

Case Study

Case Investigation of Suspected Human Infection with Avian Influenza A (H5N1) Virus

Overall Instructions

- In this exercise, group members will collectively act as a specialized public health Rapid Response Team (RRT) that has been assigned to investigate possible human illness associated with an outbreak of highly pathogenic avian influenza A (H5N1) among poultry.
- Depending on the size of the overall group being trained, it may be appropriate to break into smaller groups to complete this case study. This training has been designed for training breakout groups consisting of ≤ 10 persons, with facilitators assigned to each group.
- The scenario explores an outbreak of highly pathogenic influenza A (H5N1) in poultry that leads to human infection with the same H5N1 virus.
- Facilitators should adapt the scenario, as needed, to their local situation in order to improve the realism of the exercise and more effectively engage students.

Resources

Some useful documents for reference during this exercise or to examine when released include:

- WHO guidelines for investigation of human cases of avian influenza A (H5N1) – released January, 2007. Available at http://www.who.int/csr/resources/publications/influenza/WHO_CDS_EPR_GIP_2006_4/en/index.html
- WHO Rapid Advice Guidelines on pharmacological management of humans infected with avian influenza A (H5N1) virus, 2006. Available at http://www.who.int/medicines/publications/WHO_PSM_PAR_2006.6.pdf
- CDC Guidance for State and Local Health Departments for Conducting Investigations of Human Illness Associated with Domestic Highly Pathogenic Avian Influenza Outbreaks in Animals – forthcoming
- USDA Summary of the National Highly Pathogenic Avian Influenza Response Plan, updated August 2006. Available at http://www.aphis.usda.gov/newsroom/hot_issues/avian_influenza/avian_influenza_summary.shtml

Case Study Outline

Section	Title	Time Allotted
A	Preparation	20 min
B	Possible Poultry Outbreak	25 min
C	Planning Response – Logistics	15 min
D	Planning Response – Communications	25 min
E	Initial Response	15 min
F	Investigation – Interviewing	20 min
G	Investigation – Quarantine, Antivirals, Vaccine	20 min
H	Investigation – Active Surveillance	15 min
I	Investigation – Case Classification & Communication	15 min
J	Investigation – Case Interviewing	10 min
K	Investigation – Case Management & Communication	10 min
L	Investigation – Infection Control	20 min
M	Investigation – Case Classification & Line Listing	25 min
N	Investigation – Specimen Collection	15 min
O	Investigation – Assessing Human-to-Human Transmission	20 min
P*	Investigation – Daily Report	20 min
Q*	Investigation – Epi Curve	30 min
R	Investigation – Mass Prophylaxis	15 min
S	Investigation – Risk Communication	15 min
T	Conclusion	5 min
U	Evaluation	25 min

* These sections may be omitted if group work runs behind schedule.

A. Preparation

Instructions:

Read the following background information. In your small group, discuss the question that follows.

Time Allotted: 20 minutes

Background

It is Wednesday, November 14, 2007, and you are busy with the day-to-day work of the health department in your state. Among other activities, your health department has conducted two seasonal influenza vaccination clinics during this month, and another is scheduled for early December. The vaccine supply for seasonal influenza is expected to exceed demand this year.

You haven't been thinking much about avian influenza lately, although you know that the World Health Organization has classified the current Pandemic Alert Period situation as Phase 4, resulting from several clusters of limited human-to-human transmission of H5N1 virus in Asia and Europe. Just a couple of days ago, you heard that one Southeast Asian country conducted mass poultry depopulation in an effort to decrease human infection there. To date no avian or human cases of highly pathogenic H5N1 have occurred in North or South America, although other avian influenza A viruses are circulating among poultry and wild birds.

Question 1 – With the worldwide Pandemic Alert Period situation classified as Phase 4 (increased, but still limited human-to-human transmission), what influenza surveillance activities are currently happening in your state for each of the following groups? Discuss routine seasonal influenza surveillance and enhanced H5N1 surveillance (if applicable).

- Poultry
- Wild Birds
- Humans

Presumptive positive
H5 test in hen

B. Possible Poultry Outbreak: Part 1

Instructions:

Read the following scenario. As a group, brainstorm ideas to address the question that follows.

Time Allotted: 10 minutes

Resource: Notifiable Avian Influenza (NAI) Case Definition, USDA (Appendix A)

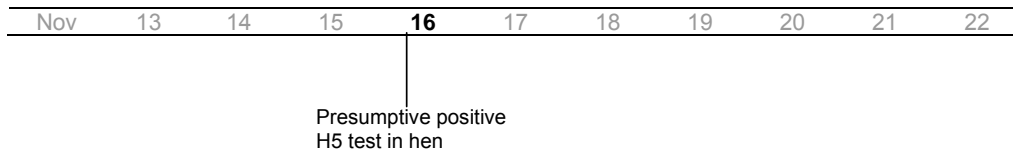
Update 1

On Friday, November 16th, around 10am, you receive a phone call from your state epidemiologist, who just spoke with the state veterinarian. The state vet received a call this morning from a USDA-approved veterinary laboratory participating in the National Animal Health Laboratory Network (NAHLN). The laboratory reported a presumptive positive H5 result from a reverse transcriptase polymerase chain reaction (RT-PCR) test. The sample was from a hen brought to the laboratory by the owner of a small local farm after it was found dead late yesterday. Multiple samples from the bird are now being sent to the National Veterinary Services Laboratory (NVSL) in Ames, Iowa, to confirm the presence of H5 and for further antigenic typing. Your State Department of Agriculture will not make an official announcement of the presumptive positive H5 result until it is confirmed by a RT-PCR test at NVSL (results can be expected within 24 hours at the most). In addition to RT-PCR testing, NVSL will conduct confirmatory tests including viral isolation, genetic sequencing, pathogenicity testing, and further analysis of viral isolates (results within 5-10 days). In the meantime, the State Department of Agriculture is sending a team to the scene to investigate and to take samples from the rest of the flock, at least half of which has died—thereby meeting the USDA case definition for Notifiable Avian Influenza as a “presumptive positive”. The USDA Area Veterinarian in Charge is sending a Foreign Animal Disease Diagnostician to the farm to conduct an investigation. The vet also mentioned that the farmer’s daughter was home sick from school today. Your state epidemiologist asks you to call the state vet to gather additional information.

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Question 1 – What questions would you ask the state vet during this phone call?



B. Possible Poultry Outbreak: Part 2

Instructions:

Read the following update. In your small group, discuss the questions that follow.

Time Allotted: 15 minutes

Resources: Profile of Springfield County (Appendix B)
WHO Rapid Advice Guidelines on pharmacological management of humans infected with avian influenza A (H5N1) virus (Appendix C)

Presumptive positive
H5 test in hen

Update 2

From your conversation this morning with the state vet, you learned that the farm is a small, family-owned operation on 50 acres of land in the northeast part of Springfield County (Appendix B). The owner, Rick Jackson, teaches at Springfield High School, and has the farm as a side business.

Around 3 p.m., the state vet calls back to tell you that 53 of the 80 chickens on the farm have died since yesterday, and others have symptoms of illness, including hemorrhages under the skin. The flock has been placed under immediate quarantine, and will be depopulated later today. Although the results of testing at NVSL to determine whether the strain is low- or highly-pathogenic have not returned, the state Department of Agriculture is proceeding as if the strain is highly-pathogenic due to the presumptive positive case definition. The Foreign Animal Disease Diagnostician onsite at Jackson Farm agrees that the strain is probably highly pathogenic. USDA has sent additional representatives to collaborate with the state on the investigation. The area is near a waterfowl habitat, so the vet will find out whether any wild birds have recently tested positive for H5N1, and notify the Department of Fisheries and Wildlife of the poultry outbreak.

When you ask about personal protective equipment (PPE), the vet says that the State Dept of Agriculture has PPE, including fit-tested N-95 respirators, available for its response team already. However, the vet requests that you provide antiviral chemoprophylaxis to the team, since team members will be responsible for depopulating and disposing of the flock. She asks that you also consider providing PPE and chemoprophylaxis to poultry workers throughout the area, since it is still unclear how the H5 virus entered the county.

Question 1 – Which agency is currently in charge? Consider whether any emergency operations plans are activated, and whether the incident command structure would be used at this stage.

Question 2 – In addition to routine animal and human surveillance activities, what types of active surveillance for illness in humans would be implemented in this setting?

Presumptive positive
H5 test in hen

Question 3 – Do you plan to provide antiviral chemoprophylaxis to the State Department of Agriculture response team? If so, where are the antivirals located? How do you access them? How will chemoprophylaxis be implemented?

Question 4 – Should you plan to provide antiviral chemoprophylaxis to other area poultry workers at this stage?

C. Planning Response - Logistics

Instructions:

You must plan how you will respond to this situation before you leave for the field. Read the following update, and as a group, answer the questions. Use an easel, pad of paper, or chalkboard to create the list requested in Question 2.

Time allotted: 15 minutes

Update 3

Because of the high mortality of the flock, and the presumptive positive H5 classification, you decide to proceed as if the virus is highly pathogenic. After receiving permission from the state veterinarian to visit the farm, you call your public health rapid response team and prepare for an investigation. The team will be responsible for identifying people who may have been exposed to ill poultry, and monitoring those people for signs and symptoms of human infection with H5N1 viruses.

Question 1 – Who are the members of the public health rapid response team (RRT)? Think about this in terms of roles that should be filled, and note which person will serve as the team lead. (Keep in mind that not all members of a rapid response team will necessarily conduct field work).

Question 2 – What documentation, forms and other resources does the team need to bring? Create a checklist of necessary paperwork and resources.

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SAMPLE CHECKLIST OF DOCUMENTS NEEDED FOR AVIAN INFLUENZA OUTBREAK INVESTIGATION

Documents and Forms

- Proof of health department employment – Photo ID
- Field investigation guide
- Questionnaires – Cases
- Questionnaires – Contacts
- Questionnaires – Health care providers
- Letter from health officer to access medical records protected by HIPAA
- Line-listing form
- Data collection form for environmental/home investigation
- Standard Template for Daily Situation Reports
- Sample Collection Form – Clinical
- Sample Collection Form – Animal
- Sample Collection Form – Environmental
- Educational and informational materials for public
- Contact information – local and state phone numbers, Nextel numbers and emails
- Checklist for RRT Investigation and Surveillance Procedures
- 3 Short (9 word) communication messages to be updated daily

Resources

- Laptop computer w/ flash drive or CDs, data management software
- Antiviral medication
- Inactivated seasonal influenza vaccine and coolers to store it
- Personal protective equipment (goggles, fit-tested respirators, gowns, gloves, hair cover)
- Specimen collection materials, sterile viral transport media, blood drawing supplies, appropriate swabs
- Thermometers (for fever logs)
- Decontamination solution, alcohol-based hand gel
- Communications equipments (e.g. cell phones, radios)
- WHO and CDC guidelines on conducting an avian influenza investigation
- Basic summary of avian influenza in humans, including case definitions, reporting, and case management
- Contact information for team members, supervisors, Department of Agriculture representatives, and state veterinarian
- Educational information (e.g. brochures about avian influenza and personal safety)
- Money
- Digital camera for documentation
- Cell phones
- Medical equipment (e.g. stethoscope) for clinicians
- Permanent marking pens
- First aid kit

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H5 test in hen

D. Planning Response - Communications

Instructions:

Read the following update. As a group, please brainstorm answers to the following questions and complete the table provided in your workbook.

Time allotted: 20 minutes

Update 4

You’ve now planned your initial response, and gathered documentation and supplies to make a visit to the farm. Before you leave, you need to develop a communications plan. It will be especially important to plan for communications between your health department and the Department of Agriculture and to determine how your agencies will coordinate messages to the public.

Question 1 – What (if any) information do you need to communicate to each of the following individuals or organizations before you leave? Note that your State Epidemiologist or State Health Director will likely take responsibility for communicating with CDC and other federal agencies, and either the State Health Director or Public Information Officer will take primary responsibility for communicating with the public.

WHO to contact	Information to share
Your State Veterinarian	
Your State Department of Agriculture	
Your State Epidemiologist	
Your State (or local) Health Dept. Public Information Officer	
Hospitals and healthcare facilities in affected area	
Diagnostic / Reference Laboratory	
Emergency Management	
Your Family	

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Question 2 – Which person (role) on the RRT is responsible for communicating with agencies, health-care providers, and the media?

Question 3 – Will there be communication/language/cultural barriers when you arrive in the field?

Question 4 – How will team members communicate with each other once they are in the field? Have all rapid response team members been trained on how to use necessary communication devices?

Question 5 – Should public health and agriculture agencies establish a Joint Information Center (JIC) at this time? Do sites make use of “virtual JICs” at this early stage? Why or why not?

Question 6 – What communication channels will be used to share information between public-health officials at different levels of government (federal, state and local) or in different geographic areas?

E. Initial Response

Instructions:

Read the following update. In your small group, discuss the questions that follow.

Time Allotted: 15 minutes

Resources: CDC Interim Guidance for Protection of Persons Involved in U.S. Avian Influenza Outbreak Disease Control and Eradication Activities, 2004 (Appendix D)
Canadian Food Inspection Agency Biosecurity Checklist, 2006 (Appendix E)

Presumptive positive
H5 test in hen

Update 5

It is around 6 p.m. on Friday the 16th, and your rapid response team (RRT) has arrived at the farm, which has been designated as an infected premise by the USDA. Only you and the public-health veterinarian are permitted to enter the farm. You manage to find the state veterinarian, who directs you toward the house, where the couple who owns the farm is waiting. The couple's two teenage daughters are both home – one of whom stayed home sick from school today. The state vet tells you that the couple also has a son in his early twenties who lives with his parents but isn't currently at home. It isn't clear whether any of these people have symptoms of human infection with avian influenza A (H5N1).

Question 1 – What biosecurity issues do you need to consider when entering and exiting the farm?

Question 2 – Should your rapid response team use PPE when interviewing potential cases and contacts? If yes, what precaution level? If not, why is PPE not necessary in this situation?

Question 3 – The family has noticed that some first responders from the Department of Agriculture are wearing gloves and masks. They ask you whether they should be wearing gloves and masks too. How do you respond?

Question 4 – What is the specific assignment of each team member in this situation? Complete the chart below.

Presumptive positive
H5 test in hen

RRT Role	Task
Clinician	Assess family, exposed persons and contacts
Epidemiologist	Undertake interviews of cases, exposed and contacts, and necessary follow-up. Observational investigation of premises, consider surveillance options.
Public-Health Veterinarian	Work as a liaison between public health and agriculture agencies to ensure an effective joint response.
Laboratory Technician	Collect, label, package, ship and track specimens.
Infection Control Practitioner	Operate as a safety officer, assure infection control and biosecurity measures are maintained.
Other (logistician, environmental health specialist, etc)	Perhaps work as a liaison officer with other agencies.

F. Investigation - Interviewing Possible Cases

Instructions:

Read the following update. In your small group, act out the role play that follows.

Time Allotted: 20 minutes

Resource: Generic Outbreak Reporting Questionnaire (Appendix F)

Update 6

You have decided that you will interview the farmer, Rick Jackson, his wife and daughters, and any farm workers. Meanwhile, one of your team members will act as a communications liaison to exchange information with other agencies, including the state Department of Agriculture. In addition, that person will try to contact and interview the older son.

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Presumptive positive
H5 test in hen

Role Play Instructions – Split into groups of two. One person will be an interviewer from your rapid response team (RRT), and the other person will be Rick Jackson, the owner of Jackson farm. The RRT interviewer can use the form provided in Appendix F as an interview guide, if desired. The farmer should review the information on the following two pages and use it to respond to questions. The RRT interviewer should NOT look at the information on the following two pages. Keep in mind that the farmer should answer only those questions posed by the interviewer.

Presumptive positive
H5 test in hen

Information for Rick Jackson, farm owner

Name: Rick Jackson

Age: 43 **Date of Birth:** August 22, 1963

Family: wife, Heidi, son, Trevor (22), and two daughters, Lisa (18) and Claire (15).
Claire stayed home sick from school today with a sore throat and a cough.

Job: High school teacher and football coach

Medical History

Chronic illnesses: None, except high blood pressure since 1999

Medications: High blood pressure meds since 1999

Smoking: Used to smoke regularly but quit 12 years ago

Allergies: None

Seasonal influenza shot: None

Most recent doctor's visit: At least two years ago

Signs & Symptoms: You have been feeling fine – no fever, body aches, or eye irritation. You do have a slight cough that started today, but it isn't anything serious. You aren't concerned about yourself, but you are concerned about your family and your livelihood.

Farm: You operate a small 50-acre farm, and raise chickens primarily for consumption. Each month, you purchase 80 broiler chicks from a reputable mail-order company. At the end of the month, you slaughter them and sell them at the local farmer's market. Your family also uses the poultry products. You had 80 chickens on your farm prior to the outbreak. Your chickens are free-range, and it's possible that they would have been in contact with droppings from wild birds or that wild birds may have shared their water source.

Employees: You don't have any employees, but your son Trevor and daughter Claire help out quite a bit on the farm. Your neighbor Bill Zalesky is retired, and he usually spends a couple of days each week helping out at the farm, in exchange for some chicken.

Contact with poultry: Several people, including you, your son Trevor, and your daughter Claire, have daily close contact with the poultry. Trevor feeds and waters the flock in the morning, and Claire does the same after school. Your wife Heidi and daughter Lisa have occasional contact, including preparing and cooking chicken from the farm. Your neighbor Bill helps with poultry slaughtering every month.

Presumptive positive
H5 test in hen

Yesterday: When you woke up yesterday, you found 10 chickens dead. Others looked ill, with swollen heads and legs, nasal discharge, and lack of coordination. You were very concerned about avian influenza and Exotic Newcastle Disease. You wrapped one of the dead birds in a garbage bag and brought it to the closest veterinary laboratory, in your regular truck, the 1994 Ford F150. You and Trevor had the majority of contact with the sick and dead birds, and Bill Zalesky (neighbor) helped out for a short while.

Other potential contacts: There are daily visitors to the farm, of one type or another, including friends of the family, and people picking up and dropping off supplies (e.g. chicken feed). You sell your chickens at the farmer's market on the last Saturday of every month.

G. Investigation - Quarantine, Antivirals, and Vaccine

Instructions:

Read the following update. In your small group, discuss the questions that follow.

Time Allotted: 20 minutes

Update 7

It is late in the evening of Friday, November 16th, and you have now completed interviews with the Jackson family, with the exception of the son, Trevor, who hasn't yet responded to cell-phone messages. You have also interviewed Bill Zalesky, a neighbor who helps out on the farm. Rick has a slight cough. Rick's daughter, Claire, has a sore throat and cough that began this morning, but no one else reports respiratory symptoms. No one has fever. Both Rick and Trevor had extensive contact with the sick poultry yesterday. Claire helped out for a short time yesterday, and also has routine daily poultry contact. Bill Zalesky, the neighbor, helped out yesterday, but does not report any signs or symptoms of illness. You are still awaiting confirmatory test results from NVSL, but in the meantime you need to make some decisions about quarantine, specimen collection, and antiviral chemoprophylaxis.

Presumptive positive
H5 test in hen

Question 1 – Do you recommend that any or all of these people remain under voluntary quarantine? If so, for how long? As a reminder: quarantine is for people who have been exposed but are not yet ill, and isolation is separation of ill people from others.

Question 2 – Do you administer post-exposure antiviral chemoprophylaxis to any or all of these people? If so, which drug should you use?

<i>Patient Age</i>	<i>Prophylactic Dose</i>
≥ 13 years	1 capsule (75 mg) once a day
1 to 12 years	≤ 15 kg: 30 mg once a day
	>15-23 kg: 45 mg once a day
	>23-40 kg: 60 mg once a day
	≥ 40 kg: 75 mg once a day

Question 3 – Do you collect specimens from any or all of these people?

Question 4 – Do you administer inactivated seasonal influenza vaccine to any or all of these people? If yes, what is your rationale for using inactivated seasonal influenza vaccine?

Question 5 – What is your plan for monitoring the Jacksons and Bill Zalesky for avian influenza A (H5N1) signs and symptoms?

Question 6 – Are there other people who should receive antiviral chemoprophylaxis?

H. Investigation - Active Surveillance

Instructions:

Read the following update. In your small group, discuss the questions that follow.

Time Allotted: 15 minutes

Presumptive positive
H5 test in hen

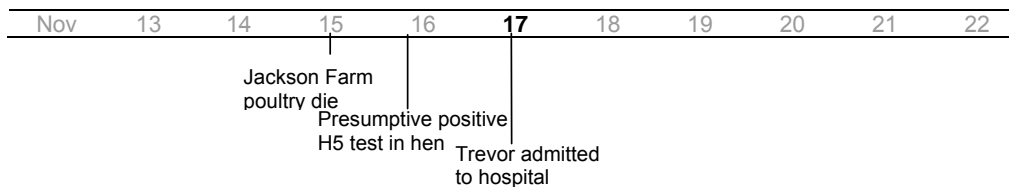
Update 8

It's now late in the evening on Friday, November 16th. Before calling it a day, your rapid response team has a debriefing and planning meeting. You want to plan and prioritize activities for tomorrow. You know that active surveillance is going to be a key strategy to prevent and treat human cases of avian influenza A (H5N1).

Question 1 – What specific surveillance strategies will you use to identify potential human cases and contacts?

Question 2 – Who do you need to follow-up with in the morning? Which possible cases or contacts are your highest priority?

Question 3 – Who do you need to update about today's events?



I. Investigation - Case Classification

Instructions:

Read the following update. In your small group, discuss the questions that follow.

Time Allotted: 15 minutes

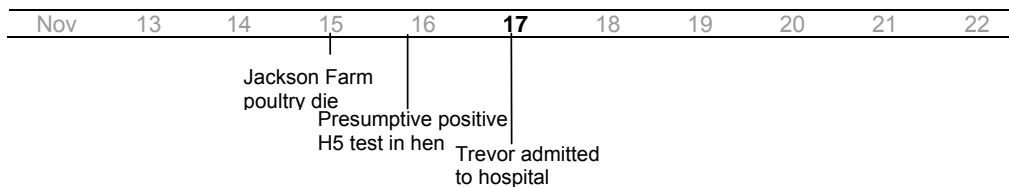
Update 9

Early in the morning on Saturday, November 17th, you receive a call from Heidi Jackson, who is at Springfield Regional Medical Center with her son Trevor. According to Heidi, Trevor came home late last night with fever and shortness of breath, and she took him to the emergency room. He was admitted to the hospital at 4 a.m. after spending a short time in the emergency room. She apologizes for not calling sooner, but she assures you that she alerted the ER staff to the possibility that Trevor had avian influenza.

You immediately send one of your RRT members to the hospital. You are provided with Trevor's medical chart. It includes the following information:

Onset of fever and shortness of breath on Nov 16th
 Moderate respiratory distress
 No significant medical history
 Initial blood count reveals low lymphocytes and leukocytes
 Vitals upon admission:
 Temperature = 101.3°F
 Respiratory Rate = 28
 Blood Pressure = 180/100
 Oxygen Saturation = 90%
 Oropharyngeal specimen collected - results are pending

Question 1 – Does Trevor meet CDC's case definition for influenza A (H5N1)?
 If so, would his case be classified as suspect or confirmed?



Question 2 – What would need to happen in order for this case to move from its current classification to the next?

Question 3 – While you are at the hospital, do you make any additional recommendations to health-care providers or infection control practitioners there?

Question 4 – Are there any other actions you would take while at the hospital?

J. Investigation - Case Interviewing

Instructions:

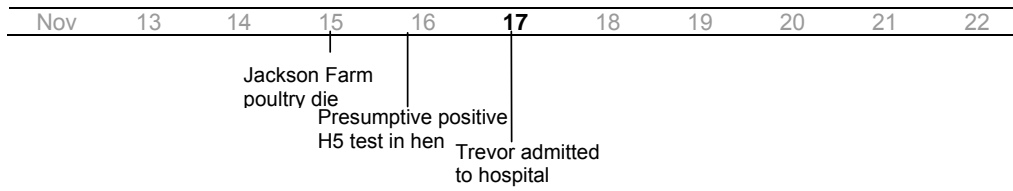
Read the following update. In your small group, discuss the questions that follow.

Time Allotted: 10 minutes

Update 10 - Morning of November 17, 2007

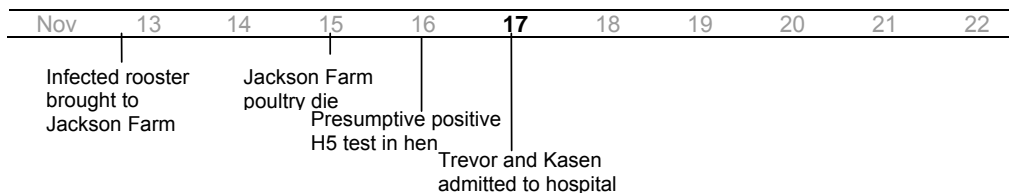
Although Trevor is ill, one of your RRT members was able to conduct an interview with him in the hospital. The interview uncovered the following information.

Trevor works as a mechanic at a local repair shop, and has several friends who also work there. On Monday Nov 12th, Trevor's coworker and friend, Kasen Punyawong, returned from a trip home to Pao Mai in Southeast Asia to visit his extended family. In Pao Mai, Kasen's family is very involved in many aspects of cockfighting, a popular sport in that country. While Kasen was visiting his family, the Pao Mai government announced a mass poultry culling operation to limit the spread of avian influenza A (H5N1) in their country. To save the family's most prized and valuable rooster, Kasen shipped the bird into the U.S. The rooster was not detected by U.S. customs. Kasen brought the rooster to the Jackson farm on Tuesday, November 13th to show Trevor. The young men talked about how they could make a lot of money by breeding the rooster with hens from the Jackson farm. Trevor thought that the bird looked ill. He denies bringing the rooster into direct contact with the other poultry on the farm, but admits that the birds were in relatively close proximity. Trevor refuses to tell you where the rooster is now, and expresses regret at "ratting out" his friend.



Question 1 – Who should you notify about this new information?

Question 2 – Are there additional potential contacts that you should now follow-up with?



K. Investigation - Case Management and Communication

Instructions:

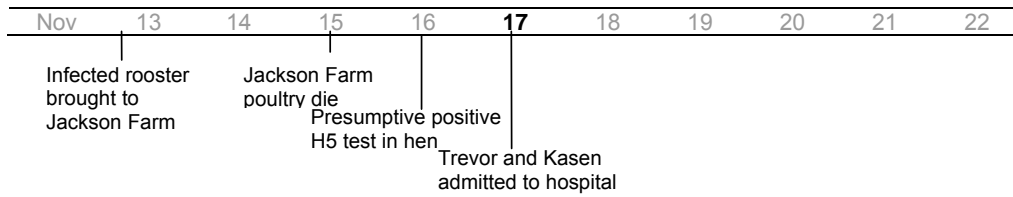
Read the following update. In your small group, discuss the questions that follow.

Time Allotted: 10 minutes

Update 11 - Evening of November 17, 2007

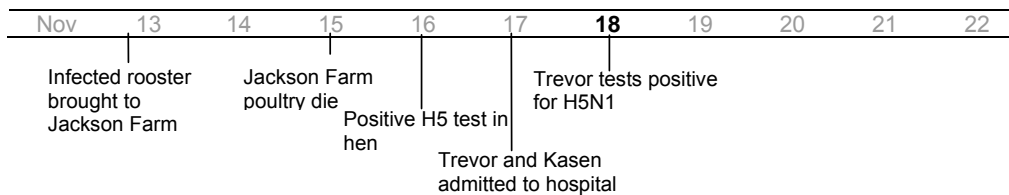
Today has been a busy day. Below is a summary of the news you've received so far.

- The National Veterinary Services Laboratory has confirmed the positive H5N1 test for the hen from Jackson Farm. It will still be several days before a formal determination of the pathogenicity and additional genetic sequencing is completed.
- The state Department of Agriculture faxed a list of people from their office who were initial responders at Jackson Farm, along with their phone numbers. You've also been notified that the remaining poultry at Jackson Farm were depopulated yesterday evening. Additional specimens were collected and sent to NVSL for further testing.
- Kasen Punyawong was admitted to the hospital this afternoon with fever, cough, and muscle aches. He is in an isolated hospital room and is being treated presumptively as an influenza A (H5N1) case, but you haven't yet been able to interview him.
- A member of your RRT went to the hospital to get a list of yesterday's emergency room patients and their times of arrival, hospital admission, and discharge. It isn't clear which patients may have had contact with Trevor in the ER. Several members of your team plan to follow-up with these possible contacts today.
- You receive a call from Heidi Jackson that her husband's cough is now severe, and this afternoon he developed fever and diarrhea. Her daughter Claire has also developed fever and muscle aches today. Heidi is worried and wants to know if she should take her husband and daughter to the hospital.
- Finally, you hear a report about the avian influenza investigation on the local news. You expect that the local health department will receive many calls from the worried well in the coming days.



Question 1 – Do you recommend that Heidi bring Rick and/or Claire to the hospital, keep them at home, or follow another course of action?

Question 2 – Are you communicating with the public during this time? If so, what are the key messages to convey? Through which media channels?



L. Investigation - Infection Control

Instructions:

Read the following update. In your small group, discuss the questions that follow.

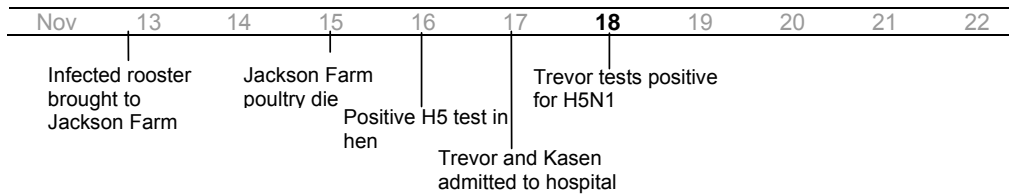
Time Allotted: 20 minutes

Update 12

It is Sunday morning, November 18th, and you have just learned that RT-PCR testing for Trevor is positive for avian influenza A (H5N1). You notify your State Health Director and State Epidemiologist, who immediately call the Directors Emergency Operations Center at CDC. Your State Epidemiologist instructs you to continue with your investigation while he consults with CDC about next steps. CDC staffers are being deployed to the area, and will assist your Rapid Response Team on the remainder of the investigation.

Together with a representative from the State Department of Agriculture, you conduct an interview with Kasen's brother Pravat, who is Kasen's only household contact. From the interview, you learn that the fighting cock died on Wednesday, November 14th, and Kasen buried the bird behind Pravat's house. The Department of Agriculture will exhume the bird for laboratory tests and examination, and will disinfect the premises.

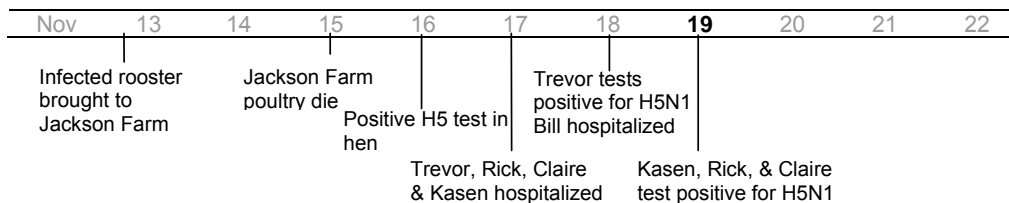
You and your RRT also interview people from the Dept of Agriculture who were first responders at Jackson farm, Trevor's and Kasen's coworkers, some of the people who visited the emergency room yesterday, healthcare workers who have been in contact with Trevor, some passengers on Kasen's airline flights (through CDC Division of Global Migration and Quarantine), and other responders. You have not been able to interview Kasen, because he was admitted to the hospital yesterday, and is very ill. His chest x-ray shows significant infiltration, and he has been intubated and sedated.



Question 1 – What infection control measures would you initiate for each of these groups: close contacts of suspected and confirmed cases, first responders to poultry outbreak, ER visitors, and health-care workers? Discuss possible actions in the following areas:

1. Antiviral Chemoprophylaxis
2. Quarantine
3. Other non-pharmaceutical interventions (e.g. social distancing)
4. Communication

Question 2 – What infection control measures should you recommend to Springfield Regional Medical Center, where Trevor, Kasen, Rick, and Claire are being cared for?



M. Investigation - Case Classification and Line Listing

Instructions:

Read the following update. In your small group, complete the activities that follow. Use case and contact list templates.

Time Allotted: 25 minutes

Update 13

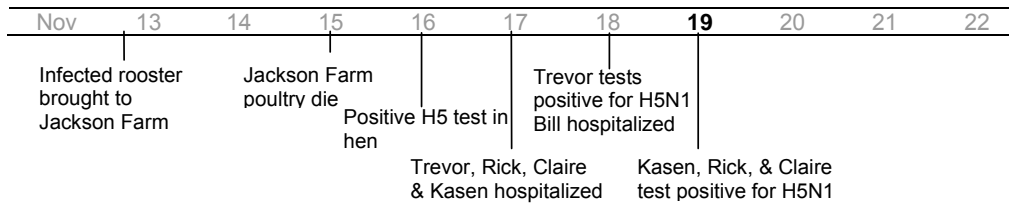
It is midday on Monday, November 19th, and you have compiled a great deal of information from interviews conducted over the weekend and this morning. Below is a sample of the data.

Initial cases

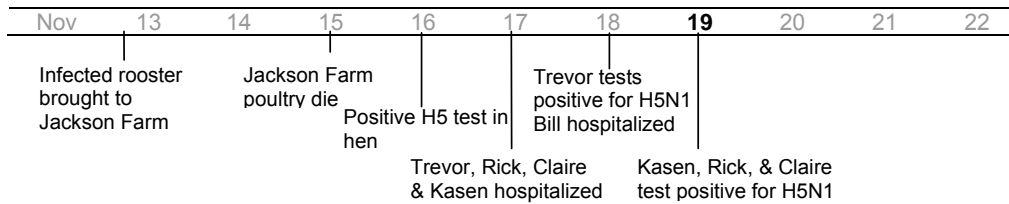
- Trevor Jackson (22-year-old male) remains hospitalized, and he is now in critical condition. Symptom onset began with fever and shortness of breath on November 16, 2007. He has developed pneumonia, and blood testing has revealed low lymphocyte and leukocyte counts. His chest radiograph (below) shows evidence of lower left lobe consolidation. The positive RT-PCR test was confirmed to be influenza A (H5N1) by the CDC laboratory and WHO collaborating center. Treatment with oseltamivir began on November 17.



Source: Ungchusak, K, et al. *N Engl J Med* 352(4):333-340



- Rick Jackson (43 y.o. male) is also hospitalized, with fever (101.9°F), cough, and diarrhea. His cough began on 11/16/07, and onset of other symptoms was 11/17/07. He was admitted to the hospital late that day (Saturday the 17th). RT-PCR on oropharyngeal swabs positive for influenza A (H5N1). Oseltamivir treatment was initiated presumptively on 11/16/07.
- Kasen Punyawong (24 y.o. male) was admitted to the hospital in the morning of 11/17/07 with fever (102.1°F), severe cough, and muscle aches. His symptoms began on 11/15/07. RT-PCR on respiratory specimens was positive for influenza A (H5N1), and his chest radiograph shows significant infiltration. He required mechanical ventilation on 11/17/07 and remains sedated. Oseltamivir treatment was initiated on 11/17/07.
- Claire Jackson (15 y.o. female) is hospitalized in stable condition. Cough and sore throat began on 11/16/07, fever and muscle aches on 11/17/07. Oseltamivir treatment was initiated presumptively on 11/16/07. RT-PCR on oropharyngeal swabs positive for influenza A (H5N1).

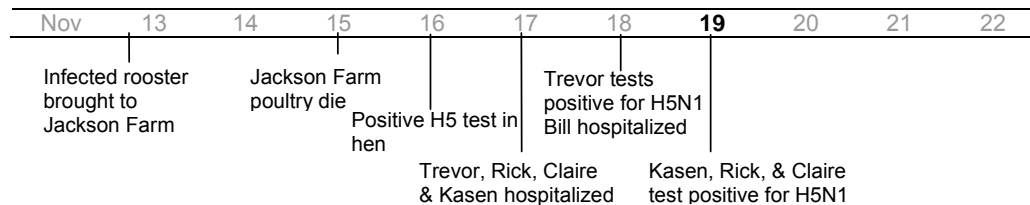


Additional Interviews

- Interview #1 – Heidi Jackson (wife of Rick). 41 y.o. female. No symptoms. Oseltamivir chemoprophylaxis initiated on 11/16/07.
- Interview #2 – Lisa Jackson (daughter of Rick), 18 y.o. female. No symptoms. Oseltamivir chemoprophylaxis initiated on 11/16/07.
- Interview #3 – Bill Zalesky (neighbor of Rick), 68 y.o. male. Fever, severe cough, sore throat, and shortness of breath began on 11/17/07. Admitted to hospital on 11/18/07. Blood testing has revealed low lymphocyte counts, moderately low platelet counts, and increased aminotransferases (liver enzymes). Treatment with oseltamivir was initiated on 11/18/07. RT-PCR influenza test results pending.
- Interview #4 – Jim Baxter (Dept of Agriculture first responder), 40 y.o. male. Fever, body aches, and shortness of breath began on 11/18/07. Admitted to hospital and treated with oseltamivir today (11/19/07). Laboratory results pending.
- Interview #5 – Shana Patel (ER nurse), 26 y.o. female. Fever, cough, and sore throat began this morning (11/19/07). No international travel, or known contact with poultry, but she does spend time outdoors in areas where waterfowl may be present. Cared for Trevor Jackson in the ER on 11/16/07. Treatment with oseltamivir will begin today. Laboratory results pending.
- Interview #6 – Pravat Punyawong (Kasen’s brother), 27 y.o. male. No symptoms. Had contact with rooster on 11/13/07. Spent time with brother from 11/13/07 till 11/17/07, when he brought Kasen to the hospital. Oseltamivir prophylaxis initiated on 11/18/07.

Question 1 – Classify each of the above as a suspect case, confirmed case, or contact of a case.

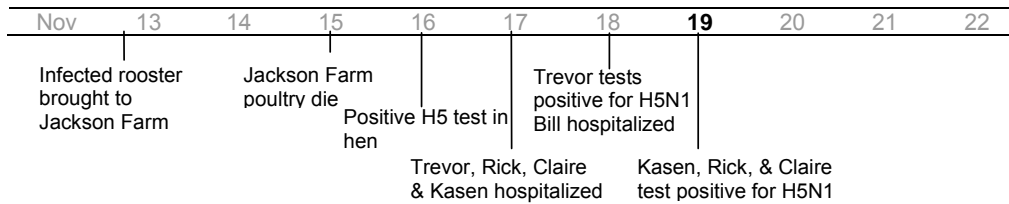
Question 2 – A line list of cases is included on the following page. Please discuss any additional information that should be added to the line list.



Case Linelist

ID	First Name	Last Name	Age	Sex	Case Status	Date of Onset	Symptoms*	Possible Exposure	Laboratory Results	Status
1	Trevor	Jackson	22	M	Conf	11/16	F,C,D	Poultry	+	Hospitalized
2	Kasen	Punyawong	24	M	Conf	11/15	F,C,M	Poultry	+	Hospitalized
3	Rick	Jackson	43	M	Conf	11/16	F,C,D	Poultry	+	Hospitalized
4	Claire	Jackson	15	F	Conf	11/16	F,C,ST,M	Poultry	+	Hospitalized
5	Bill	Zalesky	68	M	Susp	11/17	F,C,SOB,ST	Poultry	Pending	Hospitalized
6	Jim	Baxter	40	M	Susp	11/18	F,SOB,M	Poultry	Pending	Hospitalized
7	Shana	Patel	26	F	Susp	11/19	F,C,ST	Case #1 or wild birds	Pending	Hospitalized

*F=fever, C=cough, D=diarrhea, SOB=shortness of breath, ST=sore throat, M=muscle aches

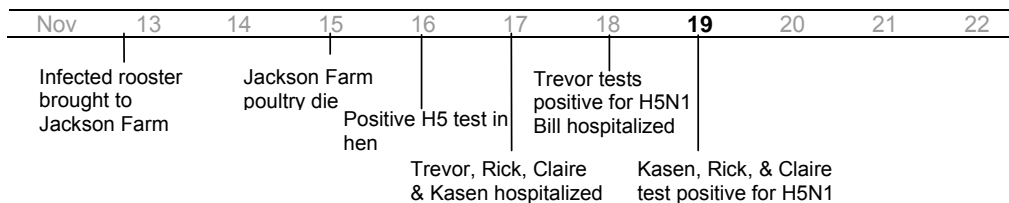


Question 3 – A line listing of contacts is included below. Again, please discuss any additional information that should be added to the list.

Contact Tracing Linelist

ID	First Name	Last Name	Age	Sex	Relationship to Case	Possible Exposure Type	Possible Exposure Date
1	Heidi	Jackson	41	F	Rick's wife	Case #1	?
2	Lisa	Jackson	18	F	Rick's daughter	Case #1	?
3	Pravat	Punyawong	27	M	Kasen's brother	Case #2	11/13-11/17

Question 4 – Discuss the significance of Interview #5 (Shana Patel, ED nurse), and specific actions that you would take in response to this information.



N. Investigation – Specimen Collection

Instructions:

Read the following update. In your small group, discuss the questions that follow.

Time Allotted: 15 minutes

Update 14

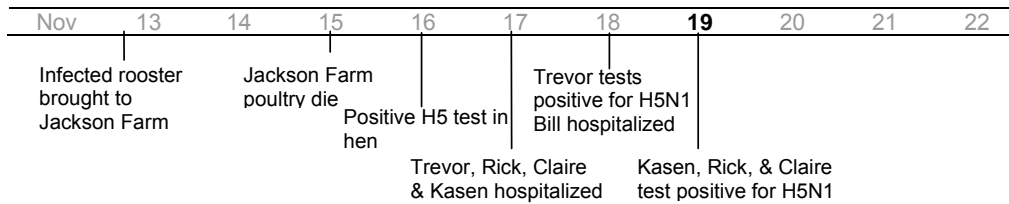
This afternoon (Nov 19th), you conduct an interview with Abby Crawford, a good friend of Claire Jackson's. She and Claire spend a lot of time together, and she was with Claire the day before Claire's symptoms first appeared. During the course of your interview, she reports that she has a cough and body aches that began this morning. You recommend that she be evaluated by a clinician and started on oseltamivir treatment presumptively. Before you leave, though, you need to decide whether to collect specimens from Abby.

Question 1 – Should you collect a specimen from Abby? If so, which specimens should be collected?

Question 2 – If you chose to collect a specimen, please describe the procedure for specimen collection, including necessary personal protective equipment. Be sure to note how and where the specimen(s) should be transported.

Question 3 – Should any additional specimens be collected from Abby either now or in the future?

Question 4 – Should you collect specimens from asymptomatic contacts of suspect and/or confirmed cases?



O. Investigation - Assessing Human-to-Human Transmission

Instructions:

Read the following update. In your small group, discuss the questions that follow.

Time Allotted: 20 minutes

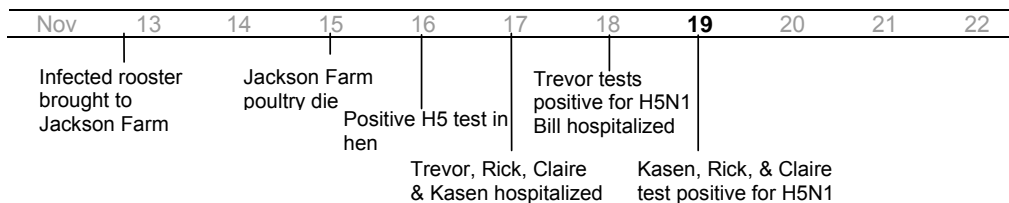
Update 15

You now have two suspect cases (Shana Patel, the ER nurse, and Abby Crawford, Claire’s friend) in which human-to-human transmission of H5N1 virus seems possible. To assess the possibility that Shana and Abby contracted illness from wild birds, you contacted your state Department of Fisheries and Wildlife. They have stepped up their surveillance of wild birds in response to the Jackson Farm outbreak, but have not found any birds that are positive for HPAI H5N1 virus yet. In addition, nationwide surveillance has not detected HPAI H5N1 virus elsewhere in the country.

Question 1 – How do you determine whether human-to-human transmission has occurred in this outbreak?

Your phone rings. The caller identifies himself as Anderson Cooper from CNN. Although the media has been covering the poultry outbreak from the start, the possibility of human-to-human transmission has intensified the coverage. Mr. Cooper says, “I’m doing a special report tonight about the outbreak of H5N1 in your area. Right now I’m on site at Jackson Farm, and I’d like to get some information on the investigation into possible human cases. Is it true that this bird flu is being transmitted from person to person?”

Question 2 – Quickly prepare a response to Mr. Cooper based on the current situation.



P. Investigation - Daily Report

Instructions:

Below is an example of a daily situation report that is used during outbreak investigations. It provides a way to organize and summarize information that might be gathered during each day of an investigation. Fill out Sections 1, 6, and 7 using data from November 19th of the Jackson Farm case study. The other sections have already been completed. Please answer the question that follows.

Time Allotted: 20 minutes

Daily Situation Report

Date: November 19, 2007 Location(s) Visited: various interview sites

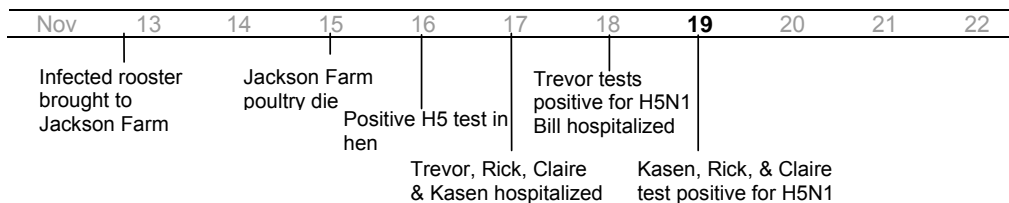
1. Rapid Response Team Composition

Name	Affiliation	Role

2. Surveillance/Epidemiology

2a. Update on Human Cases

As of Nov 19th there are four confirmed and four suspect cases of Influenza H5N1. All confirmed cases and three of the suspect cases are hospitalized.



2b. Previously Reported Cases

Case #1: Trevor Jackson, 22-year-old male. Symptom onset 11/16/07, hospitalized 11/17/07. RT-PCR positive for Influenza A (H5N1). Oseltamivir treatment initiated 11/17/07. Exposed to ill poultry.

Case #2: Rick Jackson, 43-year-old. male. Symptom onset 11/16/07, hospitalized 11/17/07. RT-PCR positive for Influenza A (H5N1). Oseltamivir treatment initiated 11/16/07.

Case #3: Kasen Punyawong, 24-year-old male. Symptom onset 11/15/07, hospitalized 11/17/07, RT-PCR positive for Influenza A (H5N1). Oseltamivir treatment initiated 11/17/07. Exposed to sick or dying poultry.

Case #4: Claire Jackson, 15-year-old. female. Symptom onset 11/16/07, hospitalized 11/17/07. Oseltamivir treatment initiated on 11/16/07. RT-PCR positive for Influenza A (H5N1).

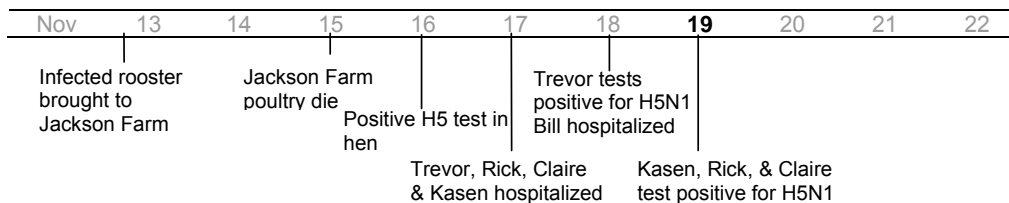
2c. New Cases (all suspect)

Case #5: Bill Zalesky (neighbor of Rick), 68-year-old male. Symptom onset 11/17/07. Admitted to hospital on 11/18/07. Low lymphocyte counts, moderately low platelet counts, and increased aminotransferases (liver enzymes). RT-PCR influenza test results pending. Oseltamivir treatment initiated on 11/18/07.

Case #6: Jim Baxter (Dept. of Agriculture first responder), 40-year-old male. Symptom onset 11/18/07. Treatment with oseltamivir began today (11/19/07). Laboratory results pending.

Case #7: Shana Patel (ER nurse), 26-year-old female. Symptom onset 11/19/07. No international travel or known exposure to poultry. Cared for Trevor Jackson in the ER on 11/16/06. Laboratory results pending. Oseltamivir treatment initiated today (11/19/07).

Case #8: Abby Crawford (friend of Claire) 16-year-old. female. Symptom onset today (11/19/07). Treatment with oseltamivir began today (11/19/07). Laboratory results pending.



2d. Contact Tracing

Contact #1: F, age 41, wife of Case #2. Oseltamivir prophylaxis initiated 11/16/07. Denies any symptoms.

Contact #2: F, age 18, daughter of Case #2. Oseltamivir prophylaxis initiated 11/16/07. Denies any symptoms.

Contact #3: M, age 27, brother of Case #3. Oseltamivir prophylaxis initiated 11/18/07. Denies any symptoms.

3. Laboratory

Oropharyngeal swab specimens taken from all five suspected cases. All specimens forwarded to the state health laboratory for diagnosis and subtyping.

4. Clinical Management/Infection Control

Contacts are being advised to remain at home for 10 days after their last contact with poultry or a person under investigation. Contacts have been educated about risk factors/risk behaviors of exposure, and the signs/symptoms of avian influenza A (H5N1) illness. All contacts have received instructions on how to self-monitor and report signs and symptoms, especially fever. They have also been instructed on seeking healthcare if symptoms become severe.

5. Animal Health

Remaining Jackson Farm poultry depopulated on 11/16/07. Environmental specimens taken from Jackson Farm. Results pending.

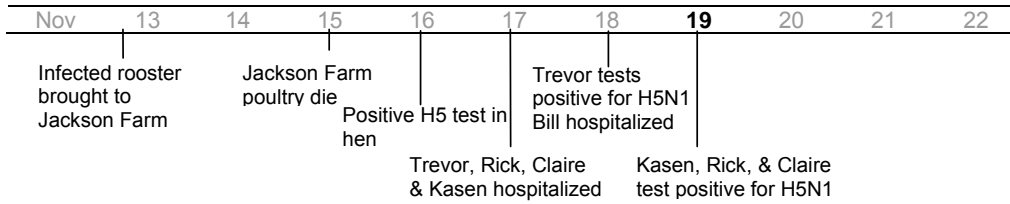
Samples from the first dead hen tested positive for influenza A (H5N1) (RT-PCR) at the National Veterinary Services Laboratory. Pathogenicity results are expected shortly, although the high poultry mortality and confirmation of Influenza A (H5N1) in humans make these results less urgent.

Note: If the USDA or State Department of Agriculture has decided to depopulate additional poultry within a particular radius of Jackson Farm, that information would be included in this section of the report.

6. Planned Activities

Continue monitoring known contacts for signs and symptoms.

Continue tracing contacts and exposed persons that fall in to three categories: A) people who were exposed to the Jackson Farm poultry, B) people who were exposed to the



infected rooster from Pao Mai, and C) people who have been in contact with one of the suspected or confirmed human cases. Some groups to trace include: Kasen’s family, people who may have had exposure to the fighting cock between Pao Mai and U.S., health-care workers at Springfield Regional Medical Center, people in the ER with Trevor, and people who purchased poultry products from Jackson Farm prior to the outbreak.

Visit (or telephone) each contact daily for at least 10 days following a known exposure to an AI case.

Report cases to appropriate authority.

Other Activities: _____

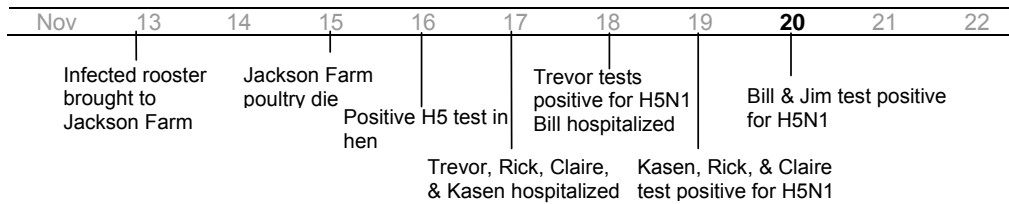
7. Requests for assistance and resources

8. Other

You may want to include your line listing. In addition, issues you may want to discuss here are:

- Media issues
- Law enforcement issues related to the smuggling of the fighting cock
- Additional concerns

Question 1 – This is one example of a daily report that could be used in an outbreak situation. How might this kind of report be used by non-public health agencies? Consider possible additions and modifications that would be necessary before sharing the report.



Q. Investigation - Epi Curve

Instructions:

Read the following update. As a group, create an epi curve based on what you know to date. Choose one group member to draw the epi curve on a flip chart. Then, discuss the question that follows.

Time Allotted: 30 minutes

Update 16

It is the afternoon of November 20th, and you and your team continue to trace contacts and conduct interviews throughout the area. Updated information on suspected cases and contacts is included below.

Laboratory results are now available for many suspect cases. The following people have now tested positive for Influenza A (H5N1) and are **confirmed cases** (date of onset in parentheses):

- Kasen Punyawong (11/15/07)
- Trevor Jackson (11/16/07)
- Rick Jackson (11/16/07)
- Claire Jackson (11/16/07)
- Bill Zalesky (11/17/07)
- Jim Baxter (11/18/07)

Suspect cases awaiting laboratory results are:

- Abby Crawford (11/19/07)

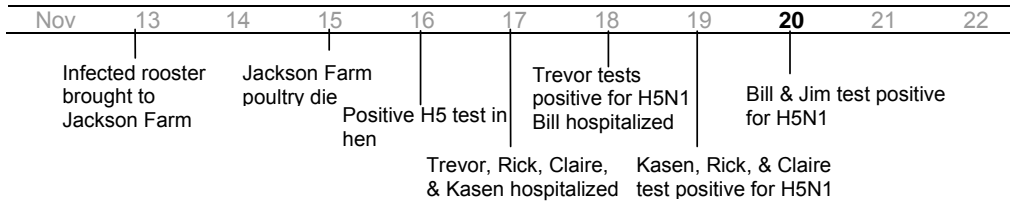
People whose laboratory tests have been **negative for Influenza A (H5N1)** are:

- Shana Patel (positive for influenza A subtype H1 - seasonal influenza)

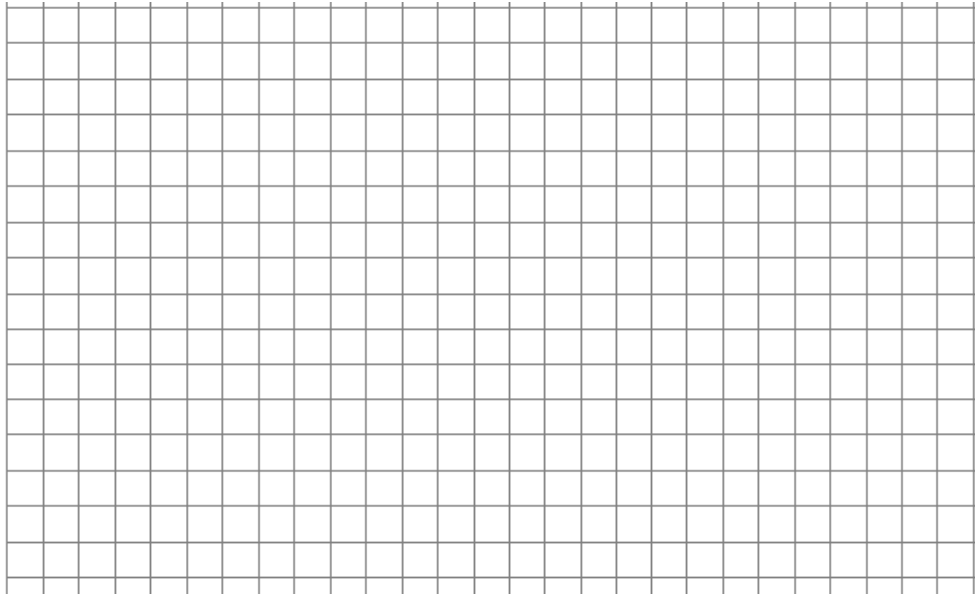
Based on Shana Patel’s laboratory results, you note that seasonal influenza vaccination could have prevented a lot of concern about Influenza A (H5N1) for both Shana Patel and outbreak investigators.

Asymptomatic contacts who did not have a laboratory test are:

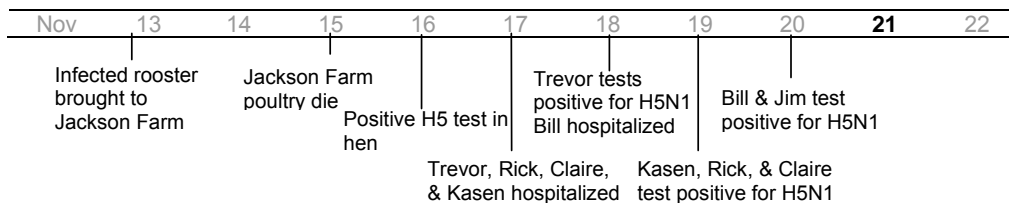
- Heidi Jackson
- Lisa Jackson
- Pravat Punyawong



Group activity – Using the data above and your case line listing, create an epi curve using the graph paper below. (Note: It may be useful to indicate the onset of illness in poultry on your curve.)



Question 1 – What does the epi curve tell you about the outbreak?



R. Investigation - Mass Antiviral Chemoprophylaxis

Instructions:

Read the update below, which includes information from the World Health Organization's pandemic influenza draft protocol for rapid response and containment (May 2006). Discuss whether the current situation meets the WHO guidelines for mass administration of prophylaxis.

Time Allotted: 15 minutes

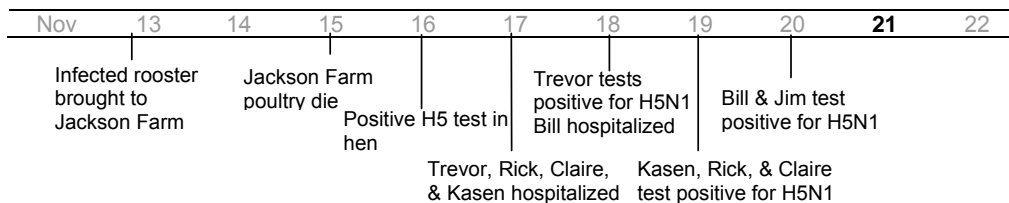
Update 17

Today is Wednesday November 21st, and the influenza A (H5N1) outbreak is all over the news. CDC staff members, including an EpiAid team, have been in town for several days, as has a response team from the USDA, and it seems as though the entire state health department has taken up residence in Springfield County. However, the most pressing issue facing you today is related to antiviral chemoprophylaxis. The community, led by the principal of Springfield High School (where Rick Jackson teaches), is demanding that the health department provide antiviral chemoprophylaxis to the entire community. To determine how to respond, you decide to consult the *WHO pandemic influenza draft protocol for rapid response and containment*. * A summary of relevant information is below.

The purpose of mass antiviral chemoprophylaxis is to prevent a pandemic by providing antiviral chemoprophylaxis to everyone in a particular geographic area. For disease containment, WHO recommends administering antiviral medication to at least 90% of the population in the targeted area through one of two methods:

- 1) Mass chemoprophylaxis of the affected population within 5-10km from each detected case
- 2) Targeting administrative areas (i.e., census blocks, counties) to cover the "at risk" population (10,000-50,000 people)

Each person receives a single course of oseltamivir for 10 days.



According to the WHO, rapid containment measures, including mass prophylaxis, should be used if there is **evidence of improved human-to-human transmission**. The following criteria can be used to determine whether the virus is more efficiently moving between persons:

“1. Clustering of cases of moderate-to-severe respiratory illness (or deaths) with two generations of transmission in a health care facility, and laboratory confirmation of influenza A (H5N1) infection in at least one of them. The cases could be three or more health care workers who have no known exposure other than contact with ill patients, or just one health care worker and additional patients with evidence of nosocomial infections.

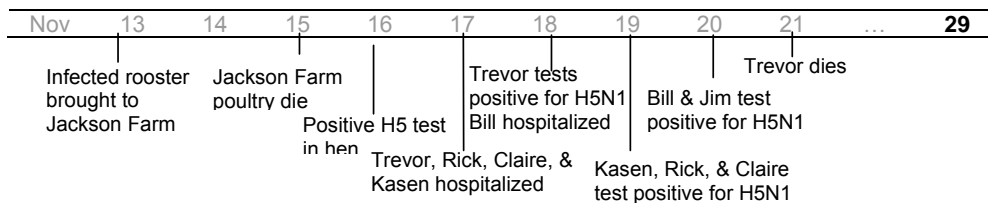
2. Moderate-to-severe respiratory illness (or deaths) in 5 to 10 persons with evidence of human-to-human transmission in at least some as determined by temporal sequencing of onset dates of cases and opportunities among cases for exposures to one another consistent with respective infectiousness and incubation period. At least 2 of these persons should have a laboratory-confirmed influenza A (H5N1) infection....”

*Available at http://www.who.int/csr/disease/avian_influenza/guidelines/protocolfinal30_05_06a.pdf

Question 1 – Based on the WHO guidance above, do you think that administration of mass antiviral chemoprophylaxis is indicated in this situation?

Question 2 – How do you respond to the public?

Question 3 – Whether or not you think mass antiviral chemoprophylaxis is indicated in this situation, please discuss how you would decide which people should receive antiviral chemoprophylaxis. In other words, how do you define the geographic boundary of your target area?



S. Investigation - Risk Communication

Instructions:

Read the following update. In your small group, create an appropriate public message.

Time Allotted: 15 minutes

Update 18

It is still Wednesday, November 21st, and it appears as though the outbreak is subsiding. In addition to the six previously confirmed cases, contact tracing identified only one additional suspect case, a friend of Kasen's. This morning the laboratory reported that specimens from the suspect case tested negative for influenza A and were actually identified as an adenovirus (a common virus causing respiratory illness). Trevor Jackson has died, and Kasen Punyawong remains hospitalized in critical condition. This morning you received Abby Crawford's laboratory results, which were positive for influenza A (H1), seasonal influenza A virus infection, and negative for avian influenza A (H5N1).

Although you suspect that the outbreak has subsided, you must implement intensive active surveillance in hospitals, and perhaps, also the community for at least 14 days following the last case identification to be sure no new cases are occurring. You would also like to develop a message to the public that addresses basic infection control. Your office has been swamped with phone calls about whether it is safe to eat turkey. Since the Thanksgiving holiday is tomorrow, you would like to craft a message specifically about food safety.

Question 1 – What message should the public information officer on a joint Agriculture and Public Health task force disseminate to the public about basic infection control?

Question 2 – What message would you disseminate to the public about food safety, especially during the Thanksgiving holiday?

Question 3 – Are there populations in your area that might not receive media messages because of language, cultural, or other barriers? How could you ensure that public health messages are communicated to these populations?

T. Conclusion

Update 19

Today is November 29, 2007, a week after Thanksgiving. You are not surprised to hear that the National Veterinary Services Laboratory has confirmed that the H5N1 strain of avian influenza from Jackson Farm poultry was highly pathogenic. Below is a summary of what you know about each confirmed or suspect case.

Trevor Jackson - died

Kasen Punyawong - died

Rick Jackson –still hospitalized, in stable condition

Heidi and Lisa Jackson – no symptoms

Claire Jackson – recovering in hospital

Bill Zalesky – still hospitalized, in critical condition

Pravat Punyawong (Kasen's brother) – no symptoms

Jim Baxter – recovering in hospital

Shana Patel – positive for seasonal influenza A (H1), negative for H5N1

Abby Crawford –positive for seasonal influenza A (H1), negative for H5N1

Together with the USDA, the Department of Agriculture has conducted extensive surveillance of other poultry farms throughout Springfield County and the rest of the region, but has not detected any additional cases of HPAI H5N1. The Jackson family is being compensated for the poultry that were depopulated.

The community reaction has lessened somewhat, and it appears as though your messages emphasizing the absence of sustained human-to-human transmission have calmed people's fears. You still have a lot of paperwork to fill out. CDC and local team members are assisting you with follow-up studies, but you hope that you'll be able to get back to your other responsibilities in the next week or so.

U. Evaluation

Instructions:

Read the following update. While the experience of working through this scenario is fresh in your mind, answer the questions that follow individually, and then discuss responses with your small group. Have one group member record common themes to share with the larger group.

Time Allotted: 25 minutes

Update 20

It is now December 7, 2007, three weeks after the initial human cases of influenza A (H5N1) in your area. You are exhausted, but take comfort in knowing that the quick and decisive action of your rapid response team may have contributed to limiting the spread of the outbreak. There were a total of six confirmed human cases of influenza A (H5N1), but you believe that the outbreak could have been much worse. Your health department continues to work alongside CDC to conduct follow-up interviews of contacts, monitor cases, and communicate with the public and other agencies.

Question 1 – On a scale of 1 (poor) to 10 (excellent), please rate your group’s response to the outbreak. Discuss your rating (considering which aspects of the response worked the best, and which aspects could be improved).

Question 2 – What was the most important thing that you learned during the outbreak?

Question 3 – Was there anything that surprised you during the outbreak?

Question 4 – In what ways would your response to avian influenza in humans differ markedly if the disease was introduced via an international traveler rather than in domestic poultry?

Question 5 – Based on this exercise, what is the next step that you will take to make sure that your agency is better prepared for an avian influenza outbreak?

Final Instructions

Share key pieces of feedback with the larger group. Focus on lessons learned and next steps.

Appendix A: Notifiable Avian Influenza (NAI) Case Definition

From USDA Summary of the National Highly Pathogenic Avian Influenza Response Plan, August 2006

http://www.aphis.usda.gov/newsroom/hot_issues/avian_influenza/contents/printable_version/DraftSummaryNationalHPAIresponseplan08-31-06.pdf

Case definitions

These case definitions are used to classify premises that may be exposed and/or infected.

Clinical Description: The clinical manifestations and mortality from HPAI infections can vary considerably depending on species, age, sex, concurrent infections, virus strain and environmental conditions. The digestive, respiratory, nervous, reproductive or circulatory systems may be affected. Surveillance programs may detect HPAI infection with no clinical signs.

Clinical Case Definition of HPAI: Flocks of domestic poultry with one or a combination of the following clinical signs and gross lesions:

- Reduction in normal vocalization; listlessness; conjunctivitis; drops in egg production sometimes with pale, misshapen or thin-shelled eggs
- Respiratory signs such as rales, snicking, and dyspnea
- Neurological signs such as incoordination or torticollis
- A drop in feed and/or water consumption
- Swollen or necrotic combs and wattles
- Swollen head and legs
- Subcutaneous hemorrhage of legs
- Lungs filled with fluid and blood
- Tracheitis and airsacculitis
- Petechial hemorrhages on internal organs

AND/OR:

Flocks that experience mortality listed for each compartment:

- Commercial broilers: Mortality exceeding four birds per 1,000 per day for two consecutive days
- Commercial layers: Four times the normal daily mortality for two consecutive days (0.5 per 1,000 per day for layers from two to 50 weeks and 0.75 per 1,000 per day for layers over 50 weeks) or 5 percent drop in egg production over three days
- Commercial turkeys: Mortality in excess of two birds per 1,000 per day
- Backyard flocks: Any sudden and significant mortality event or sudden drop in egg production should be investigated
- Depending on the pathogenicity of the virus, birds raised on litter may experience rapidly spreading mortality. Mortality in birds reared in cages (e.g., layers, quail) may progress more slowly over a 10- to 15-day period

Standard Case Classifications:

Confirmed positive case: A bird or other animal that has clinical signs consistent with HPAI and from which HPAI was isolated and identified in a USDA laboratory or other laboratory designated by the Secretary of Agriculture (see Diagnosis and Reporting below).

Presumptive positive case: A bird or other animal that has clinical signs consistent with HPAI in addition to a positive laboratory result (see Diagnosis and Reporting below) and additional epidemiological information indicative of HPAI.

Suspect case: A bird or other animal that has clinical signs consistent with HPAI.

Appendix B: Profile of Springfield County

Population: 138,462

Major Cities: Springfield (largest city, population 44,917), Lakeview, Jefferson

Description: Springfield County is mostly rural, with a medium-sized city, Springfield, near the center of the county.

Median age = 36 years

<u>Age Group (yrs)</u>	<u>Percent of Population</u>
<18	23.8
18-24	9.9
25-44	29.9
45-64	22.3
65+	14.1



Median Household Income: \$39,168

Major Highways: Interstate 60 runs east-west through the county, and State Route 8 runs north-south

Hospital: Springfield Regional Medical Center, 182 beds

Healthcare Providers: 82 active primary care physicians, 58 active dentists

Birth Rate: 13.7 per 1,000 population

Leading Causes of Death: Heart disease, cancer, stroke, respiratory disease, diabetes

Appendix C: Summary of Rapid Advice Guidelines on pharmacological management of humans infected with avian influenza A (H5N1) virus (World Health Organization, 2006)

http://www.who.int/csr/disease/avian_influenza/guidelines/pharmamanagement/en/index.html

Brief summary of recommendations

This advice pertains only to influenza A (H5N1) infections in the current pre-pandemic situation. Recommendations will be updated as new information becomes available or if there is evidence for sustained human-to-human transmission of H5N1 or another novel avian influenza virus emerges. Whenever feasible, sequential clinical data collection and virological sampling (for analysis at WHO-designated laboratories) should be performed during treatment or should apparent failures of chemoprophylaxis occur.

Self-medication in the absence of appropriate clinical or public health advice is discouraged. When considering chemoprophylaxis for H5N1 infection, priority should be given to standard infection control practices. This includes protection of health-care workers and individuals involved in eradication of animals infected with H5N1 virus as well as household contacts of H5N1 patients.

As stated above, the quality of the evidence for the following recommendations is very low and this is mainly the result of the availability of only very indirect data from high-quality studies in seasonal influenza. For treatment of patients with confirmed or strongly suspected human infection with the H5N1 virus, where neuraminidase inhibitors are available for therapy:

- Clinicians should administer oseltamivir treatment (strong recommendation); zanamivir might be used as an alternative (weak recommendation). The quality of evidence, if considered on a continuum rather than in four categories, is lower for the use of zanamivir compared to oseltamivir.
- In these patients, clinicians should not administer amantadine or rimantadine alone as a first-line treatment (strong recommendation).
- Clinicians might administer a combination of a neuraminidase inhibitor and an M2 inhibitor if local surveillance data show that the H5N1 virus is known or likely to be susceptible (weak recommendation), but this should only be done in the context of prospective data collection.

For treatment of patients with confirmed or strongly suspected H5N1 infection, where neuraminidase inhibitors are not available for therapy:

- Clinicians might administer amantadine or rimantadine as a first-line treatment if local surveillance data show that the H5N1 virus is known or likely to be susceptible to these drugs (weak recommendation).

In general, decisions to initiate antiviral chemoprophylaxis should be guided by the risk

stratification described below. Stratification is based on observational data for reported cases of human H5N1 infection and on high quality data from studies of seasonal influenza.

High-risk exposure groups are currently defined as:

- Household or close family contacts¹ of a strongly suspected or confirmed H5N1 patient because of potential exposure to a common environmental or poultry source as well as exposure to the index case.

Moderate risk exposure groups are currently defined as:

- Personnel involved in handling sick animals or decontaminating affected environments (including animal disposal) if personal protective equipment may not have been used properly.
- Individuals with unprotected and very close direct exposure² to sick or dead animals infected with the H5N1 virus or to particular birds that have been directly implicated in human cases.
- Health-care personnel in close contact with strongly suspected or confirmed H5N1 patients, for example, during intubation or performing tracheal suctioning, or delivering nebulised drugs, or handling inadequately screened/sealed body fluids without any or with insufficient personal protective equipment. This group also includes laboratory personnel who might have an unprotected exposure to virus containing samples.³

Low risk exposure groups are currently defined as:

- Health-care workers not in close contact (distance greater than 1 meter) with a strongly suspected or confirmed H5N1 patient and having no direct contact with infectious material from that patient.
- Health-care workers who used appropriate personal protective equipment (PPE) during exposure to H5N1 patients.
- Personnel involved in depopulating non-infected or likely non-infected animal populations as a control measure.
- Personnel involved in handling sick animals or decontaminating affected environments (including animal disposal), who used proper personal protective equipment (PPE).

Where neuraminidase inhibitors are available:

¹ A close contact may be defined as an individual sharing a household with, or remaining unprotected whilst within speaking distance (< 1 meter) of, or in the care of, a patient with confirmed or strongly suspected H5N1 infection.

² Examples of high-risk exposure based on confirmed transmission to humans include: unprotected exposure to infected animal products such as consumption of blood from H5N1 infected ducks; preparation of food or other products from infected animals (e.g. plucking feathers); or prolonged exposure to infected birds in a confined space, such as playing with pets.

³ This definition of moderate risk is based on very few cases recognized under these situations to date. As circumstances may change rapidly, it would be reasonable to consider the moderate and high-risk groups together for prophylaxis decisions. If a particular patient has been implicated in possible human-to-human transmission, then these examples of exposures could be defined as high risk.

- In high-risk exposure groups, including pregnant women, oseltamivir should be administered as chemoprophylaxis, continuing for 7–10 days* after the last exposure (strong recommendation); zanamivir could be used in the same way (strong recommendation) as an alternative.
- In moderate risk exposure groups, including pregnant women, oseltamivir might be administered as chemoprophylaxis, continuing for 7–10 days* after the last exposure (weak recommendation); zanamivir might be used in the same way (weak recommendation).
- In low risk exposure groups oseltamivir or zanamivir should probably not be administered for chemoprophylaxis (weak recommendation). Pregnant women in the low-risk group should not receive oseltamivir or zanamivir for chemoprophylaxis (strong recommendation).
- Amantadine or rimantadine should not be administered as chemoprophylaxis (strong recommendation).

* Current CDC Influenza Division recommendation is 10 days

Appendix D: Interim Guidance for Protection of Persons Involved in U.S. Avian Influenza Outbreak Disease Control and Eradication Activities.

<http://www.cdc.gov/flu/avian/professional/protect-guid.htm>

February 17, 2004

(Antiviral drug recommendations updated January 14, 2006)

Objective

This document provides interim guidance for protection of persons involved in activities to control and eradicate outbreaks of avian influenza among poultry in the United States. Activities that could result in exposure to avian influenza-infected poultry include euthanasia, carcass disposal, and cleaning and disinfection of premises affected by avian influenza. This interim guidance, developed in cooperation with the U.S. Department of Agriculture (USDA), should be considered complementary to avian population disease control and eradication strategies as determined by the state government, industry, or the USDA. These guidelines will be updated as necessary.

Background: Avian Influenza

Influenza viruses that infect birds are called “avian influenza viruses” (www.cdc.gov/flu/avian/facts.htm). These are type A influenza viruses that are genetically distinguishable from influenza viruses that usually infect people. There are many subtypes of avian influenza A viruses, including H7 and H5. Avian influenza viruses can be distinguished as “low pathogenic” and “high pathogenic” forms based on genetic features of the virus and the severity of the illness they cause in poultry.

Birds that are infected with avian influenza viruses can shed virus in saliva, nasal secretions, and feces. Contact with feces or respiratory secretions is important in the transmission of infection among poultry. Between flocks, infection usually spreads due to movement of infected birds and the actions of humans in moving feedstuff, personnel, equipment, and vehicles into and from premises that are contaminated with infected feces or respiratory secretions. The duration that these viruses can survive in the environment depends on temperature and humidity conditions, but they may survive up to weeks in cooler and moister conditions.

Avian influenza viruses do not usually infect humans; however, several instances of human infections and outbreaks of avian influenza have been reported since 1997 (for more information, see “Basic Information About Avian Influenza” at www.cdc.gov/flu/avian/facts.htm). In 2003, influenza A (H7N7) infections occurred among persons who handled affected poultry and their families in the Netherlands during an outbreak of avian flu among poultry. More than 80 cases of H7N7 illness were reported (the symptoms were mostly confined to eye infections, with some respiratory symptoms), and one patient died (a veterinarian who had visited an H7N7 flu-affected farm). Although there was evidence of limited person-to-person spread of infection, sustained human-to-human transmission did not occur in this or other outbreaks of avian influenza. It is believed that most cases of avian influenza infection in humans have resulted from contact with infected poultry or contaminated surfaces. However, other means of transmission are also possible, such as the virus becoming aerosolized and landing on exposed surfaces of the mouth, nose, or eyes, or being inhaled into the lungs.

CDC Recommendations

The following interim recommendations are based on what are deemed **optimal** precautions for protecting individuals involved in the response to an outbreak of high pathogenic avian influenza from illness and the risk of viral reassortment (i.e., mixing of genes from human and avian viruses). The health risk to humans from low pathogenic avian influenza viruses is less well established, but is likely to be lower. Nonetheless, it is considered prudent to take all possible precautions to the extent feasible when individuals have contact with birds infected by any avian influenza virus as part of control and eradication activities.

Basic Infection Control

- Educate workers about the importance of strict adherence to and proper use of hand hygiene after contact with infected or exposed poultry, contact with contaminated surfaces, or after removing gloves. Hand hygiene should consist of washing with soap and water for 15-20 seconds or the use of other standard hand-disinfection procedures as specified by state government, industry, or USDA outbreak-response guidelines.
- Ensure that personnel have access to appropriate personal protective equipment (PPE), instructions and training in PPE use, and respirator fit-testing (detailed below).

Personal Protective Equipment

- Disposable gloves made of lightweight nitrile or vinyl or heavy duty rubber work gloves that can be disinfected should be worn. To protect against dermatitis, which can occur from prolonged exposure of the skin to moisture in gloves caused by perspiration, a thin cotton glove can be worn inside the external glove. Gloves should be changed if torn or otherwise damaged. Remove gloves promptly after use, before touching non-contaminated items and environmental surfaces.
- Protective clothing, preferably disposable outer garments or coveralls, an impermeable apron or surgical gowns with long cuffed sleeves, plus an impermeable apron should be worn.
- Disposable protective shoe covers or rubber or polyurethane boots that can be cleaned and disinfected should be worn.
- Safety goggles should be worn to protect the mucous membranes of eyes.
- Disposable particulate respirators (e.g., N-95, N-99, or N-100) are the minimum level of respiratory protection that should be worn. This level or higher respiratory protection may already be in use in poultry operations due to other hazards that exist in the environment (e.g., other vapors and dusts). Workers must be fit-tested to the respirator model that they will wear and also know how to check the face-piece to face seal.¹ Workers who cannot wear a disposable particulate respirator because of facial hair or other fit limitations should wear a loose-fitting (i.e., helmeted or hooded) powered air purifying respirator equipped with high-efficiency filters.
- Disposable PPE should be properly discarded, and non-disposable PPE should be cleaned and disinfected as specified in state government, industry, or USDA outbreak-response guidelines. Hand hygiene measures should be performed after removal of PPE.

¹ Respirators should be used in the context of a complete respiratory protection program as required by the Occupational Safety and Health Administration (OSHA). This includes training, fit-testing, and fit-checking to ensure appropriate respirator selection and use. To be effective, respirators must provide a proper sealing surface on the wearer's face. Detailed information on respiratory protection programs is provided at www.osha.gov/SLTC/etools/respiratory and www.cdc.gov/niosh/topics/respirators.

Vaccination with Seasonal Influenza Vaccine

- Unvaccinated workers should receive the current season's influenza vaccine to reduce the possibility of dual infection with avian and human influenza viruses. There is a small possibility that dual infection could occur and result in reassortment. The resultant hybrid virus could be highly transmissible among people and lead to widespread infections. Vaccination of all residents of affected areas is not supported by current epidemiologic data.

Administration of Antiviral Drugs for Prophylaxis

- Workers should receive an influenza antiviral drug daily for the duration of time during which direct contact with infected poultry or contaminated surfaces occurs. The choice of antiviral drug should be based on sensitivity testing when possible. In the absence of sensitivity testing, a neuraminidase inhibitor (oseltamivir) is the first choice since the likelihood is smaller that the virus will be resistant to this class of antiviral drugs than to amantadine or rimantadine. Also, please note the January 14, 2006 CDC Health Alert Notice (HAN), in which CDC recommends that neither amantadine nor rimantadine be used for the treatment or prevention (prophylaxis) of influenza A in the United States for the remainder of the 2005-06 influenza season: www.cdc.gov/flu/han011406.htm. For further information about the use of antiviral drugs for influenza, see "Prevention and Control of Influenza. Recommendations of the Advisory Committee on Immunization Practices (ACIP)." MMWR 2003; 52(RR08): 1-36. Available at www.cdc.gov/mmwr/preview/mmwrhtml/rr5208a1.htm.

Surveillance and Monitoring of Workers

- Instruct workers to be vigilant for the development of fever, respiratory symptoms, and/or conjunctivitis (i.e., eye infections) for 1 week after last exposure to avian influenza-infected or exposed birds or to potentially avian influenza-contaminated environmental surfaces.
- Individuals who become ill should seek medical care and, prior to arrival, notify their health care provider that they may have been exposed to avian influenza. In addition, employees should notify their health and safety representative.
- With the exception of visiting a health care provider, individuals who become ill should be advised to stay home until 24 hours after resolution of fever, unless an alternative diagnosis is established or diagnostic test results indicate the patient is not infected with influenza A virus.
- While at home, ill persons should practice good respiratory and hand hygiene to lower the risk of transmission of virus to others. For more information, visit CDC's "Cover Your Cough" website at www.cdc.gov/flu/protect/covercough.htm.

Evaluation of Ill Workers

- Workers who develop a febrile respiratory illness should have a respiratory sample (e.g., nasopharyngeal swab or aspirate) collected.
- The respiratory sample should be tested by RT-PCR for influenza A, and if possible for H1 and H3. If such capacity is not available in the state, or if the result of local testing is positive, then CDC should be contacted and the specimen should be sent to CDC for testing.
- Virus isolation should **not** be attempted unless a biosafety level 3+ facility is available to receive and culture specimens.
- Optimally, an acute- (within 1 week of illness onset) and convalescent-phase (after 3 weeks of illness onset) serum sample should be collected and stored locally in case testing for antibody to the avian influenza virus should be needed.

Available at <http://www.cdc.gov/flu/avian/professional/pdf/protectionguid.pdf>

Biosecurity Checklist

Measures to help prevent the introduction and spread of avian influenza on your farm

VISITORS

- Maintain a visitor log (include date, name, business, contact information, farm visits within the past 24 hours and next farm visit).
- Secure farm entrance with a locked gate.
- Ensure parking site is at least 30 meters away from poultry houses.
- Provide clean clothing and footwear for all visitors (including hair coverings).
- Require all visitors to wash their hands before entering poultry houses.
- Lock doors to poultry barns when farm staff are not working.

POULTRY AND DOMESTIC WATERFOWL

- Implement a program to regularly monitor the health of the flock.
- Follow a strict schedule when caring for the flock (the CFIA recommends youngest flocks to oldest flocks).
- Isolate new birds from existing flocks.
- Seal poultry house attics and cover ventilation openings with screens.
- Prevent exposure of birds, bird feed and water to wild birds and outside animals.
- Prevent contact of outdoor-raised birds (waterfowl, free-range birds) with wild birds by means of fencing and netting.
- Remove or control vegetation growth in the vicinity of poultry houses.
- Drain ponds and bodies of standing water close to poultry houses.
- Purchase all birds and feed from reputable suppliers that maintain strict biosecurity controls.

SANITATION

- Power-wash all vehicles and equipment with detergent and disinfect on a hard, dry surface such as a concrete panel before entering the premises.
- Routinely clean footwear thoroughly with detergent and disinfectant when entering and leaving each poultry barn.
- Change all foot baths at least daily, and more frequently in high-traffic areas.
- Ensure thorough cleaning and disinfection for all cages transporting birds.

Appendix F: Generic Outbreak Reporting Questionnaire

(from CDC Guidance for State and Local Health Departments for Conducting Investigations of Human Illness Associated with Domestic Highly Pathogenic Avian Influenza Outbreaks in Animals)

This questionnaire is based on a questionnaire developed by the Fraser Health Authority, British Columbia, Canada, for use in the 2004 HPAI avian influenza outbreak in British Columbia. Fields where specific information has to be included have been identified (with < > brackets) to make this form easy to adapt at the time of an avian influenza outbreak. It is expected that this will be a useful tool for any state/local health department faced with an avian influenza outbreak in the future.

Avian Influenza in _____
<outbreak State/location>

Avian Influenza Surveillance Report Form

When completed, please fax to the attention of:

_____ <contact person and fax number>

{Suggested Opening Script}

Hello. My name is:_____. I am a public health nurse from _____
<health department>.

As part of our duties under the _____ <cite state authority> we are following up with people who may have been exposed to avian influenza, otherwise known as bird flu. The avian influenza virus currently causing outbreaks among poultry in _____ <outbreak area> may have caused some illness in people who have had contact with infected birds or people. This form of influenza virus has rarely been known to cause illness in humans, but when it does, the illness can be severe. For this reason, it is very important that we collect detailed information about this outbreak and any possible illness in people.

All identifying information that is collected will be kept private and confidential to the extent permitted by law and shared only with public health officials who need to know in order to understand and provide treatment to anyone who may need it. Depending on the information we collect, this may take up to 20 minutes. Is this a good time to talk? If not, when would be a better time? _____

[If the interview not proceeding well, ask] Is there someone else that I should speak to instead in your home (or farm, etc.) related to this outbreak? If so, whom?
_____/_____/_____ <name/relationship>

Please use the back of the page for additional notes, including commentary on relevant details and dates (e.g., direct exposures, incidents, personal protection equipment, etc.).

Section I. Health Department Information

Date of report (mm/dd/yyyy): ____/____/_____

Contact Information:

Name of person administering questionnaire: _____

Name of state/local health department: _____

Phone no. of health department: _____

This report is NEW UPDATE

As of this report, this person is classified as a:

Suspect Case

Confirmed Case

Person Under Investigation

Contact

Section II. Case Demographic Information

{Identification number (ID#) assigned to interviewee: _____ <format of ID# assignment must be predetermined>}

Last name: _____

First name: _____

Date of Birth (mm/dd/yyyy): ____/____/_____

Age: _____ years

Sex: Male Female

Home address: _____

Home city: _____

State of residence: _____

Zip code: _____

Phone numbers in state of residence:

Home: _____

Office: _____

Cell: _____

Address while in _____ <outbreak state> if different from above: _____

Phone Number(s) while in _____ <outbreak state> if different from above: _____

Planned date of return to state of residence [if applicable] (mm/dd/yyyy):

_____/_____/_____

What is your occupation/industry? _____

Who is your employer? _____

Please indicate appropriate relationship based on occupation/employer:

- Farm owner
- Family member of farm owner
- Farm employee
- USDA worker
- Other (specify): _____

Comment [D1]: Boxes out of line?

Specific job on farm and nature of exposure to poultry or poultry products

7. Have you received influenza vaccination in the last 12 months?

- Yes No Unknown

Section IV. Case Clinical Symptoms

Have you had any eye symptoms?

a. When did the first of these symptoms begin (mm/dd/yyyy)?

_____/_____/_____

2. Have any of the following influenza-like symptoms started or become worse than usual since ____/____/_____ <date of outbreak onset (mm/dd/yyyy)>?

(Check all that apply, but please report only those symptoms that are NEW or WORSE since the outbreak began. Note date of onset for each symptom present.):

- Fever
- Temperature: _____ °F
- Cough
- Runny nose
- Sore throat
- Headache
- Muscle aches
- Joint Aches
- Fatigue
- Diarrhea
- Chills

Shortness of Breath or Difficulty Breathing

Sweats

If yes, please answer the following:

a. When did the first of these symptoms begin (mm/dd/yyyy)?

____/____/____

3. Did you have any other symptoms that started or became worse than usual since
____/____/____ <date of outbreak onset (mm/dd/yyyy)>?

Yes No Unknown

If yes, please answer the following:

a. Describe these symptoms: _____

b. How would you rate these symptoms?

Mild Moderate Severe Unknown

c. How quickly did these symptoms start:

Suddenly Gradually Unknown

d. When did the first of these symptoms begin (mm/dd/yyyy)?

____/____/____

Section V. Case Health Care Provision

1. Did you see a health-care provider for your symptoms?

Yes No Unknown

If yes, please respond to the following:

a. What type of health-care provider did you see?

Physician

If yes, was he/she a general practitioner or a specialist?

Nurse practitioner

Physician assistant

Other, specify: _____

b. What was the diagnosis? _____

c. What is the health-care provider's name?

d. What is the health-care provider's address?

e. What is the health-care provider's phone number?

2. Where did you seek medical assistance for your symptoms?

Hospital emergency department

Walk-in clinic

Health center

Occupational health clinic

Other; please specify: _____

Please provide the name and location: _____

When did you seek medical care (mm/dd/yyyy)? ____/____/____

7. Have you taken antiviral medications (e.g., Tamiflu/oseltamivir or Relenza/zanamivir) since <date of outbreak onset>?

Yes No Unknown

If yes, reason for medication:

Treatment for influenza symptoms

Preventative measure due to exposure to poultry

Other (specify) _____

Specify name of medication (e.g. Tamifl/oseltamivir or Relenza/zanamivir):

How many capsules or inhalations did you take each day (in milligrams)?

Medication start date: (mm/dd/yyyy) ____/____/____

Medication stop date: (mm/dd/yyyy) ____/____/____

Section VI. Possible Exposure to Avian Influenza Information

1. Since <date of outbreak onset> have you had contact with poultry, poultry products, or poultry manure?

Yes No Unknown

If yes, when was your first contact/exposure? (mm/dd/yyyy) ____/____/____

When was your last contact/exposure? (mm/dd/yyyy) ____/____/____

2. Do any of these statements apply to you (check all that apply)?

I own a poultry farm

I live on a poultry farm

I am a family member or household contact of a poultry farmer

I am employed by a poultry farm

I am a veterinarian

I have been helping depopulate poultry

I have been transporting poultry carcasses

I have been working at an incinerator

Other (specify):

3. What poultry farm(s) have you visited or worked on since <date of outbreak onset>?

Farm 1 Name and address _____

Farm 2 Name and address _____

Farm 3 Name and address _____

{Section below to be completed by public health staff with information from USDA or State Agriculture officials}

Farm 1:

Name of farm: _____

Was this farm the site of laboratory-confirmed avian influenza outbreaks in poultry?

Yes No Unknown

Location on farm where poultry infections occurred: _____

Date Positive(mm/dd/yyyy)

Date Depopulated(mm/dd/yyyy)

Date Clean(mm/dd/yyyy)

Farm 2:

Name of farm: _____

Was these farm the site of laboratory-confirmed avian influenza outbreaks in poultry?

Yes No Unknown

Location on farm where poultry infections occurred: _____

Date Positive(mm/dd/yyyy)

Date Depopulated(mm/dd/yyyy)

Date Clean(mm/dd/yyyy)

Farm 2:

Name of farm: _____

Was this farm the site of laboratory-confirmed avian influenza outbreaks in poultry?

Yes No Unknown

Location on farm where poultry infections occurred: _____

Date Positive(mm/dd/yyyy)

Date Depopulated(mm/dd/yyyy)

Date Clean(mm/dd/yyyy)

4. Have you participated in any of the following activities at these farms? Please identify next to each activity the farm number in Q 3 above for each farm or farms where you undertook these activities (adapt exposures to local context).

I have not been directly involved with poultry

- I worked at an incinerator
- I worked in a slaughterhouse
- I brought equipment to farms (e.g., equipment to gas flocks)
- I worked with carbon dioxide gas to euthanize the birds
- I collected eggs
- I was in direct contact with surfaces that may have been contaminated by poultry
- I was in direct contact with manure from the poultry
- I shared a confined air space with infected or potentially infected poultry
- I assessed the health of poultry
- I caught live poultry
 - I had other contact with live poultry (specify) _____

-
- I collected dead poultry
 - I had other contact with dead poultry (specify) _____

-
- I loaded / unloaded poultry carcasses into / out of trucks
 - Other (please specify): _____

6. If you have been exposed to potentially infected poultry, were you wearing any of the following while you were exposed? *{check all that apply}*

- Gloves
- Mask (Type _____)
- Goggles
- Safety glasses
- Impermeable Coveralls
- Disposable shoes or shoe covers Head and hair cover
- Disposable Outer garments
- Boots that can be cleaned and disinfected after exposure and worn again
- Outer garments that can be washed and worn again

7. Can you remember any events of concern in terms of exposure? Please describe. Please keep in mind that all of this information will be kept confidential to the extent permitted by law *{use additional space if necessary}*. This would include any known breaches in any personal protective equipment that you may have worn.

8. Have you had close contact with a person who lives/works on a poultry farm since <date of outbreak> and who has/had respiratory or eye symptoms? By close contact, we mean family members, roommates, intimate partners, etc.

- Yes No Unknown

If yes, who (and relationship to you)?

If yes, date of your first exposure to this person (mm/dd/yyyy): ____/____/____

Date of your last exposure to this person (mm/dd/yyyy): ____/____/____

Section VII. Contacts

1. How many other people live in your household not including yourself?

None

1-3

3-5

>5

3. Have any of your household members or other personal close contacts experienced any of the symptoms that were mentioned earlier since <date of outbreak>?

Yes No Unknown

If yes, please provide the following information for these people:

Name of Contact No. 1:

Their relationship to you:

Dates of contact with this person (mm/dd/yyyy):

Single day only ____/____/____

Multiple days ____/____/____ ____/____/____ ____/____/____

Continuous contact from ____/____/____ to ____/____/____

Contact telephone number: _____

Contact address:

Name of Contact No. 2:

Their relationship to you:

Dates of contact with this person (mm/dd/yyyy):

Single day only ____/____/____

Multiple days ____/____/____ ____/____/____ ____/____/____

Continuous contact from ____/____/____ to ____/____/____

Contact telephone number: _____

Contact address:

Name of Contact No. 3:

Their relationship to you:

Dates of contact with this person (mm/dd/yyyy):

Single day only ____/____/____

Multiple days ____/____/____ ____/____/____ ____/____/____

Continuous contact from ____/____/____ to ____/____/____

Contact telephone number: _____

Contact address:

Section VIII. Other People Exposed

If exposed at a farm: Have any other people had close contact with infected birds at the same farm as yourself, including direct handling of birds or manure or shared the same confined airspace as infected birds?

Yes No Unknown

If yes, how many people? _____

If yes, what are their names and telephone numbers?

1.Name _____ Tel. No. _____

2.Name _____ Tel. No. _____

3.Name _____ Tel. No. _____

{Suggested Closing Script}

Thank you very much for taking the time to answer our questions. There may be other questions we need to ask you as part of our public health follow-up, and, if so, we may call you back. You are also free to call us anytime if you have any questions. The _____ <state/local> Health Department's telephone number is _____ and our hours of operation are _____ a.m. to _____ p.m.

{Note to Interviewer}: Conclude with relevant public health recommendations and offer to send the “Dear Poultry Farmer” letter or other information, if appropriate and not already received.