Case Study Exercise

Investigation and Management of Suspected Cluster of Human Cases of AI/PI

Pandemic Phase 4-5

Facilitator

Facilitator Instructions

1. Allow time for students to offer suggested answers to what should be done in this scenario.
2. Thank students for their suggested answers.
3. Review the suggested answers provided below.
4. Discuss whether student answers were similar to or different from the actual responses and actions taken/planned by human/animal health authorities.
5. Depending on the size of the overall group being trained, it may be appropriate to break into smaller groups to complete this case study. This training has been designed for training breakout groups consisting of < 10 persons, with facilitators assigned to each group.
6. In the scenario, students will be deployed to the fictional city of Indiraghat town in Indiraghat District of Sikkim state to investigate a severe respiratory disease outbreak.
7. 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.

Instructions

For this exercise, you will work with your group to complete a case study investigation. Each segment of case study information will be followed by a series of questions. Facilitator or one person in your group should read the information aloud to group members. Then, work as a group to generate possible answers for each question that the group thinks to be most appropriate. Record the answers in the space provided.

Case Study: V

Time allotted: 15 minutes

October 13th
A staff doctor at Jagdamba hospital notifies the District Health Office that they have admitted three previously healthy persons, one of whom had severe respiratory illness. The doctor is concerned that his patients may have avian influenza, as confirmed poultry outbreaks have been reported in the neighbouring country and is continuing. Indiraghat borders that country and the border is porous.

Question 1: If you, as CMO of the District, had received this call, what additional information would you want to receive from the treating physician?

Facilitator: Conduct a brainstorming session by asking participants to identify a series of questions that would be useful to ask the treating physician at this time.

Suggested answer
Possible questions to ask treating physician include:

1. What is the age, gender, occupation and medical status of each patient?
2. When did patients present to hospital? What was the date of symptom onset?
3. Were samples taken? Which ones? Where are they being analysed?
4. What other labs were done (e.g., CBC)?
5. Were x-rays taken?
6. Do you/your hospital have personal protective equipment (PPE)? Was it used while examining this patient?
7. What kind of treatment has each patient received? Was oseltamivir given to the patients?
8. Is there clinical evidence of avian influenza infection?
9. Where do the patients reside? Are the patients linked in any way? Are there possible exposures to avian influenza? Contact with wild or domestic birds?
10. Are there other similar cases? Are they linked to these two patients? If so, who are they and how many might be exposed?
11. Provide names and contact information for medical personnel, medical facilities or other public health officials already involved in the investigation.

Question 2: As head of the District Rapid Response Team (RRT) you have been asked to investigate the cases. You have a high degree of suspicion from your experience that it could be avian influenza. What all resources and supplies will you think of adding to your inventory list? Where would you obtain these resources?

Time: Minutes: 15

Facilitator answer: List all resources and supplies needed that participating RRTs can refer to in the event of a real investigation. A sample resource inventory for a field investigation is provided below:

Sample Resource Inventory for a Field Investigation

Resource	Location/agency
Transportation	Health agency/Civil Aviation/MHA
Personnel	Own district-primary and secondary health infrastructure Health manpower from neighbouring districts State health agency (State RRT) National health agency (Central RRT) Veterinary department of district & State Security Personnel (If quarantine has to be done)-State Police/NDRF/CRPF/BRO
Antiviral medication	Central government stockpile-NICD
PPE	Central government/State government stockpile/stocks available in district hospital/pharmacy shops
Sampling supplies	NICD/NIV/State RRT
IEC materials	Central government (NICD/EMR); State government
Decontamination solution	District hospital laboratory/State hospital laboratories/ IDSP laboratories/Laboratories in the neighbouring state
Guidelines/SOPs	District health office/State health office
Contact list for team members, supervisor and those who should be informed	Your workplace resources
Notebook or laptop computer for recording and/or storing data, camera for photos	Your workplace resources
Communications equipment such as mobile phones and radios	Your workplace resources
Money	District resources/state resources/NRHM

October 14th

The RRT arrives at Indiraghat and goes directly to the Jagadamba hospital to begin investigation of the family cluster with severe respiratory illness. The RRT learns that the Jagadamba Hospital's microbiologist had taken the naso pharyngeal swabs of the first case admitted to the hospital on 11th itself (after getting advice from his friend working in the ICMR lab at Kolkata) and dispatched it to that lab and that report is awaited. She said she acted fast on her own because the child had visited a village across the border two weeks back which is endemic for H5N1.

The medical charts and chest x-rays for the suspect avian influenza cases are provided to the investigative team.

Abstracted Data from Medical Charts for Case 1-3

Case - 1

Five year old male presented to the hospital on October 11th with fever, cough, shortness of breath and diarrhoea.
Date of symptom onset: October 8th
Vitals upon admission:

- Temperature = 39°C
- Heart rate = 120
- Respiratory rate = 30
- Blood pressure = 90/60
- Oxygen saturation = 88%

X-ray on 11th: small patchy infiltrates in the lower zones of both lungs.

Incubated on October 11th and placed on mechanical ventilation.

Case - 2

55 year old female admitted on October 11th
Full time caretaker and grandmother of Case - 1
Onset of fever, cough on 10th and shortness of breath
Alert, oriented, anxious
No other significant medical history, except to be hypertensive on regular medication for past three years.
Initial blood count reveals low lymphocytes and leukocytes.
Vitals upon admission:

- Temperature = 38.5°C
- Respiratory Rate = 28
- Blood Pressure = 180/100
- Oxygen Saturation = 90%
- Lab results pending.

Case - 3

Eight year old male presented to the hospital on October 13th with fever, cough, and diarrhoea
Date of symptom onset: October 11th
Friend of case-1, had been playing together in the past one week.
Vitals upon admission:

- Temperature = 39°C
- Heart Rate = 120
- Respiratory Rate = 30
- Blood Pressure = 90/60
- Oxygen Saturation = 94%

Chest X-ray Normal

Lab Result Pending

Child CXR on admission (Case - 1)

(Image from Faculty of Medicine, Chinese University of Hong Kong; Copyright © 2002-2006. Department of Diagnostic Radiology and Organ Imaging)

You immediately ring up ICMR lab at Kolkata and you are informed that Naso pharyngeal aspirates are positive for H5 influenza by real-time RT-PCR

Time allotted (For question no. 3-5): 15 minutes

Question 3: Do any of these cases meet the WHO case definition for influenza A/H5? If so, would these cases be classified as confirmed, probable, suspect or under investigation?

Case - 1: Probable Influenza A/H5 case based on exposure and symptoms and findings in chest x-ray.

Case - 2: Suspect Influenza A/H5 case based on symptoms AND exposure to a probable case within 7 days of symptom onset while that case was infectious (i.e., her grandson).

Case - 3: Suspect Influenza A/H5 case based on symptoms AND exposure to a probable case within 7 days of symptom onset while that case was infectious (i.e., her grandson).

Question 4: Is any additional information needed to classify these cases?

Facilitator answer: Confirmation from a WHO reference laboratory would help in confirming the diagnosis.

You observe that the hospital is crowded the staff nurses in the hospital ICU where the case no 1 is admitted are not following universal precautions. The other two cases are in the general ward where relatives and well wishers of the admitted patients have crowded the ward.

Question 5: What infection control precautions you would immediately put into place?

Facilitator answer: The healthcare workers would wear full complement of PPE. All aerosol generation procedures in case-1 should be done using N95 respirator. All staff should be put under oseltamivir chemoprophylaxis. The other two patients should be transferred to individual rooms with good ventilation. They should be provided with mask. All the heathcare workers attending on them should follow universal precautions. All the patients relatives/visitors in the ward and ICU should be listed and followed up for fever and cough. Entry to the hospital should be restricted.

Update

The district RRT was concerned that there may be other human cases of avian influenza in Indraghat District that have not been recognised. Interview of the relatives of case 2 and 3 at the hospital reveals that they never had any exposure to dead poultry or have not visited the neighbouring country. They also convey that two of the neighbours who visited the grandmother during the initial part of her illness are also perhaps running fever. The RRT decides to conduct epidemiological investigations.

Time allotted: 15 minutes

Question 6: How would the RRT find out if there are additional cases and what case finding strategies will the RRT use?

Facilitator Guidance
Possible case finding strategies and answers to issues raised above

1. Hospital/Other health care facilities
    a. Talk to doctors, nurses, other hospital workers about potential contacts

b. Retrace the movements of the cases within the hospital and determine possible exposures to staff, visitors and other patients. Were there other patients/visitors who may have been next to cases in the ward?

c. Contact other healthcare facilities in the city (e.g., clinics, other hospitals, lay health workers) and request that they increase their vigilance in looking for possible avian influenza cases. Review healthcare registers to see if there are cases that may have been missed.

2. Talk to patient
   a. Interview the patient kept in isolation room (RRT interviewer must wear full PPE). Administer case finding questionnaire:
   - Ask the patient if, s/he knows of anyone else who is sick with similar symptoms
   - Ask about risk factors and exposure; chain of exposure
   - Ask if patient knows if there were outbreaks in animals in home or community; when it started; how serious
   - History of exposure activities and who else may have been doing it (to identify others possibly infected); e.g. dressing chickens
   - Ask about all of their personal contacts (family members, number and name; workplace contacts; school contacts or playmates)
   - Linelist – trace contacts

   b. Advise patient that the RRT will go to his/her home for further investigation

3. Go to home of patient to continue investigation.
   Interview family members, other villagers and traditional healers who may be aware of additional cases.

- Ask about exposure history of the patient; how he/she was exposed to poultry and other animals
- Ask if others have developed symptoms
- Conduct environmental survey - chickens or other animals in/around house, samples from animals, environment
- Ask the traditional healers/traditional medicine providers if they have received any visits from sick villagers

October 16th

The two neighbours who had visited the grandmother at her residence have been indeed running high fever and one of them has difficulty in breathing. The blood samples of the grandmother and the other child in the hospital (case 3) has tested positive by RT-PCR for H5. Two staff nurses who attended case 1 have also become febrile. You appraise the state Nodal point for Avian Influenza. He alerts the state health department and the central government. You are informed of the decision of the government to depute the central and state RRT.

Time: 15 minutes

Question 7: The central RRT activates the containment plan. An event based active surveillance need to be put in place. What would be the major procedures that would be followed by the RRT?

Facilitator answer: Geographic mapping; identification of the containment zone and surveillance zone. Notifying this area using the epidemic act. Implementing movement restrictions in the area; identifying requisite manpower for house to house surveillance. Providing protection to the healthcare workers using PPE. Transportation of suspect cases to identified hospital.Risk communication; chemoprophylaxis (based on the availability of oseltamivir). Safe disposal of the infectious waste. Taking care of the logistics.

Question 8: The contingency plan suggests mass chemoprophylaxis with Oseltamivir. But the stock is not even enough to provide the same to one third of the population in the containment zone. Who will be prioritised to receive antiviral prophylaxis?

Facilitator Answer: If antiviral prophylaxis is available, it should be provided to all identified contacts who do not have known allergies or contraindications to the selected antiviral drug. With limited supplies, priority groups of contacts should be identified (e.g., household contacts or healthcare workers) and provided with antiviral prophylaxis. It should be explained to non-priority contacts that there is a scarcity of antiviral drugs and that they will be monitored carefully for the development of symptoms. Prophylaxis should be given to each contact for 10 days after last contact with case-patient.

Question 9: Public demands surgical masks. There is limited availability. What will you recommend for personal protection if surgical masks are not available?

Facilitator answer: If surgical masks are not available it would be reasonable to have people cover their mouths with cloth or tissues. The efficacy of these materials in preventing the spread of avian influenza has not been scientifically evaluated. However, they may provide at least some protection. A better option would be communicating the risk and advising the public on simple public health measures such as hand hygiene, respiratory etiquettes and staying away from ill persons etc.

November 12
Several other suspect AI cases have been reported in the area, and you are worried this may signal the beginning of an outbreak, maybe even with human-to-human spread of the virus.

Time allotted: 25 minutes

Question 10: Should case's families be quarantined?

Facilitator answer: Voluntary quarantine of family members is probably recommended, although it may be difficult to enforce. Parents and older relatives may have to leave the home to earn money and provide for the family.

Question 11: How long should contacts remain at home voluntarily during quarantine?

Facilitator answer: Contacts should be advised to remain at home for 7-10 days after the last contact with the suspect or confirmed case. Contacts have to be educated about risk factors/risk behaviours of exposure, and the signs/symptoms of avian influenza illness. All contacts should receive instructions on how to self-monitor for fever post-exposure. During this period, contacts have to be instructed to stay at home voluntarily. If contacts have fever, they have to be told to immediately report their symptoms to health authorities and/or the RRT and remain in voluntary home quarantine.

Question 12: Should any events be cancelled to reduce transmission among children?

Facilitator answer: If children appear to be the source of infection, it may be appropriate to cancel school, religious, or family events where people will gather and children will be present.

Question 13: What are some pros and cons of each of the following non-pharmaceutical interventions (NPI)? Consider them in your local context. That is, what are some problems that can arise or things that can facilitate use of the NPI based on the situation in your state?

a. cordon sanitaire
b. social distancing
c. daily health checks

The discussion of this question should be very specific to the local situation. Encourage participants to think of factors in their regions/districts that may assist with or hinder the implementation, enforcement or decision to use the NPI.

Question 14: What would be the RRTs advice to the civic authorities enforcing isolation and/or quarantine when citizens are unwilling to follow the orders?

Some possible answers include: enlisting assistance from influential members of the community, repeating public education messages to reiterate the importance of the NPI, discuss with the citizens, the reasons they are hesitant to comply and try to address those issues directly (i.e. if citizens are concerned with loss of wages, arrange to provide cash assistance for duration of isolation/quarantine).

Question 15: What are some practical problems that you envision with implementing social distancing measures? What are some ways to overcome these problems? Again consider these questions in the context of your particular state's situation.

The discussion of this question should be very specific to the local situation. Encourage participants to think of factors in their regions/districts that would make the implementation of social distancing measures difficult. Some general discussion points could include: difficulty in enforcing social distancing, distribution of necessities such as food and water, loss of income due to work closures or inability to get to work.

Question 16: What legal provisions exist in your district/municipality to provide authorisation to implement isolation, quarantine and other social distancing measures? Ensure all group members understand what the law says you can and cannot do.

Facilitator answer: The District Collector has the authority to close schools or offices, cancel festivals or activities, or shut down public transportation. The state can impose isolation and quarantine or to restrict access to certain regions/areas using Epidemic Act or Cr PC.

November 24th
Several suspect ILI cases have been reported in the neighbouring two satellite towns. The Government is worried that this may signal the beginning of a pandemic, perhaps human-to-human spread of the virus. The Government decides to start the containment on a war footing. The population as per the census in the containment zone is 3,15, 42.

Time allotted: 20 minutes

Question 17: The Government has a stock of 20,00,000 doses of oseltamivir. Would this be enough to give mass chemoprophylaxis?

Facilitator answer: The quantity would not be adequate to provide mass chemoprophylaxis.

Question 18: What would be the central RRTs recommendation to the Government?

Facilitator answer: Procure the supplies available in the stocks of pharmaceutical sector. Approach international organisations like WHO which has a stockpile; approach neighbouring countries known to have a stockpile.

Question 19: If the Central RRTs/state RRTs are told that it would be difficult immediately to increase the availability of Oseltamivir, how would you plan to modify the containment operation?

Facilitator answer: The mass chemoprophylaxis area could be reduced but all other activities would extend to the entire containment zone. Else start the containment and the complete when additional resources are mobilised and reach site.

Question 20: What would you communicate to the public at this stage?

Facilitator answer: Message would be targeted at the community and individual level. This would include: avoiding social gathering; avoiding sending the children to school/ play; self monitoring of fever; report early to health facility; stay away; cough etiquettes; personal hygiene.