

Introduction to Communicable Disease Surveillance and Investigation in North Carolina

January 2014



Reportable Disease Surveillance

Aaron Fleischauer, PhD, MSPH

CDC Career Epidemiology Field Officer

NC DPH



OBJECTIVES

- Learn the basis for reportable disease surveillance in North Carolina
- Follow the steps in the surveillance process
- Understand how local reportable disease surveillance fits in the national notifiable disease surveillance system



“Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health.”

- Centers for Disease Control and Prevention
MMWR, July 7, 2001



“Effective public health surveillance begins at the level of local and state health departments. They work with various healthcare providers, including laboratories, hospitals, and private providers, to obtain case reports on many infectious and some noninfectious diseases and conditions.”



REPORTABLE DISEASE SURVEILLANCE

- Guide immediate action for cases of importance;
- Monitor trends in the burden of a disease, including the detection of outbreaks;
- Guide the planning, implementation, and evaluation of programs to prevent and control disease;



REPORTABLE DISEASE SURVEILLANCE

- Evaluate public policy;
- Detect changes in health practices;
- Prioritize the allocation of health resources;
- Describe the clinical course of disease; and
- Provide a basis for epidemiologic research.



REPORTABLE DISEASE SURVEILLANCE

- Legal mandate for name-based disease reporting to public health agencies in all 50 U.S. States and territories
- In North Carolina, reportable diseases are mandated in in Article 6 of the NC General Statutes
- 77 disease and conditions are designated as reportable



**CHAPTER 41 – HEALTH: EPIDEMIOLOGY
SUBCHAPTER 41A – COMMUNICABLE DISEASE CONTROL
SECTION .0100 – REPORTING OF COMMUNICABLE DISEASES
10A NCAC 41A .0101 REPORTABLE DISEASES AND CONDITIONS**

The following named diseases and conditions are declared to be dangerous to the public health and are hereby made reportable within the time period specified after the disease or condition is reasonably suspected to exist:

- (1) acquired immune deficiency syndrome (AIDS) -24 hours;
- (2) anthrax - immediately;
- (3) botulism - immediately;
- (4) brucellosis -7 days;
- (5) campylobacter infection -24 hours;
- (6) chancroid -24 hours;
- (7) chlamydial infection (laboratory confirmed) -7 days;
- (8) cholera -24 hours;
- (9) Crutzfeldt-Jacob disease -7 days;



CASE DEFINITIONS – MENINGOCOCCAL MENINGITIS

Suspect: Clinical purpura fulminans in the absence of a positive blood culture **OR** a clinically compatible case with gram negative diplococci from a normally sterile site (e.g., blood or CSF)

Probable: A clinically compatible case that has either: Evidence of *N. meningitidis* DNA using a validated polymerase chain reaction (PCR), obtained from a normally sterile site (e.g., blood or CSF) **OR** evidence of *N. meningitidis* antigen by immunohistochemistry (IHC) on formalin-fixed tissue or latex agglutination of CSF

Confirmed: A clinically compatible case **AND** isolation of *Neisseria meningitidis* from a normally sterile site (e.g., blood or cerebrospinal fluid {CSF} or, less commonly, synovial, pleural, or pericardial fluid) or skin scrapings of purpuric lesions.



CASE DEFINITION – SHIGA TOXIN E. COLI (STEC)

Suspect: A case of postdiarrheal HUS or TTP (see HUS case definition), or identification of Shiga toxin in a specimen from a clinically compatible case without the isolation of the Shiga toxin-producing *E. coli*.

Probable: A case with isolation of *E. coli* O157 from a clinical specimen, without confirmation of H antigen or Shiga toxin production, **OR** A clinically compatible case that is epidemiologically linked to a confirmed or probable case, **OR** Identification of an elevated antibody titer to a known Shiga toxin-producing *E. coli* serotype from a clinically compatible case.

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



- Physicians
- Laboratories
- STD clinics
- Community health clinics

Case reporting



County Health Department



**North Carolina Department of Health and Human Services
Division of Public Health • Epidemiology Section
Communicable Disease Branch**



ATTENTION HEALTH CARE PROVIDERS:

Please report relevant clinical findings about this disease event to the local health department.

Confidential Communicable Disease Report—Part 1

NC DISEASE CODE
(see reverse side for code)

Patient's Last Name		First	Middle	Suffix	Maiden/Other	Alias		
Birthdate (mm/dd/yyyy)		Sex <input type="checkbox"/> M <input type="checkbox"/> F <input type="checkbox"/> Trans.		Parent or Guardian (of minors)		Patient Identifier SSN		
Patient's Street Address			City	State	ZIP	County Phone (____) ____-____		
Age _____	Age Type <input type="checkbox"/> Years <input type="checkbox"/> Months <input type="checkbox"/> Weeks <input type="checkbox"/> Days	Race (check all that apply): <input type="checkbox"/> White <input type="checkbox"/> Black/African American <input type="checkbox"/> American Indian/Alaska Native <input type="checkbox"/> Native Hawaiian or Pacific Islander		Ethnic Origin <input type="checkbox"/> Asian <input type="checkbox"/> Other <input type="checkbox"/> Unknown <input type="checkbox"/> Hispanic <input type="checkbox"/> Non-Hispanic		Was patient hospitalized for this disease? (>24 hours) <input type="checkbox"/> Yes <input type="checkbox"/> No	Did patient die from this disease? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is the patient pregnant? <input type="checkbox"/> Yes <input type="checkbox"/> No
Patient is associated with (check all that apply): <input type="checkbox"/> Child Care (child, household contact) <input type="checkbox"/> Correctional Facility (inmate or worker)				In what geographic location was the patient MOST LIKELY exposed? <input type="checkbox"/> In patient's county of residence				



- Physicians
- Laboratories
- STD clinics
- Community health clinics



*Standardized
data collection*

County Health
Department



North Carolina Department of Health and Human Services
 Division of Public Health • Epidemiology Section
 Communicable Disease Branch



ATTENTION HEALTH CARE PROVIDERS:

Please report relevant clinical findings about this disease event to the local health department.

CRYPTOSPORIDIOSIS

Confidential Communicable Disease Report—Part 2
 NC DISEASE CODE: 56

ATTENTION Local Health Department Staff: There is no Part 2 Wizard for this disease. Enter all information from this form into the NC EDSS question packages.

If sending this form to the Health Care Provider, remember to attach a cover letter from your agency indicating the part(s) of the form the provider should complete.

Patient's Last Name	First	Middle	Suffix	Maiden/Other	Alias	Birthdate (mm/dd/yyyy) / /	
						SSN	
NC EDSS LAB RESULTS							
Verify if lab results for this event are in NC EDSS. If not present, enter results.							
Specimen Date	Specimen #	Specimen Source	Type of Test	Test Result(s)	Description (comments)	Result Date	Lab Name—City/State
/ /						/ /	

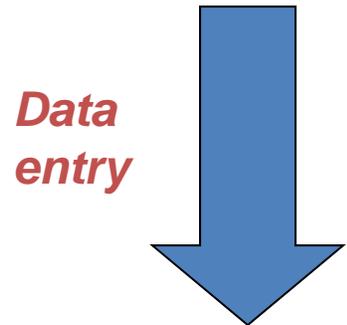




- Physicians
- Laboratories
- STD clinics
- Community health clinics



County and State Health Departments



North Carolina Electronic Disease Surveillance System (NC EDSS)

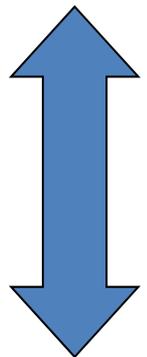


- Physicians
- Laboratories
- STD clinics
- Community health clinics



County and State Health Departments

Data sharing



North Carolina Electronic Disease Surveillance System (NC EDSS)



August 2013 Monthly Report

	Cases in August, 2013	Cases January - August, 2013	Average cases January - August, 2008-2012	Cases in 2012	Average cases per year, 2008-2012
General Communicable Diseases					
Anthrax	0	0	0	0	0
Botulism ¹	0	0	1	1	1
Brucellosis	0	0	1	5	2
Campylobacter Infection*	145	671	548	1,141	834
Cholera	0	0	0	0	0
Creutzfeldt-Jakob Disease	1	17	7	18	12
Cryptosporidiosis	40	90	63	89	111
Cyclosporiasis	0	0	1	2	1
Dengue	1	7	3	8	6
E. Coli O157:H7/STEC Infection*	12	59	75	223	149
Ehrlichiosis ²	8	48	58	209	156
Encephalitis, Arboviral Other	0	0	0	0	2
Encephalitis, California group (e.g. Lacrosse)	1	4	4	29	50
Encephalitis, Eastern Equine	0	0	0	2	2
Encephalitis, West Nile	0	0	1	18	11
Foodborne - C. perfringens	0	1	0	0	0
Foodborne - Staphylococcal	0	3	2	2	3
Foodborne Other	0	2	9	3	11
Haemophilus Influenzae	12	109	70	99	100
Hantavirus	0	0	0	0	0
Hemolytic Uremic Syndrome	1	4	3	7	6
Hemorrhagic Fever Virus infection	0	0	0	0	0
Hepatitis A	4	33	30	34	43
Hepatitis C - Acute	9	42	32	64	46
Influenza death (<18 years old)	0	0	3	2	4
Influenza, Adult Death (18 years of age or more) ³	0	38	12	28	24
Influenza, NOVEL virus infection ⁴	0	0	165	0	224
Legionellosis	9	58	40	69	66
Leprosy (Hansen's Disease)	0	1	0	1	0
Leptospirosis	0	0	0	0	1
Listeriosis	2	12	11	14	21
Lyme disease	20	94	54	202	245
Malaria ⁵	1	15	24	34	41
Meningococcal Invasive Disease	0	10	12	6	16
Monkeypox	0	0	0	0	0
Plague	0	0	0	0	0
Pneumococcal meningitis	1	27	22	31	30
Psittacosis	0	0	0	0	0
Q Fever	2	6	2	9	4
Rabies - Human	0	1	0	0	0
Salmonellosis*	218	1,016	1,129	2,214	2,134
SARS	0	0	0	0	0
Shigellosis	18	105	175	138	259

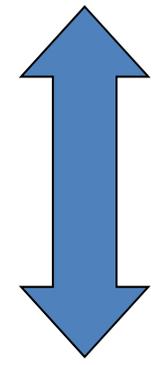


- Physicians
- Laboratories
- STD clinics
- Community health clinics

CDC, State, and local surveillance information consumers (e.g., health departments, clinicians, laboratories)



County and State Health Departments



North Carolina Electronic Disease Surveillance System (NC EDSS)

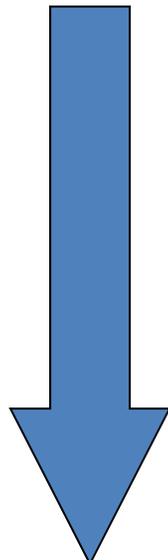


- Physicians
- Laboratories
- STD clinics
- Community health clinics



County and State Health Departments

Planning and Intervention



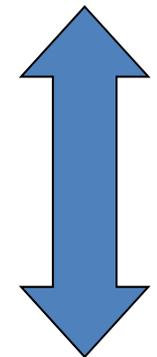
Public Health Action



- Physicians
- Laboratories
- STD clinics
- Community health clinics

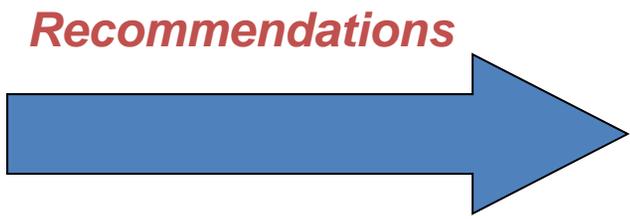


County and State Health Departments



North Carolina Electronic Disease Surveillance System (NC EDSS)

Evaluation

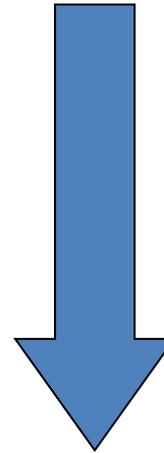


- Physicians
- Laboratories
- STD clinics
- Community health clinics



Reporting

County Health
Departments



Reporting

Centers for
Disease
Control and
Prevention



Notification

State Health
Department



NATIONALLY NOTIFIABLE DISEASE SURVEILLANCE (NNDSS)

- National, voluntary, passive disease surveillance system
- Standard list of nationally notifiable diseases (NNDs)
- New diseases may be added as new pathogens emerge (e.g., SARS)
- System is managed by CDCs National Center for Public Health Informatics



NATIONALLY NOTIFIABLE DISEASE SURVEILLANCE (NNDSS)

- National standards— consistent case definitions for nationally notifiable diseases
- Maintain the official national notifiable diseases statisticsIdentify specific disease trends
- Assess prevention and control programs
- Track national health trends



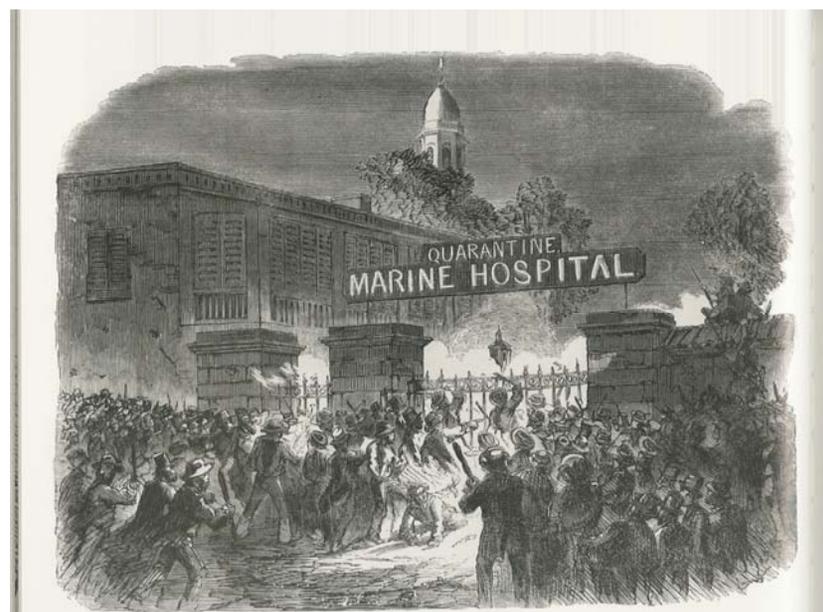
NNDSS

- List revised periodically
- 60 notifiable diseases and conditions
- Occasionally disease are deleted or added
- For example: “novel influenza virus A infection” and “smallpox”
- Some differences between reportable disease lists and the NNDs list



NNDSS

- 1878 – Port Quarantine Act
- 1893 – Interstate Quarantine Report
- 1912 – State and Federal Reporting (reportable/notifiable)
- 1950 – CSTE/PHS meeting to establish the NNDs
- 1961 – CDC assumes lead for NNDs



NNDSS

- 2001 – CSTE adopted the position statement on standardizing the structure of public health case definitions
- 2005 – International Health Regulations
- 2009 – CSTE position statement on immediately nationally notifiable conditions
- 2010 – CSTE approved Babesiosis and Coccidioidomycosis as nationally notifiable

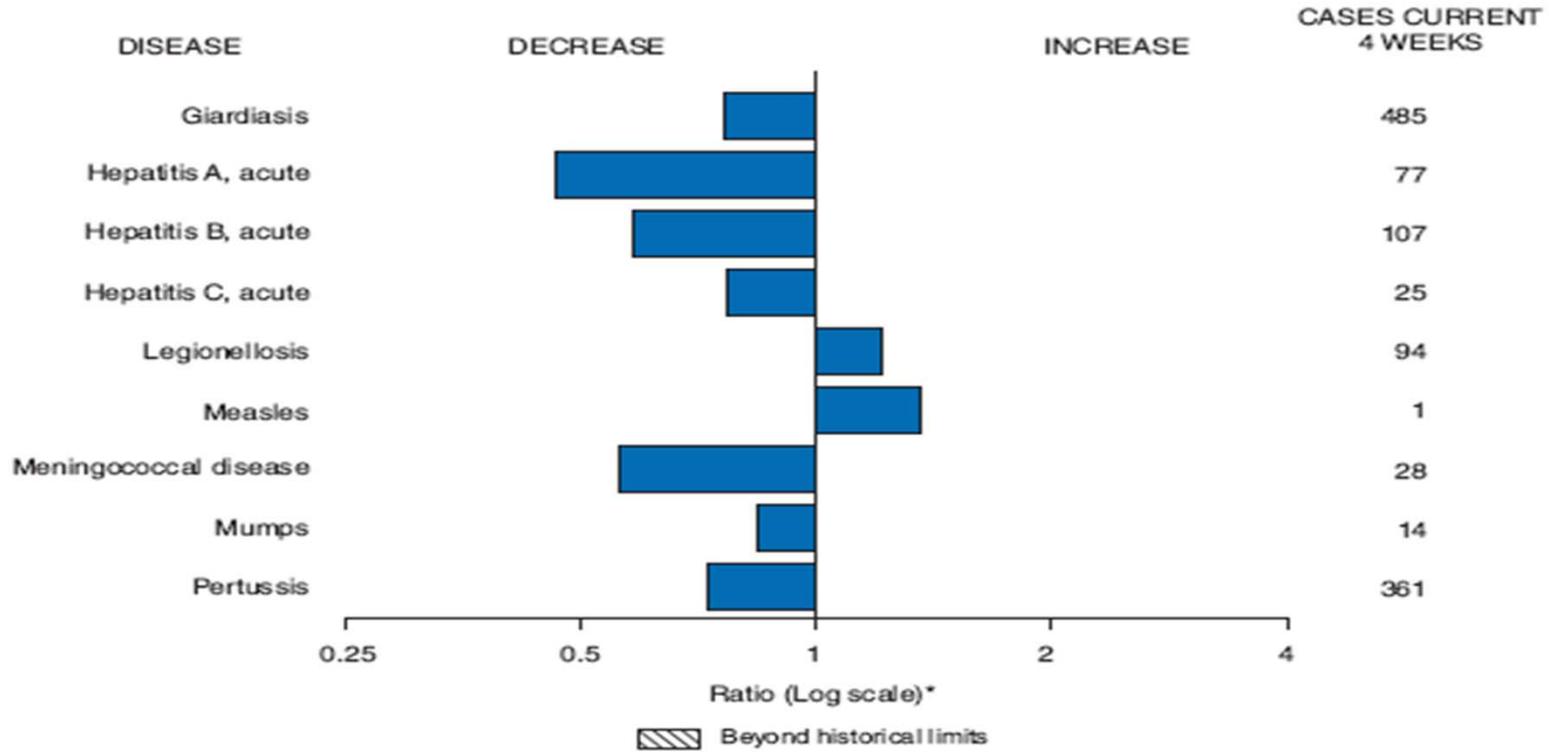


NATIONAL DISEASE SURVEILLANCE

- Over 100 federal surveillance systems
- Collect data on over 200 infectious and non-infectious conditions such as:
 - Active Bacterial Core Surveillance (ABCs)
 - Foodborne Diseases Active Surveillance Network (FoodNet)
 - National West Nile Virus Surveillance System
 - Viral Hepatitis Surveillance Program (VHSP)



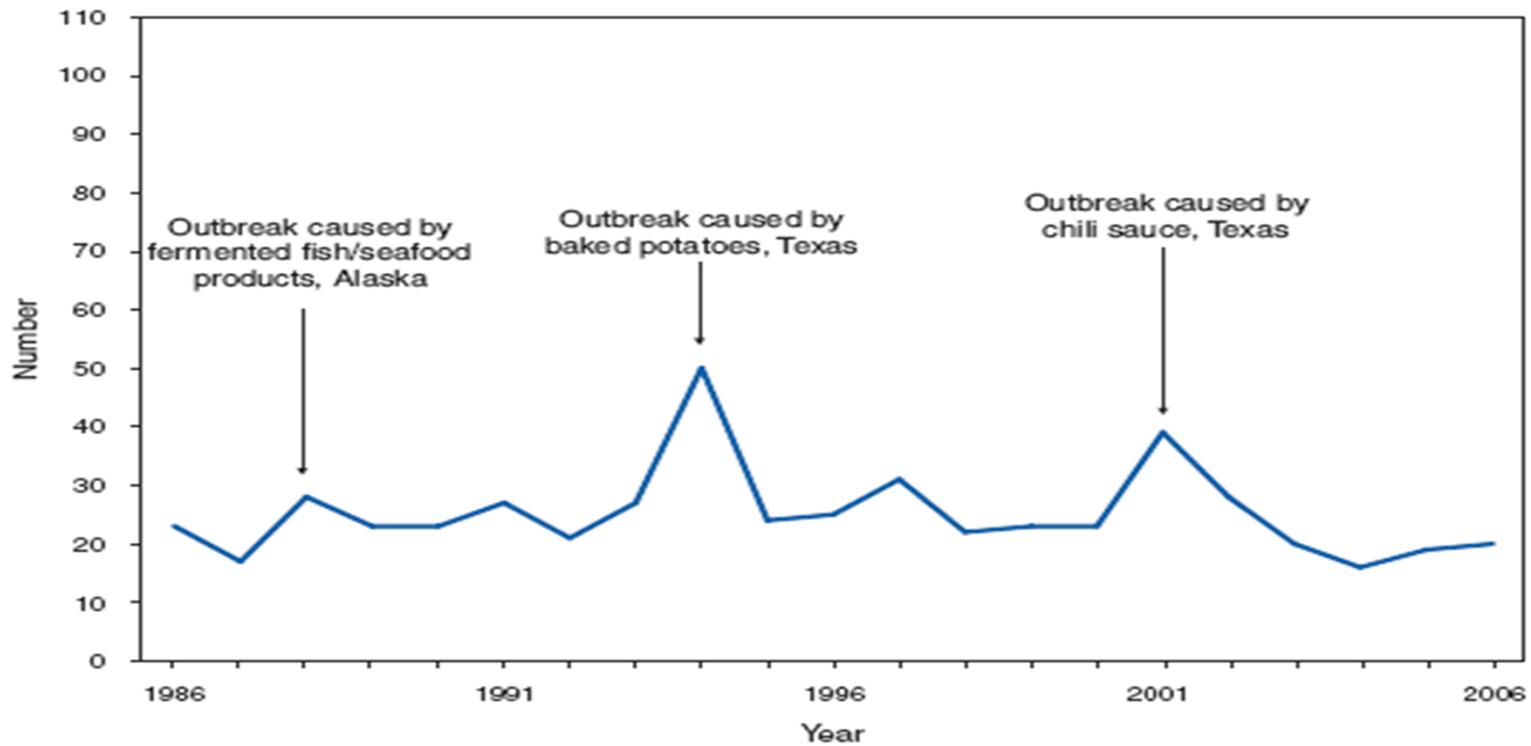
FIGURE I. Selected notifiable disease reports, United States, comparison of provisional 4-week totals January 31, 2009, with historical data



* Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.



BOTULISM, FOODBORNE. Number of reported cases, by year — United States, 1986–2006



Home-canned foods and Alaska Native foods consisting of fermented foods of aquatic origin remain the principal sources of foodborne botulism in the United States. During 2006, a multistate outbreak of foodborne botulism was linked to commercial carrot juice.

FOR MORE INFORMATION

- North Carolina CD Manual:
<http://epi.publichealth.nc.gov/cd/lhds/manuals/cd/toc.html>
- CDC case definitions
http://www.cdc.gov/epo/dphsi/casedef/case_definitions.htm
- CDC infectious disease surveillance systems.
http://www.cdc.gov/ncidod/osr/site/surv_resources/surv_sys.htm
- CDC nationally notifiable infectious diseases.
<http://www.cdc.gov/epo/dphsi/phs/infdis2004.htm>

