

**NJ Health**  
New Jersey Department of Health

## FORENSIC EPIDEMIOLOGY IN ACTION – PLAGUE

A JOINT PUBLIC HEALTH/  
FBI INVESTIGATION




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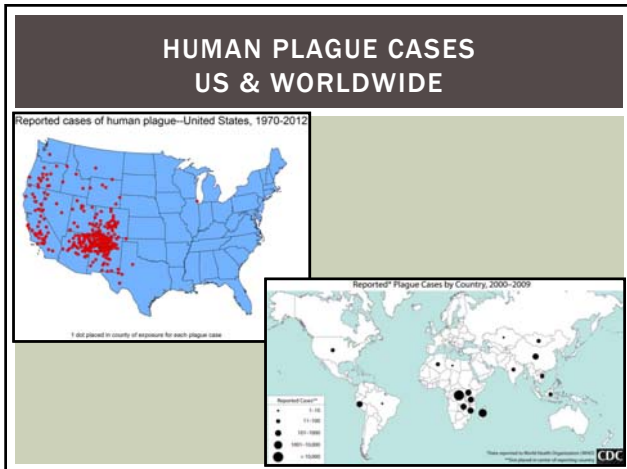
**RUTGERS**  
School of Public Health

## PLAGUE – (YERSINIA PESTIS) CLINICAL PRESENTATIONS

- **Bubonic**
  - Sudden onset fever, chills, weakness, headache + **swollen, painful lymph nodes (buboes)**
- **Septicemic**
  - Fever, chills, weakness, **abdominal pain, shock, possible bleeding into skin and organs**
- **Pneumonic**
  - Fever, headache, weakness, + **rapidly developing pneumonia with SOB, chest pain, cough, bloody mucous**

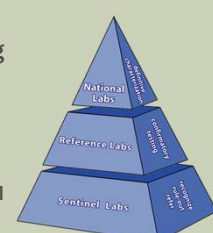




Source: <http://www.cdc.gov/plague/symptoms/index.html>



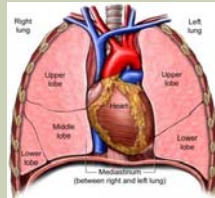
## LABORATORY RESPONSE NETWORK (LRN)

- 150 biological laboratories
- Mandatory proficiency testing program
  - Simulates real-world scenarios involving potential BT agents
  - Preparation, packaging, and distribution of biological material
- NJDOH Reporting and response



### PLAGUE CASE STUDY

- Patient admitted with radiating chest pain x 2wks, history of back pain, normal CXR
- No fever
- CT scan showed mediastinal mass with pleural effusion
  - **Pleural effusion Identified *Y. pestis***
- Hospital laboratory calls NJDOH/CDS with a rule-out *Y. pestis*



### CASE STUDY – INITIAL FINDINGS

- Incompatible clinical presentation
- Unclear epi features
  - Unclear country of origin, travel history / visitors
  - Recent layoff
  - Pets: bird and new dog
- Specimen approved for testing / LHD notified
  - PHEL (reference lab) confirmed *Y. pestis*
  - Isolate with original fluid sent to CDC (national lab)
- Areas of Concern
  - Atypical clinical presentation for *Y. pestis*
  - Laboratory confirmation
  - Not found naturally in NJ
  - No known travel history to endemic areas
  - Recent job loss
  - Language barrier
- CDS contacted FBI to discuss case/threat assessment
  - **Joint public health/FBI interview**

### PUBLIC HEALTH / LAW ENFORCEMENT GOALS / OBJECTIVES

- |  |  |
|--|--|
| <p>Public Health</p> <ul style="list-style-type: none"> <li>■ GOAL: To protect the public, to stop the spread of disease and to protect public health personnel</li> </ul> | <p>Law Enforcement</p> <ul style="list-style-type: none"> <li>■ GOAL: To protect public safety, to prevent a criminal act, to identify, apprehend and prosecute perpetrators and to protect law enforcement personnel</li> </ul> |
|--|--|

- Interview Objectives:**
1. Determine source of infection
  2. Investigate possible bioterrorism linkages
  3. Identify broader public health concerns

### KEY INTERVIEW QUESTIONS

- |  |  |
|--|--|
| <p>Public Health</p> <ul style="list-style-type: none"> <li>■ Travel history – US, international</li> <li>■ Clinical background</li> <li>■ Peruvian (or other) visitors</li> <li>■ Animal contact</li> <li>■ Ill close contacts</li> </ul> | <p>FBI</p> <ul style="list-style-type: none"> <li>■ Demeanor                     <ul style="list-style-type: none"> <li>■ Hiding or refusing to provide information                             <ul style="list-style-type: none"> <li>■ Delayed response, avoiding eye contact</li> </ul> </li> </ul> </li> <li>■ Awareness of suspicious people or activity</li> <li>■ Ill neighbors or coworkers</li> <li>■ Animal die-off</li> </ul> |
|--|--|

### INTERVIEW FINDINGS

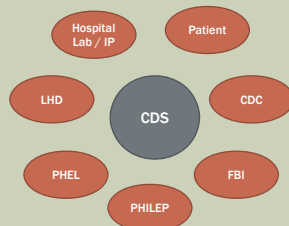
- No travel history
  - Daughter spent 2 months in Peru, returning that month
- No relevant clinical background
  - Chest pain, SOB since August
- Animal contact
  - Healthy parrot (x 5 yrs)
  - 2 month old healthy puppy, purchased 3 weeks prior
  - No other animal contact, no sightings of dead animals/rodents, no bug bites
- No ill close contacts / no visitors

### CASE SOLVED

- Conference call with CDC/interested parties
    - CDC confirmatory testing identified "***Y. pestis avirulent ALL-22***"
  - LRN Proficiency test sent to hospital 2 wks prior
    - Included ***Y. pestis avirulent ALL-22***
- Likely laboratory contamination
- Epidemiological and law enforcement investigation was terminated

### FINAL THOUGHTS

- Communication can work
  - Existing relationships
- Practice makes perfect
  - LRN/Epi Notification Protocols
  - Epi/Law Enforcement training and exercises



### Questions?



Thank you!  
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