

Practical High Pathogenicity Avian Influenza First Response Training Exercises

Andrea M. Miles, STOP AI, DAI, 7600 Wisconsin Avenue, Bethesda, MD 20814, USA
 Meredith MacDonald, TRG, 4401 Wilson Blvd. Arlington, VA 22203, USA
 Ed Salt, TRG, 4401 Wilson Blvd. Arlington, VA 22203, USA
 Gary Mullins, STOP AI, DAI, 7600 Wisconsin Avenue, Bethesda, MD 20814, USA
 Harm Kiezebrink, BFC – Bird Flu Control GmbH, Schaftlanstrasse 132, 81371 Munich, Germany
 Jules Sparrey, Livetec, 1 Sand Road, Flitton, BEDFORD, MK45 5DT, UK



Figure 1. Participants don and then wear personal protective equipment in doors for 15 minutes during a lecture to detect respiratory difficulty and become familiar with uncomfortable qualities.



Figure 2. Participants remove personal protective equipment while crossing over a line to simulate the intersection of the clean and dirty zones.

SUMMARY: The response to an avian influenza outbreak, especially a highly pathogenic avian influenza (HPAI) outbreak should focus on three basic principles: 1) protect humans first, 2) protect animals and 3) contain the virus to make the outbreak a single event. STOP AI, a U.S. Agency for International Development (USAID) funded project, has designed and conducted practical training exercises that engage participants in simulated experiences that enhance their confidence and ability to apply these principles in a real outbreak. This paper describes three specific exercises: a) wearing and removing personal protection equipment (PPE) in a controlled environment, b) site zoning and c) a planning and resource mapping exercise staged in Poutloopia – a fictional region in a developing country. These exercises are combined with classroom training to provide the experiential training important for adults. The PPE activity emphasizes the physical challenges of working in full PPE and the importance of proper removal. In the zoning exercise, teams focus on planning and consideration of area required for tasks by setting up a clean area, transit corridor, infected/culling area, and non-transit areas at a farm or other outdoor area. In an alternative form of this exercise, participants may be given a hand drawn map of a farm and asked to indicate the zoning using colored markers. In either case, they are asked to discuss their logic and sequence. Poutloopia is a contained set of scenarios and maps where all resources (human and equipment, represented on stickers) are available for a HPAI outbreak response. In a series of iterations, participants must determine where surveillance should occur; where road blocks should be placed during an outbreak; which birds to cull first; what type of people (for example: veterinarian, medical, police, decontamination specialists) and equipment are needed during the outbreak response; and the time required and thus how many people of each type are needed. The Poutloopia scenarios presented are adapted to the conditions of the region where the training takes place, thus adding to its realism and utility.

THE IMPORTANCE OF EXPERIENTIAL TRAINING

Training of personnel is one of the most important aspects of preparedness for response to any emergency situation, including response to disease outbreak. Experiential training allows participants to gain experience by applying their knowledge and skills in simulated scenarios. Applying classroom theory in a controlled environment allows participants to learn from mistakes without jeopardizing their safety and helps prepare them to respond to actual emergencies—incidents of disease. Specifically, experiential training uses repeated drills to hone participant's knowledge of response procedures, confidence handling high-pressure situations, as well as decision-making and problem-solving skills. In the case of a zoonotic disease such as HPAI, where the mortality rate in infected people is currently greater than 60%, it is imperative that they learn how to wear and remove PPE safely for their own protection. This paper outlines three different uses of classroom and experiential training to prepare participants for HPAI outbreak response; however they can also be applied to other situations and diseases.

WEARING AND REMOVING PERSONAL PROTECTIVE EQUIPMENT (PPE) IN A CONTROLLED ENVIRONMENT

Responders must understand the importance of wearing PPE to prevent the transmission of disease to other locations. In the case of a zoonotic disease such as HPAI, where the mortality rate in infected people is high, personnel must also understand the importance of wearing each piece of PPE for their own safety. While it is important for personnel to learn the proper sequence for putting on or "donning" PPE, even more important is for them to learn how to correctly remove the PPE so as not to contaminate themselves or the environment. It is also important that they understand the concepts of clean and dirty areas, donning in the clean area and removing it as they move from the dirty area into the clean area. Another important concept is to understand that not everyone is physically capable of wearing PPE, either for health reasons (including respiratory disease or difficulty) or because of inability to find a respirator that forms a complete seal on their face.

Objectives of the personal protective equipment (PPE) exercises are to:

- 1) Understand how each piece of the equipment contributes to participant personal safety and prevention of disease spread;
- 2) Practice donning and removing the PPE so participants can repeat the proper procedures in the field;
- 3) Wear PPE in a controlled environment to become acclimated and determine if participants are good candidates to wear this equipment in the field (Figure 1); and
- 4) Cross over safely between clean and dirty zones (Figure 2), so that this becomes an ingrained concept during donning and removal.

Figure 3. Example of site zoning for a small commercial farm. White boxes indicate existing structures. The Green Zone is used for assembly and donning personal protective equipment. A disinfection area separates the Green and Orange Zones. The Orange Zone is used for transit and equipment storage. A disinfection area separates the Orange and Red Zones. The Red Zone is the area of highest anticipated disease risk. The Yellow Zones should not be entered, except for disease surveillance. The Red, Orange and Green Zones will be completely decontaminated after disposal of birds and other contaminated disposables.

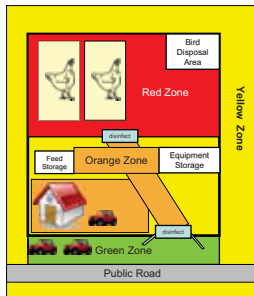


Figure 4. Exercise participants physically zoning a "Simulated HPAI Outbreak Response Site".

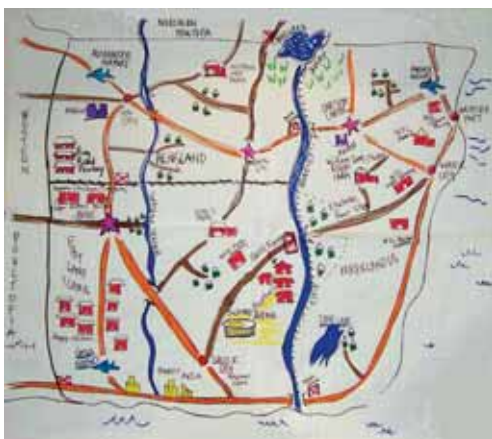


Figure 5. Map showing an example of a Poutloopia Exercise. Here three countries, Hensland, Waterlandia and Footlandicana are shown within a fictional region of Poutloopia in Africa, between Sudan and South Africa.

SITE ZONING

Zoning is a biosecurity principle that can be used to prevent the spread of disease during surveillance or disease outbreak. It is also a practical tool that can be applied to countries, regions within a country, villages, as well as multiple or individual farms. It is important that responders understand there are many different applications of zoning:

- 1) Geographic zoning for trade (OIE, 2008);
- 2) High risk zones for surveillance activities (FAO, 2008);
- 3) Outbreak response zoning; and
- 4) Site zoning (described here).

When there is a high degree of suspicion of a disease on a farm or other location (referred to as a site) all movement of animals, people and vehicles should be stopped and a temporary quarantine enforced in order to prevent the possible spread of disease. In order to allow some movement of people for surveillance or movement of workers or family members off of the farm, the site is zoned into areas of "least" to "most infected" (or suspect infected) with disinfection stations in between them. This allows for movement while decreasing the likelihood of disease spread. A green or clean zone is set up at the site entrance, with a disinfection station at the interface with the orange or transit zone. The orange zone extends to any home on the site, buildings with equipment, and to the red or most infected (suspect infected) zone. A second disinfection area is set up at the interface between the orange (transit) zone and the red zone. The red zone includes all of the area where infected (suspect infected) animals are housed (or roam). It may be extended to include areas for culling and disposal. The area outside the aforementioned zones are considered to be yellow zones, the yellow zones should not be entered by any personnel, unless this is necessary for surveillance of other animals (including people).

Figure 3 shows an example of zoning at an individual farm during a HPAI outbreak response, presented as an example during a classroom discussion of the topic. In order to have participants grasp the concept of zoning and its many applications they are asked to draw zones on a hand-drawn example farm, then physically zone an outdoor site (Figure 4), and later mark zones within a region or country in the Poutloopia Exercise.

POUTLOOPIA, A PLANNING AND RESOURCE MAPPING EXERCISE

Poutloopia is an exercise used to reinforce concepts learned in many different types of avian influenza outbreak preparedness and response training courses. A full-day exercise can be designed to address specific concepts of preparedness planning, surveillance, response, and/or to help identify potential gaps in countries national response plans. The exercise has been developed specifically for HPAI outbreak preparedness and response; however, it can easily be adapted for other disease response trainings. One of the major lessons learned in this exercise is the need for cooperation between many different groups, including veterinary medicine, public health, village mayors or local chiefs (finance, logistics and enforcement), police (enforcement), emergency services (logistics), and public information specialists.

Participants are provided with a set of scenarios and maps of a fictional region, country, or group of countries where all resources (human and equipment, represented on stickers) are available for a HPAI outbreak response. Participants are divided into groups and assigned to a country or region within Poutloopia (example, Figure 5). They begin by reading a scenario designed to be similar to their own country, but simulated in Poutloopia by a country where all reasonable resources are available. When the simulation begins or at strategic points during the exercise, participants are notified of HPAI outbreaks in a specific region of the Poutloopia map representing either a locality or a country. During the exercise, new information about outbreaks somewhere in Poutloopia are provided, so that participants must respond, as they would during an actual outbreak, applying their surveillance, zoning, and response strategies.

Participants are asked to determine where surveillance should occur (with or without an outbreak in a nearby country). When an outbreak occurs (particularly in their own Poutloopia Country) they should determine where road blocks are to be placed, what type of people (veterinarian, medical, police, decontamination specialists, etc) and equipment are needed (Figure 6), which type of birds (backyard or farms) should be culled and disposed of first, the time required and thus how many people of each type are needed, and at which level of government. They may also be asked to write a brief plan for the next 24 to 48 hours. This exercise reinforces the three basic principles of HPAI outbreak response: 1) protect humans first, 2) protect animals, and 3) contain the virus to make the outbreak a single event.

When the exercise is used help identify potential gaps in a country's preparedness plans, participants are given a Poutloopia Country Response Plan at the start of the exercise. During the exercise they identify gaps in this plan. After the exercise, participants can be given the opportunity to apply what they learned by identifying the strengths and gaps in their own country response and/or surveillance plans. Sharing this analysis with colleagues also helps them learn from others.

CONCLUSIONS

The exercises described here using practical techniques for training in use of PPE, zoning, surveillance and outbreak response have been taught successfully through STOP AI in more than 30 countries in Europe, Asia, and Africa. Participants from countries facing HPAI outbreaks, post-outbreak recovery, and increased surveillance and preparedness for possible future outbreaks, have found the exercises provide practical tools and insights they can use in their daily jobs.

REFERENCES

- OIE, 2008. Terrestrial Animal Health Code 2008. World Organization for Animal Health http://www.oie.int/eng/normes/mcode/en_sommaire.htm
- FAO, 2008. The Global Strategy for Prevention and Control of H5N1 Highly Pathogenic Avian Influenza. Rome, 2008. Food and Agriculture Organization of the United Nations. <ftp://ftp.fao.org/docrep/fao/011/a/j134e/a/j134e00.pdf>



Figure 6. Example of zoning and planning using a Poutloopia Exercise map of Waterlandia. In this exercise participants have marked a HPAI outbreak in the Chickadee River Village Area, surrounding the village with a Protection Zone (marked in RED) and Surveillance Zone (marked in Orange). A Quarantine Control Check Point has been set up at the nearest cross roads. Initial personnel needed for local and national emergency response are indicated with personnel stickers.