Cyclosporiasis (method of ID): _____
Diphtheria (1)
Ehrlichiosis/Anaplasmosis (2) ☐ *A. phagocytophilum* ☐ *E. chaffeensis*
☐ Unspecified ☐ IFA IgM titer _____ IgG titer _____
☐ Blood smear ☐ PCR ☐ Other _____
Enterococcal infection, vancomycin-resistant (2,3) _____
Escherichia coli O157 infection (1)
Giardiasis
Gonorrhea (test type) _____
Group A streptococcal disease, invasive (3)
Group B streptococcal disease, invasive (3)
Haemophilus influenzae disease, invasive, all serotypes (1,3)
Hansen's disease (Leprosy)
Hepatitis A IgM anti-HAV **ALT**_____ **AST** _____ ☐ **Not Done**(1,4*)
Hepatitis B ☐ HBsAg ☐ IgM anti-HBc (1)
Hepatitis C (anti-HCV) Ratio: _____ ☐ RIBA ☐ PCR (5)
Herpes simplex virus (infants ≤ 60 days of age) (specify type) _____
☐ Culture ☐ PCR ☐ IFA ☐ Ag detection
HIV genotype (electronic file) (report only to the State) (6)
HIV infection (report only to the State) (6)
☐ Western Blot (1) ☐ HIV Viral Load:___copies/mL ☐ Not Detectable
HPV (report only to the State) (7)
Biopsy proven ☐ CIN 2 ☐ CIN 3 ☐ AIS
or their equivalent (specify) _____
Influenza: ☐ A ☐ B ☐ Unk. ☐ Subtype _____
☐ RT-PCR ☐ Culture ☐ Rapid test
Lead Poisoning (blood lead ≥10 µg/dL) (8)
☐ Finger Stick: _____ µg/dL ☐ Venous: _____ µg/dL
Legionellosis
☐ Culture ☐ DFA ☐ Ag positive
☐ Four-fold serologic change (titers) _____
Listeriosis (1)
Lyme disease (9)
Malaria/blood parasites (1,2) _____
Measles (Rubeola) (10) (titer) _____
Meningococcal disease, invasive (1,3)
Mercury poisoning
☐ Urine ≥ 35 µg/g creatinine: _____ µg/g
☐ Blood ≥ 15 µg/L: _____ µg/L
Mumps (10) (titer): _____
Neonatal bacterial sepsis (11) spp: _____
Pertussis (titer) _____
☐ DFA ☐ Culture (1*) ☐ PCR
Pneumococcal disease, invasive (1,3)
Poliomyelitis
Rabies
Rocky Mountain spotted fever
Rotavirus
Rubella (10) (titer): _____
Salmonellosis (1,2) (serogroup/serotype): _____
SARS-CoV infection (1) ☐ IgM/IgG
☐ PCR: _____ (specimen) ☐ Other: _____
Shiga toxin-related disease (1)
Shigellosis (1,2) (serogroup/species): _____
Staphylococcus aureus infection with MIC to vancomycin ≥ 4 µg/mL (1)
MIC to vancomycin: _____ µg/mL
Staphylococcus aureus disease, invasive (3)
methicillin-resistant Date pt. Admitted: ____/____/____
Staphylococcus epidermidis infection with MIC to vancomycin ≥ 32 µg/mL (1)
MIC to vancomycin: _____ µg/mL
Syphilis ☐ RPR (titer): _____ ☐ **FTA*** ☐ VDRL (titer): _____ ☐ **TPPA***
Trichinosis
Tuberculosis (1)
AFB Smear: ☐ Positive ☐ Negative
If positive: ☐ Rare ☐ Few ☐ Numerous
NAAT: ☐ Positive ☐ Negative ☐ Indeterminate
Culture: ☐ *Mycobacterium tuberculosis*
☐ Non-tuberculosis mycobact. (specify: *M.* _____)
Vibrio infection (1) (species): _____
Yellow fever
Yersiniosis (species): _____

Diseases that are possible indicators of bioterrorism

Anthrax (1,12)
Botulism (12)
Brucellosis (1,12)
Glanders (1,12)
Bacillus species, non-hemolytic, non-motile, from blood or CSF, growth within 32 hours of inoculation (1,12)
Melioidosis (1,12)
Plague (1,12)
Q fever (12)
Ricin poisoning (12)
Smallpox (1,12)
Staphylococcal enterotoxin B pulmonary poisoning (12)
Tularemia (12)
Venezuelan equine encephalitis (12)
Viral hemorrhagic fever (12)

1. Send isolate, culture, or slide to the State Laboratory for confirmation. For Shiga-toxin, send positive broth. For positive HIV and IgM anti-HAV, send ≥ 0.5mL residual serum. For positive IgM anti-HBc, send ≥ 0.5mL residual serum within 6 months.
2. Specify species/serogroup.
3. Sterile site isolates: defined as sterile fluids (blood, CSF, pericardial, pleural, peritoneal, joint, or vitreous), bone, internal body site (lymph node, brain, heart, liver, spleen, kidney, pancreas, or ovary), or **other normally sterile site including muscle.**
4. **Report the peak liver function tests (ALT, AST) conducted within one week of patient's HAV IgM positive test, if available. Check "Not Done" when appropriate.**
5. Report all positive anti-HCV with signal to cutoff ratio, all positive RIBA, but only confirmatory PCR tests.
6. Laboratories conducting HIV genotype tests should report the HIV DNA sequence file electronically. Report all positive HIV antibody and antigen tests, and all viral load tests (including those with no virus detectable).
7. On request from the DPH and if adequate tissue is available, send fixed tissue from the specimen used to diagnose CIN2, 3 or cervical AIS or their equivalent for HPV typing according to instructions from the DPH.
8. Report lead results ≥10µg/dL within 48 hours to the Local Health Director and the DPH; submit ALL lead results at least monthly to the DPH.
9. Only laboratories with automated electronic reporting to the DPH are required to report positive results.
10. Report all IgM positive titers, but only IgG titers that are considered significant by the laboratory performing the test.
11. Report all bacterial isolates from blood or CSF obtained from an infant ≤72 hours of age.
12. Report by telephone to the DPH, weekdays 860-509-7994, evenings, weekends, and holidays 860-509-8000.

REPORTABLE DISEASES, EMERGENCY ILLNESSES and HEALTH CONDITIONS - 2012

The Commissioner of the Department of Public Health (DPH) is required to declare an annual list of Reportable Diseases, Emergency Illnesses and Health Conditions. The Reportable Disease Confidential Case Report form (PD-23) or other disease specific form should be used to report the disease, illness, or condition. Reports (mailed, faxed, or telephoned into the DPH) should include the full name and address of the person reporting, attending physician, disease, illness or condition, and full name, address, date of birth, race/ethnicity, sex and occupation of the person affected. Forms can be found on the DPH website. See page 4 for a list of persons required to report Reportable Diseases, Emergency Illnesses and Health Conditions. Mailed reports must be sent in envelopes marked "CONFIDENTIAL." Changes for 2012 are noted in **bold** and with an asterisk (*).

Category 1 Diseases: Report immediately by telephone on the day of recognition or strong suspicion of disease for those diseases marked with a telephone (☎). Also mail a report within 12 hours.
Category 2 Diseases: Diseases not marked with a telephone are Category 2 diseases. Report by mail within 12 hours of recognition or strong suspicion of disease.

Acquired Immunodeficiency Syndrome (1,2)
☎ Anthrax
Arboviral disease (California group, Dengue, EEE, SLE, WNV)
Babesiosis
☎ Botulism
☎ Brucellosis
Campylobacteriosis
Carbon monoxide poisoning (3)
Chancroid
Chickenpox
Chickenpox-related death
Chlamydia (*C. trachomatis*) (all sites)
☎ Cholera
Clostridium difficile, community-onset (4)
Creutzfeldt-Jakob disease (age < 55 years)
Cryptosporidiosis
Cyclosporiasis
☎ Diphtheria
Ehrlichiosis/Anaplasmosis
Escherichia coli O157:H7 gastroenteritis
Gonorrhea
Group A Streptococcal disease, invasive (5)
Group B Streptococcal disease, invasive (5)
☎ Guillain-Barré Syndrome
Haemophilus influenzae disease, invasive all serotypes (5)
Hansen's disease (Leprosy)
Healthcare-associated infections (6)*
Hemolytic-uremic syndrome
Hepatitis A
Hepatitis B
- acute infection (2)
- HBsAg positive pregnant women

Hepatitis C - acute infection (2)
HIV-1 infection in (1)
- persons with active tuberculosis disease
- persons with a latent tuberculous infection (history or tuberculin skin test ≥5mm induration by Mantoux technique)
- persons of any age
- pregnant women

HPV: biopsy proven CIN 2, CIN 3 or AIS or their equivalent (1)
Influenza-associated death
Influenza-associated hospitalization (7)
Lead toxicity (blood level ≥ 15 µg/dL)
Legionellosis
Listeriosis
Lyme disease
Malaria
☎ Measles
☎ **Melioidosis***
☎ Meningococcal disease
Mercury poisoning
Mumps
Neonatal herpes (≤ 60 days of age)
Neonatal bacterial sepsis (8)
Occupational asthma
☎ Outbreaks:
- Foodborne (involving ≥ 2 persons)
- Institutional
- Unusual disease or illness (9)

☎ Pertussis
☎ Plague
Pneumococcal disease, invasive (5)
☎ Poliomyelitis
☎ Q fever
☎ Rabies (human and animal)
Reye syndrome
Rheumatic fever
☎ Ricin poisoning
Rocky Mountain spotted fever
Rotavirus
☎ Rubella (including congenital)
Salmonellosis
☎ SARS-CoV
☎ Septicemia or meningitis with growth of gram positive rods within 32 hours of inoculation
Shiga toxin-related disease (gastroenteritis)
Shigellosis
Silicosis
☎ Smallpox
☎ Staphylococcal enterotoxin B pulmonary poisoning
☎ *Staphylococcus aureus* disease, reduced or resistant susceptibility to vancomycin (1)
Staphylococcus aureus methicillin-resistant disease, invasive, community acquired (5,10)
Staphylococcus epidermidis disease, reduced or resistant susceptibility to vancomycin (1)
Syphilis
Tetanus
Trichinosis
☎ Tuberculosis
☎ Tularemia
Typhoid fever
Vaccinia disease
☎ Venezuelan equine encephalitis
Vibrio infection (*parahaemolyticus, vulnificus*, other)
☎ Viral hemorrhagic fever
☎ Yellow fever

FOOTNOTES:
1. Report only to State.
2. CDC case definition.
3. Includes persons being treated in hyperbaric chambers for suspect CO poisoning.
4. Community-onset: illness in a person living in the community at the time of illness onset and no known hospitalizations in preceding 3 months; if hospitalized, a positive test taken within 48 hours of admission.
5. Invasive disease: confirmed by isolation from sterile fluid (blood, CSF,pericardial, pleural, peritoneal, joint, or vitreous) bone, internal body sites, or **other normally sterile site including muscle.**
6. **Report healthcare-associated infections listed by the Centers for Medicare and Medicaid Services (CMS) Inpatient Prospective Payment System (IPPS) from CMS required facility types and locations. In 2012, all hospitals licensed by DPH as a general or children's hospital are required to report Central Line Associated Blood Stream Infections from all adult and pediatric ICUs, and all level II/III or III neonatal ICUs; Catheter Associated Urinary Tract Infections from all adult and pediatric ICUs; and abdominal hysterectomy and colon surgery procedure associated Surgical Site Infections. Reporting shall be made through the National Healthcare Safety Network, using NHSN's surveillance definitions, protocols and instructions, forms, and software.**
7. Reporting requirements are satisfied by submitting the Hospitalized and Fatal Cases of Influenza—Case Report Form to the DPH (or in Hartford, Middlesex, and New Haven counties to Yale Emerging Infections Program at 203-764-4357); in a manner specified by the DPH.
8. Clinical sepsis and blood or CSF isolate obtained from an infant ≤ 72 hours of age.
9. Individual cases of "significant unusual illness" are also reportable.
10. Community-acquired: infection present on admission to hospital, and person has no previous hospitalizations or regular contact with the health-care setting.

How to report: The PD-23 is the general disease reporting form and should be used if other specialized forms are not available. Specialized reporting forms from the following programs are available: on the website or by calling the following telephone numbers HIV/AIDS Surveillance (860-509-7900), Sexually Transmitted Disease Program (860-509-7920), Tuberculosis Control Program (860-509-7722), Occupational Health Surveillance Program (860-509-7740), or Epidemiology and Emerging Infections Program for the PD-23 or Hospitalized and Fatal Cases of Influenza—Case Report Form (860-509-7994). The PD-23 can be found on the DPH website or by writing the Department of Public Health, 410 Capitol Ave., MS#11EPI, P.O. Box 340308, Hartford, CT 06134-0308 (860-509-7994); or by calling the individual program.

Telephone reports of Category 1 disease should be made to the local director of health for the town in which the patient resides and to the Epidemiology and Emerging Infections Program (860-509-7994). Tuberculosis cases should be directly reported to the Tuberculosis Control Program (860-509-7722). For the name, address, or telephone number of the local Director of Health for a specific town contact the Office of Local Health Administration (860-509-7660). **For public health emergencies, an epidemiologist can be reached evenings, weekends, and holidays through the DPH emergency number (860-509-8000).**

GENERAL ENTERIC DISEASES INTERVIEW FORM

Fax completed form to:
DPH Epidemiology Program
Fax: 860-509-7910

DPH USE
ID # _____

GENERAL ENTERIC DISEASES INTERVIEW FORM

Revised January 2012, Page 1 of 2

LHD USE

Completed by:_____ Health Dept:_____Phone:_____Date:__/__/__
- ☐ Patient was interviewed
- ☐ Patient could not be interviewed, because: ☐ unreachable ☐ refused ☐ no working phone ☐ other_____

CASE INFORMATION

Last Name: _____ First Name: _____
Street: _____ City: _____ Zip: _____
Phone: (___) ___-____ DOB: __/__/____ Age: _____ Sex: ☐ M ☐ F

Date specimen collected __/__/____ Type of specimen: ☐ stool ☐ blood ☐ urine ☐ other _____
Pathogen: _____ Laboratory: _____

*Begin interview here. Please be sure to complete the core surveillance variables in **BOLD**.*

1. On what day and at what time did you start to feel sick? **Onset Date:** __/__/____ **and Time:** ___:___ AM PM

2. Did you have any of the following symptoms during your illness?
   - Vomiting ☐ yes ☐ no Date vomiting onset: __/__/____ Time of onset: ___:___ AM PM
   - Diarrhea ☐ yes ☐ no Date diarrhea onset: __/__/____ Time of onset: ___:___ AM PM
     Number of day's diarrhea lasted: _____
   - Bloody diarrhea ☐ yes ☐ no
   - Fever ☐ yes ☐ no Highest temperature: _____

3. **Were you hospitalized?** ☐ yes ☐ no
   If yes, hospital name: _____ **Date admitted:** __/__/____ **Date discharged:** __/__/____

4. How many days did your illness last: _____ # of days

5. **Outcome:** ☐ **Survived** ☐ **Died**

6. If case is an adult: What is your occupation? _____
   - Handle or prepare foods outside the home? ☐ yes ☐ no If yes, where _____
   - Provide direct patient care outside the home? ☐ yes ☐ no If yes, where _____
   - Work in a daycare setting? ☐ yes ☐ no If yes, where _____

7. If case is a child: Does your child attend daycare? ☐ yes ☐ no
   If yes, name of daycare _____ Location _____

8. Can you tell us about other household members, their ages, occupation, and whether they have been ill with a similar illness:

Name	Relationship	Age	Occupation	Ill	If yes, onset date & symptoms
_____	_____	____	_____	☐ yes ☐ no	_____
_____	_____	____	_____	☐ yes ☐ no	_____
_____	_____	____	_____	☐ yes ☐ no	_____

NOTE: If case or household contacts are involved in high risk occupations/activities, implement appropriate control recommendations. Refer to the "Reportable Diseases Reference Manual".

9. **What is your race?** ☐ **White** ☐ **Black** ☐ **Asian** ☐ **Native Hawaiian/Other Pacific Islander**
   ☐ **American Indian/Alaska Native** ☐ **Other** _____ ☐ **Unknown**

10. **Are you of Hispanic background?** ☐ **Yes** ☐ **No** ☐ **Unknown**

11. **Did you travel outside of the U.S. in the 7 days before illness?** ☐ **yes** ☐ **no**
    If yes, country _____ **date depart U.S.:**__/__/____ **date return U.S.:**__/__/____

12. Did you travel to any other states in the 7 days before illness? ☐ yes ☐ no
    If yes, city/state _____ date depart CT:__/__/____ date return CT:__/__/____

Case Last name:_____ First name:_____

13. Did you attend any large gatherings (parties, festivals, fairs, etc.) in the 7 days before illness? ☐ yes ☐ no
    If yes, when __/__/___ where/type function _____
    Foods eaten _____

14. Did you eat out at any restaurants in the 7 days before illness? ☐ yes ☐ no
    If yes, list names of restaurants, locations, date/time of meal, and food items eaten:
    a. Name _____ City: _____ Date __/__/___ Time: ___:___ AM PM
    Foods eaten: _____
    b. Name _____ City: _____ Date __/__/___ Time: ___:___ AM PM
    Foods eaten: _____
    c. Name _____ City: _____ Date __/__/___ Time: ___:___ AM PM
    Foods eaten: _____

15. Where did you purchase groceries eaten in the 7 days before illness?
    Name _____ City_____
    Name _____ City_____

16. Did you have any of these other possible exposures in the 7 days before illness?
    - Swimming or wading? ☐ yes ☐ no If yes, where _____
    - Drank untreated water (pond, lake, river, etc.)? ☐ yes ☐ no If yes, where _____
    - Visited a farm or petting zoo? ☐ yes ☐ no If yes, where _____
    - Contact with farm animals? ☐ yes ☐ no If yes, where & type animal _____
    - Contact with reptiles (snakes, turtles, etc.)? ☐ yes ☐ no If yes, where & type animal _____
    - Contact with household pets? ☐ yes ☐ no If yes, type of animal _____
    - Contact with persons sick w/ diarrhea? ☐ yes ☐ no If yes, who _____

ADDITIONAL EXPOSURE QUESTIONS FOR SALMONELLA AND CAMPYLOBACTER ONLY

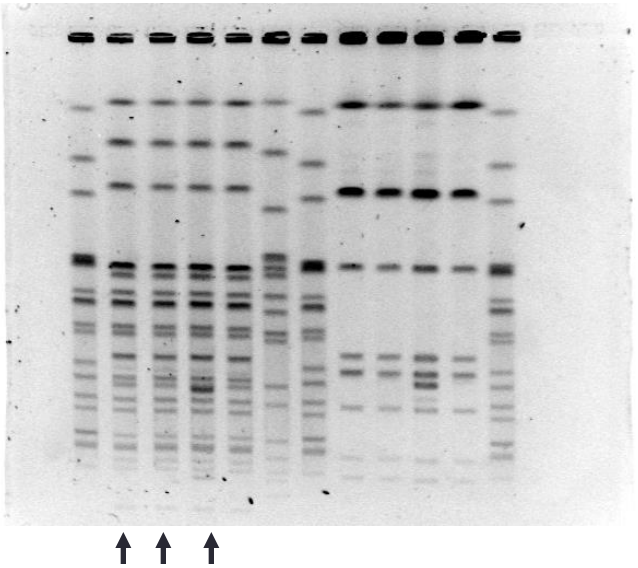
Did you eat the following items either at home or out in the 7 days before illness? If yes, specify brand/type/where purchased?

Eggs	☐ yes	☐ no	_____
Foods made w/ raw eggs (homemade mayonnaise, cookie dough)	☐ yes	☐ no	_____
Raw or unpasteurized milk	☐ yes	☐ no	_____
Raw or unpasteurized cheese	☐ yes	☐ no	_____
Chicken	☐ yes	☐ no	_____
Other poultry (turkey, duck, etc.)	☐ yes	☐ no	_____
Pork (including ham, sausage, etc.)	☐ yes	☐ no	_____
Hamburger/ground beef	☐ yes	☐ no	_____
If yes, was hamburger from premade patties or bulk?			_____
What was the number of patties or size of package?			_____
Was it fresh or frozen at the time of purchase?			_____
What percent fat/lean was it?			_____
Other beef	☐ yes	☐ no	_____
Frozen entrees (pot pies, stuffed chicken products, pizza, etc.)	☐ yes	☐ no	_____
Prepackaged salad or lettuce	☐ yes	☐ no	_____
Lettuce, whole heads or loose leaf	☐ yes	☐ no	_____
If yes, specify type of lettuce (iceberg, romaine, red leaf, green leaf, mesclun, etc.)			_____
Raw spinach	☐ yes	☐ no	_____
Raw tomatoes	☐ yes	☐ no	_____
If yes, specify type of tomatoes (vine, roma/plum, regular/large, cherry, etc.)			_____
Sprouts (alfalfa, bean)	☐ yes	☐ no	_____
Fresh (not dried) herbs (parsley, cilantro, basil, etc.)	☐ yes	☐ no	_____
Cantaloupe	☐ yes	☐ no	_____
Other fresh fruits	☐ yes	☐ no	_____
Unpasteurized juice/cider/smoothie	☐ yes	☐ no	_____
Raw nuts (not roasted/processed)	☐ yes	☐ no	_____
Peanut butter	☐ yes	☐ no	_____
Peanut butter-containing products (packaged PB crackers, etc.)	☐ yes	☐ no	_____

Please fax completed form to DPH at 860-509-7910. Thank you.

Detecting Clusters
Molecular Subtyping

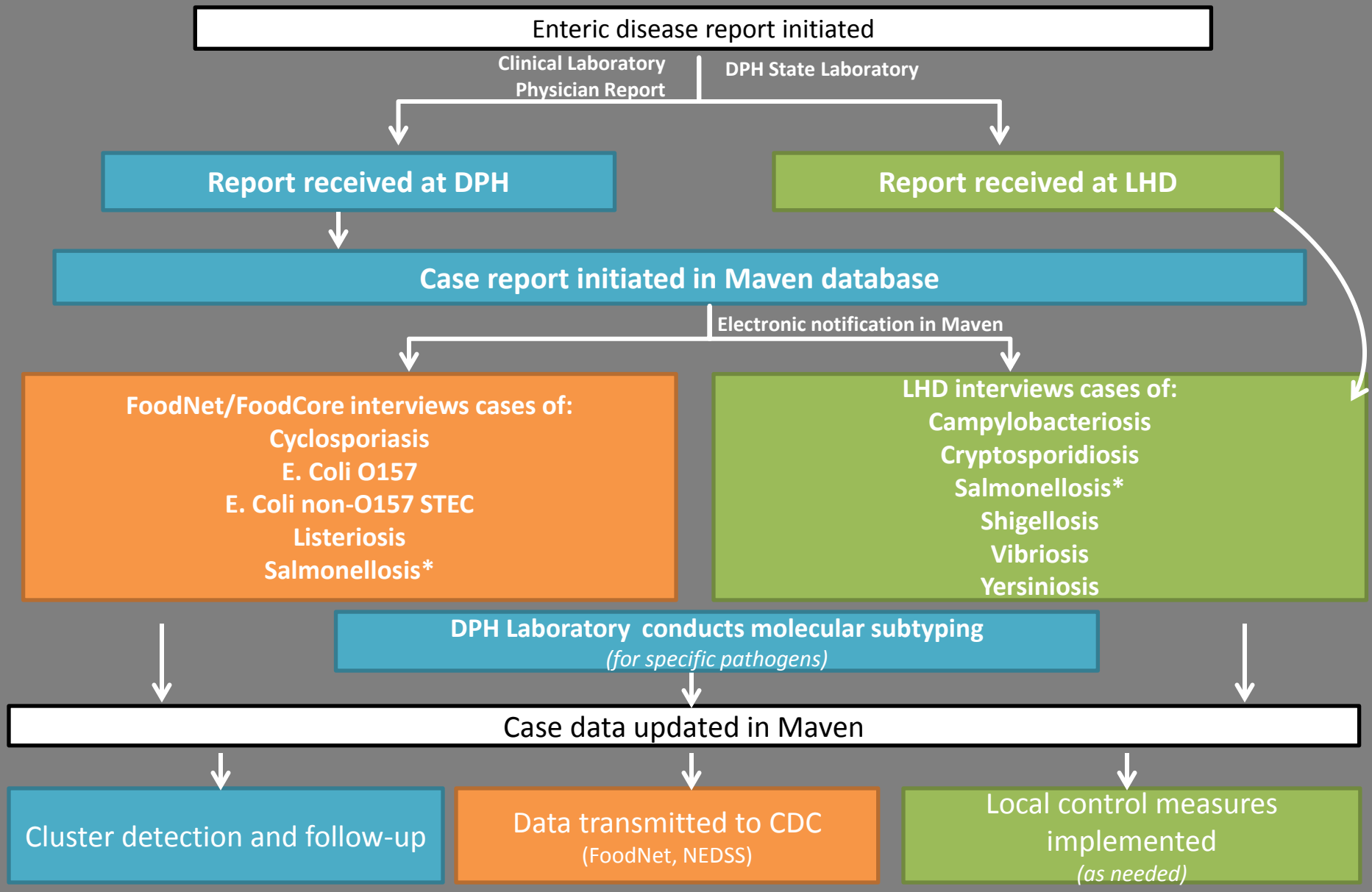
- Isolates submitted to State Laboratory
- Confirmation, subtyping
- Pulse-field gel electrophoresis (PFGE)
- Isolates that undergo PFGE
  - *E. coli O157* and other STEC
  - *L. monocytogenes*
  - *Salmonella spp*.
  - *S. sonnei*
  - *V. parahaemolyticus*
  - *V. cholerae*



PulseNet


Area Laboratories
CDC PulseNet Central
County/City Laboratories
USDA Laboratories
FDA Laboratories
West
Mountain
South Central
North Central
Midwest
Mid-Atlantic
Southeast
Northeast

Enteric Disease Surveillance and Follow-up Flow Chart, Connecticut, April 2013



* Note: FoodCORE will complete salmonellosis interviews if:

1) The LHD requests assistance (for all salmonellosis in their jurisdiction or on a case-by-case basis)
2) The LHD does not complete a salmonellosis interview within 10 days

OUTBREAKS IN CONNECTICUT

Food-Related Illness and Death in the US

- > 200 diseases transmitted through food
- Causes: bacteria, viruses, parasites, toxins, metals
- Symptoms: mild gastrointestinal illness to life threatening neurologic, hepatic and renal syndromes

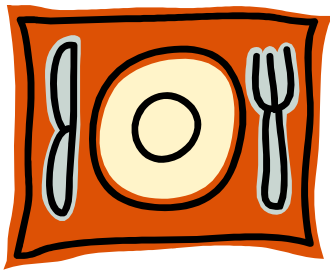
Public Health Burden of Foodborne Disease*

- Data from multiple surveillance systems analyzed
- Foodborne disease annually account for
  - 48 million illnesses in US
    - 1 in 6 Americans get a foodborne illness each year
    - 128,000 hospitalized
    - 3,000 deaths

* Source: http://www.cdc.gov/foodborneburden/index.html

What is a foodborne outbreak?

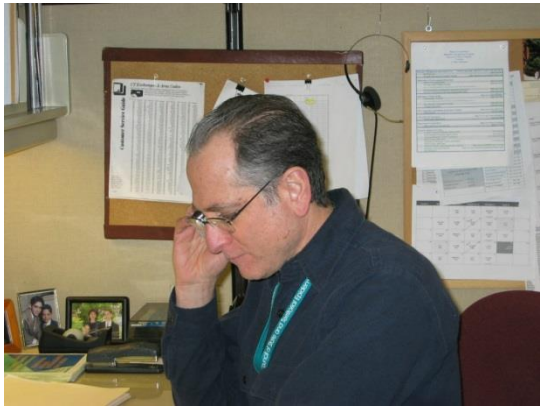
- Occurrence of **two or more cases** of a similar illness resulting from the ingestion of a common food

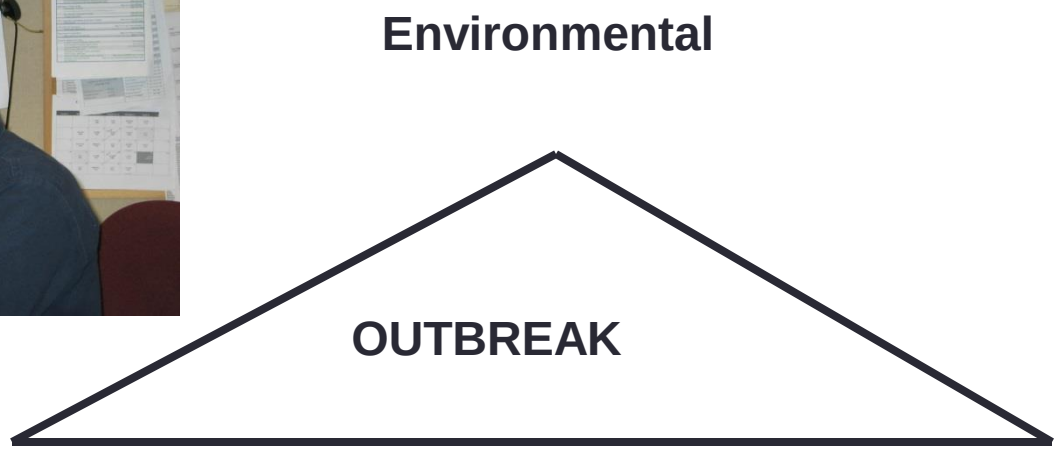


Types of Foodborne Outbreaks

- Point source outbreak
  - common exposure at a defined time and place
  - easily recognized
  - most common type of outbreak reported
  - usually detected by event participants
- Dispersed outbreaks
  - cases have no immediately obvious association
  - more difficult to detect and investigate
  - may be related to common exposure or point source (ex. widely distributed contaminated food item)

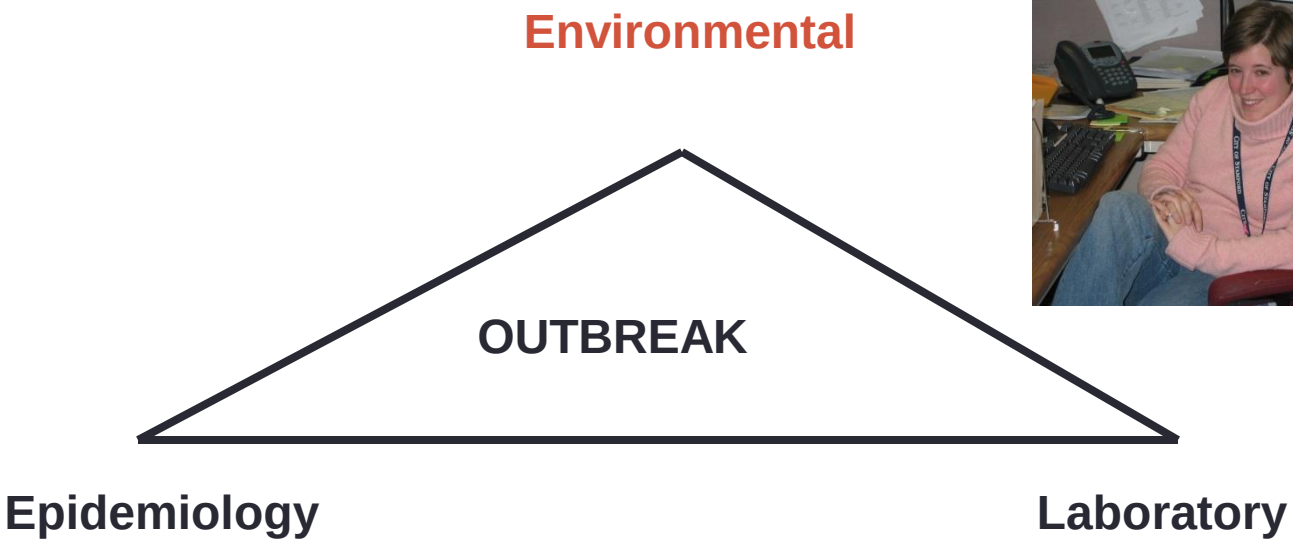
Individuals Involved in Investigating a Foodborne Outbreak





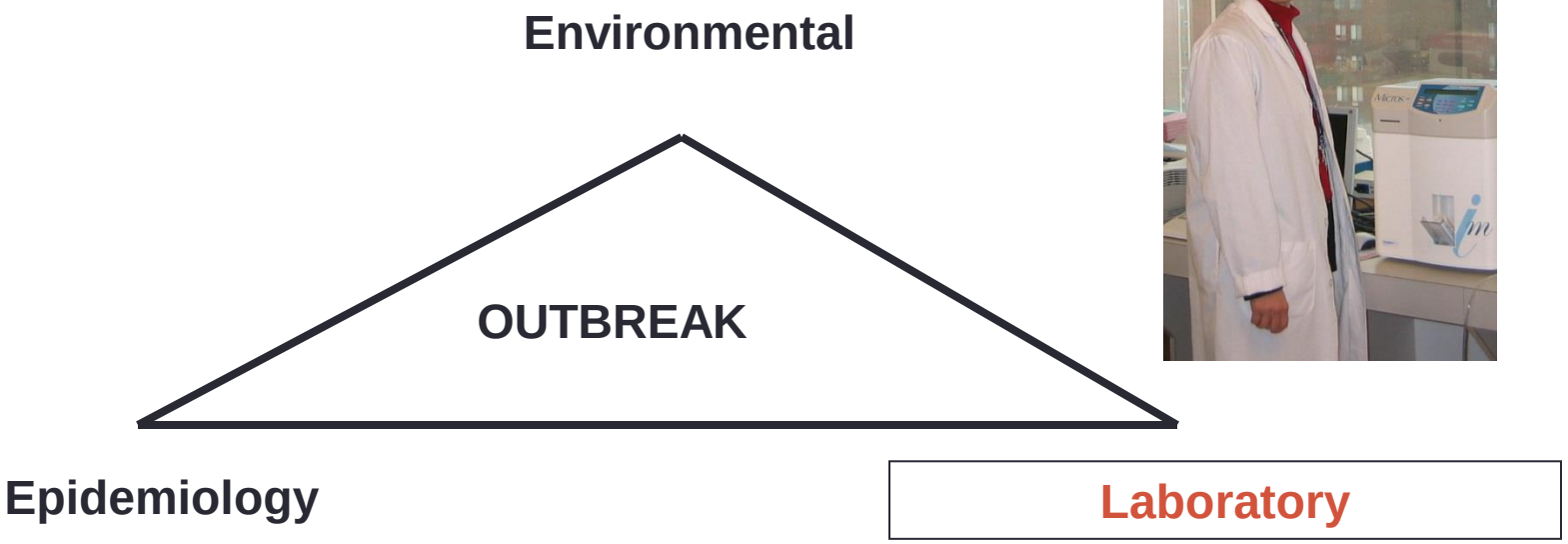
-Create questionnaire, database, conduct data analysis
-Interview ill/well attendees
-Identify risk factors (special studies)

Individuals Involved in Investigating a Foodborne Outbreak



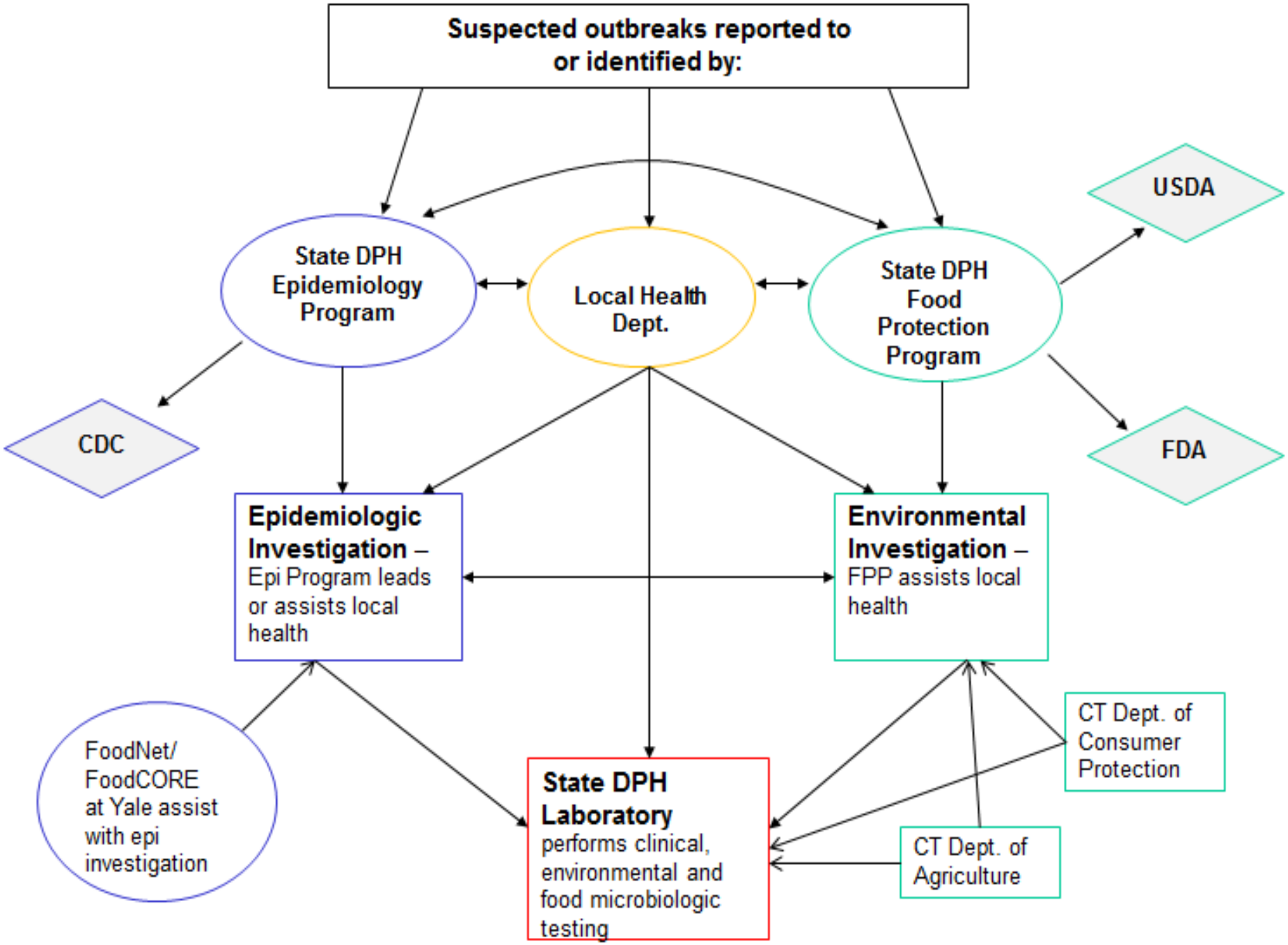
–Implement control measures
–Identify contributing factors
–Regulatory authority

Individuals Involved in Investigating a Foodborne Outbreak



–Confirm etiologic agent

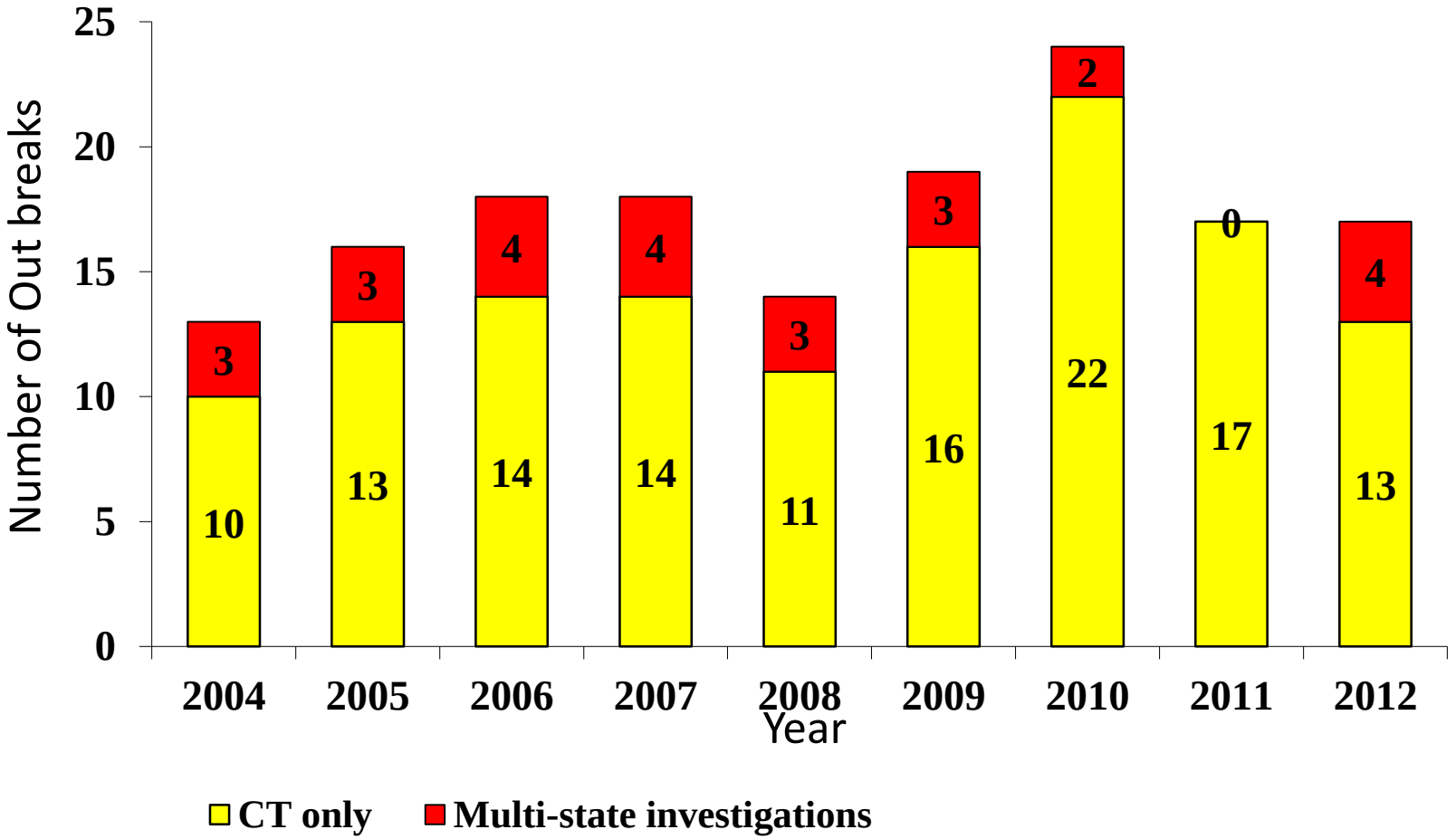
–Test food samples


Suspected outbreaks reported to or identified by:
State DPH Epidemiology Program
Local Health Dept.
State DPH Food Protection Program
USDA
CDC
FDA
Epidemiologic Investigation – Epi Program leads or assists local health
Environmental Investigation – FPP assists local health
FoodNet/ FoodCORE at Yale assist with epi investigation
State DPH Laboratory performs clinical, environmental and food microbiologic testing
CT Dept. of Consumer Protection
CT Dept. of Agriculture

Number of Reported Foodborne Outbreaks

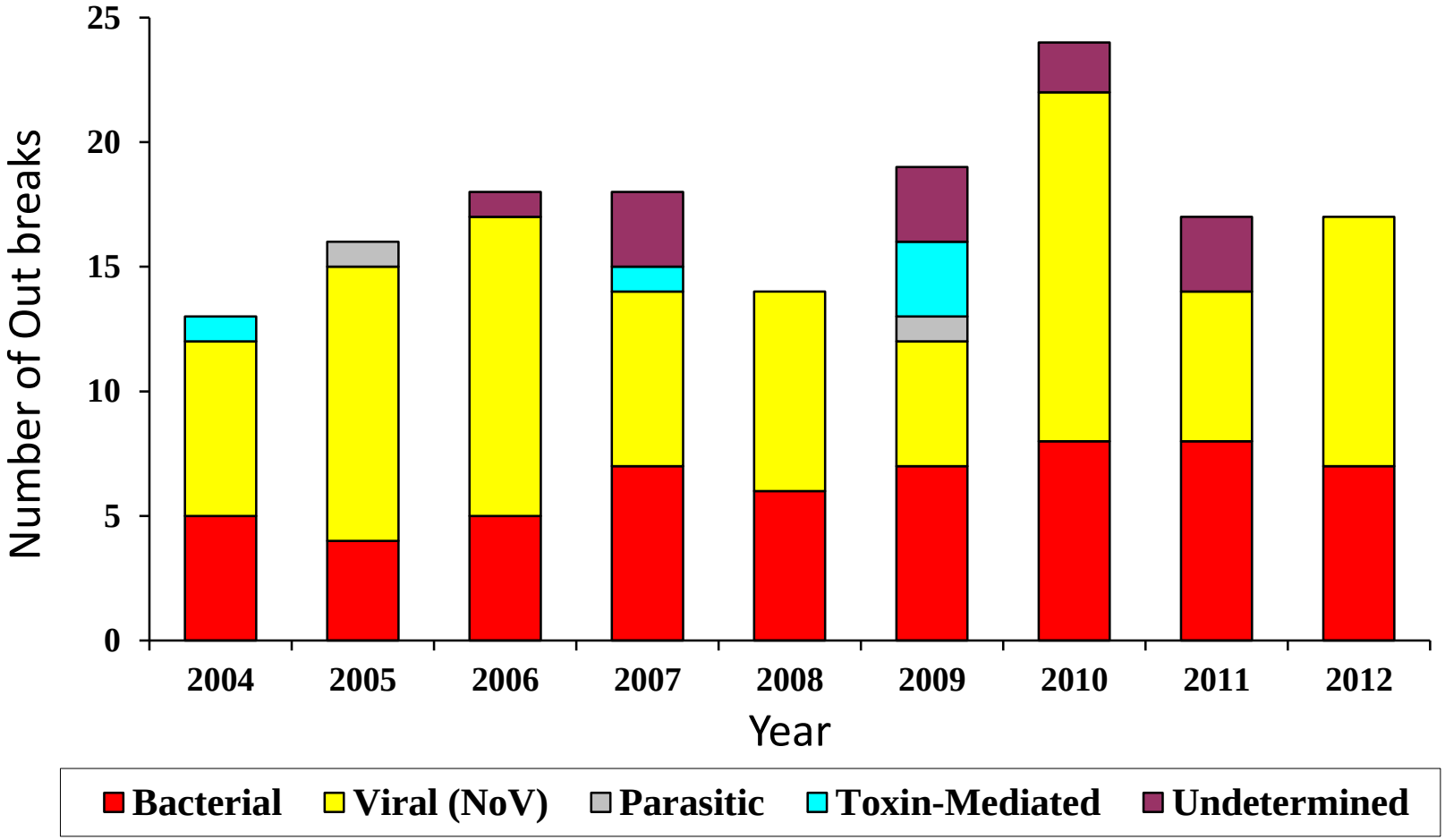
Connecticut, 2004-2012

N = 156



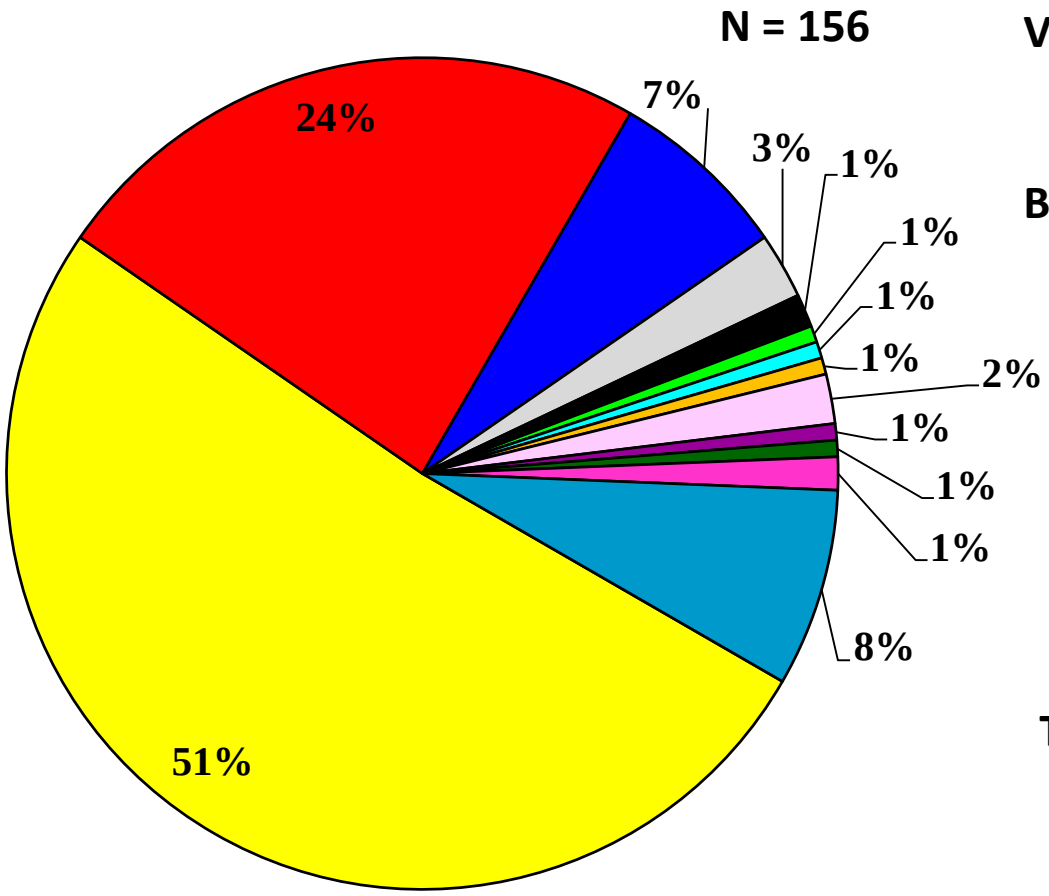
Causative Agents of Reported Foodborne Disease Outbreaks in Connecticut, 2004-2012

N = 156



Foodborne Disease Outbreaks by Etiology

Connecticut, 2004-2012



Viral: n=80

- **Norovirus (80)**
  - Laboratory-confirmed (70)
  - Suspected (10)

Bacterial: n=57

- ***Salmonella* (37)**
- ***E. coli* O157 (11)**
- ***Clostridium perfringens* (4)**
  - Laboratory-confirmed (2)
  - Suspected (2)
- ***Staphylococcus aureus* (2)**
- ***Campylobacter* (1)**
- ***Shigella* (1)**
- ***Vibrio parahaemolyticus* (1)**

Toxin-mediated: n=5

- ***Bacillus cereus* (3)**
- **Ciguatoxin (1)**
- **Scombroid (1)**

Parasitic: n=2

- ***Cyclospora* (2)**

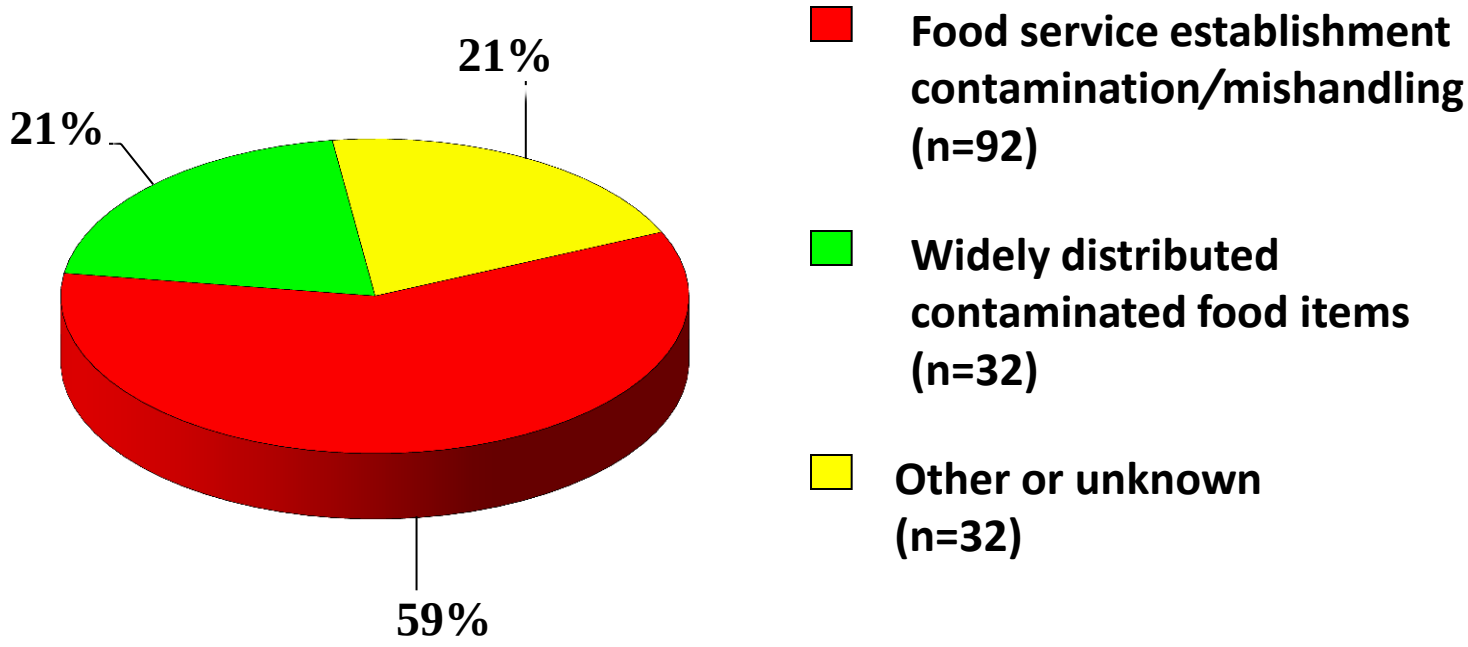
Undetermined: n=12

- **Unknown etiology (12)**

Foodborne Disease Outbreaks by Source

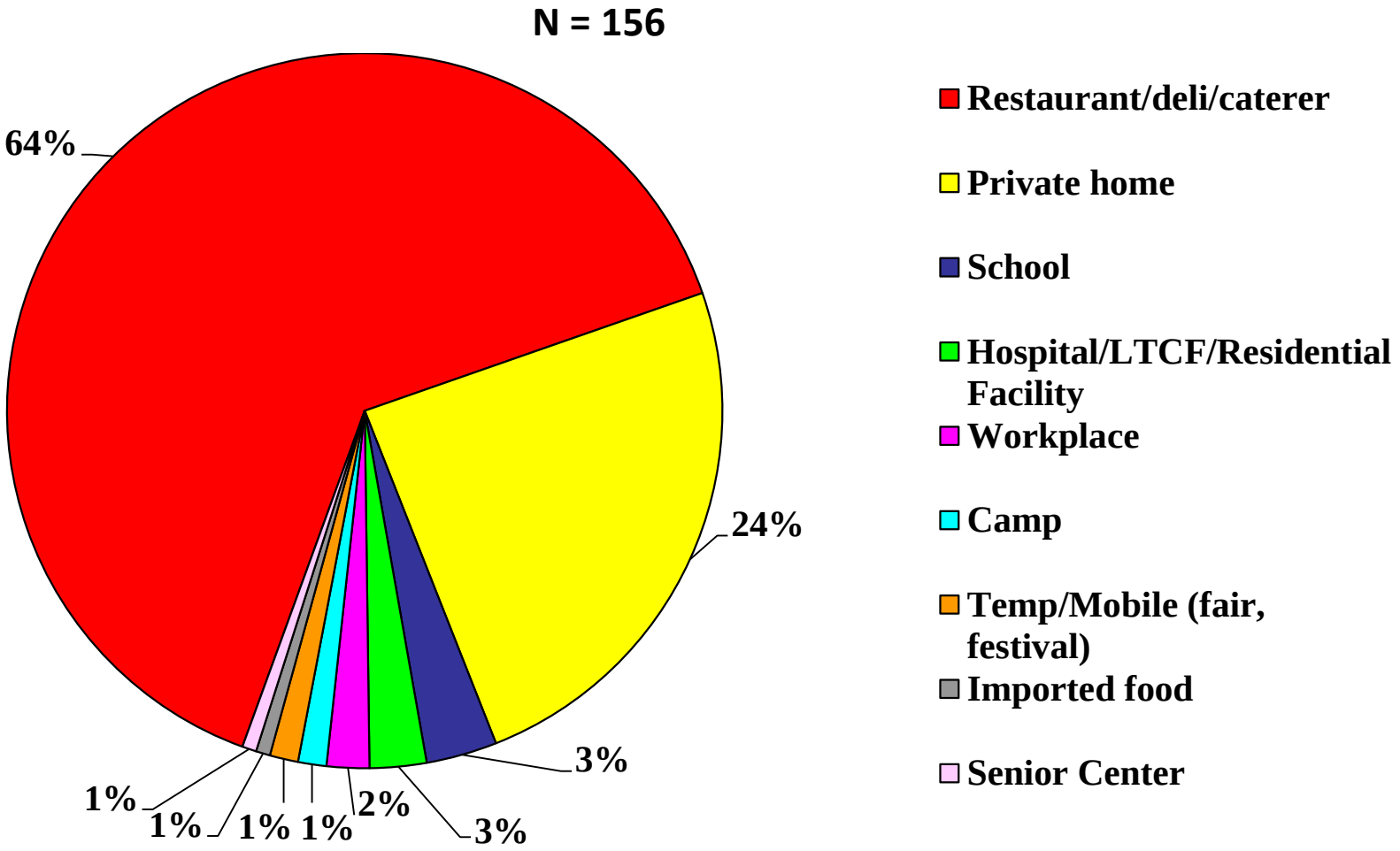
Connecticut, 2004-2012

N = 156



Foodborne Disease Outbreaks by Setting

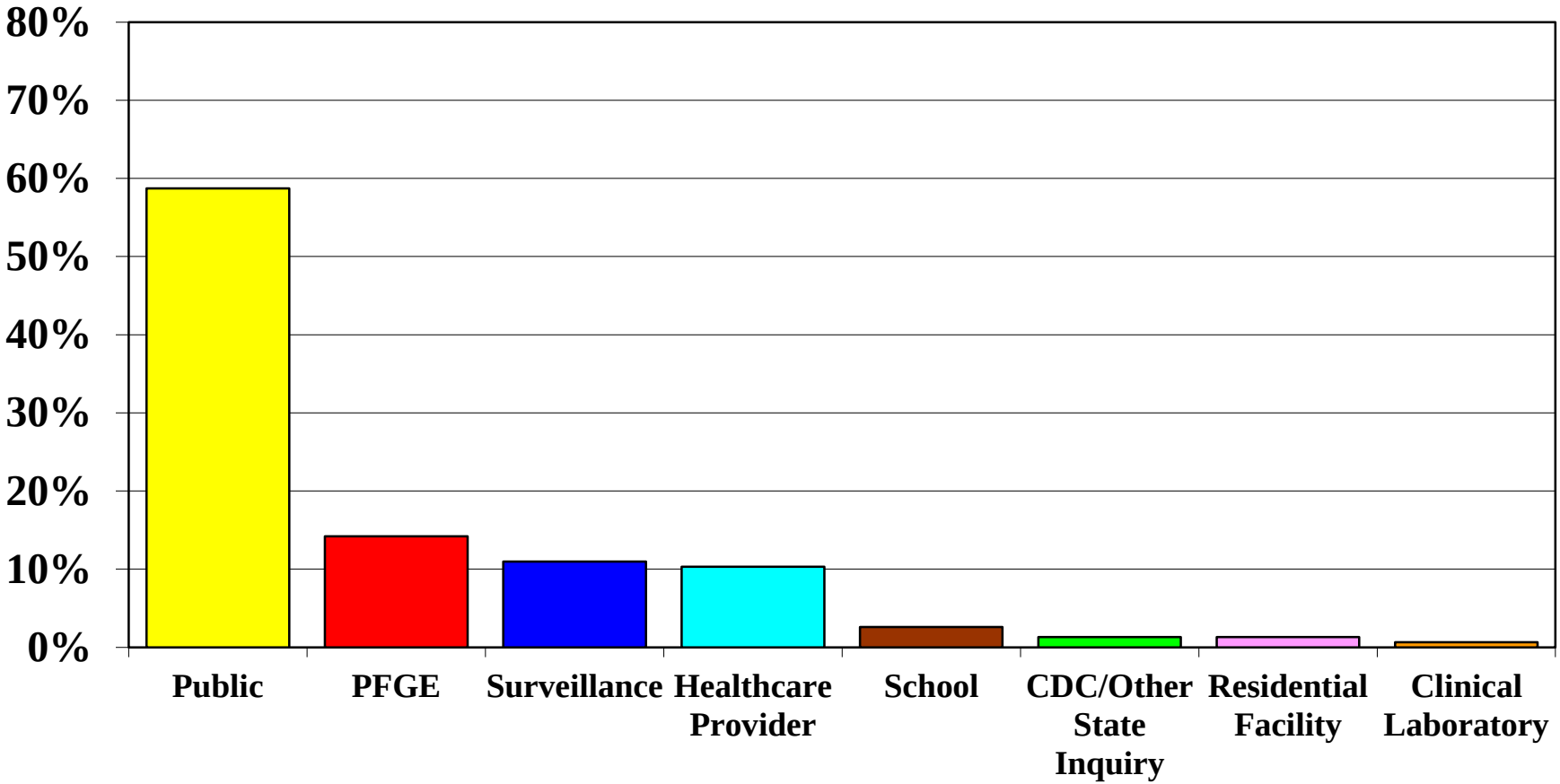
Connecticut, 2004-2012



Foodborne Disease Outbreaks by Reporting Source

Connecticut, 2004-2012

N = 156



* Reporting source missing for one outbreak

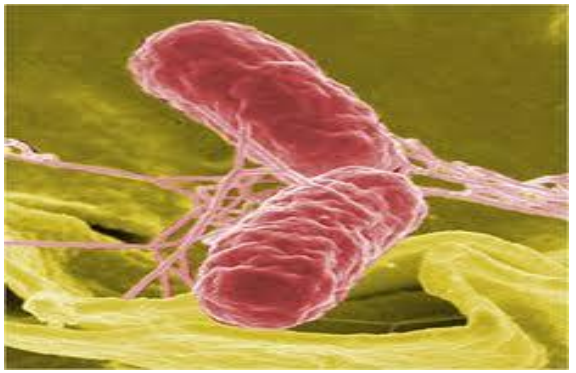
Multi-State Foodborne Disease Outbreaks Detected by PFGE Involving Connecticut

Year	*Salmonella*	*E. coli* O157:H7
2004	Roma tomatoes	N/A
2005	Unpasteurized orange juice	Lettuce, grapes
2006	Tomatoes (n=2) Peanut butter	Spinach
2007	Puffed vegetable snack food Frozen pot pies	Ground beef (n=2)
2008	Ground turkey Jalapeno peppers/tomatoes Peanut butter	N/A
2009	Salami	Raw cookie dough Ground beef

THE OUTBREAK

Background
Salmonellosis

- Estimated 1.4 million cases per year
- 40,000 cases reported in the US each year
- More than 2500 serotypes known to cause human disease
- Traditionally associated with animal-based food products
- Other food and water sources may also become contaminated

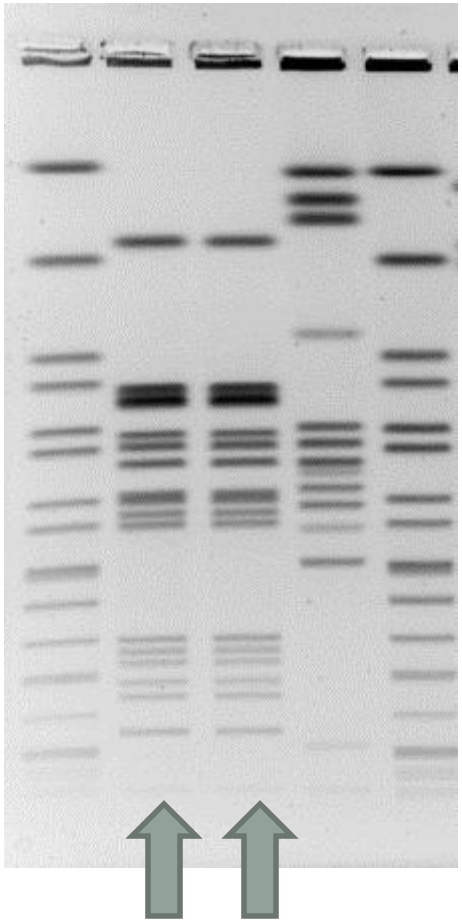


Background
Salmonellosis

- Symptoms
  - Diarrhea
  - Abdominal pain
  - Headache
  - Fever
- Incubation
  - 12 to 72 hours
- Duration
  - 5-7 days
- Shed in stool throughout infection

The Alert (03/01/2012-03/08/2012)

- March 1
  - NY State identifies potential Salmonella cluster
  - 4 cases of *Salmonella* Bareilly
  - *Salmonella* Bareilly is a rare serotype
    - Accounts for <0.5% of infections
- March 8
  - Connecticut is contacted by CDC
  - 4 CT residents identified that match a national cluster pattern of *Salmonella* Bareilly
  - 26 cases in 12 states



S. Barielly PFGE results from 2 CT cases

Initial Hypothesis (03/09/2012-03/16/2012)

- Among individuals with a completed hypothesis generating questionnaire:

Exposure	Exposed	Expected*
Any Seafood	80% (16/20)	
Any Fish	58% (11/19)	23% (Fresh fish)
Sushi	53% (10/19)	5% (Sushi, sashimi, ceviche)

- Among individuals reporting sushi consumption:

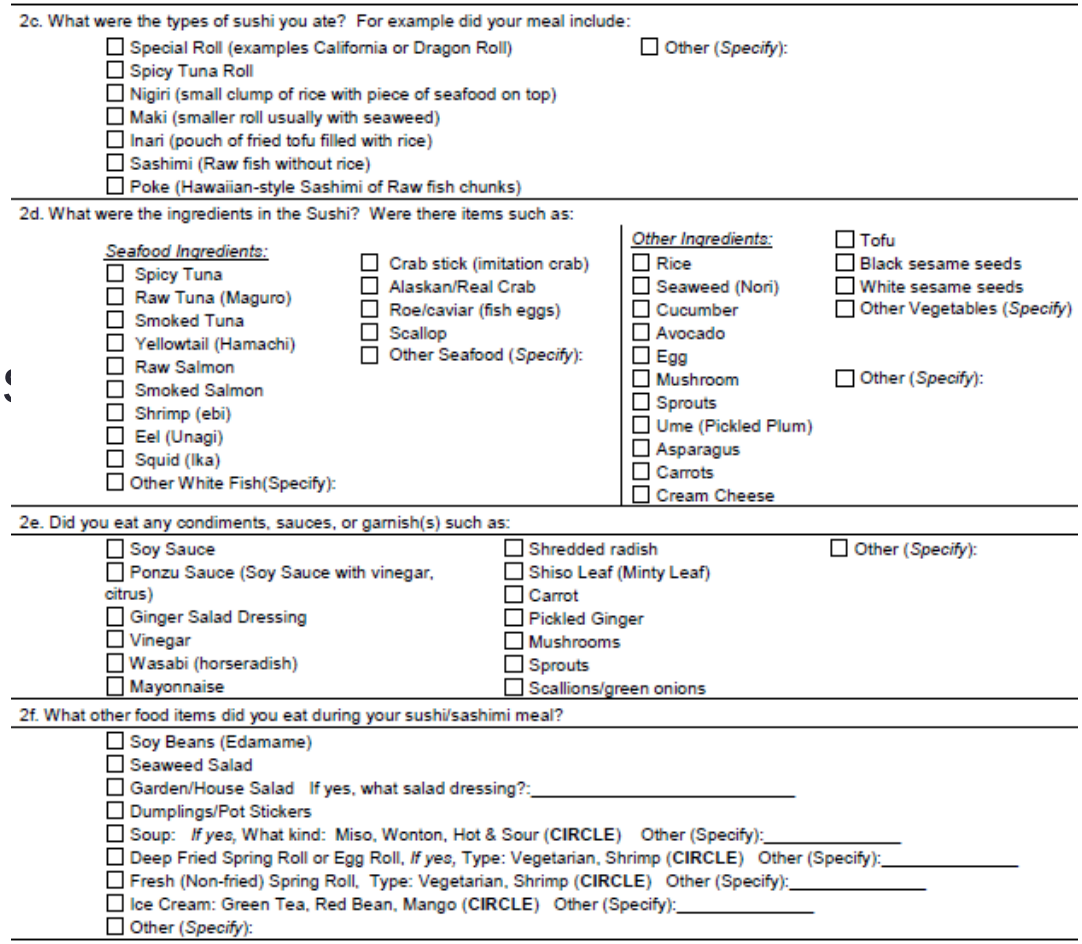
Exposure	Exposed
Tuna Sushi	100% (8/8)

- Restaurant clusters identified in 2 Japanese restaurants (TX, WI)
- 2 cases reported buying sushi at the same grocery store (WI)

*Expected consumption in general population is based on results of the FoodNet Population Study

Outbreak-Specific Questionnaire (Launched 03/16/2012)

- Case-patients interviewed with standardized questionnaires
- Able to compare responses across states
- Questions included:
  - Symptoms
  - Restaurants
  - Grocery Stores
  - Foods Consumed
- Extensive section on sushi



2c. What were the types of sushi you ate? For example did your meal include:

- ☐ Special Roll (examples California or Dragon Roll)
- ☐ Spicy Tuna Roll
- ☐ Nigiri (small clump of rice with piece of seafood on top)
- ☐ Maki (smaller roll usually with seaweed)
- ☐ Inari (pouch of fried tofu filled with rice)
- ☐ Sashimi (Raw fish without rice)
- ☐ Poke (Hawaiian-style Sashimi of Raw fish chunks)
- ☐ Other (*Specify*):

2d. What were the ingredients in the Sushi? Were there items such as:

Seafood Ingredients:

- ☐ Spicy Tuna
- ☐ Raw Tuna (Maguro)
- ☐ Smoked Tuna
- ☐ Yellowtail (Hamachi)
- ☐ Raw Salmon
- ☐ Smoked Salmon
- ☐ Shrimp (ebi)
- ☐ Eel (Unagi)
- ☐ Squid (Ika)
- ☐ Other White Fish(Specify):
- ☐ Crab stick (imitation crab)
- ☐ Alaskan/Real Crab
- ☐ Roe/caviar (fish eggs)
- ☐ Scallop
- ☐ Other Seafood (*Specify*):

Other Ingredients:

- ☐ Rice
- ☐ Seaweed (Nori)
- ☐ Cucumber
- ☐ Avocado
- ☐ Egg
- ☐ Mushroom
- ☐ Sprouts
- ☐ Ume (Pickled Plum)
- ☐ Asparagus
- ☐ Carrots
- ☐ Cream Cheese
- ☐ Tofu
- ☐ Black sesame seeds
- ☐ White sesame seeds
- ☐ Other Vegetables (*Specify*)
- ☐ Other (*Specify*):

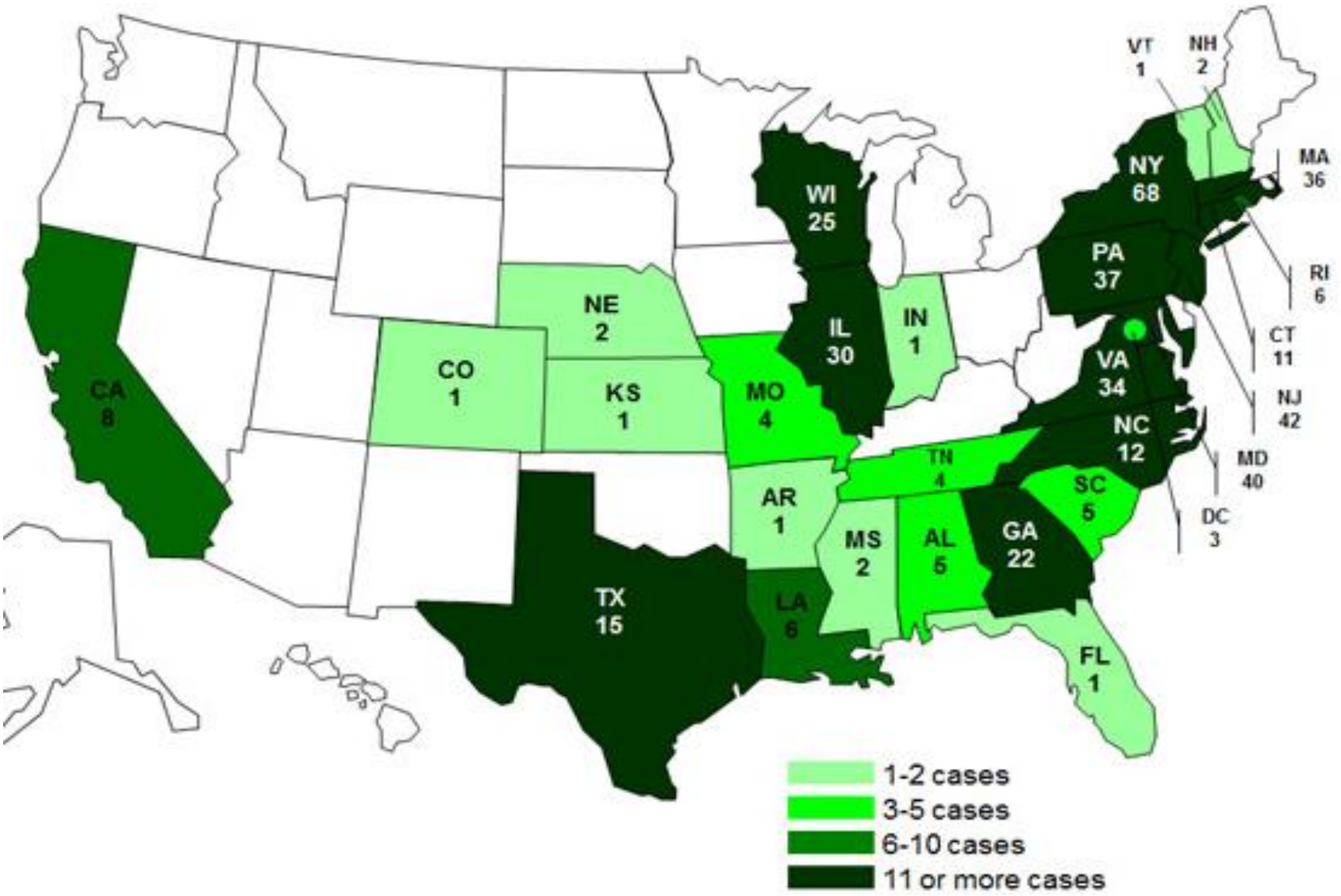
2e. Did you eat any condiments, sauces, or garnish(s) such as:

- ☐ Soy Sauce
- ☐ Ponzu Sauce (Soy Sauce with vinegar, citrus)
- ☐ Ginger Salad Dressing
- ☐ Vinegar
- ☐ Wasabi (horseradish)
- ☐ Mayonnaise
- ☐ Shredded radish
- ☐ Shiso Leaf (Minty Leaf)
- ☐ Carrot
- ☐ Pickled Ginger
- ☐ Mushrooms
- ☐ Sprouts
- ☐ Scallions/green onions
- ☐ Other (*Specify*):

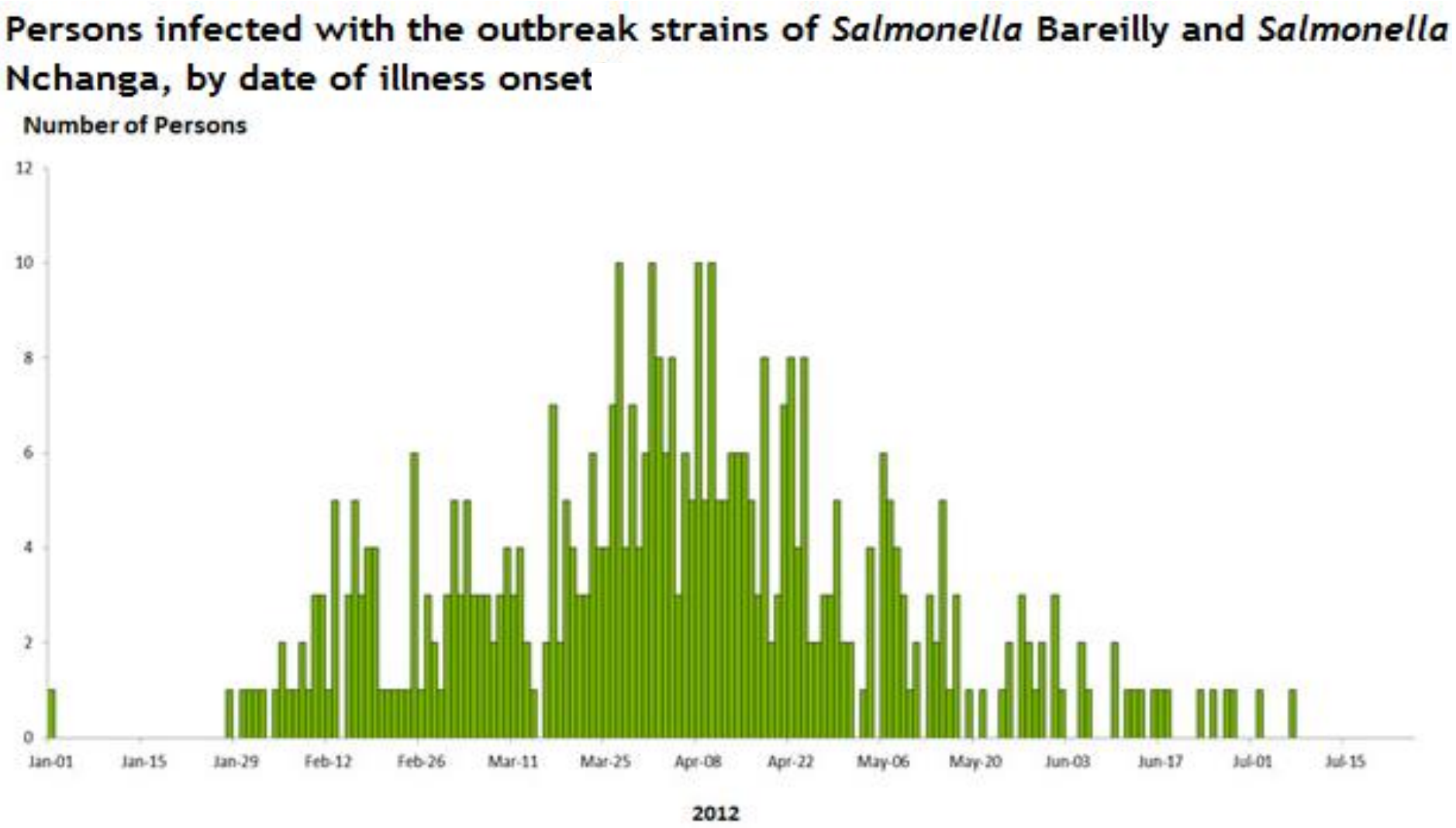
2f. What other food items did you eat during your sushi/sashimi meal?

- ☐ Soy Beans (Edamame)
- ☐ Seaweed Salad
- ☐ Garden/House Salad If yes, what salad dressing?:_____
- ☐ Dumplings/Pot Stickers
- ☐ Soup: *If yes,* What kind: Miso, Wonton, Hot & Sour (**CIRCLE**) Other (Specify):_____
- ☐ Deep Fried Spring Roll or Egg Roll, *If yes,* Type: Vegetarian, Shrimp (**CIRCLE**) Other (Specify):_____
- ☐ Fresh (Non-fried) Spring Roll, Type: Vegetarian, Shrimp (**CIRCLE**) Other (Specify):_____
- ☐ Ice Cream: Green Tea, Red Bean, Mango (**CIRCLE**) Other (Specify):_____
- ☐ Other (*Specify*):

Geographic Distribution of *S.* bariellyand *S.* nchanga cases



National Epidemic Curve



Outbreak Questionnaire Results

- **Connecticut**
  - Interviewed 10/11(91%) of cases
  - 2 restaurant clusters identified
  - 80% of interviewed cases reported eating sushi
  - 100% of sushi eaters reported eating “spicy tuna”

- **National**
  - 90% of cases reported eating sushi
  - 81% of sushi eaters reported eating “spicy tuna”

Restaurant Comparison Study (Launched 03/29/2012)

- **Purpose**: To determine if cases associated with the outbreak are more likely to eat tuna than other sushi eaters

- Conducted study in restaurants with 2 or more laboratory-confirmed cases
- Requested order information for date/time that case consumed meal
  - Assess food items served to other restaurant groups
  - Confirm that menu items ordered by case match reported food history

Restaurant Comparison Results (03/29/2012-04/09/2012)

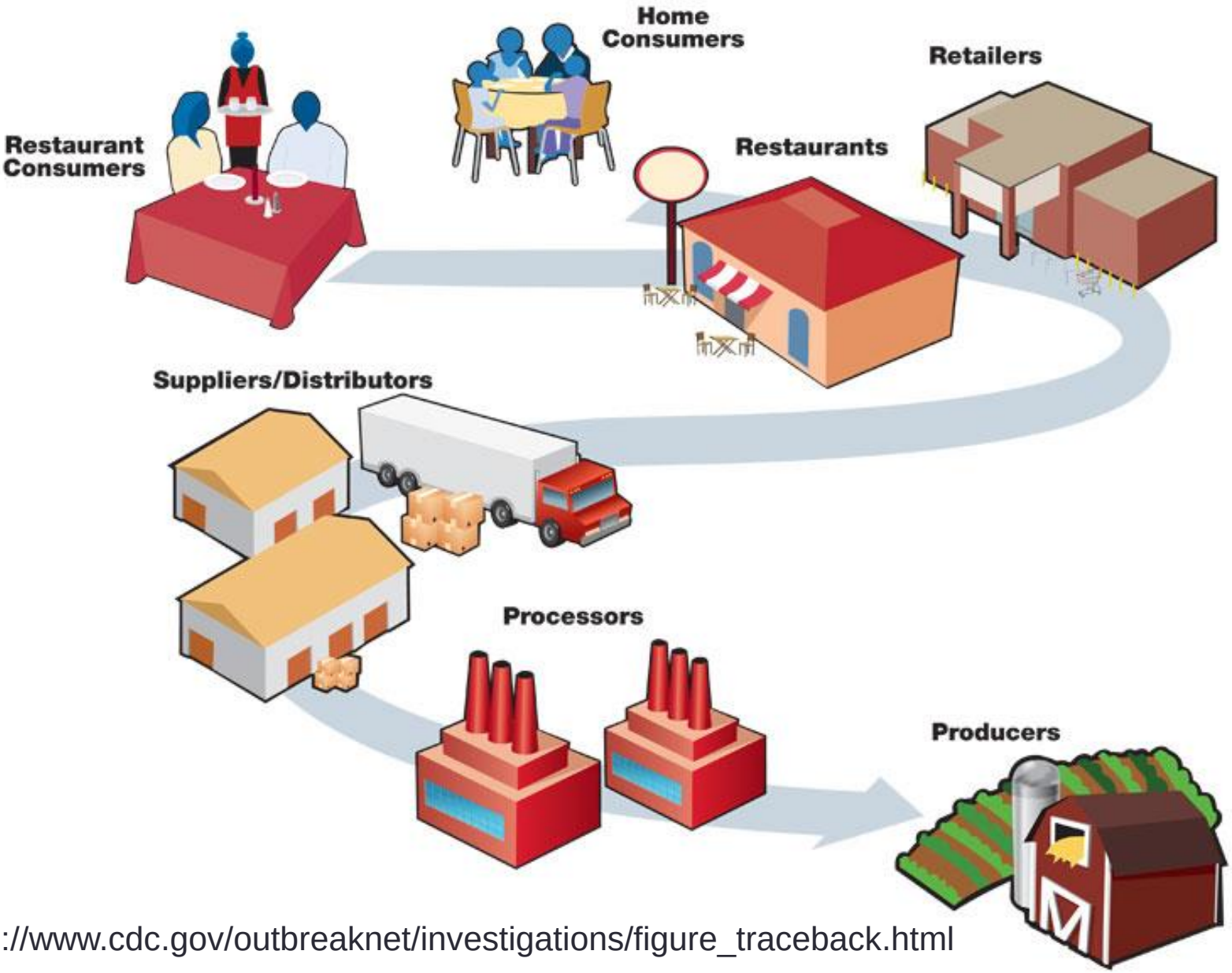
- 1 restaurant cluster identified in CT*
  - 4 case-patients reported sushi consumption at restaurant
  - Restaurant had electronic records
  - Manager reported using fresh tuna loin in all tuna sushi, including spicy tuna
  - Invoices collected
- 5 restaurant clusters identified nationally at time of study

	Case-Patients	Comparison Group
Any Sushi Tuna	91%	63% (range 43%-84%)
“Spicy Tuna”	84%	40% (range 29%-53%)

*2 clusters identified in CT, but only 1 known at time of restaurant comparison study

“Spicy Tuna’

Tracing the Food Back to the Source



http://www.cdc.gov/outbreaknet/investigations/figure_traceback.html

Traceback Activities (03/15/2012-04/13/2012)

- Invoices were collected on all ingredients used in preparation of spicy tuna sushi from restaurants
- FDA compared invoices from across states and determined that a common frozen tuna product was used
- CT restaurant owner admitted to using frozen tuna product

STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

Jewel Mullen, M.D., M.P.H., M.P.A.
Commissioner

Dannel P. Malloy
Governor
Nancy Wyman
Lt. Governor

Environmental Health Section

EHS Circular Letter # 2012-21

Date: April 16, 2012

To: Directors of Health
Certified Food Inspectors
Chief Sanitarians
Interested Parties

From: Tracey Weeks, MS, RS; Food Protection Program

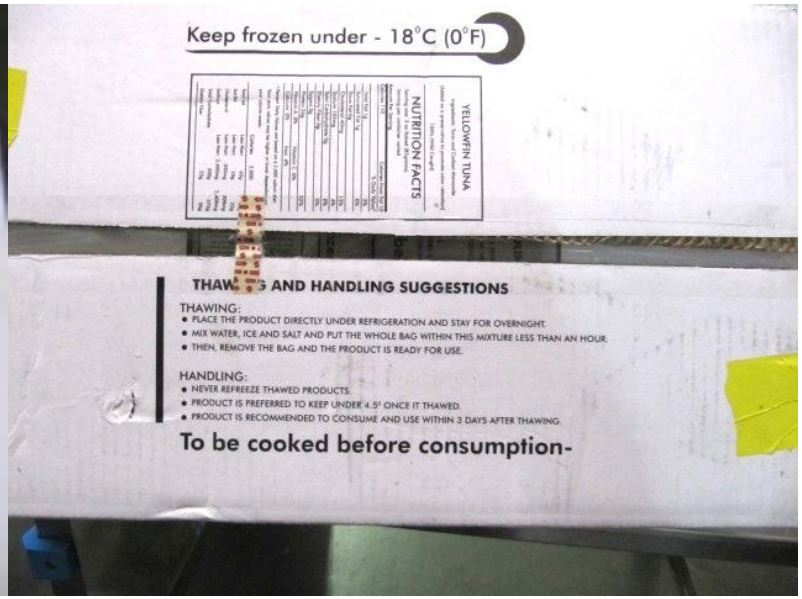
Re: **Recall of Frozen Raw Yellowfin Tuna product from Moon Marine USA Corporation *"Nakaochi Scrape"* Associated with a Multistate Outbreak of *Salmonella* Bareilly Infections**

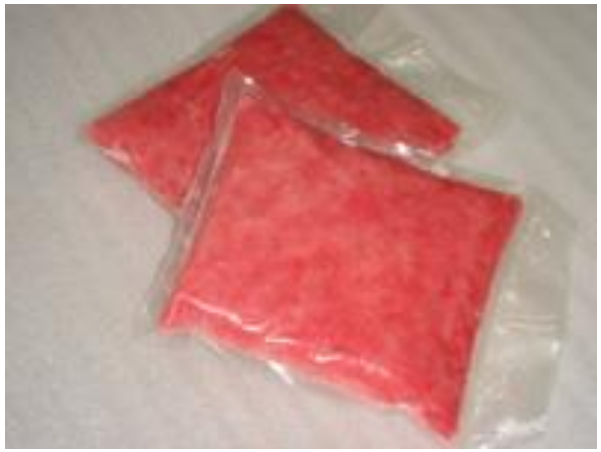
On Friday evening, April 13, 2012, the FDA released traceback information that identified a common source of raw tuna associated with cases of *Salmonella* Bareilly that are part of a multistate outbreak. Connecticut's investigation of a restaurant associated cluster of cases provided information to FDA that helped to identify the source. FDA's press release included the following information:

- Moon Marine USA Corporation (also known as MMI) of Cupertino, Calif. is voluntarily recalling 58,828 lbs. of a frozen raw yellowfin tuna product, labeled as Nakaochi Scrape AA or AAA. Nakaochi Scrape is tuna backmeat, which is specifically scraped off from the bones, and looks like a ground product.
- The product is not available for sale to individual consumers, but may have been used to make sushi, sashimi, ceviche and similar dishes available in restaurants and grocery stores.

What exactly is tuna scrape?

Recalled Tuna Products





Traceforward Activities

- FDA provided CT with a partial list of restaurants that received recalled product
- 2 restaurants identified in Fairfield County
  - 1 restaurant was associated with illnesses
- LHDs went to restaurants
  - Ensure recalled product was not being served
  - Collect product for product testing

Laboratory Investigation

- National
  - 6 states isolated *Salmonella* from tuna samples
  - 53(96%) of 55 of samples tested were positive
  - PFGE was done on 41 samples
    - 36 positive for *Samonella* Barielly
    - 12 positive for *Samonella* Nchanga
    - 7 positive for both serotypes
- Connecticut
  - Able to isolate both *Salmonella* Barielly and *Salmonella* Nchanga from intact package of tuna collected by LHD

	MAVENeventIDCT	Serotype
➔	food	Nchanga
➔	food	Bareilly

FDA Environmental Investigation

- On April 24, 2012, FDA issues report of findings from outbreak inspection of a Moon Fishery (India) Pvt. Ltd facility
  - Contamination of ice/water that comes into contact with raw product
    - Bird feces
    - Insects and filth from outdoors
    - Rust
  - Poor cleaning/sanitation practices
    - Broken surfaces/tiles
    - Remaining product residue after cleaning
    - Peeling paint
  - No hand drying devices available at handwashing stations
  - Facility did not maintain proper food safety documentation

http://www.fda.gov/downloads/AboutFDA/CentersOffices/OfficeofFoods/CFSAN/CFSANFOIAElectronicReadingRoom/UCM303440.pdf

News & Events

FDA NEWS RELEASE

For Immediate Release: July 26, 2013
Media Inquiries: Shelly Burgess, 301-796-4651, shelly.burgess@fda.hhs.gov
Consumer Inquiries: 1-888-INFO-FDA

Español Français 中文 عربي Русский

FDA takes step to help ensure the safety of imported food

Agency releases new proposed rules under FSMA for verifying foreign suppliers and accrediting third-party auditors

In order to implement the bipartisan Food Safety Modernization Act (FSMA) signed by President Obama, the U.S. Food and Drug Administration today issued two proposed rules aimed at helping to ensure that imported food meets the same safety standards as food produced in the United States.

These proposals are part of the FSMA approach to modernizing the food safety system for the 21st century. FSMA focuses on preventing food safety problems, rather than relying primarily on responding to problems after the fact. The FDA encourages Americans to review and comment on these important proposed rules.

Under the proposed rules, importers would be accountable for verifying that their foreign suppliers are implementing modern, prevention-oriented food safety practices, and achieving the same level of food safety as domestic growers and processors. The FDA is also proposing rules to strengthen the quality, objectivity, and transparency of foreign food safety audits on which many food companies and importers currently rely to help manage the safety of their global food supply chains.

The new measures respond to the challenges of food safety in today's global food system. Imported food comes into the United States from about 150 different countries and accounts for about 15 percent of the U.S. food supply, including about 50 percent of the fresh fruits and 20 percent of the fresh vegetables consumed by Americans.

"We must work toward global solutions to food safety so that whether you serve your family food grown locally or imported you can be confident that it is safe," said FDA Commissioner Margaret A. Hamburg, M.D. "Today's announcement of these two new proposed rules will help to meet the challenges of our complex global food supply system. Our success will depend in large part on partnerships across nations, industries, and business sectors."

Under the proposed regulations for Foreign Supplier Verification Programs (FSVP), U.S. importers would, for the first time, have a clearly defined responsibility to verify that their suppliers produce food to meet U.S. food safety requirements. In general, importers would be required to have a plan for imported food, including identifying hazards associated with each food that are reasonably likely to occur. Importers would be required to conduct activities that provide adequate assurances that these identified hazards are being adequately controlled.

"FSMA provides the FDA with a modern tool kit that shifts the paradigm for imports, as well as domestic foods, from a strategy of reaction to one of systematic prevention," said Michael R. Taylor, deputy commissioner for foods and veterinary medicine. "Rather than relying primarily on FDA investigators at the ports to detect and respond to food safety problems, importers would, for the first time, be held accountable for verifying, in a manner transparent to the FDA, that the food they import is safe."

FSMA also directs the FDA to establish a program for the Accreditation of Third-Party Auditors for imported food. Under this proposed rule, the FDA would recognize accreditation bodies based on certain criteria such as competency and impartiality. The accreditation bodies, which could be foreign government agencies or private companies, would in turn accredit third-party auditors to audit and issue certifications for foreign food facilities and food, under certain circumstances.

Importers will not generally be required to obtain certifications, but certifications may be used by the FDA to determine whether to admit certain imported food that poses a safety risk into the United States. The FSVP proposed rule and the third-party accreditation proposed rule are available for public comment for the next 120 days. The two proposed rules will help the FDA create an integrated import oversight system that works efficiently to improve food safety and protect the public health.

Should you eat sushi?

- Infants, older adults, pregnant women, and persons with impaired immune systems are more likely than others to develop severe illness and should not eat raw or partially cooked fish or shellfish.

http://www.fda.gov/food/recallsoutbreaksemergencies/outbreaks/ucm298741.htm#advice

Conclusions

- PFGE is an important tool for the detection of outbreaks due to widely distributed food items
- Multistate outbreak investigations require increased collaboration between local, state, and federal partners
- Multistate outbreaks can be resource intensive
  - Active case finding
  - Epidemiological and environmental studies
  - Laboratory testing of clinical, environmental, and food specimens
  - Implementing control measures
- Usually have less cases than point-source outbreaks
- Findings of investigation can have widespread impact

Timeline of Events: Multistate Outbreak of *Salmonella* Bareilly and *Salmonella* Nchanga Infections Associated with a Raw Scraped Ground Tuna Product -- United States, 2012

Outbreak Identification and Source Implication

March 1
NY State Department of Health notified CDC's Outbreak Response Team (ORT) of a cluster of 4 ill persons infected with *Salmonella* Bareilly with the same unusual pulsed-field gel electrophoresis pattern.

March 2
PulseNet shows 11 persons in 7 states with the same pattern. CDC began coordinating a multistate investigation and held first multistate conference call.

March 8
Exposure information from 8 ill persons revealed that 7 reported eating seafood and 5 ate sushi in the week before becoming ill. TX Department of State Health Services reported first cluster of 2 unrelated ill persons who ate at the same Japanese steakhouse which serves sushi.

March 13
WI Department of Health Services (WDHS) reported a second cluster of unrelated ill persons eating at the same Japanese restaurant.

March 16
Preliminary information from 22 ill persons revealed that in the week before illness 80% reported eating seafood and 55% reported eating sushi. Among 8 ill persons who reported the type of sushi, all reported eating tuna. WDHS reported a third cluster of unrelated ill persons who ate sushi purchased from the same grocery store.

March 22
Among 19 ill persons who were asked detailed questions about eating sushi, 18 reported eating sushi in the week before illness and 80% of sushi eaters reported eating spicy tuna. CT Department of Public Health reported a fourth cluster of unrelated ill persons who ate sushi at the same restaurant. MD Department of Health and Mental Hygiene reported a fifth cluster of unrelated ill persons who ate sushi at the same restaurant.

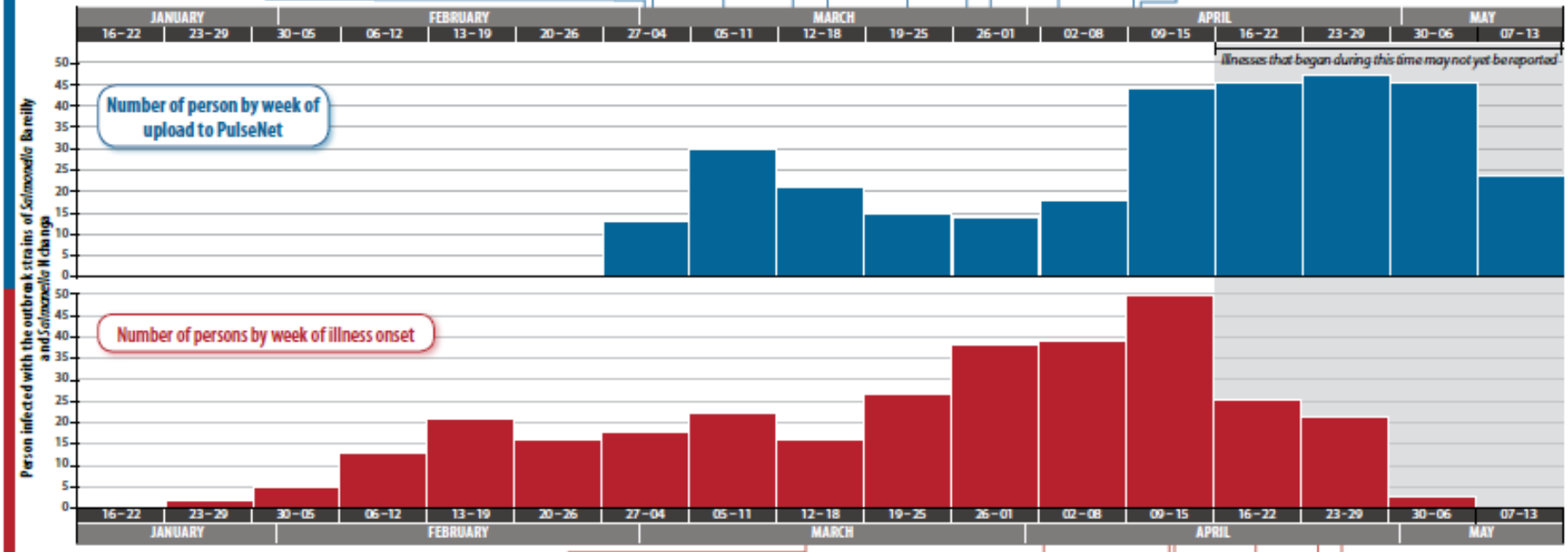
March 27
Among 29 ill persons who were asked detailed questions about eating sushi, 90% reported eating sushi and 81% of sushi eaters reported eating spicy tuna.

March 29
Restaurant sushi order comparison study launched.

April 4
CDC posted initial web announcement about investigation.

April 9
Preliminary results of restaurant comparison study from 4 restaurants show that the proportion of comparison sushi orders containing spicy tuna as an ingredient averaged 37% (ranging from 29% to 53%).

April 10
WDHS notified CDC's ORT about 5 recent *Salmonella* Nchanga infections occurring in the same states as the *Salmonella* Bareilly cases. One ill person in WI had reported eating tuna sushi.



n=316 for whom information was reported as of May 14, 2012

Trackback and Regulatory Activities, and Results of Product Testing

March 15
FDA began receiving supplier and invoice data collected by state and local departments of health and agriculture.

April 2
FDA activated an Incident Management Group and transferred *Salmonella* Bareilly response activities within the FDA Emergency Operations Center. CDC staff member joined FDA Team in Washington, DC.

April 13
Moon Marine USA Corporation voluntarily recalled 58,828 pounds of frozen raw yellowfin tuna product, labeled as Nakaochi Scrape AA or AAA, from a single tuna processing facility in India. CDC and FDA warned public not to eat recalled product.

April 13 – 14
FDA issued two Import Alerts for fresh and frozen tuna from Moon Fishery India Pvt Ltd.

April 19 – 24
FDA conducted a seafood Hazard Analysis and Critical Control Point Inspection at Moon Fishery Pvt Ltd. in India.

April 24
WDHS announced that the Department of Agriculture Trade and Consumer Protection laboratory had found *Salmonella* Bareilly contamination in recalled yellowfin tuna and in a spicy tuna roll made with the recalled tuna.

April 26
FDA announced finding the outbreak strains of *Salmonella* Bareilly and *Salmonella* Nchanga in unopened packages of yellowfin tuna product imported from Moon Marine USA Corporation.

For more information, visit CDC's *Salmonella* website: http://www.cdc.gov/salmonella/

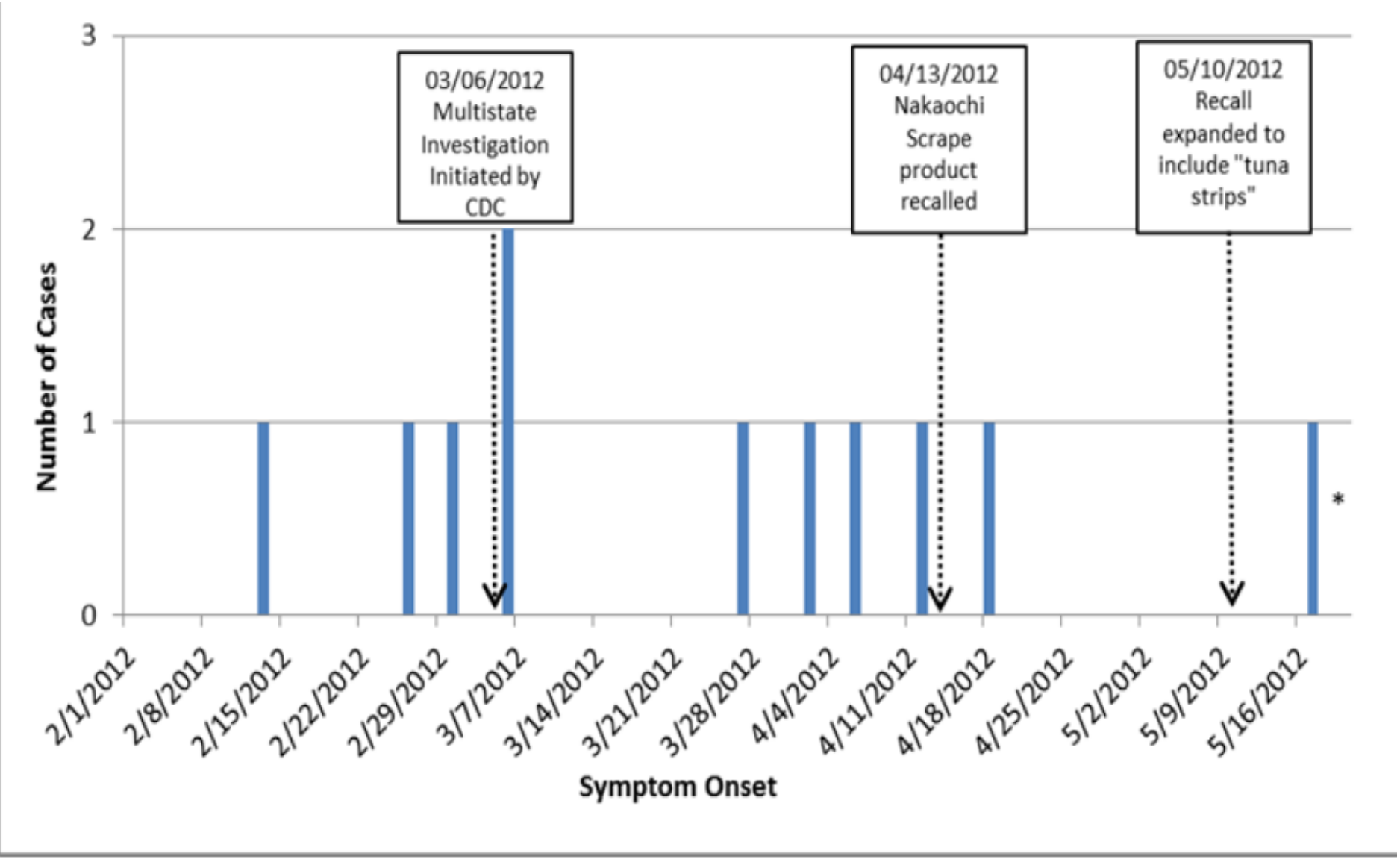
As of May15, 2012
CS270379-A

Acknowledgements

Local Partners	State Partners	Federal Partners
Stonington HD	DPH Epidemiology Program	CDC
Fairfield HD	DPH Food Protection Program	FDA
Norwalk HD	DPH State Laboratory	
Other LHDs	Other State HDs	

Questions???

CT Epi Curve



*Estimated onset based on date of specimen collection.