

Ghana Biosecurity, Surveillance and Outbreak Response

Training of Trainers (TOT)

7-18 July 2008

Your Trainers

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Introductions

Please tell us:

- Name
- Work experience/training background
- Expectations you have for this course

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Course Purpose

The purpose of this TOT is to familiarize participants with the contents of the course on Biosecurity, Surveillance, and Outbreak Response and to introduce tools and techniques that will help you deliver training effectively.

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Course Objectives

- Turn to *Participant Manual*

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Course Schedule

TIME	Monday 16 June	Tuesday 17 June	Wednesday 18 June	Thursday 19 June	Friday 20 June
AM	Opening Ceremony Overview of AI	Biosecurity Principles, Procedures and Planning	Biosecurity Principles, Procedures and Planning continued	Topics on Surveillance Introduction to the PPE Kit	Introduction to the Lab Kit Depopulation and Disposal Options Cleaning and Disinfection Principles
LUNCH					
PM	Public Health and Occupational Safety National Preparedness and Response Plans	Biosecurity Principles, Procedures and Planning continued	Animal and Human Surveillance	Outbreak Response and Management	Posttest Exercise

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Course Schedule

TIME	Monday 23 June	Tuesday 24 June	Wednesday 25 June	Thursday 26 June	Friday 27 June
AM	Wet Lab	Field Visit Observing Biosecurity	Methodology for Training Adults	Preparation for Practice Training	Practice Training continued
LUNCH					
PM	Considerations in Outbreak Recovery	Field Visit Debriefing	Facilitation Skills	Practice Training	Application Planning Closing
	Preparation for the Field Visit	Wrap up of Course Technical Content			

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The Participant Manual

- The manual will be used to convey key concepts covered in the course.
- There is space to make notes as well as capture reflections.
- Reference materials are included for your use during and after the course.

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The Trainer Guide and Power Point Slides

During the TOT portion of the course, you will receive the *Trainer Guide* and Power Point slides.

You will use these materials later in the course during your practice training.

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Guidelines for Working Together

- Keep time (start on time, return from breaks on time, end on time)
- Switch mobile phones off or to "vibrate"
- Participate fully
- Ask questions freely
- Balance talking and listening
- Respect each other's points of view
- Others?

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Welcome!

Let's Get Started...

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OVERVIEW OF AVIAN INFLUENZA

Ghana Biosecurity, Surveillance, and Outbreak Response TOT

MODULE PURPOSE

To provide an overview of the natural history of AI, with particular emphasis on H5N1 Highly Pathogenic (HPAI) strain.

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MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Define avian influenza;
- Identify avian influenza subtypes and pathogenic forms;
- Describe how the avian influenza virus is transmitted among birds and to other species;
- Identify potential health and economic risks associated with an outbreak of H5N1 HPAI.

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LESSON 1: AVIAN INFLUENZA VIRUSES (HPAI)

- Is highly pathogenic to poultry species
- Is constantly evolving with unpredictable results
- Poses the risk of a human pandemic
- Threatens livelihoods especially of rural poor
- Causes economic losses, trade in poultry and poultry products affected

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Avian Influenza Etiology

- Family – Orthomyxoviridae (RNA virus)
- AI virus type A – human, swine, equine, avian
- AI virus type B and C – humans only
- Classification into types A, B or C based on differences between their nucleoprotein (NP) and matrix protein (MP) antigens

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AI Etiology

AI viruses further categorized into subtypes according to surface antigens

Hemagglutinin (H1-16) – involved in binding of virus to host cell receptors and major antigen for neutralizing antibodies

Neuraminidase (N1-9) – responsible for release of progeny virions from cell surface

H5N1 is the virus of interest in the most recent global outbreak

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AI Pathogenicity

AI viruses are further classified by pathogenicity (low or high pathogenicity) done through chicken inoculation or nucleotide sequencing

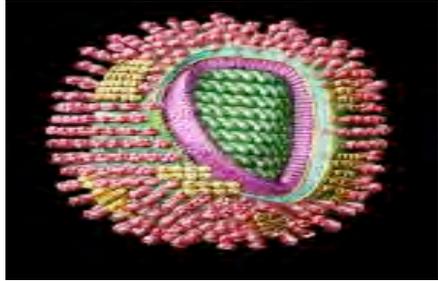
Pathogenicity seems to be correlated to the ability of trypsin to cleave the hemagglutinin molecule into two subunits

Almost all highly pathogenic strains belong to H7 and H5 subtypes and to a lesser extent H9

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AI Virus Structure



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Epidemiology of AI

- Domestic fowl, ducks, geese, turkeys, guinea fowl, quail and pheasants are very susceptible
- Immediate source of infection is hard to pin down but most outbreaks historically have started with direct or indirect contact of domestic poultry with wild waterfowl
- Once established, the disease is highly contagious and high concentrations of virus are excreted in feces and in oculonasal discharges

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Epidemiology of AI

- Spread from flock to flock can occur by movement of infected birds, contaminated shoes, clothing, equipment etc.
- Airborne transmission can occur if birds are in close proximity. Infection occurs by direct deposition of virus in the conjunctiva, nares and trachea
- There is no evidence for vertical transmission

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Incubation period

- Usually 3-7 days

Depends on:

- the strain of the virus, dose and route of exposure
- Species and age of host
- Immune status of host

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Clinical Signs and Case Definition of HPAI

- Variable and dependent on species, age, concurrent diseases and environment
- **Sudden high mortality in a flock**
- Respiratory signs (sneezing, gasping, coughing)
- Oculonasal discharge
- Edema of face and cyanosis of combs and wattles
- Diarrhea
- Hemorrhages on skin of shanks, breast
- Egg production drops
- Nervous signs

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Check Your Knowledge - Lesson 1

Take a moment to check your knowledge:

- How do flu viruses change?
- Which virus subtypes can cause HPAI?
- How can flu viruses be destroyed?

See p. 5 in your Participant Manual

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LESSON 2: HISTORY OF H5N1

Areas reporting confirmed presence of H5N1 avian influenza in poultry and wild birds since 2003

As of 14 April 2008

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CUMULATIVE NUMBER OF CONFIRMED HUMAN CASES OF AVIAN INFLUENZA A/(H5N1) REPORTED TO WHO (as of 8 April 2008)

Country	Total	
	Cases	Deaths
Azerbaijan	8	5
Cambodia	7	7
China	30	20
Djibouti	1	0
Egypt	50	22
Indonesia	133	108
Iraq	3	2
Lao People's Democratic Republic	2	2
Myanmar	1	0
Nigeria	1	1
Pakistan	3	1
Thailand	25	17
Turkey	12	4
Viet Nam	106	52
Total	382	241

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HPAI H5N1 in Africa

Eleven countries affected from 2006 to date:

- Nigeria (first country to report cases; 1 human death)
- Egypt (second country to report; 22 human deaths)
- Sudan
- Niger
- Burkina Faso
- Cameroon
- Ghana
- Ivory Coast
- Benin
- Djibouti?
- Togo

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HPAI Outbreaks in Ghana

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HPAI Outbreaks in Ghana

- April 2007 - Tema
- May 2007 - Sunyani
- June 2007 - Aflao

- 10,000 birds culled
- No reported human cases

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Discussion - Lesson 2

Are any of these facts surprising to you?

Currently H5N1 HPAI is a zoonotic and not a human pandemic. What do you think of H5N1 HPAI being an animal health emergency?

See p. 8 in your Participant Manual

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LESSON 3: HPAI TRANSMISSION

PATHS OF AVIAN INFLUENZA INFECTION

Barriers to infection

- Hand-washing / good hygiene
- Personal protective equip. / dedicated clothing
- Vehicle & equipment disinfection
- Enclosing poultry / avoid attraction
- Healthily movements on and off premises
- Depopulation
- Vaccination
- Proper disposal of carcasses
- Pest control
- Avoiding contaminated environment / carcasses

Sources of infection

- Feces
- Contaminated environment / body of water
- Contaminated equipment / vehicles
- Eggs & meat
- Secretions
- Carcasses / live infected birds / infected people
- Feath (birds, rodents, cats, etc.)
- Blood
- Contaminated clothing / footwear
- Unknown
- Presumed transmission pathway

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Sources of infection

- Feces
- Contaminated environment / body of water
- Contaminated equipment / vehicles
- Eggs and meat
- Secretions
- Carcasses / live infected individuals
- Pests (insects, rodents, cats, etc.)
- Blood
- Contaminated clothing / footwear

Barriers to transmission

- Hand-washing / good hygiene
- Personal protective equipment / dedicated clothing
- Vehicle and equipment disinfection
- Enclosing birds / avoiding attractants
- Restricting movements on and off premises
- Depopulation
- Vaccination / medication (humans only)
- Proper disposal of carcasses
- Pest control
- Avoiding contaminated environment / carcasses

Wildlife Health Center and Cooperative Extension Global Livestock CRSP

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Exercise 1: Identifying the Transmission Paths

Follow the steps on p. 11 in your *Participant Manual* to complete the exercise within your table group.

Take 10 minutes to complete the exercise and choose one person from your group who will report out.

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LESSON 4: RISK OF H5N1 HPAI TO HUMANS

- The risk from avian influenza viruses is generally low to most people, because most do not infect humans.
- H5N1 HPAI is one of the few avian influenza viruses to have crossed the species barrier to infect humans and is among the most deadly of those that have infected humans.
- Most cases of H5N1 HPAI in humans have resulted from direct contact with infected poultry (e.g., domesticated chickens or ducks) or surfaces heavily contaminated with secretion/excretions from infected birds.

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Important point

So far, the spread of H5N1 HPAI virus person-to-person has been limited and has not continued beyond one person or a small cluster of people. Nonetheless, because all influenza viruses have the ability to change, scientists are concerned that H5N1 virus one day could be able to infect humans and spread easily from one person to another.

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Important Point

The H5N1 HPAI virus has raised concerns that it could cause a human pandemic because:

- It is especially virulent.
- It can be transmitted from birds to mammals and, in some limited circumstances, to humans.
- Most humans have no immunity to H5 virus.

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Exposures resulting in human infections

- Home slaughter of poultry (dressing, plucking, and contact with blood)
- Touching poultry unexpectedly sick or dead
- Being less than one meter from dead poultry
- There is no evidence that the disease can be transmitted by infected poultry meat as long as there has been no cross contamination and it is cooked to an internal temperature of 70°C (158 F).
- H5N1 HPAI can produce rapidly-developing and severe illness in humans, with viral pneumonia and multi-organ failure as common outcomes.

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HPAI H5N1 Update

- 62 countries have reported outbreaks in poultry and/or wild birds
- 14 countries have recorded human deaths
- Total of 241 human deaths out of 382 cases has been reported since 1997

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LESSON 5: IMPACTS OF H5N1 HPAI

What are some of the costs or impacts of an H5N1 HPAI outbreak in a country?

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WE'RE OFF TO A GOOD START!



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OVERVIEW OF AVIAN INFLUENZA

REFLECTION



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**PUBLIC HEALTH AND
OCCUPATIONAL SAFETY**

Ghana Biosecurity, Surveillance, and Outbreak Response TOT

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MODULE PURPOSE

To present principles for veterinary, public health, and other animal control workers to prevent exposure to HPAI, to identify suspect human cases of HPAI, and to provide guidelines for managing individuals exposed to HPAI.

To describe practical implications for personal protection and propose a system of risk management to reduce exposure of workers to HPAI virus

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MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Identify risks for transmission to humans;
- Understand basic infection prevention principles;
- Describe the protective measures people in various roles should implement to minimize the risk of infection from and/or the spread of HPAI;
- List the safety and biosecurity procedures that must be in place on an infected site during outbreak response and justify the need for strict enforcement of these principles;
- Describe and explain the need for procedures for taking rest breaks, water and food when at an infected site without compromising worker safety;
- Explain simple and safe procedures for the immediate replacement of worn or defective PPE.

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LESSON 1:

**PUBLIC HEALTH AND
OCCUPATIONAL SAFETY**

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History of H5N1 in Humans

- First reported in Hong Kong in 1997, when 18 cases resulted in 6 deaths.
- As of November 2006, 258 cases have been reported
- Other subtypes of AI have rarely infected humans
- Most human cases have been associated with direct contact with infected poultry
- What's the current global status?

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Public Perception of H5N1 HPAI

- How well do you think the general public understands bird flu?
- How have you seen it portrayed on the news?
- Do people know how to prevent it? Or that it is preventable?
- Have you heard any crazy ideas about how it's transmitted?
- Who is/should be responsible for educating the public? Workers?

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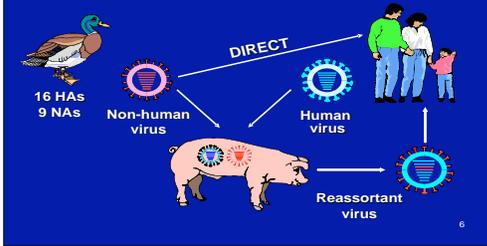
The public and all HPAI control workers must be taught accurate basic information:

- What are the key messages to convey?
- What are the challenges?
- What approaches have worked in your experience?

The public and all HPAI control workers must be taught accurate basic information:

- What is the H5N1 HPAI virus
- Where and how the virus survives
- How the virus is transmitted to humans
- Importance of routine hand-washing and other basic hygiene habits
- What actions to take if they have sick or dead birds
- Where they might encounter exposure to HPAI
 - how to avoid it

Transmission of Influenza A



Routes of HPAI H5N1 Transmission

Direct Contact

- Host comes into contact with reservoir
- Skin-to-skin contact, fingers to mucous membranes
- Contact with contaminated soil or vegetation

Indirect Contact

- Disease is carried from reservoir to host
- Particles in the air
- Contaminated surfaces (fomites)

Transmission of Influenza Viruses

	Seasonal Influenza in Humans	Avian Influenza in Humans
Droplet	Yes	Probable (human to human)
Airborne	Likely	Unknown
Contact	Yes	Yes (bird to human)

Infection Control Precautions

All levels require hand hygiene

Precaution Levels:

- Standard Precautions
- { Contact Precautions
- { Droplet Precautions } Transmission-based precautions
- { Airborne Precautions }

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Standard Precautions

- Prevent the transmission of common infectious agents
- Hand washing is key 
- Assume infectious agent could be present in the animal/patient's
 - Blood
 - Body fluids, secretions, excretions
 - Non-intact skin
 - Mucous membranes
- Use PPEs

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Contact Precautions

- Prevent infection through direct or indirect contact with poultry or contaminated environment
- Examples
 - Avian influenza
 - Ebola hemorrhagic fever
 - Methicillin Resistant S. Aureus
 - Shigellosis



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Contact Precautions

Taken in addition to Standard Precautions

- Limit animal/patient movement
- Isolate or cohort animal/patients
- Gown + gloves for animal/patient or room contact
- Do not touch eyes, nose, mouth with hands
- Avoid contaminating environmental surfaces
- Wash hands immediately after contact with poultry or suspect human case
- Use dedicated equipment if possible

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Droplet Precautions

- Prevent infection by large droplets from
 - Sneezing
 - Coughing
 - Talking
- Examples
 - Neisseria meningitidis*
 - Pertussis
 - Diphtheria
 - Influenza



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Droplet Precautions

Taken in addition to Standard Precautions

- Wear surgical mask within 1 meter of patient
- Wear face shield or goggles within 1 meter of patient
- Place patients in single rooms or cohort 1 meter apart
- Initiate "cough etiquette"—All patients instructed to cough into inner elbow or provided tissues or a handkerchief to cough into to prevent droplet spread.
- Limit patient movement within facility
 - Patient wears mask when outside of room

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Airborne Precautions

- Taken *in addition* to Standard Precautions
- Prevent spread of infection through very small (< 5 microns) airborne particles
- Examples
 - Tuberculosis
 - Measles
 - Varicella
 - SARS

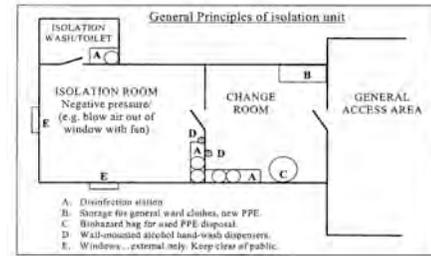


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Airborne Precautions

- N95 mask (or equivalent) for personnel
 - Check seal with each use
- Negative pressure isolation room for patients
 - Air exhaust to outside away from others
- Patient to wear a surgical mask if outside of the isolation room

Negative Pressure Isolation Room



Poultry Farm Worker Protection

- Practicing careful personal hygiene when working with poultry can greatly minimize workers' risk of disease.
- **Hand-washing**
 - One of the simplest and most effective
 - Hands should be lathered with soap for at least 20 seconds.
 - An alcohol-based hand rub can be used



Poultry Farm Worker Protection

- **Clothing**
 - Workers should wear clean clothes to the farm, and change into dedicated work clothing (including coveralls, hats, and boots), which never leave the farm.
 - farm should have a **decontamination area**
- **Decontamination**
 - When workers are finished handling poultry, manure, or other sources of viruses for the day, they should shower and change back into their own clothes.
 - If showers are not available at the farm, workers should change out of their work clothes, leaving them to be laundered at the farm and shower when they arrive at home.

Poultry Farm Worker Protection

- **Vaccinations**
 - Workers should have seasonal influenza vaccinations.
 - These do not protect against H5N1 HPAI, but they help prevent dual infections with AIV and seasonal flu in the same person.
 - Dual infections could allow different flu viruses to exchange genetic material (reassortment), possibly leading to changes that could make AIV spread more easily.

Poultry Farm Worker: Responding to Sick or Dead birds

- If workers notice severely depressed birds or a large number of dead birds, they should
 - immediately leave the poultry house if they are not wearing sufficient PPE to prevent exposure.
 - contact a supervisor to investigate and determine if the problem is mechanical
 - From outside the house if possible
- Anyone entering the poultry house should put on full PPE and limit the time and amount of contact with dead or dying birds and potentially infective manure.

Backyard/Smallholder Poultry Owner Protection

- Outreach for small farmers is a key part of preventing transmission from poultry to people
- Lack of basic knowledge contributes to poor personal hygiene practices and increases the risk of infection.
- Biosecurity
- Basic sanitation
 - Hand-washing
 - Limit transmission
- Keep poultry outside and out of family living space

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Backyard/Small holder Poultry Owner Protection

Protecting Children

- Many of the human cases of HPAI H5N1 have occurred in small children and young adults
- Supervise if they play with or care for poultry to prevent exposure.
- Restricting the access of children to poultry will reduce exposure.
- Any children around poultry should be taught to practice good hand hygiene.



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Live Bird Market Worker Protection

- To be able to make the correct decisions about personal protection, market workers will very likely need some basic education.
 - What viruses are
 - Where and how they survive
 - How they are transmitted
 - Importance of routine hand-washing habits in the markets.

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Live Bird Market Worker Protection

- Education is key
- Birds that die in the markets are potential **sources of infection**.
- If a worker finds a single dead bird, the bird should be **removed** from the cage and placed into an **enclosed container**
- Any bird that has died in the market should **not be eaten**
- If possible, the bird should be submitted to authorities for **testing**.
- After the bird has been handled, the worker should do a complete and thorough **hand-washing**.
- Workers should always wash hands before eating and before leaving for home.

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Live Bird Market Worker Protection

- **Large Numbers of Dead Birds:**
 - **Limit exposure** by leaving the market
 - **Secure** the market areas so others can not enter.
 - **Contact their supervisor**, the market owner, or designated first responder.
 - **Monitor** their own health
 - Consider quarantine or culling all exposed birds

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Applying Control Strategies in Real Life

- Although difficult to contract, over half the confirmed cases of H5N1 HPAI in humans have been fatal.
- Preventing infection is the best method of control.
- Lack of basic knowledge of avian influenza biology contributes to risky practices.
- Correct use of Personal Protection Equipment (PPE) is an important measure for limiting exposure to infection.

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Location Influences Actions

- Medical facilities
- Homes
- Farms
- Markets
- Rural versus Urban areas



Anticipate Exposures

- Contact with. . .
- Animals/poultry
 - Infected individuals
 - Individuals suspected to be infected
 - Potentially contaminated substances
 - Potentially contaminated surfaces / items
 - High-risk procedures
 - Corpses



Assess Existing Infection Control Infrastructure

- Policies and procedures
- Authority
- Human resources
- Financial resources
- Engineering resources



Assess Existing Infection Control Infrastructure

- Do policies describe PPE for workers?
- Are procedures in place for environmental decon?
- Will you need to promote respiratory and hand hygiene in the community?



Surveillance of Animal Control Workers and Family Members of HPAI Affected Households

- Daily symptom check of all control workers
- Symptom check of all family members
- Confirm temperatures of any suspect symptoms
- Referral for evaluation of any suspected cases of human HPAI
- Prompt isolation for anyone exhibiting symptoms



Case Definition for Suspect Human HPAI

Any individual presenting with an unexplained LRI with:

- Fever (temperature > 38 C.)
- Shortness of Breath or
- Difficulty breathing

Case Definition for Suspect Human HPAI

And one or more of the following exposures in the 7 days prior to symptom onset:

- Exposure to poultry or wild birds or their remains or to an environment contaminated with their feces in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month
- Close contact with a suspect, probable or confirmed human or animal case
- Consumption of raw or undercooked poultry products in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month
- Handling animal/human samples suspected of containing H5N1

Management of Suspect Human HPAI Case

- Initiate prompt infection control activities with standard and airborne precautions for all personnel in contact with suspect patient
- Refer to nearest health facility capable of evaluation of patient.
- Maintain strict isolation of patient, either in health facility or in home:
 - 7 days for adults
 - 21 days for children
- If suspect human case meets case definition, start Oseltamivir 75 mg twice a day immediately pending confirmation of positive or negative Influenza A H5 test.

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Accidental Exposure of Control workers to HPAI

- Active daily surveillance for symptoms and fever
- Consider initiating prophylaxis;
 - Oseltamivir 75 mg once a day for 10 days
- Refer for further evaluation and treatment if patient meets case definition of suspect human HPAI.
- Consider quarantine

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Exposure of Workers to HPAI: Case Studies

Turn to p. 10 in your *Participant Manual*.

- Read the case study assigned to your table group.
- Discuss the case with your group and decide how you would handle the situation.
- Choose one person to summarize your discussion and report out.
- Take five minutes for your discussion.

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LESSON 2:

SITE MANAGEMENT FOR PROTECTION, CONTAINMENT AND ENFORCEMENT

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AUTHORITY & CONTROL



What can you do to enforce biosecurity and biosafety around an outbreak site?

“Operational activity should be led by an official veterinarian with the authority....to ensure that they adhere to the biosecurity standards.....” (OIE)



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AUTHORITY AND CONTROL

- Establish and **enforce** rigorous Gate Control with full decontamination
- Allow people onto the site for the minimum amount to time and only if absolutely necessary
- Divide site into risk areas
- Control and decontaminate people as they pass through these boundaries



Four Principles

All activities on an infected site must comply with the 4 principles:

1. Protect people
2. Protect animals
3. Contain the virus
4. Make it a single event

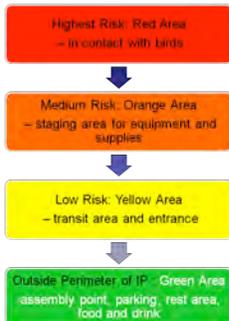
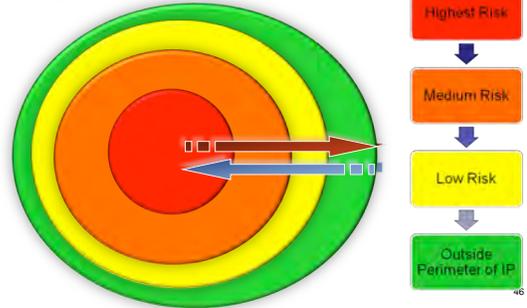


INFECTED PREMISES OR INFECTED AREA CONTROL

- What are the most high risk **places** and **activities** on an infected site?
 - A commercial farm
 - A village –several back yards
- What critical control points could you establish to reduce exposure to infection?



High to low risk areas



What to do in practice:

- Use existing barriers or mark out with tape or rope to define the risk areas
- Place intermediate decontamination points at suitable places between the areas
- Do not cross a barrier except at designated point
- It is permitted to pass clean materials across the barrier



MANAGING FLOW

- Main Site Entrance: Gate Officer
 - Register and check authorized people
 - Stop people **entering** site without full, correct PPE
 - Stop people **exiting** site without full decontamination
- Between areas use the decontamination points
 - Decontamination Assistant to control
 - Wash hands
 - Clean boots
 - If necessary provide assistance to change damaged/worn PPE



The Use Of PPE In Outbreak Response

Purpose:

- Protect people
- Protect animals
- Prevent contamination and virus spread



DISCARD PPE WHEN YOU TAKE A BREAK

- Remove PPE
- Take your break
- Put on new PPE



AND AFTER SINGLE USE!

- Use plastic bags provided
 - Be sure to seal the bag
 - Dispose of the bag appropriately



WHAT IF THERE IS A SHORTAGE OF PPEs?

- What are the key areas to protect?
- What alternatives to proprietary PPE are available?



**PUBLIC HEALTH AND
OCCUPATIONAL SAFETY**

REFLECTION



NATIONAL PREPAREDNESS AND RESPONSE PLANS FOR HPAI

Ghana Biosecurity, Surveillance, and Outbreak Response TOT



MODULE PURPOSE

To provide the tools for guidance on preparing and assessing national HPAI preparedness plans that can be used for Highly Pathogenic Avian Influenza (HPAI) and adapted for other Transboundary animal diseases.

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MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Describe the key features of a National HPAI Preparedness and Response Plan (PRP) and Standard Operating Procedures (SOP) components;
- Evaluate an existing National HPAI PRP;
- Identify gaps in an existing National HPAI PRP.

3



Definition of HPAI National Preparedness and Response Plans

A document that details a set of actions and activities that can be implemented to prevent, prepare for, respond to and recover from an incursion of HPAI-H5N1 virus

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Key Terms and Goals of the Plan

- Prevention** prevent the introduction and spread of HPAI-H5N1 virus through implementation of activities such as strict biosecurity, targeted passive and active surveillance and improvement of veterinary services delivery
- Preparedness** prepare for a rapid and coordinated response by bringing together adequate personnel, equipment and supplies
- Response** respond to the presence of HPAI-H5N1 virus to minimize the spread of disease and to eradicate the disease with minimal loss of animals and livelihoods through control measures
- Recovery** recover from the devastating impact of an HPAI outbreak on the poultry sector and on livelihoods through restocking, compensation and review and revision of the plan

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Key Terms

Standard Operating Procedures (SOP)

A set of written instructions, protocols, or worksheets that document routine or repetitive activity followed by an organization or body to facilitate consistency in the quality and integrity of a product or end result

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Topics

- Lesson 1: Country Status and Assessment
- Lesson 2: Prevention and Preparedness
- Lesson 3: Response and Recovery
- Lesson 4: Components of Standard Operating Procedures for Implementation of a National Preparedness and Response Plan for HPAI
- Lesson 5: Public Health Component
- Lesson 6: Public Awareness and Communications Strategy
- Lesson 7: Financial and Funding Strategy
- Lesson 8: Important Appendices

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Lesson 1
Country Status and Assessment

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Country Status and Assessment

- **Country background information** including geography, climate and population
- **Veterinary Services (VS)** structure and delivery – number of personnel, level of training, diagnostic laboratory system (number of labs, lab infrastructure, type of tests, state of lab equipment and relevance to lab functions, lab personnel and level of training, training opportunities)

OIE PVS tool
http://www.oie.int/eng/oie/organisation/en_vet_eval_tool.htm?e1d2

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Country Status and Assessment

Poultry Sector

- poultry production systems
- species and numbers and associated economic importance
- common poultry diseases in the country and their control
- descriptions of marketing systems for poultry, live bird markets and distribution channels
- overview of poultry slaughter plants and processing methods if any

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Country Status and Assessment

Migratory and Wild Birds

- main migratory wild bird resting spots and bird habitats and their proximity to poultry production and urban population centers
- interaction between wild birds and poultry

Animal Health Surveillance System

- active or passive, animal health monitoring, surveys, lab testing, data management and reporting

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Lesson 2
Prevention and Preparedness

12

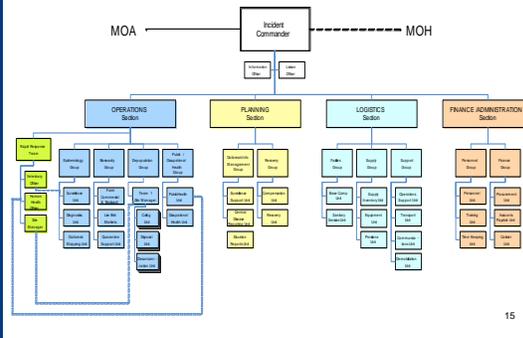
Prevention and Preparedness

- Chain of command and national and local coordinating mechanisms – government agencies responsible for writing and implementing the plan, coordination between animal health and human health agencies, roles of non-governmental organizations
- Setting up regional and local centers for outbreak management
- One type of command structure that can be used for outbreak management at the national, regional and local levels is the incident management model (IMM)

Prevention and Preparedness - IMM Overview

In an outbreak, a successful response depends on:

- Making sure that tasks are assigned
 - In every response, no matter the size, certain jobs or tasks must be successfully completed.
- People only being responsible to a single supervisor
 - This prevents confusion
- Good communication
 - From the workers to the supervisors and from the supervisors to the workers
- IMM provides a flexible structure to accomplish these goals



Prevention and Preparedness - IMM Management Functions

- **INCIDENT COMMAND**
 - sets the objectives, strategies, and priorities
 - has overall responsibility for managing the outbreak
- **OPERATIONS**
 - determines how operational objectives of the Outbreak Action Plan will be accomplished
 - implements the plan
- **PLANNING**
 - develops the Outbreak Action Plan for accomplishing the objectives
 - collects and analyzes outbreak data, tracks resources (personnel, supplies, materials), and maintains records of the outbreak and response
- **LOGISTICS**
 - provides support, resources, training and other services to meet the operational objectives
- **FINANCE/ADMINISTRATION**
 - recruits personnel, tracks them and their time worked, and pays salaries
 - pays compensation if agreed upon, and all other invoices

Table Exercise

You will be divided into 4-5 groups for a short table discussion on the IMM. Look at the model and the management functions on p.8-10 in your *Participant Manual*. Discuss the questions below and be prepared to summarize your discussion with the larger group.

1. What questions do you have regarding the IMM?
2. What are your reactions to this type of set up? In a developed country? In a developing country?
3. Any ideas on how such a structure can be modified and improved for use in the field in mostly resource poor countries?

Preparedness and Prevention

- Is there an existing National HPAI PRP in Ghana? Does it have animal health, public health and communications components?
- Is there a veterinary legal and regulatory framework for plan implementation?

If one exists it should include disease reporting, welfare concerns regarding mass culling and disposal of infected livestock, compensation policies and human and animal movement restrictions



Preparedness and Prevention

- **Biosecurity** – farms (sector definition), live bird markets, rapid response teams
- **Surveillance** – passive and active (poultry and wild birds), sample types, testing of samples, field and lab testing, sample submission, screening and confirmatory tests, frequency of testing, sampling locations, reporting, GIS, data management
- **Importation bans**- seaports, airports and border posts

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Prevention and Preparedness

- **Improvement of veterinary service delivery** including diagnostic capability- physical structure rehabilitation, training of personnel, diagnostic equipment and supplies
- **Equipment and supplies inventory** (Transportation, PPE, disinfectants, sampling supplies, culling, disposal, communications equipment, data collection equipment, data management equipment and supplies etc.)

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Prevention and Preparedness

- **Personnel evaluation and training-** rapid response teams (composition)
- **Review of response plans** – frequency and method
- **Simulations** – field or tabletop for testing and refining the plan, SOPs, coordinating mechanisms
- Preparation of **compensation strategy** or update of existing strategy

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Lesson 3
Response and Recovery

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Response and Recovery

- Case definition of suspect cases
- Diagnosis - field tests, confirmatory tests, international testing and notification
- Deployment of rapid response teams
- Quarantine and movement control- quarantine declaration (legal authority), signage, entry and exit points, zoning definitions
- Epidemiology- risk analysis, GIS, data management
- Outbreak surveillance – quarantine zone, surveillance zones in infected areas, live bird markets

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Response and Recovery

- Biosecurity- infected and non-infected farms in outbreak area, rapid response teams, live bird markets
- Culling methods – cervical dislocation, carbon dioxide, lethal injection for certain species
- Disposal methods – burial, burning or incineration and composting
- Decontamination - cleaning and disinfection, disinfectants

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Response and Recovery

- Vaccination
- Lifting of quarantine
- Restocking
- Payment of compensation
- National HPAI PRP review incorporating lessons learned

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Lesson 4
Components of Standard Operating
Procedures for Implementation of HPAI
National Preparedness and Response
Plans

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Standard Operating Procedures Components

Biosecurity

- commercial establishments- farm sanitation, flock management, location, housing, feed delivery, vaccinations, traffic control
- backyard flocks – semi-intensive and extensive systems – housing, sanitation, species, carcass disposal
- households- village flocks, health and hygiene,
- live bird markets- cleaning and disinfection, market shut down, species,
- rapid response teams- seasonal flu vaccinations, antiviral prophylaxis, traffic flow, PPE

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Standard Operating Procedures Components

Surveillance

- surveillance and epidemiology network
- surveillance types – active and passive for poultry and wild birds
- surveillance locations
- outbreak surveillance – infected farms, protection zone and surveillance zone
- sampling size determination
- sample collection (tracheal and cloacal swabs, blood), handling and preservation
- sample submission to national and international laboratories

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Standard Operating Procedures Components

Quarantine and Movement Control

- disease zoning definitions
- quarantine control points
- enforcement of movement control

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Standard Operating Procedures

Culling procedures

- cervical dislocation (manual and mechanical)
- carbon dioxide gas
- lethal injection (ratites)

Disposal methods

- burial
- burning or incineration
- composting

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Standard Operating Procedures

Decontamination

- disinfection of farms, litter and equipment
- disinfection of laboratory equipment and environment
- Classes and action of disinfectants

Compensation

- compensation rates determination
- payment methods
- funding sources

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Lesson 5
Human Health Component

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National Preparedness and Response Plan

Public Health Overview

- Public health surveillance systems
- Human resources in public health sector
- Public health infrastructure
- Laboratory facilities
- Emergency epidemiologic response plans

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Lesson 6
Communications and Public Awareness

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Integrated National Preparedness and Response Plan

Communications and Public Awareness Component

- Public awareness of HPAI
- National plan and mechanism for HPAI communication
- Technical capacity for HPAI communications
- State of mass media in the country
- National and local communication activities

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Lesson 7
Financial Plan – Funding Component

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Integrated National Preparedness and Response Plan

Financial Plan - Budgets

- Equipment (laboratory, culling, disposal, PPE)
- Training programs
- Surveillance activities
- Rehabilitation and construction of physical structures

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Lesson 8
Important Appendices

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Appendices

1. Contact lists (National hotlines)
2. HPAI disease facts
3. HPAI lab test descriptions
4. Sample types, sample collection and sample submission
5. International shipment of samples to OIE/FAO reference labs
6. Equipment list for surveillance, culling, disposal, decontamination
7. Types and action of disinfectants
8. Quarantine signage
9. Notice of depopulation (letter)
10. Forms – lab submission forms (national and international), disease investigation forms, depopulation and compensation forms
11. Vaccination guide
12. List of important websites and links
13. FAO production sector description
14. Poultry population by region/district/county and species
15. National veterinary service organogramme
16. Country map

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Recapping Elements of an NPRP

1. Country Status and Assessment
2. Prevention and Preparedness
3. Response and Recovery
4. Components of Standard Operating Procedures for Implementation of a National Preparedness and Response Plan for HPAI
5. Public Health Component
6. Public Awareness and Communications Strategy
7. Financial and Funding Strategy
8. Important Appendices

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Table Task

- Each group will be assigned one or two of the elements of an National Preparedness and Response Plan (NPRP). With your group, discuss the most important information to include in your section(s). What checklist questions would you include?
- Devise a **set of checklist questions** that can be used to assess a National Preparedness and Response Plan. Use the blank forms in your *Participant Manual beginning on p. 24*. pages. A few examples have been given.
- Take 10 minutes for the activity and be prepared to share one or two items from your list.



Table Task - example

	YES	NO
Prevention and Preparedness Does the existing plan have animal and human health and communication components?		
Communications and Public Awareness Component Does the plan have a communications and public awareness component?		
Financial Plan Any budget included for equipment (culling, disposal, Laboratory, PPEs etc.)		



**NATIONAL PREPAREDNESS AND
RESPONSE PLANS FOR HPAI**

REFLECTION


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BIOSECURITY PRINCIPLES, PROCEDURES AND PLANNING

Ghana Biosecurity, Surveillance, and Outbreak Response TOT


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Module Purpose

To learn principles and methods for preventing an H5N1 HPAI outbreak.

Module Objectives

By the end of this course, participants will be able to:

- Define biosecurity principles;
- Describe basic biosecurity measures;
- Identify potential biosecurity risks,
- Explain biosecurity measures adapted for different environments: commercial and smallholder farms, live bird markets, and consumers;
- Understand biosecurity practices for transporting poultry to market;
- Use biosecurity planning and checklists.

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What should poultry farmers do if they suspect birds have H5N1 HPAI *on the farm*?



3


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What should poultry sellers do if they suspect birds have H5N1 HPAI *at the market*?



4


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Getting Started Discussion

With your table group, answer the question:

- Tables 1, 3 and 5 – What should poultry farmers do if they suspect birds have H5N1 HPAI *on the farm*?
- Tables 2 and 4 – What should poultry sellers do if they suspect birds have H5N1 HPAI *at the market*?

Decide on the steps you would recommend. Choose a someone at your table who will share your recommendations.

You have 10 minutes for this discussion.

5


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What should poultry farmers do if they suspect birds have H5N1 HPAI *on the farm*?

1. Leave the Poultry House Immediately
2. Decontaminate Workers
3. Contact the Authorities
4. Don't Visit Other Farms
5. Don't Move, Sell, or Eat Your Birds
6. Keep Records of the Sick and Dead Birds

6



What should poultry sellers do if they suspect birds have H5N1 HPAI *at the market*?

1. Contact the Authorities
2. Get the Virus Off Yourself and Others
3. Don't Touch, Move, Sell, or Eat Your Birds
4. Don't Visit Other Stalls, Markets, or Farms
5. Keep Records of the Sick and Dead Birds

7



Discussion

- Which of these steps are most often ignored by farm workers and poultry sellers?
- What would you do when talking with each of these groups to get them to actually follow the steps you've recommended?

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What If Help Isn't Available?

- 1. Protect Yourself**
 - Wear Protective Clothing – PPE or Face Mask and Gloves
 - Wash Your Hands Immediately
- 2. Kill the Sick Birds Safely and Humanely**
 - Minimize Contact with Blood and Feces
- 3. Dispose of the Dead Birds Properly**
 - Burning and/or Burial

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TOPICS WE WILL COVER

- Lesson 1: Introduction to Biosecurity Principles
- Lesson 2: Biosecurity in Different Settings – Commercial and Smallholder Farms
- Lesson 3: Biosecurity Practices for Transporting Poultry to Market
- Lesson 4: Biosecurity Measures in Different Settings – Live Bird markets
- Lesson 5: Biosecurity Planning for Commercial Farms and Live Bird Market Administrators

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Lesson 1: Introduction to Biosecurity Principles



What is Biosecurity?

Bio = Life
Security = Protecting
Biosecurity = Protecting Life

Biosecurity is a set of practices designed to prevent the spread of disease into a farm or market.

It is the process of keeping germs away from poultry and poultry away from germs.

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Three Major Components

1. Isolation
2. Traffic Control
3. Sanitation

Prerequisite: Healthy Poultry

Good animal husbandry and management is essential!

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Animal Husbandry and Management

Ensuring the good health and maintenance of poultry

For example:

- Provide adequate feed, water, air
- Remove carcasses regularly
- Keep records of flock health

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Isolation

Creating an environment where poultry are protected from carriers of disease – people, other animals, air, water, etc.

For example:

- Keeping poultry in closed, screened buildings on the farm, and in secure cages at the market
- Practicing All-In, All-Out Management
- Separate poultry from other animals and from other poultry species
- No standing bodies of water on property

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Traffic Control

Controlling the movement of people, animals, equipment, and vehicles into, out of, and within a farm or market

For example:

- Not allowing unauthorized persons onto farm property
- Requiring vehicles not used for farm work to be parked at the farm gate
- Working from healthy to sick, young to old birds
- Not allowing fowl dealers on to the farm

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Sanitation

Regular cleaning and disinfection of housing, equipment, vehicles and people

For example:

- Workers wash hands and feet, change clothes and shoes before working with birds
- Clean and disinfect equipment regularly
- Clean and disinfect poultry houses and cages between flocks
- Have a pest control program

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How Disease Spreads Between Farms and Markets

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Some of the ways that infectious diseases can be spread:

- Introduction of diseased birds
- Introduction of birds that are carriers of disease
- Shoes and clothing of people
- Contact with objects that are contaminated with disease agents
- Carcasses of dead birds
- Impure water, such as surface drainage water
- Pests: rodents, wild animals and birds
- Insects
- Contaminated materials: feed, feed bags, egg flats, crates, coops, etc.
- Contaminated vehicles: delivery trucks, motorcycles, wheelbarrows, etc.
- Contaminated premises through soil and old litter
- Egg transmission (for HPAI, this is limited to egg surfaces)

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Exercise 1: Identifying Biosecurity Risks

Follow the steps on p. 5 of your *Participant Manual* to complete this exercise.

- Study the illustration of the farm on p. 6.
- Circle each biosecurity risk that you notice.
- In the space provided, write directions for correcting the infractions that you indicated on the illustration

Take 10 minutes and be prepared to share your answers with the group.

HINT: *There are at least 10 infractions pictured.*

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Figure 3: Illustration of Problem Farm

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Biosecurity Risks

1. Carcasses left outside
2. Poultry house is not secured (chickens are out in the open)
3. Gate is open
4. Feed bin is open
5. There is a pond on the farm
6. Mixed species are on the farm
7. The vehicles is parked in front of the poultry house
8. There are weeds around the house
9. There are stray cats and dogs
10. The signs are contradictory (No Entry sign, along with a sign that says that eggs sales are inside the farm)

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Lesson 2: Biosecurity Measures in Different Settings – Commercial and Smallholder Farms

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Movement of Poultry From Farm to Table

```

    graph TD
      A[Commercial Poultry Farms and Rural Markets] --> B[Fowl Dealers]
      A --> C[Poultry Transporters]
      B --> D[Poultry Sellers]
      C --> D
      D --> E[Live Bird Markets]
      E --> F[Consumers]
  
```

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Discussion

- How many of you work with commercial or smallholder farms?
- Who do you work with on the farm?
- How would you describe their level of knowledge about poultry diseases? About biosecurity?
- In your experience, what biosecurity practices do most farms follow?
- What are the most common biosecurity risks you've seen on commercial farms?

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Biosecurity Messages for Commercial and Smallholder Farms

1. Practice Good Animal Husbandry
2. Design and Maintain Your Farm to Keep Diseases Out
3. Control Entry to and Movement on Your Farm
4. Keep Your Farm Clean

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1. Practice Good Animal Husbandry

1. Provide adequate feed and water
2. Remove carcasses at least twice a day
3. Cull sick birds regularly
4. Monitor and Record Flock Health
5. Never Add New Poultry to a Flock
6. Do Not Keep Multiple Species of Poultry

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2. Design and Maintain Your Farm to Keep Diseases Out

Restrict Access to the Entire Farm

- Fence and gate farm
- Fence poultry area
- No standing bodies of water on the farm

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3. Control Entry to and Movement on Your Farm

1. Entering the Farm

Visitors

- Only visitors with legitimate business
- Do not allow visitors into bird pens unless absolutely necessary
- Visitors entering the bird pens must change clothes, footwear, wear a hair cover and gloves
- Keep a visitor log book

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3. Control Entry to and Movement on Your Farm

1. Entering the Farm

Farm Workers

- Don't hire workers who keep birds at home
- Encourage workers to bathe before work
- Require workers to wash hands and feet before entering the farm
- Have dedicated clothing and footwear for workers

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3. Control Entry to and Movement on Your Farm

1. Entering the Farm

Vehicles and Equipment

- Park outside vehicles at the farm gate
- Clean and disinfect any vehicles that must enter the farm
- Do not park any vehicles near the poultry houses

Vehicles and equipment to be particularly aware of: feed trucks and poultry crates/egg flats that leave the farm

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3. Control Entry to and Movement on Your Farm

2. Movement within the Farm

Work from healthy birds to sick, and from young to old

When moving between poultry houses:

- Wash hands
- Clean and disinfect footwear or change into footwear dedicated to the house you're entering

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3. Control Entry to and Movement on Your Farm

3. Movement from the Farm

Never visit live bird markets unless absolutely necessary

- If necessary, disinfect footwear when returning to your farm and bathe and change clothes before entering your poultry houses

Never visit a neighbor who has sick poultry and don't let other farmers visit your farm if you have sick poultry

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3. Control Entry to and Movement on Your Farm

4. Conducting Farm Business

Buying Live Birds

- Only buy from people you know and trust
- Never purchase from an area with HPAI outbreaks
- Quarantine any new birds for at least 2 weeks

Selling Live Birds

- Transport poultry offsite to a poultry dealer, or
- Transfer to a poultry dealer on your farm, or
- Transport to a live bird market, or
- Sell directly from the farm

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3. Control Entry to and Movement on Your Farm

4. Conducting Farm Business

Selling Eggs

- Collecting eggs from pens – using plastic vs. paper flats
- Sorting the eggs into flats to be taken off the farm – using plastic vs. paper flats
- Never bring paper egg flats back from the market to the farm
- If selling eggs directly from the farm, sell them at the farm gate

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3. Control Entry to and Movement on Your Farm

Precautions for People Who Move Between Farms

- Do not visit more than 2 farms per day
- Do not visit more than 1 farm where birds are sick, bathe and change clothes/shoes immediately after
- Park outside the farm gate
- Wash hands/feet and change clothes/shoes before entering and upon exiting

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4. Keep Your Farm Clean

1. Clean and Disinfect Equipment Regularly
 - Daily for equipment in direct contact with birds
 - Weekly for bird areas and other equipment
 - Clean by removing off organic matter using a scrub brush, soap, and hot water
 - Apply disinfectant and allow sufficient contact time
2. Feed Management
 - Keep away from pests
 - Clean up spills immediately
 - Clean automatic feeders once a month
 - Do not reuse feed bags, if used

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4. Keep Your Farm Clean

3. Litter Management
 - Change litter after each flock
 - Compost used litter to make it safe for use as a fertilizer
4. Clean Poultry Houses Between Flocks
5. Pest Control
 - Keep feed in secure containers/areas
 - Keep the area around poultry houses free of debris and weeds/grass
 - Keep changing areas clean and orderly
 - Use traps or poison to control pests

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Table Exercise

- Review the material from Lesson 2 (p. 8-28) in the *Participant Manual*.
- Identify which of these biosecurity practices are the **most important** and yet **least used** on commercial poultry farms. Choose one or two to focus on.
- Discuss with your group some ideas you have for encouraging farmers to adopt these essential biosecurity practices.
- Be ready to share your ideas.
- Take about 20 minutes for your discussion.

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Summary of Key Points

- Wear clean, protective clothing and footwear when working with poultry
- Keep dedicated clothing and footwear on the farm for workers and visitors
- Prevent poultry from mixing with wild birds, other animals, and pests
- Restrict the movement of poultry/eggs, animals, manure, equipment, and people between farms and markets
- Control the movement of poultry/eggs, animals, manure, equipment, and people on the farm
- Practice basic hygiene – regular hand washing and decontaminating footwear

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Recapping - Biosecurity Risks

1. Carcasses left outside
2. Poultry house is not secured (chickens are out in the open)
3. Gate is open
4. Feed bin is open
5. There is a pond on the farm
6. Mixed species are on the farm
7. The vehicles is parked in front of the poultry house
8. There are weeds around the house
9. There are stray cats and dogs
10. The signs are contradictory (No Entry sign, along with a sign that says that eggs sales are inside the farm)

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Recapping - Biosecurity Practices

1. Design and Maintain Your Farm to Keep Diseases Out
2. Practice Good Animal Husbandry
3. Control Entry to and Movement on Your Farm
4. Keep Your Farm Clean

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Small Group Exercise

1. Read the biosecurity risk on your card.
2. With your group, create a procedure that farm workers can follow that will minimize the biosecurity risk assigned and use good biosecurity practices.
3. The procedure should be clear, simple, and require few resources.
4. Be clear about what will be done, by whom, where, and when. You can use the SOP template in Appendix H as a guide.
5. Identify one person to present your SOP.
6. Take about 30 minutes for your discussion.

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Discussion of SOPs

- If you were working with a commercial farm, what approach would you recommend to train workers to use these procedures?
- What would you recommend that the farm manager do to encourage compliance with the SOP?

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Smallholder Farms

- How many of you work with smallholder farmers?
- How would you describe their level of knowledge about poultry diseases?
- About biosecurity?
- What's their level of literacy?

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Discussion

- What are the biggest challenges to adopting biosecurity practices for smallholders?
- Which do you think are the most important practices?
- Which ones will be the easiest to adopt?
- What are some ideas about how to work with smallholders to get them to adopt some of these practices (can you use SOPs?).

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**LESSON 3: BIOSECURITY PRACTICES
FOR TRANSPORTING POULTRY TO
MARKET**

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Discussion

- Who moves poultry to market in Ghana?
- How often do you interact with poultry dealers and transporters?
- What are the common practices around transporting poultry to market?
- What are the common biosecurity risks?

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Safely Transporting Birds to Market

1. Start with Healthy Birds
2. Don't Spread Disease
3. Keep It Clean

Participant Manual, pp. 29-31

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Safely Transporting Birds to Market

1. **Start with Healthy Birds**
 - Only buy birds from trusted producers
 - Do not accept sick birds

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Safely Transporting Birds to Market

2. **Don't Spread Disease**
 - Avoid collecting birds from multiple farms in one day
 - Never bring dealer/transporter cages onto farms
 - Have easily identifiable cages
 - Do not enter poultry houses to pick up birds
 - Avoid carrying people and birds in the same vehicle at the same time
 - Also avoid carrying multiple species together
 - Respect poultry movement bands during outbreaks

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Safely Transporting Birds to Market

3. **Keep It Clean**
 - Clean and disinfect vehicles before and immediately after transporting birds
 - Use cages made of plastic or metal
 - Frequently dispose of and replace cages made of wood (e.g., millet stalks, raffia, palm products, bamboo)

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Small Group Exercise: Role-play

- Each table group will be assigned a biosecurity practice for transporting poultry to market to discuss with a transporter:
- With your group, decide how you will convince the transporter to adopt the practice. Develop a message you would deliver to him/her.
- Choose one person from your group to be the messenger and one to be the transporter. You will *role-play* the conversation.
- Take about 15-20 minutes to prepare.

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Small Group Exercise: Role-play

- Do not accept or purchase from flocks showing signs of disease.
- Avoid collecting birds from different farms on the same day
- Do not enter poultry houses to pick up birds.
- Clean and disinfect vehicles before and immediately after transporting birds
- Frequently replace (burn or bury) the traditional cages made from millet stalks, raffia, palm products or bamboo.

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**BIOSECURITY PRINCIPLES,
PROCEDURES AND PLANNING**

REFLECTION

**LESSON FOUR: BIOSECURITY MEASURES
IN DIFFERENT SETTINGS- LIVE BIRD
MARKETS**



59



60



Discussion

- What are the biosecurity challenges in live bird markets?
- Who is responsible for improving biosecurity in live bird markets?
- What is the role of the municipal authorities?
- What is under their control?
- How would you describe their level of knowledge about poultry diseases?
- About biosecurity?
- What's their level of literacy?

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Key Biosecurity Messages for Municipal Market Managers

1. Locate markets away from food
2. Control the flow of traffic in the market
3. Provide for good sanitation
4. Educate sellers about biosecurity practices
5. Conduct regular disease surveillance

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Pair Task

Discuss the following questions with a partner:

1. What are the easiest recommendations to implement in live bird markets in Ghana?
2. Which are the hardest? What are the obstacles?
3. How can you overcome these obstacles?

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Discussion

- What role do the poultry sellers in the market play in biosecurity?
- How would you describe their level of knowledge about poultry diseases?
- About biosecurity?
- What's their level of literacy?

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The two most important biosecurity points for poultry sellers:

- Never buy or sell sick poultry
- Never sell carcasses of dead poultry

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Other Key Messages for Poultry Sellers

For urban markets:

- Start with healthy birds
- Be alert for illness in your birds
- Keep it clean

One additional point for rural markets:

- Organize the market

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Discussion

- Which recommendations are easiest to implement? Why?
- Which are the hardest? Why?
- How best can you convey the messages?
- How can you encourage adoption of these practices?

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Discussion

- What are you learning about how to encourage and support biosecurity in live bird markets?
- What ideas do you have about working with the municipal authorities and poultry sellers to increase biosecurity?

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Biosecurity for Consumers

- What do consumers need to know and do to be safe from H5N1 HPAI?
- How do you reach consumers to communicate this information?
- What can poultry sellers do to promote safe poultry handling and preparation?
- What can municipal authorities do?
- What can you do?

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Safe Cooking Practices

- Eat only healthy birds
- Wash your hands before cooking
- Chop raw vegetables first
- Prepare raw meat and eggs next
- Wash your hands after touching raw meat/eggs
- Clean all surfaces that touch raw meat/eggs
- Cook meat thoroughly
- Eat (or refrigerate) cooked foods within 2 hours

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LESSON 5: BIOSECURITY PLANNING FOR COMMERCIAL FARMS AND LIVE BIRD MARKET ADMINISTRATORS



Suggested Process for Developing a Biosecurity Plan for Commercial Farms and Live Bird Market Administrators

1. Define the objectives
2. Assess risk
3. Establish biosecurity procedures
4. Train staff
5. Monitor the effectiveness of the biosecurity plan

80



Exercise 2: Biosecurity Planning

- In this exercise, you will be evaluating the biosecurity efforts of a specific setting and creating a plan for improvements.
- Turn to p. 53 in your *Participant Manual* and follow the directions. Work with your group to complete the exercise.
- Choose a reporter and be prepared to share your answers with the group.
- You have 45 minutes for this exercise.

81



Discussion

- What are the important learning points that you're taking away from this discussion about how to increase biosecurity in commercial farms and live bird markets?

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ADDITIONAL INFORMATION

- Contact Information for Ghana Agricultural Offices and Veterinary Services
- Checklist A – Commercial Farm Risk Assessment Checklist
- Checklist B – Biosecurity Checklist for Live Bird Markets
- Appendices

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BIOSECURITY PRINCIPLES, PROCEDURES AND PLANNING

REFLECTION

ANIMAL AND HUMAN SURVEILLANCE

Ghana Biosecurity, Surveillance, and Outbreak Response TOT

MODULE PURPOSE

To discuss the steps, methods, and objectives for the surveillance of H5N1 HPAI in different populations of birds and to discuss the elements of a good surveillance system for Human AI.

2

MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Define key components of surveillance;
- Describe various types of surveillance used for HPAI H5N1;
- Identify types of surveillance for inclusion in a national plan;
- Identify appropriate sampling procedures;
- Understand the importance of collecting appropriate sample sizes.

3

Exercise 1: Check your Understanding

Review the list of surveillance concepts on p. 3 of your *Participant Manual* and determine whether you believe them to be True or False.

We will repeat the exercise at the end of the module and compare your responses now with your responses later.

4

TOPICS

- Lesson 1: H5N1 HPAI Surveillance
- Lesson 2: Sample Size Calculation
- Lesson 3: Surveillance in Poultry and Captive Populations
- Lesson 4: Elements of a Good Health System for Human Health

5

H5N1 HPAI SURVEILLANCE

A systematic form of data recording with three distinct elements:

- Sampling, recording and analyzing data
- Dissemination of information to interested parties, so that
- Action can be taken to control disease

6

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SURVEILLANCE

RANDOM SURVEILLANCE

- Random selection of a population to look for a disease or condition. It can also be described as a specific form of probability sampling

TARGETED SURVEILLANCE

- Sampling a population in an adaptive manner, taking into account other historical population information

7

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□ =chicken
 ○ =pigeon
 △ =quail
 X =sample

POSITIVE
NEGATIVE

Random surveillance ⁸

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□ =chicken
 ○ =pigeon
 △ =quail
 X =sample

POSITIVE
NEGATIVE

Targeted surveillance ⁹

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Data Collection Methods

Passive vs. Active Surveillance

PASSIVE - The testing of sick or dead birds that are reported.

ACTIVE - The systematic testing of the birds or animals, including those that are healthy.

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SURVEILLANCE TYPES – DIAGNOSTIC TECHNIQUES

- Clinical (or syndromic) surveillance
- Virological surveillance
- Serological surveillance

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Exercise 2: Review of Key concepts

- Follow the steps on p. 7 in the *Participant Manual* to conduct this exercise.
- Compare your answers with the person next to you.
- Be prepared to report key findings back to the larger group.

Take 15 minutes for this exercise.

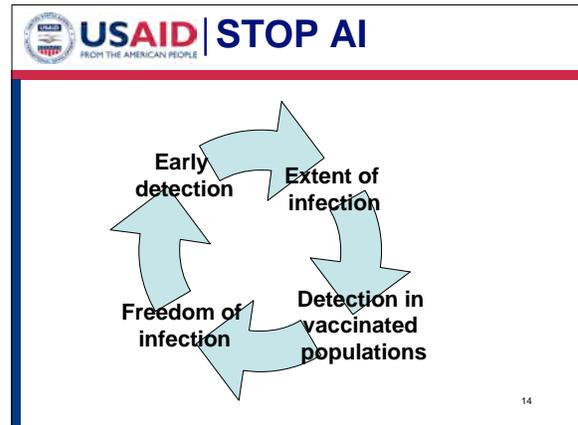
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SURVEILLANCE OBJECTIVES

- Early detection
- Extent of infection
- Detection of disease in vaccinated populations
- To prove freedom of infection (determined by the OIE)
see p. 8 in the *Participant Manual*

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Zoning and Compartmentalization

- Recent strategic changes have been made in the design of the science based international standards to move from **entire country freedom** as the basis for trade to the application of zoning or compartmentalization principles, to minimize economic consequences previously associated with disease reporting.

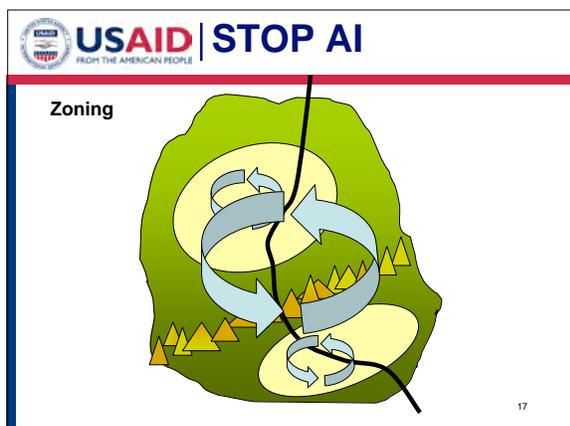
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ZONING

Zoning is based on separating a country into areas of differing disease status by natural or artificial geographical barriers.

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COMPARTMENTALIZATION

- Compartmentalization is the separation of disease status by the application of appropriate management systems, including bio-security management
- A good example is the consideration of poultry breeder farms (with grandparent or pureline flocks) as compartments due to their high level of biosecurity and superior management.

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Compartmentalization

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SURVEILLANCE IN OTHER SPECIES

- Mammalian species such as cats, pigs, dogs, mice, weasels, ferrets and humans have been infected by H5N1 HPAI.
- Surveillance in these species is now low but will become more important if virus mutations allow the disease to spread rapidly.

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SAMPLE SIZE CALCULATION

- **Prevalence** – The rate of disease in a population.
- **Confidence Level** – The degree of certainty that a statistical prediction is accurate. Confidence levels from 95% to 99% are acceptable.

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SAMPLE CALCULATION

- Mathematical approaches to calculate the sample size required for a particular prevalence, population size and confidence level can follow either the **hypergeometric** or **binomial approach**.

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SAMPLE SIZE CALCULATION

- To calculate the sample size required for a particular prevalence, population size and confidence level two mathematical approaches can be followed:
 - 1) The hypergeometric approach
OR
 - 2) The binomial approach

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SAMPLE SIZE CALCULATION

Hypergeometric approach

- requires very complicated calculations
- considers sampling without replacement. This means that a bird's chance of being selected increases after each sample is taken
- Tables can be used to make the calculations

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Table 1. Number needed to test to be 99% confident that disease will be detected if present at or above 5 levels of prevalence

Flock size (N)	Prevalence (P)				
	P = 0.10	P = 0.05	P = 0.02	P = 0.01	P = 0.005
	Sample size (n)				
N	n	n	n	n	n
20	18	20	20	20	20
50	29	41	50	50	50
100	35	59	90	99	100
150	38	67	117	143	150
200	39	72	136	180	198
250	40	75	149	210	244
300	41	77	159	235	286
350	41	79	167	255	324
400	41	80	174	272	360
450	42	81	179	287	391
500	42	82	183	300	420
600	42	83	189	320	470
700	42	84	194	336	511
800	43	85	198	349	546
1,000	43	86	204	367	601

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SAMPLE SIZE CALCULATION

Binomial approach

- is a very good approximation for big populations (over 10,000)
- For the calculation of the recommended sample size following the binomial distribution, the following equation should be used (U.S. Interagency Strategic Plan 2006):

$$n = \log(1 - c) / \log(1 - P)$$

where n is the sample size, c is the desired level of confidence, and P is the prevalence of positive samples in the population. An adequate sample size should allow for over 95% confidence that AI is detected.

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SAMPLE CALCULATION

Example: to detect AI at or below 1.5% prevalence with a >95% level of confidence, 200 individual birds from the population of interest should be sampled (U.S. Interagency Strategic Plan 2006).

$$n = \log(1 - 0.95) / \log(1 - 0.015) = 198.2 = 199$$

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● = positive
● = negative
⊗ = sample

.5% prevalence, 500 population
99% confidence

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● = positive
● = negative
⊗ = sample

10% prevalence, 500 population
95% confidence

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SURVEILLANCE IN POULTRY AND CAPTIVE POPULATIONS

Clinical Surveillance

- Poultry workers should know the H5N1 HPAI signs and lesions.
- Can be used to target broad populations.
- It is impossible to distinguish clinically between HPAI and velogenic viscerotropic Newcastle disease.

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SURVEILLANCE IN POULTRY AND CAPTIVE POPULATIONS

Virological Surveillance

- RT-PCR is among the most rapid and most accurate tests available and are frequently used to screen large commercial poultry populations.
- Virus isolation, although more time consuming, remains the gold standard method, and should only be done in a laboratory with comprehensive biosafety safeguards.
- Rapid on-site diagnostics (lateral flow antigen ELISA).

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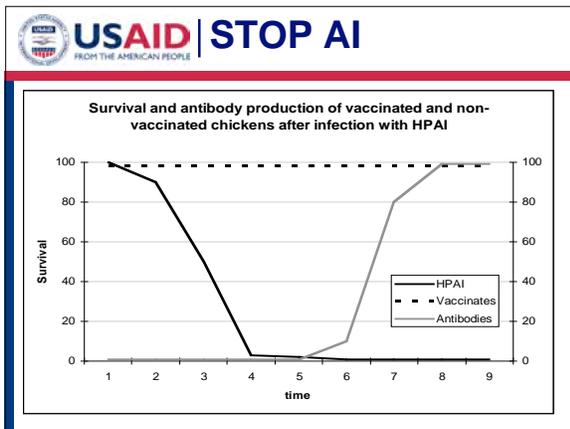
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SURVEILLANCE IN POULTRY AND CAPTIVE POPULATIONS

Serological Surveillance

- Serosurveillance has limitations.
- Sometimes, infected birds don't develop antibodies.
- Most domestic fowl don't survive long enough after the infection with HPAI viruses.
- Some species, such as ducks, don't always seroconvert.
- Non-infected birds may also have antibodies: antibodies are produced in response to vaccination

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REVIEW OF SURVEILLANCE OBJECTIVES

- 1. Early Detection:** The strategy employed will depend on the risk of infection in poultry.
- 2. Extent of Infection:** Surveillance should focus on the same populations as in early detection under high risk.
 - Surveillance in zoos and pet shops
 - Live bird markets (or wet markets)

See p. 14 in your *Participant Manual*

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Seronegative: No evidence of prior infection

- Infection is introduced into a mostly seronegative population.
- Many birds from seronegative flocks will get infected.
- Shedding starts 6 to 24 hours after exposure.
- It will be easy to detect shedding birds, because the prevalence will be high after a few days.
- The negative source flocks act as sentinels with naïve immune systems.

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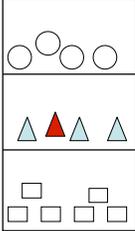
Seropositive: evidence of prior infection (antibodies)

- If most birds are seropositive, individuals are resistant to infection and few will become infected and shed the virus.
- It will be much more difficult to detect shedding birds, because the prevalence is low.
- In this scenario, the use of sentinels might be more cost and time effective.

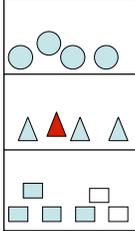
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Seronegative



Seropositive



△ = naive
 ▲ = virus positive
 ▲ = antibody positive

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Exercise 3: Check your Understanding

- Review the list of surveillance concepts on p. 16 that you saw at the outset of this module and determine whether you believe them to be True or False.
- Compare your responses with your responses in Lesson 1 of this module (on p. 2).

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ELEMENTS OF A GOOD SURVEILLANCE SYSTEM FOR HUMAN HEALTH

- Simplicity
- Flexibility
- Acceptability
- Sensitivity
- Predictive value positive
- Representativeness
- Timeliness

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SURVEILLANCE-SIMPLICITY

- Refers to both structure and ease of operation- should be as simple as possible while still meeting its objectives

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SURVEILLANCE- FLEXIBILITY

- Can adapt to changing information needs or operating conditions with little additional cost in time, personnel, or funds

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SURVEILLANCE- ACCEPTABILITY

- The willingness of individuals and organizations to participate
- Some quantitative indicators include:
 - Participation rates (MD, lab, hospital, cases etc)
 - If high, how quickly it was achieved
 - Interview completion (question refusal rates)
 - Completeness of forms
 - Timeliness of reporting

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SURVEILLANCE- SENSITIVITY

- Proportion of cases reported
 - $(\text{true} + /(\text{true} + \text{false} -))$
- Affected by:
 - Cases seeking medical care
 - Dx of cases- skill of providers or sensitivity of diagnostics
 - Whether case will be reported given Dx
- Sensitivity can also refer to ability to detect epidemics

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SURVEILLANCE- PREDICTIVE VALUE POSITIVE

- Proportion of identified cases who actually do have the disease/condition
 - $(\text{true} + /(\text{true} + \text{plus false} +))$
- A low PVP may lead to wasted resources
 - Non-cases being investigated
 - Epidemics mistakenly identified

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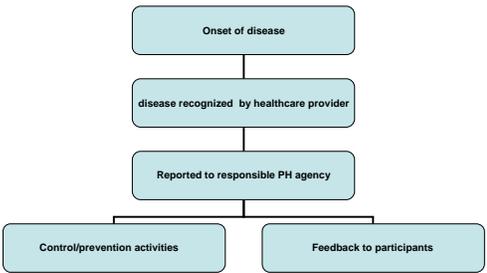
SURVEILLANCE - REPRESENTATIVENESS

- Accurately describes the occurrence over time and its distribution in the population by place and person
- Understand:
 - Characteristics of the population
 - Natural history of the disease (mode of transmission, latency, fatal outcome etc)
 - Prevailing medical practices (referral patterns, sites performing diagnostic tests)

45

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SURVEILLANCE- TIMELINESS
Speed or delay between steps in system



```

graph TD
    A[Onset of disease] --> B[disease recognized by healthcare provider]
    B --> C[Reported to responsible PH agency]
    C --> D[Control/prevention activities]
    C --> E[Feedback to participants]
  
```

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IHR AND REPORTING REQUIREMENTS

- The revised International Health Regulations (IHR) entered into force on June 15th 2007.
 - set of rules and procedures agreed by 193 countries
 - will help to make the world more secure from threats to global health.
 - agreed by the World Health Assembly in 2005 and represent a major step forward in international public health security.

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ANIMAL AND HUMAN SURVEILLANCE

REFLECTION

SURVEILLANCE PLANNING

Ghana Biosecurity, Surveillance, and Outbreak Response TOT

1

MODULE PURPOSE

To apply acquired surveillance knowledge to design an outbreak investigation form and surveillance plan.

MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Design an outbreak investigation form;
- Create a sample surveillance plan;
- Apply acquired surveillance knowledge to a real-world setting.

2

OUTBREAK INVESTIGATION DESIGN AND SURVEILLANCE PLANNING EXERCISES

3

Designing an Outbreak Investigation Form

Exercise 1: Designing an OUTBREAK INVESTIGATION FORM

In your small groups follow the steps below to conduct this exercise:

- Consider the information you would need to investigate an outbreak.
- Then create an *Outbreak Investigation Form* using the information you generated above. Use the following headings and the blank format in your manual:
 - LIVESTOCK DATA
 - MANAGEMENT AND HUSBANDRY
 - SAMPLE COLLECTION

Be prepared to share your form with the larger group.

4

Surveillance Planning

Exercise 2: Surveillance Planning

In your small groups follow the steps on p. 7 in the *Participant Manual* to conduct this exercise.

5

Round Table Discussions

- Topics on Surveillance...
- What questions do you have?
- What would you like to know more about?

6



SURVEILLANCE PLANNING

REFLECTION



INTRODUCTION TO THE PERSONAL PROTECTION EQUIPMENT (PPE) KIT

Ghana Biosecurity, Surveillance, and Outbreak Response TOT



PHOTO CREDITS

- Ross Graham
- Andrea Miles
- Jarra Jagne
- Mike Bielinski
- Nathan Kennedy



MODULE PURPOSE

To familiarize participants with the contents of the Personal Protective Equipment (PPE) kit.



MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Identify and explain the contents of the PPE Kit and describe their function;
- Explain the concepts of : "clean" and "dirty" zones;
- Correctly put on (don) the PPE;
- Correctly take off (doff) the PPE.



The Personal Protection Equipment Kit

(PPE)



Personal Protective Equipment PPE)



- Tyvek Coveralls
- Shoe Covers
- N-95 Respirator
- Goggles
- Plastic Apron
- Gloves
- Germicidal Wipes
- Alcohol Wipes
- Infectious Waste Bag

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Why Use PPEs?

- You can be infected by HPAI through your eyes, nose or mouth



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Why Use PPEs?

- Virus can be carried to farms
- Virus can survive in the environment
- You may not be aware that it is there



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DONNING OF PPE

- The following slides will show the sequence of activities involved in donning PPE
- Human healthcare workers will also follow the same sequence

9

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Before You Put on the PPE

- Remove your watch and any jewelry
- Remove extra clothing
- It is recommended to leave cell phones behind. If for any reason you need to have a cell phone with you, put it in a plastic bag so the surface of the bag can be easily disinfected

10

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Before You Put on the PPE: Wash Your Hands!

- Wet hands with soap and water
- Rub all surfaces
- Rub for 20 seconds
- Rinse well
- Wash forearms and face
- Towel or air dry



11

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- Big is good: Coveralls should be 2 sizes larger than you normally wear



12



Donning the PPE properly

SEQUENCE

- Coveralls
- Shoe covers
- Respirator
- Goggles
- Pull hood over head
- Apron
- 2 pairs of gloves



13



Put On Coveralls



14



Put on Shoe Covers



15



Put On Your Respirator



16



Put on Goggles and Pull Up Hood



17



Put On Apron



18

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Put on Inner and Outer Gloves



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Ready to Go!



21

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You May Also Want To:

- Tape on a sample bag to carry back samples



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Questions?

23

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PPE Donning Activity

Now we are going to help a volunteer don a PPE following the procedure just described.

24



PPE Donning Activity

- What, if anything, was difficult about donning the PPE?
- What do you want to remember, and to encourage others to remember, about donning the PPE?



Doffing the PPE



Proper Order for Doffing the PPE

- Open biohazard bag
- Wipe off gloves with germicidal wipes
- Remove:
 - Apron
 - Shoe covers
 - Outer gloves
 - Coveralls
 - Goggles
 - Respirator
 - Inner gloves
- Tie off biohazard bag
- Wash hands with soap and water



Removing PPE:

**Open Biohazard Bag
Clean Gloves**



Remove Apron



Remove Shoe Covers



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Remove Outer Gloves

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Roll Down coveralls without touching outside

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Remove Goggles

Remove goggles by the strap that was covered by hood, not by the front piece!

33

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Remove Respirator: By the straps!

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Remove Gloves, Close Bag, & Use Germicidal Wipe Hands

35

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Clean Hands, Arms and Face with Alcohol Wipes and Wash With Soap and Water, if Possible

- Wet hands with soap and water
- Rub all surfaces
- Rub for 20 seconds
- Rinse well
- Wash forearms and face
- Towel or air dry

36



Do Not Reuse PPE

- PPE kit contents are designed for single use only
- Do not wash and reuse
- Reuse could result in:
 - Self-contamination
 - Contaminating someone else
 - Contaminating a new location



Discard PPE:

- Immediately if it is torn, heavily soiled or wet
- Immediately after use



Discard PPE After Use!

- Use plastic bags provided
 - Be sure to seal the bag and disinfect the surface of the bag
 - Dispose of the bag appropriately by burial
 - Burning is not a preferred method of disposal due to the environmental implications associated with burning plastic
 - Proper disposal is important to prevent further disease spread and contamination



Disposal of PPE In a Hospital Setting

- PPE should be removed, placed in the biohazard bag provided and placed in the appropriate waste receptacle in the isolation room
- PPE are then disposed of according to hospital procedures which may involve autoclaving before final burial or incineration



When You Take a Break:

- Remove PPE
- Take your break
- Put on new PPE



Questions?



Doffing the PPE

Help our volunteer remove and dispose of the PPE, following the procedure just described.



Doffing the PPE

- What, if anything was difficult about doffing the PPE?
- What do you want to remember, and to encourage others to remember, about doffing the PPE?



Exercise: PPE Scenario

Turn to p. 14 in your *Participant Manual*.

Read the scenario and then, at your tables:

- Discuss the scenario and decide what you would say to your colleague.
- Decide on the message you would deliver to him.
- Be sure to identify someone at your table who can share your message with the larger group.



INTRODUCTION TO THE PERSONAL PROTECTION EQUIPMENT (PPE) KIT

REFLECTION

OUTBREAK RESPONSE AND MANAGEMENT

Ghana Biosecurity, Surveillance, and Outbreak Response TOT

1

MODULE PURPOSE

This module is about the practical steps you can take within a regional or district veterinary station, department, or office:

- before you ever have an outbreak,
- when you suspect the disease is present,
- when you have an outbreak,
- when you are finished.

2

MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Describe the **preparation** needed locally to develop practical and rapid response plan;
- Describe the **components** of a response operation;
- Define the procedure for deciding on the **extent of restricted areas**, establishing and enforcing movement controls;
- Explain the importance of the **action planning** prior to a response operation;
- Describe the **activities** undertaken on an infected site during depopulation.

3

INTRODUCTION TO OUTBREAK RESPONSE

4

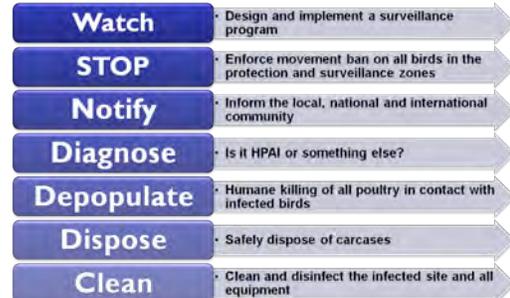
TO CONTAIN AN OUTBREAK

Rapid Response Teams **must** be mobilized and deployed to eradicate infected flocks, within 24-48 hours of high suspicion or confirmation of disease



- Protect people
- Protect animals
- Contain the virus
- Make it a single event

5



6

COLLECT AND ANALYZE DATA

7

DISCUSSION

- What **sources** of information on numbers of poultry and poultry farm or backyard flocks do you have?

8

MAKE AN ANALYSIS IN THE LOCAL AREA

Size	Total Number of birds	Total number of farms or holdings	Basic data	Housing/farm Summary	Shed details	Full farm survey
0-100	small	big	✓			
101 – 1000			✓	✓		
1001 – 5000			✓	✓		
5001 -10 000			✓		✓	
10 001 – 50 000			✓		✓	
50 001 – 100 000			✓			✓
100 001 +	big	small	✓			✓

9

MAP IT!

- Mark the major farms on a map along with any slaughterhouses, markets, feed mills, or hatcheries
 - Plan what resources you might need to mobilize and cull the largest farms, visit them and have a look around
- Consider where the highest density of back yard birds are kept – it is not the number of birds but the number of households
 - Plan how you would approach the culling of birds in a village or urban area, discuss the plan with community leaders

10

ESTIMATE RESOURCES

- How many veterinary officers might you need in a major outbreak?
- How many contract staff will be needed for depopulation work?
- What equipment and vehicles might you need?
- What are you going to do with that number of carcasses?
- Do you have a mechanism for paying compensation?

11

INVESTIGATE & REPORT

12

OUTBREAK INVESTIGATION FORM

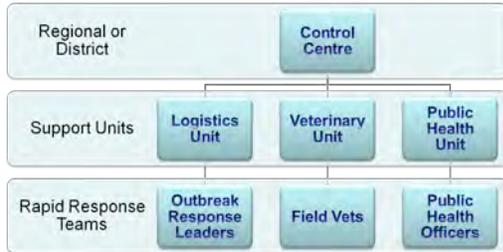
- What additional non-clinical information can be collected at the time of the investigation to prepare a depopulation plan and to prevent the need for a return visit to the farm?



ACTION ON CONFIRMATION

Focus on Field Operations

MOBILIZE THE REGIONAL OR DISTRICT DISEASE CONTROL CENTER



SET UP QUARANTINE AREAS AND ENFORCE MOVEMENT CONTROLS

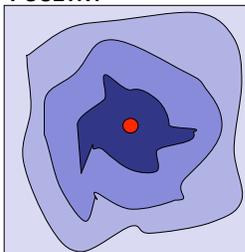
Work with your table group to answer the following questions:

- Who defines the area?
- Who legally declares the area?
- Who enforces the controls?

Choose one person to report out to the group.

Take five minutes for this discussion.

FAO GUIDELINES ON QUARANTINE AREAS FOR POULTRY

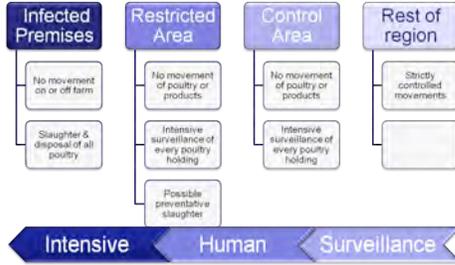


- IP** • Infected Premises
• Farm
- IA** • Infected Area
• village
- RA** • Restricted Area
• 1 – 5 km
- CA** • Control Area
• 2 – 10 km

QUARANTINE AREAS: WHAT DO YOU CALL THEM?



QUARANTINE AREAS: WHAT HAPPENS IN THEM?



PLANNING THE FIELD RESPONSE

PLANNING THE FIELD RESPONSE

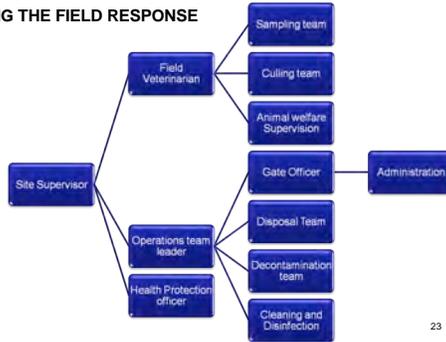
- Use data collected at time of diagnosis
- If incomplete a second trip will have to be made to the INFECTED farm



PLANNING THE FIELD RESPONSE

- Select a culling AND disposal method within the constraints of the conditions and resources available
 - Decision trees for culling and disposal
- Allocate resources
- Each Rapid response team must have
 - Outbreak Response Leader
 - Field Veterinarian
 - Public Health Officer
- Large infected sites will require delegation of tasks

PLANNING THE FIELD RESPONSE



MOBILIZING THE OPERATION

SITE SET-UP

- Plan how the site can be divided in risk areas.
- Establish gate security and decontamination areas with entry and exit registration.
- Establish a Green Area place for staging of personnel, equipment and hygiene and rest facilities.
- Establish the red, orange, yellow risk areas.
- Bring in the equipment – stage largest amounts in the Green Area and only necessary equipment into the Orange/Red areas.

25

RUNNING THE OPERATION

- Brief the operational support staff on their tasks
- Brief the culling and disposal team on the logistics of the operation outside of the site.
- Distribute and check PPE then bring in full team.
- If on-site disposal is being used then this must be prepared.
- Once the disposal system is established then culling can begin

26

CLEAN UP

- Breaking down equipment
- Washing equipment
- Disinfecting equipment
- Reporting on used equipment
- Cleaning up the site
- Breaking down the red, orange, yellow, green area
- Final departure leaving entrance secured with basic C&D

27

FOLLOW UP AND DEBRIEFING

28

FOLLOW UP AND DEBRIEFING

- Debriefing of site team/unit leaders to record exactly what was done on site.
- Follow up medical checks for all workers attending an infected site
- Instructions to site owner/manager for deep cleaning of site and disposal of litter.
- Establishment of “closed” period on farm once final C&D is completed

29

THE OUTBREAK RESPONSE IN GHANA

30



MAY 9 2007

31



MAY 9 2007

32



9 10:40

33



9 10:40

34



9 11:02

35



8 11:34

36



9-11-05

37



9-11-05

38



9-11-06

39



9-12-02

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9-13-07

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9-13-07

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9-13-02

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9-13-03

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9-13-12

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9-13-11

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9-13-22

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16-12-03

48





16-12-51

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16-14-05

56



16-17-27

57



16-18-24

58

OUTBREAK RESPONSE AND MANAGEMENT

REFLECTION

59



INTRODUCTION TO THE LAB KIT

Ghana Biosecurity, Surveillance, and Outbreak Response TOT



PHOTO AND SLIDE CREDITS

- Synbiotics Corporation
- Jarra Jagne
- Dr. Benjamin Lucio

2



MODULE PURPOSE

To familiarize participants with:

- The contents of the Laboratory and FLU DETECT test kits.
- Sampling practices for use on both poultry and wild birds.
- Key steps in the shipping process, including preparation of collection vials, storage of samples.
- Preparation of samples for shipping.

3



MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Identify the contents of the Laboratory Kit;
- Describe appropriate sampling techniques for use on both poultry and wild birds;
- Name the steps involved in testing both tracheal and cloacal samples.

4



Laboratory Kit

The laboratory kit serves the following purpose:

- Rapid field testing
- Collection of specimens for virus characterization
- Provision of shipping materials

5



LAB KIT CONTENTS

Personal Protective Equipment (PPE)	Sampling and Testing Equipment	Packaging and Shipping Equipment
<ul style="list-style-type: none"> • Infectious waste bags • Alcohol pads, 70% • PDI Sani Cloth virucidal wipes • DuPont Tyvek white coverall with hood and boots • DuPont Proshield III shoe covers • Vinyl inner gloves, 4 mil • Chemical splash goggles with indirect vents • N-95 respirator • Respirator fit test kit (Bitrex solution) • Plastic aprons 	<ul style="list-style-type: none"> • Synbiotics Avian Influenza Flu-Detect Type A AntigenTest Kit • BD Universal Viral Transport Combo Kit • Biological Sampling Module • Tissue Forcep 1x2 Teeth Econ 5-1/2" • Scissors, general surgical, straight, CRS • Poultry shears, Heritage cutlery 7220 • Saline Solution • Polyurethane Swabs • Pipettes 	<ul style="list-style-type: none"> • Mailing labels • Safe-T-Pak STP-310 insulated infectious shipper • Safe-T-Pak STP 314 freezer gels • Ammonium nitrate cold packs • Sharpie markers • Rubber bands • Whirl-Pak 5x12" sterile sample collection bags • Igloo cooler pack • Packaging tape 3"

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Synbiotics Flu Detect™ Kit Contents

- 1 test tube rack (for 5 tubes)
- 1 dropper bottle containing extraction buffer (6ml)
- 30 test tubes and caps
- 30 swabs
- 1 vial containing 30 test strips

7



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Synbiotics Flu Detect™ Test

- 15 minute assay based on a rapid immunochromatographic technology
- Can be done on a farm or in the lab
- Detects Influenza Type A virus only and not H5N1
- Appropriate for use in poultry and wild birds
- Best results when used to test sick or recently dead birds

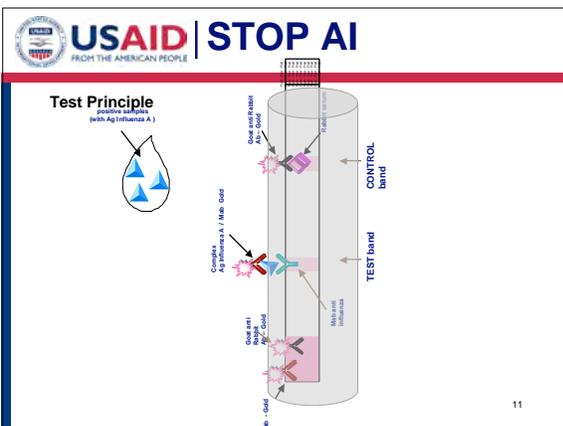
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Principle of the test

- The test strip uses two antibodies specific to the nucleoprotein of Influenza Type A virus
- An anti-influenza A antibody bound to Influenza A antigen present in the sample forms a complex which migrates along a strip
- The antigen-antibody complex is captured on a sensitized reaction line by the second antibody
- Accumulation of the complex causes the formation of a clearly visible pink/purple band
- Above the reaction line is a control band which ensures the test was performed correctly

10



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Importance of Sample Collection

Samples are collected for testing purposes:

- Field testing (combined with clinical signs): immediate decisions to stop movement, impose quarantines
- National laboratory testing: confirm results, determine quarantines, make decisions about outbreak management

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Importance of Sample Collection

OIE Reference lab testing:
Track virus
Watch for mutations
Potential assistance with vaccine preparation

WHO Reference lab testing:
Track virus
Watch for mutations that would signal the possible start of a human pandemic



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Sample Collection

- Samples are collected for preliminary and confirmatory testing for HPAI H5N1 virus
- Preliminary tests include rapid antigen tests and agar gel precipitation
- Confirmatory tests include real time RT-PCR testing and virus isolation

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Sample Collection For Animal Testing

- It is generally recommended that both tracheal (also oropharyngeal) and cloacal swabs should be collected from infected birds. If for any reason you have to make a choice,
 - Trachea/oropharynx is best site for sample collection for domestic poultry species
 - Cloaca is best site for sample collection for wild birds
 - Samples may be pooled (5 maximum).
 - Pool only similar samples, do not mix cloacal and tracheal samples

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Sample Collection For Animal Testing

- Samples should be collected from sick or recently dead birds for best results. Enzymes produced during decomposition of carcasses can interfere with the test to produce false positives



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Synbiotics Flu Detect™ Tracheal and Oropharyngeal Samples

- Tracheal or oropharyngeal samples should be taken from behind the tongue and into the trachea or oropharyngeal area (not just from the mouth)



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Sample Testing

- Place swab directly into extraction buffer (see Step 1 for testing tracheal swabs)
- Place swab into Viral Transport Media (VTM) first if the sample is a cloacal or tracheal swab that will be sent for further testing (viral isolation)
- Samples can be pooled with up to 5 swabs per pooled sample. Pool per testing site. **Do not mix tracheal and cloacal samples**

(Note: VTM is not part of Flu Detect™ Kit, but is provided in test tubes as part of the overall Lab Kit)

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Synbiotics Flu Detect™ Tracheal Samples

- Step 1**
 - Place test tube in rack
 - Add 8 drops (~250µl) extraction buffer into test tube

22

Synbiotics Flu Detect™ Tracheal Samples, continued

- Step 2**
 - Insert swab sample into Flu Detect™ extraction buffer
 - Rotate swab 5-10 times in buffer.
 - Press swab against side of tube to extract liquid.
 - Dispose of swab.

23

Synbiotics FLU DETECT™ Tracheal Samples, continued

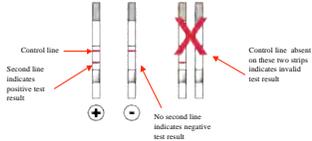
- Step 3**
 - Insert test strip, labeled side up, so that pink pad is just submerged into extracted sample.
 - Incubate for 15 minutes.
 - Remove strip and read results.

24

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Synbiotics Flu Detect™ Tracheal Samples, *continued*

- Step 4: Reading results and validation:
 - Control line is at the top, closest to handle
 - If control line is absent the test is *invalid*



Control line
Second line indicates positive test result
Control line absent on these two strips indicates invalid test result
No second line indicates negative test result

25

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Interpreting results

- A positive test result may be truly positive or could be a false positive (decomposing tissues can give false positives and leaving the strip in for more than 15 minutes can also give false positives)
- A negative result could be a false negative
- Therefore always follow up with further CONFIRMATORY testing after using the rapid antigen test kit

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Synbiotics Flu Detect™ Cloacal Samples

- Best type of sample for wild birds
- Avoid solid excrement and blood
- Preferably extracted in viral transport media, which is provided in separate tubes as part of the Lab Kit
- Virus load in cloacal samples is low especially with HPAI
- VTM use is recommended if samples are to be sent for virus isolation (extraction buffer has detergents that will destroy virus)



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Synbiotics Flu Detect™ Cloacal Samples, *continued*

- Pipette 0.5 ml of BHI or Viral Transport Media into a clean test tube
- Place the cloacal swab into the media
- Rotate swab 5-10 times



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Synbiotics Flu Detect™ Cloacal Samples, *continued*

- Press swab against side of tube to remove liquid
- Dispose of swab
- Allow contents to settle and remove 200 µl off the top and deposit in a new test tube; now add 3 drops of extraction buffer



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Synbiotics Flu Detect™ Cloacal Samples, *continued*

- Insert test strip into tube
- Allow to incubate for 15 min
- Read results

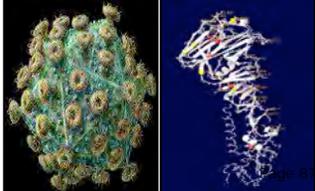


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Remember the Importance of Sample Collection

- Samples needed to confirm outbreak
 - World Health Organization
 - World Animal Health Organization (OIE)
- Needed to track the virus
- May help in vaccine development



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Preparing Sample Collection Vials

- Add 1-2 ml of viral transport media
 - Store at -20°C until ready to use
 - Store at 4°C for 48-96 hours
 - Store at room temperature if < 2 days
- Number the vials to correspond to the Field Data Collection Sheet

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Preparing Sample Collection Vials, *continued*

Minimum data for Field Data Collection Sheet:

- Date sample collected
- Geographic location of sampling (village/owner)
- Species sampled (chicken, duck, name of human, etc.)
- Type of sample (tracheal swab, cloacal swab, etc.)

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Sample Field Data Collection Sheet

No	Date	Geographic Location	Species	Type of Sample

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Storage of Samples

- Collect sample, rotate swab in vial, press against side of tube to extract liquid and discard swab
 - Samples should be stored at 4°C soon after sampling for a maximum of 48-96 hours
 - If longer storage is required, store at -70°C
 - Avoid repeated freezing and thawing
 - Do not freeze swabs or tissues at -20°C if virus isolation is to be done

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Storage of Samples, *continued*

- Blood samples: allow blood to clot, pour off cells and store serum at 4°C for up to one week or -20°C for storage.
- Tissue samples:
 - For virus isolation: pack on ice, *do not place in viral transport media*, and freeze at -70°C as soon as possible
 - For histopathology: place in formalin, 1 part tissue to 10 parts of a 10% formalin solution

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Serum Collection



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Preparation of samples for shipping

- Samples for shipping should be packed in a three-layer packaging system that meets International Air Transport Association (IATA) regulations:
 - The primary package must be wrapped with absorbent material
 - The secondary package must be watertight
 - The outer package is where the gel packs and ice packs are placed together with information about the samples (protected in a plastic bag)

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Preparation of samples for shipping, *continued*

- If samples are to be shipped internationally, dry ice should be used in the outer package instead of gel packs
- Never use dry ice in the tightly sealed inner package (it may explode)
- Samples have to be sealed well when dry ice is used to avoid destruction of the influenza virus by CO₂
- Please refer to the most current edition of the International Air Transport Association (IATA) Dangerous Goods Regulations for specifics

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Applicable Guidelines

- Each country has regulations on transporting infectious materials within its borders
- International shipments must follow the most current edition of the International Air Transport Association (IATA) Dangerous Goods Regulations

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INTRODUCTION TO THE LAB KIT

REFLECTION

DEPOPULATION AND DISPOSAL OPTIONS

Ghana Biosecurity, Surveillance, and Outbreak Response TOT

1

MODULE PURPOSE

- Depopulation, also called culling of birds & disposal of carcasses, is one of the fundamental parts of a stamping out strategy.
- This session introduces both technical and practical information on culling and disposal techniques.
- Through discussion and exercises, we'll discuss the relative merits of each system and integrate it with the method of disposal.

2

MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Prepare for a depopulation operation according to the international guidelines of FAO and OIE;
- Compare and select suitable culling and disposal techniques that are applicable under different situations;
- Compare and select different options for additional materials needed to carry out the depopulation operation.

3

LESSON 1: DEFINITION OF STAMP OUT

4

STAMP OUT

- OIE: carrying out under the vet authority, the killing of animals infected and suspected to be infected.
- FAO: designation of clean & infected zones, intensive disease surveillance within the infected zone, quarantine of livestock movement, and immediate slaughter and disposal of all susceptible animals (depopulation).

5

DEPOPULATION

Depopulation

- Depopulation is culling AND disposal

Humane Killing

- Methods used should result in immediate death of an animal or immediate loss of consciousness lasting until death; when loss of consciousness is not immediate, it should not cause anxiety, pain, distress or suffering in animals.
- The method of restraint of an animal should be considered part of the killing process.

6

LESSON 2: PRINCIPLES FOR OUTBREAK RESPONSE

7

THE FOUR PRINCIPLES OF OUTBREAK RESPONSE

- Protect humans
- Protect animals
- Contain the virus
- Make the outbreak a single event

p. 2 in your *Participant Manual*

8

LESSON 3: ASSESSING THE CULLING OPTIONS

9

OIE RECOMMENDED POULTRY KILLING METHODS

4 generic categories:

- physical
- chemical
- electrical
- gaseous agents

10

NOT TOO SIMPLE!



NOT TOO COMPLICATED!



BUT DON'T OVERKILL IT EITHER



ELECTROCUTION



CONTAINER GASSING



CONTAINER GASSING WITH CULLINGBAGS



WET FOAM SYSTEM



GAS LIFT SYSTEM



COMPLEX CONTAINER SYSTEMS



19

METHODS USED IN GHANA

- What are the culling methods used in Ghana?
- Which are most effective? Most appropriate?

20

AVOID EXTRA POULTRY HANDLING



21

MAKE SURE YOUR CARCASS DISPOSAL OPTION IS IN PLACE IN TIME



22

AVOID CULLING IN THE OPEN AIR



23

Table Discussion

With your table group, review and answer the questions on p. 6 in your *Participant Manual*.

Take 10 minutes for your discussion and be prepared to share your answers.

24

LESSON 4: DISPOSAL OPTIONS

25

DISPOSAL METHODS

- Burial
- Incineration
- Rendering
- Composting

26

..... AND HOW WOULD YOU DEPOPULATE THIS?



27

INCINERATION



28

BURIAL



29

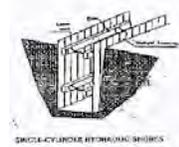
CONTROLLING EXCAVATION HAZARDS



Sloping in type C soil



Shielding



Shoring

30

IN HOUSE COMPOSTING



31

OPTIONS IN GHANA

32

Disposal Methods

- Which of the four methods do you see used most often?
- What experiences have you had with rendering?
- What are some lessons you've learned in working with composting and burial?

33

DEPOPULATION AND DISPOSAL OPTIONS

REFLECTION

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CLEANING AND DISINFECTION PRINCIPLES

Ghana Biosecurity, Surveillance, and Outbreak Response TOT

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Photo Credits

Bird Flu Control
Andrea Miles
Jarra Jagne
Federal Livestock Dept. Nigeria

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MODULE PURPOSE

To familiarize participants with the concepts of decontamination and decontamination procedures appropriate for use in the event of an outbreak.

3

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MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Define cleaning and disinfection and explain what each accomplishes;
- Recognize the contents of the decontamination kit;
- Describe decontamination procedures for use in the event of an outbreak.

4

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Decontamination

Removal or neutralization of disease organisms (or hazardous chemicals) through a process of cleaning and disinfection.

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Decontamination Is Key To Human and Animal Health



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Why do we decontaminate?

- To destroy viruses and other disease organisms
- To prevent contamination of people
- To allow for safe repopulation
- Decontamination is a key component of routine biosecurity on farms and in bird markets



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Survival of Avian Influenza Virus

- Virus can survive:
 - Up to 4 days at 22°C
 - 35 days at 4°C in poultry manure
 - > 30 days at 0°C in water



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Survival of Avian Influenza Virus

- Virus can survive several days in carcasses at room temperature or up to 23 days if refrigerated




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Live Bird Markets Are A Likely Source of HPAI Transmission



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Agents that Deactivate Avian Influenza Virus:

- Some soaps when used with water
- Many household detergents / cleaners
- Disinfectants and Chemicals



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Decontamination = Cleaning + Disinfection

1. Clean: remove organic material, dirt and grease
2. Disinfect: using an appropriate disinfectant for the job



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TRUCK DISINFECTION



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Cleaning is a two-step process

- Dry cleaning: Using a brush, a rag or tools such as blow dryers to remove dry organic material
- Dry cleaning should not be used for cleaning poultry houses which contained flocks infected with HPAI
- Dry cleaning may cause aerosolization of the virus and increase the risk of infection for humans

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Cleaning is Improved With:

- Soaps
- Detergents
- Warm water
- Scrubbing
- Brushing
- Power washers




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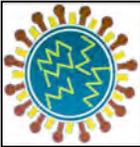
Wet Cleaning

- Wet cleaning: Using soap and water, soak the area and scrub to remove remaining organic material as well as dirt and grease
- Wet cleaning reduces the risk of aerosolization of virus

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Soaps and Detergents




- Destroy the fat in the virus membrane, killing the virus
- Membrane is double outer and inner white layer in diagram and the dark outer ring in electron micrograph

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When Cleaning Poultry Houses:

- Remove manure down to bare concrete or wood
- If possible, use high-pressure spray to clean
- Disinfect




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Cleaning after Depopulation

- Once the virus has been destroyed, the manure and feed should be removed down to a bare concrete floor
- If the floor is earthen, one inch or more of soil should also be removed
- The manure can be buried at least 5 feet deep. It may also be composted for 90 days or longer, depending on the environmental conditions
- The compost should be tightly covered with black polyethylene sheets to prevent the entry of birds, insects, and rodents

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Cleaning after Depopulation

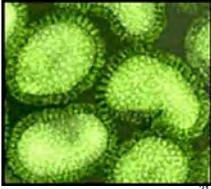
- Feathers can be burned; alternatively, they may be removed and the area wet down with disinfectant
- High-pressure spray equipment should be used to clean all equipment and building surfaces
- Once all surfaces are clean and free of all organic material, the entire premises should be sprayed with an approved residual disinfectant
- Cresolic or phenolic disinfectants are usually effective

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Disinfection Concepts

- Avian influenza virus is killed by:
 - Sunlight
 - Heat
 - Drying
 - Most disinfectants

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Disinfectants

Chemical Group	Examples
Oxidizing agents	Hydrogen Peroxide Virkon®
Alcohols	Isopropyl, Ethanol
Halogens	Betadine (iodine) Sodium hypochlorite
Phenolics	Lysol Tek-Trol
Quaternary Ammonium	Roccal, Quatracide
Coal Tar Distillates	Cresol and Cresolic Acid
Aldehydes	Glutaral, Glutaraldehyde, Formaldehyde

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Choosing the Right Disinfectant

The choice of disinfectant will depend on the following:

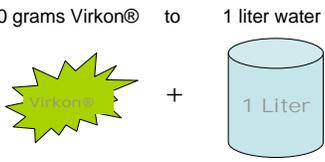
- Cost
- How efficiently it destroys viruses and other organisms
- Temperature
- Activity with organic matter
- Toxicity - how safe is it for both animals and humans?
- Contact time and residual activity
- Effect on fabric and metal equipment
- Solubility (acidity, alkalinity, pH)

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Disinfection Concepts

- Disinfectants need to be mixed properly to be effective
- Example:
 - 10 grams Virkon® to 1 liter water



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Disinfection Concepts

- Check label for instructions on safe use
- As a safety measure, never mix disinfectants from the different chemical groups

NEVER MIX




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Disinfection Concepts

- Organic material such as excrement or dirt absorbs disinfectants and makes them less effective: clean before you disinfect




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Disinfection Concepts

- The virus survives well in water
- Rinsing with water is not enough--**WATER CAN SPREAD THE VIRUS**
- Both detergents and disinfectants must be used




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Disinfection Concepts

- Bird feces is the biggest danger for spreading the avian influenza virus
- Disinfect cages when moving birds




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Wooden Equipment is Difficult to Clean and Disinfect



29

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Disinfection Concepts

- Transmission of the virus has been strongly linked to transporting live birds, contaminated dead birds or litter in vehicles
- Be sure to decontaminate all vehicles and equipment!




30

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Decontamination During Outbreaks



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Virkon® – Safety issues

- Virkon® is non-toxic but it is best to avoid contact with the skin and eyes
- When Virkon® is used on food preparation surfaces, it is important to rinse the area well with water after air-drying

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Preparatory activities

- Soak bird carcasses with Virkon®
- Remove carcasses
- Remove all organic matter (litter and manure) from the buildings
 - Bury or compost on the premises, or
 - Double bag it and take to a designated landfill or incinerator

39

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Cleaning

- Use a detergent and pressure washer (if available) and thoroughly soak
 - Floors
 - Walls
 - Ceilings
 - Nest boxes
 - Feeders
 - Fans and other equipment
- Allow 10 minutes for detergent to penetrate and then scrub everything accessible with a scrub brush

40

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Disinfecting

- Disinfect fans and other electrical equipment, using a cloth soaked in Virkon®
- Spray all areas with Virkon, including bird housing, barnyards, and paths
- Allow Virkon® to soak for at 24 hours before rinsing

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Disinfecting, *continued*

- Disinfect village footpaths and roads
- Allow disinfectant to soak in for at least 30 minutes



Note: Pictures show disinfection using lime (calcium hydroxide)

42 

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DISINFECTATION OF BACKYARD CHICKEN HOUSE



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Repeating the Decontamination Procedure

After 7 days have passed, repeat decontamination procedure (both cleaning and disinfecting)

44

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Repopulation

- Repopulation should not occur until the outbreak has been declared eradicated
- OIE recommends waiting 21 days after removal of last infected birds
- Sentinel birds may help to determine if disinfection is complete




45

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Exercise: Decontamination Case Study



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Exercise: Decontamination Case Study

Turn to p. 9 in the *Participant Manual*.

Read the case study and study the photo.

With your table group, answer the questions:

1. How can you help the farmer do a better C&D (refer to the picture) with the funds the government has allocated?
2. What do you see wrong with this picture?
3. What disinfectant will you recommend?

Take five minutes for your discussion and choose a reporter.

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CLEANING AND DISINFECTION PRINCIPLES

REFLECTION



POULTOPIA SIMULATION

Ghana Biosecurity, Surveillance, and Outbreak Response TOT



MODULE PURPOSE

To provide an opportunity to apply technical and practical information on culling and disposal techniques as well as on outbreak response and site management.

2



MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Identify important outcomes and actions for the implementation of a simulated situation;
- Plan a response strategy;
- Develop recommendations on culling and disposal techniques;
- Practice intra-team collaboration.

3



Small Group Exercise

It's time to apply the concepts we have covered on managing an outbreak response: restricting movement, containing the spread, managing the site and depopulating.

Take a few minutes to:

- Read through the River Mohr scenario on p. 2 in the *Participant Manual*.
- Read the instructions on p. 3 in the *Participant Manual*.

4



Small Group Exercise

STEP 1

- Use colored markers to identify the red, orange, yellow, and green zones on your map.
- Use the symbols to show the following on your map:
 - Entrance/checkpoints, registration and administration points, and human health care point
 - Storage, food & beverage distribution, and sanitation points
 - Culling point(s) and carcass disposal points

5



Small Group Exercise

STEP 2

- Use the symbols to show on the map which people will be involved at the various points of the outbreak response. Identify the number of people you will need for each function (write the number the symbol).
- Use the symbols to show on the “Who’s in Charge” chart the people who will be involved at the national, regional and local levels. Identify the lead person at each level on your chart.

6



Small Group Exercise

STEP 3

- Use the “Checklist for Assessing Culling and Disposal Options” (on the next pages) to assess the scenario and develop recommendations on the most appropriate culling and disposal techniques.
- Write the culling technique you have chosen on the “**Culling and Disposal**” chart. List the time it will take for you to complete the culling as well as the equipment you will need for culling, cleaning, disinfection, and disposal.

7



Small Group Exercise

STEP 4

- Prepare a five-minute presentation of your recommendations.
- Select a reporter to share your recommendations with the group.

8



Small Group Report Outs

Share with us a brief presentation of your recommendations!

9



Summary and Reflection

- What was it like to conduct this level of planning?
- What was the hardest part for you to complete? Why?
- What are the two most important things you want to remember from this exercise?
- What do you want to learn more about? How will you do this?

10



POULTOPIA SIMULATION

REFLECTION



CONSIDERATIONS IN OUTBREAK RECOVERY

Ghana Biosecurity, Surveillance, and Outbreak Response TOT



MODULE PURPOSE

To discuss the range of issues, options, and challenges in the recovery stage of an H5N1 HPAI outbreak.

MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Describe basic recovery options and benefits;
- Understand the challenging issues related to vaccinating to prevent HPAI;
- Understand the components and challenges of compensation for culling poultry.

2



LESSON 1: RECOVERY



Recovery Measures

- **Waiting**—Verify a sufficient waiting period before restocking
- **Determine infection source**—Determine how a flock became infected and correct any deficient biosecurity measures
- **Compensation**—Compensation for losses, provided by governments, communities, or co-ops, encourages participation and cooperation
- **Vaccination**—Controversial but can be used together with biosecurity
- **Restore Confidence**—When an outbreak is over, it is important to communicate effectively with consumers and the public to restore their confidence

4



Recovery in Different Scenarios

Consider how you might address recovery differently given specific scenarios:

- Smallholder Poultry
- Live-Bird Wet Markets
- Commercial Flocks
- Zoos and Aviary Collections
- Wildlife

•Take ten minutes to read through the sections on p. 2-6 in your *Participant Manual*. Then we will discuss each.

5



Recovery in Smallholder Flocks

- After the site has been thoroughly cleaned and disinfected, wait for a period of time required for virus to die before restocking to reduce the risk of infecting the replacement flocks.
- **Compensation** for losses, provided by governments, communities, or co-ops encourages participation and cooperation, especially when owners may rely solely on the sale of their birds for their livelihood.

6

Recovery In Live Bird Markets

- After the site has been fully cleaned and disinfected, have the market **inspected** by someone knowledgeable about disease before restocking.
- Verify a **sufficient waiting** period before repopulating (24 hours after inspection verifies thorough cleaning or several days if there is uncertainty about how well the market has been cleaned).
- Determining the source of infection is critical and may take additional time. Repopulation without getting rid of the infection in supply flocks will result in immediate reinfection of the market.

7

Recovery In Live Bird Markets

- **Compensation** for losses, provided by governments, communities, or co-ops, encourages participation and cooperation
- Accurate information about disease outbreaks can help to **restore consumer confidence** in wet market businesses

8

Recovery in Commercial Farms

- **Wait for period** of time required for virus to die before restocking to reduce the risk of infecting the replacement flocks (at least 2 weeks)
- **Compensation** for losses, provided by governments, communities, or co-ops, encourages participation and cooperation
- Communication with consumers and trading partners to **restore confidence** is critical to the recovery of businesses
- Putting sentinel birds in buildings that were previously infected and went through depopulation, cleaning, and disinfection may confirm that those facilities no longer have the virus.

9

Recovery in Zoos and Aviaries

- **Wait** for period of time required for virus to die before restocking to reduce the risk of infecting the replacement animals.
- It is a good idea to **use sentinel** birds to ensure virus is gone before fully restocking.
- Consider vaccinating replacements.
- **Restoring the confidence** of visitors and tourists after an outbreak is important in restoring income streams.

10

Recovery and Wildlife

- Continued prevention through biosecurity measures in the area surrounding infection is important.
- Many wildlife areas rely on tourism for income and volunteers as a workforce and it is critical to communicate accurate information about disease status to restore confidence in visiting refuges after disease detection.

11

What about Vaccinating Poultry?

Vaccination is an addition to biosecurity and NOT an alternative to proper biosecurity measures!

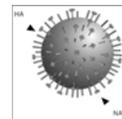


Figure 1: Influenza A Virus

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Vaccination

Response in poultry

- Influenza vaccines do not create “sterilizing immunity”—a response so strong that birds will resist infection.
- Birds that are vaccinated are more resistant to infection than unvaccinated birds.
- Vaccinated birds do not show clinical signs of disease and shed much less virus than unvaccinated birds.

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H5N1 and H5N2(Infection and Vaccine)

- Vaccinating Chickens with an H5N2 vaccine to protect them from H5N1 infection and to tell if they are vaccinated, you would test for N type. If the result indicates N2, then the chicken has been vaccinated. If the result is N1, then the chicken is infected. If the result indicate N1 and N2, then the chicken is vaccinated and infected.
- DIVA- Differentiating(D) infected (I)from Vaccinated(V) Animals(A)

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LESSON 2: COMPENSATION

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Compensation

What is compensation?

- Compensation is defined as a payment for losses incurred

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1. Why Is Compensation Important?

- Compensation encourages disease reporting and compliance with culling regulations.
- Farmers are more likely to cooperate if they know they can recover the cost of culled birds.
- Compensation in poor countries is even more essential to prevent an adverse impact on people’s livelihoods.

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2. How Much Compensation Should Be Paid?

- The market value of the birds at the time of depopulation is usually the rate used for compensation but the determination of market value itself has to be done carefully.
- It is important to apply uniform rates of compensation in the whole country. Different prices can be paid for different species and categories of birds but care should be taken not too have too many categories that will make the plan difficult to administer.

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3. How Is Compensation Paid?

- Compensation can be paid by cash, checks or in-kind
- For large commercial operations that are financially more organized, money is given in the form of a written check.
- For small scale farmers and poultry traders in live bird markets, cash payments are commonly provided.
- It may be possible to replace culled birds with healthy birds for restocking but this type of compensation is difficult to administer. Birds may have to be culled again if the disease situation is unstable.

19

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4. What Needs to be Done to Ensure Proper Compensation?

- Proper record keeping or registration is the basis for the success of any compensation program.
- The veterinary services and its culling teams must keep accurate records of the age, type of birds killed, and the number of birds that died that died during the outbreak together with the owner's name and location.

20

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5. Who Makes The Payments?

- A simple system should be set up by the government.
- Money can be paid out at religious institutions, government offices and the homes of the farmers.
- Non-governmental organizations can help give out payments.

21

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6. Who Funds The Payments?

- Taxes can be collected from commercial farmers
- Some commercial farmers can pay for private insurance
- Countries may have to seek assistance from regional groupings

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Example: Compensation Rates For Ghana

Appendix I: Compensation Rates to Persons Whose Birds are Destroyed in the Control of Bird flu Outbreaks in Ghana

Class of birds	Market Price GH cedis	Percentage Payment, %	Amount payment, GH cedis
Parents			
Broiler	12.00	90	10.80
Layer	9.00	90	8.10
Commercial			
Layer	5.00	85	4.30
Broiler	5.50	85	4.40
Turkey	50.00	85	40.00
Duck	3.00	70	2.10
Cockerels	3.00	70	2.10
Table eggs	0.10	50	0.05
Fertile eggs	0.30	60	1.80
Day-old chicks(Broiler)	0.70	90	0.65
Day-old chicks(Layer)	1.10	90	1.00
Quinea fowl	3.00	70	2.10

Source : National Task on Avian Influenza(2007)

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How to Fund Compensation Programs

- **National funding**--Some countries are able to fund compensation programs entirely from their national budget.
- **Cost-sharing approach** between government and industry has become common in many countries. When producers bear some of the costs of disease outbreak control, they are more motivated to cooperate in prevention and control methods. Since public health and domestic and international trade can be greatly affected by HPAI outbreaks, government agencies in these sectors may also contribute to compensation funds.

24

How to Fund Compensation Programs

- **Industry Funding**—In some countries, larger producers have contributed funds to compensate smaller farmers, in the interest of protecting trade and export activities.
- **International Organizations' Funding**-- The risk of an avian flu pandemic in humans has caused some international organizations to consider funding of compensation programs in developing countries as a public health priority. Non-governmental organizations and donor and development bank financing are therefore becoming more frequent partners in funding HPAI compensation programs.

25

EXERCISE: DESIGNING COMPONENTS OF A COMPENSATION PROGRAM

Read the scenario on p. 14 in your *Participant Manual*.
With your group, answer the four questions listed.

Be prepared to share your recommendations with the larger group.

You have 20 minutes to complete the exercise.

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CONSIDERATIONS IN OUTBREAK RECOVERY

REFLECTION



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WET LAB

Ghana Biosecurity, Surveillance, and Outbreak Response TOT



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Team Assignments

We will work in five groups:

GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5

2



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Wet Lab Logistics

- Meeting Time: **XXXXX**
- Meeting Place: **XXXXX**

We will come back to the hotel in time for lunch and then reconvene in the conference room at **XXXX p.m.**

Please review your Wet Lab Manual over the weekend!

3



FIELD VISIT OBSERVING BIOSECURITY

Ghana Biosecurity, Surveillance, and Outbreak Response TOT



MODULE PURPOSE

To provide an opportunity to apply technical knowledge on biosecurity and surveillance planning to a real world farm setting.

MODULE OBJECTIVES

At the conclusion of this module, participants will be able to:

- Complete a data collection and outbreak investigation form;
- Identify biosecurity infractions and recommend solutions for dealing with the infractions.

2



Team Assignments

We will work in five groups:

GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5

3



Team Task: Preparation

- With your team, review the field visit forms and checklists that you will fill out. Plan how you will organize yourself in your teams (how you'll use your time, share assignments to complete the forms, etc.).
- Identify what you want to pay attention to and take note of at the various sites.
- Identify what questions you want to ask the owner/manager and workers.

4



Team Task: Onsite During the Field Visit

- Observe and record biosecurity risks and strengths
- Gather additional information about current practices by interviewing owners/managers and workers
- Complete the forms and checklists

5



Team Task: Debriefing the Field Visit

- Prioritize the biosecurity risks
- Develop recommendations to address the top risks
- Plan how you would communicate your findings and recommendations to the owners/managers and workers
- Be prepared to share your findings and recommendations with the group

6

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Field Visit Sites

	Name	Location
Poultry Farm		
Hatchery		
Feed Mill		

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Field Visit Logistics

- **Meeting Time:**
- **Meeting Place:**
- **Lunch arrangements:** Box lunch at the poultry farm

After the field visit, you will be transported back to the XXXXXX Hotel. We will reconvene at XXXX a.m. to debrief the visit.

8

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Field Visit Debriefing

With your team, discuss and record on flipchart paper:

- Some general observations and findings
- The top 3 biosecurity risks you observed
- Recommendations to address the 3 top risks
- Your communications approach for sharing your recommendations with the owners/managers and workers
- You have 1 hour to prepare. Each team will have 10 minutes to make a brief presentation on your findings.

9

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Field Visit Debriefing

GENERAL OBSERVATIONS	
TOP 3 RISKS 1. 2. 3.	RECOMMENDATIONS 1. 2. 3.
COMMUNICATIONS APPROACH	

10

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Team Presentations

As you listen to each group's presentation, think about these questions:

- What did you like about their recommendations and/or approach?
- What advice would you give them about their recommendations and/or approach?

11

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Discussion

- What are you noticing about the biggest biosecurity risks in the field?
- Does what you're hearing confirm what you've observed in the past or does it surprise you?
- What are you learning about what it will take to address these risks?

12



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**FIELD VISIT OBSERVING
BIOSECURITY**

REFLECTION

METHODOLOGY FOR TRAINING ADULTS

Ghana Biosecurity, Surveillance, and Outbreak Response TOT

Module Purpose

To introduce the Experiential Learning Cycle and effective tools for delivering training to adult learners.

2

Module Objectives

At the conclusion of this module, participants will be able to:

- Describe the elements and value of the Experiential Learning Cycle and how it applies to training adult learners;
- Plan and deliver organized presentations which are crafted to a specific audience;
- Use a core set of facilitation skills to conduct training sessions and present the key ideas and concepts from the Stop AI Biosecurity, Surveillance, and Outbreak Response Course.

3

THE ADULT LEARNER

The Adult Learner

- Describe the typical adult learner you will be working with. How will he/she best learn?
- What would characterize an effective learning event for these adult learners?

5

At your table groups:

- Discuss your answers with each other.
- Share some examples of your description of a typical adult learner and the kind of learning event best suited to these learners.
- Put your notes on flipchart paper and be prepared to share with the larger group.
- Take 20 minutes for your discussion.

6

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Adult Learners...

- ...are most focused on solving real work problems that make a difference to them.
- ...come with significant life experiences and want to be respected for their experience.
- ...can skip many basics and theoretical points; they like to go right into the practical application of what they are learning.

7

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Adult Learners...

- ...have many demands and commitments, which often get in their way of learning; they have responsibilities outside of the workshop.
- ...like to be engaged and have fun while learning.

8

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Discussion

What does a trainer/facilitator do to create an effective learning environment for our participants?

9

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Effective Training for Adult Learners

- Makes explicit links between real world and content.
- Is participatory – provides opportunities to share or contribute ideas.
- Includes practice in the use of skills or frameworks.
- Integrates and makes links between sessions/topics.
- Uses a mix of methodologies.
- Matches methods to content in ways appropriate for the learning you are trying to achieve.

10

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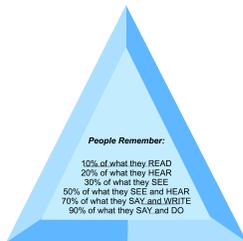
Effective Training for Adult Learners

- Challenges participants to be analytical.
- Helps participants identify the relevance/importance/applicability to their work.
- Balances individual and group context for learning.
- Supports theoretical frameworks with concrete examples.
- Provides materials/resources that eliminate obstacles to learning.

11

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Dale's Cone of Experience



People Remember:

- 10% of what they READ
- 20% of what they HEAR
- 30% of what they SEE
- 50% of what they SEE and HEAR
- 70% of what they SAY and WRITE
- 90% of what they SAY and DO

12

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How People Learn

People learn by moving from:

- the old to the new
- the simple to the complex
- the familiar to the unfamiliar
- the concrete to the abstract
- the practical to the theoretical
- the present to the future

13

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Discussion

Why is it important for us to understand our audience before a course begins?

14

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Training Needs Assessments

Complex assessments are usually done before a series of courses are designed.

When designing a single course, a simple assessment of some of the participants will help us understand what their needs might be.

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Training Needs Assessments

Sample Methods:

- Surveys
- Observation
- Interviews
- Focus groups
- Document reviews (previous course evaluations, etc.)

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THE EXPERIENTIAL LEARNING CYCLE

17

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Experiential Learning Cycle (ELC)

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Experiential Learning Cycle (ELC)

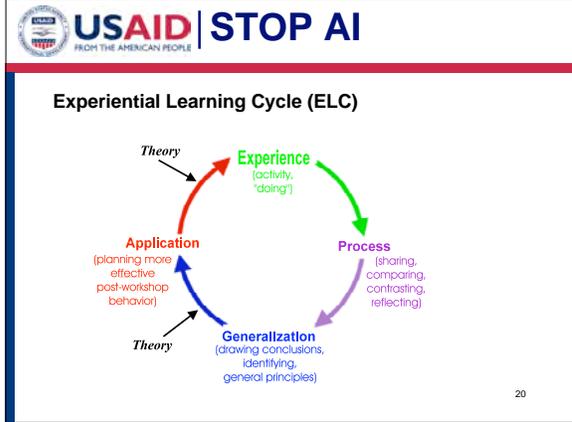
First, you have people **do something** – complete an exercise, solve a problem, etc. (experience)

Then you encourage them to **talk about what they did** and to pull out any lessons they learned (processing)

Next you **explore whether the lessons learned are useful** to other situations (generalizing)

Finally you ask them to think about **how they will apply** what they learned when they go back to their work places (application)

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The ELC in Training Design

Read through the assigned Trainer Guide module and identify the following:

- **Experience:** examples where participants are asked to do something.
- **Processing, generalizing, application:** examples of how the trainer guide handles the questioning to help participants process the experience, drawing out lessons learned, generalize principles and apply them to real world situations.
- Take 20 minutes for this discussion

21

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Discussion

- How does processing differ from generalizing?
- What specific questions can you use to start the processing?
- Which step in the process is most likely to be skipped? What is the implication of skipping it?

22

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FACILITATION SKILLS

23

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What are Facilitation Skills?

- Facilitation skills are core skills for all effective trainers.
- They are the glue that holds the training sessions together and keeps the learner engaged.
- These skills appear simple, but to be effective, they take lots of practice and an understanding of what you are trying to accomplish with the use of each skill.

24

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Making Presentations More Interactive

TIPS

- Stop to elicit input
- Summarize frequently
- Use concrete examples
- Employ humor
- Ask questions

25

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Making Presentations More Interactive

2. Pose questions to the group. Facilitate the group to answer the question rather than answering it yourself.

26

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Making Presentations More Interactive

Some Sample Processing Questions

What are your observations about _____?

Where did you have difficulties?

What surprised you?

What worked?

What were your reactions?

27

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Making Presentations More Interactive

Some Sample Generalization Questions

What have you learned about...?

What conclusions about _____ can we draw from this?

What principles can we develop from this?

What are some significant points to remember from this section of the course on _____?

28

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Making Presentations More Interactive

Some Sample Application Questions

How can you apply _____?

How can you use _____?

As a result of our work on _____, what will/can you now do differently when you return to your job?

What do you still need to work on during the rest of the course?

29

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METHODOLOGY FOR TRAINING ADULTS

REFLECTION

FACILITATION SKILLS PRACTICE

Ghana Biosecurity, Surveillance, and Outbreak Response TOT

Module Purpose

To provide an opportunity to apply technical and practical information and practice facilitation skills to deliver training on biosecurity, surveillance and outbreak response.

2

Module Objectives

At the conclusion of this module, participants will be able to:

- Use facilitation skills to:
 - Encourage participation when delivering interactive presentations/lecturettes;
 - Generate interaction among participants;
 - Guide learners through an experiential module;
- Practice the training techniques incorporated into the Stop AI Biosecurity, Surveillance, and Outbreak Response TOT Trainers Guide.

3

Asking Questions

- Asking open-ended questions that elicit more information
- Asking closed-ended that results in “Yes,” “No,” “Maybe”, or a finite, specific answer

4

Paraphrasing

- Restating in your own words what you heard-both thoughts and feelings
- Be careful not to interject your own analysis

5

Summarizing

- Brings closure to conversation
- Makes a transition
- Repeats key points/decisions/next steps that have been discussed or decided

6



Encouraging

- Verbal and non-verbal use of your body and voice to send signals that you care about the person and what s/he is saying.
- Expressed by listener
- Can have cultural dimension

7



Other Helpful Techniques

- Nod your head
- Maintain eye contact
- Keep an open body position
- Make encouraging statements
- Repeat the last word or two of the speaker
- Repeat a sentence

8



Practicing Facilitation Skills

TOPICS:

- The procedure for properly donning a PPE
- [Elements of a good surveillance system](#)
- Depopulation and disposal options in Ghana
- [Lessons learned from the outbreak response in Ghana](#)
- Effective biosecurity measures for a smallholder farm

9



Practicing Facilitation Skills

You will be facilitating a discussion with a small group of no more than four people on one of the suggested topics. You may choose your topic.

Using the facilitation skills guidelines in the previous module, think about and prepare for your practice facilitation. You have 20 minutes to prepare.

You will have 10 minutes to facilitate this discussion, and 5 minutes to receive feedback from the participants.

10



Practicing Facilitation Skills

What are the key points you are going to present?

What questions will you ask to elicit participation and discussion?

How will you use the other facilitation skills during your practice?

p. 5 in your *Participant Manual*

11



Task in fours

- Each person will have 10 minutes of practice facilitation
- Each person will receive 5 minutes of feedback and discussion
 - What skills did the facilitator use?
 - What impact did they have on the discussion?
 - What is one example of something that could have been done differently to make the discussion more interactive?

12

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Record Your Feedback

What you are doing well:

Areas for improvement:

What are you discovering about using facilitation skills to elicit participation?

What skill areas do you want to pay particular attention to as you both prepare for and practice your training session?

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Debriefing the Practice

- How did it feel to practice?
- What was easier than they expected?
- Which skills were used the most? Examples?
- What was more difficult and why?
- What impact did paraphrasing seem to have on the discussion?
- What did you discover about the role of listening in facilitation?
- What will you want to do more of in your own training sessions?

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OTHER TRAINING TECHNIQUES

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Preparation – Proper Prior Planning Prevents Poor Performance

- Logistics – Ensure you have considered the room set-up, learning materials and equipment needed
- Know whom to call for assistance for:
 - Equipment issues
 - Additional supplies
 - Refreshments

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Preparation -- Planning, *continued*

Meet with your co-trainer to:

- Discuss how you will work together
- Review the agenda, materials and organize the timing based on what you need to be covering in each section
- Practice how you will introduce the session
- Review the guidelines for participation

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Preparation – Before Participants Arrive

- Arrive early to set-up the room:
 - Materials are in place
 - Charts prepared
 - Pre-printed charts – agenda, additional guidelines-posted
 - Sign-in sheet is easily accessible
 - Equipment is working

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Creating the Positive Learning Environment

- Greet participants as they arrive.
- Direct participants to the sign-in sheet and to refreshments area
- Remind participants that you will begin the session promptly
- Make introductions

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Getting Started

- Begin on time
- Introduce yourself for the benefit of those you may not have greeted before the session
- Review the agenda and learning objectives – ask if there are questions
- Review the guidelines for participation, add others if indicated and gain commitment

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Delivery

- Speak clearly and loud enough for people to hear
- Be energetic about the topic
- Remember the time – don't rush or go too slow
- Pay attention to your participants - non-verbal cues

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Transitions

Use transitions to weave ideas together (make connections) and signal that you are making a new point and/or moving to the next topic.

- *“Now that we’ve covered...”*
- *“The next important factor is...”*
- *“Finally, let’s consider...”*
- *“Let’s take a break and when you return we’ll...”* or
- *“We started here this morning, after break we will pick up....[re-cue the agenda]”*

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Co-training

Trainers work collaboratively to design the training session and determine the best methods to use.

Trainers then plan who takes the lead for delivering which parts of the session.

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Co-training

Use the two checklists in your *Participant Manual* to help you plan for your practice training sessions:

- [Focusing on the Audience](#)
- [Presentation Planning](#)

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PRACTICE TRAINING PREPARATION

Practice Training

- You will be working with a co-trainer. Together, you will present a 45-minute portion of one of the training modules from this course.
- You and your co-trainer may choose any part of a training module that you would like. Be sure that the sections you select are consecutive and that they will give you the opportunity to present material, facilitate a task, and do some processing questions.

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Practice Training

- You will have the whole morning tomorrow for preparation time. Each team will be assigned a presentation time.
- Each training team will receive 15 minutes of feedback from the trainers and/or your colleagues after your presentation.

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Instructions for Practice Training

- Find a partner to work with and agree on a module from the STOP AI Biosecurity, Surveillance and Outbreak Response Trainer Guide that you would like to present.
- Review the **design** of your module. Make sure you are both clear on the points the module is making.

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Instructions for Practice Training

- Choose segments from the module that total a 45-minute session. Highlight **key points** from the presentation, and choose **one small group activity** to practice.
- Divide** the work between the two trainers to prepare for delivery.
- Make sure you prepare the **supporting materials** that you will need (flipcharts, slides, handouts, etc.).

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Practice Training

Your team will be assigned one time slot:

THURSDAY		GROUP A	GROUP B
Round One	2:00 – 3:00	Team 1	Team 2
Round Two	3:00 – 4:00	Team 3	Team 4
	4:00 – 4:15	BREAK	
Round Three	4:15 – 5:15	Team 5	Team 6
	5:15 – 5:30	Debrief	
FRIDAY		GROUP A	GROUP B
	9:00 – 9:15	Prepare for the Day	
Round Four	9:15 – 10:15	Team 7	Team 8
	10:15 – 10:30	BREAK	
Round Five	10:30 – 11:30	Team 9	Team 10

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FACILITATION SKILLS PRACTICE

REFLECTION

PRACTICE TRAINING

Ghana Biosecurity, Surveillance, and Outbreak Response TOT

Practice Training Schedule

THURSDAY		GROUP A	GROUP B
Round One	2:00 – 3:00	Team 1	Team 2
Round Two	3:00 – 4:00	Team 3	Team 4
	4:00 – 4:15	BREAK	
Round Three	4:15 – 5:15	Team 5	Team 6
	5:15 – 5:30	Debrief	
FRIDAY		GROUP A	GROUP B
	9:00 – 9:15	Prepare for the Day	
Round Four	9:15 – 10:15	Team 7	Team 8
	10:15 – 10:30	BREAK	
Round Five	10:30 – 11:30	Team 9	Team 10

2

Debriefing the Practice So Far

What did you like about your facilitation during the practice session?

What do you think you could have done differently?

What advice do you have for the remaining groups?

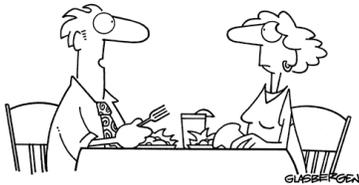
3

Sneak Preview...

We will be completing the Reflection on p. 23 of the Facilitation Skills Practice module in your *Participant Manual*...you may want to look ahead and be thinking about the questions...

4

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"I gave a presentation today but I only pretended to know what I was talking about. Fortunately, my audience was only pretending to listen."

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DEBRIEFING THE PRACTICE TRAINING

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"If I can put everyone to sleep within the first five minutes, the rest of my presentation should go pretty well."

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Debriefing the Practice Training

Using the page in your *Participant Manual*, reflect first individually, and then with your co-trainer on the following:

What did you like about your facilitation during the practice session?
What do you think you could have done differently?

What have you learned from your experience of:

- Planning for your session?
- Delivering your session?
- Co-training with your colleague?
- Using facilitation skills?

What will you want to do now to be better prepared to deliver the training?

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Some Common Mistakes in Training Delivery

- Processing Questions That Do Not Relate To the Experience
- No Application Questions to Help Participants Relate Session to Their Work/Life
- Not Maximizing Participant Involvement

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Time to Wrap Up...

...and plan how you will apply your learning from the **STOP AI Ghana Biosecurity, Surveillance and Outbreak Response Training of Trainers (TOT)**!

Turn to p. 2-3 in the APPLICATION PLANNING section at the back of your *Participant Manual*.

Take 5-10 minutes to complete the worksheet.

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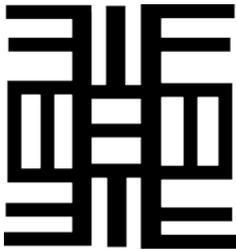
Course Evaluation

- Please complete the final evaluation.
- We value your comments, suggestions and feedback!

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Best of luck with your training on AI!



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