

## 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  $\leq 10$  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](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](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](http://www.aphis.usda.gov/newsroom/hot_issues/avian_influenza/avian_influenza_summary.shtml)

## Case Study Outline

<b>Section</b>	<b>Title</b>	<b>Time Allotted</b>
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 a 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

***Suggested Answer*** –

*Poultry: The USDA oversees poultry surveillance in three areas – 1) live bird markets, 2) commercial poultry flocks, and 3) backyard flocks (not testing, but*

*encouragement of owners to enhance biosecurity on their farms). Commercial surveillance occurs through the National Poultry Improvement Plan (NPIP), and includes systematic testing of poultry flocks and monitoring of poultry production facilities. For more information on USDA activities, see [www.usda.gov/birdflu](http://www.usda.gov/birdflu) and [www.aphis.usda.gov/vs/nahss](http://www.aphis.usda.gov/vs/nahss). Participants should be encouraged to note state-specific surveillance activities, as they will differ significantly based on the state's poultry population. This is a good opportunity for public health professionals to learn more from their colleagues in agriculture about local and statewide poultry surveillance activities.*

*Wild Birds: The US Department of the Interior conducts wild bird surveillance in collaboration with USDA. The surveillance has five components – 1) investigation of morbidity and mortality in wild birds; 2) monitoring live, apparently healthy, wild birds, with an emphasis on those whose migratory patterns put them at higher risk- more testing occurs in Alaska than in any other state, because of significant mixing of Asian and North American birds that occurs there; 3) monitoring hunter-killed birds; 4) use of sentinel animals (either non-commercial backyard poultry flocks, or disease free ducks; and 5) environmental sampling of water and bird feces. Monitoring information is stored in the National HPAI Early Detection Data System (HEDDS).*

*Humans: Routine influenza surveillance in the U.S. includes seven components: 1) laboratory reporting from WHO and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories, 2) U.S. Sentinel Providers Surveillance Network, 3) the 122 cities mortality reporting system, 4) state and territorial epidemiologists' reports, 5) influenza-associated pediatric mortality, 6) the Emerging Infections Program (EIP), and 7) the New Vaccine Surveillance Network (see <http://www.cdc.gov/flu/weekly/pdf/flu-surveillance-overview.pdf>). Participants may discuss how their state monitors data from these and other systems.*

*Surveillance for Influenza A (H5N1) in the United States prior to known virus circulation is largely passive. However participants should be encouraged to discuss how they have made local practitioners and public health workers aware of CDC and/or State case definitions to trigger specimen collection and testing.*

*“Testing for avian influenza A (H5N1) virus infection is recommended for:*

*A patient who has an illness that:*

- requires hospitalization or is fatal; **and***
- has or had a documented temperature of  $\geq 38^{\circ}\text{C}$  ( $\geq 100.4^{\circ}\text{F}$ ); **and***
- has radiographically confirmed pneumonia, acute respiratory distress syndrome (ARDS), or other severe respiratory illness for which an alternate diagnosis has not been established; **and***

*has at least one of the following potential exposures within 10 days of symptom onset:*

*A) History of travel to a country with influenza H5N1 documented in poultry, wild birds, and/or humans, **and** had at least one of the following potential exposures during travel:*

- *direct contact with (e.g., touching) sick or dead domestic poultry;*
- *direct contact with surfaces contaminated with poultry feces;*
- *consumption of raw or incompletely cooked poultry or poultry products;*
- *direct contact with sick or dead wild birds suspected or confirmed to have influenza H5N1;*
- *close contact (approach within 3 feet) of a person who was hospitalized or died due to a severe unexplained respiratory illness;*

*B) Close contact (approach within 3 feet) of an ill patient who was confirmed or suspected to have H5N1;*

*C) Worked with live influenza H5N1 virus in a laboratory.*

*Testing for avian influenza A (H5N1) virus infection can be considered on a case-by-case basis, in consultation with local and state health departments, for:*

- *A patient with mild or atypical disease (hospitalized or ambulatory) who has one of the exposures listed above (criteria A, B, or C); **or***
- *A patient with severe or fatal respiratory disease whose epidemiological information is uncertain, unavailable, or otherwise suspicious but does not meet the criteria above (examples include: a returned traveler from an influenza H5N1-affected country whose exposures are unclear or suspicious, a person who had contact with sick or well-appearing poultry, etc.)*

*Participants may want to discuss how these guidelines are communicated to hospitals and other healthcare providers.*

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 16<sup>th</sup>, 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?

**Suggested answer** – Choose one group member to write questions on the flip chart. Some possible questions include the following:

1. Information about the agriculture response
  - a. Is the State Dept of Agriculture implementing their AI plan?
  - b. Does the veterinary pathologist or the Foreign Animal Disease Diagnostician believe that this is a highly pathogenic influenza outbreak?
  - c. What actions have been taken at the affected farm? Has the flock been isolated or depopulated?
  - d. Has the Dept of Agriculture implemented enhanced surveillance of other area farms?
  - e. How can the public health department best assist the department of agriculture at this stage?
  - f. Can public health send a response team to interview potential exposed persons and/or contacts of human suspected cases (if there are any)? Please note that the public health response team does not necessarily need to be on the farm to accomplish this – in fact, the question of whether public health needs to be onsite may generate useful discussion between public health and agriculture/veterinary representatives.
  - g. Has the Dept of Agriculture team been trained on proper use of personal protective equipment (PPE)? Is all necessary equipment available to the team?
  - h. Has the Dept of Agriculture team received chemoprophylaxis with oseltamivir or another antiviral medication? Has the team received seasonal influenza vaccination? NOTE: Seasonal influenza vaccination does NOT protect against H5N1 infection, but rather is used to prevent the possibility of viral reassortment between H5N1 and human influenza strains.
  - i. Who else has been notified of the situation?
2. Info about the farm
  - a. Is there illness and/or death in the rest of the flock?
  - b. What kind of feed and equipment is being used?
  - c. When did the dieoff begin and when were symptoms first noticed in birds?
  - d. What types of workers are there?
    - i. How many?
    - ii. What are the different job duties and exposures?
    - iii. Do they speak English?

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- iv. *What is the most culturally appropriate way to communicate with them without scaring them (either of the virus, or perhaps of legal issues with regard to immigration)*
  - e. *Size of flock and type of operation?*
  - f. *What is the name and contact information of the farmer?*
3. *Information about people*
- a. *How many people had contact with poultry in the 72 hours prior to signs and symptoms of illness in the birds? Get details about people and types of contact.*
  - b. *Has personal protective equipment been provided to the family, any farm workers, and responders? Is the PPE being used?*
  - c. *Who is responsible for monitoring responders for signs and symptoms of avian influenza?*
  - d. *Does anyone (including the daughter who stayed home from school) have flu-like symptoms?*
  - e. *Has the daughter sought medical care, and if so, is her clinician aware of the potential H5 outbreak on the farm?*

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**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)

**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.

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**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.

***Suggested answer** – Answers may vary depending on local area, but it is likely that the state Department of Agriculture and/or the USDA are taking a lead role in the investigation at this stage. Participants should discuss the trigger points for activation of emergency plans and incident command structure (ICS). If ICS is activated, who is the lead incident commander? If it is not activated, who is in charge? What other agencies (in addition to Agriculture and Health) are involved at this point? Participants should be encouraged to discuss which aspects of the response are led by the Department of Agriculture, which (if any) by the Department of Public Health, and which (if any) by Emergency Management at this early stage. Another possible discussion point is whether any federal agencies would be involved in the response at this early stage. In states without well-developed avian influenza response plans, it is probable that the USDA would get involved. It would also be a good idea if someone or several people were tasked with the role of making sure responders and workers are in compliance with wearing appropriate PPE and using it correctly.*

**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?

***Suggested answer** – Although testing for pathogenicity takes 5-10 days, the positive H5 screening test, along with the mortality in the flock, means that the cases meet USDA’s presumptive H5 highly pathogenic case definition (Appendix A). Specific actions in response to an outbreak of HPAI in animals include: active case/contact finding among the family and persons exposed on the farm, hospital-based surveillance for severe acute respiratory illness with epidemiologic “triggers” for specimen collection and investigation (see CDC criteria for testing from Section A, Question 1 answer), or other methods including syndromic surveillance. The most important populations for surveillance and monitoring are people who have had, or will have, direct contact with poultry, including family members, any farm workers, and responders to the poultry outbreak. These people should undergo active daily surveillance for 10 days after last exposure to assess illness.*

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**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?

***Suggested answer** – Yes, antiviral chemoprophylaxis with oseltamivir or another neuraminidase inhibitor should be provided to the response team. The team will have close contact with sick or dead birds, and therefore will have a high risk for infection. Participants should be encouraged to discuss which agency is responsible for providing the antivirals, the locations of antiviral stockpiles in their own states, the logistics for accessing the antivirals, and triggers for requesting resources from the Strategic National Stockpile (SNS). Considerations for implementation of chemoprophylaxis include: Will prescriptions be written? Will a full 10 day course of capsules be provided to contacts, or will directly observed therapy be conducted? How will you monitor compliance and adverse events? Finally, responders should be reminded that antiviral chemoprophylaxis is not a substitute for personal protective equipment. PPE must still be used appropriately.*

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

***Suggested answer** – Since the primary objective is to prevent human infection and illness from H5N1 in poultry, the decision to provide antiviral chemoprophylaxis depends on the risk of having contact with infected poultry. The World Health Organization has published recommendations on who should receive post-exposure prophylaxis (Appendix C). According to the recommendations, people should be classified as high, moderate, or low risk based on the type of exposure, and decisions to administer prophylaxis should be based on the level of risk (see summary of risk categories below). At this stage, there is no evidence of disease on other poultry farms, so most area poultry workers would not meet the moderate or high risk criteria defined by WHO. Still, if time permits, it may be worthwhile to discuss which agency (i.e. health department or other) would have the responsibility for providing antiviral medication to poultry workers in a situation where the outbreak spread to other poultry farms.*

*The World Health Organization has stratified exposure groups as follows (Schunemann et al, 2007):*

*“High-risk exposure groups are currently defined as:*

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- *Household or close family contacts 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:*

- *Individuals with unprotected and very close direct exposure to sick or dead H5N1 infected animals or to particular poultry that have been implicated directly in human cases*
- *Persons involved in handling sick animals or decontaminating known infected animals or environments, if personal protective equipment might not have been used properly*
- *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 also includes laboratory personnel who might have an unprotected exposure to virus-containing samples.*

*Low-risk exposure groups are currently defined as:*

- *Health-care workers not in close contact (distance greater than 1m or no direct contact with infectious material) with a strongly suspected or confirmed H5N1 patient*
- *Health-care workers who used appropriate personal protective equipment during exposure to H5N1 patients*
- *Personnel involved in depopulating non-infected or likely non-infected animal populations to prevent viral spread*
- *Personnel involved in handling sick animals or decontaminating known infected animals or environments, who used proper personal protective equipment.*

*In the absence of sustained human-to-human transmission, the general population is currently not considered at risk.”*

[http://www.who.int/csr/disease/avian\\_influenza/guidelines/pharmamanagement/en/index.html](http://www.who.int/csr/disease/avian_influenza/guidelines/pharmamanagement/en/index.html)

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### 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).

***Suggested answer** – At a minimum, the team should include a clinician, an epidemiologist, and ideally, a public health veterinarian. Some other roles to consider for a rapid response team are an industrial hygienist or safety officer, a laboratory technician, a phlebotomist, an administrator/operations manager, a logistician, interviewers, an occupational or environmental health specialist, a communication specialist, and a hospital representative. Team lead will vary by local area.*

**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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**Suggested answer** – *Although responses will vary, the following is a sample list of documents, forms, and resources that might be useful.*

**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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**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.

<b>WHO to contact</b>	<b>Information to share</b>
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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**Suggested answer** – Choose one group member to record responses on a flip chart. Responses will vary, and the list below is not exhaustive. It assumes that the responders are local health department officials. Expected answers could be adjusted appropriately for state-level responders.

<b>WHO to contact</b>	<b>Information to share</b>
Your State Veterinarian	Explain Dept of Health procedures for investigation following HPAI outbreak. Request permission to visit site or consider using the phone to avoid exposure and biosecurity concerns. Get info on proper PPE to use onsite
Your State Department of Agriculture (Note: in some states the State Veterinarian will be the point of contact at the State Department of Agriculture, but this may vary by state)	Notify of farm site visit and public health human contact tracing activities. Inquire about depopulation plans, boundaries for surveillance zones etc.
Your State Epidemiologist and State Health Department	Notify of farm site visit Discuss case and contact tracing and plans for any broader surveillance in the community.
Your State (or local) Health Dept Public Information Officer	Apprise of the ongoing investigation and the agencies/departments involved and discuss plans for any broader surveillance in the community.
Hospitals and healthcare facilities in affected area	Alert to the possibility of HPAI on a farm and remind them of human signs and symptoms, reporting procedures. Provide them with CDC case definition for determining which SARI cases specimens should be collected from.
Diagnostic / Reference Laboratory	Warn that potential HPAI specimens from ill persons are likely to come in for diagnosis. Inquire about their special needs for specimen delivery.
State/County Emergency Management	Apprise of the ongoing investigation and the agencies/departments involved
Your Family	Teach them to watch for signs and symptoms of HPAI among each other, and how to prevent transmission

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

*Suggested answer* – This may vary depending on the local area. The RRT should be prepared to deal with the media immediately, in case they are already at Jackson Farm. It is possible that the RRT will not have direct contact with the media, but because they may be working in the field, it is likely that they will come into contact with health care providers and the general public. The RRT may want to designate one team member as the communications liaison.

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

*Suggested answer* – The RRT may want to find out ahead of time whether the farm owner and workers speak English. If not, the RRT should be prepared to provide translation or a bilingual interviewer. The team should inquire about the most culturally appropriate way to approach the workers (e.g. a designated occupational health liaison). In addition, the RRT should provide reassurance that they are only investigating the potential human health aspects – not looking for potential worker violations, etc. The RRT should also provide reassurance about PPE and other strategies (e.g. handwashing) that the farmer can use to protect himself, workers, family, etc.

**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?

*Suggested answer*–

*Depending on the situation at the site, some options for logistics may be:*

▪ *The team will not be separated*  
OR

▪ *All team members stay in communication with one person, updating them on their whereabouts and progress. This one person then can answer any questions about where team members are, what they are doing, and what progress has been made.*  
OR

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- *The team meets at the same place at time every day, or twice a day, for a debriefing and writing/sharing the daily written report.*

*Options for mechanics of communication:*

- *2-way radios*
- *Cell phones*
- *Pagers*
- *Satellite phones (Nextels)*
- *Meet in person*

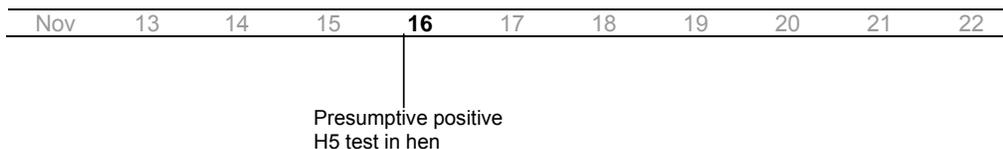
*This is a good place for redundancy – having more than one system of communication is wise. Communication with local area authorities may be necessary to ensure that radios are operating on the correct frequency for the area, and that your team’s communications are not interfering with other local area emergency functions.*

**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?

**Suggested answer** – *Answers to this question will vary by state. Participants should be encouraged to discuss triggers for opening a Joint Information Center and identify the persons at local and state public health and agriculture agencies who are responsible for deciding to open a Joint Information Center. They may also want to discuss alternative ways to share information and ensure consistent messages if a JIC is not opened.*

**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?

**Suggested answer** – *Epi-X, Health Alert Network, personal emails and phone calls.*



## 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)

### **Update 5**

It is around 6 p.m. on Friday the 16<sup>th</sup>, 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?

***Suggested answer** – The state Department of Agriculture or the USDA will have jurisdiction over biosecurity and biosafety procedures at the infected premises and in the surrounding area, so the public health team should follow instructions from those agencies. If the RRT is allowed onto the farm, team members will likely follow specific precautions including getting permission from the state veterinarian to enter the area, showering and changing clothing before leaving the farm, and thoroughly decontaminating and disinfecting any vehicles or equipment that were brought onto the premises. An example of biosecurity guidelines from the Canadian Food Inspection Agency can be found in Appendix*

Presumptive positive  
H5 test in hen

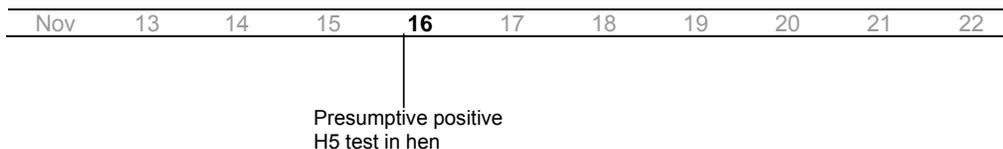
*E. The key point is to avoid bringing any contaminated material off of the infected premises. It is possible that the Department of Agriculture will request that the RRT set up their operation outside of the infected premises. In that case, the RRT should arrange meetings with exposed persons or contacts at off-site locations such as an agricultural response trailer or a USDA trailer. Local circumstances will dictate the feasibility of these types of options.*

**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?

***Suggested answer** – The necessary level of PPE will depend on whether the RRT is actually conducting interviews on the farm, another area designated as an infected premise by the USDA, or at an offsite location. If they are on the farm or another infected premise, the USDA and State Department of Agriculture will likely require that all visitors to the premise wear PPE. If the RRT is conducting in-person interviews in some other location, then PPE is required only when conducting interviews within 3 feet of symptomatic persons whose illness began after their reported exposure. Participants may want to discuss the challenges to conducting interviews when wearing PPE. Finally, participants from different agencies (e.g. public health, agriculture) should discuss PPE recommendations from their respective agencies to identify areas where guidance may differ.*

**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?

***Suggested answer** – According to the CDC’s guidelines for people with occupational exposure (Appendix D), outbreak responders should optimally wear PPE including gloves, gowns, shoe covers, and disposable particulate respirators (e.g. N-95). CDC has not yet issued guidance for PPE use in home and community settings, although such guidance is currently in preparation. Based on current information about the influenza A (H5N1), the primary risk factor is close contact with poultry, so the family should be instructed not to have further contact with the poultry. However, if the family may have contact with potentially infected premises or poultry, it would be prudent to follow guidelines for those who are occupationally exposed. In addition, the family should be educated on proper respiratory and hand hygiene. If anyone in the family develops symptoms, the other family members should wear gloves and masks to minimize the small possibility of human-to-human transmission. Family members should also use*



*hand hygiene measures and avoid close contact. RRT members and other responders may also want to take this opportunity to make recommendations for biosecurity precautions that need to be taken when entering or leaving the house (e.g. procedures for soiled shoes and work clothes).*

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

<b>RRT Role</b>	<b>Task</b>
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.

**Suggested answer** – *Although responses will vary, at least one RRT member, ideally a public health veterinarian, should act as a liaison officer responsible for communicating with responders from other agencies (especially the Dept of Agriculture), and the incident commander, if applicable. It is important that agencies coordinate in order to avoid asking the family the same questions multiple times, to make sure that standard state and federal agency procedures for PPE are being followed, to maintain biosecurity, and to share relevant information. Is there any chance that foul play has occurred? If so, how would you deal with law enforcement, especially as it relates to sharing information while assuring that legal investigations don't scare away potential cases and contacts? The other RRT members will probably conduct initial screening interviews of the family. One member may want to be responsible for tracking down the couple's son so he can be interviewed.*

Presumptive positive  
H5 test in hen

**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.

**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.

**Facilitator** – *After the group has completed the role play, ensure that they have covered Rick Jackson’s symptoms and the names of others who had contact with poultry.*

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.

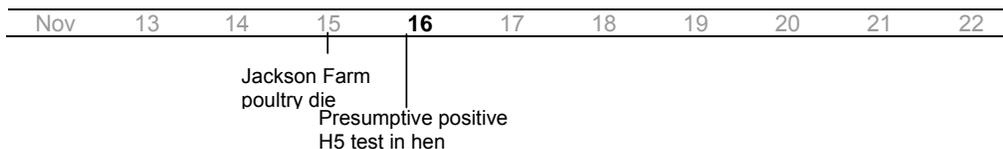
**Employees:** You don't have any employees, but your son Trevor and daughter Claire help out quite a bit on the farm. Your neighbor Bill Zalesky is retired, and he usually spends a couple of days each week helping out at the farm, in exchange for some chicken.

**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.

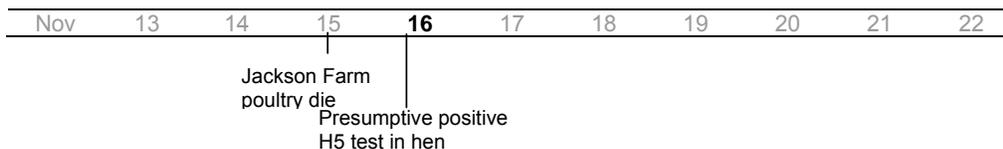
Time Allotted: 20 minutes

#### Update 7

It is late in the evening of Friday, November 16<sup>th</sup>, 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.

**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.

- **Suggested answer** – *There are three issues here: 1) to prevent movement of contaminated materials from the farm to other places, 2) to limit opportunities for virus transmission between humans, and 3) to closely monitor exposed persons for early symptom onset and rapid treatment. The Department of Agriculture should provide clear guidelines about biosecurity (e.g. showering and changing clothes when leaving the farm). The Department of Public Health should provide guidance about contact with other people. At a minimum, the Jacksons and their neighbor Bill should be instructed not to visit any other farms or unaffected locations, to prevent the spread of the virus via contaminated material. Those people who had exposure to ill poultry but who are not symptomatic (Bill, and*



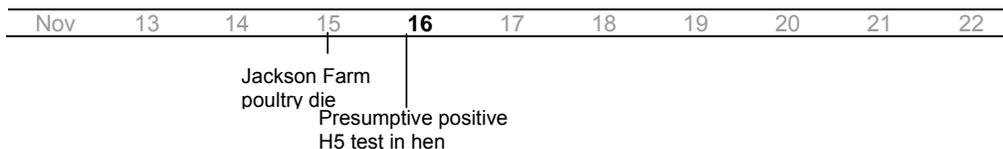
*Trevor, if he can be found) should be asked to stay home and monitor symptoms for the next 10 days. If any of these persons develop symptoms, their close contacts should be similarly identified and monitored. The definition of close contact is household and other contacts in work, school, and community settings who had close unprotected (i.e., not wearing PPE) contact in the 1 day before through 14 days after the case patient's symptom onset. Examples of close contact (within approximately 3 feet) with a person include providing care, speaking with, or touching. All should be given clear instructions about how to report their signs and symptoms to the RRT (or other health dept staff), and when to seek medical care. The team may want to ask the rest of the family to put themselves under voluntary quarantine as well, since it is possible that they have been exposed to poultry and have yet to develop symptoms. If any do develop symptoms, efforts should be made to reduce the exposure of asymptomatic persons to symptomatic persons (e.g. voluntary isolation). Please note that depending on the specific circumstances suspect or confirmed cases that have completed isolation for at least 7 days, and who are no longer symptomatic, may not be considered a source of exposure to others.*

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

**Suggested answer** – *According to the WHO guidelines for use of antivirals (Appendix C), Trevor and Bill Zalesky, would be at moderate risk, based on “handling sick animals...if personal protective equipment may not have been used properly.” For moderate risk groups, the guidelines state that prophylaxis with oseltamivir may be used. However, it is probably best to collect specimens from Claire and Rick have respiratory symptoms and should receive treatment doses of oseltamivir presumptively pending laboratory test results. Prior to receiving treatment, oropharyngeal swabs and other respiratory specimens should be collected from Rick and Claire and sent immediately for influenza A (H5N1) testing.*

*The neuraminidase inhibitors are effective against seasonal influenza viruses, but the degree of effectiveness against avian influenza A (H5N1) remains unclear. Based on the available data, which are very limited, the World Health Organization does recommend oseltamivir chemoprophylaxis for high- and moderate-risk exposure groups, which include close contacts of suspected and confirmed human cases and ill poultry (Appendix C, see also Schünemann et al., 2007). Oseltamivir should be given as soon as possible after exposure status is known and continue for 10 after last known exposure.*

*Dosing schedule for oseltamivir chemoprophylaxis*



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

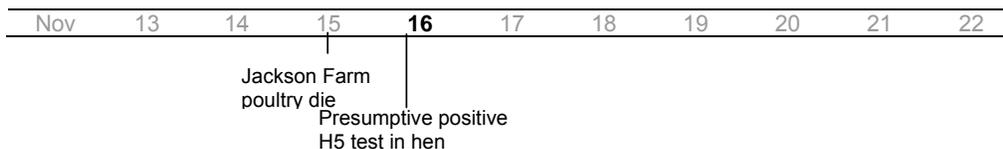
*Duration of chemoprophylaxis depends on the epidemiologic setting, but post-exposure use is typically for 10 days.*

*Heidi and Lisa Jackson did not have contact with the poultry, and therefore do not meet the WHO moderate or high risk criteria for receiving antiviral chemoprophylaxis. However, local or state public health officials may decide to administer antiviral chemoprophylaxis as a precautionary measure. Note underlying medical conditions, pregnancy, and breastfeeding status before administering medications.*

*Note: Amantadine and rimantadine (drugs sometimes used for treatment of seasonal influenza) are NOT recommended for avian influenza, because H5N1 has been shown to be resistant to these drugs in some patients.*

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

**Suggested answer** – *CDC recommends that specimen collection be considered on a case-by-case basis for people with mild disease and known exposure to poultry infected with H5N1, or for persons with severe or atypical respiratory illness but incomplete epidemiologic data (CDC, 2006). Based on this guidance, the presumptive positive diagnosis of HPAI H5 on the farm, and the fact that you will start them on antiviral medication, you should probably collect oropharyngeal and perhaps also nasopharyngeal specimens from Rick and Claire, the two family members with close poultry contact and possible disease symptoms. Specimen collection will be addressed in greater detail in Section N. While oropharyngeal swabs may be best to detect the presence of avian influenza A (H5N1) in non-intubated humans, nasopharyngeal swabs could allow for a simultaneous determination of whether seasonal influenza is circulating. Serology is a*



*debatable issue here—while it may have operational research value, it could also be argued that paired sera could be used to confirm the presence of the virus at a later date if the current specimens do not yield conclusive results. In general, more specimens make identification of infection more likely.*

**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?

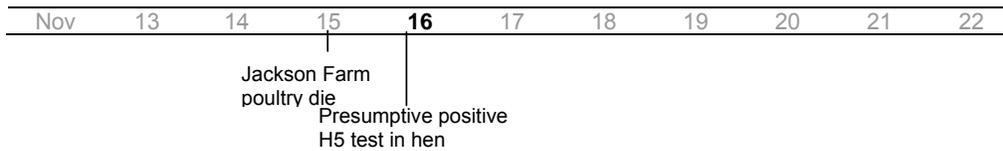
**Suggested answer** – *The RRT should probably recommend that all of these people receive inactivated seasonal influenza vaccine. Please emphasize that human influenza vaccine will provide NO protection against infection with the H5N1 virus. Rather, the goal is to reduce the chance of dual infection with human influenza A and HPAI H5N1 viruses to prevent the chance for viral reassortment. Participants may want to discuss how to effectively communicate this distinction to people receiving seasonal influenza vaccine, and to the general public. It is also important to note that it may take up to 2 weeks for the body to mount an immune response to the vaccine. However, because the RRT does not know about the possibility for ongoing exposure, it is best to recommend the vaccine. Finally, note that live influenza virus vaccine should NOT be given to people exposed to H5N1 who may also be receiving antiviral chemoprophylaxis.*

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

**Suggested answer** – *Monitoring should focus on two areas: signs and symptoms of avian influenza A (H5N1), and adverse effects of antiviral medications. At this point, since the number of contacts is manageable, the RRT should probably call all contacts on a daily basis to assess any signs and symptoms, with emphasis on those listed below. Contacts reporting the signs or symptoms below should be evaluated by a clinician.*

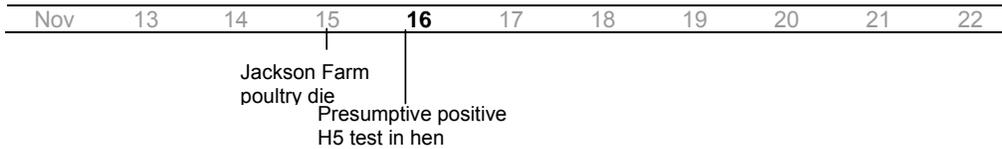
*Signs and symptoms of avian influenza A (H5N1) in humans – fever, cough, shortness of breath, sore throat, muscle aches, headaches, occasional diarrhea, abdominal pain, and vomiting.*

*Adverse effects of antiviral medications - Effects may include allergic reactions, skin rashes, facial swelling, and hepatitis. Less serious side effects include headache, nausea, vomiting, and fatigue. The most common and likely adverse effects of oseltamivir are gastrointestinal. However, the FDA recently added neuropsychiatric symptoms as rare adverse effects to the packaging label for Tamiflu. <http://www.fda.gov/cder/drug/infopage/tamiflu/default.htm>*



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

***Suggested answer** – Yes. Anyone involved in the HPAI control and eradication activities who meets criteria outlined in the CDC guidelines for antiviral prophylaxis among occupationally exposed should also receive antiviral chemoprophylaxis with oseltamivir or zanamivir. As the contact investigation proceeds, there may be others who should also receive antiviral chemoprophylaxis, including people who may have been in contact with ill poultry and people in contact with suspected or confirmed human cases (e.g. coworkers, friends).*



## H. Investigation - Active Surveillance

### Instructions:

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

Time Allotted: 15 minutes

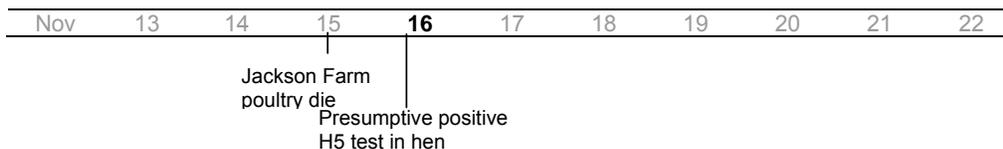
### Update 8

It's now late in the evening on Friday, November 16<sup>th</sup>. 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?

*Suggested answer –*

- *Identify individuals and groups that had known or potential exposures in the 72 hours prior to the first signs of illness in poultry. Begin with people that had known contact with the ill poultry or may have been exposed to contaminated material such as manure or farm equipment, including farm visitors, Department of Agriculture response team members, other first responders, and veterinary and laboratory staff who handled the first dead bird. Include these people in the active surveillance system.*
- *Work with Department of Agriculture to determine whether animals, supplies, or equipment were transported between Jackson Farm and other areas in the 72 hours before the poultry developed symptoms. Those areas could potentially be exposed, so human case-finding activities may be warranted there. Use your interviews to identify the range of different occupational exposures.*
- *Work with Department of Agriculture to identify the source of the virus, and identify contacts as investigation develops.*
- *Expand hospital-based surveillance by:*



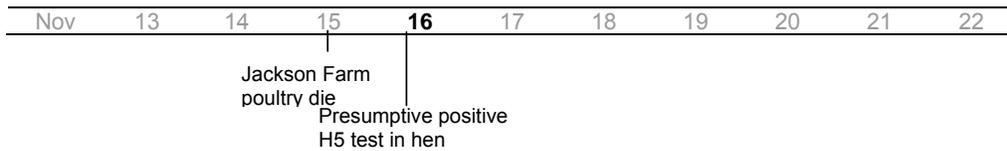
- Providing area hospitals and other healthcare providers with CDC/State case definition and risk assessment questions – this might occur through a HAN or other blanket message.
- Alerting area and state laboratories to consider H5 infection in persons with respiratory illness and contact with sick or dead poultry, and to immediately report any influenza A viruses that cannot be subtyped.
- Active monitoring of healthcare workers for signs and symptoms of illness. Participants should discuss how to determine which hospitals should receive enhanced surveillance.
- Consider possibility of sensitization of the community to report cases meeting the clinical and epidemiologic criteria for specimen collection and investigation.
- Consider how to find people who have visited Jackson Farm in 72 hours prior to the first symptom onset in poultry. Participants should discuss records or other methods (e.g. media messages) that might be used to find these people.

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

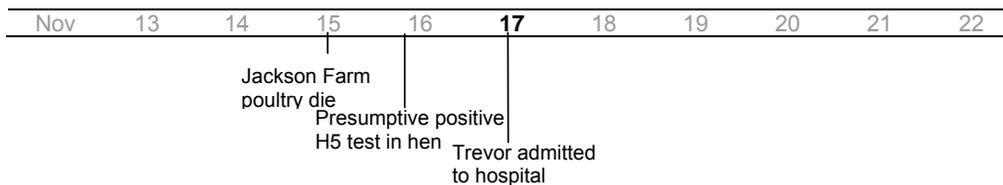
**Suggested answer** – Rick Jackson’s son, Trevor, is the highest priority because he had direct contact with the sick birds, and he has yet to respond to cell phone messages. Monitoring signs and symptoms in Rick and Claire Jackson, the rest of the Jackson family, and the neighbor, Bill Zalesky, is also a high priority because these people had known or possible contact with sick poultry. You will also want to follow-up with the state vet and other initial responders, including laboratory staff that handled the dead bird, to monitor them for signs and symptoms of illness, to assess compliance with proper use of PPE, and to ensure that they received antiviral chemoprophylaxis if appropriate. Finally, you should follow-up with anyone else who visited the farm over the past few days, people who purchased Jackson Farm chicken at the local farmer’s market. At this point, people who had direct contact with the sick poultry are the highest priority, since there isn’t yet an indication of possible human-to-human transmission.

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

**Suggested answer** – Some people you may want to update are the State Health Director, State Epidemiologist, Local Health Director, Incident Commander (if such a structure has been activated), Commissioner of Dept of Agriculture, State Veterinarian, attending physician at hospital ER, other local healthcare providers, and the public. It may be best to work with a Communications Officer to disseminate information to some of these groups. The local rapid response



*team may not communicate with these persons directly so discussion should focus on appropriate reporting chains for situation reports and updates. The CDC will be involved in the investigation at some level, either directly onsite or through frequent briefings. Communication with the CDC will likely occur through the State Epidemiologist and/or State Health Director. Also, the CDC laboratory will likely be involved in testing human clinical specimens.*



## I. Investigation - Case Classification

### Instructions:

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

Time Allotted: 15 minutes

### Update 9

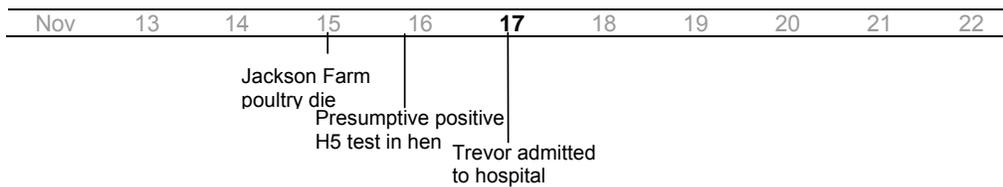
Early in the morning on Saturday, November 17<sup>th</sup>, you receive a call from Heidi Jackson, who is at Springfield Regional Medical Center with her son Trevor. According to Heidi, Trevor came home late last night with fever and shortness of breath, and she took him to the emergency room. He was 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?

**Suggested answer** – *Yes, Trevor meets the case definition as a suspect case because he presented with fever and another symptom, had direct contact with*



*sick poultry in the days before his symptom onset, and has a pending laboratory test.*

*Note: These case definitions are currently being modified by CDC, so participants should look for revised CDC Guidance for State and Local Health Departments for Conducting Investigations of Human Illness Associated with Domestic Highly Pathogenic Avian Influenza Outbreaks in Animals in the near future. Also, for international reporting, participants should refer to the case definitions issued by the World Health Organization*

*([http://www.who.int/csr/disease/avian\\_influenza/guidelines/case\\_definition2006\\_08\\_29/en/index.html](http://www.who.int/csr/disease/avian_influenza/guidelines/case_definition2006_08_29/en/index.html)). According to the International Health regulations, 2005, WHO asks that all probable and confirmed cases (according to its classification) be reported to the WHO regional office.*

*According to the CDC Interim Case Classification Guidelines a **suspect** case is a person who has:*

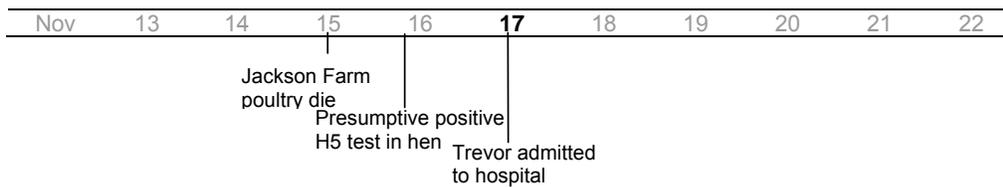
*Documented temperature  $\geq 38$  C ( $\geq 100.4$  F) and one of the following: cough, sore throat, and/or respiratory distress AND*

*One of the following exposures within 10 days of onset*

- a. Direct exposure to sick or dead domestic poultry*
- b. Direct exposure to surfaces contaminated with poultry feces*
- c. Consumption of raw or partially cooked poultry or poultry products*
- d. Close contact (within 3 feet) of an ill patient with confirmed or suspected avian influenza A (H5N1) virus infection*
- e. Works with live HPAI (H5N1) virus in a laboratory*
- f. Laboratory test for avian influenza A (H5N1) is pending, inadequate or unavailable*

*A **confirmed** case is a person who tests positive for avian influenza A (H5N1) virus by one of the following methods:*

- a. Isolation of H5N1 from viral culture*
- b. Positive RT-PCR for H5N1*



c. 4 fold rise in H5N1 specific antibody titer by microneutralization assay in paired sera

d. Positive IFA for H5 antigen using H5N1 monoclonal antibodies

*Note: If a person tests positive by any of the methods above, but does not meet the clinical and exposure criteria, they may still be counted a confirmed H5N1 infections and treated as a confirmed case for the purpose of the investigation and follow-up.*

*A report under investigation is a person for whom additional information needed on clinical and exposure information*

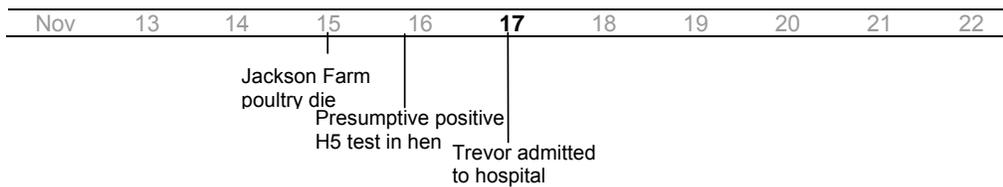
*A person who is not a case has a negative avian influenza A (H5N1) virus testing result from a sensitive laboratory testing method using adequate and appropriately timed clinical specimens*

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

**Suggested answer** – Trevor would be considered a confirmed case if he had a positive test for avian influenza A (H5N1) through one of the following methods: viral culture, RT-PCR, IFA, or 4-fold rise in H5N1 antibody titer in paired samples. Note: It is likely that CDC will need to confirm all initial U.S. cases at its own laboratory, even after positive confirmatory results from a state health department laboratory.

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

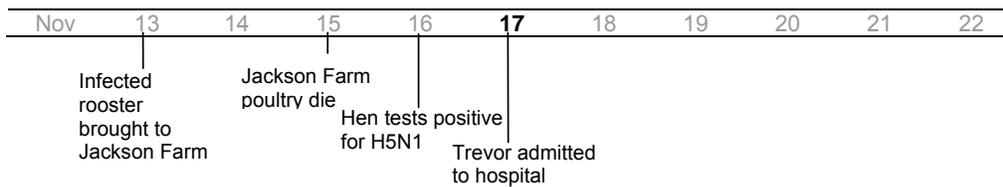
**Suggested answer** – Recommend that staff working with Trevor implement standard, contact, droplet and airborne precautions, including fit-tested N95 respirators, when performing any aerosol-generating procedures such as intubation, suctioning of an endotracheal tube, or administering aerosolized bronchodilator medications. If available, Trevor should be placed in a negative pressure room. CDC is currently revising its guidelines for control of avian influenza in healthcare settings, so recommendations are forthcoming. At a minimum, Trevor should be placed in an isolated room, and staff and visitors should observe standard, contact and droplet precautions. All bodily fluids must be considered potentially infectious: stool, blood, respiratory secretions, sputum, etc. Providers should also be advised to assess risk of avian influenza for patients with respiratory illness.



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

**Suggested answer** – Possible responses:

- Conduct an interview with Trevor if his health permits
- Get a list of people who were in the emergency room the night Trevor was there
- Get a list of healthcare providers who have been in contact with Trevor since his arrival and begin active daily monitoring for illness for 10 days after last exposure.
- Get a list of persons who had close contact with Trevor beginning 24 hours before his onset of symptoms through 14 days after his onset of symptoms.
- Request information about other severe acute respiratory illness and perhaps ILI cases admitted in the last 48 hours—try to determine if any had epidemiologic links to infected poultry, infected premises or perhaps other exposed persons.
- Report the suspect case to state epidemiologist. The state epidemiologist or state health director is responsible for reporting to the CDC.



## J. Investigation - Case Interviewing

### Instructions:

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

Time Allotted: 10 minutes

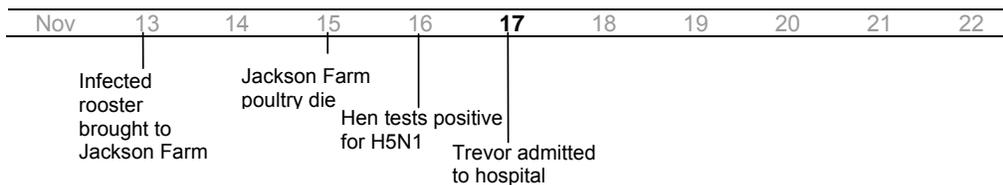
### Update 10 - Morning of November 17, 2007

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 12<sup>th</sup>, 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 13<sup>th</sup> 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?

**Suggested answer** – *Because the bird was smuggled illegally into the U.S., this has now become not only a public health and agriculture issue, but also a law enforcement issue. At the least, you should notify the state veterinarian (or Dept*



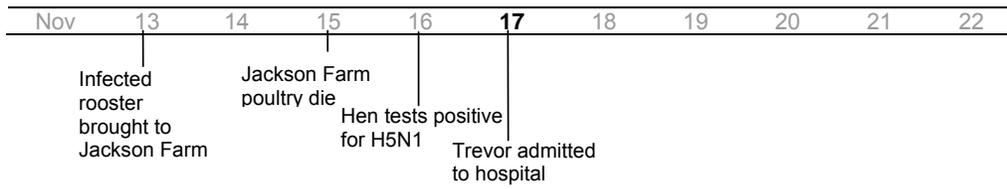
*of Agriculture) immediately, local law enforcement, and US Customs and Border Protection (CBP). CBP is the federal agency with jurisdiction for enforcement of illegal imports. It would be ideal if plans for a coordinated response were in place with these agencies in advance, as it will be critical that public health activities not jeopardize law enforcement activities, and law enforcement operations not hinder the identification of additional cases and contacts.*

*Details on HPAI H5N1 - Import restrictions*

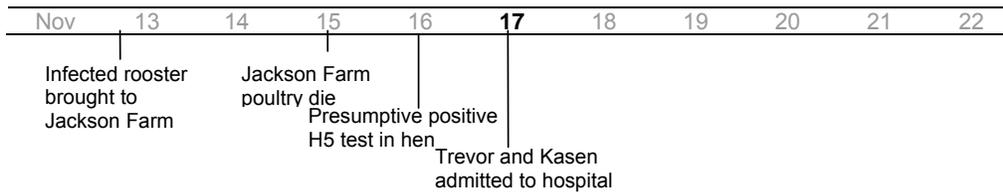
- *In order to protect the U.S from the introduction of HPAI, USDA-APHIS maintains trade restrictions on the importation of poultry and poultry products originating from countries and/or regions where HPAI H5N1 strains have been detected in commercial or traditionally raised poultry.*
- *While USDA establishes the regulations for these restrictions, the DHS U.S. Customs and Border Protection (CBP) is responsible for enforcing these laws.*
- *In addition to imposing import restrictions, in general, USDA-APHIS quarantines and tests live birds imported into the U.S. to ensure that they do not have any foreign animal diseases such as the HPAI H5N1 virus.*
- *To combat the illegal importation or smuggling of pet birds and poultry, USDA maintains a special program, Smuggling Interdiction and Trade Compliance, through which officers work cooperatively with CBP Agriculture Specialists at U.S. ports of entry. These officers also educate DHS and other state and federal partners about prohibited products and restricted commodities.*
- *It should also be noted that other countries could impose similar restrictions on poultry exported from the U.S. As a result, the poultry industry acts proactively to eliminate outbreaks. Agriculture and veterinary representatives may want to discuss the consequences of premature reporting, and whether this could be a barrier to timely reporting.*

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

**Suggested answer** – *The priority is to interview Kasen to get details about his travel and possible symptoms, as well as to get information about the bird. The RRT should follow-up with Kasen’s household contacts and other close contacts, especially those that may have been in contact with the smuggled bird. After following up with Kasen and his close contacts, the RRT should initiate additional contact tracing, by getting information about Kasen’s flights between Pao Mai and the U.S., and contacting the airline, his fellow passengers, as well as people who handled baggage. Together with the state Department of Agriculture and the USDA, the RRT needs to get information about exactly how the bird traveled into*



*the U.S., where it was kept once in the U.S. and where it is located now. If the rooster was infected with HPAI H5N1 and looked ill on Tuesday, it is likely that the bird is now dead. However, depending on how the bird was smuggled into the U.S., there may be a large number of people who were in contact with the bird.*



## K. Investigation - Case Management and Communication

### Instructions:

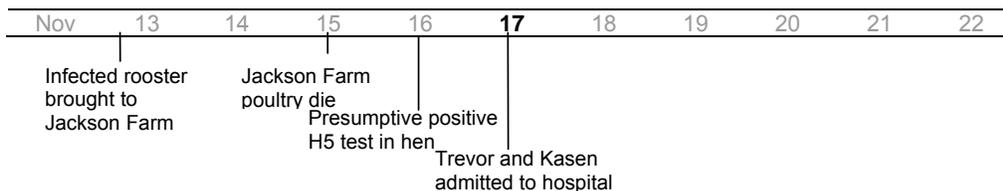
Read the following update. In your small group, discuss the questions that follow.

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.

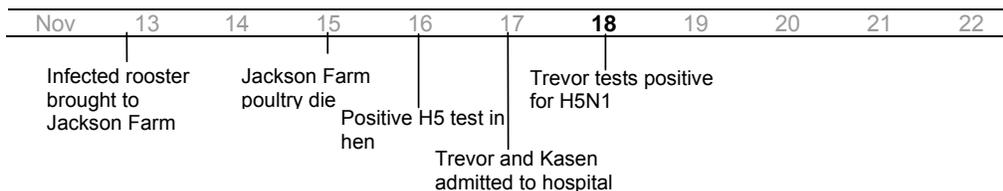


**Question 1** – Do you recommend that Heidi bring Rick and/or Claire to the hospital, keep them at home, or follow another course of action?

**Suggested answer** – *Since their symptoms became more severe, and you know that both Rick and Claire had close contact with the poultry, they should be brought to the hospital, either by Heidi or an emergency transport vehicle. Either way, you should notify the hospital in advance that they will be arriving, and that everyone who is in contact with them should be using droplet precautions at a minimum, and preferably airborne precautions (including fit-tested N95 respirators, but not necessarily a negative pressure room). This is likely to be the decision made in the early phases of an outbreak when every attempt is being made to contain it at the source. However the decision of where to monitor exposed and symptomatic persons who are not yet necessarily ill enough to hospitalize will be based on local resources if more cases begin to appear in the community. This type of decision making should be outlined in State and Local pandemic plans. Keep in mind that the decision to hospitalize is based on clinical severity and patient stability, proximity to a hospital, the presence of underlying conditions that could increase susceptibility to illness, local hospital resources, and patient compliance.*

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

**Suggested answer** – *It is likely that communication with the public will be handled by a Joint Information Center (JIC) or state and local health directors. The JIC should conduct a joint press conference with representatives from the Department of Agriculture and Department of Public Health, as well as the Incident Commander, if the Incident Command Structure has been activated. Key messages include where to report any suspected cases of influenza A (H5N1) that you know of in the community, personal infection control practices (e.g. hand washing), food safety, update on possible human cases, update on the investigations and what is known of human to human transmissibility, and advice on when to seek medical care if you are concerned that you are someone you know may have influenza A (H5N1) infection. It should also convey empathy for everyone involved in the outbreak, especially Kasen Punyawong, the Jackson family, and others who are ill. It is important that communication be regular, honest, and proactive, and should be occurring throughout the investigation. The departments of agriculture and public health may also consider setting up a hotline to respond to public inquiries.*



## L. Investigation - Infection Control

### Instructions:

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

Time Allotted: 20 minutes

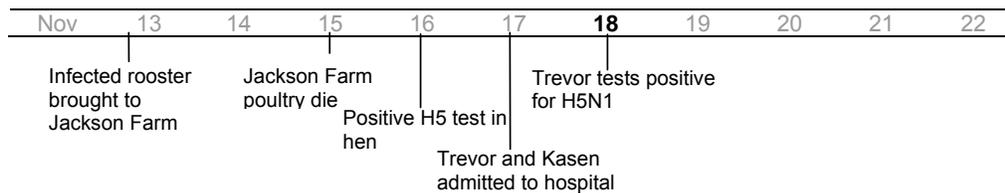
### Update 12

It is Sunday morning, November 18<sup>th</sup>, 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 14<sup>th</sup>, 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

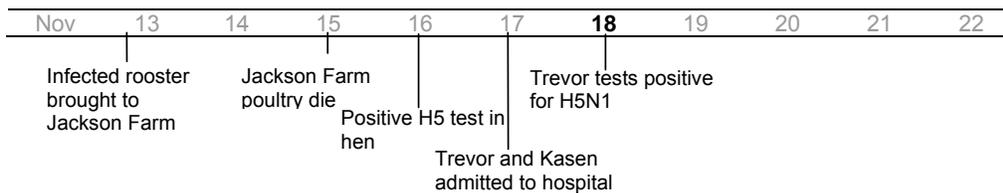


poultry outbreak, ER visitors, and health-care workers? Discuss possible actions in the following areas:

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

**Suggested answer –**

1. *Antivirals – According to recent WHO guidelines, the highest priority group for antiviral chemoprophylaxis is household family members and close contacts of strongly suspected or confirmed influenza A (H5N1) patients. Therefore, oseltamivir should be administered to household or close-family contacts of Kasen, Trevor, Rick and Claire, including Kasen’s brother Pravat, and the rest of the Jackson family. Groups with moderate-risk exposure are also recommended to receive antiviral chemoprophylaxis. These groups include people with unprotected and very close direct exposure to sick or dead HPAI H5N1 infected animals, people handling sick animals without proper use of PPE, and healthcare personnel in close contact with strongly suspected or confirmed H5N1 patients without proper use of PPE (Schunemann et al, 2007). Note that in a slight departure from WHO guidelines, CDC has recommended that in this country, all responders directly involved in depopulating birds known to be infected with HPAI H5N1 should also receive post-exposure antiviral chemoprophylaxis irrespective of their reported PPE use. Oseltamivir should be provided to first responders to the poultry outbreak and healthcare workers in contact with suspected and confirmed cases. Note that Department of Agriculture response personnel involved in control and eradication have probably already been started on antiviral chemoprophylaxis, based on the guidance in USDA directive 6800.1. However, public health should verify this with the Dept of Agriculture. Be sure that there are plans in place to monitor adverse events following antiviral administration. If time permits, participants may want to discuss how such monitoring would be implemented.*
2. *Quarantine – CDC guidance for contacts does not require quarantine, but asks that individuals self-monitor for symptoms. However, quarantine would be indicated if the virus was causing severe illness, or was spreading from person to person.*
3. *Other non-pharmaceutical interventions – At this point, the primary intervention is to limit contact between farms, since the only human cases*



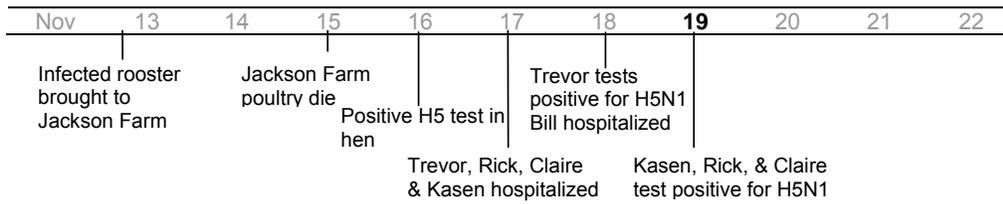
*to date have had close contact with sick poultry. The RRT should also emphasize the importance for handwashing and household infection control measures.*

4. *Communication – Advise all contacts to avoid touching their faces and mucous membranes (including eyes) with their hands. They should also be advised of proper hand hygiene (soap and water for at least 15-20 seconds, or hand sanitizer with a minimum of 60% alcohol).*

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

**Suggested answer** – *Each case-patient should be placed in isolated rooms if they are not already there. Anyone entering the room should take standard, contact, and droplet precautions. People providing direct care should follow droplet and airborne precautions. They should also use eye protection when within 3 feet of the patient, or when entering the patient’s room if oxygen or aerosolized bronchodilators are administered. These precautions should be employed until at least 14 days after the onset of symptoms. Negative pressure isolation should be used when performing aerosol-generating procedures (e.g. intubation).*

*All healthcare workers caring for case-patients should have been previously vaccinated with the seasonal influenza vaccine, and should self-monitor for fever and/or respiratory symptoms. Healthcare workers with such symptoms should stay home until 24 hours after the fever has resolved (CDC, 2006, CDC, 2004). If not previously vaccinated, healthcare workers should receive inactivated influenza vaccine. Healthcare workers vaccinated with live attenuated influenza virus (LAIV) vaccine should not be caring for these patients and should not receive antiviral medications until at least one week (7 days) after receiving LAIV vaccine. The hospital should provide education and PPE to anyone entering the patient’s room, including but not limited to, respiratory therapists, housekeeping staff, and family members.*

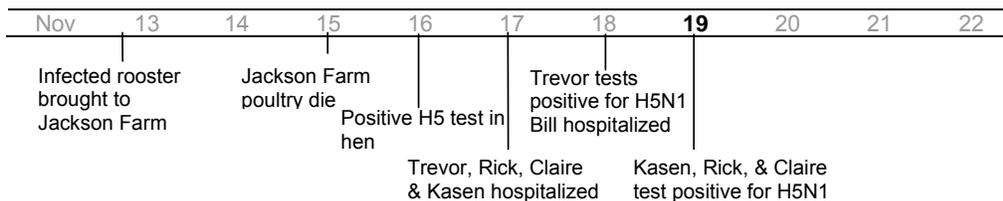


**M. Investigation - Case Classification and Line Listing**

**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

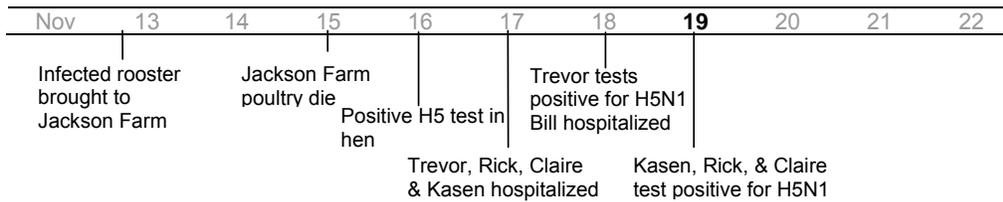
It is midday on Monday, November 19<sup>th</sup>, and you have compiled a great deal of information from interviews conducted over the weekend and this morning. Below is a sample of the data.

#### Initial cases

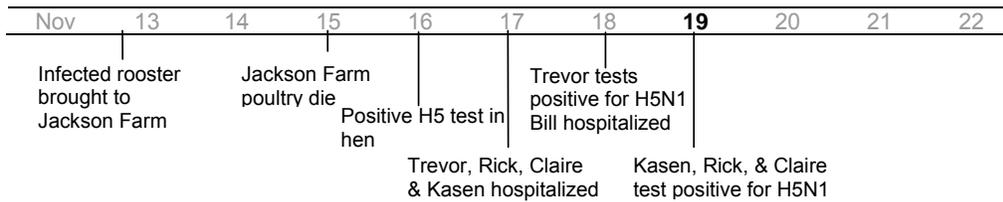
- Trevor Jackson (22-year-old male) remains hospitalized, and he is now in critical condition. Symptom onset began with fever and shortness of breath on November 16, 2007. He has developed pneumonia, and blood testing has revealed low lymphocyte and leukocyte counts. His chest radiograph (below) shows 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 17<sup>th</sup>). 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

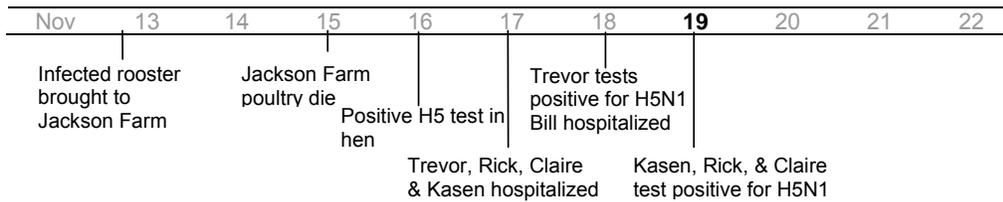
- Interview #1 – Heidi Jackson (wife of Rick). 41 y.o. female. No symptoms. Oseltamivir chemoprophylaxis initiated on 11/16/07.
- Interview #2 – Lisa Jackson (daughter of Rick), 18 y.o. female. No symptoms. Oseltamivir chemoprophylaxis initiated on 11/16/07.
- Interview #3 – Bill Zalesky (neighbor of 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.

**Suggested answer** –

*Trevor Jackson, Kasen Punyawong, Rick Jackson, Claire Jackson – confirmed cases*

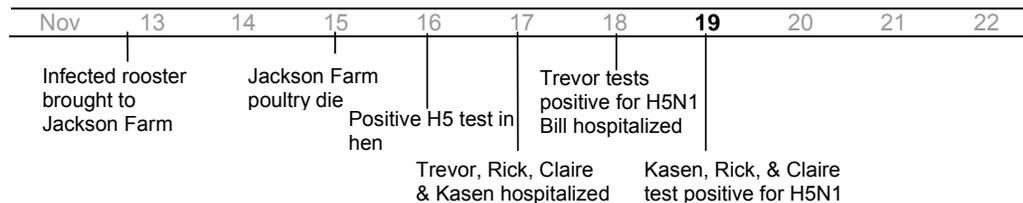
*Bill Zalesky, Jim Baxter, Shana Patel – suspect cases*



*Pravat Punyawong, Heidi and Lisa Jackson are close contacts of confirmed cases.*

**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.

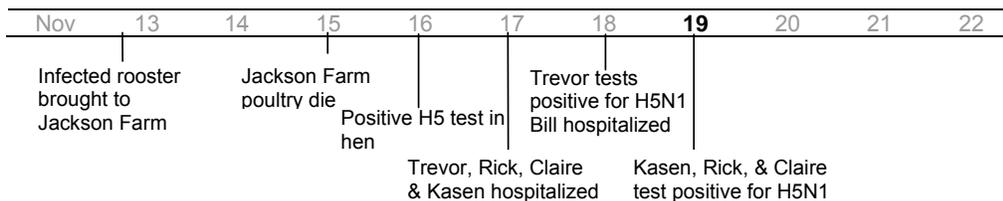
**Suggested answer** – *The line list should include all of the personal, clinical, and exposure information necessary to classify and reclassify cases. Other variables that could be included are: interview date, interviewer initials, date of poultry exposure, dates of exposure to ill persons and confirmed cases, type of monitoring, type of prophylaxis (if any), date prophylaxis began, date of specimen collection, specimen type, type(s) of laboratory tests, results of last laboratory test, treatment (type and date), type of hospital care (e.g. ICU or not), presence of pneumonia, some index of illness severity, status of patient (e.g. stable, critically ill), vaccination history, hospital or physician contact, and any additional data from health checks.*



### 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.

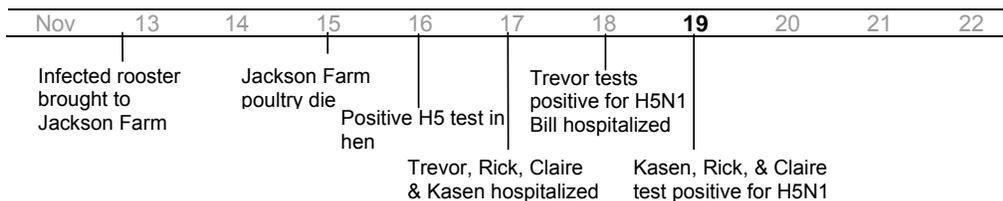
**Suggested answer** – The line list should include all of the personal, clinical, and exposure information necessary to classify and reclassify cases and contacts. Some other variables that could be included are: interview date, interviewer initials, type, date, and level of poultry exposure, type, date, and level of exposure to suspect and confirmed cases, type of monitoring, quarantine status, date prophylaxis began, date of specimen collection, specimen type, results of last lab test (type and date), type and dates of treatment, vaccination history, and any additional data from health checks.

### Contact Tracing Linelist

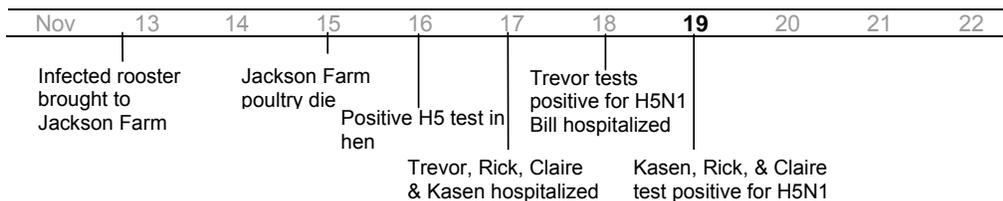
ID	First Name	Last Name	Age	Sex	Relationship to Case	Possible Exposure Type	Possible Exposure Date
1	Heidi	Jackson	41	F	Rick's wife	Case #1	?
2	Lisa	Jackson	18	F	Rick's daughter	Case #1	?
3	Pravat	Punyawong	27	M	Kasen's brother	Case #2	11/13-11/17

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

**Suggested answer** – This case may have resulted from human-to-human transmission. Shana has no reported direct contact with poultry, but did have close contact with a confirmed case. The fact that she may have been in contact with droppings from wild birds makes the interpretation more complicated; however, there has been no indication that wildlife officials have detected HPAI in wild birds. The most important initial recommendation is that Shana be hospitalized, isolated, and evaluated by a clinician. Specimens should be collected for RT-PCR, and she should be treated with oseltamivir as soon as possible. The RRT may want to conduct a more detailed interview with Shana, but in the meantime proceed as if human-to-human transmission has occurred. Possible actions are listed below:



- *Surveillance – alert hospitals and healthcare providers to report suspected cases of Influenza A (H5N1) or clusters of severe respiratory illness in persons socially or occupationally linked, or in health care workers. Recommend using PPE with anyone presenting with respiratory illness, and keeping patients with possible influenza A (H5N1) infection in isolated rooms. If active surveillance has not been initiated at Springfield Regional Medical Center, it should be started at this point. It may also be prudent to implement active monitoring of healthcare workers, if this is not already occurring and to consider enhanced and active surveillance in the community.*
  
- *Disease Containment – the possibility of human transmission makes disease containment measures even more important. Participants may want to discuss triggers for providing mass antiviral prophylaxis to at risk persons in the area. At the least the RRT should recommend voluntary quarantine to all contacts of suspected and confirmed cases to limit the possibility for additional transmission. The team should prioritize case finding and contact tracing activities (by adding additional interviewers, if necessary).*
  
- *Communication – the public should be informed of where to report cases and clusters, be given an update of the investigation findings to date, and be advised to practice proper hand hygiene, avoid touching their face or mucous membranes with their hands, and watch for symptoms in themselves and their families.*



## N. Investigation – Specimen Collection

### Instructions:

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

Time Allotted: 15 minutes

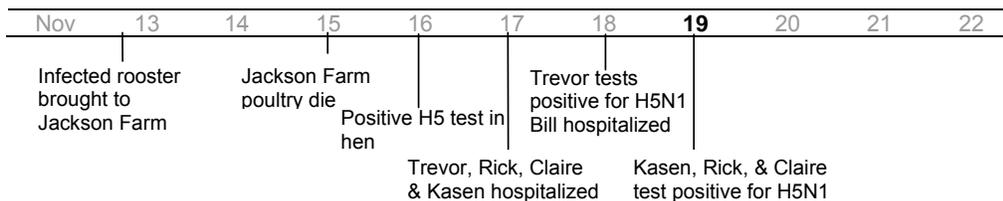
### Update 14

This afternoon (Nov 19<sup>th</sup>), 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?

***Suggested answer** – Participants can refer to the materials for the laboratory module that will be included in the optional third day of training.*

*Yes, you should collect a specimen from Abby. She is a close contact of a suspect case (Claire Jackson), and there is a slight possibility that human-to-human transmission could have occurred between Trevor Jackson and Shana Patel, the ER nurse. The preferred specimens for human cases of H5N1 are lower respiratory tract specimens, if available (e.g. a person is intubated). If not available, then oropharyngeal specimens are the best upper respiratory tract specimen, because they appear to contain more virus for H5N1 detection than nasal or nasopharyngeal specimens. Nasal and nasopharyngeal swabs are less desirable because they may contain less influenza A (H5N1) virus (CDC HAN, 2006). However nasopharyngeal swabs are preferable for detecting seasonal influenza. Therefore both oropharyngeal and nasopharyngeal swabs should be collected, if possible, because a laboratory may simultaneously test first for*



*seasonal influenza before looking for less common Influenza A subtypes. In general, respiratory specimens should be collected from multiple sites on multiple days from the same patient. If possible, specimens should be collected within 3 days of illness onset. You may also consider collecting blood (now during the acute phase AND later during the convalescent phase) for paired serology testing. Serology may be especially useful if specimens are being collected several days after symptom onset.*

**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.

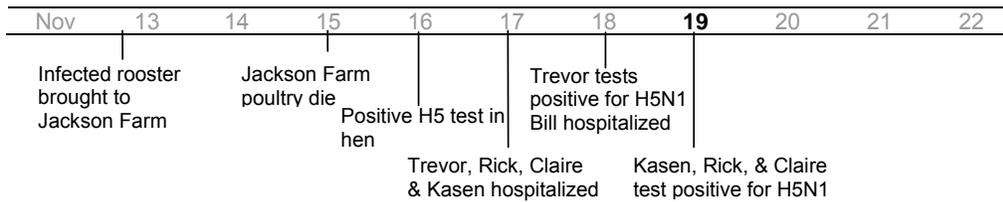
**Suggested answer** – RRT members should collect oropharyngeal and nasopharyngeal swab specimens and use contact and droplet precautions, as well as an N95 or better respirator. The procedure for oropharyngeal specimen collection is:

- Use sterile Dacron or rayon swabs with plastic shafts
- Swab the posterior pharynx and tonsillar areas, avoiding the tongue
- Place swabs immediately into sterile vials containing 2ml of viral transport media. Break the applicator sticks near the top and tighten the cap. Label each specimen container with the patient's name, ID number, and date the sample was collected.

*Refrigerate samples after collection. Keep sample at 4°C using cold packs if necessary.*

*Ship samples to a laboratory that can conduct RT-PCR testing for H5 (notify laboratory that specimen will be arriving). This will often be the state laboratory. CDC may also request that you send specimens to their laboratory as well.*

*Participants should discuss specific aspects of specimen collection, handling, and transport in their local areas. Which laboratory should specimens be sent to? Is the process different since it's a Sunday? How will the RRT be notified of the laboratory results?*

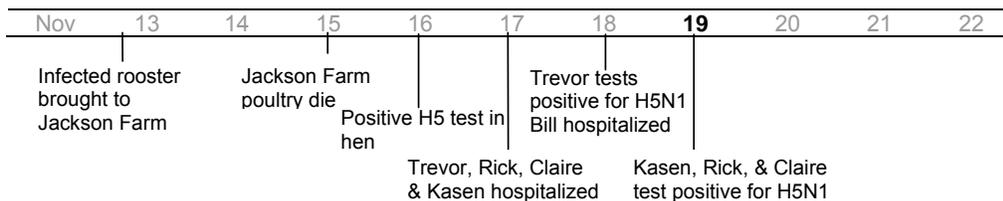


**Question 3** – Should any additional specimens be collected from Abby either now or in the future?

*Suggested answer* – Acute serum samples could be collected not more than 7 days from the date of symptom onset (in this case today – 11/19/07). Convalescent samples could be collected 2-4 weeks after acute serum samples.

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

*Suggested answer* – The current CDC guidelines do not recommend laboratory testing of contacts, but factors including the epidemiology of the outbreak may affect the decision to test asymptomatic contacts. If little virus is being shed, serology would be a method to consider in such a situation.



## O. Investigation - Assessing Human-to-Human Transmission

### Instructions:

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

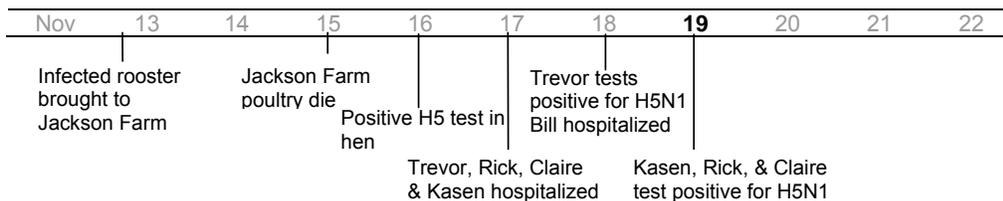
Time Allotted: 20 minutes

### 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?

***Suggested answer** – First, you should review Shana's and Abby's medical charts for laboratory results which may rule out influenza A (H5N1) in favor of an alternative diagnosis. If it is possible that Shana and Abby are infected with influenza A (H5N1), you can proceed with assessing the possibility of human-to-human transmission based upon an epidemiological investigation. The RRT should get detailed information on Shana's and Abby's activities and contacts over the past several days. The team should compare the onset dates to the incubation period of influenza to determine whether human-to-human transmission is possible. It will also be very useful to determine the current seasonal influenza activity, and other differential diagnoses that were considered by their physicians. Creating a timeline and an epi curve may be helpful to answer this question. Wildlife authorities have not detected the HPAI H5N1 influenza virus in wild birds and neither Shana nor Abby reported any contact with poultry, so human-to-human transmission is at least plausible. However, it is*



*important to rule out all possibilities, including the chance that they were infected with undercooked poultry, or from raw poultry being prepared for cooking, that originated at Jackson Farm or that they have another disease, such as seasonal influenza.*

*Note: The WHO Guidelines for Investigation of Human Cases of Avian Influenza A (H5N1) provide guidance on how to determine if human to human transmission has occurred. In practice it can be very difficult to differentiate between human-to-human transmission and a common source exposure. Human-to-human transmission may be indicated in the setting of:*

*Well documented exposure to a confirmed, probable, or suspect human case*

**and**

*The time interval between contact with a human case and illness onset is 7 days or less*

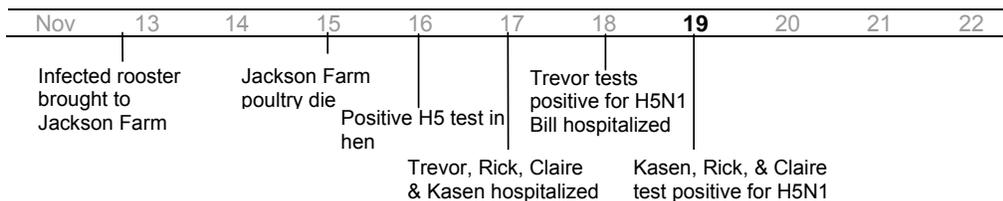
**and**

*Absence of an alternative source of exposure such as exposures to birds, animals, feathers, droppings, fertilizers made of fresh bird droppings, contaminated environments, or laboratory specimens*

**OR**

*Several generations of transmission linked to a primary case*

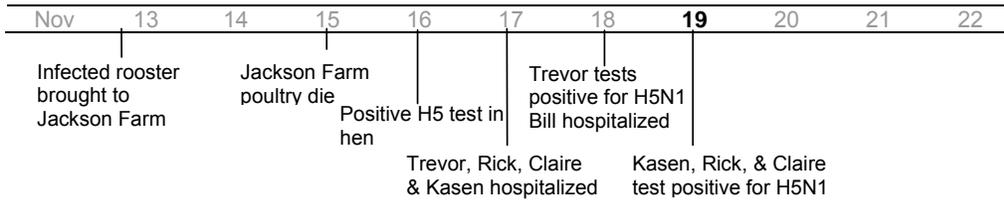
*In line with the International Health Regulations (2005), WHO should be notified if the investigation suggests that human-to-human transmission is occurring as described above. If transition from inefficient and non-sustained human-to-human transmission of influenza to efficient and sustained transmission were to occur, consideration of more intensive “containment” procedures may be indicated.*



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.

***Suggested answer** – Although responses may vary, it is probably not the responsibility of the RRT to communicate directly with the media. The RRT should refer Mr. Cooper to the health department’s Public Information Officer or the Joint Information Center that is operating during the investigation. However if time permits the group could make 3-5 sentences preferably of 9 words or less that concisely summarize the investigation and RRT recommendations to the public to date.*



**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 19<sup>th</sup> 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

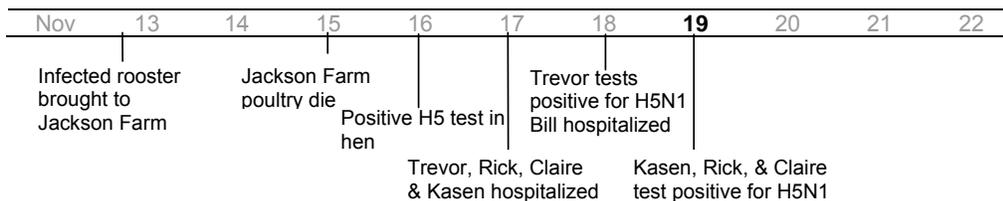
**1. Rapid Response Team Composition**

Name	Affiliation	Role

**2. Surveillance/Epidemiology**

**2a. Update on Human Cases**

As of Nov 19<sup>th</sup> 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).

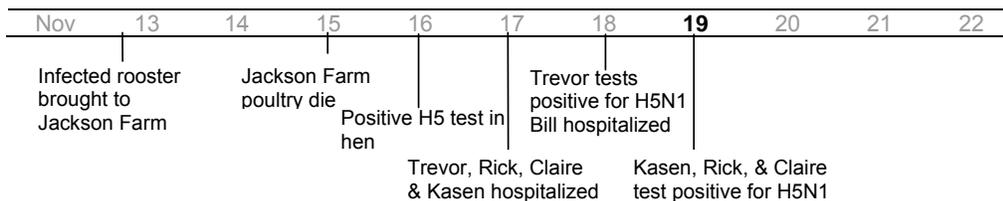
## 2c. New Cases (all suspect)

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.

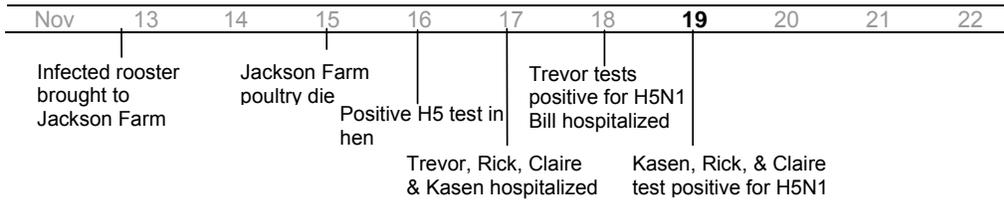
Samples from the first dead hen tested positive for influenza A (H5N1) (RT-PCR) at the National Veterinary Services Laboratory. Pathogenicity results are expected shortly, although the high poultry mortality and confirmation of Influenza A (H5N1) in humans make these results less urgent.

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**

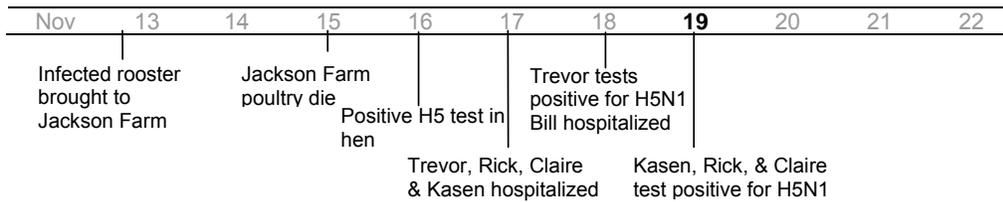
\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**8. Other**

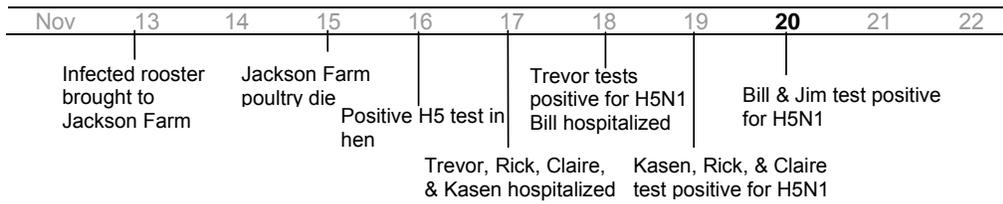
You may want to include your line listing. In addition, issues you may want to discuss here are:

- 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.



**Suggested answer** – *A summary version of this report could be shared with the state Department of Agriculture and/or the USDA on a daily basis. It may not need to include as much data on individual cases and contacts. If the outbreak progresses to a situation where Emergency Management is involved, it might also be shared with incident commanders and/or emergency management personnel. As in other outbreak situations, this type of report is useful for communication between various public health agencies, including the CDC and the WHO. If this report is being disseminated publicly, the names and identities of cases and contacts should remain anonymous.*

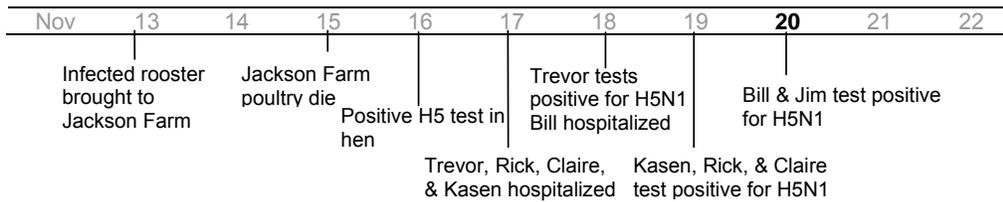


**Q. Investigation - Epi Curve**

**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 20<sup>th</sup>, 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)

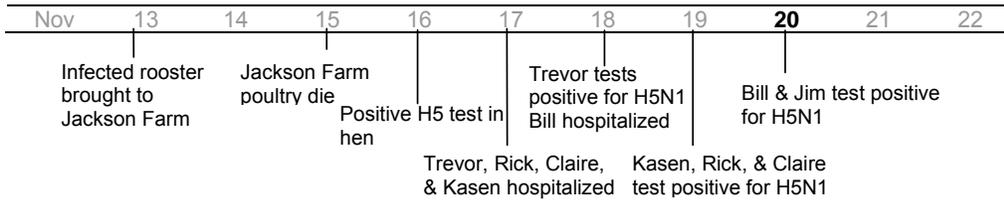
People whose laboratory tests have been **negative for Influenza A (H5N1)** are:

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

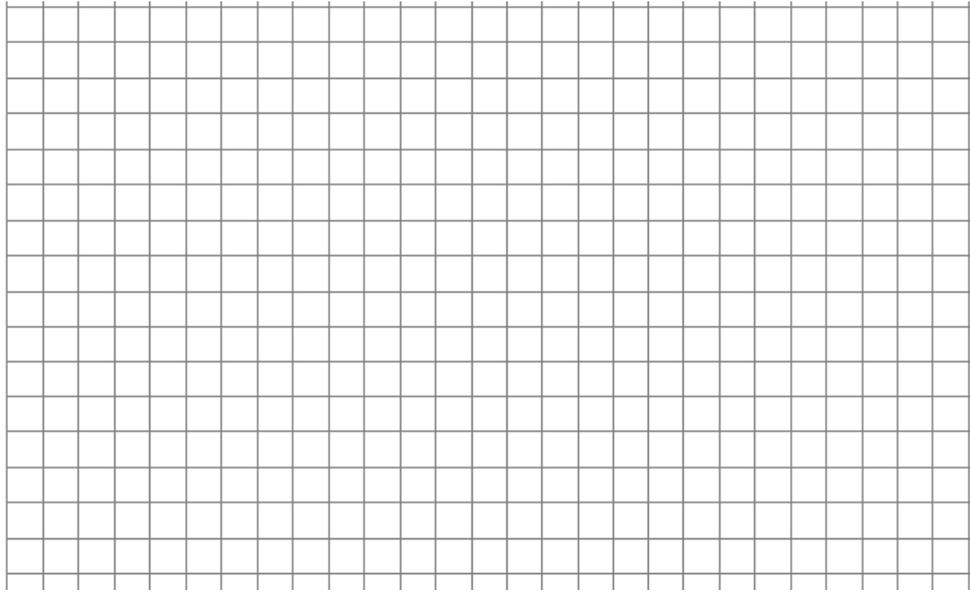
Based on Shana Patel's laboratory results, you note that seasonal influenza vaccination could have prevented a lot of concern about Influenza A (H5N1) for both Shana Patel and outbreak investigators.

Asymptomatic contacts who did not have a laboratory test are:

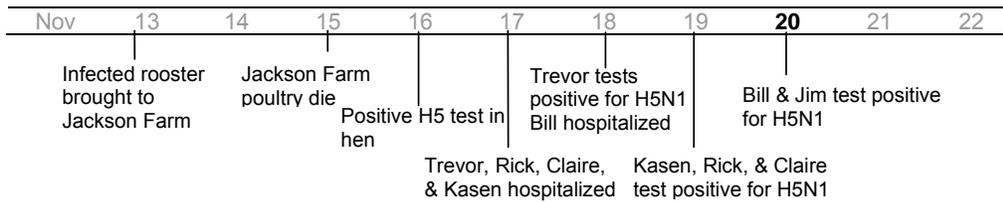
- Heidi Jackson
- Lisa Jackson
- Pravat Punyawong



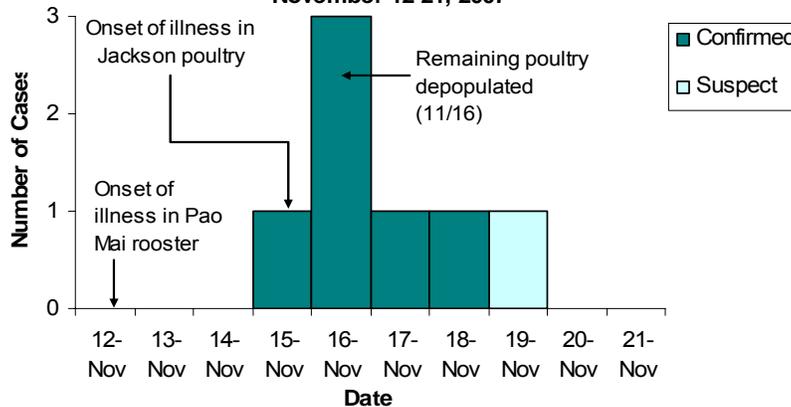
**Group activity** – Using the data above and your case line listing, create an epi curve using the graph paper below. (Note: It may be useful to indicate the onset of illness in poultry on your curve.)



*Suggested answer* – The epi curve to date is below.



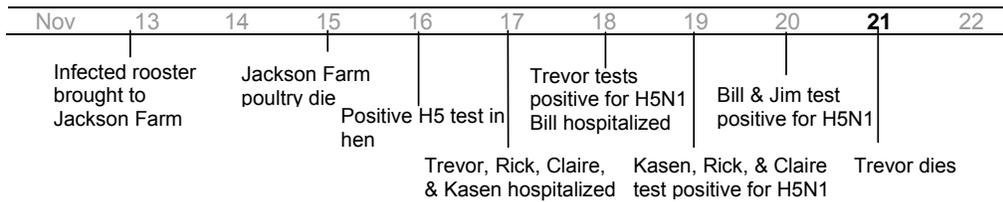
**Epi Curve - Jackson Farm H5N1 Human Outbreak**  
**November 12-21, 2007**



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

**Suggested answer** – Kasen (onset 11/15) had extensive exposure to the index bird since Nov 12<sup>th</sup> so the date of infection is unknown, but it’s likely that his incubation period is 3-4 days. Trevor had exposure to the index bird on Tuesday (11/13), and developed illness on Friday (11/16), so probably had a 3 day incubation period. Rick and Claire (onset 11/16) had contact with the Jackson Farm poultry, but not the index bird, for several days prior to coming down with symptoms, but it is likely that their incubation periods were about 1-2 days. The case on Nov 17<sup>th</sup>, Bill Z, had contact with the sick poultry on the 15<sup>th</sup>, which would also indicate a 2 day incubation period. Finally, Jim Baxter (onset 11/18) had exposure to the dead birds on Nov 16<sup>th</sup>, indicating a 2 day incubation period.

Participants should be encouraged to indicate the potential source of exposure (poultry or human) for each case in the epi curve to understand more about the spread of the outbreak. Sustained human-to-human transmission would indicate that this is a propagated outbreak, so getting more information from Abby Crawford, the suspect case with disease onset of 11/19, is crucial. It is also likely, at this early stage, that the epi curve is not yet complete because case finding is ongoing.



## 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

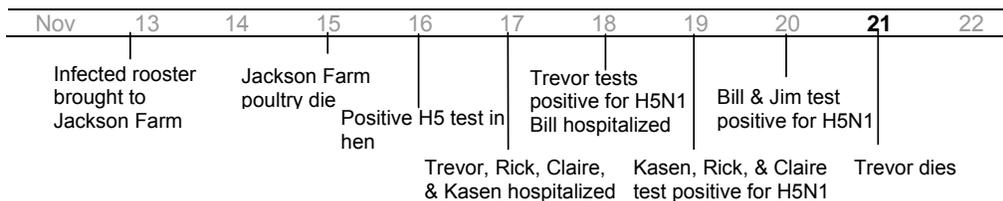
### Update 17

Today is Wednesday November 21<sup>st</sup>, 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....”

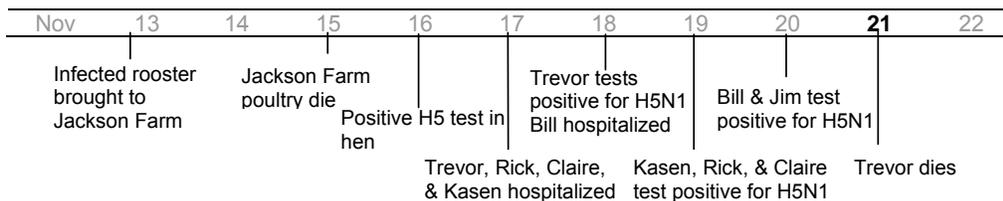
\*Available at [http://www.who.int/csr/disease/avian\\_influenza/guidelines/protocolfinal30\\_05\\_06a.pdf](http://www.who.int/csr/disease/avian_influenza/guidelines/protocolfinal30_05_06a.pdf)

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

*Suggested answer* – No, mass antiviral chemoprophylaxis is not indicated in this situation because there is no evidence yet of improved human-to-human transmission.

**Question 2** – How do you respond to the public?

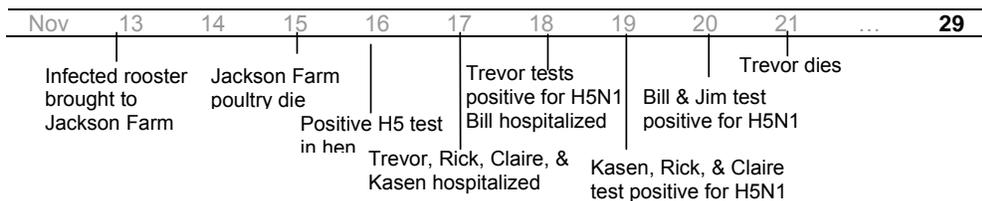
*Suggested answer* – Throughout the message, demonstrate empathy for the public, and especially those affected directly by the outbreak. Reassure the public that the disease is not spreading between people, and so antiviral chemoprophylaxis is not necessary for people who do not have exposure to sick or dying poultry or sick persons. Tell them that they will be provided with regular (at least daily) updates – and follow through. Use this as a teachable moment and remind them how to report suspected cases and clusters and non-pharmaceutical



*measures to prevent influenza transmission in general, BUT be sure to emphasize the difference between seasonal influenza and avian influenza A (H5N1). Assure the public that local, state, and federal public health officials are closely monitoring the outbreak, and that seasonal influenza has been detected in the area already. Specifically, note that one healthcare worker who cared for a patient with influenza A (H5N1) became ill with seasonal influenza, not avian influenza. This may be a good time to emphasize to the public that seasonal influenza vaccine is available, and to remind the public that we expect outbreaks of seasonal influenza every year. However, be very clear that seasonal influenza vaccination does not protect against avian influenza A (H5N1).*

**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?

**Suggested answer** – *This is a difficult issue, but decisions should be made either by drawing a ring of 5-10km radius from each suspected case, and providing prophylaxis to anyone residing within the ring, or by county or census block, based on risk of exposure (see WHO guidelines in Appendix C), or potential exposure groups such as persons at work, school, social contacts etc... Participants should be encouraged to discuss how they would assess risk of exposure among different groups within the community.*



## S. Investigation - Risk Communication

### Instructions:

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

Time Allotted: 15 minutes

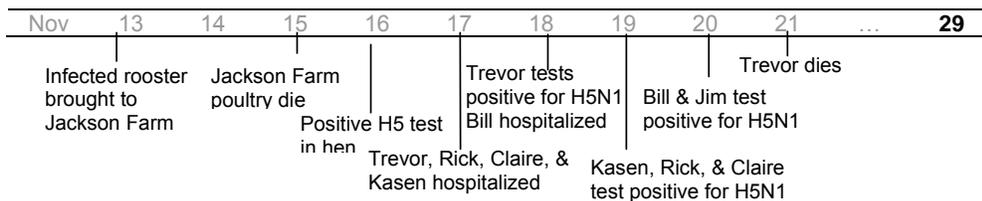
### Update 18

It is still Wednesday, November 21<sup>st</sup>, 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?

**Suggested answer** – *The message should address hand-washing, the lack of human-to-human transmission in the current H5N1 human outbreak (therefore meaning that PPE is not necessary), and the fact that people can avoid risk by not having contact with ill poultry. It may be wise to address a separate message to*



*poultry farmers and workers advising them about proper use of PPE and awareness of signs and symptoms of HPAI H5N1 in both birds and humans.*

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

**Suggested answer** – *Eating properly cooked poultry is safe, but provide people with the minimum temperature and length of time that they should cook their turkeys (adjusted for size), and proper procedures for storing the leftover turkey. Emphasize that there are important precautions for handling, preparing, cooking and eating poultry. The effectiveness of handwashing should be a key message. Also emphasize that sick poultry should NOT be prepared for consumption. Ideally, these messages would have been disseminated from the start of the outbreak.*

**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?

**Suggested answer** – *Answers will vary depending on the local area, but some examples of populations that might not receive public health messages are: people in institutions (nursing homes, prisons, etc), homeless people, people who do not speak English, migrant farm workers, and people with disabilities. Communicating with these groups ideally would involve identifying and working with them prior to an emergency event and determining the best ways to reach them. Participants should be encouraged to identify organizations that represent these groups that could be partners in emergency planning.*

## 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.

***Facilitator** – Encourage the group to discuss these questions openly, and to identify areas in which their response could be improved. If there are specific aspects of the response that were particularly good (or bad), you may want to provide your own feedback (as an observer) to the group.*

**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](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](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 contacts<sup>1</sup> 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 exposure<sup>2</sup> 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.<sup>3</sup>

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:

---

<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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](http://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](http://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.<sup>1</sup> 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.

<sup>1</sup> 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](http://www.osha.gov/SLTC/etools/respiratory) and [www.cdc.gov/niosh/topics/respirators](http://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](http://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](http://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](http://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.*

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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:

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Name of Contact No. 3:

Their relationship to you:

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

Single day only \_\_\_\_/\_\_\_\_/\_\_\_\_

Multiple days \_\_\_\_/\_\_\_\_/\_\_\_\_ \_\_\_\_/\_\_\_\_/\_\_\_\_ \_\_\_\_/\_\_\_\_/\_\_\_\_

Continuous contact from \_\_\_\_/\_\_\_\_/\_\_\_\_ to \_\_\_\_/\_\_\_\_/\_\_\_\_

Contact telephone number: \_\_\_\_\_

Contact address:

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### 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.*