



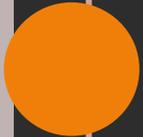
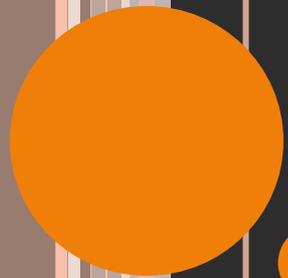
OUTBREAK INVESTIGATION, TOOLS, AND RESOURCES

Lesley Brannan, MPH
Epidemiologist / IRID Team Leader
Emerging and Acute Infectious Disease Branch
Texas Department of State Health Services - Austin

PRESENTATION OBJECTIVE

- List two resources available to support influenza investigations





RESOURCES AND TOOLS

TEXAS INFLUENZA SURVEILLANCE HANDBOOK

○ Outbreak Section:

- Why investigate
- Outline of a response
- Basic info to collect
- Case definitions
- Line lists
- Epi Curves
- Case Confirmation
- Resources

- [Cover/Table of Contents](#)
- [Introduction / Contributors / Record of Revision](#)
- [Section I: Influenza 101](#)
- [Section II: Influenza Overview](#)
- [Section III: Influenza Surveillance Reporting](#)
- [Section IV: Influenza Surveillance Activities](#)
 - [Subsection a: ILINet](#)
 - [Subsection b: IISP](#)
 - [Subsection c: ILI Activity](#)
 - [Subsection d: Laboratory Surveillance](#)
 - [Subsection e: NREVSS](#)
 - [Subsection f: Influenza-Associated Pediatric Mortality](#)
 - [Subsection g: Novel Influenza](#)
 - [Subsection h: Influenza-Associated Pregnant/Postpartum Mortality](#)
 - [Subsection i: Other Surveillance Activities](#)
- [Section V: Recruitment and Retention](#)
- [Section VI: Laboratory Support](#)
- [Section VII: Outbreaks](#)
- [Section VIII: Glossary and Acronyms](#)
- [Appendix](#)



**Updated
annually**

EAIDB INVESTIGATION GUIDELINES

○ Sections Include:

- Basic Epidemiology
- Definitions
- Case Investigation
- Managing Special Situations
- Reporting and Data Entry Requirements
- Laboratory Procedures

[Home](#) > [Infectious Disease Control](#) > Investigation Guidance
Investigation Guidance

Infectious Disease Control INVESTIGATION GUIDANCE

[IDCU Home](#)

[Investigation Forms](#)

The Emerging and Acute Infectious Diseases Guideline (EAIDG)

****UPDATED April 2015**** ([PDF](#), 5.35 MB) (Check individual chapters below for updates)

The purpose of this handbook is to provide a centralized resource for outbreak and reportable disease investigations to local and regional health departments in Texas. This handbook is intended as a tool to help local and regional public health staff with their surveillance activities and investigations. Our hope is that this handbook will continue to grow over the years and highlight some of the best investigation practices in the state. Information covers control measures, case definitions, case statuses, laboratory collection/shipping procedures and more.

List of Individual Chapters:

[Table of Contents](#) (PDF, 152 KB)

[Amebiasis](#) (PDF, 252 KB)

[Amebic Meningitis/Encephalitis](#) (PDF, 350 KB)

[Botulism](#) (PDF, 385 KB)

[Campylobacteriosis](#) (PDF, 333 KB)

[CRS](#) (Congenital Rubella Syndrome)(PDF, 250 KB)

[Cryptosporidiosis](#) (PDF, 209 KB)

[Cyclosporiasis](#) (PDF, 310 KB)

[Diphtheria](#) (PDF, 370 KB)

[Ebola](#) (PDF, 316 KB)

[GAS](#) (*Streptococcus pyogenes*, Invasive) (PDF, 244 KB)

[Gastroenteritis Outbreaks](#) (PDF, 435 KB)

[GBS](#) (*Streptococcus agalactiae*, Invasive) (PDF, 244 KB)

Legionellosis
Meningococcal
Novel influenza
Novel coronavirus
Pneumococcal disease

Updated
annually

http://www.dshs.state.tx.us/idcu/health/infection_control/Investigation-Guidance/

SUBJECT MATTER EXPERTS

- Laboratorians
- Local flu coordinators and epidemiologists
- Regional Flu Coordinators and epidemiologists
- State Flu Coordinator: Johnathan
- State Infectious Respiratory and Invasive Diseases Team Lead: Lesley
- CDC SMEs—influenza, respiratory diseases
- Unexplained Respiratory Disease Outbreak (URDO) working group at CDC



INFLUENZA WEBSITES

- DSHS flu: www.dshs.state.tx.us/idcu/disease/influenza/
- CDC flu: <http://www.cdc.gov/flu/index.htm>

- Summary data
- Disease information
- Prevention and control
 - Antivirals
 - Vaccine
 - Outbreak recommendations
- Information for the public
- Alerts

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

SEARCH



CDC A-Z INDEX ▾

Influenza (Flu)



Language: English ▾

Flu activity has returned to summer-time levels in the United States. H3N2 viruses were most common overall during this season, however, there was a wave of influenza B activity starting in early March. According to a report published in the [Morbidity and Mortality Weekly Report \(MMWR\)](#), the season was moderately severe overall, and severe for people 65 years and older, with very high hospitalization rates in that age group.

While most flu activity occurs from October to May in the United States, flu viruses are detected year-round, including at lower levels during the summer months. [Influenza antiviral drugs](#) can treat flu illness. CDC recommends these drugs be used to treat people who are very sick or who are at [high risk of serious flu-related complications](#) who have flu symptoms. Early antiviral treatment works best.



Information About Canine Influenza (dog flu) in the United States

FLU BASICS

Symptoms, How Flu Spreads, Higher Risk Groups, Past and Current Flu Season

HEALTH PROFESSIONALS

Vaccination, Antiviral Drugs, Infection Control, Diagnostic Testing, and Training

PREVENTION - FLU VACCINE

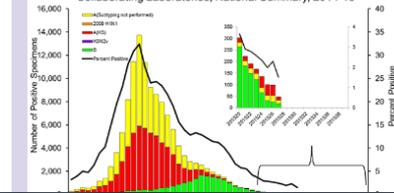
Vaccine Safety, Vaccination Coverage, Influenza VIS, NIVW, Infection Control

FREE RESOURCES

Printable Materials, Photos, Podcasts, Videos, PSAs, eCards, Badges & Buttons, Articles

Flu Activity & Surveillance

Influenza Positive Tests Reported to CDC by U.S. WHOINREVSS Collaborating Laboratories, National Summary, 2014-15



CDC'S URDO WEBSITE

- Unexplained Respiratory Disease Outbreaks (URDO) <http://www.cdc.gov/urdo/index.html>
- Differential Diagnosis Spreadsheets <http://www.cdc.gov/URDO/differential.html>
 - Demographic and Epidemiologic Data
 - Clinical Information
 - Risk Factors for Disease
- Various tools, spreadsheets, instructions



Unexplained Respiratory Disease Outbreaks (URDO)

URDO Home

Investigate an Outbreak +

Generate a Differential
Diagnosis

Specimen Collection and
Handling

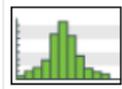
Diagnostic Testing

Prevention

References and Publications +



Health professionals and public health partners may use this website to help identify and investigate unexplained respiratory disease outbreaks.



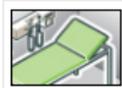
[Investigate an Outbreak](#)

Initial steps, line lists, epi curve template, case questionnaire, sample data collection forms...



[Diagnostic Testing](#)

Pathogen detection and characterization assays for selected respiratory pathogens...



[Generate a Differential Diagnosis](#)

Lists of the most likely infectious causes or etiologies of the outbreak...



[Prevention](#)

Infection control, respiratory hygiene...



[Specimen Collection & Handling](#)

Specimen collection, handling, storage, and shipping...



[Publications, Helpful Websites, & Additional Resources](#)

Information on selected respiratory diseases; national, state and local resources...

Differential diagnosis for a respiratory disease outbreak: Demographic and epidemiologic data

Pathogen	Disease	Incubation period	Person to person transmission?	Means of transmission	Attack rate	Case fatality	Age groups primarily affected	Season	U.S. (temperate) regions	International regions
Adenovirus	Adenovirus	2 to 14 days	Yes	Fecal-oral Droplet Contact	High	Low	Children Adults	Any	All	Worldwide
<i>Bacillus anthracis</i>	Anthrax	1 to 60 days	No	Aerosol Contact Ingestion	Moderate	High	All	Any	All	Worldwide, except Antarctica
<i>Blastomyces dermatitidis</i>	Blastomycosis	2 to 8 weeks	No	Inhalation	Low	Low	All	Any	Central/Midwest Southeast	Mexico Central America South America
<i>Bordetella pertussis</i>	Pertussis	5 to 21 days	Yes	Droplet	High	Low	Children Adults	Summer, Fall	All	Worldwide
<i>Chlamydia (Chlamydophila) psittaci</i>	Psittacosis	5 to 14 days	Rare	Inhalation Droplet	Low	Low	All	Any	All	Worldwide
<i>Chlamydia (Chlamydophila) pneumoniae</i>	Chlamydia pneumonia	1 to 4 weeks	Yes	Droplet	High	Low	All	Any	All	Worldwide
<i>Coccidioides immitis</i>	Coccidioidomycosis	1 to 3 weeks	No	Inhalation	High	Low	Adults	Any	Southwest Central/Midwest	Mexico Central America South America
Coronavirus	SARS	2 to 10 days	Yes	Droplet Contact	Low	Moderate	Adults	Any	All	Worldwide, except SARS-HCoV: China, Hong Kong, Taiwan, Singapore, Canada (last case 2004)
<i>Coxiella burnetii</i>	Q fever	2 to 3 weeks	Rare	Inhalation, Contact with contaminated materials, Tick bite	Moderate	Low	Adults	Any	All	Worldwide
<i>Francisella tularensis</i>	Tularemia	1 to 21 days	No	Aerosol Ingestion Animal bite Insect bite Aerosol Skin wound	Low	Moderate	All	Summer, Winter	All	Northern Hemisphere
Group A <i>Streptococcus</i>	Strep pharyngitis Rheumatic fever	1-3 days (strep pharyngitis)	Yes	Droplet	Moderate	Low	All	Winter, Spring	All	Worldwide
<i>Haemophilus influenzae</i>	H. influenza	Unknown	Yes	Droplet	Low	Low	Children Adults	Winter	All	Worldwide
Hantaviruses, New World	Hantavirus pulmonary syndrome	1 to 4 weeks	Rare (Andes virus)	Droplet, Aerosol, Mucous membrane	Low	High	Adults	Summer, Fall	All	North, Central, and South America
<i>Histoplasma capsulatum</i>	Histoplasmosis	3 to 21 days	No	Inhalation	Moderate	Low	Adults	Any	Central/Midwest	Worldwide, especially Central and South America

Tools for Epidemiological Investigation of Outbreaks

1. **Start to collect information:** [Respiratory Outbreak Survey](#)  [1 page]
2. **Compile available data**
 - a. [Develop case definition](#)  [2 pages]
 - b. [Complete line list](#)  [2 pages]
 - c. [Generate an epicurve](#)
 - d. [Collect and store available clinical and pathologic specimens](#)
 - e. List current control measures implemented to date, if any
3. **Develop public health response to outbreak. Consider:**
 - a. Number of cases and severity of disease
 - b. Need and potential for interventions (e.g., cohorting, quarantine, vaccination, use of prophylaxis, elimination of a potential source of disease)
 - c. Likelihood of natural versus intentional source of infection
 - d. Level of public health, provider or community concern
4. **Recommended reporting and response**
 - a. Notify appropriate local and state public health officials
 - b. Discuss with staff in your program (e.g., laboratory, epidemiology, environmental and veterinary and other personnel as appropriate)
 - c. If indicated, notify CDC of the outbreak—[Report an Emergency](#).

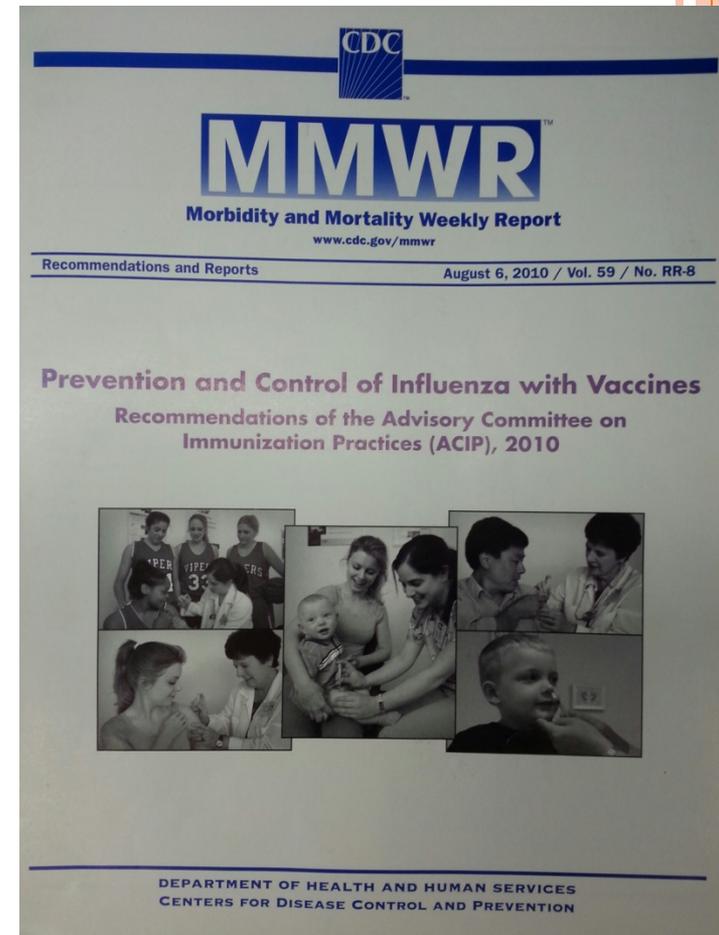
Data Collection Forms

[Data Collection Forms](#)

Note: This form is designed to assist investigators in collecting information relevant to identifying etiologies of respiratory outbreaks. These **are not** for reporting an outbreak of disease to the CDC. For reporting assistance, please refer to your [State Health Department](#)

ADVISORY COMMITTEE ON IMMUNIZATION PRACTICES

- ACIP releases flu vaccination recommendations each season
 - www.cdc.gov/flu/professionals/acip/
- The 2010 guidance is extremely useful



OUTBREAK-RELATED TESTING: DSHS

- Virology PCR testing:
 - Influenza viruses A & B
 - RVP test: Adeno, HMPV, para 1-3, RSV, rhino/entero (not typed) - **NP swabs required!**
- Viral culture: by request
- Bacterial culture:
 - *Legionella* (must be specifically requested)
 - *Streptococcus pneumoniae* from normally sterile sites only
- PCR for pertussis (Molecular)
- PCR for select agents (Biothreat Team)
- Culture/DNA probe: fungi (e.g., *Coccidioides immitis*), mycobacteria
- http://www.dshs.state.tx.us/lab/mrs_labtests_toc.shtml

OUTBREAK-RELATED TESTING: LRNs

- CDC's RT-PCR influenza test
- Select agent PCR testing
- Specific tests vary by lab (LRN coordinators in Austin are compiling a list)



OUTBREAK-RELATED TESTING: CDC

- Mycoplasma
- Chlamydophila spp.
- And many others:
<http://www.cdc.gov/laboratory/specimen-submission/list.html>



DSHS LABORATORY SUBMISSION FORMS

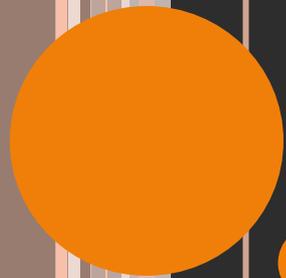
- G-2B for bacteriology testing; G-2V for virology
- Do you have an electronic copy?
 - Call Lab Reporting (512-776-7578) to get one
 - HSRs and LHDs can also call EAIDB
 - Saves time during an investigation
 - Fill it out completely, write in “outbreak-related”

G-2V:

Section 4. VIROLOGY	
<input type="checkbox"/> Electron Microscopy	<input type="checkbox"/> Measles, real-time RT-PCR
<input type="checkbox"/> Culture: Reference {Virus ID} Virus suspected: _____ Submitted on (cell type): _____	<input type="checkbox"/> Mumps, real-time RT-PCR
<input type="checkbox"/> Influenza surveillance {Influenza real-time RT-PCR} Vaccine received: <input type="checkbox"/> Yes <input type="checkbox"/> No Date vaccine received: _____ Travel history (if known): _____ Animal contact (if known): _____	<input type="checkbox"/> MERS Coronavirus (Novel coronavirus) ++++ <i>Prior authorization required.</i> ++++ Call Infectious Disease (512) 776-7676 for authorization
	<input type="checkbox"/> Viral isolation, clinical {Comprehensive cell culture} Virus suspected: _____
	<input type="checkbox"/> Other: _____

- Make sure the info matches the tube
 - 1 form per specimen/tube





REPORTING

OUTBREAK REPORTING

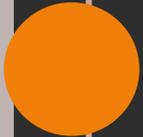
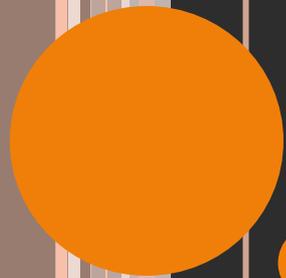
- Texas Administrative Code: “any outbreak, exotic disease, or unusual group expression of disease”
- Any setting (LTCF, hospital, school, daycare, prison, community, etc.)
- Highest priority:
 - Agent: influenza, legionellosis, novel/emerging pathogens (e.g, MERS, EV-D68), other severe disease, or unspecified etiology
 - Presentation/outcome: pneumonia clusters, multiple hospitalizations, multiple deaths
 - Setting: LTCFs, hospitals, vulnerable populations
 - Timing: e.g., flu outbreak in the summer
 - Other: public concern, media attention



OUTBREAK REPORTING

- Complete DSHS Respiratory Disease Outbreak Summary Form
<http://www.dshs.state.tx.us/idcu/investigation/>
- Enter legionellosis waterborne outbreaks in National Outbreak Reporting System (NORS)





DISCUSSION

GENERAL QUESTIONS

- Should we develop an outbreak toolkit?
 - Letters to facilities
 - Checklists for HDs and/or facilities
 - FAQs/Information sheets
 - Cheat sheets with latest CDC guidance (prevention/control, antiviral recommendations, etc.)
 - Line list templates
 - Collection forms for other types of data (e.g., vaccination status of residents, staff)
- Which outbreaks to prioritize for investigation?
 - Different actions depending on priority level?
- How should respiratory outbreaks be reported to EAIDB?

