

Epidemiology Bureau

Population Health Division

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Outline

- Infectious Disease Epidemiology/What is an epidemiologist
- Reporting Process
- 4 Pillars of Epidemiology Program
- Number of Investigations/Outbreaks
- Our Community Partners
- Questions

Infectious Disease Epidemiology

- The study of *how* and *why* infectious diseases emerge and spread among different populations, AND what strategies can prevent or contain the spread of disease at the population level.



UTAH REPORTABLE DISEASES

Utah law requires that the following diseases be reported to your local health department or the Utah Department of Health.

REPORT WITHIN 24 HOURS OF A SUSPECT DIAGNOSIS

- Anthrax (*Bacillus anthracis*) or anthrax-like illness caused by *Bacillus cereus* strains that express anthrax toxin genes²
- Botulism (*Clostridium botulinum*)²
- Cholera (*Vibrio cholerae*)
- Coronavirus, novel – including COVID-19, MERS, and SARS
- Diphtheria (*Corynebacterium diphtheriae*)²
- *Haemophilus influenzae*, invasive disease²
- Hepatitis A
- Influenza infection, non-seasonal strain²
- Measles (*Rubiova virus*)²
- Meningococcal disease (*Neisseria meningitidis*)²
- Plague (*Yersinia pestis*)²
- Poliomyelitis, paralytic and non-paralytic
- Rabies (human and animal)
- Rubella (excluding congenital syndrome)
- Smallpox (*Variola virus*)
- *Staphylococcus aureus*, with resistance (VRSA)^{1,2} to vancomycin
- Transmissible spongiform encephalopathies (prion diseases), including Creutzfeldt-Jakob disease
- Tuberculosis (*Mycobacterium tuberculosis* complex)^{1,2}
- Tularemia (*Francisella tularensis*)²
- Typhoid, cases and carriers²
- Viral hemorrhagic fevers, including *Ebola*, *Lassa*, *Marburg*, and *Nipah* virus-related illnesses

Also immediately Reportable: Unusual diseases or outbreaks of any kind and any exposure/infection that may indicate a bioterrorism event

REPORT WITHIN 3 WORKING DAYS OF IDENTIFICATION

- Acute flaccid myelitis (AFM)
- Adverse event resulting from smallpox vaccination (*Vaccinia virus*)
- Anaplasmosis (*Anaplasma phagocytophili*)
- Arbovirus infection, including Chikungunya, West Nile¹, and Zika virus²
- Babesiosis (*Babesia*)
- Botulism, infant (*Clostridium botulinum*)²
- Brucellosis (*Brucella species*)
- Campylobacteriosis (*Campylobacter*)²
- *Candida auris* or *haemulonii* from any body site^{1,2}
- Carbapenem-resistant *Acinetobacter* species, *Enterobacter* species, *Escherichia coli*, and *Klebsiella* species^{1,2}
- Carbapenemase producing *Acinetobacter* species, all *Enterobacteriaceae* species²
- Chagas disease
- Chancroid (*Haemophilus ducreyi*)
- Chickenpox (*Varicella-zoster virus*)
- Chlamydia trachomatis infection
- Coccidioidomycosis (*Coccidioides*)
- Colorado tick fever
- Cryptosporidiosis (*Cryptosporidium*)
- Cyclosporiasis (*Cyclospora cayetanensis*)
- Dengue fever
- Ehrlichiosis (*Ehrlichia*)
- Encephalitis or meningitis (bacterial, fungal, parasitic, protozoan and viral)
- *Shiga* toxin-producing *Escherichia coli* (STEC) infection²
- Giardiasis (*Giardia lamblia*)
- Gonorrhea (*Neisseria gonorrhoeae*) sexually transmitted and ophthalmia neonatorum¹
- Hantavirus infection (*Sin Nombre virus*)
- Hemolytic uremic syndrome, post-diarrheal
- Hepatitis, viral, including hepatitis B (acute, chronic and perinatal), C (acute, chronic and perinatal), D, and E
- Human immunodeficiency virus (HIV) infection, including perinatal and acquired immunodeficiency syndrome (AIDS) diagnosis
- Influenza-associated hospitalization²
- Influenza-associated death in a person less than 18 years of age
- Legionellosis (*Legionella*)²
- Leprosy (*Hansen's Disease*)
- Leptospirosis (*Leptospira*)
- Listeriosis (*Listeria monocytogenes*)²
- Lyme disease (*Borrelia burgdorferi*)
- Malaria (*Plasmodium*)
- Mumps
- Mycobacteria other than tuberculosis
- Pertussis (*Bordetella pertussis*)
- Psittacosis (*Chlamydia psittaci*)
- Q Fever (*Coxiella burnetii*)
- Relapsing fever, tick-borne and louse-borne (*Borrelia*)
- Rubella, including congenital syndrome
- Salmonellosis (*Salmonella*)^{1,2}
- Shigellosis (*Shigella*)^{1,2}
- Spotted fever rickettsioses, including Rocky Mountain spotted fever (*Rickettsia*)
- Streptococcal disease, invasive, due to *Streptococcus pneumoniae*¹ and Groups A and B
- Syphilis, all stages, congenital, and syphilic stillbirths
- Tetanus (*Clostridium tetani*)
- Toxic shock syndrome, staphylococcal or streptococcal
- Trichinellosis (*Trichinella*)
- Vibriosis (*Vibrio*)², including Cholera

Also Reportable: Pregnancies associated with Hepatitis B, Hepatitis C, HIV, Listeria, Rubella, Syphilis, or Zika virus infection even if the disease was reported to public health prior to the pregnancy

¹ Full panel susceptibility results, including minimum inhibitory concentration and results suppressed to the ordering clinician, are reportable when performed on the following organisms.

² Laboratories shall submit clinical material to the Utah Public Health Laboratory for all cases identified with these organisms, or any organism implicated in an outbreak when instructed by authorized local or state health department staff.

Electronic Laboratory Reporting (ELR)

Entities reporting via ELR have additional reporting requirements not listed on this document. Those requirements can be found under the "Information for Reporters" tab at <http://health.utah.gov/epi/reporting> or by contacting the Utah Department of Health at edx@utah.gov.

Diseases may be reported to your [local health department](#) or the Utah Department of Health (UDOH) by fax (801-538-9923), email (reporting@utah.gov), or telephone (1-888-EPI-UTAH). Email reports should be sent encrypted, through a secure email system. Reports sent without encryption risk breach of confidentiality. The UDOH cannot guarantee the security of information submitted without encryption. For questions about disease reporting, email the Utah Department of Health at reporting@utah.gov, call 801-538-6181, or visit <http://health.utah.gov/epi/reporting>.

Programs within Epidemiology

- Foodborne illness
- Respiratory diseases
- Healthcare associated infections & multi-drug resistant organisms
- Vectorborne and zoonotic diseases
- Vaccine preventable diseases
- Invasive bacterial diseases & Meningitis
- Emergency preparedness & Bioterrorism
- Surveillance & data analytics
- COVID Response

Program Responsibilities



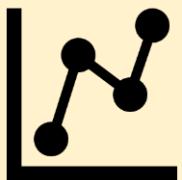
Investigation



Outbreak Response



Mitigation



Surveillance

Investigation Components

Demographics	Medical History	Symptomology	Risk Factors	Case definition	Education	Contact Tracing
<ul style="list-style-type: none">• Name• Date of Birth/Age• Gender• Race• Ethnicity• Address	<ul style="list-style-type: none">• Underlying health issues• Medical visits- inpatient and outpatient• Vaccinations when applicable• Treatments• Pregnancy status• Mortality status• Labs taken or needed	<ul style="list-style-type: none">• Symptoms• Onset date• Incubation or exposure period• Infectious period• Severity	<ul style="list-style-type: none">• Occupation• Behaviors (i.e. sexual, substance abuse, use of DEET)• Exposures (i.e. bug bites, animals, water exposure, food ingestion)• Associations with schools, group living, childcare, healthcare settings, food establishments	<ul style="list-style-type: none">• National• Standardization• Confirmed, probable, suspect, not a case	<ul style="list-style-type: none">• Disease Information• Prevention• Treatments	

Outbreak Investigations



Establish Existence of Outbreak

Identify cases

Increase testing

Case definition of outbreak

Make a line list of all cases



Descriptive Epidemiology

Line list of cases with demographics, medical information, risk factors

Epicurve

Map cases by geography



Determine Who is at Risk

Find commonalities of cases



Determine Cause of Outbreak

Find risk factors, exposures, behaviors in common

Studies may be needed (cohort, case-control)



Implement Control Measures

-Recall product

-Administer prophylaxis/vaccine

-Suggest behavior modification

-Share findings/Education

Mitigation



Immunizations



Preventive medications



Reiterate basic hygienic practices



Behavior modification



Cleaning guidance



Infection control measures

Surveillance & Data Analytics

Syndromic surveillance

Dashboards

Maps

Reports

Studies

Automating
investigative
processes

Data quality

Monitoring for
outbreaks and
commonalities

Program Investigations

Program	Avg # Cases Investigated/Year	Avg # Outbreaks Investigated/Year
Foodborne Illness	675	47
Respiratory Diseases	11,127	20
HAI/MDRO	117	10
Vectorborne/Zoonotic Diseases	911	4
Vaccine Preventable Diseases	738	8
Invasive bacterial diseases & Meningitis	485	3
Emergency preparedness & Bioterrorism	15	15

Community Partners

Healthcare providers

Infection preventionists

Laboratories

Schools and childcare centers

Group living facilities

Food establishments

Community based organizations

Animal control

Mosquito abatement

Governmental agencies



Questions?