Outbreak Scenario

Outbreak Scenario

Based on an outbreak that occurred in the Netherlands

- Logistics
- Background
- Scenario
- Investigation
- Response

Objectives

- ❑ Identify the initial steps and sequence of events of an outbreak investigation and response to a disease of unknown origin in a local community
- ❑ Recognize the professionals and organizations involved during an interprofessional and multiagency outbreak investigation and response involving a potential zoonotic disease of agricultural origin
- ❑ Identify the different mechanisms of disease transmission that could allow a zoonotic pathogen of agricultural origin to reach a community
- ❑ Ascertain the potential impact on human health (as well as agriculture) that an outbreak like this could have
- ❑ Recognize One Health principles to manage and prevent the zoonotic transmission of agricultural related agents to the community

Outbreak Scenario

Based on an outbreak that occurred in the Netherlands

- Logistics
- Background
- Scenario
- Investigation
- Response

Dynamics:

- Information will be shared with you in as the outbreak progesses
- At several intervals, questions will be presented and you will have 5 minutes to discuss them at your table
- Moderators at each table will keep the conversation moving and provide necessary background information
- Select a spokesperson at each table, as random tables will be asked to present their conclusions

= question slide to be discussed

Outbreak Scenario

- Logistics
- Background
- Scenario
- Investigation
- Response

You are a public health official working for Buckeye County Health District (BCHD)...

Outbreak Scenario

- Logistics
- Background
- Scenario
- Investigation
- Response

Friday, May 18 - 9:30am

Call to BCHD

Public Health
Prevent. Promote. Protect.

- **Since May 16, 40 students and 5 staff members have been absent due to flu-like symptoms at Northside Elementary School**
- **Two staff members were hospitalized with pneumonia**

Outbreak Scenario

- Logistics
- Background
- Scenario
- Investigation
- Response

Friday, May 18 - 11:00 AM

Ruby Dolor
Infection Preventionist at Smallville Hospital

Call to BCHD

Public Health
Prevent. Promote. Protect.

Last three days: have seen 7 patients complaining of:

- Fever, Cough, & Chest pain
- Severe headache (retrobulbar)

Diagnosis:

- Community Acquired Pneumonia
- 2 patients hospitalized & not improving
- Patients seen this morning are worsening

Tests:

- Influenza virus – Neg.
- Sputum & blood cultures - Neg. for common causes of pneumonia

Outbreak Scenario

- Logistics
- Background
- Scenario
- Investigation
- Response

Friday, May 18 - 2:30 PM

Greis Nursing Home

Call to BCHD

Public Health
Prevent. Promote. Protect.

May 16:

- 2 residents developed pneumonia

May 17:

- 3 residents developed pneumonia
- All cases being managed in-house

Tests:

- Influenza virus – Neg.
- Sputum & blood cultures – Neg. for common causes of pneumonia
- Legionella urine antigen test – Neg.

Outbreak Scenario

Greis Nursing Home is located a few blocks from the Northside Elementary School

Outbreak Scenario

IS THIS A PUBLIC HEALTH CONCERN THAT REQUIRES FURTHER ATTENTION? WHY OR WHY NOT?

You have 5 minutes to discuss among your table…

04:00

Countdown Clock
By Dr. Jeff Ertzberger

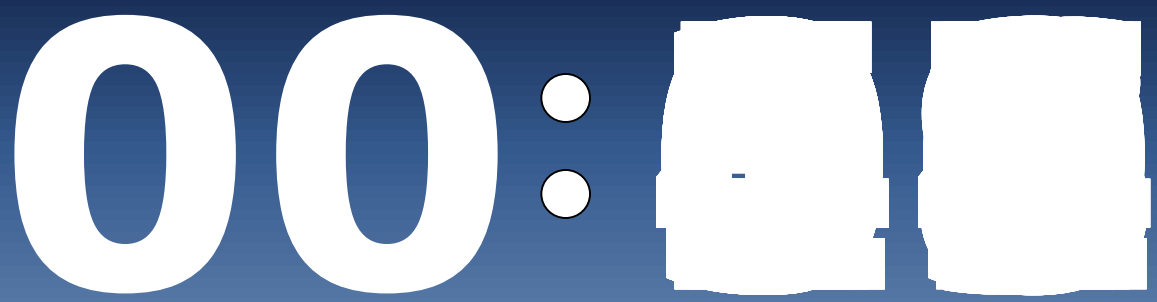
03:00

Countdown Clock
By Dr. Jeff Ertzberger

Countdown Clock
By Dr. Jeff Ertzberger

01:[illegible]

Countdown Clock
By Dr. Jeff Ertzberger



Countdown Clock
By Dr. Jeff Ertzberger

Outbreak Scenario

YES!

In many states, any unexpected pattern of suspected/ confirmed cases, deaths or increased incidence of any other unknown disease of major public health concern should be reported. In our current scenario the combined calls received by this local health department represent an increased incidence in an unidentified illness and therefore reportable, requiring an action by the LHD.

The number of similar cases reported from these locations represent an increased incidence of an unidentified illness

Outbreak Scenario

AT THIS POINT IN TIME, WHAT WOULD BE THE APPROPRIATE RESPONSE FOR THE LOCAL HEALTH DEPARTMENT?

You have 5 minutes to discuss among your table…

04:00

Countdown Clock
By Dr. Jeff Ertzberger

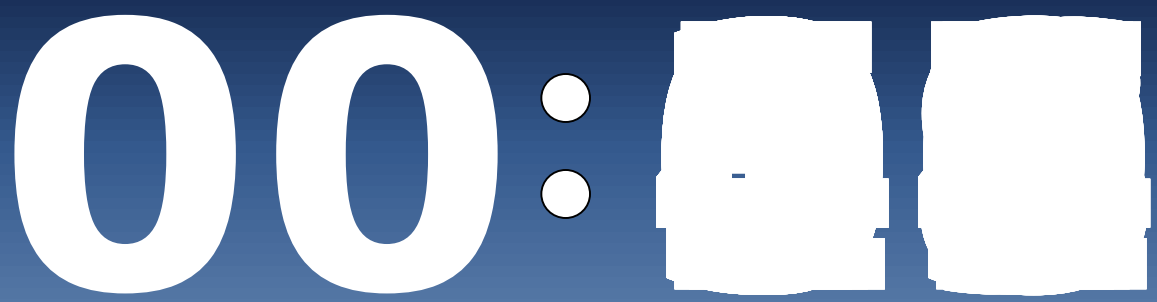
03:00

Countdown Clock
By Dr. Jeff Ertzberger

Countdown Clock
By Dr. Jeff Ertzberger

01:[illegible]

Countdown Clock
By Dr. Jeff Ertzberger



Countdown Clock
By Dr. Jeff Ertzberger

Outbreak Scenario

Case Distribution

Contact Info

cont@ct information

Infection Control

Report to State

OHIO DEPARTMENT OF HEALTH
ODH
To protect and improve the health of all Ohioans

Outbreak Scenario

Any privacy concerns when collecting this information?

Outbreak Scenario

Federal Educational Rights and Privacy Act (FERPA)

This law prohibits release of student's records without written parental consent except under certain circumstances

Except under the following circumstances

- School officials with legitimate educational interests
- Other schools to which a student is transferring
- Specified officials for audit or evaluation purposes
- Others, but at the discretion of school officials

Health Insurance Portability and Accountability Act (HIPPA)

This law protects individual identifiable health information while permitting the disclosure of information needed for direct patient care

HIPAA recognizes the legitimate need for those ensuring public health and safety to have access to this information to carry out their public health mission

Outbreak Scenario

Logistics

Background

Scenario

Investigation

Response

Friday, May 18 – 4:30 PM

- **A suspect case definition is established and an outbreak investigation begins**
- **A Public Information Officer (PIO) has been designated and preliminary information is being compiled to distribute to community stakeholders**
- **You prepare to continue interviews and staff phone lines over the weekend if necessary**

Outbreak Scenario

What kinds of information will you request from the patients during your interviews?

What questions will you ask to find the cause of the symptoms?

You have 5 minutes to discuss among your table…

04:00

Countdown Clock
By Dr. Jeff Ertzberger

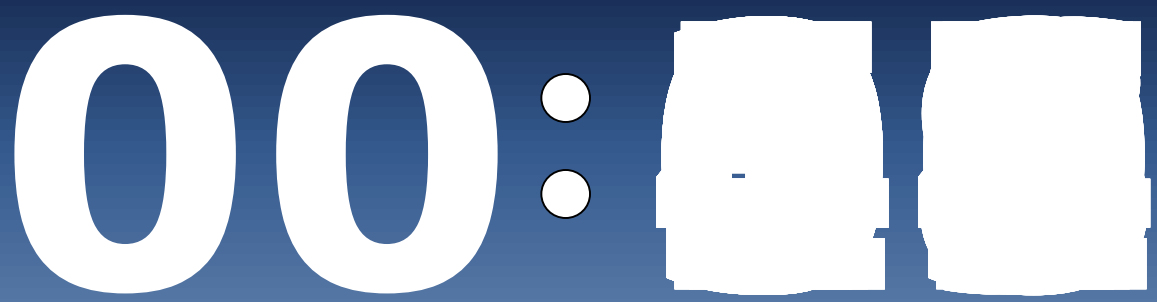
03:00

Countdown Clock
By Dr. Jeff Ertzberger

Countdown Clock
By Dr. Jeff Ertzberger

01:[illegible]

Countdown Clock
By Dr. Jeff Ertzberger



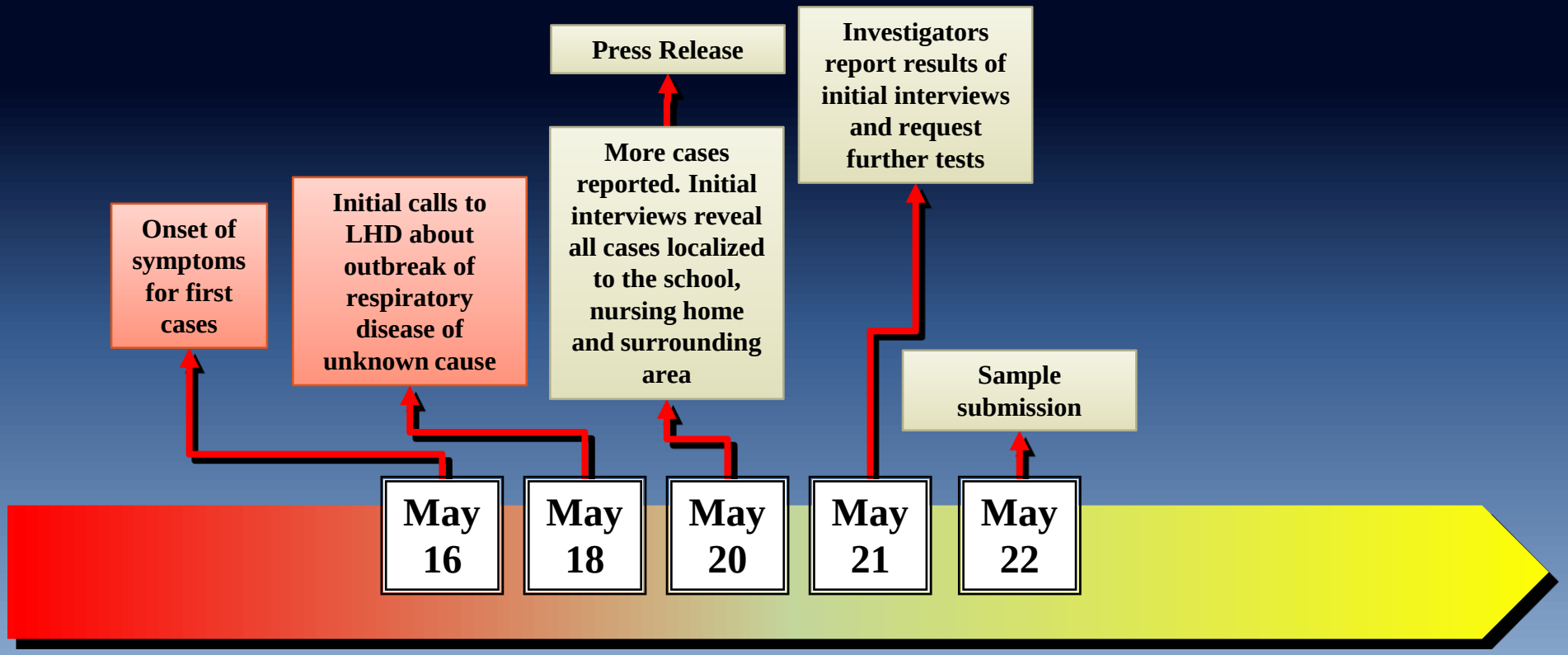
Countdown Clock
By Dr. Jeff Ertzberger

Outbreak Scenario

Questions to Ask

- Demographic questions (age, gender, race)
- Other health conditions
- Places visited (work, school, shops, library, etc.)
- Symptoms--types, onset date, duration
- Vaccination history
- Occupational exposure
- Contact with people who are ill
- Animal/Livestock exposure
- Any recent travel (national, international)

Timeline of Events



Outbreak Scenario

Logistics

Background

Scenario

Investigation

Response

Tests

Typical pathogens that cause Community Acquired Pneumonia (CAP)

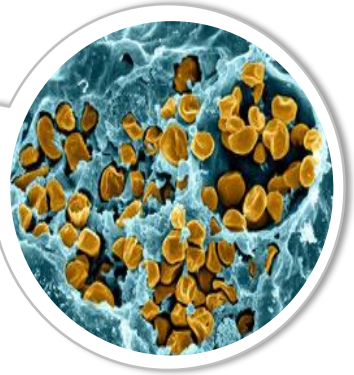
- **Bacterial (85% of CAP): *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis***
- **Viruses: Influenza A and B, parainfluenza viruses, respiratory syncytial virus, adenovirus**
- **Pneumonia not caused by one of these bacteria or viruses is considered atypical and usually caused by: *Chlamydia pneumoniae, Legionella pneumophila, Histoplasma capsulatum, Mycoplasma pneumoniae***

Outbreak Scenario

- Logistics
- Background
- Scenario
- Investigation
- Response

Tests

In cases where tests for all these pathogens are negative, less common cause of pneumonia include Q fever (*C. burnetti*), Hantavirus, Tularemia (*Francisella tularensis*) and endemic fungi among others should be investigated.



Outbreak Scenario

Logistics

Background

Scenario

Investigation

Response

Samples Positive for *C. burnetti*

***Coxiella Burnetti* (Q-Fever)**

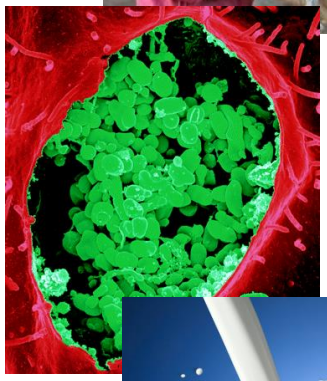
- **Bacterial zoonotic disease**

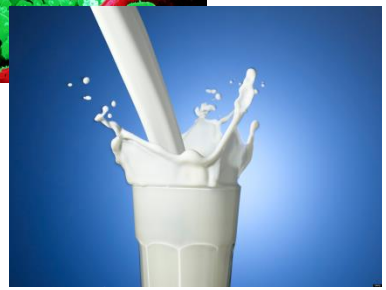
Transmission from livestock

- **<u>Inhalation</u>, ingestion, exposure to broken skin or mucus membranes**
- **Found in birth associated fluids and tissues, unpasteurized milk products, contaminated soil and bedding**
- **Human to human transmission unlikely**

Clinical signs

- **Fever, muscle pain, malaise, headaches, atypical pneumonia, hepatitis, or meningoencephalitis**
- **40% of exposed will develop signs**





Outbreak Scenario

What information would you want to provide to the public about the situation at this point and their chance of getting sick?

You have 5 minutes to discuss among your table…

04:00

Countdown Clock
By Dr. Jeff Ertzberger

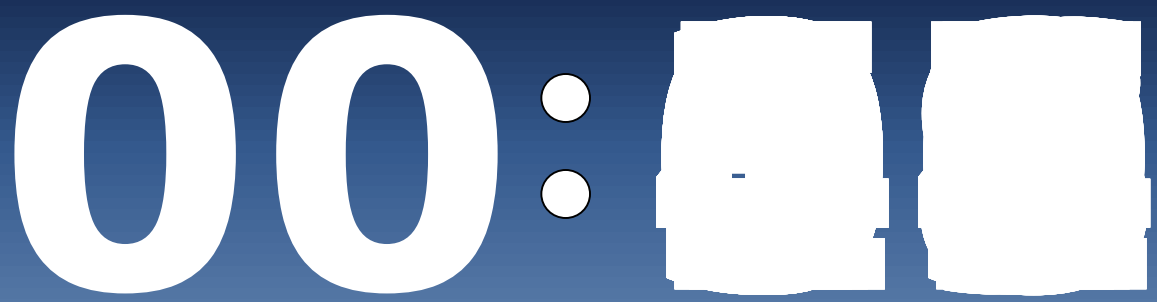
03:00

Countdown Clock
By Dr. Jeff Ertzberger

Countdown Clock
By Dr. Jeff Ertzberger

01:[illegible]

Countdown Clock
By Dr. Jeff Ertzberger



Countdown Clock
By Dr. Jeff Ertzberger

Outbreak Scenario

What is going on?

- **An outbreak of pneumonia caused by Q fever has occurred at Northside Elementary School and Greis Nursing Home in Smallsville**

What is Public Health doing?

- **Continuing the investigation**
- **Identified the cause**
- **Working to determine the source**

Outbreak Scenario

What is my risk?

- **Most commonly contracted from contact with infected livestock, consumption of unpasteurized milk or milk products, or exposure to contaminated dust**
- **Unlikely to be transferred human to human**

What should I do?

- **Anyone with symptoms should contact their family physician to determine if they should be tested**

Make sure you are consistent and clear with messages to the public — designate a spokesperson!

Outbreak Scenario

Logistics

Background

Scenario

Investigation

Response

Class B Bioterrorism Agent

Q-Fever is a Class B Bioterrorism agent and is also zoonotic

Class B Bioterrorism Agent:

- **Second highest priority**
- **Moderately easy to disseminate**
- **Result in moderate morbidity rates and low mortality rates**
- **Require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance**

Outbreak Scenario

As this is a zoonotic bioterrorism agent, what agencies should be included to the investigation team?

You have 5 minutes to discuss among your table…

04:00

Countdown Clock
By Dr. Jeff Ertzberger

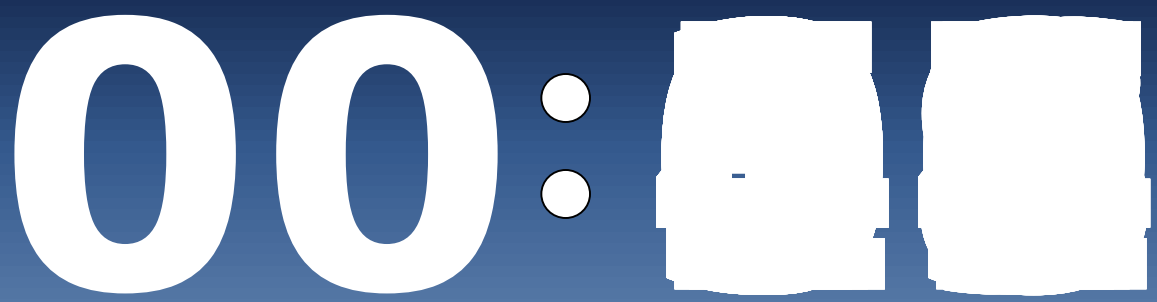
03:00

Countdown Clock
By Dr. Jeff Ertzberger

Countdown Clock
By Dr. Jeff Ertzberger

01:[illegible]

Countdown Clock
By Dr. Jeff Ertzberger



Countdown Clock
By Dr. Jeff Ertzberger

Outbreak Scenario

Agency Involvement

- **Local law enforcement/ FBI to initiate a Threat Credibility Evaluation**
- **BCHD/SDH to investigate potential food borne and other sources of infection**
- **SAHO/USDA should be contacted to investigate possible animal exposure**
- **Schedule a conference call with BCDH, SDH, CDC, FBI, SAHO, USDA-APHIS-VS**

Outbreak Scenario

Logistics

Background

Scenario

Investigation

Response

Who are these Agencies?

Conference call with:

- **BCDH: Buckeye County Department of Health**
- **SHD: State Health Department**
- **CDC: Centers for Disease Control and Prevention**
- **FBI: Federal Bureau of Investigation**
- **SAHO: State Animal Health Office**
- **USDA-APHIS-VS: United States Department of Agriculture - Animal and Plant Health Inspection Service - Veterinary Services**

Outbreak Scenario

- Logistics
- Background
- Scenario
- Investigation
- Response

FBI - Threat Credibility Evaluation

- **Are there known groups displaying behavior indicating a motive or resolve to carry out an attack?**
- **Do the operational aspects of the attack make it possible?**
- **Do the technical aspects make an attack feasible?**

These cases were not consistent with bioterrorism

Outbreak Scenario

Logistics

Background

Scenario

Investigation

Response

Public Health - Source Investigation

- **Revise case definition based on new information**
- **Revise questionnaire with more details about potential source exposures such as livestock and raw milk product consumption**
- **Re-interview all cases**

Public Health found no evidence of a food borne source or direct contact with livestock animals or their products

Outbreak Scenario

What steps should SAHO/USDA take to investigate this outbreak?

You have 5 minutes to discuss among your table…

04:00

Countdown Clock
By Dr. Jeff Ertzberger

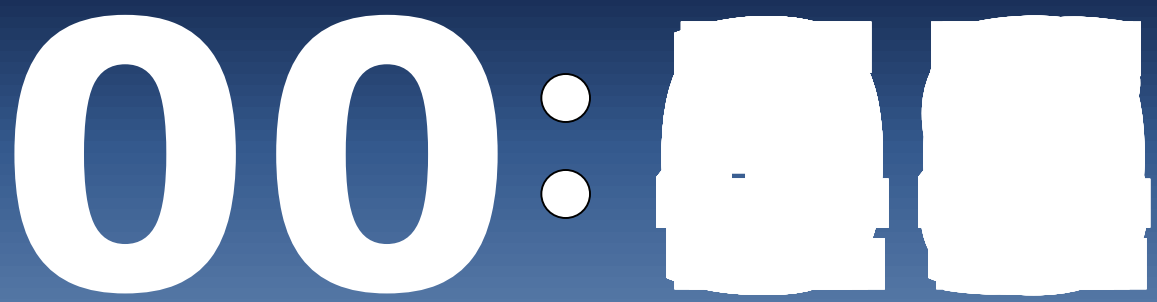
03:00

Countdown Clock
By Dr. Jeff Ertzberger

Countdown Clock
By Dr. Jeff Ertzberger

01:[illegible]

Countdown Clock
By Dr. Jeff Ertzberger



Countdown Clock
By Dr. Jeff Ertzberger

Outbreak Scenario | Based on Real Events

SAHO/USDA-Animal Source Investigation

- **Examine records at their diagnostic lab – have there been cases of Q fever diagnosed in the previous 6 months?**
- **Contact local veterinarians – any increase in Q fever cases in livestock in previous months?**
- **Identify farms within a few miles of the cases and ask farmers about herd health, reproductive problems, and manure handling practices**
- **Identify environments that could be contaminated with the pathogen**

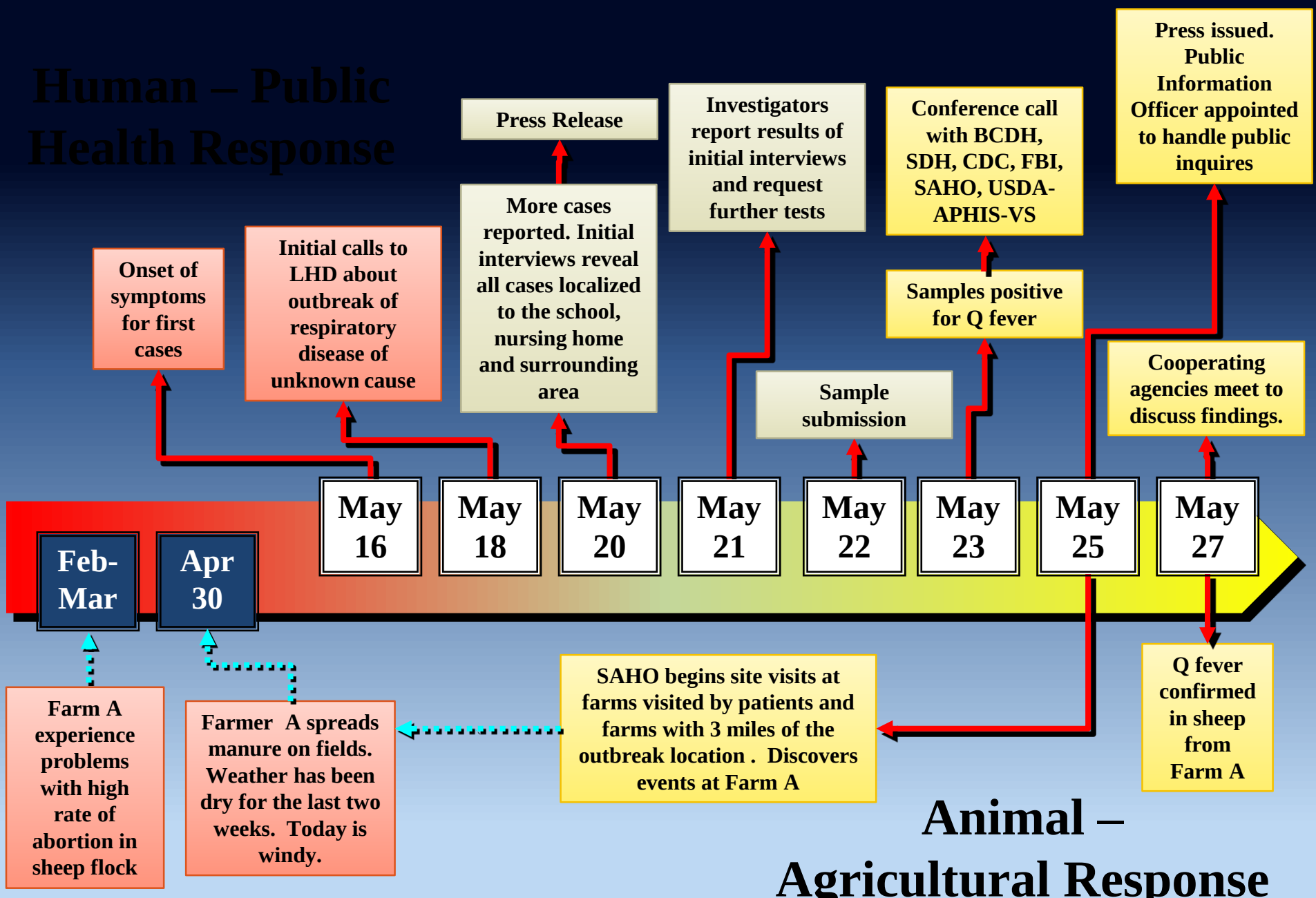
Outbreak Scenario

- Logistics
- Background
- Scenario
- Investigation
- Response

How did this happen?

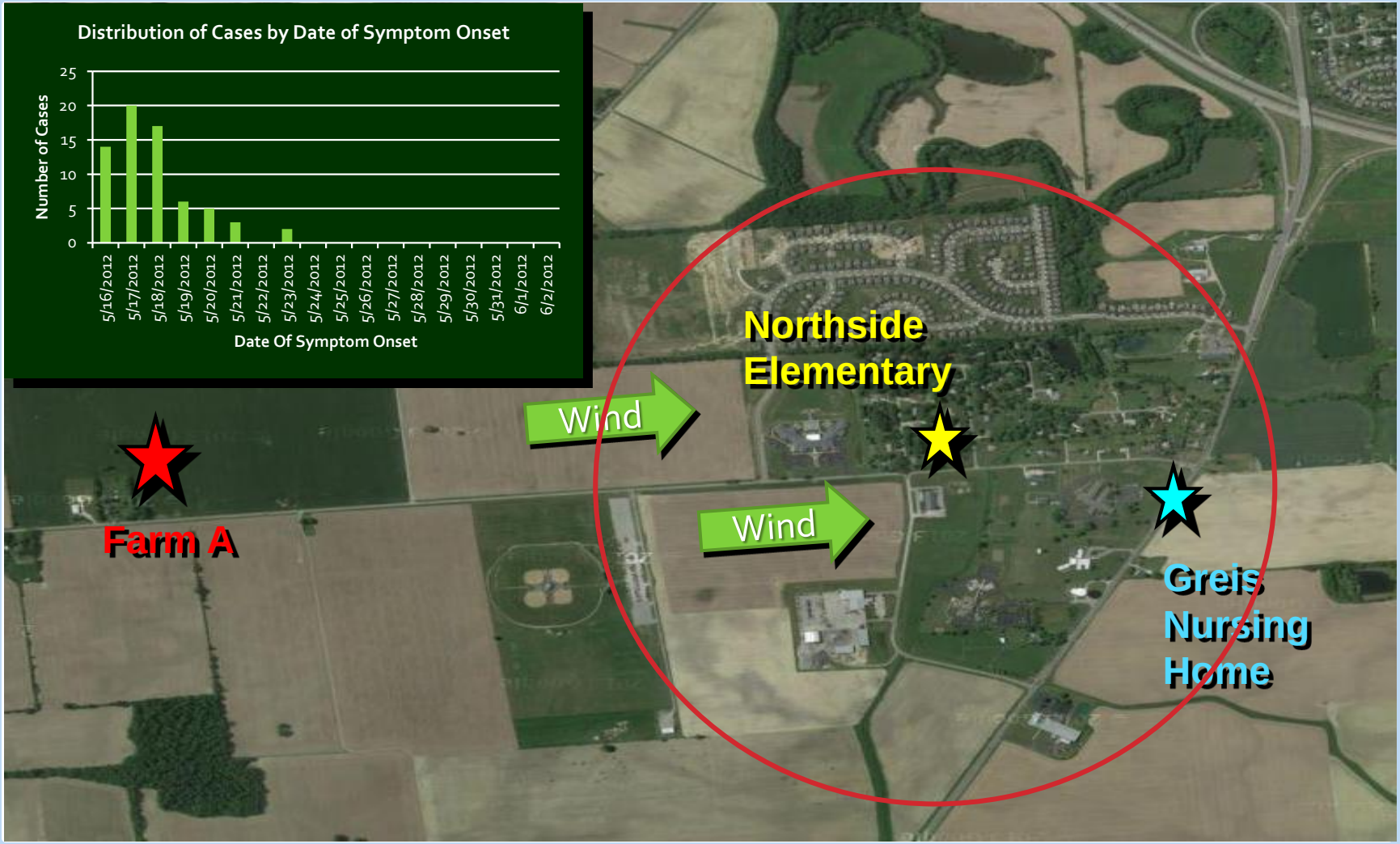
Timeline of Events

Human – Public Health Response



Animal – Agricultural Response

Outbreak Scenario



Outbreak Scenario

What prevention and control measures would you recommend (human and animal)?

You have 5 minutes to discuss among your table…

04:00

Countdown Clock
By Dr. Jeff Ertzberger

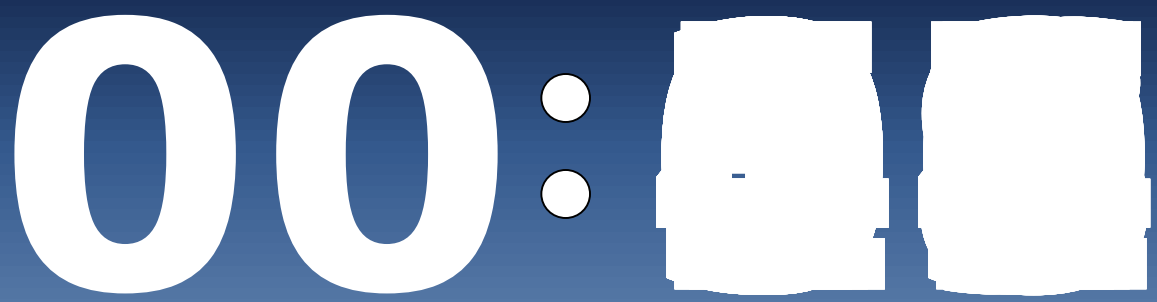
03:00

Countdown Clock
By Dr. Jeff Ertzberger

Countdown Clock
By Dr. Jeff Ertzberger

01:[illegible]

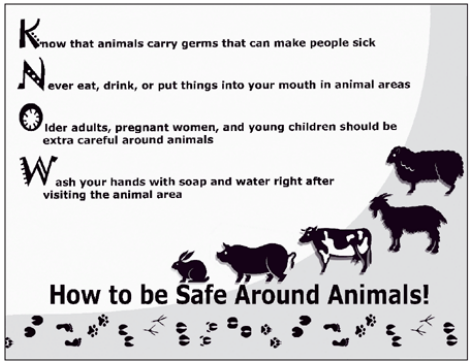
Countdown Clock
By Dr. Jeff Ertzberger



Countdown Clock
By Dr. Jeff Ertzberger

Outbreak Scenario

Prevention and Control Measures



- **Public Health and prevention messaging**
- **Continue surveillance of human cases**
- **Agricultural Response**

Outbreak Scenario

Logistics

Background

Scenario

Investigation

Response

Public Health and Prevention Messaging

- **Provide frequent updates to the media on the current investigation and disease prevention**
- **Raise awareness through outreach to local partners**
  - **Local physicians and veterinarians**
  - **Extension agents, 4-H groups**
  - **Farm Bureau**
- **Provide fact sheets on Q fever and other easily accessible information on websites, social media, via stakeholders**

Outbreak Scenario

Logistics

Background

Scenario

Investigation

Response

Continue Human Disease Surveillance

- **Identify and investigate new cases**
- **Discover past cases which meet the case definition for this outbreak, with specific emphasis on trying to identify Chronic Q-Fever**
- **Summarize the outbreak and make recommendations to prevent future outbreaks**

Outbreak Scenario

Logisti

Backgrou

Scenari

Investigati

Response

Agricultural Response

Contact livestock producers to provide education on Q fever and prevention of transmission to humans.

Special focus on:

- **Composted manure, birthing material and carcasses**

- **If composting is not possible:**
  - **Cover manure when transported**
  - **Only spread on non-windy days**
  - **Immediately plow into soil**

- **Follow local regulations in regards to spraying manure**

- **Additional recommendations are provided in the NASPHV Q-Fever compendium**

Outbreak Scenario

Logistics

Background

Scenario

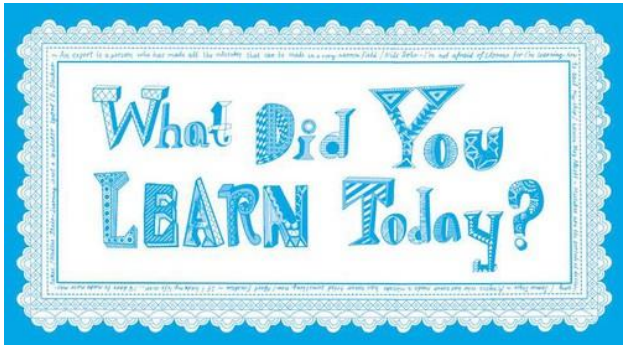
Investigation

Response

How do we Manage the Infected Animals

- **Q fever can't be effectively treated in animals**
- **Most do not show signs**
- **The pathogen is ubiquitous and persistent in the environment**
- **SAHO might have the authority to quarantine animals when he/she believes there is a dangerously contagious or infectious disease present**
- **It is incredibly unlikely that a SAHO would quarantine a farm for Q fever, because such quarantine could not be lifted as the disease cannot feasibly be eliminated from the farm**

Outbreak Scenario



What did you learn from this scenario about investigation of a zoonotic disease outbreak?

You have 5 minutes to discuss among your table…

04:00

Countdown Clock
By Dr. Jeff Ertzberger

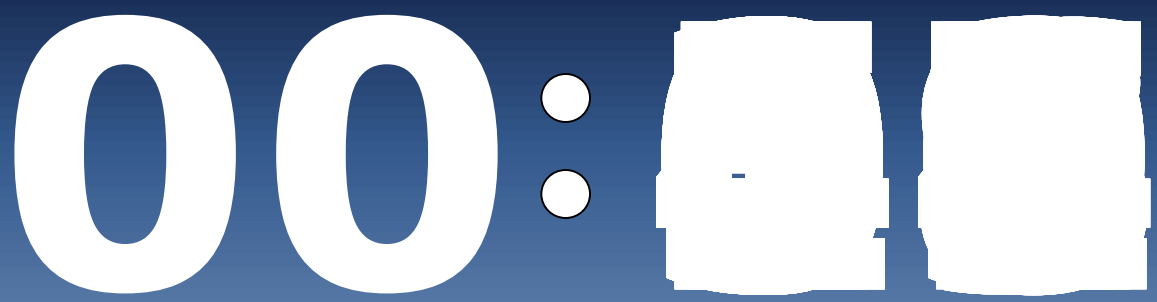
03:00

Countdown Clock
By Dr. Jeff Ertzberger

Countdown Clock
By Dr. Jeff Ertzberger

01:[illegible]

Countdown Clock
By Dr. Jeff Ertzberger



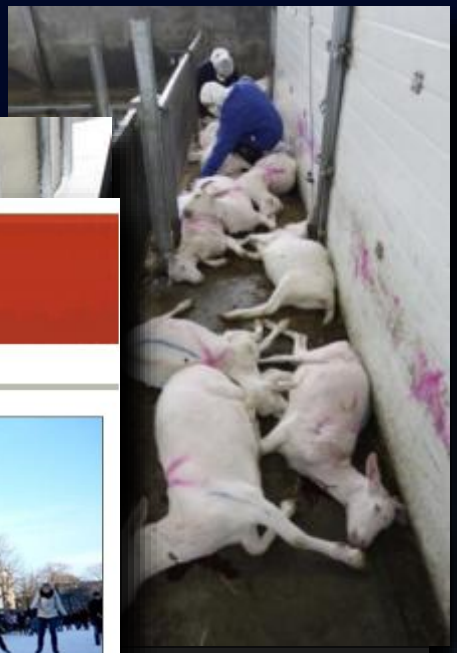
Countdown Clock
By Dr. Jeff Ertzberger

Outbreak Scenario

Key Points from the Scenario

- Many emerging infectious diseases are zoonotic
- Potential for bioterrorism attack using zoonotic agent
- Importance of communicating across disciplines
- Cooperation between human public health officials and veterinary public health officials!
- Importance of being familiar with steps in outbreak investigation

Outbreak in the Netherlands



ELSEVIER MASSON

Disponible en ligne sur ScienceDirect

Elsevier Masson France EM|consulte

Médecine et

Q fever in

Fièvre Q au

P.

[a] Jeroen Bosch H

[c] Centre for Infectiou

Abstract

Q fever is a zoonosi
The Netherlands faced
Q fever outbreak ever
as well as on its trans
management of the ep
blood donation. The n
with a need for guidar
acute outbreak was co
© 2014 Published by

Keywords: Q fever; The

Résumé

La fièvre Q est une
qui peut être fatale. D
ce qui en fait la plus
informations sur l'hist
patients atteints de fiè
d'une épizootie par le
fait du grand nombre
suivi des femmes ence
drastiques, le risque d
années.
© 2014 Publié par Els

Mots clés : Fièvre Q ; P

* Corresponding autho
E-mail address: CWint

http://dx.doi.org/10.1016/j.medmal.2014.02.006
0399-077X/© 2014 Published by Elsevier Masson SAS.

ABC Rural

Home Programs News Markets Features Events Message Boards Weather About Us Contact Us

Watch out for Q fever

By Sarina Locke
Monday, 30/07/2012

0

Australian health experts are taking serious lessons from an outbreak of Q fever in goats and people in the Netherlands in 2010.

The disease spread from milking goats, with infected straw spread over tulip fields, and dust blowing over the local community.

It took two years to realise that it was Q fever, by which time 12 people died and 4,000 were sick, as the vets hadn't warned the local doctors to test for it.

Dr Steven Graves, of the John Hunter Hospital in Newcastle, says all Australian regional doctors should watch out for symptoms.

"If somebody presents with a fever or pneumonia, they might have Q fever," he said.

"You don't have to have direct contact with animals. Fifty per cent of the cases I see the person's got no contact with animals, it just comes through the air."

About 400 people get Q fever a year in Australia, as a conservative estimate.

Australia has a vaccine for Q fever, developed by an Adelaide researcher.

People needing a vaccine are first tested for prior exposure.

In a recent trip to the Netherlands, Dr Graves suggested to the Dutch authorities that they buy Australia's vaccine for the population, but his suggestion was rejected.

"80 per cent of all human diseases actually originate from animals.

"That's what zoonosis is and that's what One Health movement is all about.

"If just one doctor and one vet had played golf together in Holland, during the early stage of the outbreak everyone would have known about it. They didn't talk to one another."

Lack of communication between vets and doctors contributed to a major outbreak of Q fever in the Netherlands in 2010. (Audience submitted: Ellyn Cook)

Audio

Q fever lessons from Dutch outbreak. Doctors and vets need to talk

Dr Stephen Graves director of the Division of Microbiology Pathology John Hunter Hospital.

Download this mp3 file

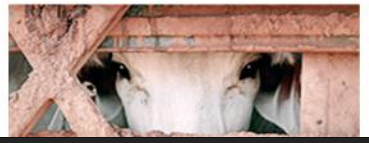


Fig. 2. Acute Q fever notifications, the Netherlands, 1 January (week 1) 2007 – 30 November (week 48) 2011.
Déclaration de fièvre Q aux Pays-Bas, du 1 janvier (semaine 1) 2007 – au 30 novembre (semaine 48) 2011.

Outbreak Scenario

Development Team

Armando E. Hoet, Joanne Midla, Jeanette O'Quin, Jason Stull, Suzanne Tomasi, Wendy Lehman, and the Ohio One Health Alliance working group

Outbreak Scenario

Questions?