Food and Agriculture
Organization of the
United Nations

Texas A&M AgriLife

Frontline curriculum
Instructor manual

IN-SERVICE APPLIED VETERINARY EPIDEMIOLOGY TRAINING

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Table of Contents

Acronyms/Abbreviations

AI	Avian Influenza
A-P-T	Animal, Place and Time
ASF	African Swine Fever
AU-IBAR	African Union InterAfrican Bureau for African Resources
BSE	Bovine Spongiform Encephalopathy
BT	Blue Tongue
CAHWs	Community Animal Health Workers
CBPP	Contagious Bovine Pleuropneumonia
CCA	Critical Control Area
CFR	Case Fatality Rate
CQI	Continuous Quality Improvement
CRD	Chronic Respiratory Disease
CSF	Classical Swine Fever
DAR	Directorate of Animal Resources
DTR	Disease Transmission Risk
DVO	Local area Veterinary Officer
ECF	East Coast Fever
EID	Emerging Infectious Disease
ELISA	Enzyme Linked Immunosorbent Assay
FAO	Food and Agriculture Organization of the United Nations
FETPV	Field Epidemiology Training Program for Veterinarians
FMD	Foot and Mouth Disease
FN	False Negative
FP	False Positive
GEMP	Good Emergency Management Practices
GIS	Geographic Information Systems
HPAI	Highly Pathogenic Avian Influenza
IFA	Immunofluorescent Antibody
IR	Incidence Rate
ISAVET	In Service Applied Veterinary Epidemiology Training
KAP	Knowledge, Attitude and Practices
LBM	Live Bird Market
LPAI	Low Pathogenic Avian Influenza
MAIFF	Ministry of Agriculture, Animal Industry and Fisheries
MS	Microsoft
NARO	National Agricultural Research Organisation
NCD	New Castle Disease
NGOs	Non-governmental Organisations
No.	Number
OB	Outbreak

OH	One Health
OIE	World Organisation for Animal Health
PAR	Population at Risk
PCR	Polymerase Chain Reaction
PM	Post-Mortem
PPE	Personal Protective Equipment
PPR	Peste des Petits Ruminants
RT-PCR	Reverse Transcriptase Polymerase Chain Reaction
RTPs	Risk Transmission Pathways
RVF	Rift Valley Fever
RVFv	Rift Valley Fever Virus
SCC	Somatic Cell Count
SOP	Standard Operating Procedure
SRRT	Surveillance Rapid Response Teams
TAD	Transboundary Animal Disease
TB	Tuberculosis
USDA	United States Department of Agriculture
UVA	Uganda Veterinary Association
VFE	Veterinary Field Epidemiology
VTM	Viral Transport Media
WHO	World Health Organization
ZDCO	Zoonotic Disease Coordination Office

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The competencies and skills that serve as the framework for Frontline ISAVET were developed by a global technical working group organised by FAO in July 2018. The lessons, exercises, case studies, field activities and standard operating procedures were developed by the following authors and contributors:

Caryl Lockhart, FAO, Rome (Technical Lead)
David Castellan, TAMUS, IIAD (Technical Lead)
Heather Simmons, TAMUS, IIAD
Dee Ellis, TAMUS, IIAD
Cheikh Fall, TAMUS, IIAD
Sam Okuthe, FAO, Uganda
Chrisostom Ayebazibwe, FAO, Uganda
Francis Ejobi, FAO, Uganda
Andrew Tamale, Makerere University, Uganda
Luke Nyakarahuka, Makerere University, Uganda
Innocent Rwego, Makerere University, Uganda
Sylvia Angibua, Uganda Veterinary Association, Uganda
Zelalem Tadesse, FAO, Kenya
Mark Obonyo, FAO, Kenya
Wonderson Awoke, FAO, Ethiopia
Frederick Kavaria FAO, Kenya
Angela Hilmers, TEPHINET
David Addis, US CDC, USA
Jessica Hill, Focus Area for Compassion and Ethics (FACE)
Emma Cooke, Emory University School of Medicine
Ismaila Seck, FAO, Ghana
Youssouf Kabore FAO, Senegal
Youssou Ndiaye, FAO, Senegal
Philippe Kone, FAO, Democratic Republic of Congo
Bamba Beye, Thies, Senegal
Wilfried Délé, Oyetola, EISMV, Senegal
Ayayi Justin Ayih-Akakpo, EISMV, Senegal
Ibrahima Lo, FAO, Senegal
Moustapha Lo, LNERV, Senegal
Magatte Ndiaye, UCAD, Senegal
Papa Segrine Seck, LNERV, Senegal
Imam Thiam, Senegal Veterinary Association, Senegal
Baba Sall, Director of Animal Health, Ministry of Livestock Production, Senegal

Monitoring and Evaluation for Frontline ISAVET was led by Jessica Cargill, TAMUS, IIAD.

This document was jointly coordinated by Caryl Lockhart, Senior Veterinary Epidemiologist, FAO AGAH/ECTAD and David Castellan, Veterinary Epidemiologist, TAMUS and reviewed internally and externally as follows:

Internal Reviewers:

Caryl Lockhart, Senior Veterinary Epidemiologist, FAO
Mark Obonyo, FAO, Kenya
David Castellan, TAMUS, IIAD
Heather Simmons, TAMUS, IIAD
Holy Akwar, Veterinary Epidemiologist, FAO
Ismaila Seck, FAO, Ghana
Youssou Ndiaye, FAO, Senegal
Philippe Kone, FAO, Democratic Republic of Congo
Jessica Cargill, Assistant Director, IIAD, Texas A&M AgriLife, TAMUS
Dee Ellis, Veterinarian, IIAD, Texas A&M AgriLife, TAMUS
Linda Logan, Professor, College of Veterinary Medicine and Biomedical Sciences (CVM), Texas A&M University
Gisela Gioia, Veterinary Epidemiologist, FAO
Carla Stoffel, ISAVET Technical Officer, FAO
Holy Akwar, Veterinary Epidemiologist, FAO
Cheikh Fall, Veterinarian (Consultant), IIAD, Texas A&M AgriLife, TAMUS
Miguel Gonzalez, Program Manager, IIAD, Texas A&M AgriLife, TAMUS
Justin Buenger, Program Coordinator, IIAD, Texas A&M AgriLife, TAMUS
Sarah Manning, Program Specialist, IIAD, Texas A&M AgriLife, TAMUS
Kayla Cates, Student Assistant, IIAD, Texas A&M AgriLife, TAMUS

External Reviewers:

Curriculum:

Angela Hilmers, Senior Associate Director for Science, TEPHINET
Innocent Rwego, Associate Professor, Department of Veterinary Population Medicine, University of Minnesota
Karoon Chanachai, Senior Veterinary Officer, National Institute of Animal Health, Department of Livestock Development, Thailand

Standard Operating Procedures (SOP):

Thomas Hairgrove, Associate Professor and Extension Specialist, Department of Animal Science, Texas A&M University
Leslie Easterwood, Clinical Assistant Professor, College of Veterinary Medicine and Biomedical Sciences (CVM), Texas A&M University
Innocent Rwego, Associate Professor, Department of Veterinary Population Medicine, University of Minnesota
Brandon Dominguez, Intelligence Officer, Veterinary Emergency Team, College of Veterinary Medicine and Biomedical Sciences (CVM), Texas A&M University
Terry Hensley, Extension Veterinarian at the Texas A&M AgriLife Extension Service and Assistant Agency Director at the Texas A&M Veterinary Medical Diagnostic Laboratory
Jan Hinrichs, Senior Natural Resources Economist, Asian Development Bank

Case Studies:

Christine Budke, Professor of Epidemiology, Department of Veterinary Integrative Biosciences, College of Veterinary Medicine and Biomedical Sciences (CVM), Texas A&M University

Kasetsart University, Thailand

Excel Videos:

Ahmed Ziad Abdilahi, Epidemiology and Risk Assessment Case Coordinator, Livestock Resources and Pastoral Development Bureau, Ethiopia
Samwel Mngumi, Veterinary Officer, Zonal Veterinary Centre – Dodoma, Tanzania
Yembeh Papayo Koroma, Animal Production Officer, Ministry of Agriculture and Forestry, Sierra Leone
Katumba Hannington, Veterinary Officer, Rubanda District Local Government, Uganda

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About this Manual

This manual serves as the primary reference for Frontline ISAVET instructors (trainers) to plan, prepare and deliver the Frontline ISAVET course curriculum and is a companion manual to the Frontline ISAVET Trainer Manual. The manual includes 36 lessons and associated exercises of the Frontline ISAVET course curriculum piloted during two regional trainings in Uganda and Senegal between October and December 2018 and subsequently reviewed extensively by teams of internal and external reviews.

Target Audience

The intended audience for this Manual is the Frontline ISAVET instructors who will implement the four-week didactic and applied Frontline ISAVET course. The target group that instructors will teach include field level veterinarians and para-veterinary professionals enrolled in the course.

Development of the Frontline ISAVET Curriculum

The curriculum foundation work (minimum core competencies and skills) for Frontline ISAVET were developed by a global technical working group organised by FAO in July 2018. The FAO technical working group includes animal health, public health and wildlife health professionals as part of a One Health approach. The competency-skills matrix for the frontline veterinary field epidemiology level was used to develop specific lesson learning objectives for the Frontline ISAVET curriculum.

Specific Objectives of the Frontline ISAVET Curriculum Instructor Manual

The specific objectives of the Frontline ISAVET Curriculum Instructor Manual are as follows:

1. Provide the structure, format and content of the Frontline ISAVET curriculum lessons, exercises and case studies.
    a. This includes specific learning objectives for each lessons.
    b. Available in English and French languages.
2. Demonstrate clear linkage between lesson learning objectives and expected outputs of exercises and case studies.
3. Provide supportive curriculum resource materials, which include MS Excel training videos, standard operating procedures and relevant references.
4. Provide a flexible base upon which to include relevant examples based on the regional and national context.
5. Emphasise the flexibility of classroom exercises designed to accommodate veterinary and para-veterinary trainees that may have different levels of academic and professional experience.

Content Development and Review

The content of the Frontline ISAVET curriculum was developed according to the following steps:

1. The specific learning objectives were developed by TAMUS, IIAD based on the FAO technical working group competency-skills matrix.
2. Lesson outlines were developed which were completed by contributors previously listed.
3. Lessons were adjusted in real-time during the pilot trainings as part of a continuous quality improvement process.

Following the Uganda and Senegal pilot trainings, the Frontline ISAVET Curriculum was re-aligned and further developed as follows:

1. English internal review by FAO IIAD epidemiologists.2. English external review by experienced field epidemiologists from animal health (Thailand), public health (USA) and wildlife health (Uganda).
2. French internal review by FAO epidemiologists from west and central Africa.
3. Final internal review by FAO IIAD epidemiologists.

Frontline ISAVET Curriculum and Exercise Matrix Overview

The Frontline ISAVET course is comprised of 4 weeks of classroom training that includes one week of field application based on 8 domains, 14 competencies and 51 skills. The Frontline ISAVET curriculum is the common framework to adapt the Frontline ISAVET curriculum for country programmes in the future. The Frontline ISAVET Curriculum Matrix is provided in Table 1.

For National Programmes wanting access to the training Power Point Slides, please send a request to ISAVET@fao.org

Table 1. Frontline ISAVET Curriculum Matrix

LESSON NUMBER	LESSON TITLE	EXERCISE
	Course Introduction and Orientation	Group introductions, sharing and discussion
	PRE-TEST	NA
1	Introduction to Animal Health Surveillance	**Exercise 1:**
2	Data for Information and Response	**Exercise 2:** **Exercise 3:**
3	Defining and counting disease cases	**Exercise 4:** **Exercise 5:**
4	Data Quality Principles	**Exercise 6:**
5.1	Describing and Acting upon Animal Disease and Health Data: Central tendency	**Exercise 7:**
5.2	Describing and Acting upon Animal Disease and Health Data: Disease Occurrence and Impact	**Exercise 8:**
5.3	Describing and Acting upon Animal Disease and Health Data: Descriptive analysis by animal-place-time	**Exercise 9:**
6	Display data for decision making	**Exercise 10:** **Exercise 11:** **Exercise 12:**
CASE STUDY 1:	To be determined	**Case study 1:**
7	Data Interpretation and Reporting to Improve Situational Awareness and Decision Making	**Exercise 13:** **Exercise 14:**

LESSON NUMBER	LESSON TITLE	EXERCISE
8	Elements of a surveillance report	**Exercise 15.1:**
9	Making recommendations for animal disease prevention and control	**Exercise 15.2:**
10	Sharing surveillance information in a network for animal disease prevention and control	**Exercise 16:**
11	Assessing Surveillance in Your Local Area to Improve Response to Animal Disease and Health Events	**Exercise 17:**
12	Animal field investigations	**Exercise 18:**
13	Investigation strategies for early prevention and control of animal disease transmission	**Exercise 19:**
14	Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation	**Exercise 20:**
15	Biosafety and biosecurity for animal disease investigations	**Exercise 21:**
16.1	Apply the steps of a animal health outbreak investigation for animal-specific and zoonotic diseases	**Exercise 22:**
16.2	Apply the steps of a public health outbreak investigation for zoonotic diseases	
CASE STUDY 2	AI Tabletop Exercise	**Case Study 2:**
17.1	Managing Outbreak Investigation Data: Collect Data and create a line listing	**Exercise 23.1:**

LESSON NUMBER	LESSON TITLE	EXERCISE
17.2	Managing Outbreak Investigation Data	**Exercise 23.2:**
18	Follow up investigations and special studies	**Exercise 24:**
19	Surveillance situation assessment for prevention and control	**Exercise 25:**
20	Display outbreak investigation findings and make relevant recommendations for prevention and control	**Exercise 26:**
21	One Health Panel Discussion: Multi-disciplinary Outbreak Investigation	**Panel Discussion and Q&A session**
22	Preparing MS PowerPoint Presentations	**Exercise 27:**
23	Guidelines for Outbreak Investigation Reports	**Exercise 28:**
24	Communicating disease transmission risk to diverse audiences	**Exercise 29:**
25	Stakeholder Risk Communication Before, During and Following an Animal Disease Event	**Exercise 30:**
26	How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report	**Exercise 31:**
CASE STUDY 3	FACE - Ethical Decision Making Framework	**Case Study 3**
28	Professionalism in the Practice of Veterinary Field Epidemiology	**Exercise 32:**
29	Emergency Preparedness and Response Planning for Animal Health Emergencies: Part 1	**Exercise 33:**

LESSON NUMBER	LESSON TITLE	EXERCISE
30	Emergency Preparedness for Animal Health Emergencies at the District Level: Part 2	**Exercise 34:**
31	Disease preparedness and response at the district level	**Exercise 35:**
32	Characteristics of a functional disease prevention and control program at the district level	**Exercise 36:**
33	Local Area Profile	**Question and Answer Session**
34	(Disease name)	**Question and Answer Session**
35	The Role of Wildlife for Priority Disease(s)	**Question and Answer Session**
36	Preparing for Field Work	**Question and Answer Session**

Frontline ISAVET Trainer Manual

Trainers should review the Frontline ISAVET Trainer Manual while using the Frontline ISAVET Curriculum Instructor Manual. The Frontline ISAVET Trainer Manual provides a source of guidance and information for Frontline ISAVET trainers including course coordinators, lead trainers, who plan and undertake Frontline ISAVET trainings at national or regional levels. Section II of the Frontline ISAVET Trainer Manual will provide the preparatory, pre-course, course and post-course activities that should be conducted while teaching the 4-week Frontline ISAVET course. Trainers are encouraged to review this section of the manual as a reference for the course.

Frontline ISAVET Trainer Manual

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Section I: Week 1 – Epidemiological Surveillance

Introduction

Estimated Lesson and Exercise Time	1 hour
Instructor Materials	ISAVET Introduction.pptx
Participant Materials	ISAVET Introduction.PDF

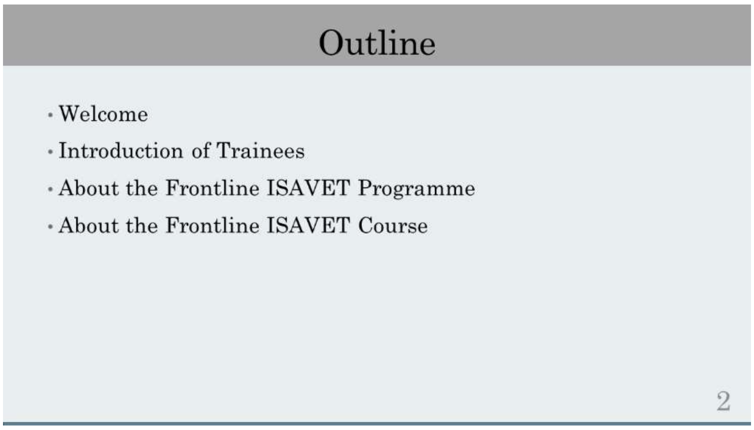
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

Introduction, Slide 1

SCRIPT / KEY POINTS:
The ISAVET programmatic team would like to extend our thanks and a warm welcome to:

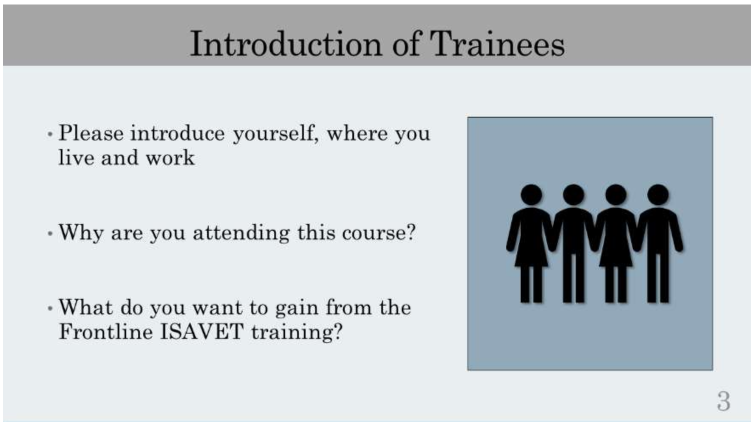
- Dignitaries from the Ministry of Agriculture
- Trainees
- Trainers
- Mentors

We would like to invite the host country to provide a brief welcome and presentation.
Here are some housekeeping items to consider: The restrooms locations are provided.
Each day there will be two coffee breaks, and lunch provided for all participants and instructors.
Each trainee will be provided with a book for taking notes and an exercise book which will guide the applied exercises used in the course.



Introduction,
Slide 2

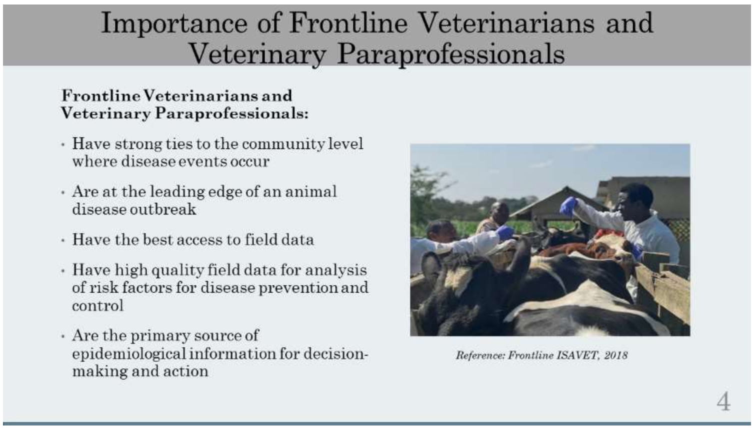
SCRIPT / KEY POINTS:
Welcome to the Frontline ISAVET Programme. Here is a basic introduction of the 4-week course for the Frontline ISAVET Programme. We would like to welcome all trainees and provide an introduction. We will also describe what the Frontline ISAVET Programme is and describe the structure of the course we will be taking in the next four weeks.



Introduction,
Slide 3

SCRIPT / KEY POINTS:
Ask each person to introduce themselves.
Then ask each trainee these two questions:
- Why are you here?
- What do you want to gain from the training?

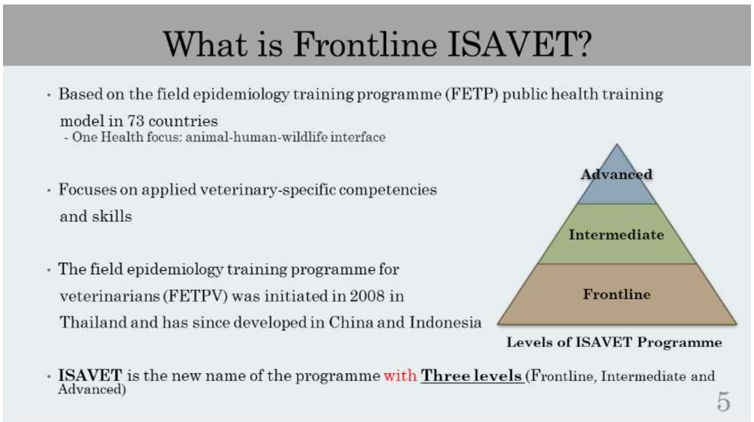
Photo: Google Images



Introduction, Slide 4

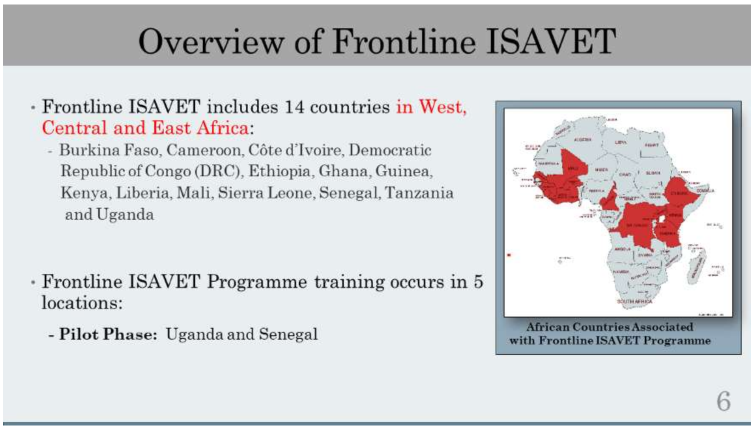
SCRIPT / KEY POINTS:
The subnational and national levels depend on high quality data from the frontline district veterinarians and veterinary paraprofessionals who encounter animal diseases and the communities firsthand. The slide explains the reasons why Frontline veterinarians and veterinary paraprofessionals play the most important role in disease prevention and control.

Frontline veterinarians and veterinary paraprofessionals are the leading edge for developing prevention and control strategies based on scientific data, known as “evidence-based decision-making”.



Introduction, Slide 5

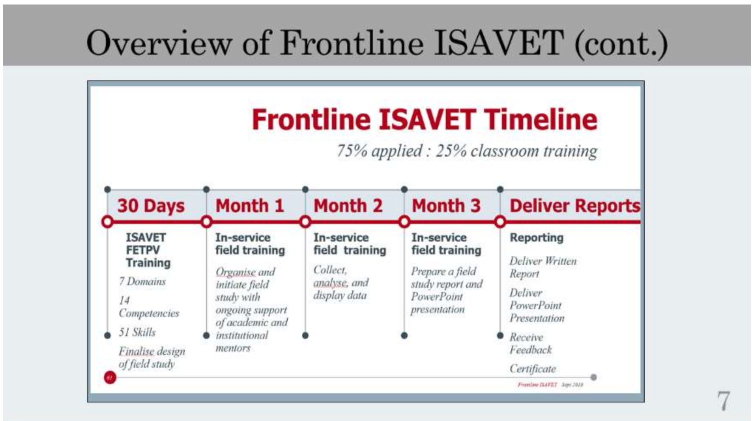
SCRIPT / KEY POINTS:
ISAVET stands for In Service Applied Veterinary Epidemiology Training. Frontline ISAVET is a field epidemiology training programme targeted at frontline district veterinarians, veterinary paraprofessionals and other animal health professionals.



Introduction, Slide 6

SCRIPT / KEY POINTS:
Frontline ISAVET is an in service training programme for field epidemiology that provides frontline veterinarians and veterinary paraprofessionals from the district level with skills in data collection, descriptive epidemiology, analysis, reporting and communicating findings. The Frontline ISAVET Programme is being piloted and implemented in West, Central, and East Africa.

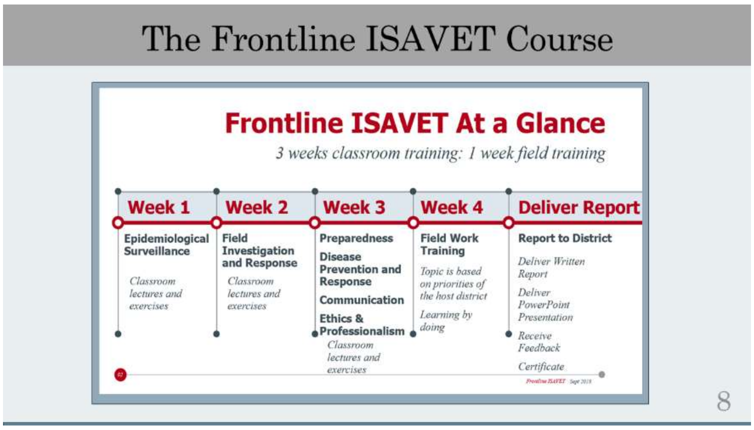
Countries receiving Frontline ISAVET training and the location of the trainings are listed and displayed on the map in the slide.



Introduction, Slide 7

SCRIPT / KEY POINTS:
The Frontline ISAVET Programme is an applied in service training programme for district veterinary and paraveterinary officers.
The course includes:

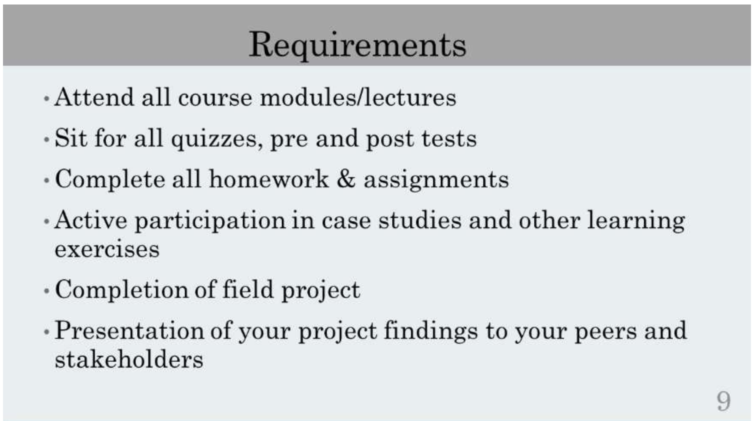
- Four-weeks of training that includes three-weeks of classroom lectures and exercises, as well as, one-week of field work to apply what has been learned through the classroom training.
- In total, 25% of the training is in the classroom and 75% is applied field training.
- Field projects are based on district and country priorities with in service field training under mentorship while at work.



Introduction,
Slide 8

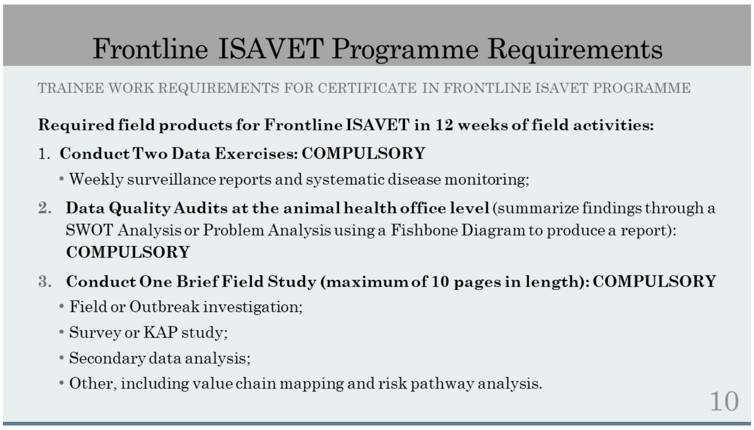
SCRIPT / KEY POINTS:
The Frontline ISAVET Programme develops transferable and critical thinking skills for endemic, emerging and newly emerging animal diseases that impact animals, humans and wildlife.
Frontline ISAVET will build skills in data collection, recording, data quality control, descriptive epidemiology, data analysis, data reporting and communicating data for decision-making and action.
Here is what we will be doing over the coming four weeks:

- Epidemiological surveillance (week 1);
- Field investigation and response (week 2);
- Preparedness, disease prevention and response, communication, ethics and professionalism (week 3); and
- Field work based on district disease priorities, resulting in a report to the district officers and farmers (week 4).



Introduction,
Slide 9

SCRIPT / KEY POINTS:



Introduction,
Slide 10

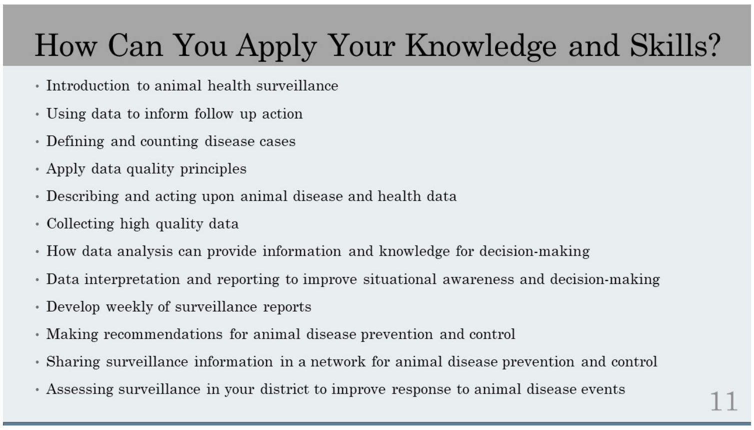
SCRIPT / KEY POINTS:
Every Frontline ISAVET trainee must fulfill the following work requirements in order to graduate:

- Pass each weekly post-test with a score of at least 60%;
- Complete exercises associated with each lesson;
- Contribute as a team member during the week of field training by following recommended biosafety and biosecurity practices and contributing to the descriptive analysis and report writing;
- Complete at least three of the following field activities during the three-month in-service field training under with the support of a mentor.

Required field products for Frontline ISAVET in 12 weeks of field activities:

Conduct Two Data Exercises: COMPULSORY
Weekly surveillance reports and systematic disease monitoring;
Data Quality Audits at the animal health office level (summarize findings through a SWOT Analysis or Problem Analysis using a Fishbone Diagram to produce a report e.g. case definition).

Conduct One Brief Field Study (maximum of 10 pages in length): COMPULSORY
Field or Outbreak investigation;
Survey or KAP study;
Secondary data analysis;
Other, including value chain mapping and risk pathway analysis.



Introduction, Slide 11

SCRIPT / KEY POINTS:
During the training, you will keep a diary of the ways that you can apply your skills in your district based on the lectures given.

Introduction, Slide 12

SCRIPT / KEY POINTS:
Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Lesson 1 – Introduction to Animal Health Surveillance

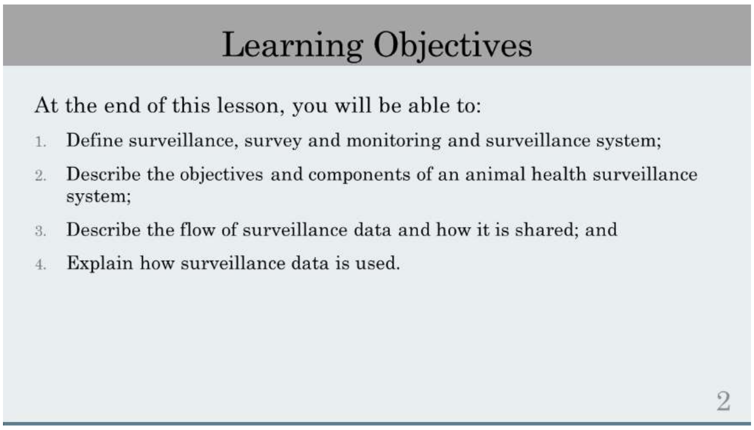
Estimated Lesson and Exercise Time	1 hour and 30 minutes
Instructor Materials	ISAVET Lesson 1 Introduction to Animal Health Surveillance.pptx
	ISAVET Lesson 1 Introduction to Animal Health Surveillance Instructor Guide.doc
	Flip chart and markers
	Computer and MS Word or MS PowerPoint
Participant Materials	ISAVET Lesson 1 Introduction to Animal Health Surveillance Participant Guide.PDF

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

EID	Emerging Infectious Diseases
FAO	Food and Agriculture Organisation of the United Nations
ISAVET	In Service Applied Veterinary Epidemiology Training
OIE	World Organisation for Animal Health
TAD	Transboundary Animal Disease
USDA	United States Department of Agriculture

Lesson 1 – Introduction to Animal Health Surveillance, Slide 1

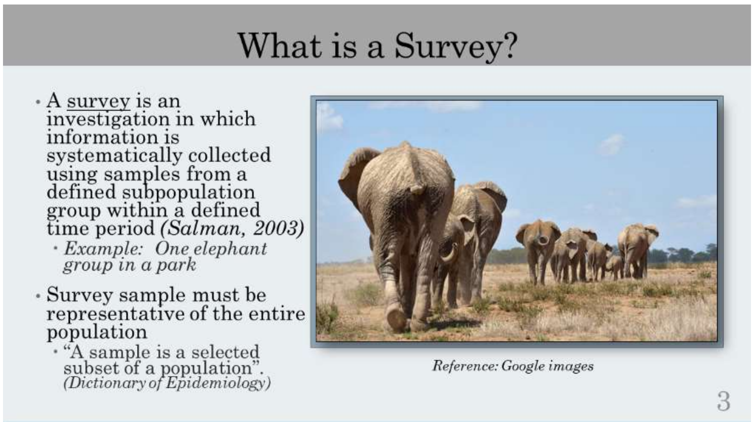
SCRIPT / KEY POINTS:
Welcome to Lesson 1 titled, "Introduction to Animal Health Surveillance".



Lesson 1 – Introduction to Animal Health Surveillance, Slide 2

SCRIPT / KEY POINTS:
In this lesson, we will:

1. Define surveillance, survey and monitoring;
2. Describe the objectives and components of an animal health surveillance system;
3. Describe the flow of field data and how it is shared; and
4. Explain how surveillance data is used.



Lesson 1 – Introduction to Animal Health Surveillance, Slide 3

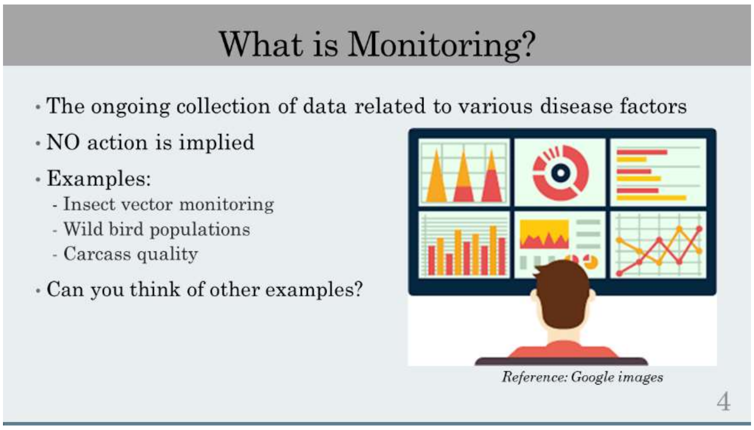
SCRIPT / KEY POINTS:
Surveillance is similar to a movie which is broad in scope and ongoing over a long period of time.

A survey is a "snapshot in time" and includes data collected in a defined population over a defined time period.

Surveys are very useful to make a rapid assessment of the burden of animal disease. For example, a sero-prevalence survey of a disease such as, brucellosis in dairy cattle can give a snapshot of the status of brucellosis in cattle and the risk for humans.
The aim is to use the measurements or observations on this sample to "draw conclusions regarding the entire population"

Key definition and concept of representativeness:
A sample is a selected subset of a population. (Dictionary of Epidemiology)
The sample must be representative of the entire population to allow investigator make conclusions on entire population.

Where entire population is not the general population but our population of interest (target population) to which the information we obtain is applied
Photo:
Image 1: Google



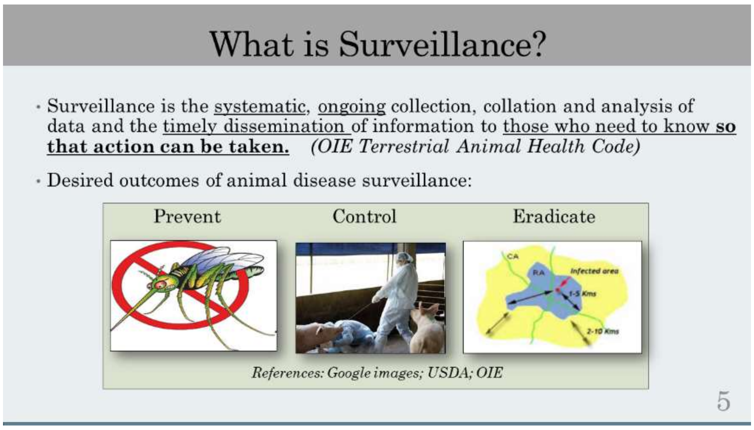
Lesson 1 – Introduction to Animal Health Surveillance, Slide 4

SCRIPT / KEY POINTS:
Monitoring involves ongoing data collection, but does not imply that action is taken. Monitoring data is useful to monitor spatial and temporal trends in the populations at risk.

Other examples of monitoring could include the following:

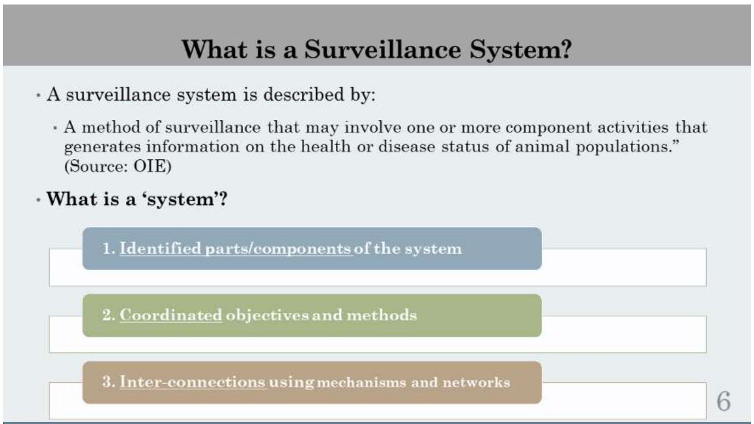
- •Animal growth rate.
- •Number of imported animals across a national boundary.
- •Number of animals slaughtered and disease conditions found in an abattoir each month over a one-year period.
- •Number of samples collected by a laboratory for a particular disease.
- •The number and type of bacterial isolates demonstrating antimicrobial resistance.

Photo:
Image 1: Google



Lesson 1 – Introduction to Animal Health Surveillance, Slide 5

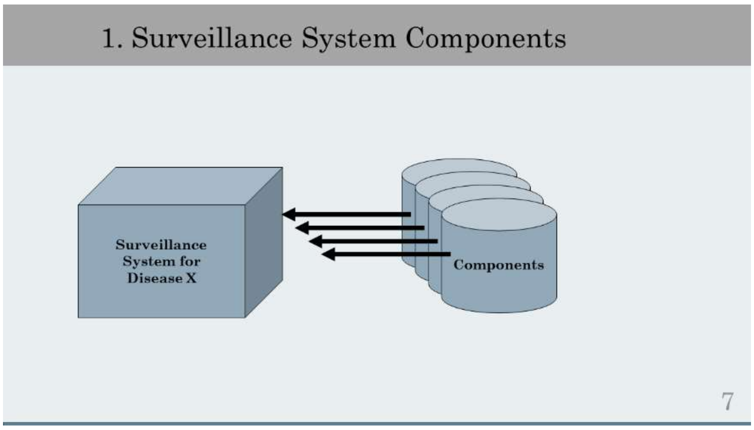
SCRIPT / KEY POINTS:
Action is the necessary outcome of a functional surveillance system. Action refers to the measures that are required for the prevention, control and eradication of animal diseases that may affect domestic and wild animals, as well as, humans.
Photo:
Image 1: Google
Image 2: USDA
Image 3: OIE



Lesson 1 – Introduction to Animal Health Surveillance, Slide 6

SCRIPT / KEY POINTS:
A surveillance system is an interconnecting network of activities and parts that work together in a coordinated and inter-connected manner and includes:
Disease detection,
data collection,
data analysis and interpretation
at all levels so that action is taken on the best available evidence.

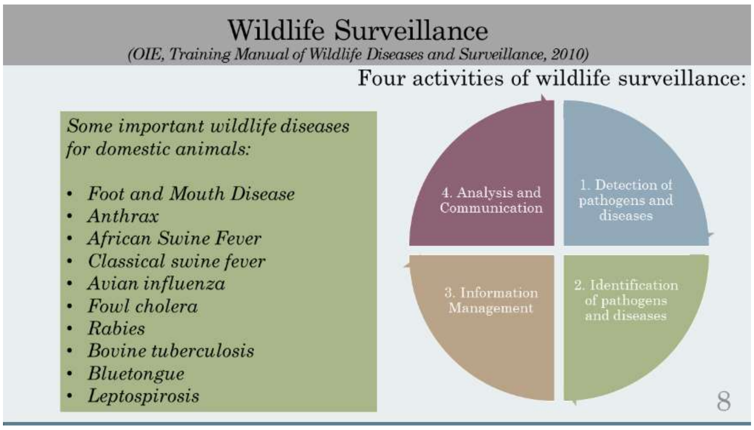
Components, coordination, and inter-connections are fundamental characteristics of a functional surveillance system for all priority emerging infectious diseases (EIDs) and transboundary animal diseases (TADs).



Lesson 1 – Introduction to Animal Health Surveillance, Slide 7

SCRIPT / KEY POINTS:
Different activities or components contribute to the surveillance system for each disease. These components may include activities related to different sources of data collection, data analysis, laboratory data, data reporting and communication as well as feedback to the data sources.

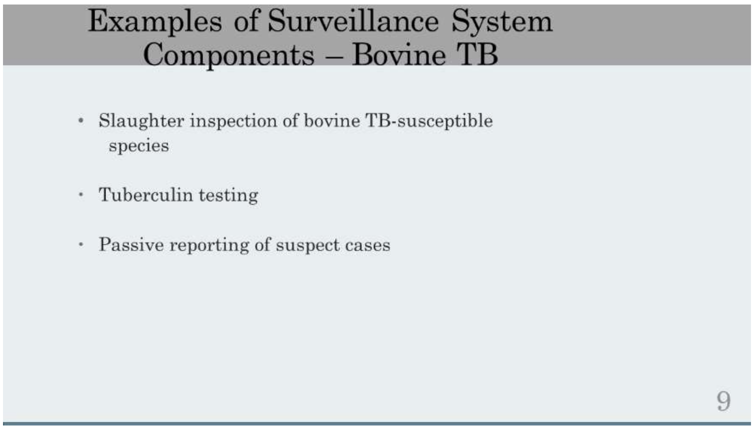
A list of data collection sources may include:
- Farms
- Abattoirs
- Markets
- Traders
- Wildlife
- Veterinarians
- Laboratory
- Border stations



Lesson 1 – Introduction to Animal Health Surveillance, Slide 8

SCRIPT / KEY POINTS:
Contact at the animal-human-wildlife interface is increasing as human populations and food production encroach upon natural areas where wildlife can be found. Wildlife surveillance is necessary to prevent and control diseases that are transmitted from wildlife species to domestic animals and humans (see a list of important wildlife diseases above).

In order to conduct surveillance for wildlife diseases four activities are required which are shown in the radial diagram:
1. Detection of pathogens and diseases
2. Identification of pathogens and diseases
3. Information Management
4. Analysis and Communication
Reference:
OIE, Training Manual of Wildlife Diseases and Surveillance, 2010

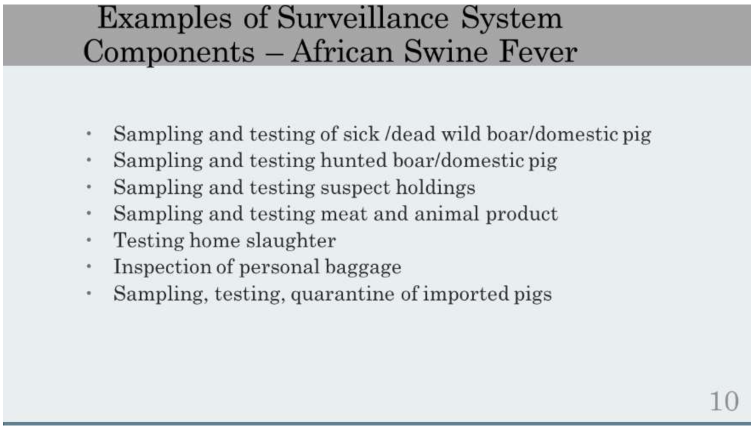


Lesson 1 – Introduction to Animal Health Surveillance, Slide 9

SCRIPT / KEY POINTS:
A surveillance system may have one or many components.
A component is a single activity that generates surveillance data. A component may be thought of as a single source of surveillance data:

Examples of surveillance system components for Bovine TB include:
- Slaughter inspection of bTB-susceptible species
- Tuberculin testing
- Passive reporting of suspect cases

Can you think of some examples in your country?

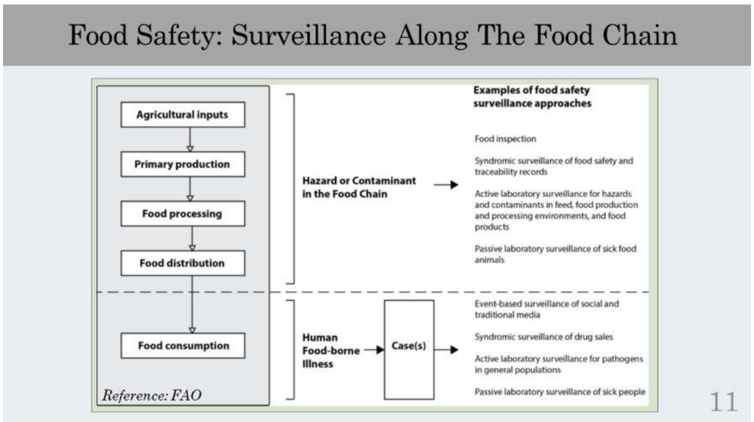


Lesson 1 – Introduction to Animal Health Surveillance, Slide 10

SCRIPT / KEY POINTS:
Another Examples of surveillance system components for African Swine Fever include:

- Sampling and testing of sick /dead wild boar
- Sampling and testing hunted boar
- Sampling and testing suspect holdings
- Sampling and testing meat and animal product
- Testing home slaughter
- Inspection of personal baggage
- Sampling, testing , quarantine of imported pigs

Can you think of some examples in your country?



Lesson 1 – Introduction to Animal Health Surveillance, Slide 11

SCRIPT / KEY POINTS:
The food chain describes the process of producing food at the farm until it reaches the consumer's table. This is often referred to as the "farm to table" approach.

Important food safety parasites include tapeworms such as Cysticercus suis and C. bovis and roundworms include Trichinella spiralis. Bacterial pathogens include Salmonella sp. , E.coli, sp. , Brucella sp. and Campylobacter sp. Parasites and bacterial pathogens remain significant food safety threats for humans in Africa as well as globally.

An early warning surveillance system is advised for each country that integrates both animal health and human health components as follows:

Animal Health Food Chain Surveillance components:

- Food inspection
- Syndromic surveillance
    - Including antibiotic sales for animals, rumor-tracking of media postings
- Laboratory surveillance
    - Active surveillance for contaminants in feed, food products, food production environment and food processing
    - Passive of sick animals

Human Food-Borne Illness:

- Event based surveillance using social and traditional media
- Syndromic surveillance of human drug sales
- Laboratory surveillance
    - Active surveillance among the population
    - Passive surveillance of sick people

Reference and Photo:

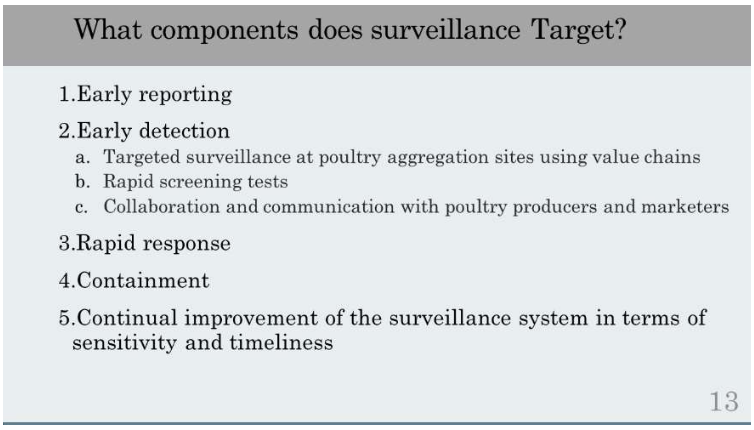
- FAO. ENHANCING EARLY WARNING CAPABILITIES AND CAPACITIES FOR FOOD SAFETY Training Handbook. First Edition. 2015.

Lesson 1 – Introduction to Animal Health Surveillance, Slide 12

SCRIPT / KEY POINTS:
Based on the specific disease situation and needs of each country, specific objectives of the surveillance system must be developed and must be achievable through the methods used.
Some types of objectives may include:

1. Early detection of livestock diseases of economic/food security/public health importance (e.g. avian influenza)
2. Enabling early reaction to such diseases (e.g. trade restrictions)
3. Correct identification of resource needs in the field so that existing resources can be correctly deployed in disease management. (e.g. target surveillance in live bird markets)

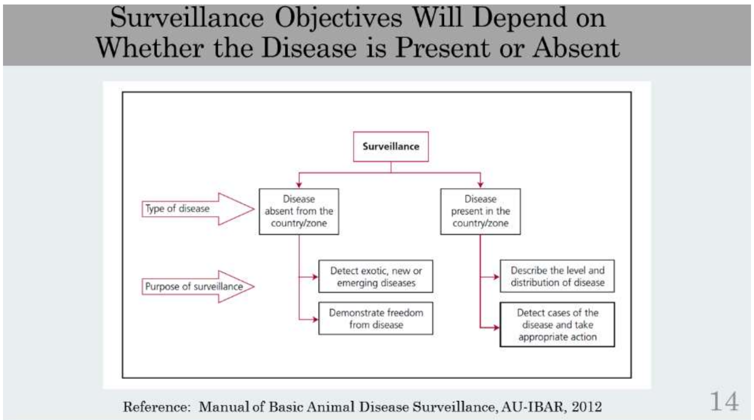
4. Provision of strategic decision-making support (e.g. clear chain of command and communication)
5. Measurement of surveillance system performance (e.g. surveillance system evaluation)



Lesson 1 – Introduction to Animal Health Surveillance, Slide 13

SCRIPT / KEY POINTS:
Early detection to avian influenza viruses in poultry, for example, must occur before they affect humans. Surveillance is therefore targeted at:

1. Early reporting
2. Early detection
    a. Targeted surveillance at poultry aggregation sites using value chains
    b. Rapid screening tests
    c. Collaboration and communication with poultry producers and marketers
3. Rapid response
4. Containment
5. Continual improvement of the surveillance system in terms of sensitivity and timeliness



Lesson 1 – Introduction to Animal Health Surveillance, Slide 14

SCRIPT / KEY POINTS:
INSTRUCTOR DIALOGUE: Ask trainees to provide examples for surveillance programmes of diseases in their country that are present and those that are not present.

Reference: Manual of Basic Animal Disease Surveillance, AU-IBAR, 2012
The objectives of surveillance will change according to the disease situation

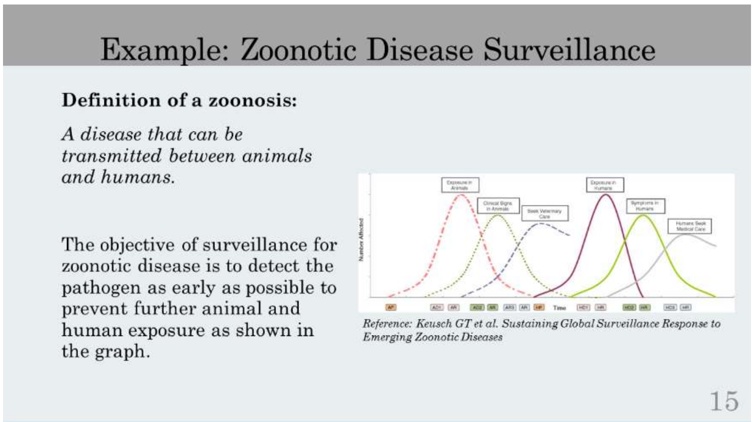
When disease is Absent
Why is Early recognition of a disease incursion important?
Early response
The cost and effectiveness of eradication or control of a new disease outbreak is normally directly related to the delay in detection. Being able to detect new disease incursions as quickly as possible is important for effective control.
Prevention of spread
For an exporting country, if there is an undetected outbreak of an exotic disease, this may then spread to a third country through animal exports. Most importing countries will demand that exporting countries have a capacity for early detection to prevent the spread of disease.

What are some of the reasons for demonstrating freedom from disease?
Trade access
If the animals in an exporting country have been demonstrated to be free from disease, it is safe to export those animals to another country.
Trade barrier
If an importing country has demonstrated that it is free from infection, that country can prevent the import of animals from an infected country (subject to a risk analysis).
Stopping control or eradication measures
If the disease has been the subject of an eradication campaign, a range of control and eradication measures may have been used, including vaccination, test and slaughter, movement restrictions, farm-level biosecurity and so on. These measures may be very expensive, but if they are stopped before the disease is eradicated, there is a risk that the disease will again spread through the population. In order to decide that it is safe to stop disease control measures, the veterinary authorities must first be confident that the disease has been truly eradicated.
Public health
For zoonotic diseases, public health measures may be in place to control the risk of spread of the disease to the human population. These might include specific testing at meat inspection or prophylactic measures in the human population. If the disease is shown to be absent, these measures can be stopped.
Political
The ability to successfully eradicate an animal disease may be a matter of national pride. Recognition of the success of such a program may be important for political reasons.

When disease is present
Finding cases & Measuring the level of disease
The ability to measure the level of disease is useful for a variety of reasons. The most common measures of disease used include prevalence and incidence, but a variety of other epidemiological measures are also available (for example, mortality rates).

Reasons for finding cases and measuring levels of disease

- For prioritization of diseases
- Facilitates risk analysis/assessment by trading partners
- Useful in establishing disease free zones
- Useful in showing spatial and temporal distributions of diseases
- Useful in early detection of changes in endemic diseases



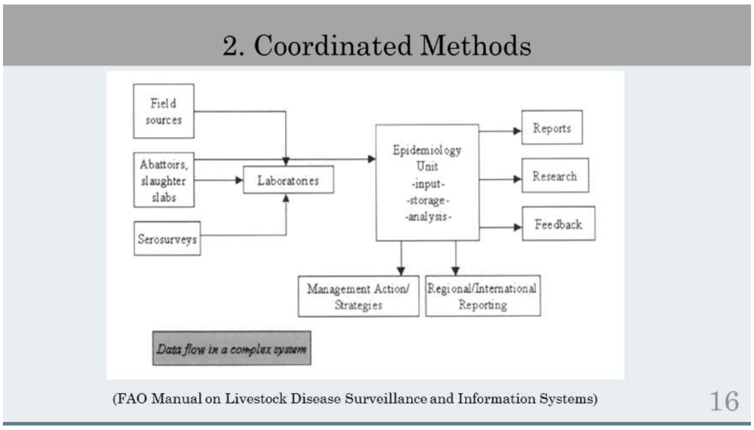
Lesson 1 – Introduction to Animal Health Surveillance, Slide 15

SCRIPT / KEY POINTS:
The objective of surveillance for zoonotic disease is to detect the pathogen as early as possible to prevent further animal and human exposure as shown in the graph. We wish to move the detection to the left of the timeline on the x axis.

Reference and Photo:

Sustaining Global Surveillance and Response to Emerging Zoonotic Diseases.
National Research Council (US) Committee on Achieving Sustainable Global Capacity for Surveillance and Response to Emerging Diseases of Zoonotic Origin; Keusch GT, Pappaioanou M, Gonzalez MC, et al., editors.
Washington (DC): National Academies Press (US); 2009.

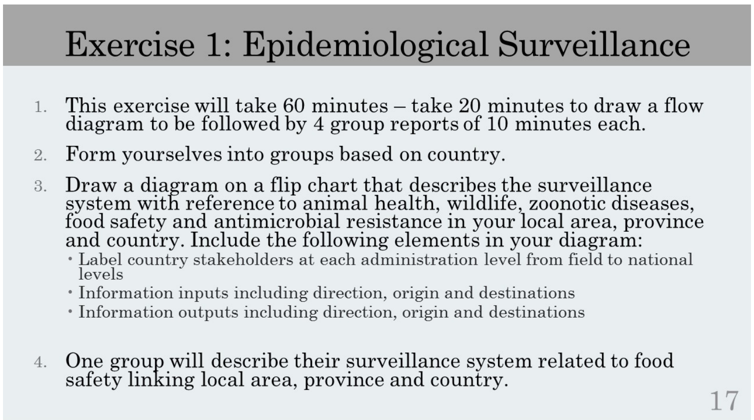
Glossary term:
A zoonosis is a disease that can be transmitted between animals and humans.



Lesson 1 – Introduction to Animal Health Surveillance, Slide 16

SCRIPT / KEY POINTS:
This diagram illustrates how for each disease, various sources of field and laboratory activities and methods are required to be coordinated for effective epidemiological input, storage and analysis from which reports (feedback) and action MUST be generated.

How does this compare to wildlife surveillance? What surveillance and information systems do exist in wildlife?



Lesson 1 – Introduction to Animal Health Surveillance, Slide 17

SCRIPT / KEY POINTS:
Exercise 1 instructions: Epidemiological Surveillance

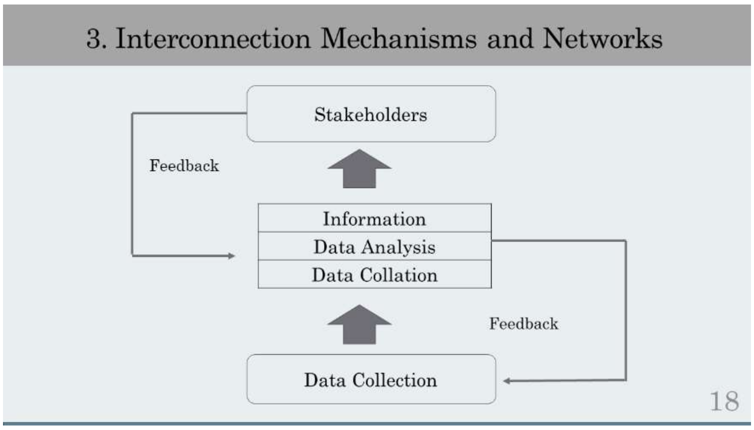
- This exercise will take 60 minutes.
- Form yourselves into groups based on country.
- Draw a flow diagram on a flip chart that describes the surveillance system in your local Area province and country.
- One group will describe their surveillance system related to food safety linking local area, province and country.

Instructors:

- Review instructor guide for answers.

Instructor Comments: Here are the main learning points of the exercise:

- Information at the lowest level (local area) is most reliable and accurate when disease reporting is transparent.
- Information is lost as it is shared from the local to the national levels due to incompleteness but also due to the aggregation of data at each level. Aggregation of data at each level limits the amount of data analysis that can be done at each level above.
- Each of the levels has a different reason and objectives for their surveillance. Therefore, the surveillance system must be structured in such a way as to serve the whole as well as the parts of the system.
- The local area level is the ground level where data is collected and managed. Therefore, the local area is the most important link in the surveillance system.



Lesson 1 – Introduction to Animal Health Surveillance, Slide 18

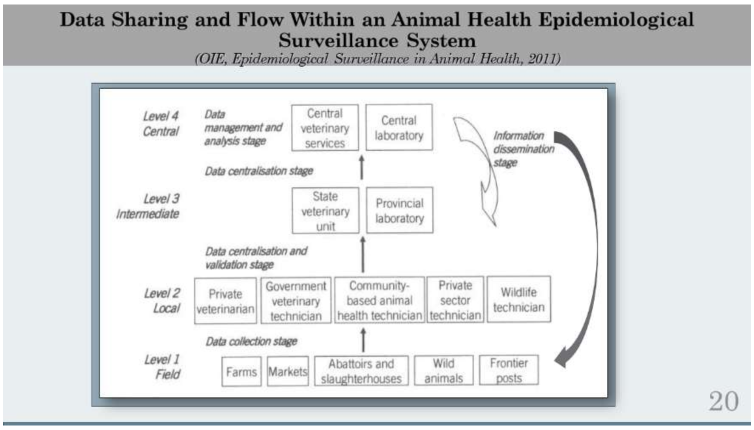
SCRIPT / KEY POINTS:
The process of surveillance and disease reporting begins with collecting high quality data which can then be collated, and analysed to become information which can be shared with stakeholders from field to national levels.

It is critical to provide feedback to those who provide the data in order to improve the quality of the data as well as to other stakeholders who may be impacted in order to take action.

Lesson 1 – Introduction to Animal Health Surveillance, Slide 19

SCRIPT / KEY POINTS:
Surveillance is a cyclical process that is iterative and ongoing. The circular line connecting each part of the surveillance cycle is representative of communication and coordination required to maintain the effective flow of surveillance data.

Let's consider each component of the surveillance cycle:
- **Detect disease:** Farmers, animal owners, veterinarians, animal health workers, abattoir workers, as well as, animal traders and marketers are the first to recognise changes from normal in either live or dead animals. Syndromic disease detection and laboratory confirmation are important to establish a disease diagnosis. Each of these groups may notice clinical and post-mortem signs of disease depending on their previous training or experience. They may also recognise that animal milk, meat and egg production has declined and may suspect that a subclinical disease could be present (examples include: mastitis, immune suppressive diseases of animals, etc.).
- **Report disease and collect data:** Suspicion of disease needs to be reported for further action to be taken to prevent and control animal diseases. Data must be collected immediately from the primary caretaker of the animals in order to understand the event in question. Data is only useful if it is reflects true events. It must be of high quality and protected so that is can be used and shared further. The data that is collected must describe Animal-Place-Time characteristics (descriptive epidemiology) of the affected population in order to be useful for disease prevention and control.
- **Analyse and interpret data:** The data that is collected is first assessed and cleaned to ensure that it is of high quality for further analysis and use. Measures of central tendency, dispersion and disease occurrence are analysed to describe the disease or production event. Data is then interpreted to explain the meaning of each finding of the analysis.
- **Take action:** The explanation provided by the results of the data analysis informs the required action to be taken to prevent and control the disease. Remember, without action, the animal health surveillance system is really a monitoring system. Action includes coordination, risk communication and risk mitigation to prevent and control the animal disease.
- **Evaluate to improve:** Targets for improvement include the 1) quality of the data; 2) function of the surveillance system; and 3) detection and response for animal diseases.



Lesson 1 – Introduction to Animal Health Surveillance,
Slide 20

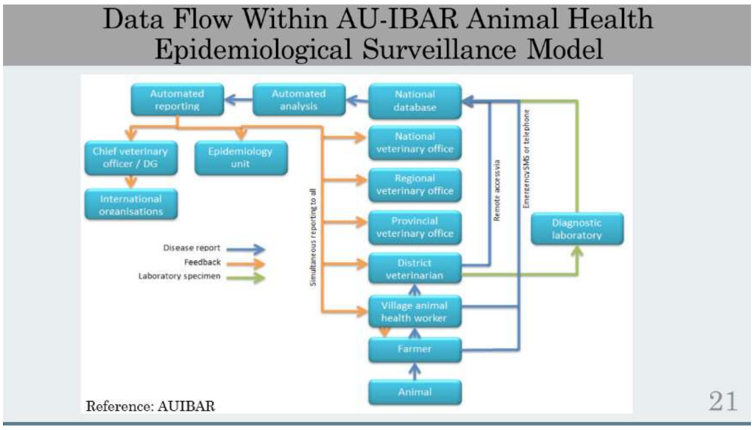
SCRIPT / KEY POINTS:
Here is a general scheme developed by the World Organisation for Animal Health (OIE) depicting actors and networks involved in the animal health surveillance system.

It is important to note the following:

- Both public and private sectors, as well as, communities are contributors to a functional surveillance system.
- The surveillance system functions on a two-way information flow that includes all levels from local to the national, regional and global levels.
- Farmers, marketers, abattoir owners, game wardens and border agents are all players at the ground-level of the surveillance system. Without their engagement, cooperation and collaboration, the surveillance system will not be functional.
- A chain of command must exist in the animal health agency to ensure information is shared in order to support action be taken for animal disease prevention and control.
- Most importantly, data management must include at all levels including the field, the local area, the subnational level and national levels.

Photo:

- Image 1: OIE



Lesson 1 – Introduction to Animal Health Surveillance, Slide 21

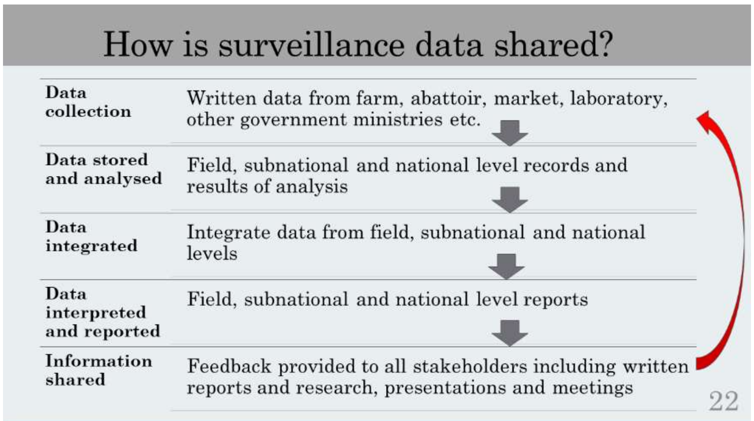
SCRIPT / KEY POINTS:
Here is a general scheme developed by the AUIBAR depicting actors and networks involved in the animal health surveillance system.

It is important to note the following:

- Both public and private sectors, as well as, communities are contributors to a functional surveillance system.
- The surveillance system functions on a two-way information flow that includes all levels from local to the national, regional and global levels.
- Farmers, marketers, abattoir owners, game wardens and border agents are all players at the ground-level of the surveillance system. Without their engagement, cooperation and collaboration, the surveillance system will not be functional.
- A chain of command must exist in the animal health agency to ensure information is shared in order to support action be taken for animal disease prevention and control.
- Most importantly, data management must include at all levels including the field, the local area, the subnational level and national levels.

Photo:

- Image 1: AUIBAR

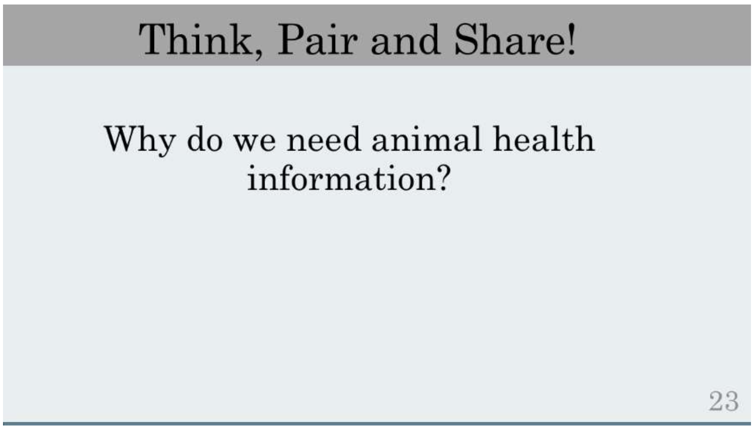


Lesson 1 – Introduction to Animal Health Surveillance, Slide 22

SCRIPT / KEY POINTS:
Data sharing is absolutely essential in a functional surveillance system if it is to lead to ACTION being taken.

Let's consider the steps that the data follows as it is shared:

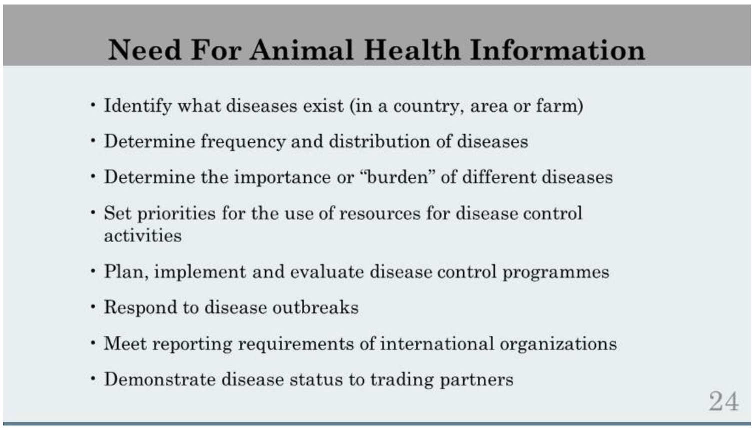
1. Surveillance data is first collected from both public and private sectors at farms, abattoirs, markets, the laboratory or from other government ministries either actively or passively.
2. The data may be collected by field, subnational or national levels and stores the data as hard copy or electronic data that can be analysed at any level to meet the needs of the surveillance system.
3. Data from each level and from other sources may be further shared and added to the original data in order to integrate various data to integrate them and get additional meaning and context from each kind of data.
4. The meaning and interpretation of all related surveillance data can then reported.
5. The information reported can then be used to:
    - Provide feedback to allm stakeholders who contribute to the surveillance data; and
    - Guide decision makers in choosing the correct course of action.



Lesson 1 – Introduction to Animal Health Surveillance, Slide 23

SCRIPT / KEY POINTS:
In pairs, discuss with your colleague on the importance of an animal health information to different stakeholders. Make sure you cover

A) Livestock health
B) Wildlife health

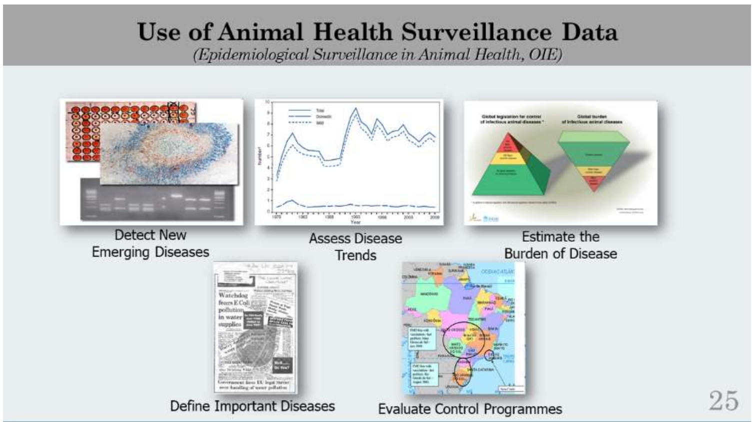


Lesson 1 – Introduction to Animal Health Surveillance, Slide 24

SCRIPT / KEY POINTS:
As noted in the previous slide, the information generated is used by decision makers to use an 'evidence-based' approach for decision makers to assure all stakeholders that an objective animal health information is being used.

Based on the disease situation in a country, surveillance will provide information related to the following issues that need to be defined in order to improve animal health in the country:

- Identify what diseases exist (in a country, Area or farm);
- Determine frequency and distribution of diseases;
- Determine the importance and "burden" of different diseases;
- This information can then be used to:
    - Set priorities for the use of resources for disease control activities;
    - Inform planning, implementation and evaluation of disease control programmes and
    - Improve response to disease outbreaks;
    - Meet reporting requirements of international organizations
    - Demonstrate disease status to trading partners

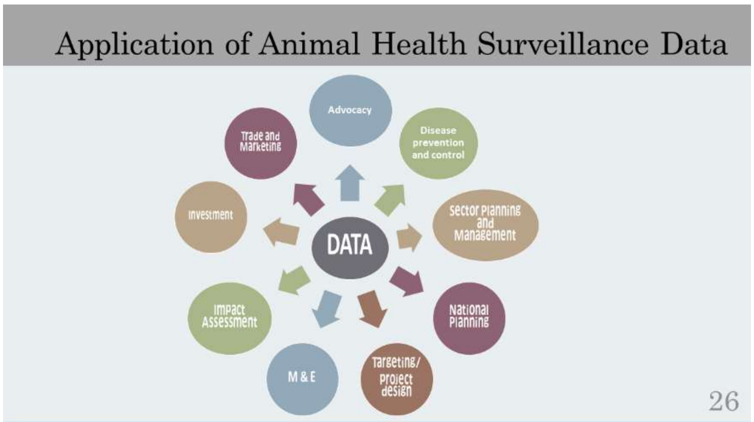


Lesson 1 – Introduction to Animal Health Surveillance, Slide 25

SCRIPT / KEY POINTS:
Let's now consider how animal disease surveillance data can be used, namely:
- Detect new emerging diseases;
- Assess disease trends over time;
- Estimate the burden of animal diseases;
- More clearly define important diseases;
- Evaluation of animal disease control programmes.

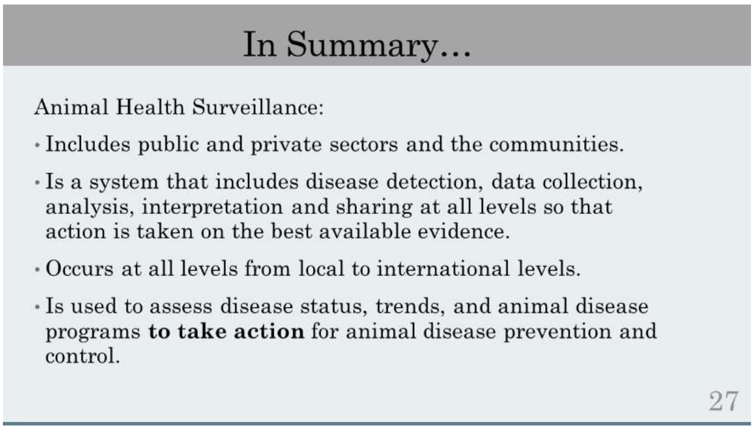
Examples of surveillance related to food safety, wildlife and zoonotic disease follow

Photos: Epidemiological Surveillance in Animal Health, OIE



Lesson 1 – Introduction to Animal Health Surveillance, Slide 26

SCRIPT / KEY POINTS:
Surveillance data from animal health surveillance system can also be applied in the following ways:
- Advocacy
- Disease prevention and control
- Monitoring and Evaluation of disease control programs
- Impact assessment of interventions
- Sector planning and management
- National planning
- Targeting/ project design
- Investment
- Trade and Marketing

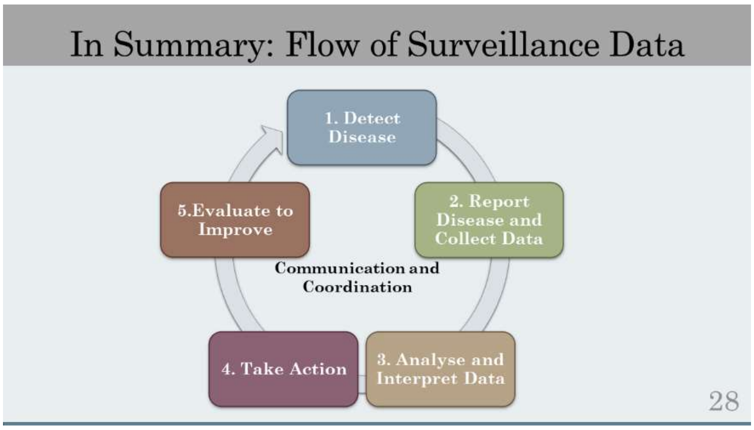


Lesson 1 – Introduction to Animal Health Surveillance, Slide 27

SCRIPT / KEY POINTS:
In summary,

- Remember that a functional surveillance system takes ACTION!
- Animal health surveillance includes many sectors at all levels.

Animal health surveillance includes disease detection, data collection, analysis and interpretation



Lesson 1 – Introduction to Animal Health Surveillance, Slide 28

SCRIPT / KEY POINTS:
In summary, the steps for the flow of surveillance data include:

- Detect disease;
- Report disease and collect data;
- Analyse and interpret data;
- Take action; and
- Evaluate and improve.

Lesson 1 – Introduction to Animal Health Surveillance, Slide 29

SCRIPT / KEY POINTS:
Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 1 – Epidemiological Surveillance

Description of Exercise:

Develop a flow diagram that describes the surveillance system in your local area, province, and country with reference to animal health, wildlife, zoonotic diseases, food safety and antimicrobial resistance. Should you have any questions about the exercise, please ask a trainer for clarification before, during, and after the exercise.

Time: 30 minutes

Organisation of Group Work:

1. Form yourselves into groups based on country.
2. Draw a diagram on a flip chart that describes the surveillance system related to food safety in your local area, province and country.

At least one group will describe their surveillance system linking local area, province and country with reference to animal health, wildlife, zoonotic diseases, food safety and antimicrobial resistance.

Include the following elements in your diagram:

Label country stakeholders at each administration level from field to national levels

- Information inputs including direction, origin and destinations
- Information outputs including direction, origin and destinations

Materials, Data or Information:

- Preferably, information is collected and displayed using MS Word or MS PowerPoint Flip chart and markers if computers are not available

Instructor Notes: Here are the key learning points of the exercise:

- Data at the lowest level (local area) is most reliable and accurate when disease reporting is transparent.
- Data is lost as it is shared from the local to the national levels due to incompleteness but also due to the aggregation of data at each level. Aggregation of data at each level limits the amount of data analysis that can be done at each level above
- Each of the surveillance levels has a different reason and objectives for their surveillance. Therefore, the surveillance system must be structured in such a way as to serve the whole as well as the parts of the system.
- The local local area level is the ground level where high quality data must be collected, managed, and shared. Therefore, the local local area is the most important link in the surveillance system since all other parts of the surveillance system depend upon it.

Lesson 2 – Data for Information and Response

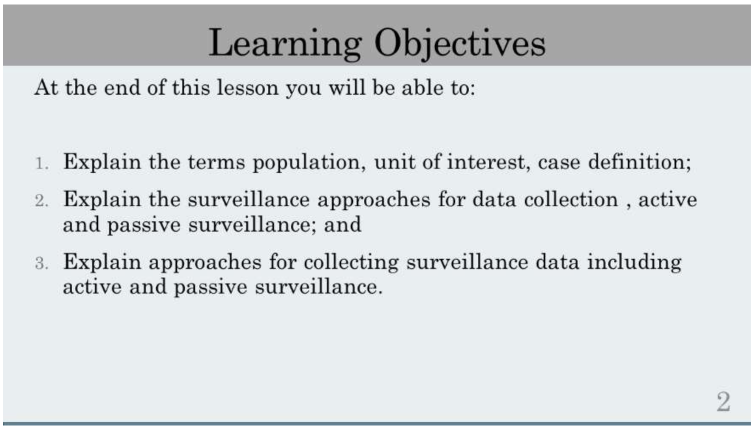
Estimated Lesson and Exercise Time	1 hour and 30 minutes
Instructor Materials	Frontline ISAVET Lesson 2 Data for Information and Response.pptx
	Frontline ISAVET Lesson 2 Data for Information and Response Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	Frontline ISAVET Lesson 2 Data for Information and Response Participant Guide.doc

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

FAO	Food and Agriculture Organization of the United Nations
ISAVET	In Service Applied Veterinary Epidemiology Training
OIE	World Organisation for Animal Health
PPR	Peste des Petits Ruminants
RVF	Rift Valley Fever

Lesson 2 – Data for Information and Response, Slide 1

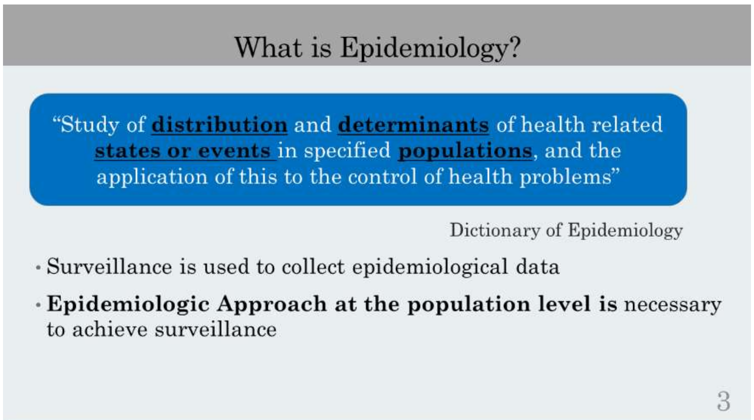
SCRIPT / KEY POINTS:
Welcome to Lesson 2, titled “Data for Information and Response”.



Lesson 2 – Data for Information and Response, Slide 2

SCRIPT / KEY POINTS:
In lesson 1, we defined surveillance and how it is different from surveys and monitoring. We also described the OIE model for animal health surveillance system that showed the flow of information from local to national levels.

In this lesson, we will:
1. Explain the terms population, unit of interest, case definition;
2. Explain the surveillance approaches for data collection , active and passive surveillance; and
3. Explain approaches for collecting surveillance data including active and passive surveillance.



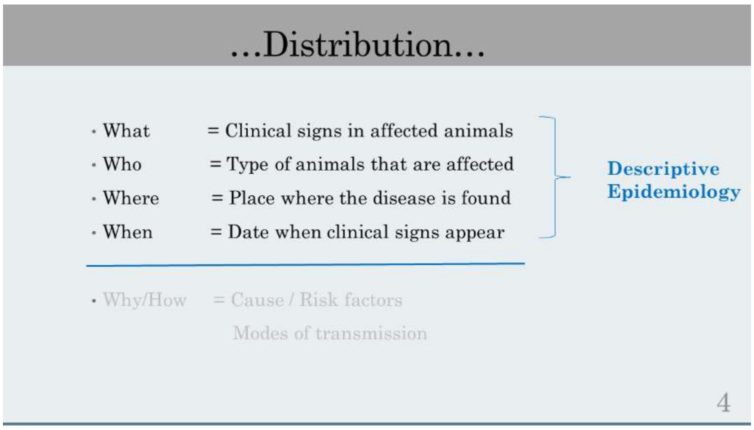
Lesson 2 – Data for Information and Response, Slide 3

SCRIPT / KEY POINTS:
Epidemiology is a scientific discipline that involves the study of the frequency and distribution of health and disease determinants in populations in order to identify risk factors for the prevention and control of disease.

Surveillance systems are used to collect epidemiological data

In order to achieve animal health surveillance, we must use the epidemiological approach.

Therefore, epidemiological surveillance deals with populations of animals at the herd, flock or group level.

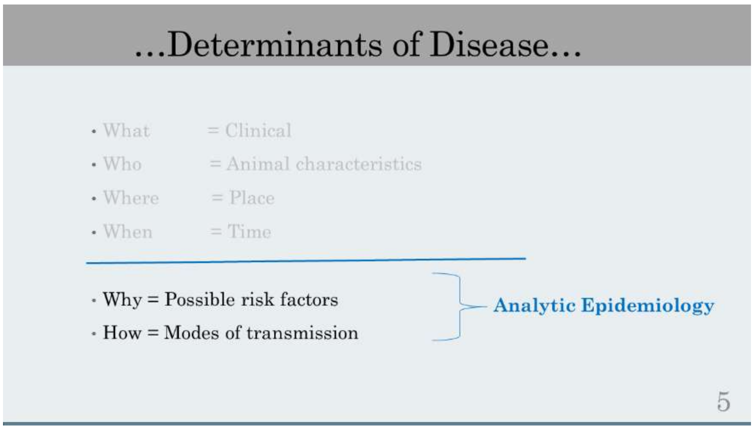


Lesson 2 – Data for Information and Response, Slide 4

SCRIPT / KEY POINTS:
Distribution refers to how health related events (e.g. disease) is distributed throughout the population, specifically according to Time, Place, and Animal/person. In other words, when, where, and to whom does the event affect?

The term “Descriptive Epidemiology” is used by some epidemiologists to cover either the first 3 W’s – What, Who and Where. Other epidemiologists use the term “descriptive epidemiology” to refer to the 4 W’s of animal, place, and time.

In descriptive epidemiology, we assess distribution of disease by asking about:
Who is getting disease?
Where is disease occurring?
When is disease occurring?
Formulation of hypotheses concerning causal and preventive factors



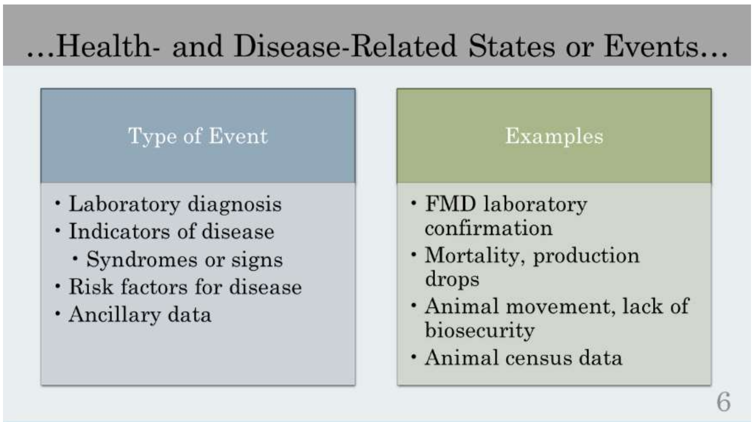
Lesson 2 – Data for Information and Response, Slide 5

SCRIPT / KEY POINTS:
Have you ever asked why disease occurs sometimes and not in other circumstances?

Disease does not occur randomly and there are always underlaying conditions for it to occur related to the agent, the host and the environment (collectively known as the epidemiological triad.

Determinants explains why and how disease occurs -- what are the risk factors that influence the presence of disease? It is important to note that it is not possible to prove the causes of disease absolutely and the

Assessing the risk factors for why and how disease occurs is included in the discipline of "Analytic Epidemiology."

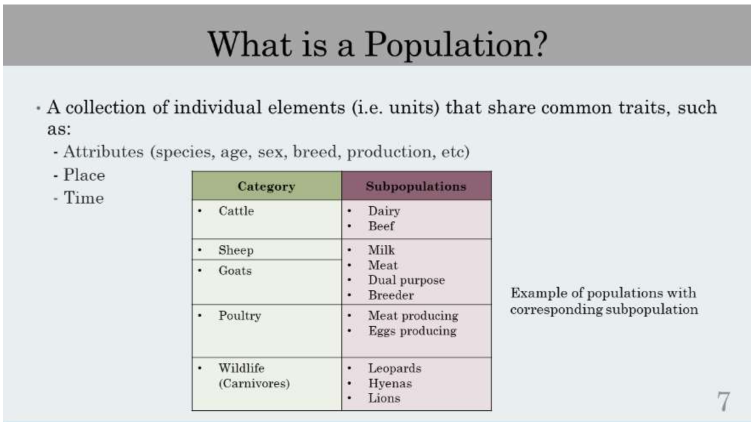


Lesson 2 – Data for Information and Response, Slide 6

SCRIPT / KEY POINTS:
There are direct and indirect methods for defining a disease event, including the following:

1. Direct laboratory confirmation
2. Indirect indicators of disease – clinical signs or syndromes; production drops; increased morbidity and mortality
3. Presence of risk factors including animal movement and lack of biosecurity

4. Ancillary data such as population changes from a census indicating reduction in animal numbers



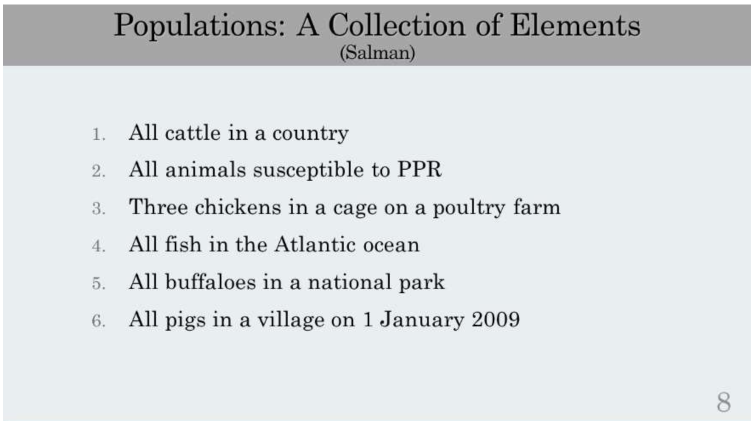
Category	Subpopulations
• Cattle	• Dairy • Beef
• Sheep • Goats	• Milk • Meat • Dual purpose • Breeder
• Poultry	• Meat producing • Eggs producing
• Wildlife (Carnivores)	• Leopards • Hyenas • Lions

Lesson 2 – Data for Information and Response, Slide 7

SCRIPT / KEY POINTS:
We define a population as a collection of individual elements that share common traits.

For example, we may consider different domestic species as separate populations such as cattle, pigs, sheep, goats and poultry.
For cattle, we can also divide the population into distinct subpopulations as being dairy cattle and beef cattle based on their breeding and production characteristics. Thus, dairy and beef cattle are considered to be subpopulations of the larger cattle population.

The same can be said for poultry meat and egg producing chickens, which are subpopulations of the poultry population.



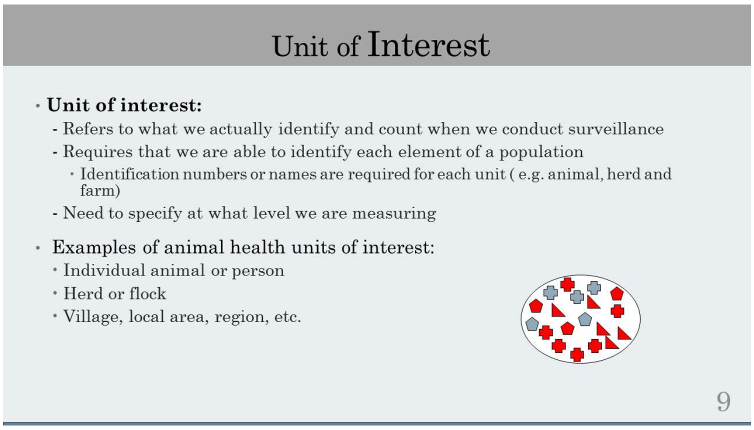
Lesson 2 – Data for Information and Response, Slide 8

SCRIPT / KEY POINTS:
A population is a collection of individual elements that are considered as a whole. Some examples are provided in this slide.

- •All cattle in a country
- •All animals susceptible to PPR
- •Three chickens in a cage on a poultry farm
- •All fish in the Atlantic Ocean
- •All pigs in a village on 1 January 2009

Note that a population can also be defined in terms of place and time.

Reference:
Salman



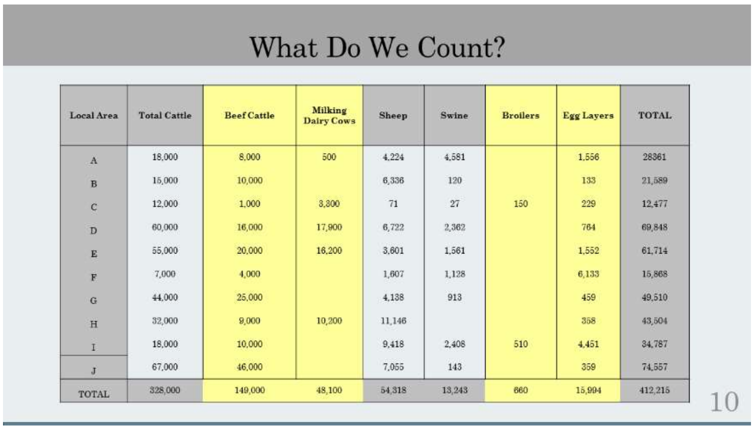
Lesson 2 – Data for Information and Response, Slide 9

SCRIPT / KEY POINTS:
The ***unit of interest*** focuses of <u>what we can identify and count</u> when conducting surveillance. To sample and count something randomly, we must identify each element.

Animal, herd and farm identification numbers or names are required.
When we estimate prevalence of a disease, we must specify at what level we are measuring. Since animals may or may not be identified individually (e.g. village chickens), we often do surveillance at the flock, herd or village level where we can assign a number to each element.

Here are some examples of animal health units of interest:

- Individual animal or person;
- Herd or flock; and
- Village, Area or region.

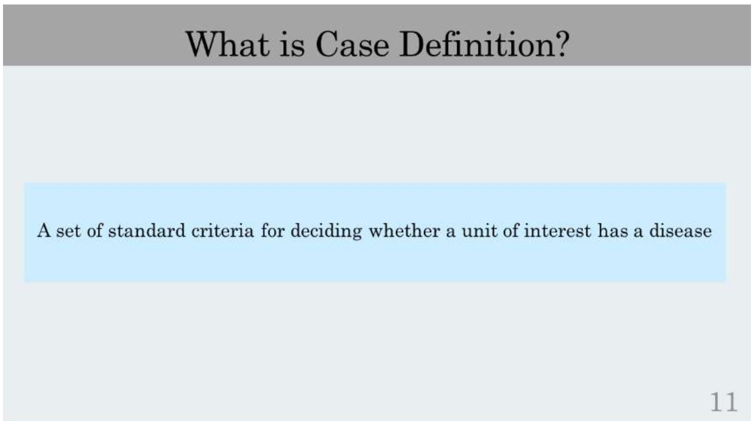


Local Area	Total Cattle	Beef Cattle	Milking Dairy Cows	Sheep	Swine	Broilers	Egg Layers	TOTAL
A	18,000	8,000	500	4,224	4,581		1,556	28361
B	15,000	10,000		6,336	120		133	21,589
C	12,000	1,000	3,300	71	27	150	229	12,477
D	60,000	16,000	17,900	6,722	2,362		764	69,848
E	55,000	20,000	16,200	3,601	1,561		1,552	61,714
F	7,000	4,000		1,607	1,128		6,133	15,868
G	44,000	25,000		4,138	913		459	49,510
H	32,000	9,000	10,200	11,146			358	43,504
I	18,000	10,000		9,418	2,408	510	4,451	34,787
J	67,000	46,000		7,055	143		359	74,557
TOTAL	328,000	149,000	48,100	54,318	13,243	660	15,994	412,215

Lesson 2 – Data for Information and Response, Slide 10

SCRIPT / KEY POINTS:
<u>Key Message:</u> It is best to plan which level of data to collect before beginning.
Consider a census of livestock in …
Counting animal populations are generally an expensive exercise, so its important that we decide at what level (i.e., what units) we count. Its not the same counting animals as opposed to farms, as opposed to villages, etc.
How do we decide what needs to be counted? This is decided prior to collecting the data and should include considerations, such as:

- The purpose and final uses of the data;
- The level of detail required;
    - (e.g., by animal - species, breed, strain, sex, production type)
    - (e.g., by location - country, province/state, local area, village, farm/house, etc.)
- Determine if the data already exists;
- Assess the resources needed to collect the data; and
- Determine the best way to collect, record, store, manage, retrieve and analyse the data.



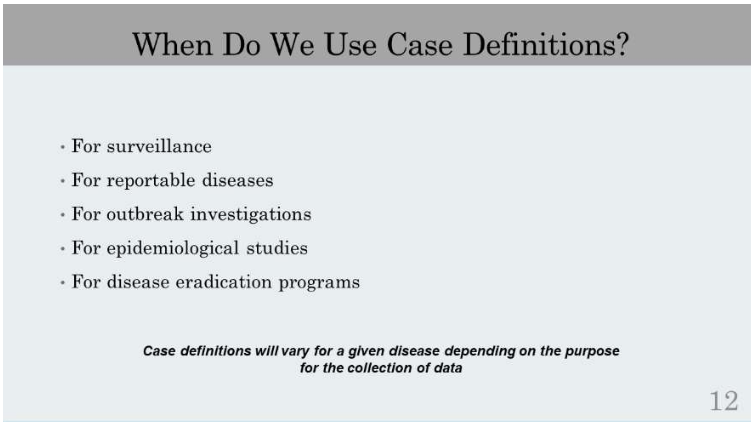
Lesson 2 – Data for Information and Response, Slide 11

SCRIPT / KEY POINTS:
Case definitions
A set of standard criteria for deciding whether a unit of interest has a disease
- Important for consistency of diagnoses
- Allows us to be sure of what we are counting e.g., counts of animals, herds, flocks, villages with a disease When disease cases are counted, it is important to understand what exactly is a positive case. This is done by creating a case definition.

Case definitions may be defined at various levels depending on what is counted, such as, individual animals, flocks, herds or villages affected by a disease outbreak or for routine surveillance. The key is to be clear on what is being counted. Case definitions are generally defined early on.

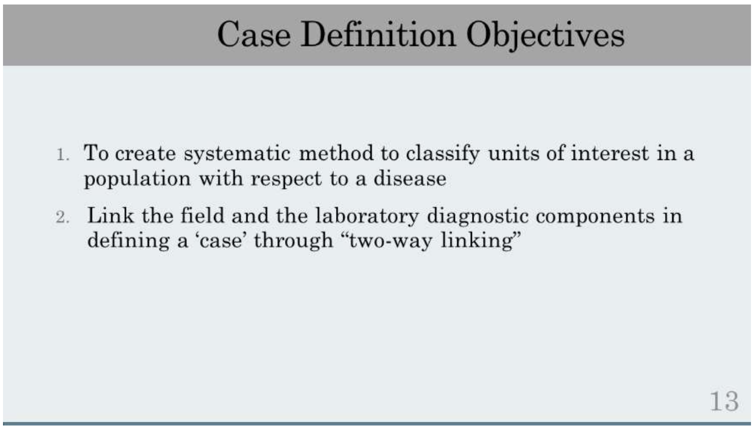
There are three types of case definitions. These are generally used to define the status of diseases in a group of animals.

Case definitions must be clearly established at the beginning to describe a disease event and they should be reviewed and modified when it is necessary to do so. Reference: Dictionary of Epidemiology



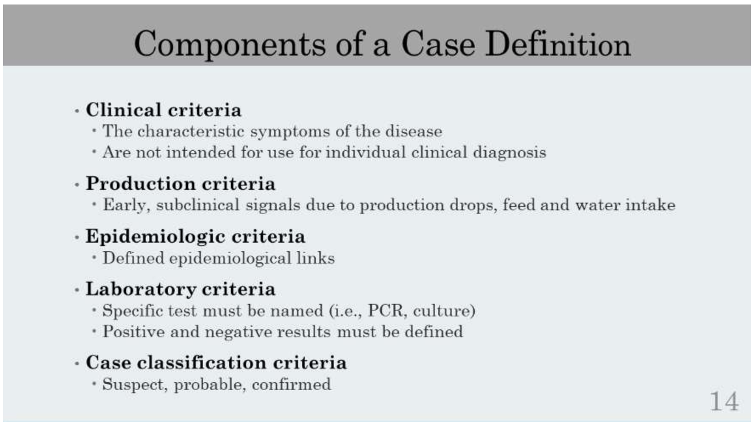
Lesson 2 – Data for Information and Response, Slide 12

SCRIPT / KEY POINTS:
Case definitions are used for a variety of purposes in epidemiology including surveillance for reportable diseases, outbreak investigations, and epidemiological studies.
The purpose of case definitions tends to vary based upon factors such as methods of reporting or data collection, educational/experience level of the staff, and the use of the information.



Lesson 2 – Data for Information and Response, Slide 13

SCRIPT / KEY POINTS:
As surveillance occurs across time and place, it is essential to accurately classify units of interest having the disease to provide a basis for comparison and detection of outbreaks. In this respect, each unit of interest (case) must be described exactly the same way whenever possible to standardize surveillance data.



Lesson 2 – Data for Information and Response, Slide 14

SCRIPT / KEY POINTS:
Case definitions usually have four sections, one each for clinical, epidemiologic, and laboratory considerations for identifying a case.

This is followed by instructions for how to classify a case as suspect, probable, or confirmed based on the clinical, epidemiologic and laboratory evidence.

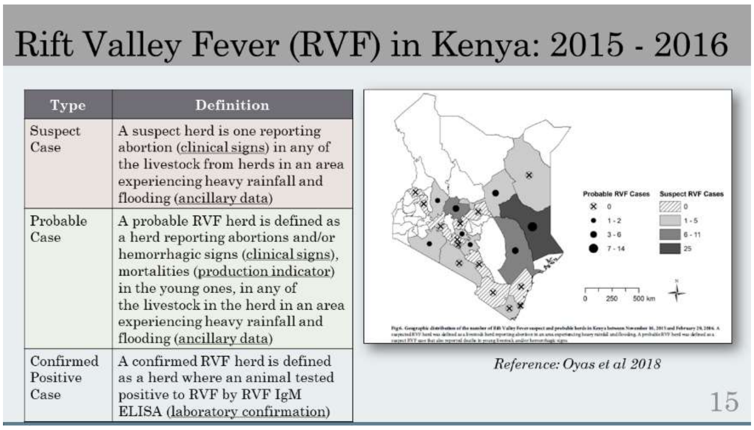
The clinical criteria often contains a succinct description of the disease, including symptoms, progression, and duration. These descriptions are written with the knowledge of what information is needed to distinguish this disease from similar diseases. Whenever possible, symptoms that can help rule out other diseases are included.

Production criteria can provide the earliest sign of subclinical changes in animal health status typically associated with drops in reproduction and fertility, milk, meat (growth rate), and eggs that are related to the presence of disease risk factors. These risk factors may include feed and water quality, infectious disease agents, toxins and mismanagement of the flock or herd.

The epidemiologic criteria usually define an acceptable epidemiologic link for that particular disease. Epidemiological link is established when at least one case in a chain of epidemiologically linked cases is laboratory confirmed. For zoonotic diseases, epi links are expanded to include transmission from laboratory-confirmed cases in animals to humans. What is important to note here is that the epi link criteria must be consistent with the way the disease is transmitted.

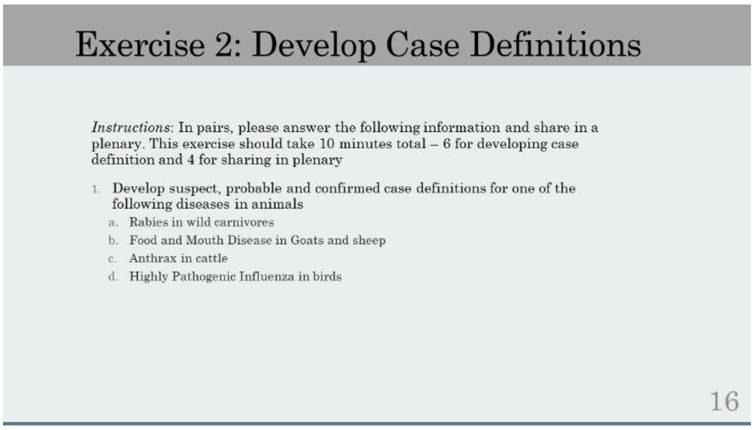
Laboratory criteria: Because of the increasing number of laboratory tests available, and their widely differing ability to correctly label a unit of interest as either having or not having a disease, the laboratory component of a case definition must specify the acceptable lab test. Usually this will be a test with well demonstrated diagnostic reliability and that is obtainable in the Area where the case definition is adopted. In addition to specifying the test, it is also important to state what a positive and negative result are.

Examples of good case definitions in animals can be found on FAO website: http://www.fao.org/3/al859e/al859e00.pdf



Lesson 2 – Data for Information and Response, Slide 15

SCRIPT / KEY POINTS:
Here are some examples of case definitions used during enhanced surveillance for Rift Valley fever (RVF) in high risk counties in Kenya during the period 2015 – 2016 in livestock for cattle, sheep, goats and camels.
Photo:
Image 1: Oyas et al 2018

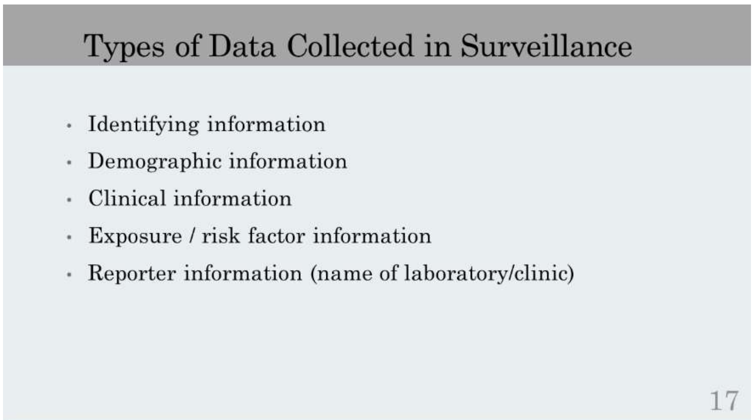


Lesson 2 – Data for Information and Response,
Slide 16

SCRIPT / KEY POINTS:
Please divide yourselves in pairs! In your note books, please develop case definitions for one of the following diseases:

a. Rabies in wild carnivores
b. Food and Mouth Disease in Goats and sheep
c. Anthrax in cattle
d. Highly Pathogenic Influenza in birds

Make sure detail how you considered in writing the case definition. What kind of information do you need to complete the case definition and where will you get it from?
This exercise will take max of 10 minutes including sharing in a plenary.

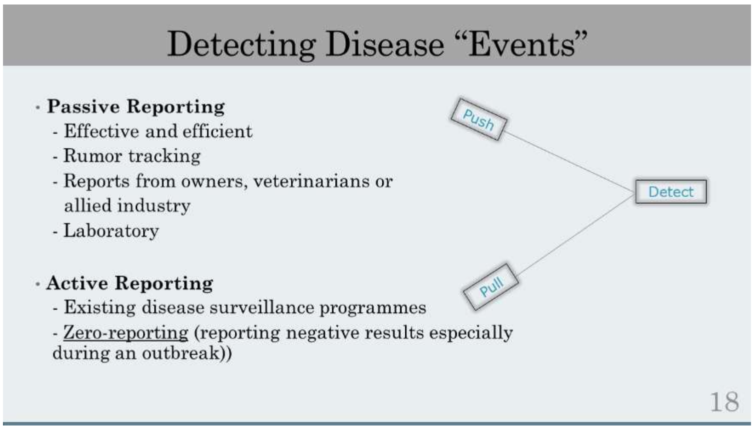


Lesson 2 – Data for Information and Response,
Slide 17

SCRIPT / KEY POINTS:
Data on most surveillance report forms can be grouped into the categories you see listed.
[Instructor could ask participants to give examples of each]

- **Identifying information** - name, address, telephone number of the farm or farmer, geocodes of the farm, etc
- **Demographic information** - age, sex, breed, species

- **Clinical information** – signs/symptoms, laboratory data/information, date of onset, number of animals at risk, number sick, number dead, treatment/prevention and control measures taken etc
- **Exposure / risk factor information** - usually disease specific, e.g., vaccination status
- **Reporter information** - name of physician or lab contact, date, telephone number



Lesson 2 – Data for Information and Response, Slide 18

SCRIPT / KEY POINTS:
We detect disease and gather information either from people who provide or "push" information to the surveillance system either through passive reporting or by "pulling" information from communities and farms actively. Some common methods are provided in the slide.

Passive Surveillance: occurs when no active effort is made to collect disease information.

Data sources: continuous routine activities

Example: Abattoir surveillance; rumour registers; farmers reporting; routine livestock market and stock routes inspections and routine laboratory surveillance of samples

Active surveillance: Veterinary authorities actively go out to look for disease

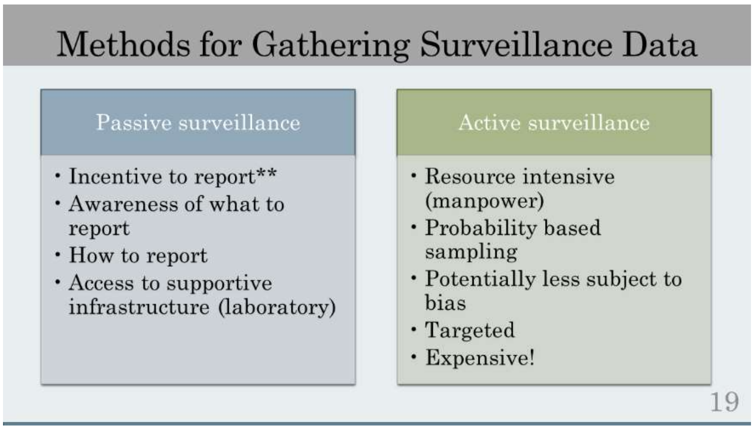
Examples:
Surveys: detailed study conducted to detect and measure the presence, absence and assessment of the risk factors of a specific disease

Disease outbreak investigations: They can be designed to generate information about diseases which occur in animal populations

Zero reporting: Zero reporting is done for specific notifiable high priority diseases

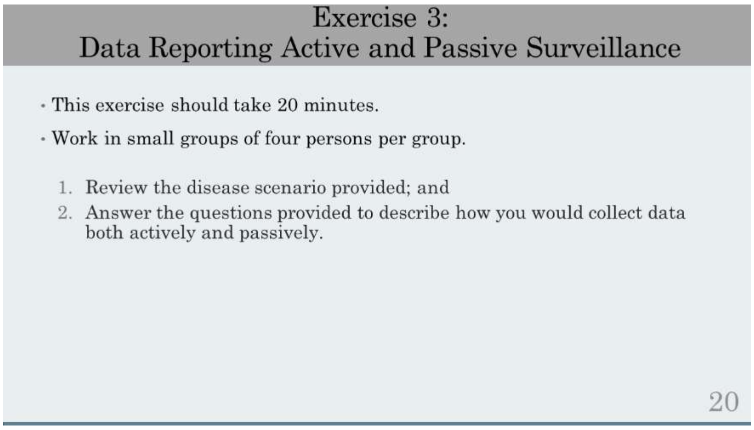
Participatory disease search (PDS): It involves engaging the communities to identify and prioritize animal health issues

Sentinel surveillance: involves recruitment of animals where the risk factors of the disease (s) of interest are highest. These animals are then monitored regularly and the signs related to the disease (s) of interest are noted.
Others: Risk based and targeted surveillance



Lesson 2 – Data for Information and Response,
Slide 19

SCRIPT / KEY POINTS:
What is passive versus active surveillance?
** There must be a benefit and incentive for farmers to report animal diseases. Sufficient manpower and funds must be available to support active surveillance and laboratory disease confirmation.

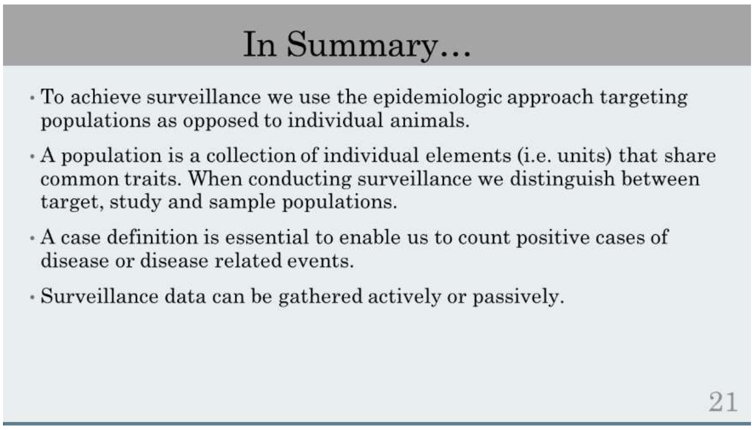


Lesson 2 – Data for Information and Response,
Slide 20

SCRIPT / KEY POINTS:
Exercise 3 instructions: Data Reporting Active and Passive Surveillance

- This exercise should take 20 minutes.
- Review the data report forms provided based on data from the local area in the scenario provided.
- Describe if data is collected actively or passively and how data is shared between the field veterinarian and the laboratory in your local area.

Instructors:
Review instructor guide for answers



Lesson 2 – Data for Information and Response,
Slide 21

SCRIPT / KEY POINTS:
A summary of the main points of this lesson follow:

- The purpose of surveillance is to provide data for action;
- To achieve surveillance we use the epidemiologic approach targeting populations as opposed to individual animals;
- A population is a collection of individual elements (i.e. units) that share common traits. When conducting surveillance we distinguish between target, study and sample populations;
- A case definition is essential to enable us to count positive cases of disease or disease related event;
- Surveillance data can be gathered actively or passively;
- The quality of data gathered is important for decision making and one should be aware of what impacts quality of data gathered; and
- The importance of data flow and impact on a key function of the surveillance system in particular timeliness.

Lesson 2 – Data for Information and Response,
Slide 22

SCRIPT / KEY POINTS:
Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 2 - Creating Suspect, Probable, and Confirmed Case Definitions

Description of Exercise:

Develop suspect, probable and confirmed case definitions for one of the following diseases in animals

Rabies in wild carnivores

Foot and Mouth Disease in Goats and sheep

Anthrax in cattle

Highly Pathogenic Influenza in birds;

Time: 25minutes

Organisation of Group Work:

For each group, create the suspect, probable and confirmed case definitions in MS Word or MS PowerPoint and be prepared to share your list.

Exercise Components and Structure:

For each group, create the suspect, probable and confirmed case definitions in MS Word or MS PowerPoint and be prepared to share your list. for one of the following diseases in animals:

Rabies in wild carnivores
Foot and Mouth Disease in Goats and sheep
Anthrax in cattle
Highly Pathogenic Influenza in birds;

Materials, Data or Information:

- MS Word or MS PowerPoint

Expected Outputs and Deliverables of Each Participant:

1. Provide examples of active and passive surveillance.
2. Show how surveillance data flows including two-way linking between field and laboratory data.

Instructor Notes:

Disease	Suspect	Probable	Confirmed
Rabies in wild carnivores	Death or attack incident with compatible signs of dumb or aggressive nervous signs antemortem	A suspect case in an Area with recent human, animal or wildlife confirmation	A suspect or probable case with positive laboratory confirmation by impression smears prepared from a composite sample of brain tissue are treated with antirabies serum or globulin labelled with fluorescein isothiocyanate (FITC)
Foot and Mouth Disease in Goats and Sheep	Clinical signs including lameness, anorexia, vesicles or erosions of the mouth, feet and mammary glands of adults	High morbidity low mortality in adults, low morbidity and high mortality in young animals in an Area with confirmed cases or known importation of confirmed cases	Demonstration of the presence of FMD virus or antigen. Tests are applied which identify whether or not the virus is present and, if present, to identify the specific serotype
Anthrax in cattle	Sudden deaths in cattle with oral, nasal and anal discharge of un-clotted blood. Nervous signs, tremors and fever in live cattle.	A suspect in an Area following rainy season with a history of previous anthrax outbreaks in cattle or cutaneous anthrax in humans	Blood samples from relatively fresh carcasses will contain large numbers of B. anthracis, which can be seen under a microscope, cultured and isolated in a laboratory, or detected by rapid tests, e.g. polymerase chain reaction (PCR).
Highly Pathogenic Influenza in birds	Sudden death in wild birds; Cyanosis, nervous signs, diarrhea, respiratory distress in poultry with hemorrhage in the shanks	Hemorrhagic necrosis of the trachea, lungs, intestinal tract on post-mortem. The Area has a population of wild bird and a history of previous AI events. Positive rapid antigen test	Positive HI with virus isolation and positive RT-PCR

Exercise 3 - Use of Active and Passive Surveillance for *Brucella Mellitensis* in Sheep and Goats

Description of Exercise:

Review the scenario provided and answer the questions related to use of active and passive surveillance. Should you have any questions, please ask a trainer for clarification before during, and after the exercise.

Work in pairs to answer the questions for the data report forms.

Exercise Components and Structure:

1. This exercise should take 20 minutes.
2. Work in small groups of four persons per group. Be prepared to report back to the class to share your group responses.
3. Review the disease scenario provided; and
4. Answer the questions provided to describe how you would collect data both actively and passively.

Materials, Data or Information:

1. Scenario for Exercise 3.
2. Provide responses in MS Word or MS PowerPoint

Expected Outputs and Deliverables of Each Participant:

1. Provide examples of active and passive surveillance.
2. Show how surveillance data flows including two-way linking between field and laboratory data.

Scenario

Background (Reference: Franc et al. BMC Public Health (2018) 18:125 DOI 10.1186/s12889-017-5016-y):

In 2013, a study. was conducted to estimate the economic impact of brucellosis in the developing nations of Africa and South/ Southeast Asia. In all, 259 studies on brucellosis from these regions were analyzed and encompassed observations from 500,000 animals, 30,000 people, and 600 food samples. The data revealed an average prevalence range of 0–88.8% in sheep and goats, 0–68.8% in cattle, 0.4–20% in camels, and 0–12.9% in other species (pigs and dogs).

In the case of brucellosis, visible losses include livestock abortion, reduced milk production, lost draught power, reduced weight gain from chronic infections and ill-thrift, premature death or culling of unproductive stock, veterinary costs associated with treating clinically ill animals and diminished animal welfare. In endemic area, Brucella spp. can cause a *significant reduction in herd productivity that compromises food security and the livelihood of farmers who depend on the sale or trade of surplus meat, dairy, and offspring from their animals.*

Scenario:

You receive a call from the local health department concerning a rise in the number of human cases of *B. mellitensis* who went to the local hospital in your local area that are confirmed by the national laboratory based on positive bacterial culture.. Twice as many females as males are affected and there has been a significant increase in human abortions has occurred during the past 3 months. Brucellosis is a reportable animal health disease and is a high priority disease in your country. Your veterinary supervisor in the national government has asked you to become a member of a special task force that has been created by the Ministry of Health and the Ministry of Agriculture to investigate the presence of *B. mellitensis* in your local area.

Please answer the following questions:

1. Is the discovery of *B. mellitensis* in humans from the local Area hospital an example of active or passive surveillance? Please explain your answer.

   The humans who voluntarily went to the hospital were self-reporting and so they were passively reporting their illness as opposed to the health department seeking human cases actively.

2. Your supervisor would like you to conduct ongoing surveillance of the local abattoirs to identify sheep and goats that react positively to the rose bengal test. Is the surveillance passive or active? Briefly explain your answer.

   Since your supervisor has asked you to look for sheep and goats that react positively to the rose bengal test, the samples and data will be collected actively through a brief survey.

3. The local health department has decided to conduct as survey of the abattoir workers and sheep and goat farmers in your local area. They would like to collaborate with you and have asked you to collect information about abortion history and chronic illness in some selected sheep and goat herds.
   a. Is the farm survey active or passive? Briefly explain your answer.
   b. Some farmers choose to contact you following the survey to report cases of of abortion in their sheep and goats of their own free will. Is this voluntary reporting by farmers active or passive? Briefly explain your answer.
   c.

   a. The farm survey is initiated by the Ministry of Agriculture and so it is a form of active data collection that will supplement the active surveillance at abattoirs.

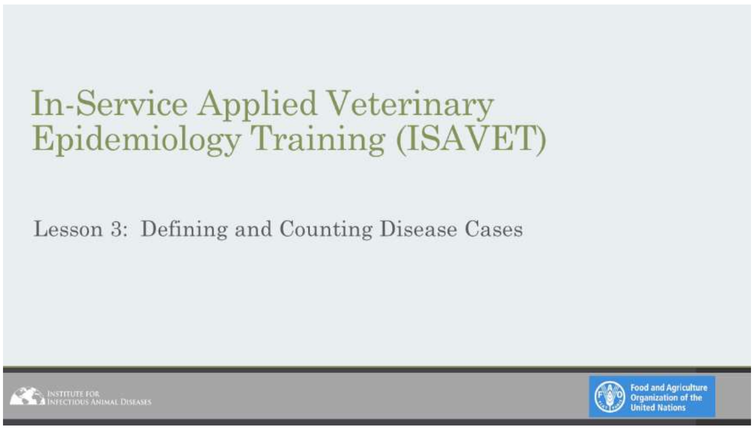
b. The farmers that choose to report are doing so of their own free will and so this information is reported passively and will contribute to additional field and laboratory investigation to improve our knowledge of the *B. mellitensis* in sheep and goat farms in the local area.

Lesson 3 – Defining and Counting Disease Cases

Estimated Lesson and Exercise Time	2 hours
Instructor Materials	Frontline ISAVET Lesson 3 Defining and Counting Disease Cases.pptx
	Frontline ISAVET Lesson 3 Defining and Counting Disease Cases Instructor Guide.doc
	Computer
	Microsoft Word and Excel
Participant Materials	Frontline ISAVET Lesson 3 Defining and Counting Disease Cases Participant Guide.PDF
Handout Materials for Exercises	Frontline ISAVET_PivotTable Handout. PDF
	Frontline ISAVET_PivotTable.xls

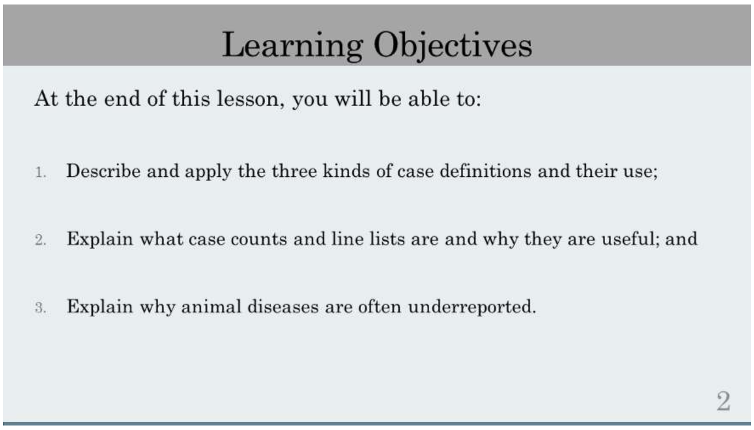
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

ELISA	Enzyme Linked Immunosorbent Assay
FN	False Negative
FP	False Positive
IFA	Immunofluorescent Antibody
ISAVET	In Service Applied Veterinary Epidemiology Training
PCR	Polymerase Chain Reaction



Lesson 3 – Defining and Counting Disease Cases, Slide 1

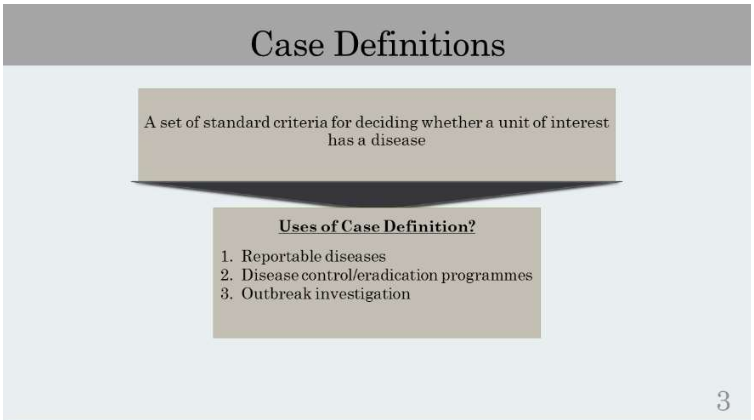
SCRIPT / KEY POINTS:
Welcome to Lesson 3 titled, "Defining and Counting Disease Cases". In this lesson, we will continue to learn about surveillance elements and characteristics.



Lesson 3 – Defining and Counting Disease Cases, Slide 2

SCRIPT / KEY POINTS:
In this lesson, we will:

- Describe the three kinds of case definitions and their use;
- Explain what case counts and line lists are and why they are useful; and
- Explain why animal diseases are often underreported.

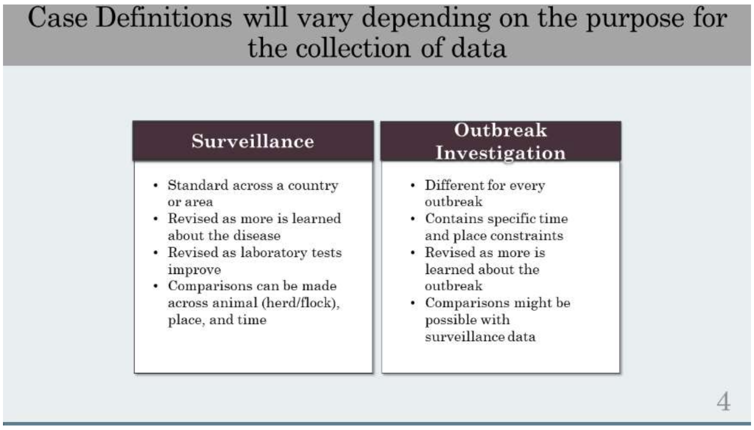


Lesson 3 – Defining and Counting Disease Cases, Slide 3

SCRIPT / KEY POINTS:
A case definition is a set of uniformly applied criteria used to determine if an animal and/or herd/flock has a particular disease. For the purposes of today's lesson, we will keep case definitions at the herd/flock level. Defining a case is an essential skill to be learned by any Frontline ISAVET field personnel.

Case definitions are used for a variety of purposes. Can anyone provide some information on when case definitions would be used in an epidemiological context?
- Reportable diseases
- Disease control and eradication programmes
- Outbreak investigation

An example of this could be an outbreak of respiratory issues in a herd or flock. In this instance, the case definition may be kept fairly broad to include clinical signs such as coughing, fever, lethargy, and breathing difficulties. This definition would allow Frontline ISAVET field personnel to identify a herd/flock case with no laboratory confirmation in a resource limited setting.



Lesson 3 – Defining and Counting Disease Cases, Slide 4

SCRIPT / KEY POINTS:
Surveillance and outbreak case definitions share the goal of applying uniform criteria in order to correctly classify affected herds/flocks, but the case definitions will vary depending on the purpose for data collection (i.e., surveillance vs outbreak investigation).

Case definitions used for surveillance purposes must cover as wide a geographical region as possible in order to allow for comparisons to be made across place and time.

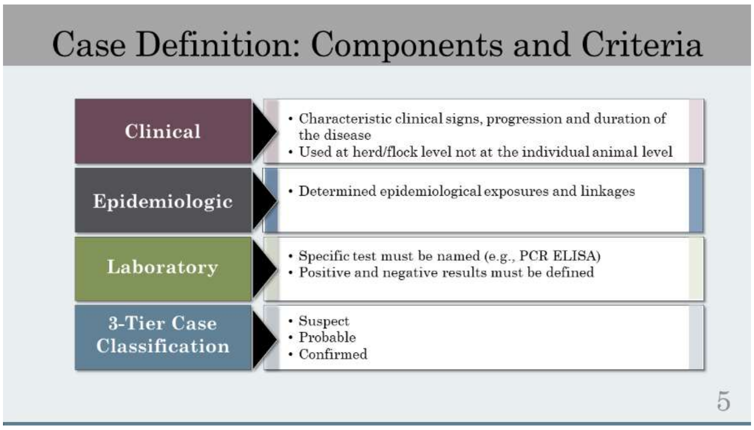
Changing the case definition considerably each year might cause underreporting, thereby producing a false understanding of the epidemiology of that disease.

Case definitions for outbreak purposes, will be developed differently.
- Even if you already know the causal agent of the outbreak, there are reasons you would not want to use a surveillance case definition (i.e., if the outbreak was caused by a reportable disease which is currently under annual surveillance).
- Applying the normal lab component of the case definition might not be feasible, if there are too many herds/flocks to test or the test is too expensive and time consuming.
- There is often a background level of disease present in the population. To exclude these cases, the outbreak case definition will include information

about time and place of exposure as herds and/or flocks become known and confirmed.

- As the outbreak investigation continues, the case definition will be refined. For example, where it might once have included all the herds/flocks within a certain Local area with consistent clinical signs at the herd/flock level, the case definition might be narrowed to include herds/flocks who are in a specific Village with specific clinical signs.

The most important difference between surveillance and outbreak case definitions is their intended use. Surveillance data is used to compare to all other cases of the disease collected by the surveillance system. Outbreak case definitions are intended to identify cases associated with an outbreak, and might not be comparable with surveillance data if the clinical and laboratory criteria are very different.



Lesson 3 – Defining and Counting Disease Cases, Slide 5

SCRIPT / KEY POINTS:

Case definitions usually have the following components which includes a clinical, epidemiologic, and laboratory considerations for identifying a case. Cases are then classified as suspect, probable, or confirmed based on the clinical, epidemiologic and lab evidence.

<u>Clinical Criteria:</u>

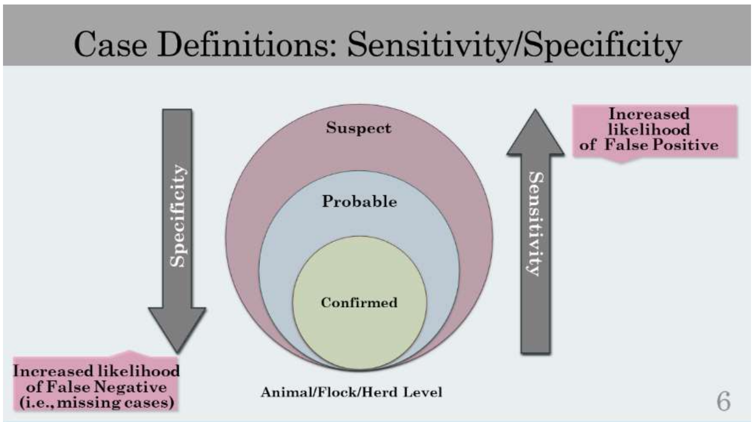
Case definitions contain a brief description of the disease, including clinical signs, progression, and duration. Clinical descriptions are written with the knowledge of what information is needed to distinguish this disease from similar diseases. Whenever possible, clinical signs are included that can help rule out other diseases.

<u>Epidemiologic Criteria:</u>

The epidemiologic criteria usually defines an epidemiologic link (i.e., exposure) for that particular disease. An epidemiological link is established when there is contact between two exposed groups involving a feasible mode of transmission when: a.) one of the groups is likely to be infectious, and b.) the other has an illness onset within one incubation period after this contact.

Laboratory Criteria:
Due to a large number of laboratory tests, and their widely differing ability to correctly label an animal or herd/flock as either having or not having a disease, the laboratory component of a case definition must specify the acceptable laboratory test and/or tests depending on the disease. Usually this will be a test with demonstrated diagnostic reliability and one that is obtainable in the area where the case definition is adopted. Laboratory testing will be variable based on the purpose of the data collection depending on whether you are wanting to increase the sensitivity/specificity of your surveillance system depending on what is occurring in the field and the purpose of your surveillance system. However, for outbreak investigations, you are looking for the most sensitive testing scheme in order to determine the true magnitude and scope of the outbreak. In addition to specifying the test, it is also important to state what a positive and negative result are. For example, for a serologic test, the laboratory test might state that a fourfold rise in antibody titers (1:64) is needed for confirmation, and that anything less than 1:64 is considered negative for the purposes of the case definition. This will be dependent upon the situation your are facing for collection of data for surveillance purposes vs. outbreak investigation purposes.

3-Tier Case Classification Criteria:
A case will be categorized as suspect, probable or confirmed. These definitions are used to determine what is needed to meet each classification for a case. Now, let's discuss more about the 3-tier case classification system and the criteria within a suspect, probable, or confirmed case.



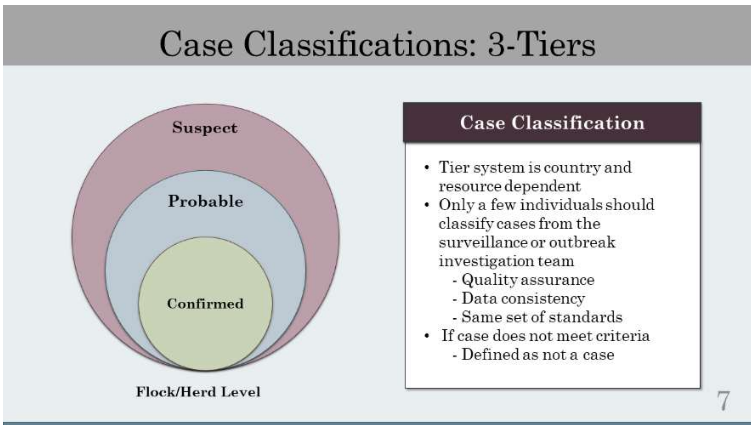
Lesson 3 – Defining and Counting Disease Cases, Slide 6

SCRIPT / KEY POINTS:
Before discussing each classification, let's introduce the topic of sensitivity and specificity as it pertains to case definitions.

Sensitive Case Definitions:
Sensitivity is the ability to detect disease (i.e., all cases). In an outbreak situation, you would want to use a case definition that is more sensitive, since more herds and/or flocks will have the disease. In addition, you also are trying to determine the magnitude of the outbreak, so you want to find as many positive cases that you can. The drawback is that

these tests can also be false positives (FPs). In an outbreak situation having high sensitivity and specificity are both desirable, however, both are inverse of each other. Therefore, it is important to reach a compromise between sensitivity for capturing cases and the ability to track down false positive cases.
In the three-tiered case classification, as suspect case is your most sensitive case definition.

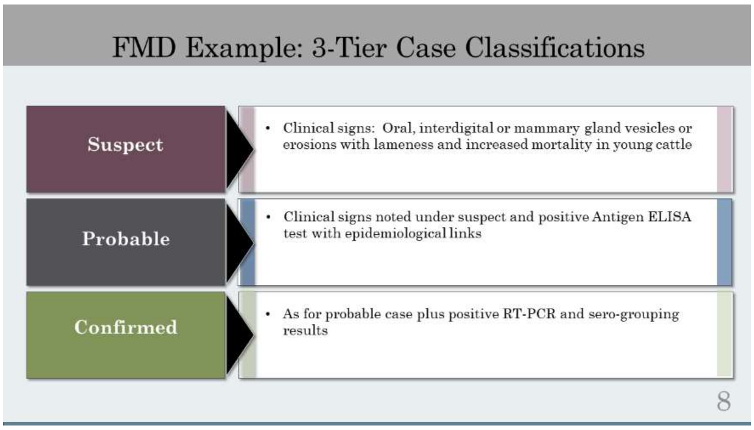
Specific Case Definitions:
Specificity is the ability to exclude non-cases (i.e., true non-cases). For example, during a non-epidemic period, a surveillance case definition may require more serologic or other specific testing information before being confirmed as a case as opposed to an outbreak, where the epidemiological link may be sufficient evidence to take action. Based on these two situations, there would be a fewer number of confirmed cases in the routine surveillance period than there would be in an outbreak investigation.
In the three-tiered case classification, a confirmed case is your most specific case definition.



Lesson 3 – Defining and Counting Disease Cases, Slide 7

SCRIPT / KEY POINTS:
Classification categories can also be called tiers. Within animal health, some countries use three tiers, and others use two tiers due to limited time and resources. For the Frontline ISAVET trainees, we will discuss a 3-tier system. The 3-tiered case definition refers to the level of certainty of diagnosis.

Once all information has been gathered, Frontline ISAVET field personnel should assign a case definition as suspect, probable, or confirmed. Case definitions should be limited to a few individuals who will classify cases so that the hard-to-classify cases are dealt with in the same standardised manner. This will improve data integrity. Sometimes the investigation reveals that a suspected case does not meet the criteria to be classified as a suspect. The case is then labeled “not a case.”



Lesson 3 – Defining and Counting Disease Cases, Slide 8

SCRIPT / KEY POINTS:

Suspect Case:

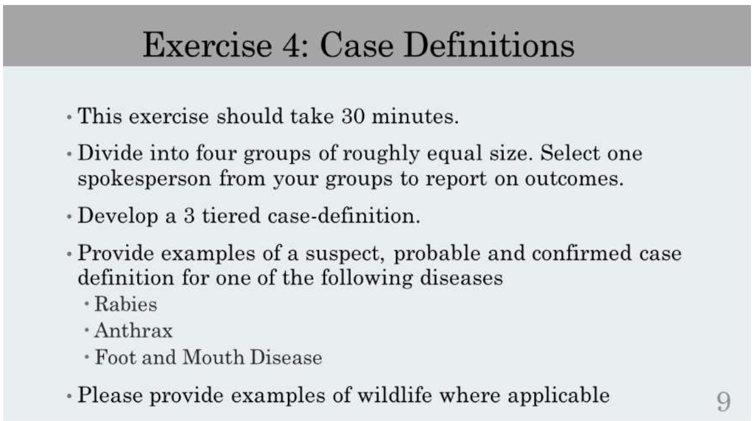
The first level of the 3-tiered case definition system is the suspect. This level is typically the most sensitive and contains primarily clinical signs frequently associated with the disease in question. In addition, it is important to distinguish any clinical signs which can help differentiate this disease from another (i.e., differential diagnosis).

Probable Case:

The second level of the 3-tiered case definition is probable. This commonly contains an epidemiological linkage, pathognomonic signs, or positive field screening results.

Confirmed Case:

The final level of the 3-tiered case definition is confirmed. The level is typically determined by a specimen that has tested positive for a disease on an approved laboratory test and has met the criteria required for both the suspect and probable levels of the case definitions. This is typically the most specific case definition.

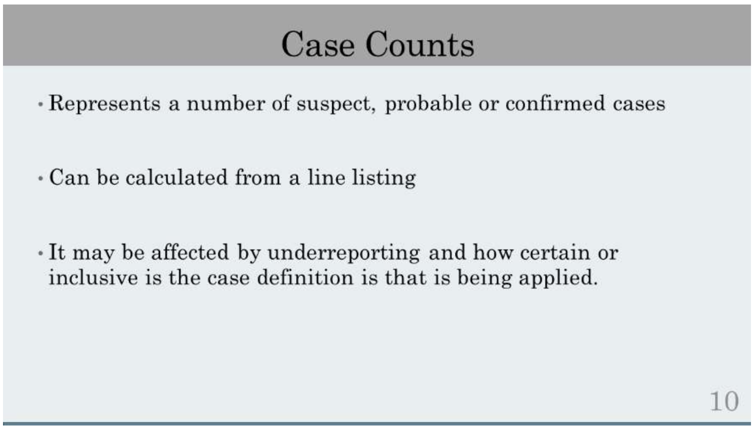


Lesson 3 – Defining and Counting Disease Cases, Slide 9

SCRIPT / KEY POINTS:
Exercise 4 instructions: Case Definitions

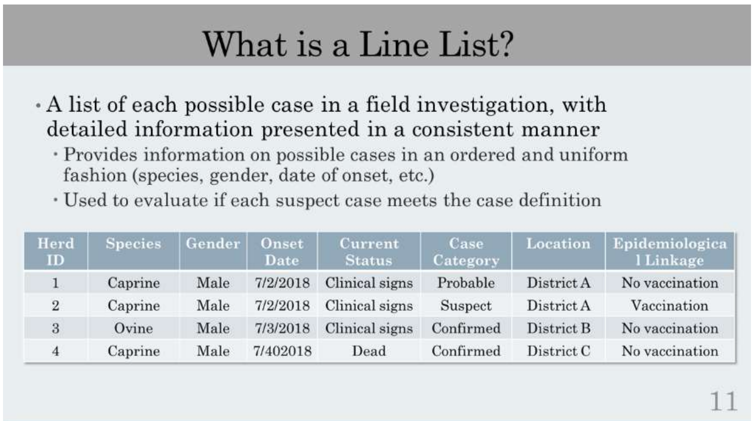
- This exercise should take 30 minutes.
- Divide into four groups of roughly equal size. Select one spokesperson from your groups to report on outcomes.
- Develop a 3-tiered cased definition.
- Provide examples of a suspect, probable and confirmed case definition.

Instructors:
Review instructor guide for answers.



Lesson 3 – Defining and Counting Disease Cases, Slide 10

SCRIPT / KEY POINTS:
The case definition will define the number of suspect, probable, or confirmed cases. These are represented as case counts. Confirmed cases allows you to showcase the scope and magnitude of and outbreak situation or patterns and trends when reviewing surveillance data.
Case counts can be calculated from a line listing. It is important to note that due to underreporting, cases reported may represent only a small fraction of the total cases of an outbreak. This is dependent upon the sensitivity and specificity of your case definition.

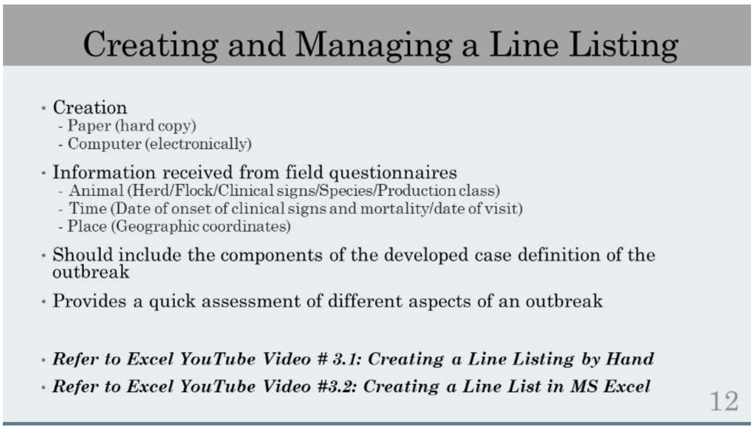


Herd ID	Species	Gender	Onset Date	Current Status	Case Category	Location	Epidemiologica l Linkage
1	Caprine	Male	7/2/2018	Clinical signs	Probable	District A	No vaccination
2	Caprine	Male	7/2/2018	Clinical signs	Suspect	District A	Vaccination
3	Ovine	Male	7/3/2018	Clinical signs	Confirmed	District B	No vaccination
4	Caprine	Male	7/402018	Dead	Confirmed	District C	No vaccination

Lesson 3 – Defining and Counting Disease Cases, Slide 11

SCRIPT / KEY POINTS:
A line listing is a tool that is very commonly used to systemmatically organize case data from field investigations. A line listing is an organized list of all the possible cases found in the field investigation that includes detailed information about variables (column headings) for each case/line.

The key is to organise data in an ordered, uniform manner. The purpose of that is to be able to quickly and easily characterize the cases in the field investigation. The types of information typically collected include demographic and identifying information, information about person, place, and time; signs and symptoms. The items in the line list are often used to develop case definitions and then subsequently determine whether an individual meets case definition.

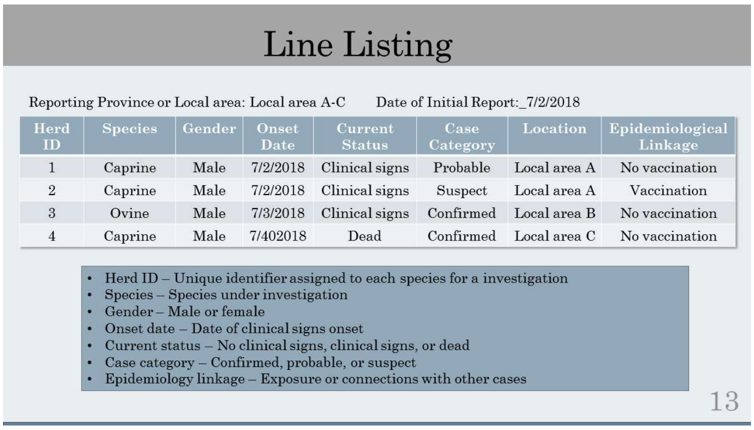


Lesson 3 – Defining and Counting Disease Cases, Slide 12

SCRIPT / KEY POINTS:
During an outbreak investigation it is important to develop a line listing. This listing allows information about animal (herd/flock), time and place to be organised and reviewed quickly. Development of the listing in an MS Excel spreadsheet is a good way to keep track of different categories of cases on a daily basis, so you can produce your epidemic curves and keep track of confirmed herds/flock by location and dates.

This line listing can easily be updated on a daily basis as an investigation progresses. (i.e., changing your case category throughout the course of the outbreak based on herd ID number). An example of this is when a probable case is confirmed by the laboratory.

Refer to Excel YouTube Video # 3.1: Creating a Line Listing by Hand
Refer to Excel YouTube Video #3.2: Creating a Line List in MS Excel

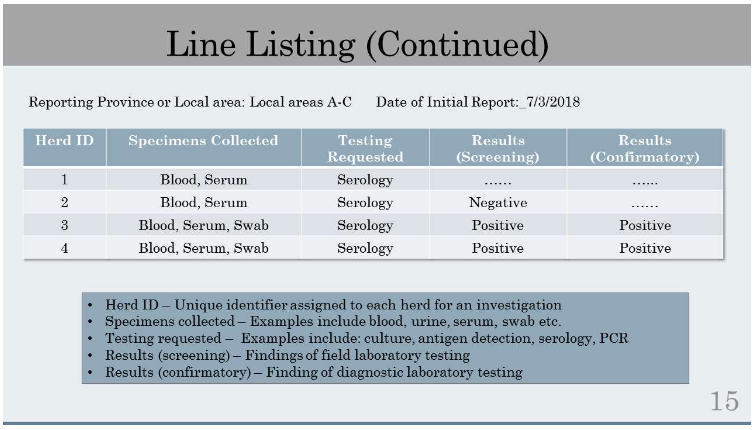


Lesson 3 – Defining and Counting Disease Cases, Slide 13

SCRIPT / KEY POINTS:
The following table gives an example of a line listing. To develop a line listing, create a table where each row represents a case and each column represents a variable of interest. For our purposes, a case will be at the herd or flock-level. The following are some examples of variables that can be used in a line listing, but this is not exhaustive. New cases should be added to the listing as they are identified and all cases should be updated throughout the investigation as they are identified, and new information from questionnaires within the local area is received.

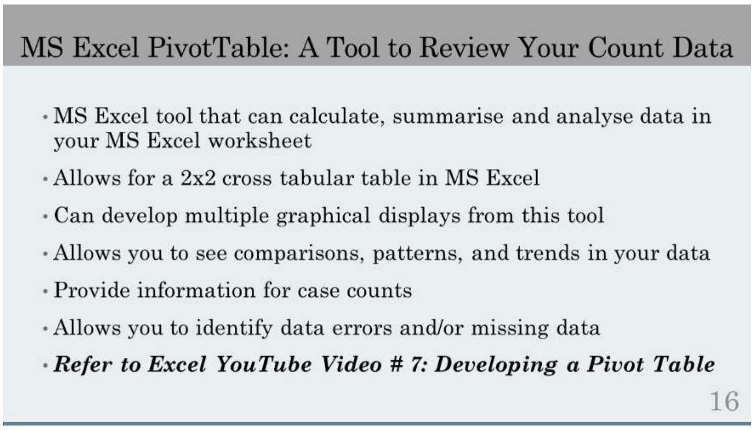
Lesson 3 – Defining and Counting Disease Cases, Slide 14

SCRIPT / KEY POINTS:
Line listings should also include the clinical signs of the disease in question. These variables will change based on the outbreak in question.



Lesson 3 – Defining and Counting Disease Cases, Slide 15

SCRIPT / KEY POINTS:
It is also important to collect laboratory information when you develop your line listing. It is good to obtain this information from the case histories that are provided to the provincial or reference laboratories. Variables to include are the specific specimens that were collected for each case, the type of testing that was requested (i.e., culture, serology, antigen identification etc.) along with the specific screening and confirmatory test results. Normally, you would want to put the official name of the screening and confirmatory diagnostic test in your line listing as these may change over time during an outbreak investigation.

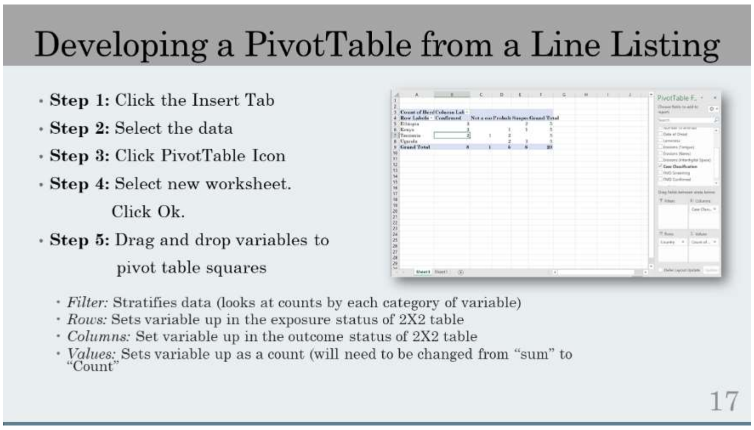


Lesson 3 – Defining and Counting Disease Cases, Slide 16

SCRIPT / KEY POINTS:
MS Excel has a tool called a Pivot Table. A PivotTable is a powerful tool to calculate, summarise, and analyse data that lets you see comparisons, patterns, and trends in your data.
The functions of the PivotTable include:

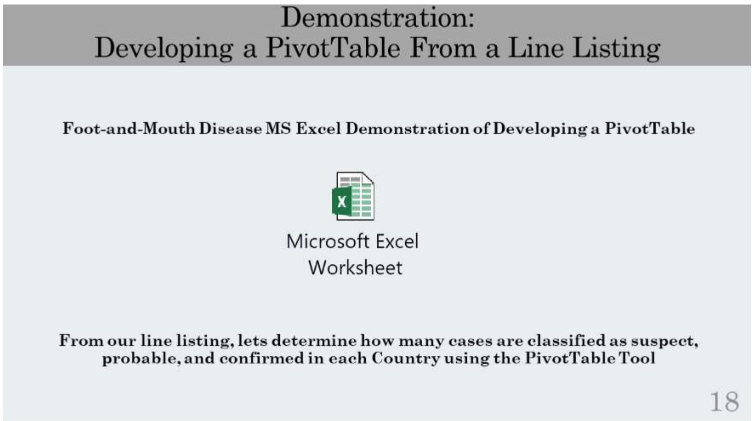
- Provides a quick synopsis of a 2X2 cross tabular table in MS Excel
- Development of multiple graphical displays (i.e., line graphs, bar charts, pie graphs etc.)
- Provides information for case counts (i.e., count data for each variable in your dataset)
- Allows you to identify data errors and/or missing data

You should have reviewed Excel YouTube Video # 7: Developing a Pivot Table prior to taking this lesson



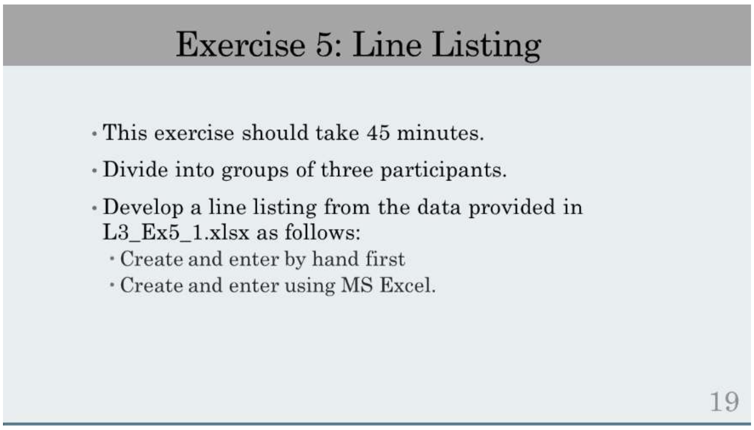
Lesson 3 – Defining and Counting Disease Cases, Slide 17

SCRIPT / KEY POINTS:
To create your PivotTable, open your MS Excel worksheet and click on the insert tab. Select the cells for the range of data that you would like to have included in your table. Next, select the PivotTable icon on the insert tab. Choose where you want the PivotTable to be placed. Usually, you will place it on a new worksheet. Select the fields you want in your PivotTable by dragging and dropping the variables from your dataset into the PivotTable squares. For count data, be sure to change the values field from sum to count as MS Excel automatically prepopulates that field with sum data.



Lesson 3 – Defining and Counting Disease Cases, Slide 18

SCRIPT / KEY POINTS:
Instructor should run through demonstration on how to develop a PivotTable using the attached MS Excel spreadsheet.



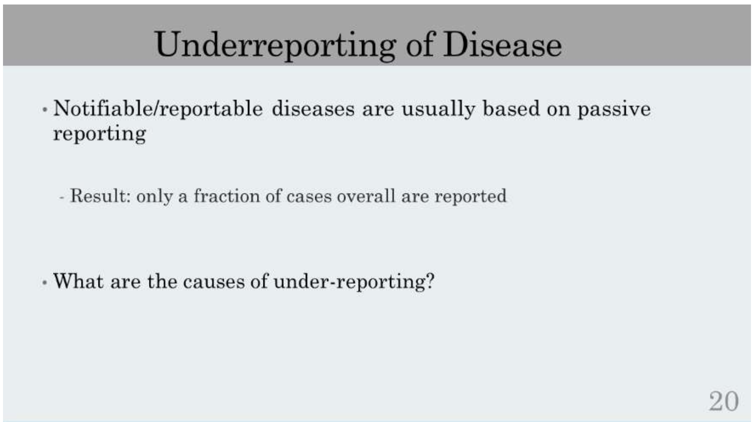
Lesson 3 – Defining and Counting Disease Cases,
Slide 19

SCRIPT / KEY POINTS:
Exercise 5 instructions: Line Listing

- This exercise should take 45 minutes.
- Divide into groups of three participants.
- Develop a line listing from the data provided.

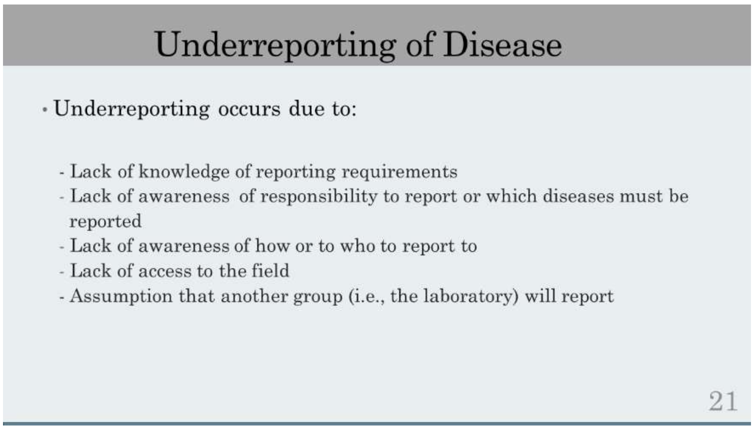
Instructors:

- Review instructor guide for answers.



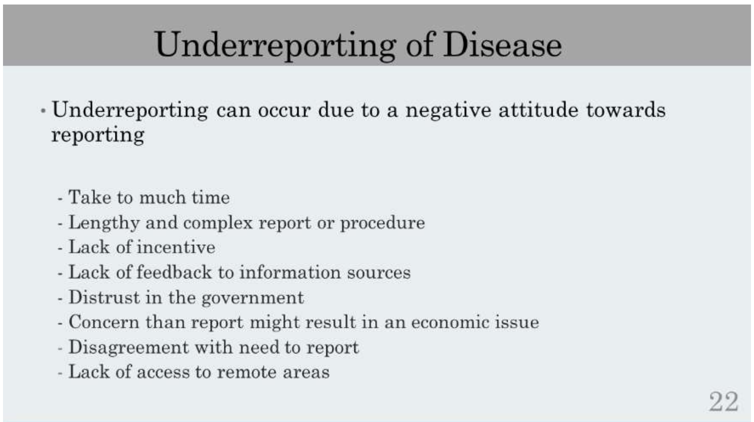
Lesson 3 – Defining and Counting Disease Cases,
Slide 20

SCRIPT / KEY POINTS:
There are several factors which can cause underreporting. What maybe the causes of under-reporting?.



Lesson 3 – Defining and Counting Disease Cases,
Slide 21

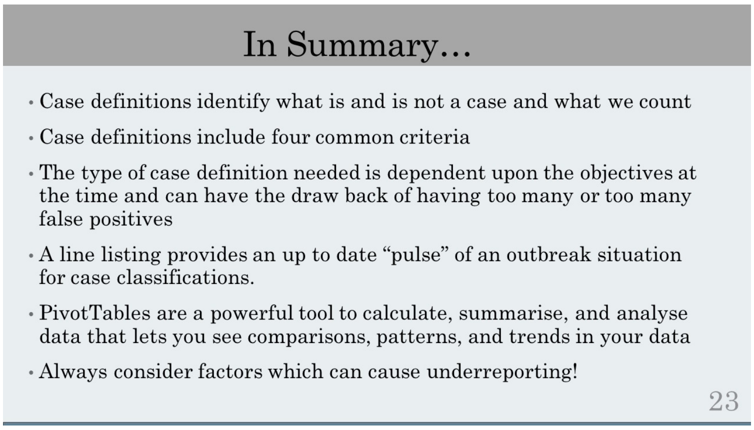
SCRIPT / KEY POINTS:
The main factor is that most notifiable/reportable animal health diseases are usually based on passive reporting. Other factors include a lack of knowledge to reporting requirements, lack of awareness on what diseases are reportable, not understanding how, when, or who to report information to, and thinking that another group will report. Often, it is not possible to get access to the field due to limitations of transportation, personal protective equipment and other logistical factors.



Lesson 3 – Defining and Counting Disease Cases,
Slide 22

SCRIPT / KEY POINTS:
Specific attitudes and or behaviors can increase the chances of underreporting. These include:

- Reporting is to time and labor intensive;
- It is too complex to develop the report;
- There is no incentive for feedback;
- There is a distrust in by farmers to report information to the government;
- There are concerns that reporting a specific result might result in an economic issues or trade barrier; and
- There may be disagreement over the need to report.



Lesson 3 – Defining and Counting Disease Cases, Slide 23

SCRIPT / KEY POINTS:
In summary, we discussed case definitions, their common criteria, what occurs with a sensitive and/or specific case definition. Specifically, we learned how to create and manage a line listing during an outbreak situation. Finally, we discussed specific factors that cause underreporting.

Lesson 3 – Defining and Counting Disease Cases, Slide 24

SCRIPT / KEY POINTS:
Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 4 – Case Definition

Description of Exercise:

Based on the information provided in the handout, use the following exercise to develop a case definition for brucellosis or theileriosis (east coast fever). Use the example provided in the case definition lecture as a reference for how a case definition should be structured and what information should be included at each level (i.e., 3-tier case definition). Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 45 minutes

Exercise Components and Structure:

1. Develop the following descriptions for your case definition.
    a. Case classification (3-tiered case definition)
2. After 45 minutes, each spokesperson will present their findings.

Organization of Group Work:

1. Divide into four groups. Select one spokesperson from your group to report outcomes to the entire group.
    a. Group A – Conducting routine surveillance for brucellosis in your country.
    b. Group B – Conducting outbreak investigation for brucellosis in your local area.
    c. Group C – Conducting routine surveillance for east coast fever in your country.
    d. Group D – Conducting outbreak investigation for east coast fever in your local area.

Materials, Data or Information:

1. Internet access
2. Computer with Microsoft Word
3. Paper and pen

Expected Outputs and Deliverables of Each Participant:

- Provide examples of a suspect, probable, and confirmed case definition.

Instructor Note(s):

Divide the class into four groups of equal size. Ask each group to nominate one person to be the spokesperson for the group and to present their suggestion for a three-tiered case definition.

Go online and download the technical information from the following websites.

Brucellosis: http://www.cfsph.iastate.edu/DiseaseInfo/disease.php?name=brucellosis-human&lang=en (technical factsheet, fast facts disease summary, PowerPoint presentation and presentation speaker notes)

Theileriosis (East Coast Fever):

http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/THEILERIOSIS.pdf

http://www.fao.org/wairdocs/ILRI/x5549E/x5549e0x.htm

Based on the information provided from the following websites, have participants develop a 3-tiered case definition.

At the end of the presentation – ask the group which factors that are different between surveillance and outbreak case definitions:

Surveillance case definitions: should cover as wide as a geographical region as possible and should only be changed in a methodical manner. Changing a case definition substantially on an annual basis can cause underreporting, causing a false understanding of the epidemiology of disease. Surveillance case definitions are used to compare to all other cases collected by a surveillance system.

Outbreak case definitions: Over time the case definition becomes refined as new information is determined. Outbreak case definitions identify cases associated with an outbreak, and may not be comparable with surveillance data, if the clinical and laboratory criteria are very different.

Group A
Conducting Routine Surveillance for Brucellosis in Your Country

1. *Case Classification (3-Tiered Case Definition):*

Suspect:

A herd with fever of unknown origin (FUO) with the following clinical signs:

Cattle	Sheep	Goats	Swine
• Third trimester abortion >50% herd • Retained placenta • Endometritis • Birth of dead or weak calves • Low milk yield < 10% of daily yield	• Late term abortions >50% herd • Retained placenta • Birth of dead or weak lambs • Fertility issues (>20% of herd with issues) • Orchitis • Epididymitis	• Late term abortions >50% herd • Retained placenta • Birth of dead or weak kids • Lameness • Mastitis	• Early or late term abortions >50% herd • Fertility issues (>20% of herd with issues) • Lameness • Arthritis • Metritis

Probable:

A case meeting the suspect definition in cattle, sheep, goats, or swine and at least one of the following:

- Epidemiologically linked to a known outbreak of infected herds in any region of Country X.
- Epidemiological linked to no vaccination of herds in the region.
- Epidemiologically linked to known outbreaks of human brucellosis from farmers.
- Epidemiologically linked to known outbreaks of human brucellosis from consuming unpasteurized dairy products.
- Positive Rose Bengal field test.

Confirmed:

A case meeting the probable definition in cattle, sheep, goats, or swine and at least one of the following:

- Laboratory isolation of *Brucella sp*. from blood, semen or other clinical tissue specimen from the field.
- Positive Rose Bengal and a positive serologic test for non-agglutinating antibodies (ELISA).

Group B
Conducting Outbreak Investigation for Brucellosis in Your Local area

1. *Case Classification (3-Tiered Case Definition):*

Suspect:

A herd with fever of unknown origin (FUO) with the following clinical signs:

Cattle	Sheep	Goats	Swine
• Third trimester abortion • Retained placenta • Endometritis • Birth of dead or weak calves • Low milk yield	• Late term abortions • Retained placenta • Birth of dead or weak lambs • Fertility issues • Orchitis • Epididymitis	• Late term abortions • Retained placenta • Birth of dead or weak kids • Lameness • Mastitis	• Early or late term abortions • Fertility issues • Lameness • Arthritis • Metritis

Probable:

A case meeting the suspect definition in cattle, sheep, goats, or swine and at least one of the following:

- Epidemiologically linked to a known outbreak of infected herds in any herds located in local area X.
- Epidemiologically linked to no vaccination of herds in local area x.
- Epidemiologically linked to known outbreaks of human brucellosis from farmers.
- Epidemiologically linked to known outbreaks of human brucellosis from consuming unpasteurized dairy products.
- Positive Rose Bengal field test.

Confirmed:

A case meeting the probable definition in cattle, sheep, goats, or swine and at least one of the following:

- Laboratory isolation of *Brucella sp*. from blood, semen or other clinical tissue specimen from the field.
- Positive Rose Bengal and a positive serologic test for non-agglutinating antibodies (ELISA).
- Positive brucella milk ring test.
- Positive fluorescent antibody test in clinical field specimens (i.e., placenta or foetus).

Group C
Conducting Routine Surveillance for East Coast Fever in Your Country

1. *Case Classification (3-Tiered Case Definition):*

   Suspect:

   A herd with fever and lymphadenopathy with any of the following clinical signs.

   - Anorexia and loss of body condition
   - Decreased milk yield
   - Lacrimation
   - Corneal opacity
   - Nasal discharge
   - Dyspnoea
   - Diarrhoea

   Probable:

   A case meeting the suspect definition and at least one of the following:

   - Epidemiologically linked to a known outbreak of infected herds in any region of Country X.
   - Epidemiologically linked to Area with high tick infestations of herds with no prevention or vector control measures (i.e. antithelerial drugs and/or acaracides) in Uganda.
   - Epidemiologically linked to no vaccination of herds in the region.
   - Positive giemsa stained smear from lymph node biopsy which contains presence of schizonts (*Theileria sp.*).

   Confirmed:

   A case meeting the probable definition and at least one of the following:

   - Laboratory isolation of *Theileria sp.* from giemsa stained smear of lymph node.
   - Positive serologic test for antibodies against *Theileria sp.* (ELISA) or an indirect fluorescent antibody test (IFA).

Group D
Conducting an Outbreak Investigation for East Coast Fever in Your Local area

1. *Case Classification (3-Tiered Case Definition):*

Suspect:

A herd with fever and lymphadenopathy with at least three of the following clinical signs:

- Anorexia and loss of body condition
- Decreased milk yield
- Lacrimation
- Corneal opacity
- Nasal discharge
- Dyspnoea
- Diarrhoea

Probable:

A case meeting the suspect definition and at least one of the following:

- Epidemiologically linked to a known outbreak of infected herds in any herds located in local area x.
- Epidemiologically linked to Area with high tick infestations of herds with no prevention or vector control measures (i.e., antithelerial drugs and/or acaracides) in herds located in local area x.
- Epidemiologically linked to no vaccination of herds in the region.
- Positive giemsa stained smear from lymph node biopsy which contains presence of schizonts (*Theileria sp*.).

Confirmed:

A case meeting the probable definition and at least one of the following:

- Laboratory isolation of *Theileria sp*. from giemsa stained smear of lymph node.
- Positive serologic test for antibodies against *Theileria sp*. (ELISA) or an indirect fluorescent antibody test (IFA).
- PCR.

Exercise 5 – Create a Line Listing in MS Excel Using the Field and Laboratory Data Provided

Description of Exercise:

Based on the information provided in the handouts, use the following exercise create a line listing in an electronic format (MS Excel) and paper-based format using the field case reports and laboratory information for a specific disease. Use the example provided in the case definition lecture as a reference for how a line listing should be structured and what information should be included. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 30 minutes

Exercise Components and Structure:

1. Determine the variables that should be included in a line listing from field and laboratory case reports.
2. Create a line listing.
3. Use a PivotTable in MS Excel to obtain values of count data from variables in a line listing.

Organisation of Group Work:

1. Each group has 30 minutes to complete the work.
2. Divide into groups of three participants.
    a. Participants can choose from two case report types to develop their line listing.
    b. The line listing should be developed at the herd level.
    c. Each group will develop a paper-based and electronic format of their line listing.

Materials, Data or Information:

1. Computer with Microsoft Word and Microsoft Excel
2. Participant Exercise ISAVET_Exercise_5_Line_Listing_ECF_Participant
3. Paper and pen

Expected Outputs and Deliverables of Each Participant:

1. Develop a line listing from field and laboratory data for a disease.
2. Be able to count and sort data using a pivot table in an electronic format.

Field Case Report and Screening Test Results: East Coast Fever

Review the following three field case reports from local area A.

Field Case Report for Country X

Case Report Number: 1 **Date of Visit:** 9/2/2018	**Field Inspector:** B. Mbasa	**Region:** Central **Sub-Local area:** A
Premise ID: 1 **Herd ID:** 1 **Age:** Not recorded **Farm Production Type:** Commercial beef with a hobby-scale goat	**GPS Coordinates:** **Longitude:** 22.324761 **Latitude:** 63.452188	

Species	Total Number at Risk	Number Sick	Number Dead	Age (M) = Mature (Y) = Young	Breed	Sex (F) = Female (M) = Male
Dairy Cattle						
Beef Cattle	15	13	3	M	Angus	F
Ducks						
Poultry						
Sheep						
Goats	4	0	0	Y	Boer	F
Swine						
Herd/Flock Level Clinical Signs		**Yes**	**No**	**Notes:**		
Anorexia		✓		Clinical signs only seen in beef cattle. No other species affected on farm.		
Loss of body condition		✓				
Lacrimation		✓				
Corneal opacity		✓				
Nasal discharge		✓				
Dyspnoea		✓				
Diarrhoea		✓				

Case History

1. **What diseases are present in the local area?**
   Trypanosomiasis, East Coast Fever, Anaplasmosis, Babesiosis, and Brucellosis

2. **What were the dates for the following?**
   - Symptoms first observed: 8/31/2018
   - First death: 9/2/2018
   - Laboratory submission: 9/2/2018

Field Case Report for Country X		
Case Report Number: 2 **Date of Visit:** 9/3/2018	**Field Inspector:** C. Raseasala	**Region:** Central **Sub-Local area:** A
Premise ID: 2 **Herd ID:** 2 **Age:** Not recorded **Farm Production Type:** Hobby-Scale	**GPS Coordinates:** **Longitude:** 23.224578 **Latitude:** 74.312217	

Species	Total Number at Risk	Number Sick	Number Dead	Age (M) = Mature (Y) = Young	Breed	Sex (F) = Female (M) = Male
Dairy Cattle						
Beef Cattle	4	2	0	M	Angus	F
Ducks						
Poultry						
Sheep						
Goats						
Swine						

Herd/Flock Level Clinical Signs	Yes	No	Notes:
Anorexia	✓		
Loss of body condition	✓		
Lacrimation			
Corneal opacity			
Nasal discharge	✓		
Dyspnoea	✓		
Diarrhoea	✓		

Case History

3. **What diseases are present in the local area?**
   Trypanosomiasis, East Coast Fever, Anaplasmosis, Babesiosis, and Brucellosis

4. **What were the dates for the following?**
   - Symptoms first observed: 9/1/2018
   - First death: Not applicable
   - Laboratory submission: 9/3/2018

Field Case Report for Country X		
Case Report Number: 3 **Date of Visit:** 9/3/2018	**Field Inspector:** R . Mutowembwa	**Region:** Central **Sub-Local area:** A
Village ID: 3 **Herd ID:** 3 **Age:** Not recorded **Farm Production Type:** Hobby-Scale	**GPS Coordinates:** **Longitude:** 99.115678 **Latitude:** 88.257322	

Species	Total Number at Risk	Number Sick	Number Dead	Age (M) = Mature (Y) = Young	Breed	Sex (F) = Female (M) = Male
Dairy Cattle	3	2	1	M	Holstein	F
Beef Cattle						
Ducks						
Poultry						
Sheep						
Goats	15	10	0	M	LaMancha	F
Swine	2	0	0	Y	Duroc	F

Herd/Flock Level Clinical Signs	Yes	No	Notes:
Anorexia	✓		Late term abortions seen in goats. Clinical signs in all species, but swine.
Loss of body condition	✓		
Lacrimation			
Corneal opacity			
Nasal discharge			
Dyspnoea			
Diarrhoea			

Case History

5. **What diseases are present in the local area?**
   Trypanasomiasis, East Coast Fever, Anaplasmosis, Babesiosis, and Brucellosis

6. **What were the dates for the following?**
   - Symptoms first observed: 9/1/2018
   - First death: 9/3/2018
   - Laboratory submission: 9/3/2018

1. What categories of information should be collected from each of the case reports and transferred to a line listing? Identify specific variables for each category.

Category	Variable(s)
Animal	Premise ID, Herd ID, Species, Production Type, Total Number at Risk, Number Sick, Number Dead, Age, Breed, Sex, Clinical signs: (Anorexia, Loss of Body Conditions, Corneal Opacity, Nasal Discharge, Dyspneoea, and Diarrhoea), Classification
Place	Date of Visit, Date Symptoms First Observed, Date of First Death, Date of Laboratory Submission
Time	Country, Region, Local area, GPS Coordinates
Other	Screening Test Result, Confirmation Test Result

2. Create a line listing from the three field case reports using MS Word.

Animal (Herd/Flock)																	
										Clinical Signs							
Premise ID	Herd ID	Species	Production Type	Total No. At Risk	No. Sick	No. Dead	Age	Breed	Sex	A[1]	LBC[2]	L[3]	C[4]	ND[5]	Dy[6]	Di[7]	C[8]
1	1	Beef Cattle	Commercial Beef	15	13	3	M	Angus	F	+	+	+	+	+	+	+	Suspect
1	1	Goats	Hobby-Scale (Goats)	4	0	0	Y	Boer	F	-	-	-	-	-	-	-	Not a Case
2	2	Beef Cattle	Hobby-Scale (Beef)	4	2	0	M	Angus	F	+	+	-	-	+	+	+	Suspect
3	3	Dairy Cattle	Hobby-Scale (Dairy)	3	2	1	M	Holstein	F	+	+	-	-	-	-	-	Suspect
3	3	Goats	Hobby-Scale (Goats)	15	10	0	M	La Mancha	F	+	+	-	-	-	-	-	Suspect
3	3	Swine	Hobby-Scale (Swine)	2	0	0	Y	Duroc	F	-	-	-	-	-	-	-	Not a Case

[1] A= Anorexia; [2] LBC = Loss of Body Condition; [3] L= Lacrimation; [4] C = Corneal Opacity; [5] ND = Nasal Discharge; [6] Dy = Dyspnoea; [7] Di = Diarrhoea; [8] C = Classification (Suspect, Probable, or Confirmed)

.		Time				Place				Other	
Premise ID	Herd ID	Date of Visit	Date Symptoms First Observed	Date of First Death	Date of Lab Submission	Country	Region	Local area	GPS Coordinates	Screening Test	Confirmatory Test
1	1	9/2/2018	8/31/2018	9/2/2018	9/2/2018	X	Central	Luwero	22.324761 (Long); 63.452188 (Lat)	----	----
1	1	9/2/2018	----	----	----	X	Central	Luwero	22.324761 (Long); 63.452188 (Lat)	----	----
2	1	9/3/2018	9/1/2018	----	9/3/2018	X	Central	Luwero	23.224578 (Long); 74.312217 (Lat)	----	----
3	1	9/3/2018	9/1/2018	9/3/2018	9/3/2018	X	Central	Luwero	99.115678 (Long); 88.257322 (Lat)	----	----
3	1	9/3/2018	9/1/2018	----	9/3/2018	X	Central	Luwero	99.115678 (Long); 88.257322 (Lat)	----	----
3	1	9/3/018	----	----	----	X	Central	Luwero	99.115678 (Long); 88.257322 (Lat)	----	----

Open the MS Excel Spreadsheet titled "ISAVET_Exercise_5_Line_Listing_ECF_Participant". In the first worksheet tab, there are six rows for which herd-level cases should be created from the field case reports. Enter the data from the five field case reports into the line listing on your electronic spreadsheet.

The following laboratory results were obtained in the field from screening tests.

		Other	
Premise ID	**Herd ID**	**Screening Test**	**Confirmatory Test**
1	1	Positive	
1	1	----	
2	1	Negative	
3	1	Negative	
3	1	Positive	
3	1	----	

3. Add the screening test results to the line list and determine what other laboratory results should be included in the line list for confirmation.

What does this change the line list classification for each of these?

Premise ID	Previous Classification	Changed To
1	Suspect	Probable
1	Not a Case	No change
2	Suspect	No change
3	Suspect	No change
3	Suspect	Probable
3	Not a Case	Not a case

Make the changes to the classification status in your spreadsheet

Using a PivotTable, identify the number of cases for the following questions.

a) How many herds are suspect? 14
b) How many herds are probable? 15

c) How many herds are confirmed? 17

Samples were taken and submitted to the lab for confirmation. On the 5th day of the outbreak, the following results for the herd IDs came back with the following confirmatory laboratory results.

		Other	
Premise ID	Herd ID	Screening Test	Confirmatory Test
1	1	Positive	Positive
1	1	----	----
2	1	Negative	Positive
3	1	Negative	Positive
3	1	Positive	Positive
3	1	----	----

4. Add the above test results to your electronic line listing.

5. After confirmation, make the correct changes to the classification status in your worksheet.

6. After confirmation testing, how many herds are confirmed positive for theileriosis (east coast fever)? 21

Lesson 4 – Data Quality Principles

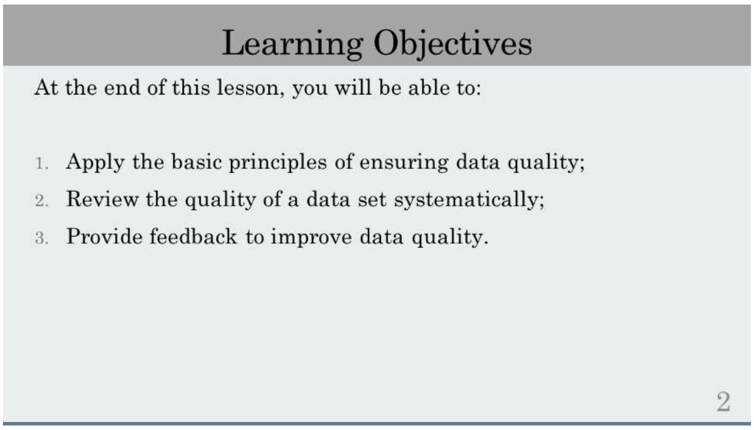
Estimated Lesson and Exercise Time	1 hour
Instructor Materials	Frontline ISAVET Lesson 4 – Data Quality Principles.pptx
	ISAVET Lesson 4 – Data Quality Principles Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 4 – Data Quality Principles Participant Guide.PDF

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

CQI	Continuous Quality Improvement
HPAI	Highly Pathogenic Avian Influenza
ISAVET	In Service Applied Veterinary Epidemiology Training

Lesson 4 – Data Quality Principles,
Slide 1

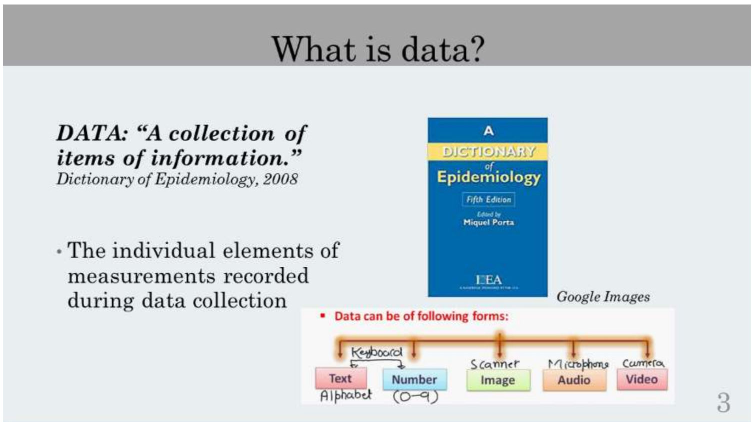
SCRIPT / KEY POINTS:
Welcome to Lesson 4 titled, “Data Quality Principles”.



Lesson 4 – Data Quality Principles,
Slide 2

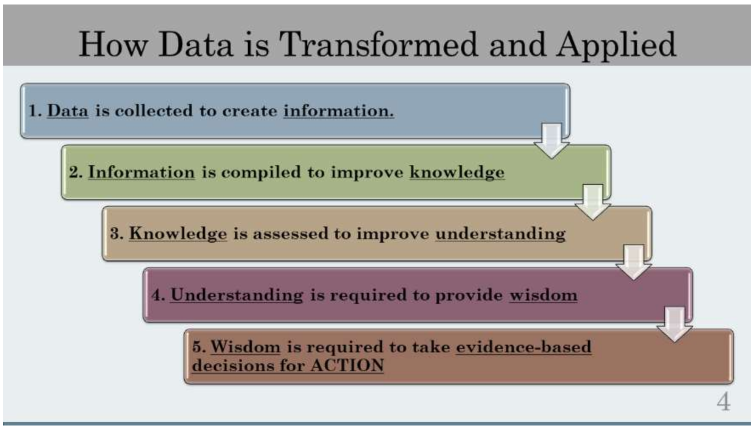
SCRIPT / KEY POINTS:
In this lesson, we will:

- Apply the basic principles of ensuring data quality;
- Review the quality of a data set systematically;
- Provide feedback to improve data quality.



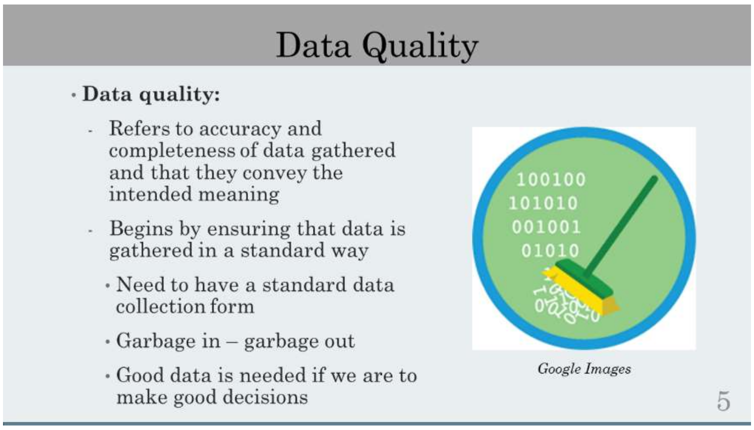
Lesson 4 – Data Quality Principles,
Slide 3

SCRIPT / KEY POINTS:
Data is the foundational elements of information that we collect and record for further use. Data can be in the form of numbers, words, letters, symbols, maps, charts, tables, recordings and other examples.
Reference: Dictionary of Epidemiology, 2008
Google images



Lesson 4 – Data Quality Principles,
Slide 4

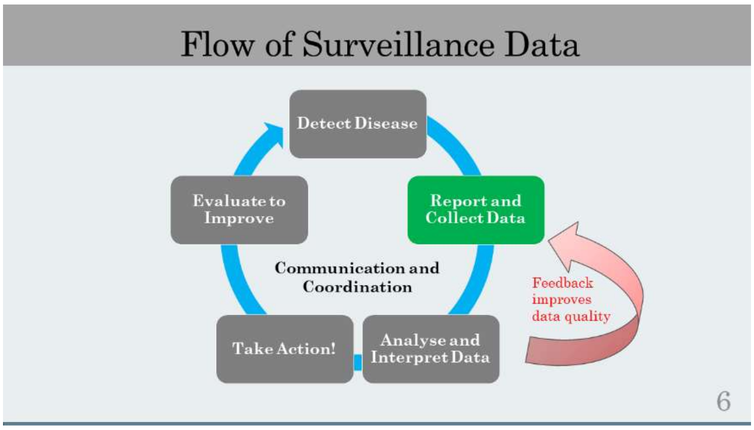
SCRIPT / KEY POINTS:
Why do we collect data? Here is a logical framework for the **use of high quality data to inform action.**
Each level of the surveillance system uses data in order to generate information, knowledge, understanding, wisdom and evidence-based decisions for taking action.



Lesson 4 – Data Quality Principles,
Slide 5

SCRIPT / KEY POINTS:
As a review, let's look at this slide again. Data quality refers to ensuring that data are accurate and complete and that they convey the intended meaning. Data quality begins with developing a useful data collection form. Keep in mind the principle of garbage in – garbage out. Data quality is important! Good data is required in order to conduct analysis and make good decisions.

Reference: Google Images



Lesson 4 – Data Quality Principles,
Slide 6

SCRIPT / KEY POINTS:
Review this slide again. Which other steps in the flow of surveillance data are affected when data quality is poor? (Allow for some brief responses)

Surveillance is a cyclical process that is iterative and ongoing. Good evidence-based decision-making depends on collecting high quality data from the start!

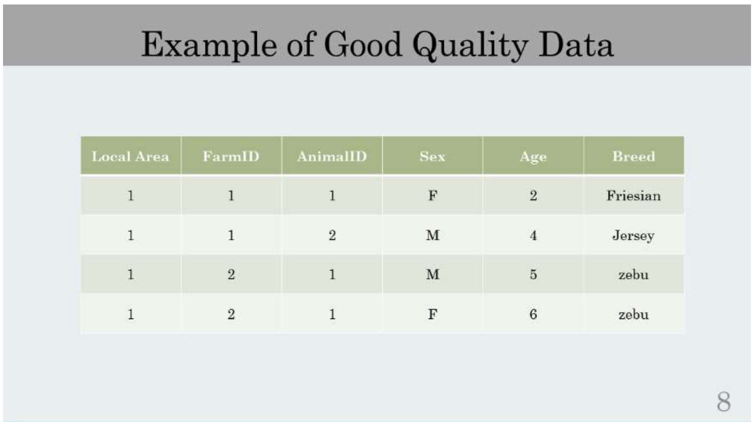
It is important to provide ongoing feedback to continually improve data quality.

Lesson 4 – Data Quality Principles,
Slide 7

SCRIPT / KEY POINTS:
Review this slide again. Here are some reasons for poor quality data:
- Poorly completed forms; Lack of training is the most common cause.
- Un-entered forms; Forms may be misplaced or lost.
- Underreporting; This commonly occurs when a disease is spreading so that farmers can sell sick animals before they die
- Overreporting; This often happens when a new surveillance program is developed.
- Duplicate reporting; The same information may be mistakenly entered for two locations as a transcription error.

- Unsystematic data collection / reporting; This is often due to lack of training
- Untruthful reporting; This happens when farmers are trying to hide the disease and sell animals before they die.
- Inconsistent reporting formats (forms); This is due to a lack of standardised form and having many types of form in circulation related to the same disease.
- Late submission / reporting; Timeliness is a critical need for surveillance so that early action can be taken.
- Inconsistent reporting periods; Regular reporting is needed so that trends are clearly visible and can be compared across the same time periods.
- Calculation errors; This is often due to mechanical errors.
- Lack of documentation; Lack of complete data collection results in missing data.
- Data or files are lost. Data must be backed up electronically and copied in duplicate to be stored separately in case of unexpected accidents.

How useful would these data be for further analysis?
Reference: Frontline FETP, 2016



Local Area	FarmID	AnimalID	Sex	Age	Breed
1	1	1	F	2	Friesian
1	1	2	M	4	Jersey
1	2	1	M	5	zebu
1	2	1	F	6	zebu

Lesson 4 – Data Quality Principles,
Slide 8

SCRIPT / KEY POINTS:

This table provides an example of data collected during routine farm visits. The format for each variable is followed clearly and consistently.

Coding is key.

For instance:

Local area 1 =

Farm ID: 1 = Kibuye A and 2 = Kibuye B

Animalid 1 = …. And 2 = …

F = Female; M = Male

Examples of Poor Quality Data

Unique ID	Local Area	Farm ID	Animal ID	Sex	Age	Weight	Clinical signs	Date of visit
1	1	23	25	f		64	vomiting, pyrexia	2017/1/12
2	1	23	25	male		64 KG	pyrexia	1/12/2017
3	1	1	2	m	1	100 lbs	diaroa	11/1/2017
4	1	1	1	female	4		diarrhoea	10/01/2017
4	1	12		4	2 yrs		death	11/1/2017
6	1	25		femal				11/1/2017
7	1	2		mal				11/1/2017

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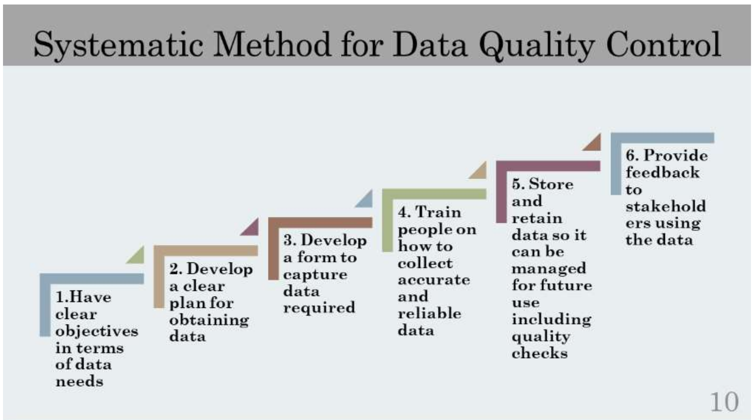
Lesson 4 – Data Quality Principles,
Slide 9

SCRIPT / KEY POINTS:
Examine the following data set in the table presented. Note the following examples of poor data quality. The responses for each variable are not clear, are missing or are incorrect. How many errors can you find?

Here are nine examples of poor quality data in this data set:

1. There are two unique ID numbers that are the same due to poorly entered data.
2. There are two farm ID with the same number due to poorly entered data.
3. There are two animals with the same ID number due to poorly entered data.
4. Male and female are written as short form and long form or are misspelled.
5. Animal ID, age, weight and clinical signs are incomplete.
6. Units for age are unclear (years or months?).
7. Unit of weight measure is inconsistent between pounds and kilograms or is not included.
8. Dates are formatted differently and are inconsistent.
9. The number 4 occurs in the sex variable column demonstrating that a categorical variable now has a quantitative variable included.



Lesson 4 – Data Quality Principles,
Slide 10

SCRIPT / KEY POINTS:
There are critical steps to take to ensure that all of the hard work invested into collecting data results in useful data that will inform evidence-based decision- making:

Step 1: Have clear objectives about the data that is needed.

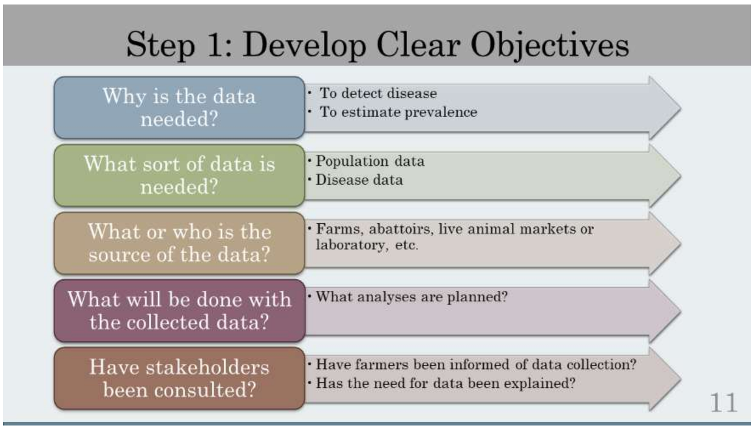
Step 2: Develop a clear plan about the best way of obtaining the data.

Step 3: Develop a form or format that can capture the data required.

Step 4: Train people about how to collect accurate and reliable information. This includes interviewing skills and data recording skills.

Step 5: Store and retain the data so that you can manage it for future use.

Step 6: Provide feedback to all stakeholders using the data.



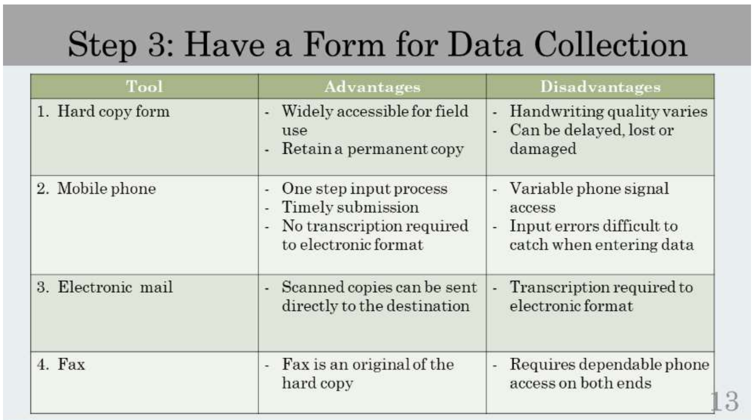
Lesson 4 – Data Quality Principles,
Slide 11

SCRIPT / KEY POINTS:
In step 1, it is best to have clear objectives for field data collection. Answer the following questions:

- Why do you need the data?
- What sort of data is needed?
- What or who is the source of the data (target group)?
- What will you do with the data once collected? What sort of analysis?
- Have all stakeholders of the data been consulted and do they understand the need for the data?

Lesson 4 – Data Quality Principles,
Slide 12

SCRIPT / KEY POINTS:
In step 2, have a clear plan for data collection – what, how, who, where, when?
WHAT – Explain what data is needed to meet the objectives of the surveillance or the survey.
HOW – Explain how the data will be collected (actively or passively) and reported.
WHO – Explain who will collect the data and whether they have been trained to collect data in a standardised way.
WHERE – Explain where the data will be stored and protected from being lost.
WHEN – Explain the timelines and deadlines for data collection.


Step 3: Have a Form for Data Collection

Tool	Advantages	Disadvantages
1. Hard copy form	- Widely accessible for field use - Retain a permanent copy	- Handwriting quality varies - Can be delayed, lost or damaged
2. Mobile phone	- One step input process - Timely submission - No transcription required to electronic format	- Variable phone signal access - Input errors difficult to catch when entering data
3. Electronic mail	- Scanned copies can be sent directly to the destination	- Transcription required to electronic format
4. Fax	- Fax is an original of the hard copy	- Requires dependable phone access on both ends

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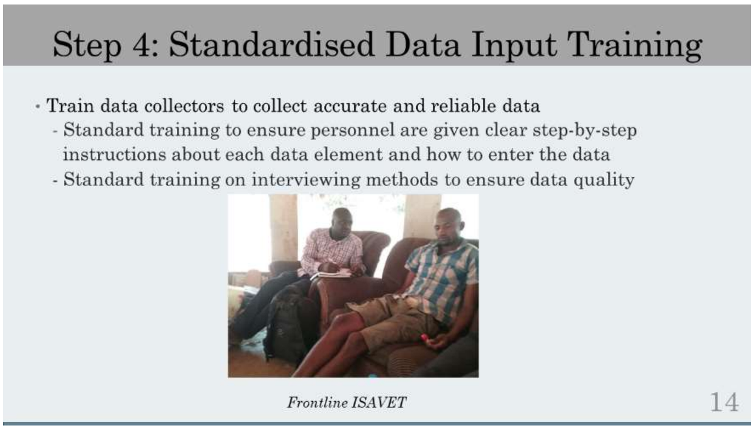
Lesson 4 – Data Quality Principles,
Slide 13

SCRIPT / KEY POINTS:
For step 3, it is best to use the most appropriate tool or form for data collection. The advantages and the disadvantages of each type of data collection tool are presented in the Table above. All data collection tools need to be (Beta) tested before they are used routinely to correct any problems. Continuous review of the tools is required.

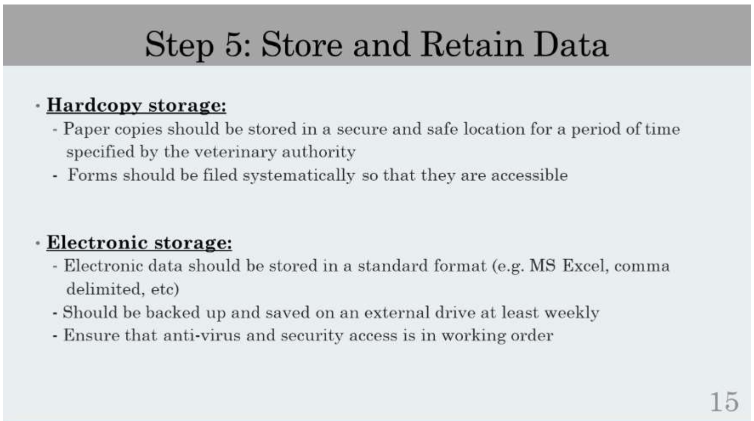


Lesson 4 – Data Quality Principles,
Slide 14

SCRIPT / KEY POINTS:
In step 4, we need to develop standards for data input. Train data collectors to collect accurate and reliable data. Specifically, it is best to:

- Develop a standardised training method to ensure that personnel are given clear step-by-step instruction about each data element and how to enter data; and
- Develop standardised training for interviewing methods to ensure data quality.

Photos: Frontline ISAVET



Lesson 4 – Data Quality Principles,
Slide 15

SCRIPT / KEY POINTS:
Hard copies should be stored in a secure and safe location for a period of time required by the veterinary authority. Avoid cluttered storage Area and file all forms systematically.

Electronic forms and records should be backed up at least weekly to ensure that they can be saved in the event of a computer failure. Check that anti-virus and security access is in working order. Store data in the standardized format (e.g. Excel comma delimited, pdf, etc.).

Step 5: Data Management – Data Quality Checks

- An important step is to check the quality of the data that has been gathered.
- This includes:
  - Ensuring the correct number of records have been entered
  - Performing quality control checks on each data field related to:
    - **Errors:** Incorrect values that have been recorded wrongly or entered/typed incorrectly into a database or spreadsheet
    - **Outliers:** An extreme observation that does not appear to be in line with other observations
    - **Missing data:** Data not entered

16

Lesson 4 – Data Quality Principles,
Slide 16

SCRIPT / KEY POINTS:
An important step in the process is to check the quality of the data that has been gathered.
This includes:

- Ensuring the correct number of records have been entered;
- Performing quality control checks on each data field; and
- The three main type of data quality issues are errors, outliers and missing data.

Data Quality Audit

COMPONENT	DESCRIPTION	METRICS	EXAMPLES
Data Collection	Standarised line list for each priority, notifiable disease	Completeness, timeliness, accuracy, zero reporting, format	Sublocal area reports were 50% complete and 30% timely
Case Reporting	Classify cases as suspect (S), probable (P) or confirmed (C)	S,P, C case definitions exist for each priority, notifiable disease	Suspect case of HPAI: Hemorrhage, necrosis diarrheoa, discharges
Analysis and Interpretation	Graphic representations	Describe disease distribution, trendline with explanation	Increase in FMD cases spatially and temporally
Follow up Confirmatory Investigation	Laboratory and field investigations	Rapid confirmatory laboratory testing and field questionnaires	A suspect case of PPR confirmed by laboratory diagnosis
Reporting	Official reports for stakeholders	Internal and external reports and presentations	1. Report to national level 2. Report to farmers

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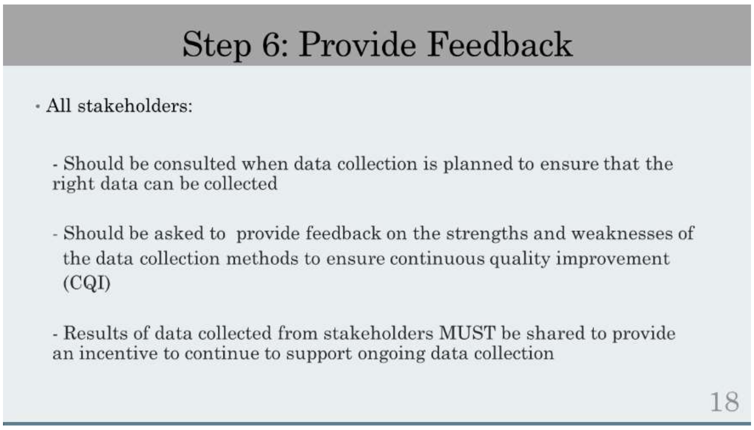
Lesson 4 – Data Quality Principles,
Slide 17

SCRIPT / KEY NOTES

Read slide.



Lesson 4 – Data Quality Principles,
Slide 18

SCRIPT / KEY POINTS:
All stakeholders should be consulted and provide feedback on the strengths and weaknesses of the data collection methods to ensure continuous quality improvement (CQI).

Lesson 4 – Data Quality Principles,
Slide 19

SCRIPT / KEY POINTS:
It is important to assess data quality because there are many threats to data quality. For instance:

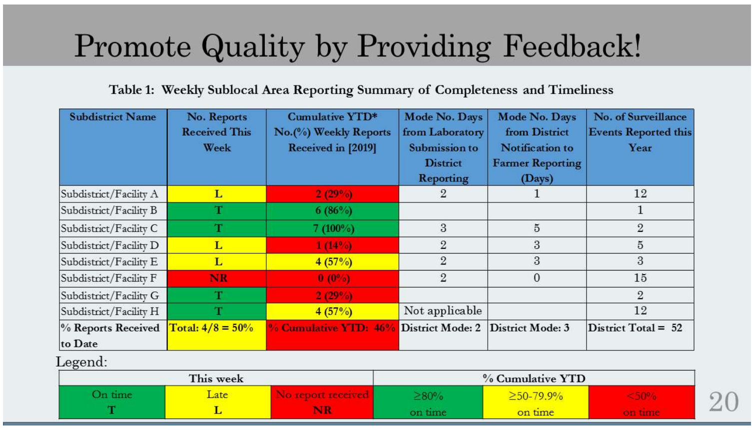
Design flaws in paper forms or computer systems can result in poor data. (for example, a poorly designed form may be missing specific prompts for relevant information or has ambiguous prompts; systems design flaws include inappropriate use of mandatory fields or an automatic default entry that requires action to change the data)

Methods for data collection affect data quality. It is important to consider at what point it is best to capture certain data and who is the best staff person to do that.

Technical errors can occur as well if the data owner is not responsible for accuracy of the data.

Interpretation differences often lead to data quality issues. Use of nonstandard vocabulary or abbreviations can cause others to interpret the data differently than the source intended.

Interfaces from one application to another are often problematic.



Promote Quality by Providing Feedback!

Table 1: Weekly Sublocal Area Reporting Summary of Completeness and Timeliness

Subdistrict Name	No. Reports Received This Week	Cumulative YTD* No.(%) Weekly Reports Received in [2019]	Mode No. Days from Laboratory Submission to District Reporting	Mode No. Days from District Notification to Farmer Reporting (Days)	No. of Surveillance Events Reported this Year
Subdistrict/Facility A	L	2 (29%)	2	1	12
Subdistrict/Facility B	T	6 (86%)			1
Subdistrict/Facility C	T	7 (100%)	3	5	2
Subdistrict/Facility D	L	1 (14%)	2	3	5
Subdistrict/Facility E	L	4 (57%)	2	3	3
Subdistrict/Facility F	NR	0 (0%)	2	0	15
Subdistrict/Facility G	T	2 (29%)			2
Subdistrict/Facility H	T	4 (57%)	Not applicable		12
% Reports Received to Date	Total: 4/8 = 50%	% Cumulative YTD: 46%	District Mode: 2	District Mode: 3	District Total = 52

Legend:

This week			% Cumulative YTD		
On time T	Late L	No report received NR	≥80% on time	≥50-79.9% on time	<50% on time

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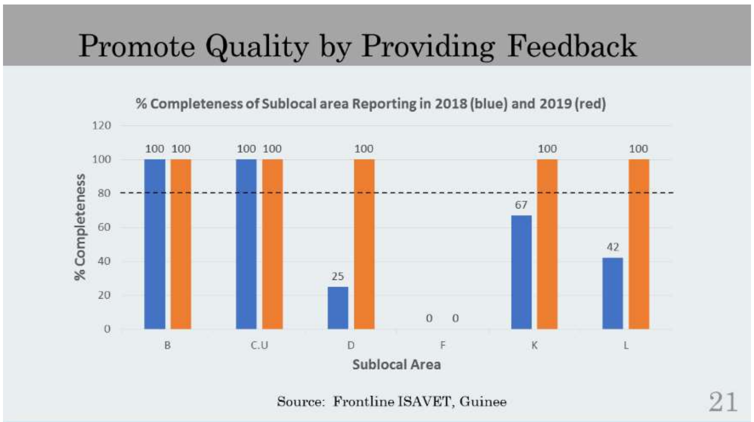
Lesson 4 – Data Quality Principles, Slide 20

SCRIPT / KEY POINTS:
Interpret your monthly report to provide feedback to sublocal area for improvement:

So far this year, reporting from the sublocal area is only 46% complete. Only 50% of sublocal area have reported on time.

The timeliness of reporting should be monitored from month to month and targets need to be set to improve timely reporting. This year, a total of 52 disease surveillance events were reported. What is the trend for each of the past 5 years and how can we improve reporting?

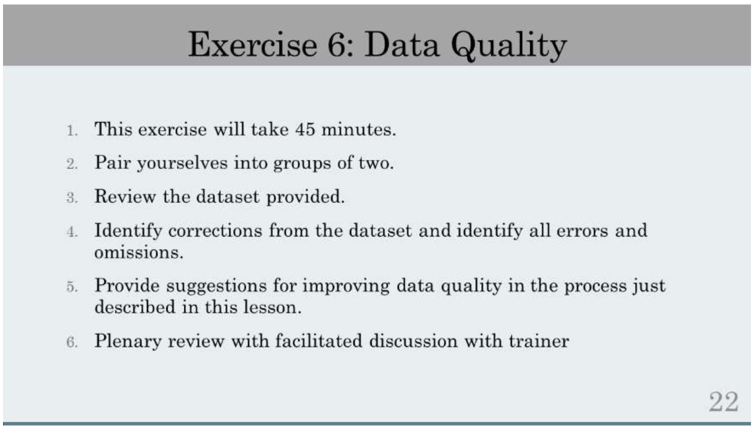


Lesson 4 – Data Quality Principles, Slide 21

SCRIPT / KEY POINTS:
If you graph the completeness of data from each sublocal area over the past 18 months in 2018 and 2019, it will illustrate where feedback and corrective action is needed. The dotted line shows the target threshold which is set at 80%.

Sublocal area D, K, and L have shown marked improvement in providing compete reports, while sublocal area F has still not submitted any reports during the same time period. What will you do next in sublocal area F?

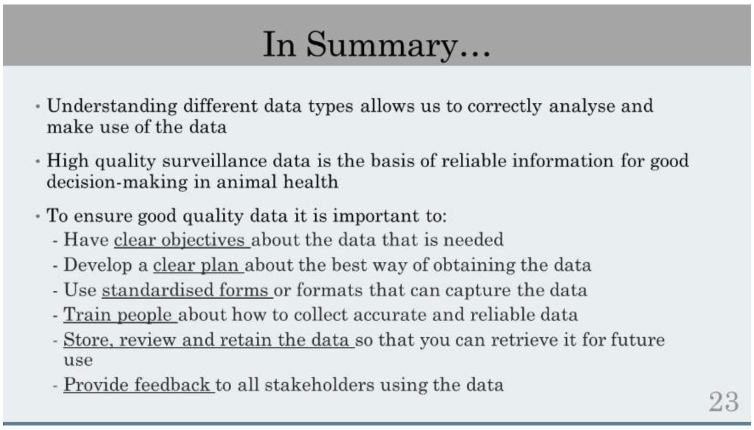
Source: Frontline ISAVET, Guinee



Lesson 4 – Data Quality Principles, Slide 22

SCRIPT / KEY POINTS:
Exercise 6 instructions: Data Quality
- This exercise will take 45 minutes.
- Pair yourselves in groups of two.
- Review the dataset provided.
- Identify corrections from the dataset and identify all errors and omissions.
- Provide suggestions for improving data quality in the process just described in this lesson.

Instructors:
- See instructor manual for answers.



Lesson 4 – Data Quality Principles, Slide 23

SCRIPT / KEY POINTS:
In summary,

- Understanding different data types allows us to correctly analyse and make use of the data
- Good quality surveillance data is the basis of reliable information for good decision-making in animal health.
- To ensure high quality data is collected, it is important to:

- Have clear objectives about the data that is needed;

- Develop a clear plan about the best way of obtaining the data;

- Use standardised forms or formats that can capture the data;

- Train people about how to collect accurate and reliable information;

-Store and retain the data so that you can retrieve it for future use; and

-Provide feedback to all stakeholders using the data

Lesson 4 – Data Quality Principles, Slide 24

SCRIPT / KEY POINTS:
Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 6 – Data Quality Principles

Review and Identify Corrections Required for Dataset with Errors and Omissions

Description of Exercise:

Using the data quality checklist, review and identify corrections required for a dataset with errors and omissions. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Alotted Time: 45 minutes

Exercise Components and Structure:

1. Work in pairs of two people.
2. You have 45 minutes to complete this exercise
3. For the dataset provided, review and identify corrections required for a dataset with errors and omissions

Materials, Data or Information:

1. Dataset of HPAI H5N1 Outbreaks in Nigeria
2. Record answers in MS Word or PowerPoint

Expected Outputs and Deliverables of Each Participant:

1. 1. Follow a systematic method to review and correct data
2.
3. 2. List ways to improve the data set provided

Dataset Dictionary

HPAI H5N1 Outbreaks in Nigeria

Records from an H5N1 HPAI outbreak from Nigeria are presented in the dataset *Exercise_6.version 4.xls*.

Each row of the data in MS Excel spreadsheet represents an outbreak report (multiple rows per affected farm) and details of the fields can be found in Table 1.

Table 1. Details of variables in the *Exercise_6.xls*.

Variable	Description
farmerid	Unique identifier for each farmer
LGA	Local government Area
GPS location	Geographic coordinates of farm
Location	Farm name
farmtype	Type of farm
Type of birds	Bird types on farm
Age	Age of birds on farm
flocksize	Bird population
Susceptiblepop	Number of susceptible birds
Date of onset	Date clinical signs observed
Date reported	Date reported
Mortality	Number of dead birds
Number slaughtered	Number of birds slaughtered
Bases for diagnosis	How cases were diagnosed
Date samples sent to lab	Date samples were sent to the laboratory
Date of confirmation	Date outbreak confirmed
Control measure	Measures implemented to control the outbreak
Status	HPAI status
Remarks	Comments

INSTRUCTOR NOTES:

- Review the dataset dictionary with the trainees. Have them determine which variables will need to be coded for future analysis.
- Identify specific errors in the dataset as a group.

farmerid	LGA	farmtype	Type of birds	Age	flocksize	Susceptiblepop	Date of onset	Date reported		Mortality	Number slaughtered	Bases for diagnosis	Date samples sent to lab	Date of confirmation	Control measure	Status	Remarks
1	Dala	layer	Layers	22weeks, 10 wks, 4wks	1568	1568	2/1/2015	2/1/2015	1/0/1900	1370	198	Clincal and	7/1/2015	8/1/2015	Quarantine	Positive	
1	Dala		Layers				3/1/2015			350	66						
1	Dala		Layers				4/1/2015			50	63						
2	Sabon gari	mixed	Chickens (Local & exotic, geese, turkeys, peacock)	Different age groups	30,000	30,000	22/12/2014	24/12/2014		919	450	Clincal and Laborator y	7/1/2015	8/1/2015	Quarantine	Negative	
3	Gwale		Layers	24wks	570	570	11/1/2015	11/1/2015		4	0	Clincal and Laborator y	12/1/2015	13/1/201 5	Quarantine	Positive	Farmer visited Rimi LBM on 06/01/2015
3	Gwale						12/1/2015			48							
3	Gwale						13/01/2015			120							
3	Manjibir	mixed	Growers	12 weeks	3,257		8/1/2015	9/1/2015		62	0	Clincal and	12/1/2015	13/01/20 15	Quarantine	Positive	
3	Manjibir		Pullets	18 weeks	2800		13/01/2015			287 pullets							
3	Manjibir		Cocks	10 weeks	6000		13/01/2015			672 cocks						Positive	
3	Manjibir		Pullets				15/01/2015			185 pullets							
3	Manjibir		cocks				15/01/2015			1105 cocks							
4	Kumbotso		Pullets	19 weeks								Clincal and	12/1/2015	13/1/201 5		Negative	
5	Gwale	layer	Layers	20 weeks	3500	3500	11/1/2015			16	0	Clincal and Laborator	15/01/201 5	Pending	Quarantine	Pending	There are some bags of feed
5	Gwale		Layers in battery cage	Adult laying birds, Apparently healthy	175		12/1/2015			86					Quarantine		
6	Kumbotso	layer	Layers	Room 1- 19weeks (affected flock)	1600	1600	9/1/2015	9/1/2015		10	0	Clinical and laboratory	10/1/2015	15/01/20 15	Quarantine	Positive	
6	Kumbotso		Layers	Room 2 - 44 weeks	1753		10/1/2015			30			15/01/201 5	Pending		Pending	
6	Kumbotso		Layers	Room 3 - 44 weeks	680		11/1/2015			102							
6	Kumbotso		Layers	Room 4 - 19 weeks	1233		12/1/2015			202							
6	Kumbotso		Layers	Room 5 - 7 weeks	4884		13/01/2015			578							
7	Kumbotso	layer	Layers	12 months	1200	1200	7/1/2015	7/1/2015		470	60	Clinical and laboratory	12/1/2015	13/01/20 15	Quarantine	Positive	670 live birds were taken to the livebird market,
7	Kumbotso	mixed	Pullets	7 weeks	300												60 dressed birds were taken to Wudil LBM
8	Tofa		Pullets (point of lay)	20 weeks	576												
8	Tofa		Pullets (point of lay)	Geese	7												
8	Tofa		Pullets (point of lay)	Turkeys	4												
8	Tofa		Pullets (point of lay)	Guinea fowl	40												
8	Tofa		Pullets (point of lay)	Local chickens	6												

1. Identify data quality issues that are found in the aforementioned dataset with a corresponding solution.

Table 2. List of data quality issues and some potential solutions

Data quality issue	Potential solutions
Missing data	Training and follow-up
Inconsistent date formats	Standardised data collection and entry tools
Inconsistent data entry across multiple fields	Standard data entry tools and training
Implausible dates	Standard data collection and data entry forms
Missing location information	Training, data collection form and GPS units

To be assigned as homework assignment and then follow the SOP provided:

Conduct data quality audit for any five selected variables and 10 randomly selected entries using the data quality audit tool provided and interpret your findings.

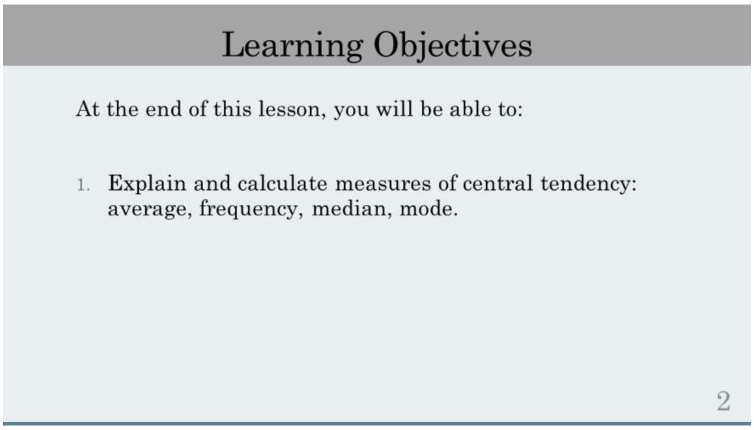
Data Audit Tool blank.xlsx

Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data: Central Tendency

Estimated Lesson and Exercise Time	1 hour and 30 minutes
Instructor Materials	Frontline ISAVET Lesson 5.1 Describing and Acting upon Animal Disease and Health Data: Central Tendency.pptx
	Frontline ISAVET Lesson 5.1 Describing and Acting upon Animal Disease and Health Data: Central Tendency.doc
	Computer
	Microsoft Word and Excel
Participant Materials	Frontline ISAVET Describing and Acting upon Animal Disease and Health Data: Central Tendency Participant Guide.doc
Handout Materials for Exercises	MS Excel Lesson 5.1_Ex7 .xls (Exercise 7)

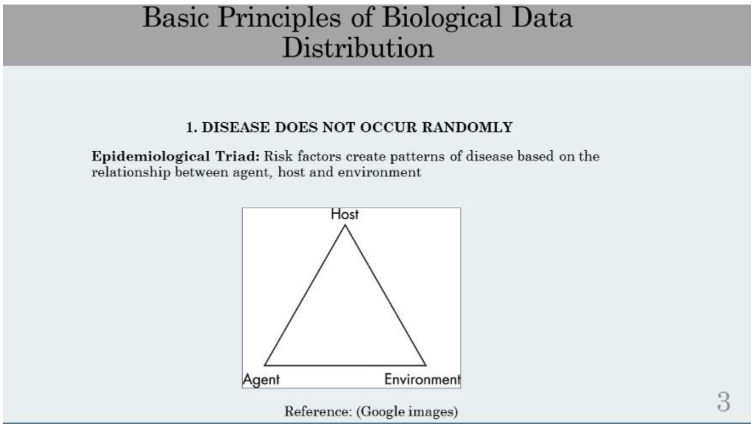
Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**, Slide 1

SCRIPT / KEY POINTS:
Welcome to Lesson 5, titled “Describing and Acting upon Animal Disease and Health Data: Central Tendency”.



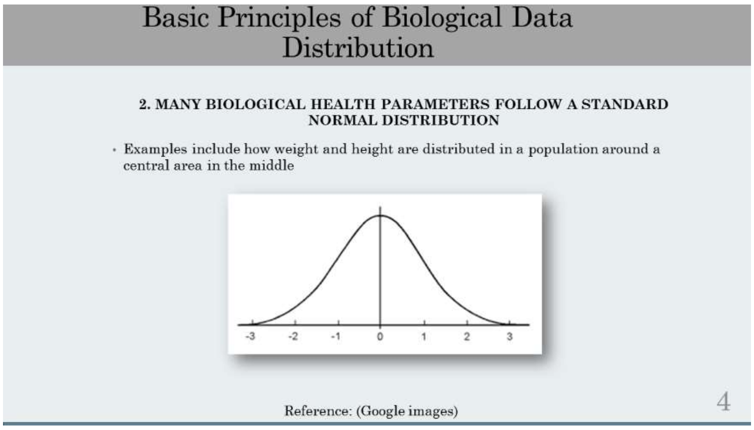
Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**,
Slide 2

SCRIPT / KEY POINTS:
In this lesson, we will:
- Prepare and follow a plan to capture and describe data by animal-place-time;
- Calculate measures of average, frequency, median, mode; and
- Calculate measures of disease occurrence and impact.



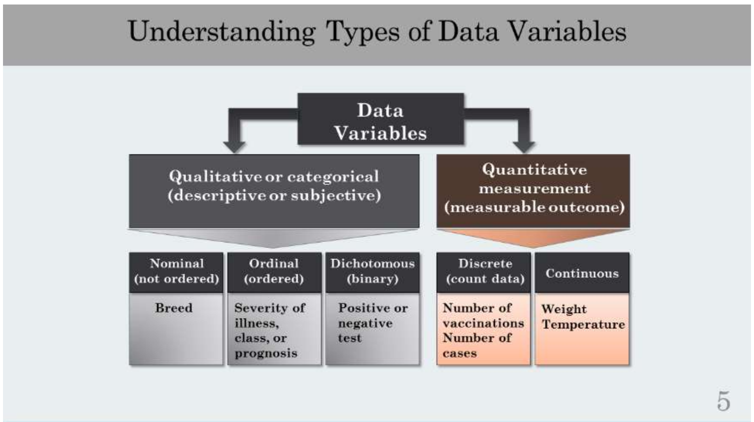
Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**,
Slide 3

SCRIPT / KEY POINTS:
PRINCIPLE 1: Epidemiology is based on the principle that disease does not occur randomly, but rather disease occurs in patterns based on common risk factors that members of a population are exposed to. These risk factors for disease include the AGENT (pathogenicity, virulence), the HOST (immune susceptibility) and the ENVIRONMENT (man-made e.g. management and natural factors (season, temperature, humidity) that favour the presence of the disease pathogen.



Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**,
Slide 4

SCRIPT / KEY POINTS:
PRINCIPLE 2: Think about how people and animals can vary in height or in weight. If we measure the height of the members of a population, we will see that very few are very short or very tall. Most people tend to be near an "average" height for that population. This tendency is biological and if we measure the frequency and distribution of the height of people in this Frontline ISAVET cohort, we would see a similar shape to the standard normal curve.
Epidemiology applies both of these concepts which explain the distribution of disease and health factors describing the pattern of disease and what an average measurement is for factors we can measure.
Photo Reference: Google images

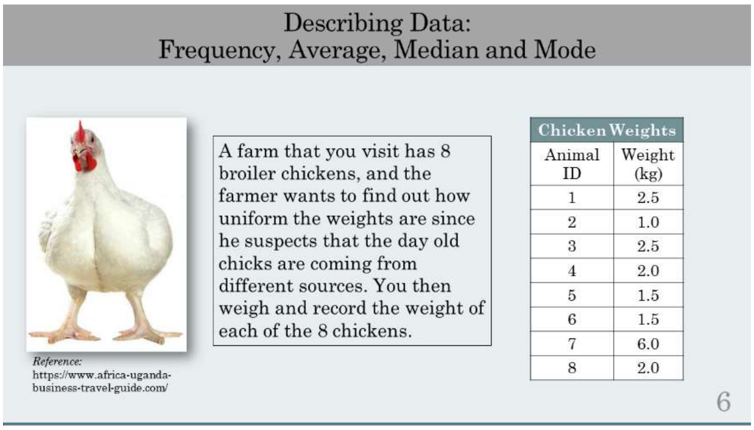


Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**,
Slide 5

SCRIPT / KEY POINTS:
There are two types of data including qualitative and quantitative data.

Qualitative data is subjective and usually determined by specific categories. Examples include nominal, ordinal and binary data. Categorical variables cannot be measured numerically, so they must be coded once entered into a dataset.

Quantitative data is measurable, and it can be categorised a discrete or continuous data. These types of data are always numeric, but continuous data can be recorded as any positive or negative number.

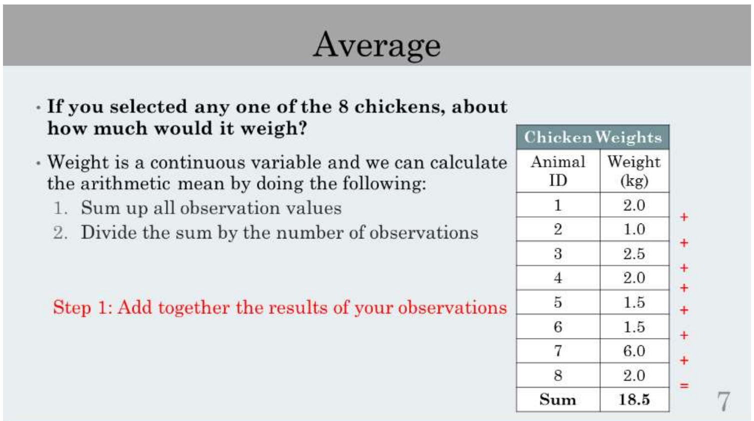


Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**,
Slide 6

SCRIPT / KEY POINTS:
Your choice of the measure to use will depend on:

- Data type (numerical data, categorical data)
- Data distribution and spread (variance).

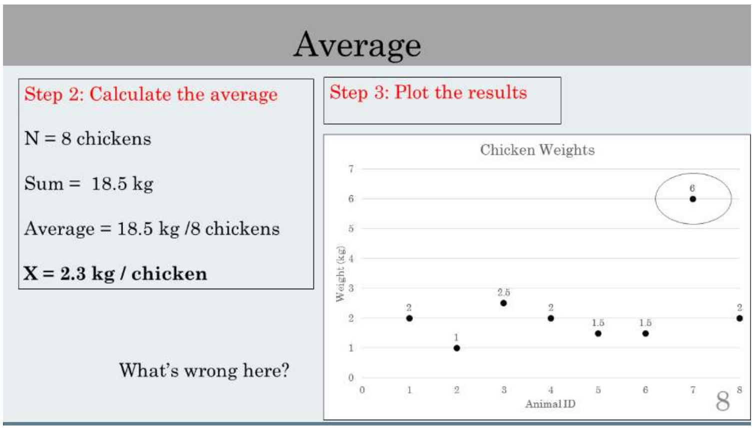
Images:
Photo 1: https://www.africa-uganda-business-travel-guide.com/



Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**,
Slide 7

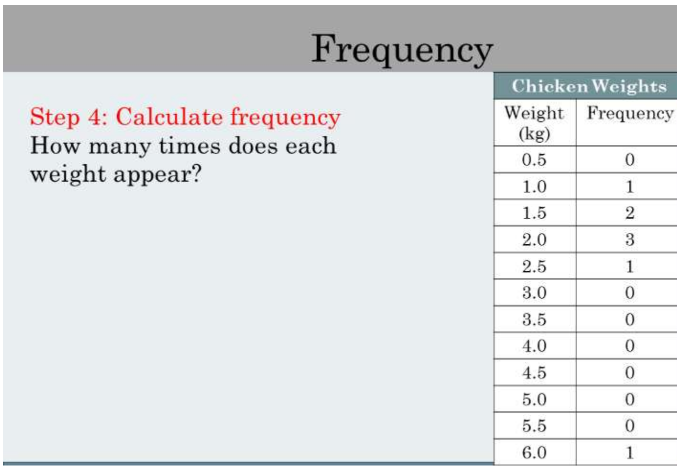
SCRIPT / KEY POINTS:
We calculate the arithmetic mean when the trait is measured as continuous data such as weight, height, temperature, etc.

Another way to phrase the question: What would be a representative average weight for your chickens on your farm?



Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**, Slide 8

SCRIPT / KEY POINTS:
When we get one value that is outside of the range of most of the other values (e.g. 6 kg) we call it an "outlier" and must deal with it since it affects the calculation of mean weight for this group of birds.

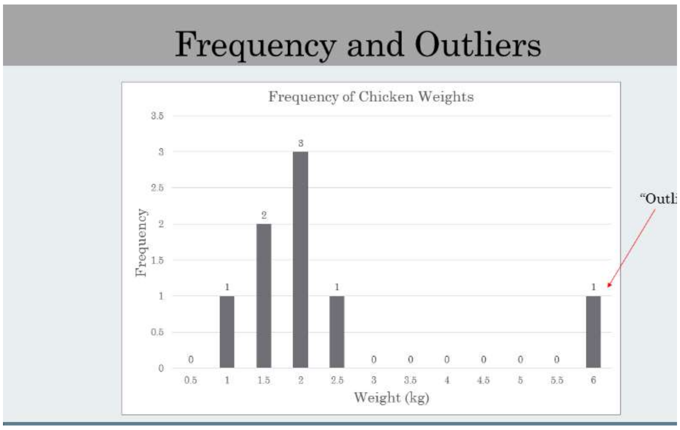


Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**, Slide 9

SCRIPT / KEY POINTS:
A standard normal curve is a basic assumption used to describe the distribution of natural distributions of age, weight, height, etc. in animals and is a key assumption underlying statistical calculations.

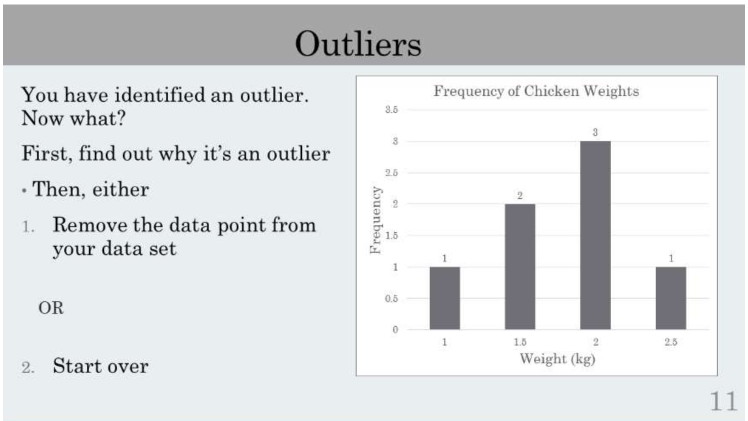
We then create a "Frequency Table" to describe the frequency in which each weight occurs. This table is used to draw a "frequency histogram" that you can see in the following slide.

Image: Google
Photo 1: Google



Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**, Slide 10

SCRIPT / KEY POINTS:
It is important to make a graph of the data in order to observe the shape of the data distribution and to identify isolated values at either extreme called "outliers".

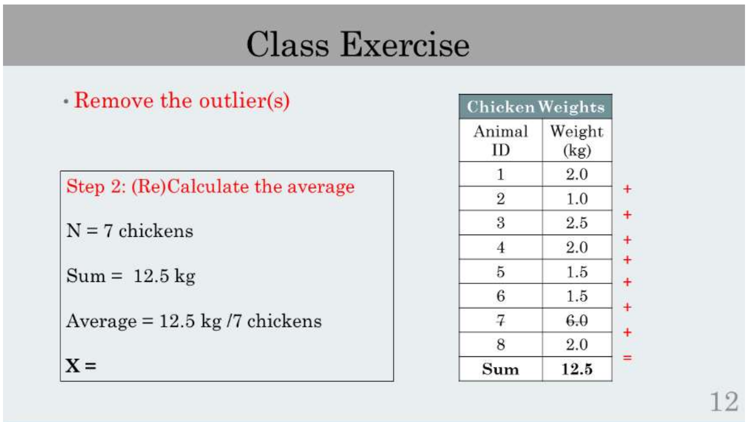


Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**, Slide 11

SCRIPT / KEY POINTS:
Why do you have an outlier? Is it an error in measurement? Or do you have a giant chicken?

You can quantitatively identify outliers using something called Standard Deviation. If a data points fall outside 2 Standard Deviations in a standard normal curve, it is considered an outlier. MS Excel can be used to calculate standard deviation and we will learn how to do that in an upcoming lesson.

The resulting histogram now more closely resembles a standard normal curve.

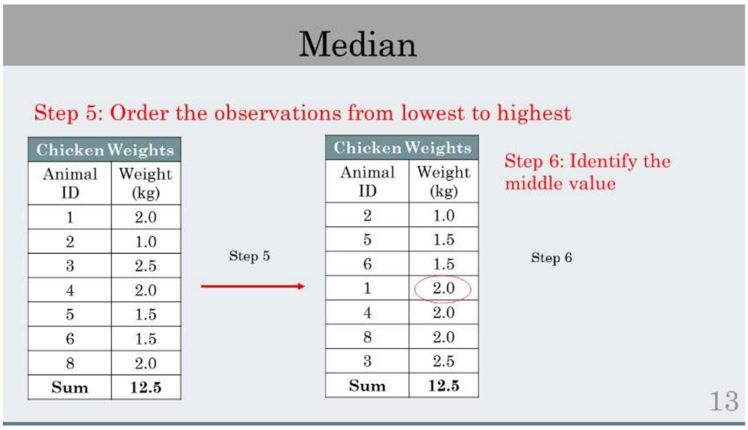


Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**, Slide 12

SCRIPT / KEY POINTS:
The answer is: 1.79 kg/chicken average

Q: What was your original question?
A: How heavy are my chickens when they are taken to market?

Q: Have you answered your question?
A: Yes, my chickens are on average 1.79 kg at market weight



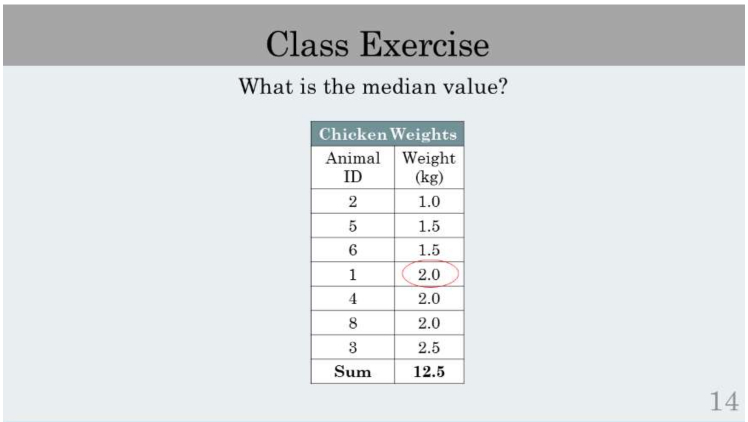
Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**, Slide 13

SCRIPT / KEY POINTS:
Median is the middle value, or the value that splits the distribution into two equal parts.

- One half of its observations are smaller than the median
- One half of its observations are larger than the median

To find the median:
1. Arrange observations in order (from smallest to largest, or from largest to smallest)
2. Find middle position as (n + 1)/2
3. Identify the value in the middle position

Answer: 1.75 kg

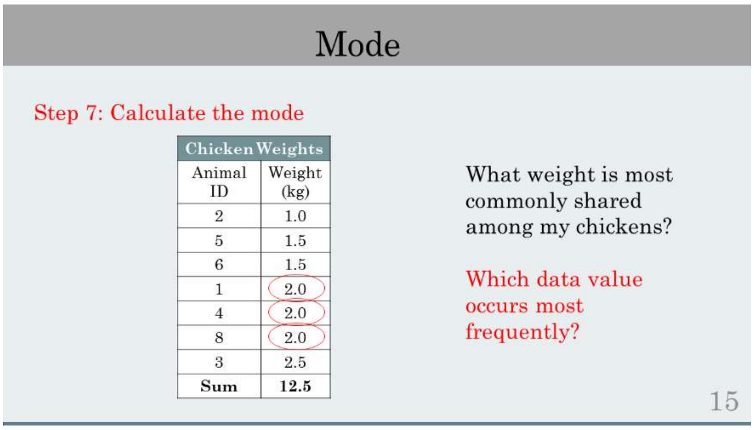


Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**, Slide 14

SCRIPT / KEY POINTS:
Note that by removing the outlier, we have more consistent results.

The answer is: 1.75 kg

What happens if you have an even number of observations/data points? When there is an even number of values, the median is the average of the two middle values. It is necessary to calculate the average of the two middle values between 1.5 and 2.0 which is 1.75.

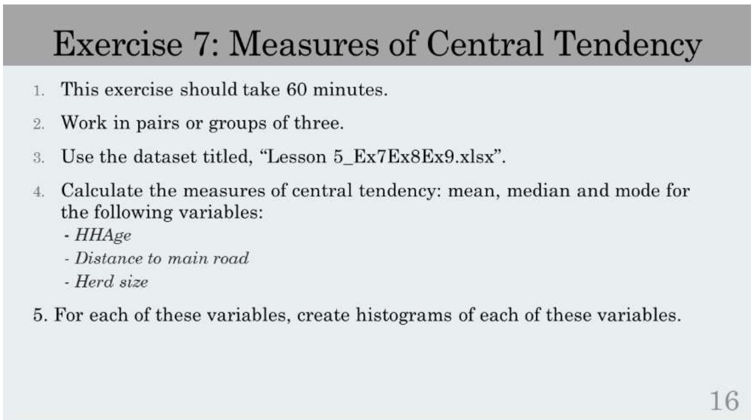


Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**, Slide 15

SCRIPT / KEY POINTS:
The mode is the simplest measure of central location. It requires no calculations. It simply is the value that occurs most frequently in the dataset.
So, to find the mode:

1. Arrange data into frequency distribution or histogram, showing the values of the variable and the frequency with which each value occurs.
2. Identify the value that occurs at the highest frequency (i.e., occurs most often).

Answer: 2 kg, this weight occurs 3 times.



Lesson 5.1 – Describing and Acting upon Animal Disease and Health Data – **Central Tendency**, Slide 16

SCRIPT / KEY POINTS:
Exercise 7
This exercise should take 60 minutes.
Work in pairs or groups of three.
Use the dataset titled, "Isigiro.xlsx".
Calculate the measures of central tendency: mean, median and mode for the following variables:
- HHAge
- Distance to main road
- Herd size

For each of these variables, create histograms of each of these variables.

End of Lesson 5.1

Exercise 7 – Calculate and Apply Measures of Central Tendency: Mean, Median, Mode, and Range

Description of Exercise:

Calculate measures of central tendency and make frequency histograms.

Allotted Time: 60 minutes

Organisation of Group Work:

- Work in pairs or small groups of three.

Exercise Components and Structure:

1. Calculate the measures of central tendency: mean, median and mode for the following variables:

   - HHAge
   - Distance to main road
   - Herd size

2. For each of these variables, create histograms of each of these variables

Materials, Data or Information:

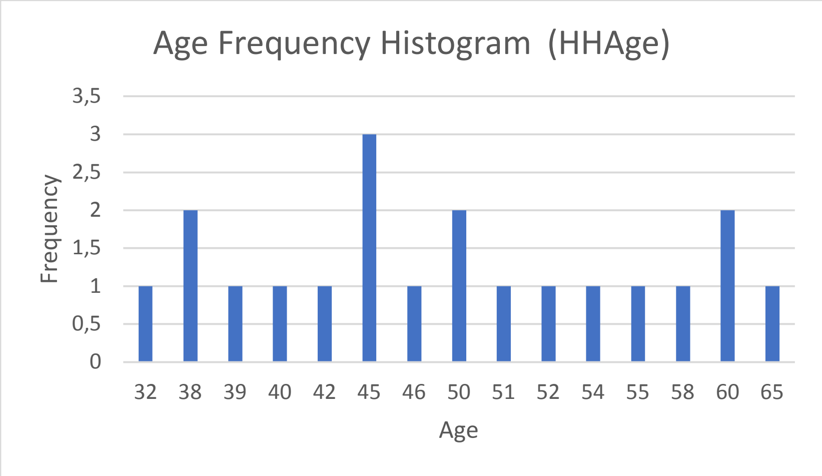
Use the dataset titled, "Lesson 5_Ex7Ex8Ex9.xlsx".

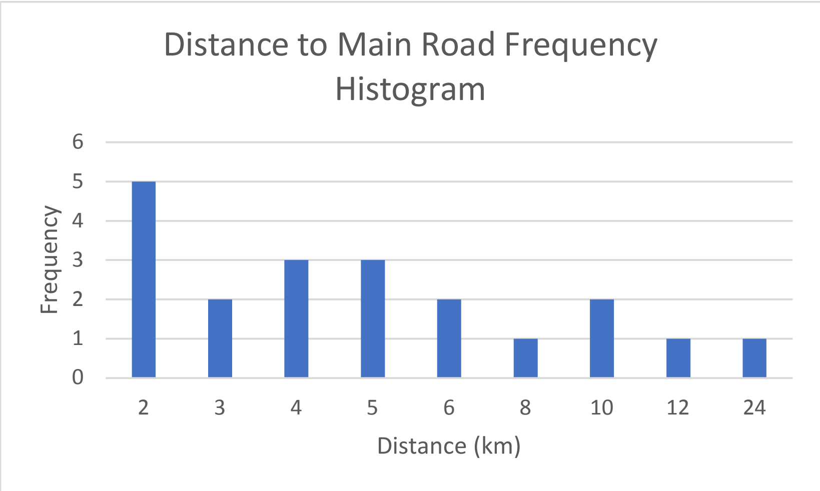
Expected Outputs and Deliverables of Each Participant:

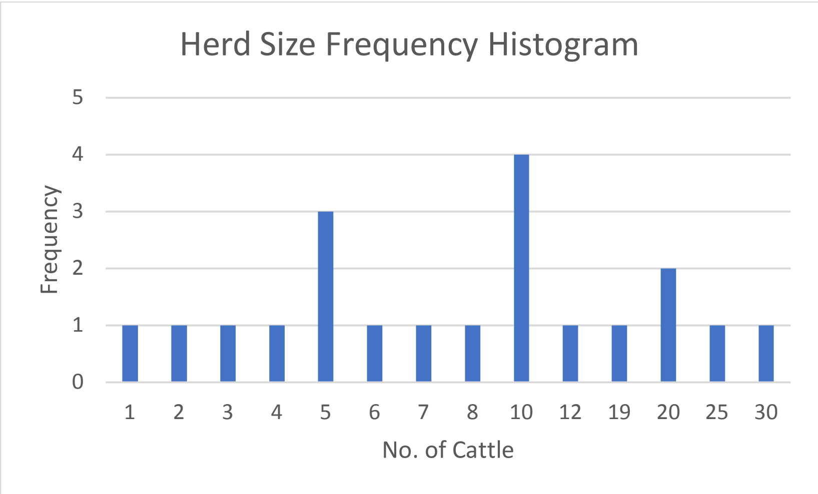
1. Mean, median and mode value for the following variables:

Measure of Central Tendency	HHAge	Distance to main road	Herd size
Mean	48	6	11
Median	48	5	9
Mode	45	2	10
Min	32	2	1
Max	65	24	30

2. Frequency histograms of the data from the same three variables.


Age Frequency Histogram (HHAge)
Frequency
3,5
3
2,5
2
1,5
1
0,5
0
32 38 39 40 42 45 46 50 51 52 54 55 58 60 65
Age


Distance to Main Road Frequency Histogram
Frequency
6
5
4
3
2
1
0
2 3 4 5 6 8 10 12 24
Distance (km)


Herd Size Frequency Histogram
Frequency
5
4
3
2
1
0
1 2 3 4 5 6 7 8 10 12 19 20 25 30
No. of Cattle

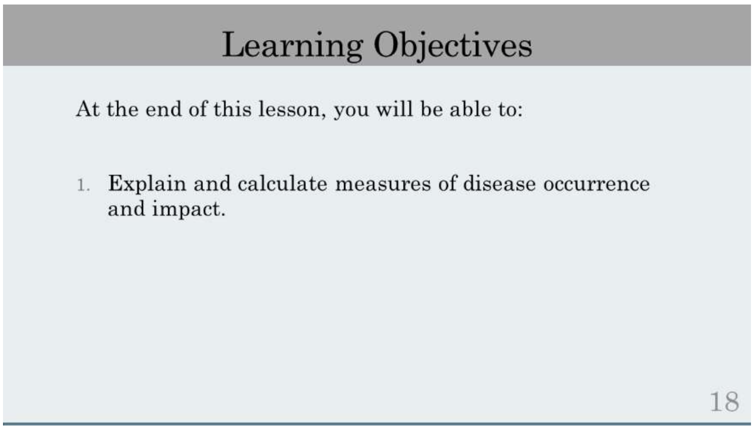
Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data: Disease Occurrence and Impact

Estimated Lesson and Exercise Time	2 hours
Instructor Materials	Frontline ISAVET Lesson 5.2 Describing and Acting upon Animal Disease and Health Data: Disease Occurrence and Impact.pptx
	Frontline ISAVET Lesson 5 Describing and Acting upon Animal Disease and Health Data: Disease Occurrence and Impact.doc
	Computer
	Microsoft Word and Excel
Participant Materials	Frontline ISAVET Describing and Acting upon Animal Disease and Health Data: Disease Occurrence and Impact Participant Guide.doc
Handout Materials for Exercises	MS Excel Lesson 5_Ex8.xlsx .xls (Lesson 8)
	MS Excel MS Excel Topic 6: Prevalence and Incidence.xls

Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 17

SCRIPT / KEY POINTS:

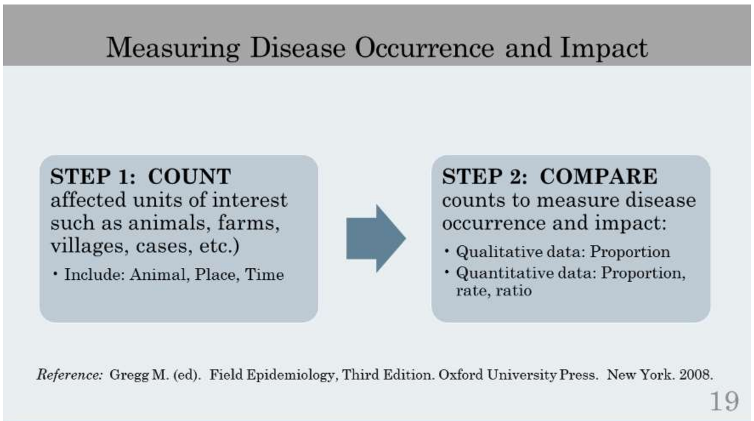
Welcome to Lesson 5, titled "Describing and Acting upon Animal Disease and Health Data: Disease Occurrence and Impact".



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 18

SCRIPT / KEY POINTS:
In this lesson, we will:

- Explain and calculate measures of disease occurrence and impact.



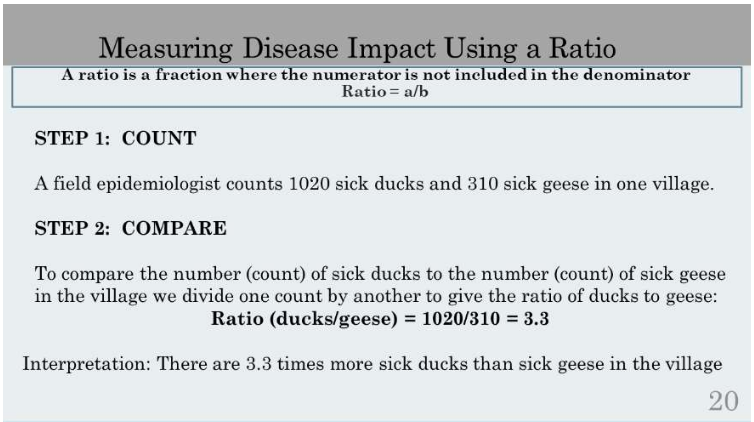
Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 19

SCRIPT / KEY POINTS:
Now, we are going to discuss measures of disease frequency.

The process includes counting, then comparing various counts in order to measure disease occurrence and impact.

Before this we need to understand that we will need to count affected units of interest be it animals, farms, herds or villages, and describe these in terms of individual, place and time. In addition to counts, there are various measures that can be used to describe disease frequency by comparing counts.

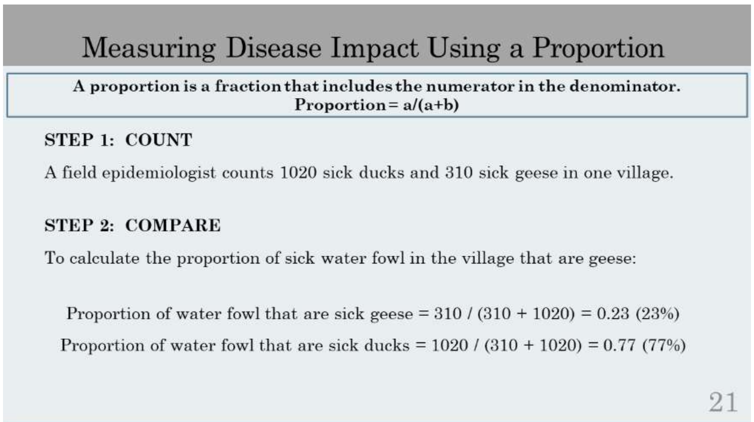
Reference: Gregg M. (ed). Field Epidemiology, Third Edition. Oxford University Press. New York. 2008.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**,
Slide 20

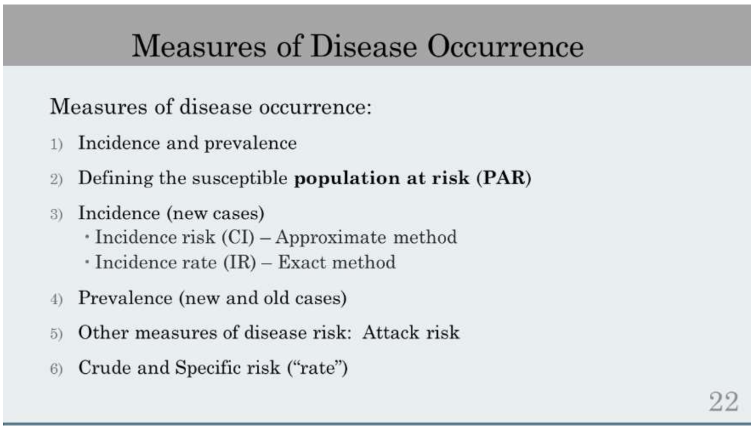
SCRIPT / KEY POINTS:
A ratio compares two counts. It is expressed as a fraction where the numerator is separate from and not included in the denominator.

Looking at the following examples, what is the ratio of ducks to geese in a village? Other common ratios used to describe disease impact include the sex ratio, age ratio, breed ratio, etc.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**,
Slide 21

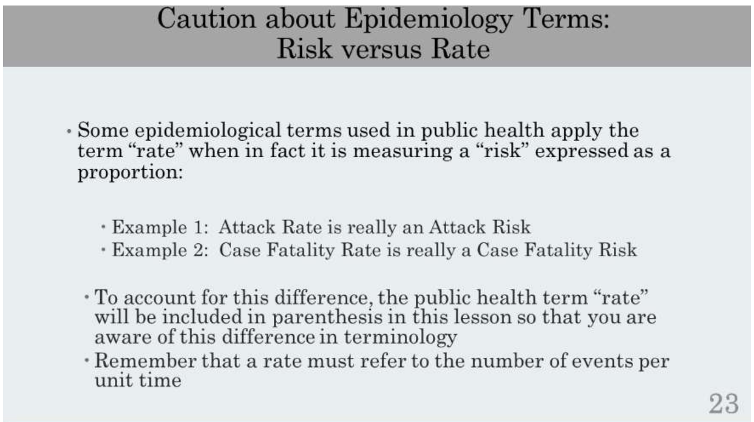
SCRIPT / KEY POINTS:
The point here is that denominators are important and we need to think carefully about what we want to compare in order to select the most appropriate denominator. Remember, that a proportion always includes the numerator count in the denominator. And that the p[roportion can be converted into a percentage if we multiply by 100.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 22

SCRIPT / KEY POINTS:
Now, we are going to discuss measures of disease frequency. These include prevalence and incidence. We will also discuss calculating animal –time at risk and discuss the issues in defining the population at risk.

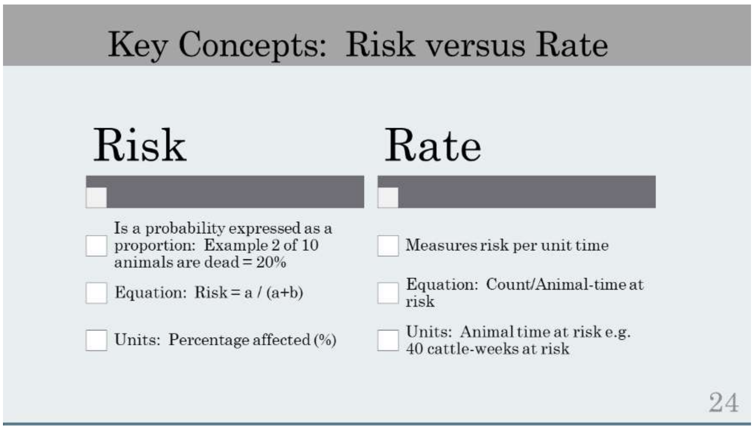
References:
Thrusfield, 2008. Veterinary Epidemiology (Third Edition).
Dohoo, Martin, Stryhn. 2003.Veterinary Epidemiologic Research.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 23

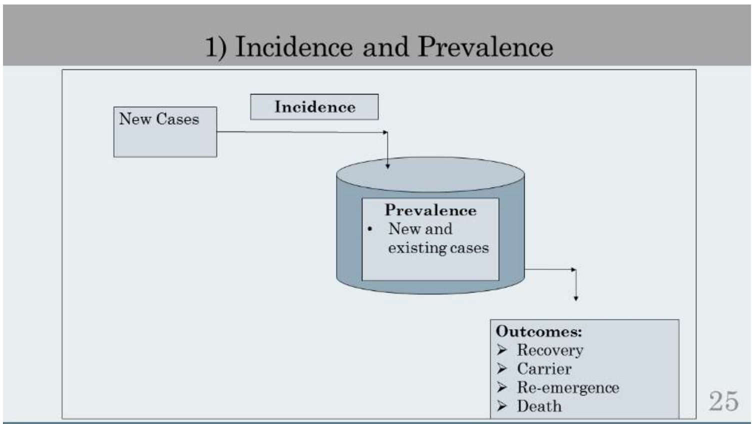
SCRIPT / KEY POINTS:
Risk is measured as a proportion:
A proportion is a fraction that includes the numerator in the denominator.
Proportion = a/(a+b)

A Rate measures risk per unit time. Time is always required whereas risk does not require a unit of time.
Example:
Cumulative Incidence = ***(Number count of new cases during a specified period)/(Number count of Invididuals initialy at risk during the period)***



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 24

SCRIPT / KEY POINTS:
Read slide.



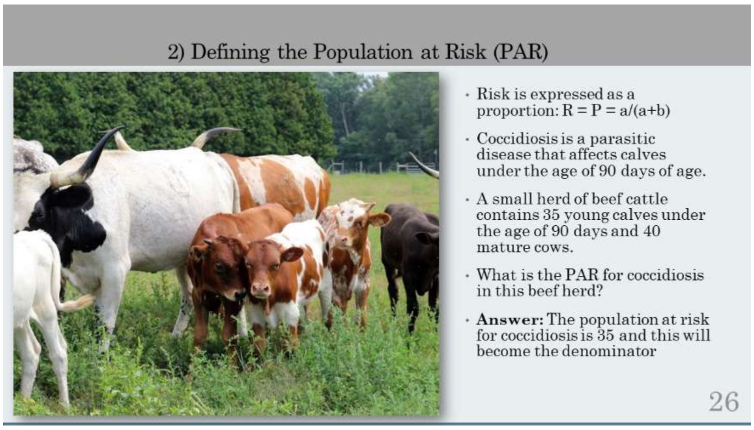
Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 25

SCRIPT / KEY POINTS:
Incidence counts the number of new cases entering in the animal population of interest. Incidence is analogous to making a movie to count each event in time

Prevalence counts the number of new and existing cases that exist in the animal population of interest. Prevalence is analogous to taking one still photograph to capture the number of past and recent events in one picture.

Case outcomes are resolved in four ways:

1. They recover from the disease;
2. They become a carrier and source of the disease for other animals;
3. The disease can re-emerge in some animals (also called "recrudescence"); or
4. The animal dies.



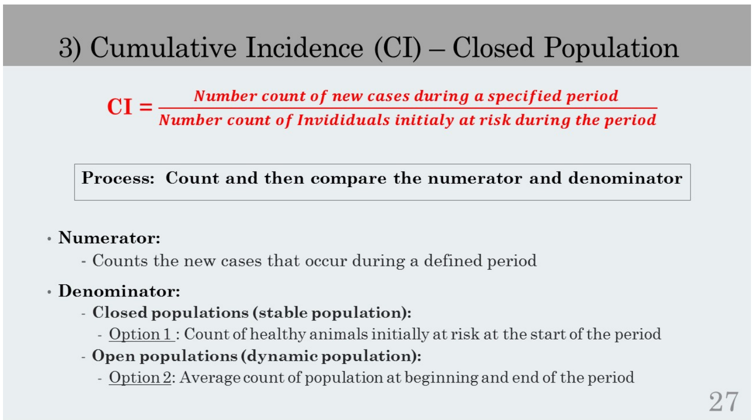
Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 26

SCRIPT / KEY POINTS:

Risk is expressed as a probability: R = P = a/(a+b)

Coccidiosis is a parasitic disease that affects calves under the age of 90 days of age.
A small herd of beef cattle contains 35 young calves under the age of 90 days and 40 mature cows.
What is the PAR for coccidiosis in this beef herd?

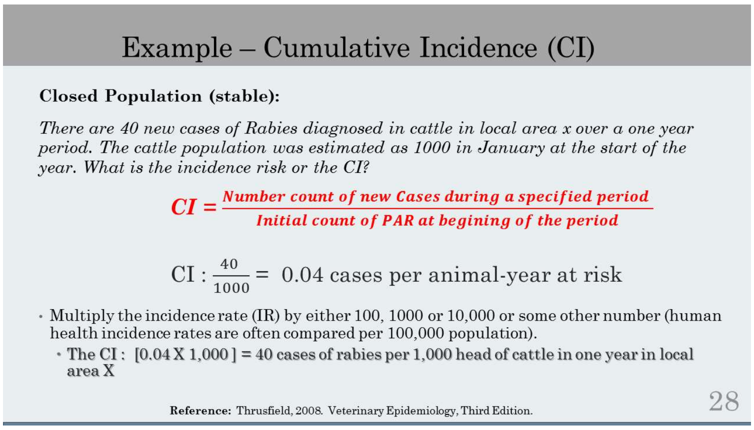
Answer: The population at risk for coccidiosis is 35 and this will become the denominator if we would like to calculate prevalence or the incidence rate.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 27

SCRIPT / KEY POINTS:
The last option for the denominator assumes that that only one case of disease is considered per animal.

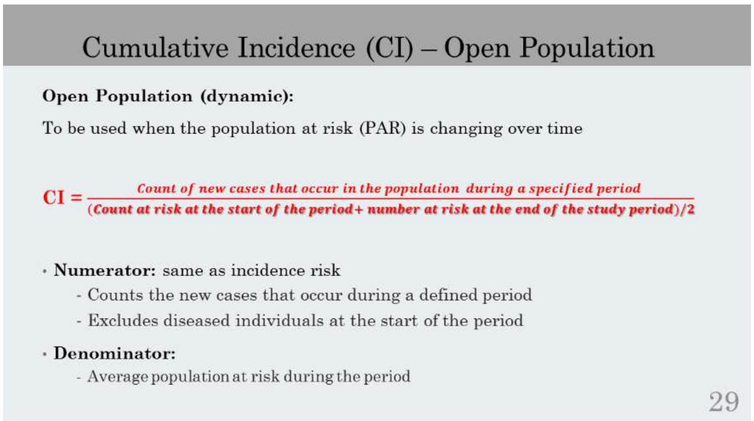
If a population is closed, it is stable in size, we choose the healthy population at risk at the beginning of the time period as the denominator. If a population is open, the population can change often making the denominator dynamic; therefore, we estimate the approximate population size at the mid-point of the time period.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 28

SCRIPT / KEY POINTS:
INSTRUCTOR NOTE: After reviewing the formula, allow 5 minutes for trainees to solve the example working in pairs.
Ref. Thrusfield, 2008. Veterinary Epidemiology, Third Edition.

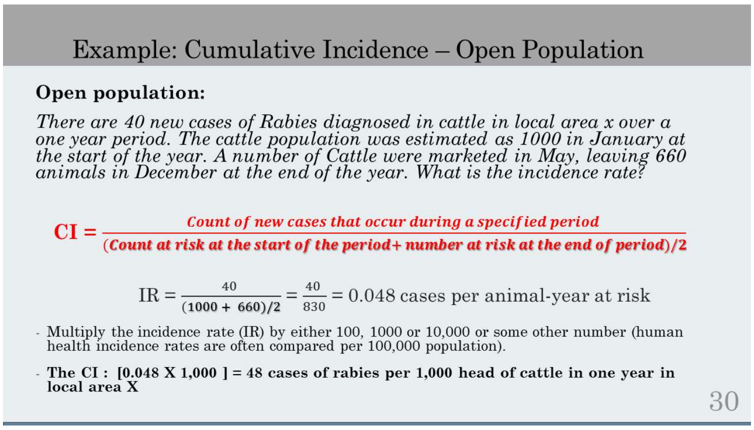
- Assumptions:
  - All animals are negative for the disease in question at the beginning of the time period
  - All animals that are dead are due to the disease (although mixed infections do occur)
  - The number of animals at the beginning and midpoint are known



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 29

SCRIPT / KEY POINTS:
This method is to be used when the population is changing i.e. in open populations (animals entering and leaving the population)

In most cases, it very difficult to record the exact time at risk of each individual, the approximate method is used.

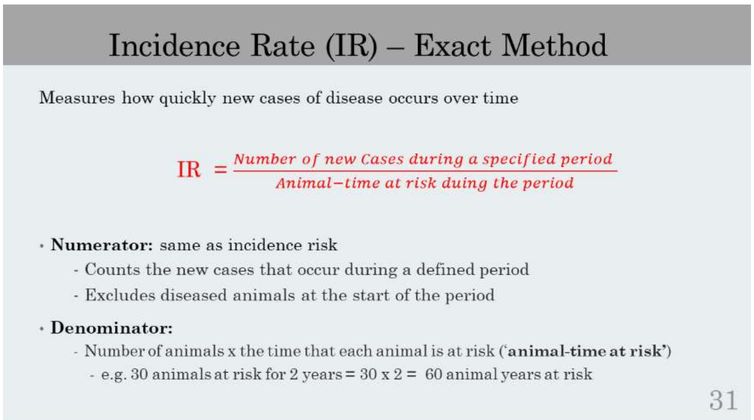


Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 30

SCRIPT / KEY POINTS:
INSTRUCTOR NOTE: After reviewing the formula, allow 5 minutes for trainees to solve the example working in pairs.

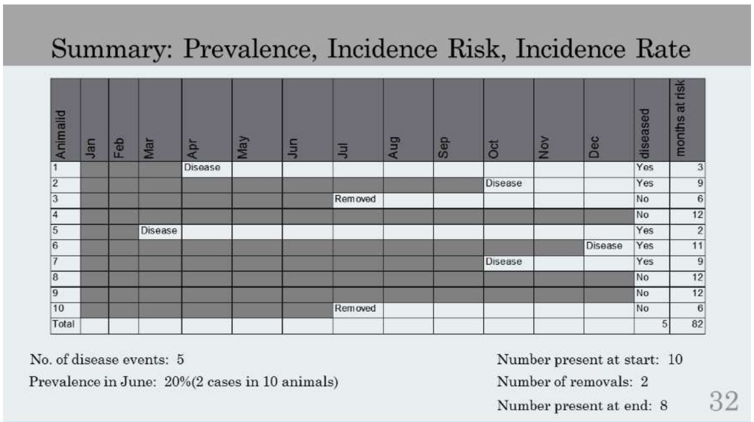
This example explains how to approximate the incidence of disease by estimating the population at risk (PAR) as the average of the initial and final population counts.

CHOOSING THE APPROPRIATE DENOMINATOR IS THE MOST CHELLENGING PART OF MEASURING DISEASE RISK!



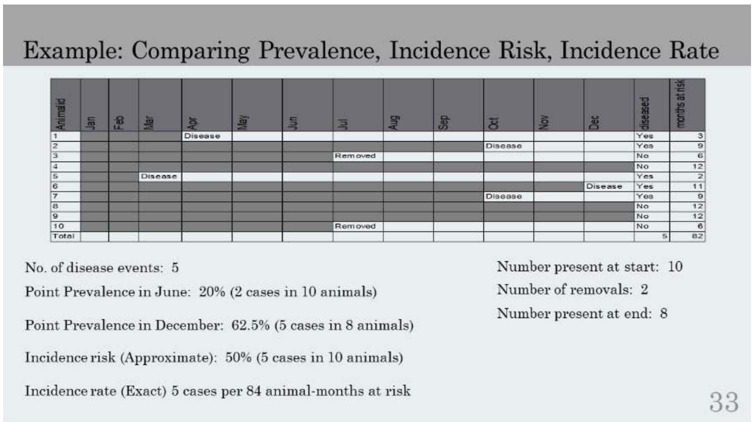
Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data –**Disease Occurrence and Impact**, Slide 31

SCRIPT / KEY POINTS:
The last option for the denominator assumes that that only one case of disease is considered per animal.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data –**Disease Occurrence and Impact**, Slide 32

SCRIPT / KEY POINTS:
The table above shows the "animal-months" at risk for 10 animals in a herd over a one-year period. It is important to account for each animal, including the healthy animals, diseased animals and animals that were removed from the herd (e.g. sold) during the specific time period in question.

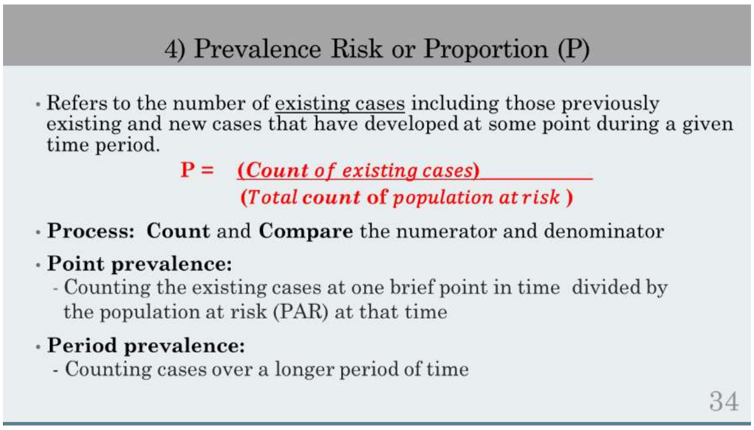


Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 33

SCRIPT / KEY POINTS:
Incidence risk – approximate – number of cases divided by the number at risk at the start of the study.

Incidence risk is equal to the number of new cases divided by the number initially at risk = 5/10 = 0.5 = 50%.

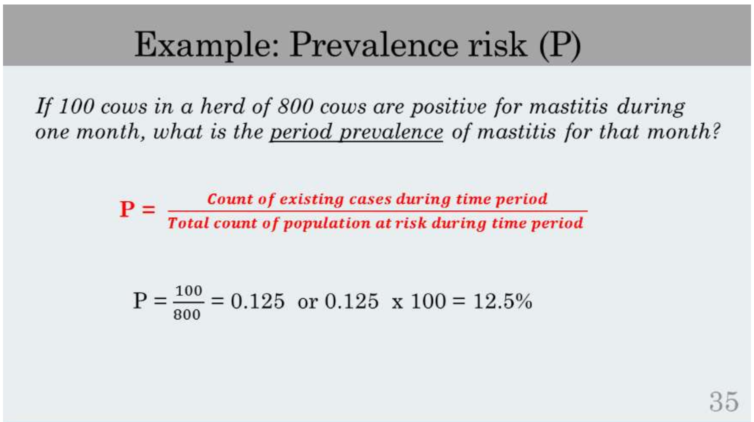
Incidence risk if we account for removals is the same since the initial population is the same.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 34

SCRIPT / KEY POINTS:
Prevalence is not a rate since it is simply one snapshot in time! Prevalence is a risk that is expressed as a proportion..

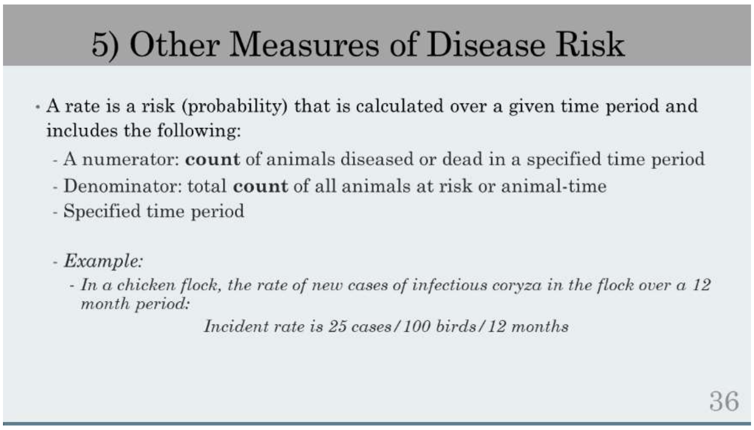
Prevalence, is generally referred to as a rate, but its actually a risk measure.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 35

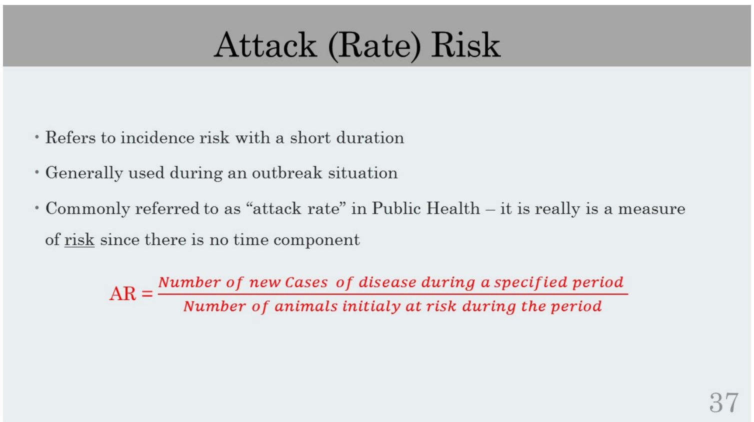
SCRIPT / KEY POINTS:
INSTRUCTOR NOTE: After reviewing the formula, allow 5 minutes for trainees to solve the example working in pairs.

Prevalence is generally expressed as a proportion, but can be expressed as a percentage. Prevalence can also be expressed as the number of cases per 10,000, or 1,000, 000 population.



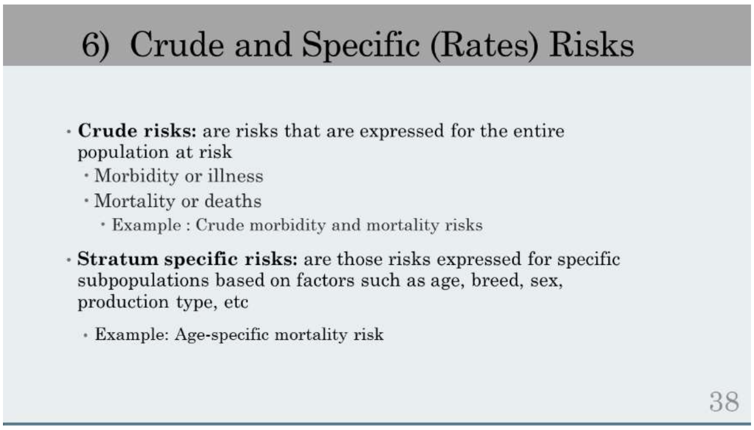
Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 36

SCRIPT / KEY POINTS:
Incident rate is one example of a measure of frequency that is considered a rate.. It is also referred to as “incidence-density”.



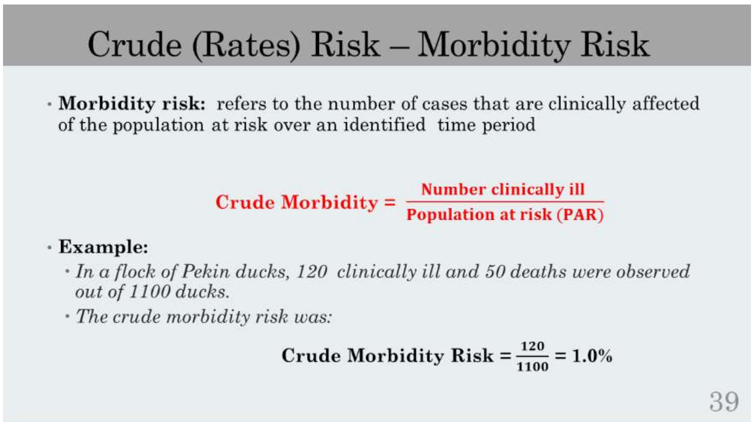
Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 37

SCRIPT / KEY POINTS:
This is just a note. You hear of the term Attack Risk and will wonder what it is. It refers to incidence risk measured during a short period of time – example during outbreaks. Attack risk is defined as the number of cases divided by the number of animals. We will discuss those later on.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 38

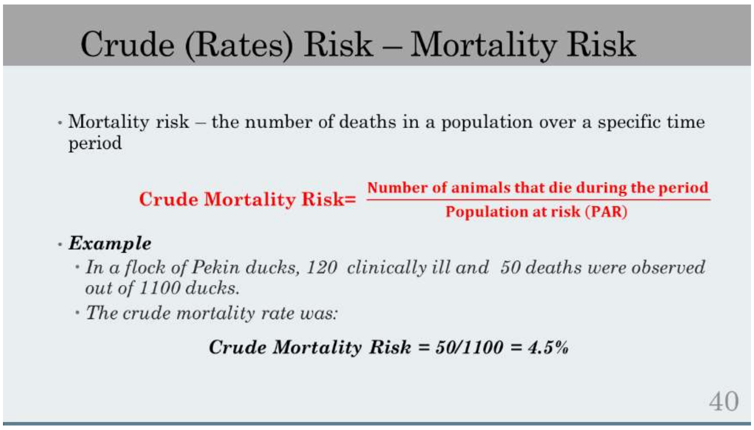
SCRIPT / KEY POINTS:
All measures of health and mortality can be expressed as crude or specific rates. Crude rates refer to rates that are expressed for the entire population at risk whilst specific rates are expressed in terms.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 39

SCRIPT / KEY POINTS:
INSTRUCTOR NOTE: After reviewing the formula, allow 5 minutes for trainees to solve the example working in pairs.

Morbidity is measure of disease impact based on the proportion of the population at risk that became ill.

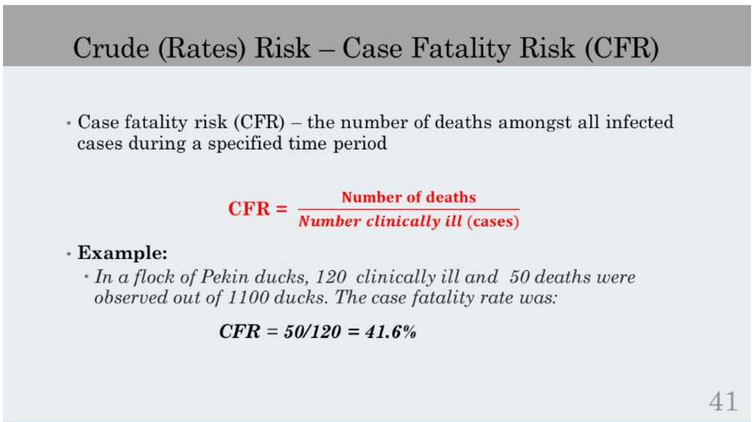


Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 40

SCRIPT / KEY POINTS:
INSTRUCTOR NOTE: After reviewing the formula, allow 5 minutes for trainees to solve the example working in pairs.

Mortality is measure of disease impact based on the proportion of the population at risk that died. At one point in time, you may observe more sick than dead animals.

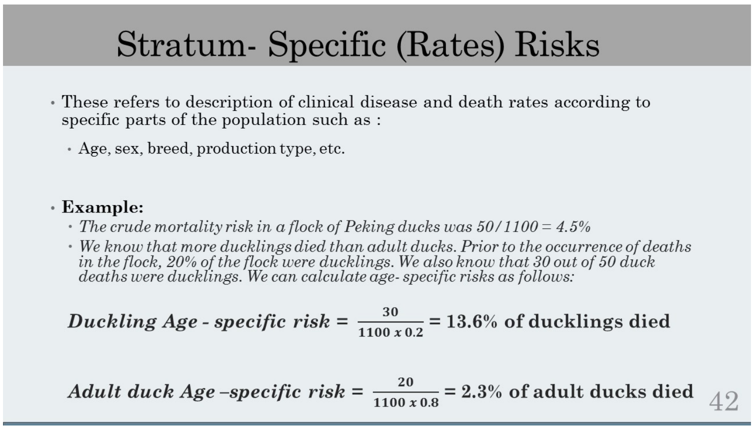
NOTE: For OIE reports, all dead animals due to a disease are assumed to have been ill previously from that disease so OIE reports require the morbidity can never be more than the mortality when we consider the data retrospectively.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 41

SCRIPT / KEY POINTS:
INSTRUCTOR NOTE: After reviewing the formula, allow 5 minutes for trainees to solve the example working in pairs.

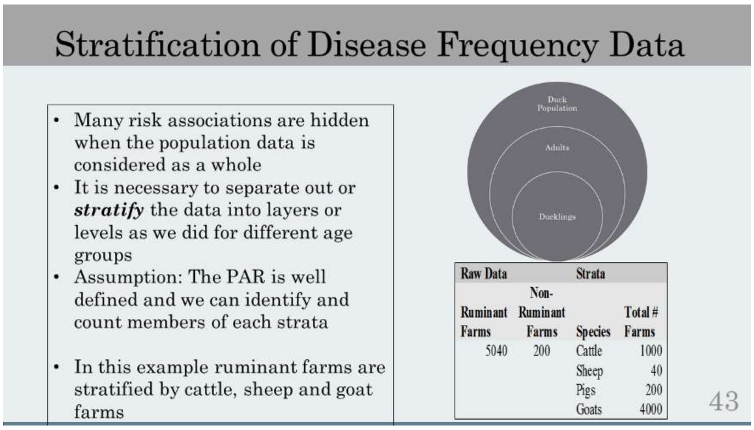
The case fatality rate is the number of animals that die during the period divided by the number of ill animals.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 42

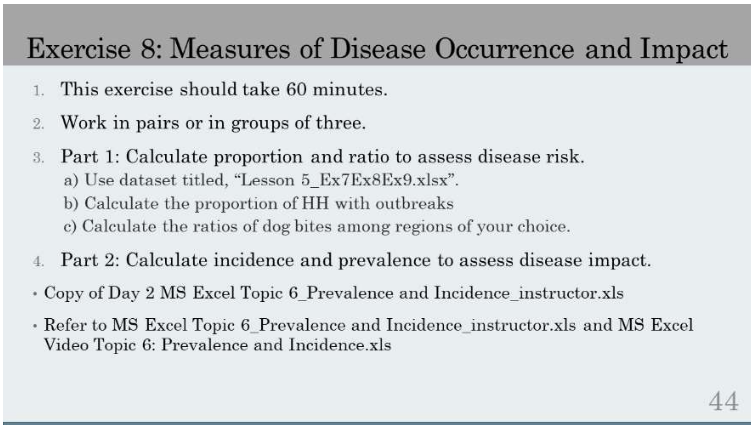
SCRIPT / KEY POINTS:
INSTRUCTOR NOTE: After reviewing the formula, allow 5 minutes for trainees to solve the example working in pairs.

Specific rates tell us much more about disease impact because disease often impacts different ages, sexes or breeds differently based on their genotypic and phenotypic characteristics.
Therefore we should always “STRATIFY” the population into different “layers” or “strata” to define the risks to specific subpopulations.
A higher proportion of ducks died (higher age-specific rate of 13.6%) in comparison with proportion of adult ducks that died (lower age-specific rate of 2.3%).



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 43

SCRIPT / KEY POINTS:
Strata are like the layers of an onion which must be opened to reveal additional meaning of the data. When we stratify the original data for the whole population, we are dis-aggregating the data and revealing what was previously hidden in each layer.



Lesson 5.2 – Describing and Acting upon Animal Disease and Health Data – **Disease Occurrence and Impact**, Slide 44

SCRIPT / KEY POINTS:
Exercise 8:
Calculate measures of disease occurrence (incidence and prevalence) and disease impact (important rates and ratios).
This exercise should take 60 minutes.
Work in pairs or in groups of three.
Part 1: Calculate proportion and ratio to assess disease risk.
Use dataset titled, "Lesson 5_Ex7Ex8Ex8.xlsx".
Calculate the proportion of HH with outbreaks
Calculate the ratios of dog bites among regions of your choice.
Part 2: Calculate incidence and prevalence to assess disease impact.
Part 2. Copy of Day 2 MS Excel Topic 6_Prevalence and Incidence_instructor.xls

Exercise 8 – Calculate Measures of Disease Occurrence (Incidence and Prevalence) and Disease Impact (Important Rates and Ratios)

Description of Exercise:

- Calculate measures of disease occurrence and disease impact

Allotted Time: 60 minutes

Organisation of Group Work:

- Work in pairs or in groups of three.

Exercise Components and Structure:

Part 1: Proportion and ratio

1) Calculate the proportion of HH with outbreaks
2) Calculate the ratios of dog bites among regions of your choice.

Part 2: Incidence vs prevalence

Follow the instructions for MS Excel Topic 6: Calculating incidence and prevalence.

Materials, Data or Information:

Part 1. Use dataset titled, "Lesson 5_Ex7Ex8Ex9. xlsx".

Part 2. Copy of Day 2 MS Excel Topic 6_Prevalence and Incidence_instructor.xls

Expected Outputs and Deliverables of Each Participant:

Part 1. Use dataset titled, "Lesson 5_Ex7Ex8Ex9.xlsx".

1) Calculate the proportion of HH with outbreaks

Proportion of HH with outbreaks	0.6

2) Calculate the ratios of dog bites among regions of your choice.

Ratio of dog bites:

Isingiro: Endinzi Subcounties	5:7	(0.71)
Kyamusoka:Bwiizi	1:7	(0.14)

Part 2. Copy of Day 2 MS Excel Topic 6_Prevalence and Incidence_instructor.xls

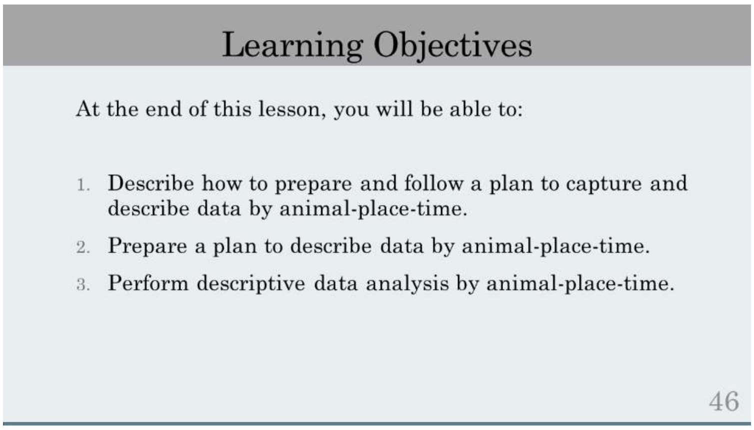
Refer to "MS Excel Topic 6 Instructor version" for the correct answers.

Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data: Descriptive Analysis by Animal-Place-Time

Estimated Lesson and Exercise Time	1 hour and 30 minutes
Instructor Materials	Frontline ISAVET Lesson 5.1, 5.2 and 5.3 Describing and Acting upon Animal Disease and Health Data: Analysis by Animal-Place-Time.pptx
	Frontline ISAVET Lesson 5 Describing and Acting upon Animal Disease and Health Data: Descriptive Analysis by Animal-Place-Time.doc
	Computer
	Microsoft Word and Excel
Participant Materials	Frontline ISAVET Describing and Acting upon Animal Disease and Health Data: Descriptive Analysis by Animal-Place-Time. Participant Guide.doc
Handout Materials for Exercises	MS Excel Lesson 5_Ex7Ex8Ex9.xlsx .xls (Lessons 7, 8 and 9)

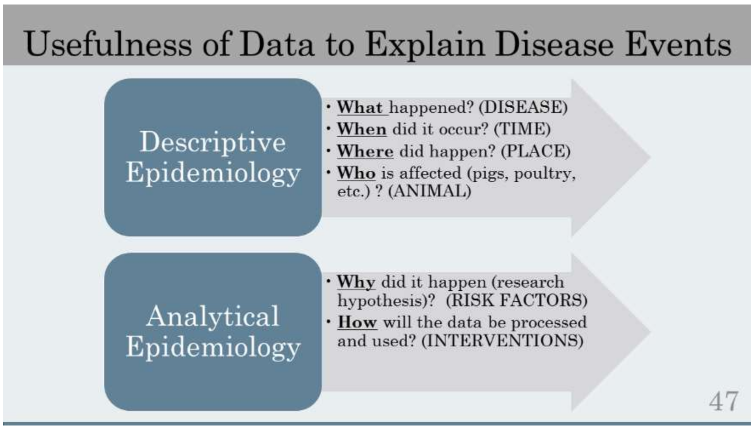
Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 45

SCRIPT / KEY POINTS:
Welcome to Lesson 5, titled “Describing and Acting upon Animal Disease and Health Data: Descriptive Analysis by Animal-Time-Place”.



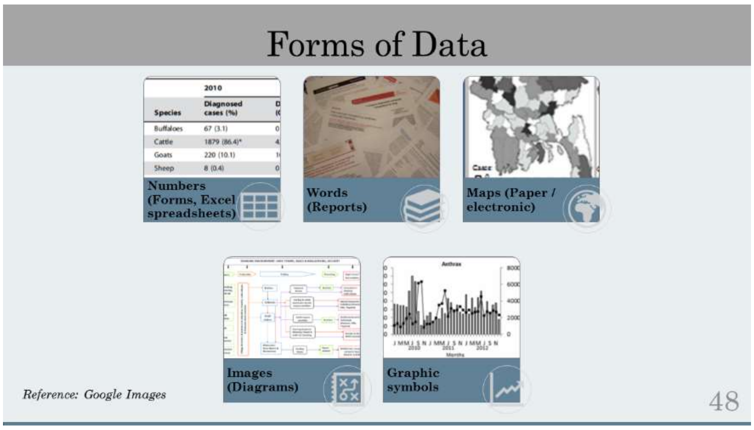
Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 46

SCRIPT / KEY POINTS:
In this lesson, we will:
- Describe how to prepare and follow a plan to capture and describe data by animal-place-time.
- Prepare a plan to describe data by animal-place-time.
- Perform descriptive data analysis by animal-place-time.



Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data – **Descriptive Analysis by Animal-Place-Time**, Slide 47

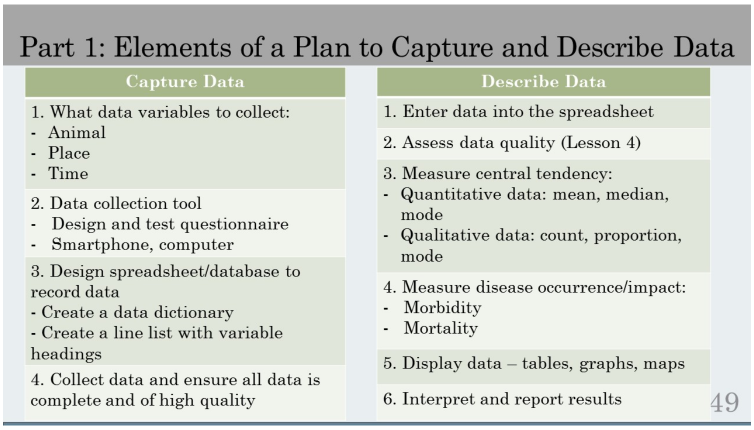
SCRIPT / KEY POINTS:
Data is not useful unless specific questions are considered before collecting the data in the field. BEFORE starting your field study, consider the following 5 Ws for collecting data:
- Why collect data?
- What is the need and the purpose of the data?
- What data is needed and at what level of detail?
- When will the data be collected?
- Where will the data be collected?
- How will the data be processed and used?



Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data – **Descriptive Analysis by Animal-Place-Time**, Slide 48

SCRIPT / KEY POINTS:
This slide illustrates the different types of data that are used to describe disease and health events. Data can be seen associated with forms, Excel spreadsheets, reports, maps, diagrams or symbols.

Images:
Google

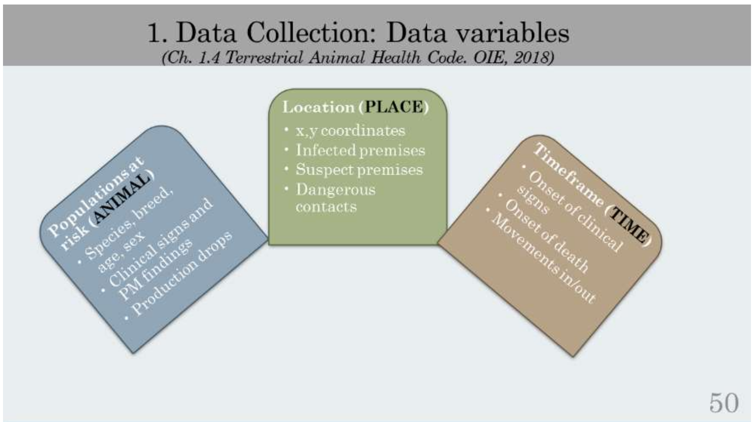


Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 49

SCRIPT / KEY POINTS:
There are several important points to consider when developing a plan to capture and describe data in terms of animal, place and time. It is best to have clear objectives for field data collection. Before data collection begins the following questions should be answered.

- What are the objectives?
- What data is needed?
- What or who is the source of the data (target group)?
- How will data be captured – via questionnaire form, Interview?
- What will you do with the data once collected?

- Data entry – spreadsheet for data entry with data dictionary and coding of variables
- What sort of analysis?
    - Data descriptive by animal, time and place
    - Variable types :
        - Categorical – counts and proportions
        - Continuous: mean, median ,mode
    - Measures of disease frequency by animal, place and time
- How will you display the data
    - Tables, graphs and maps



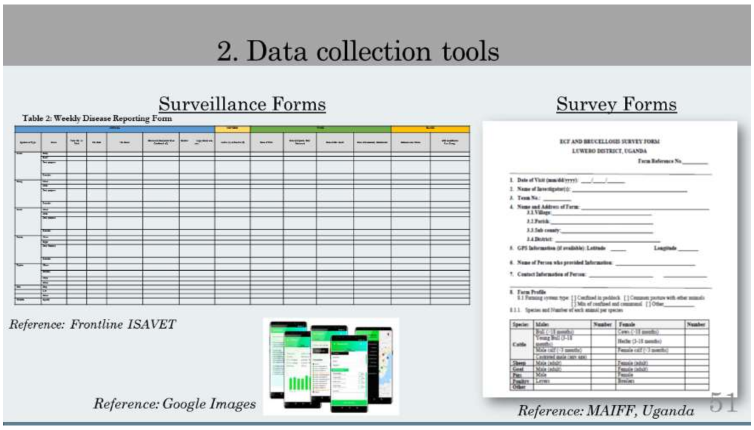
Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 50

SCRIPT / KEY POINTS:
The World Organisation for Animal Health (OIE) specifies the minimal elements of animal disease surveillance reports.
There are three elements in a surveillance analysis and reporting:

1. **Animal-Place-Time**

- **Populations at risk:** It is important to define the larger population as well as the subpopulations involved.
- **Place:** We must collect and analyse data regarding the location of animals at risk of the disease, especially infected places, as well as, other places that have had contact with the infected places (dangerous contacts).
- **Time:** We must define all critical time periods, including the following:
    - Time of onset of clinical signs;
    - Time of death;
    - Time movements into and out of the infected premises occurred;
    - Other.

We can assess risk factors and calculate the risk of disease only when we can fully describe Animal-Place-Time components in the greatest detail possible. This is why it is important to collect the information that will permit further analysis, recommendations and action to take.
Reference:
Ch. 1.4 Terrestrial Animal Health Code. OIE, 2018

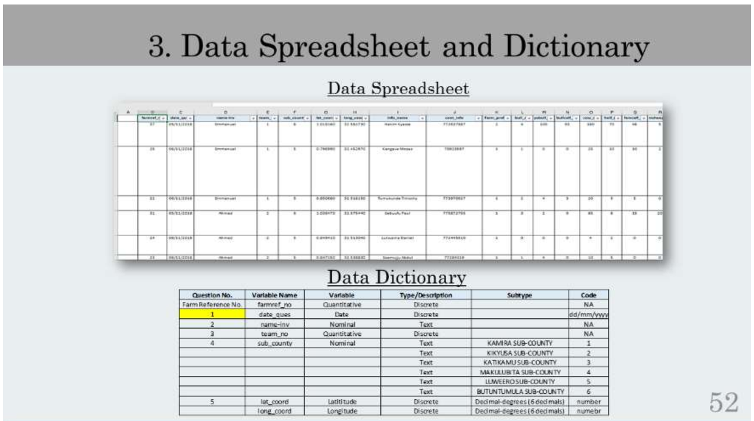


Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 51

SCRIPT / KEY POINTS:
Here is a table showing how animal data is divided into categories including species, breed, production type, age, sex and other relevant information that describes the population at risk.
Administrative records livestock data are routinely collected by Local Governments in all local area of the country on a continuous basis
Agricultural surveys are administered every year or few years to a nationally representative sample of households on a multiplicity of their characteristics, and include some livestock-related questions. They are usually conducted by the Uganda Bureau of Statistics (UBOS).

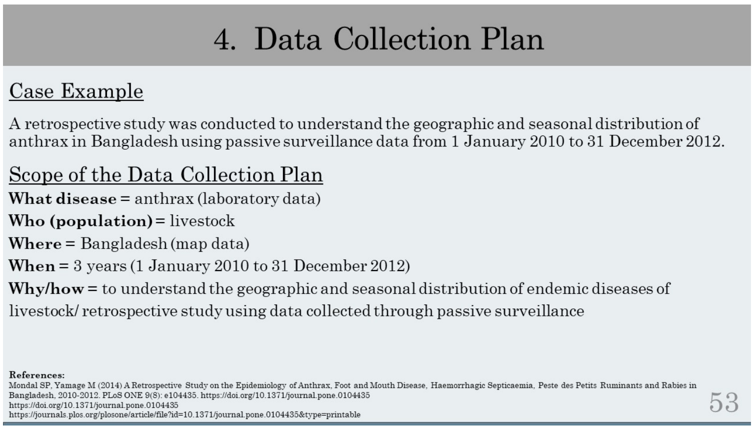
Agricultural and livestock censuses are conducted about every ten years and collect a limited set of information from every household in the country.

References:
Table: Frontline ISAVET
Images:
Photo 1: Google
Photo 2: MAIFF, Uganda



Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 52

SCRIPT / KEY POINTS:
Once data is collected it needs to be entered into a database, which can be a spreadsheet or a full fledged database. In amour case we will be working with excel spreadsheet.



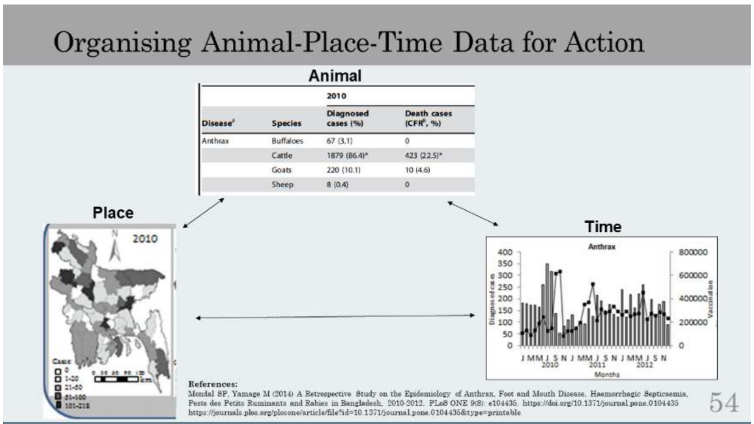
Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 53

SCRIPT / KEY POINTS:
Let's look at a case example for collecting and organizing data to answer the 5W's.

- What is the diseases of importance?
- Who is affected?
- Where are cases occurring?
- When did cases occur?
- Why are cases occurring?

Mondal SP, Yamage M (2014) A Retrospective Study on the Epidemiology of Anthrax, Foot and Mouth Disease, Haemorrhagic Septicaemia, Peste des Petits Ruminants and Rabies in Bangladesh, 2010-2012. PLoS ONE 9(8): e104435. https://doi.org/10.1371/journal.pone.0104435

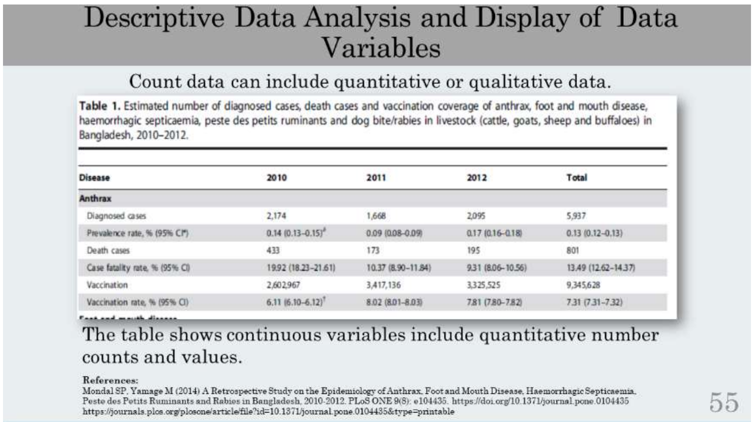
https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0104435&type=printable



Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 54

SCRIPT / KEY POINTS:
Collect any needed field investigation data based on animal-place-time and possible risk factors to permit further data analysis and display that will be useful for decision- making and taking action.

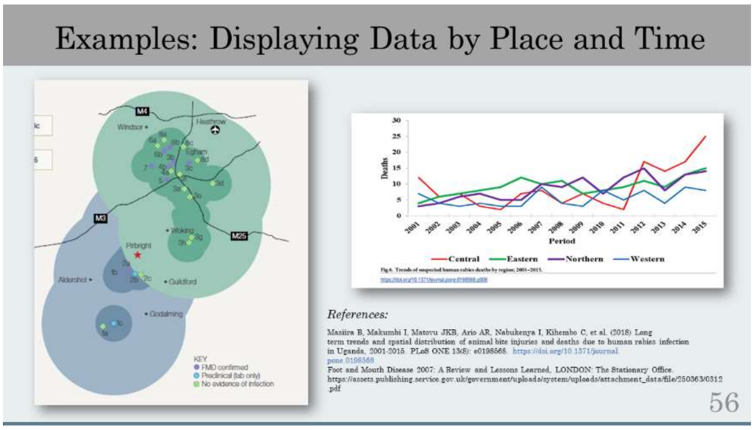
References:
Mondal SP, Yamage M (2014) A Retrospective Study on the Epidemiology of Anthrax, Foot and Mouth Disease, Haemorrhagic Septicaemia, Peste des Petits Ruminants and Rabies in Bangladesh, 2010-2012. PLoS ONE 9(8): e104435. https://doi.org/10.1371/journal.pone.0104435
https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0104435&type=printable



Disease	2010	2011	2012	Total
Anthrax				
Diagnosed cases	2,174	1,668	2,095	5,937
Prevalence rate, % (95% CI*)	0.14 (0.13–0.15)[#]	0.09 (0.08–0.09)	0.17 (0.16–0.18)	0.13 (0.12–0.13)
Death cases	433	173	195	801
Case fatality rate, % (95% CI)	19.92 (18.23–21.61)	10.37 (8.90–11.84)	9.31 (8.06–10.56)	13.49 (12.62–14.37)
Vaccination	2,602,967	3,417,136	3,325,525	9,345,628
Vaccination rate, % (95% CI)	6.11 (6.10–6.12)[†]	8.02 (8.01–8.03)	7.81 (7.80–7.82)	7.31 (7.31–7.32)

Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 55

SCRIPT / KEY POINTS:
References:
Mondal SP, Yamage M (2014) A Retrospective Study on the Epidemiology of Anthrax, Foot and Mouth Disease, Haemorrhagic Septicaemia, Peste des Petits Ruminants and Rabies in Bangladesh, 2010-2012. PLoS ONE 9(8): e104435.
https://doi.org/10.1371/journal.pone.0104435
https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0104435&type=printable

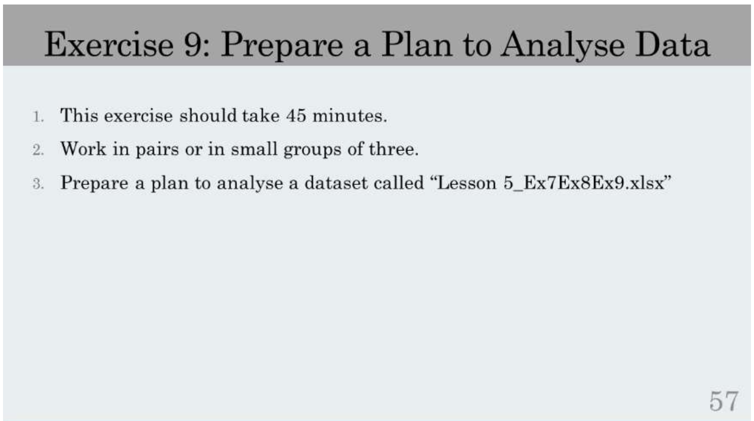


Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 56

SCRIPT / KEY POINTS:
Here is a map showing how place data is divided into categories, including foot-and-mouth disease (FMD) confirmed, pre-clinical, and no evidence of infection. Place also refers to premises with epidemiological links where movement in or out has occurred during a given time period for the population at risk.

The first known case is called the index case. Through aggressive case finding, the identification of earlier cases can shift the index case to another location and time.

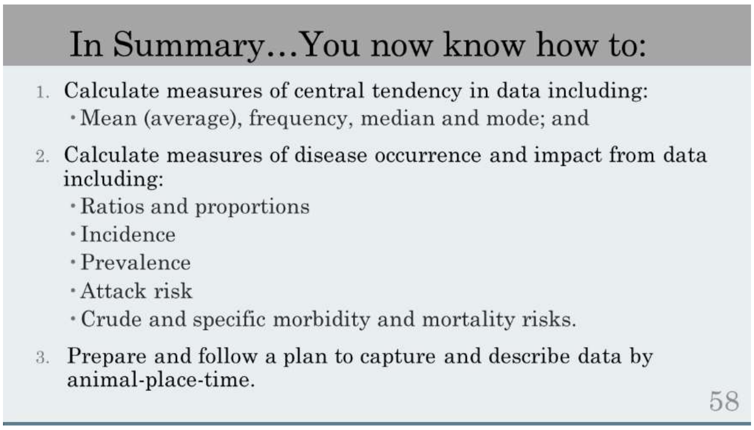
References:
Foot and Mouth Disease 2007: A Review and Lessons Learned, LONDON: The Stationary Office.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/250363/0312.pdf



Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 57

SCRIPT / KEY POINTS:
Exercise 9: Prepare a plan to analyse data

- This exercise should take 45 minutes.
- Work in pairs of three.
- Prepare a plan to analyse a dataset called "L5_Ex7Ex8Ex9.xls".
- Outcome – Checklist for analyses data
- Data quality



Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 58

SCRIPT / KEY POINTS:
You should now be able to describe an animal health event, calculate measures of central tendency and measure the occurrence and impact of the disease in the population and subpopulation.

Lesson 5.3 – Describing and Acting upon Animal Disease and Health Data –**Descriptive Analysis by Animal-Place-Time**, Slide 59

SCRIPT / KEY POINTS:
Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 9 – Prepare a plan to Analyze Data by Animal-Place-Time

Description of Exercise:

Prepare and follow a plan to capture and describe data by animal-place-time using the MS Excel file L5_Ex7Ex8Ex9.xls.

Allotted Time: 45 minutes

Organisation of Group Work:

- Total time 45 minutes
- Work in groups of two or three people.
- For the first 20 minutes groups will answer the questions below.
- During the last 25 minutes, the instructor will lead a plenary discussion.

Exercise Components and Structure:

1. Under the tab labelled "data", list the variable names in the following table that describe characteristics of animal, place and time.

ANIMAL	PLACE	TIME

2. Define a data dictionary and explain how it is used.
3. Review the data in the spreadsheet. Do you see any errors or omissions?
4. How many total animals are there in the 20 herds? What is the size of the smallest and largest herds?

Materials, Data or Information:

MS Excel file L5_Ex7Ex8Ex9.xls. contains all data under the tab labelled "data".

Expected Outputs and Deliverables of Each Participant:

1. Under the tab labelled "data" list the variable names in the following table that describe characteristics of animal, place and time. Note that record ID and occupation pertain to the line list number and the occupation of the animal owner, respectively.

ANIMAL	PLACE	TIME
Outbreak Grazing system cattle Shared water Vaccination of cattle No. of animals	Village Subcounty Local area Distance to main road	Visit Date HHAge Outbreak Date

2. Define a data dictionary and explain how it is used.

   A data dictionary is a reference tool to describe the type of variables that are being entered in a line listing. It is used to confirm the codes to enter when adding additional line list information and it is also useful to guide the type of data analysis required for quantitative and qualitative data.

3. Review the data in the spreadsheet. Do you see any errors or omissions?

   - Cell B4 has a date that is in a different format from other dates.
   - Note that outbreak date in Column I is entered only when the response in Column H is "Yes".

4. How many total animals are there in the 20 herds? What is the size of the smallest and largest herds?

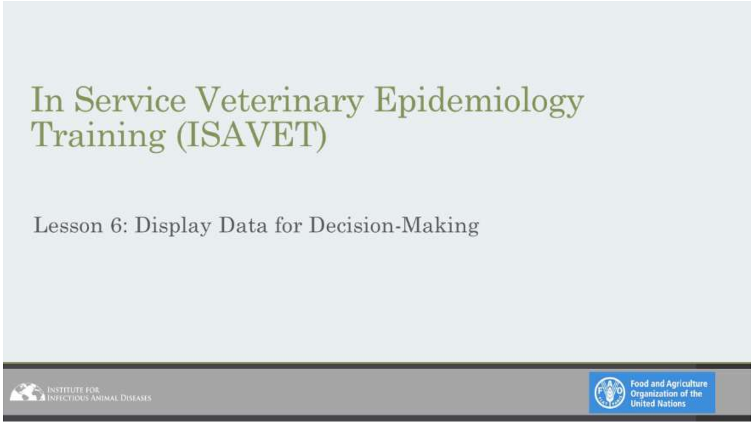
   - The total number of cattle on the 20 farms is 212.
   - The herds range in size between 1 (minimum) and 30 cattle (maximum).

Lesson 6 – Display Data for Decision-Making

Estimated Lesson and Exercise Time	Tables: 0.5 + 0.5 Line Graphs: 0.25 + 0.75 Bar and Pie Charts: 0.5 +0.5 TOTAL: 3.0 hours **PLEASE NOTE:** **Any work not completed in the time allotted for Exercises 10, 11 and 12 is to be completed as homework in order to improve your skills.**
Instructor Materials	Frontline ISAVET Lesson 6 Display Data for Decision-Making.pptx
	Frontline ISAVET Lesson 6 Display Data for Decision-Making Instructor Guide.doc
	Watch YouTube MS Excel Videos 8, 9 and 10
	Computer Microsoft Word and Excel
Participant Materials	Frontline ISAVET Lesson 6 Display Data for Decision-Making Participant Guide.PDF
Handout Materials for Exercises	MS Excel PivotTable.doc

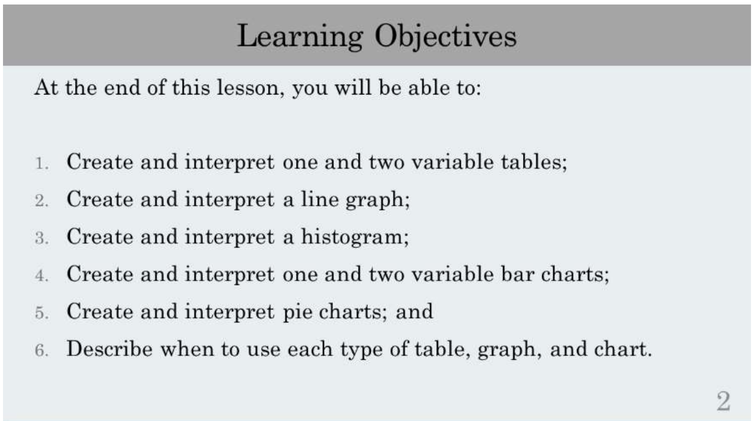
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

ECF	East Coast Fever
FMD	Foot and Mouth Disease
ISAVET	In Service Applied Veterinary Epidemiology Training
PPR	Peste des Petits Ruminants



Lesson 6 – Display Data for Decision-Making, Slide 1

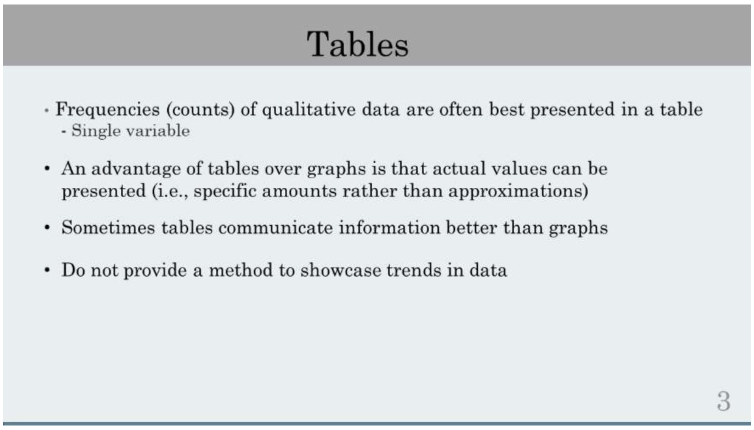
SCRIPT / KEY POINTS:
Welcome to this Lesson 6 titled, "Display Data for Decision-Making." In this lesson, we will learn to display surveillance data to provide information and knowledge for action and response.



Lesson 6 – Display Data for Decision-Making, Slide 2

SCRIPT / KEY POINTS:
In this lesson, we will:
- Organise and display data by animal-place-time;
- Display data using tables, graphs and maps; and
- Define thresholds for action and display trends and sudden changes.

Remember to keep tables, line graphs, histograms and bar charts simple and easy to read!



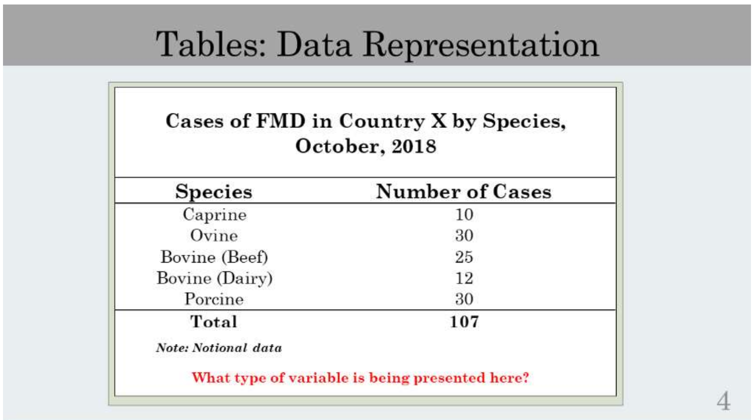
Lesson 6 – Display Data for Decision-Making,
Slide 3

SCRIPT / KEY POINTS:
In some instances, tables are better than graphs for displaying data. Tables are used for both qualitative and quantitative variables. Tables should be designed to stand alone. You should not have to refer to a corresponding text in order to understand the variables, measurements, etc. The advantages of using tables and graphs to organise data include easy visualisation of statistics, poignant descriptions of data, the provision of a summary of the overall work.

Frequencies (counts) of qualitative data, especially those with a single variable, are best presented in a table.

One advantage of using a table over a graph is that actual values can be presented. Frequencies (counts) of qualitative data, especially those with a single variable, are best presented in a table. The type of data affects the advantages and disadvantages of tables. Tables are useful for data with specific amounts rather than approximations.

Tables take viewers longer to comprehend and read due to the structure, and they also do not provide a simplistic method for capturing trends in data. Instead, the viewer must connect the dots between the data



Cases of FMD in Country X by Species, October, 2018

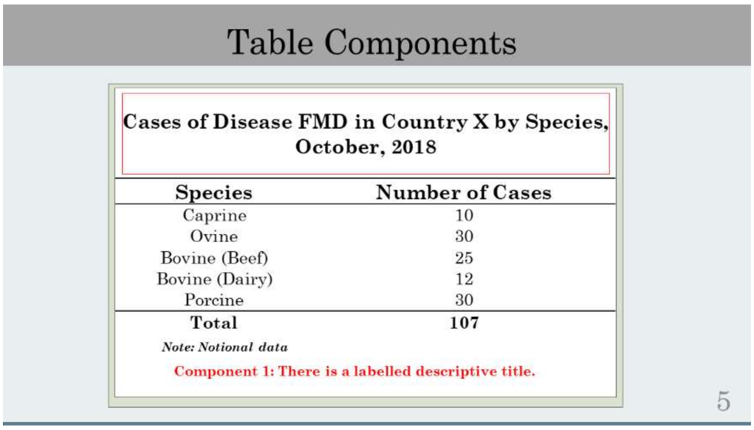
Species	Number of Cases
Caprine	10
Ovine	30
Bovine (Beef)	25
Bovine (Dairy)	12
Porcine	30
Total	**107**

Note: Notional data

Lesson 6 – Display Data for Decision-Making,
Slide 4

SCRIPT / KEY POINTS:
All tables have the same characteristics. The data are arranged in rows and columns and presented in a simple and self-explanatory manner. Here is an example of an simple table which showcases the count data for FMD cases during the month of October for goats, sheep, cattle, and swine.

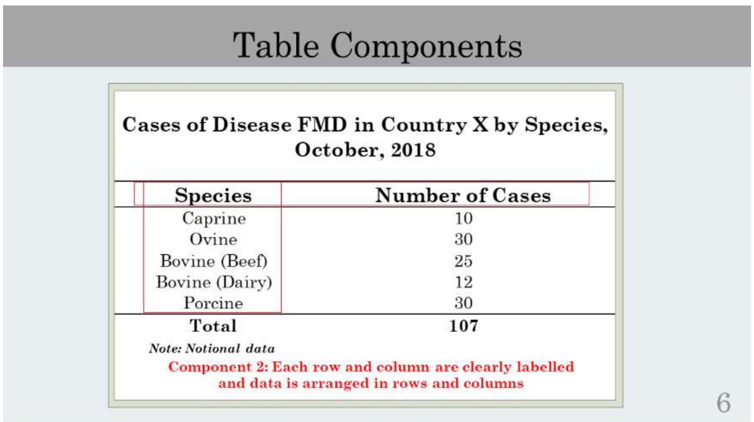
Ask students to identify the what type of variable is being presented here. The number of cases is defined as a qualitative variable (specifically: nominal). Even though the title says cases of FMD, the variable being assessed is species of animals.
What type of variable is being presented here? **QUANTITATIVE DISCRETE**



Lesson 6 – Display Data for Decision-Making,
Slide 5

SCRIPT / KEY POINTS:
Components of a good table:

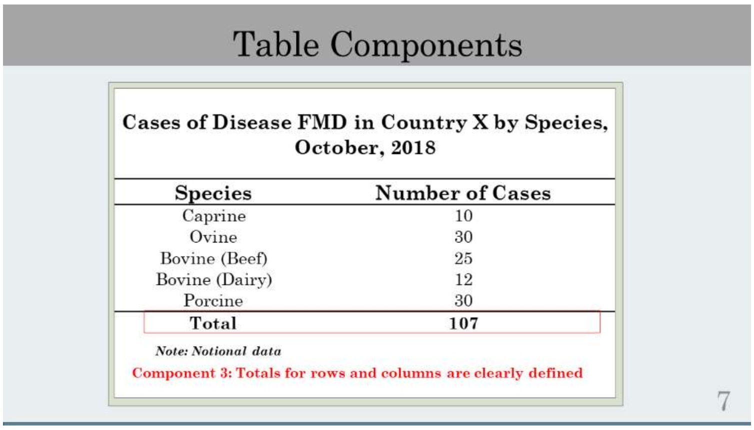
- Notice the title accurately summarizes the purpose of the table. Each column is clearly labelled. The bottom row is labelled letting us know the last number in the column is the total number of cases.



Lesson 6 – Display Data for Decision-Making,
Slide 6

SCRIPT / KEY POINTS:
Components of a good table:

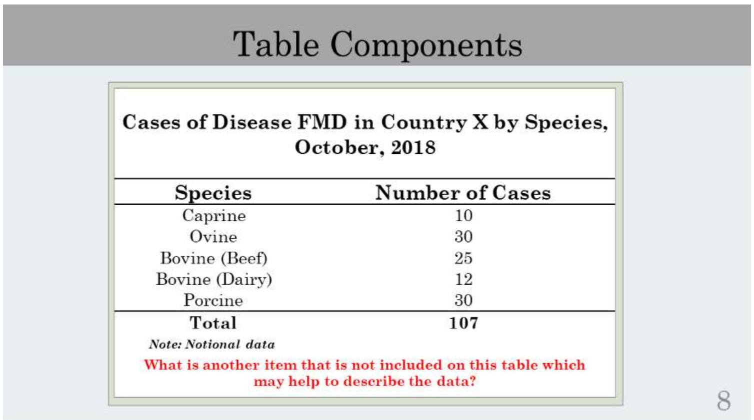
- Each column is clearly labelled. The bottom row is labelled letting us know the last number in the column is the total number of cases.
- For quantitative data, the unit of measure should be included in the column heading (i.e., Age – years)



Lesson 6 – Display Data for Decision-Making,
Slide 7

SCRIPT / KEY POINTS:
Components of a good table:

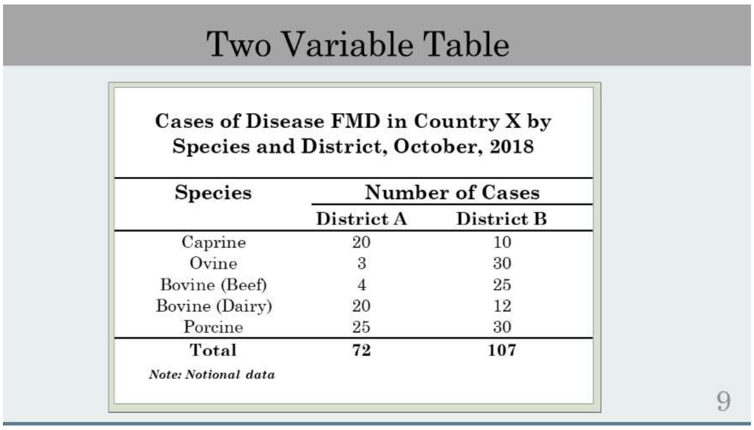
- Totals should be shown for all rows and columns that include the units of measure used. Finally, any codes used in the table, (e.g., yrs, or mg/dl), need to be explained in a footnote: yrs = Years; mg/dl = milligrams per deciliter.



Lesson 6 – Display Data for Decision-Making,
Slide 8

SCRIPT / KEY POINTS:
Components of a good table:
Ask participants, the question on the slide
RESPONSES:

1. Note the source of the data
2. List any codes used in the table, (e.g., yrs, or mg/dl), need to be explained in a footnote: yrs = Years; mg/dl = milligrams per deciliter.
3. Include a footer, if needed.



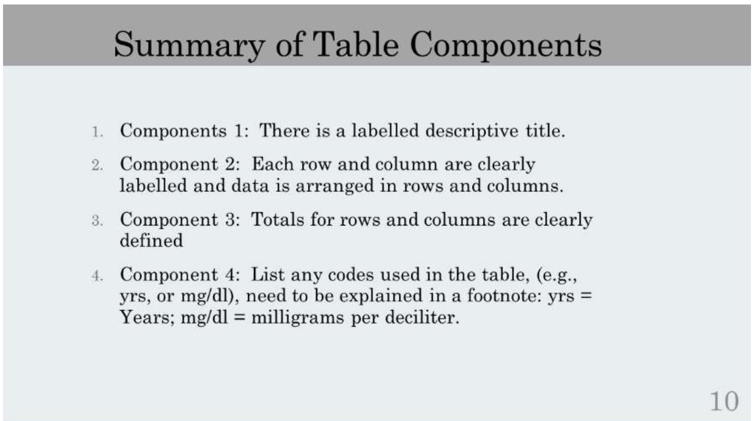
Cases of Disease FMD in Country X by Species and District, October, 2018

Species	Number of Cases	
	District A	District B
Caprine	20	10
Ovine	3	30
Bovine (Beef)	4	25
Bovine (Dairy)	20	12
Porcine	25	30
Total	**72**	**107**

Note: Notional data

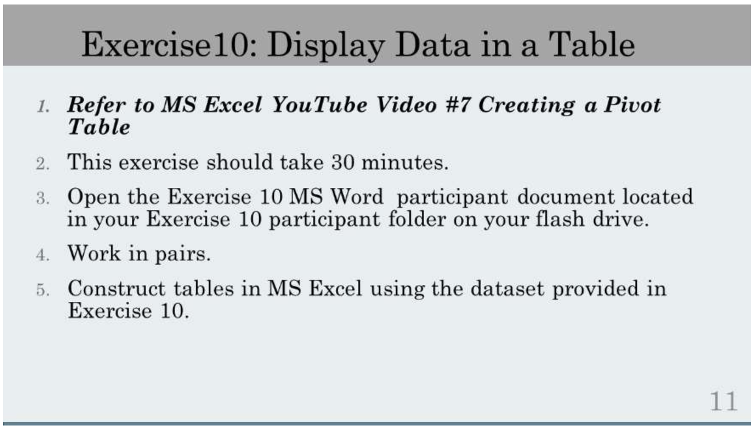
Lesson 6 – Display Data for Decision-Making,
Slide 9

SCRIPT / KEY POINTS:
Here we see the same information broken up into two variables (species and local area). This shows that there are many ways to display data. It all depends on the data you have, how you collected it, and what you would like to compare in the table.



Lesson 6 – Display Data for Decision-Making,
Slide 10

SCRIPT / KEY POINTS
Read slide.



Lesson 6 – Display Data for Decision-Making, Slide 11

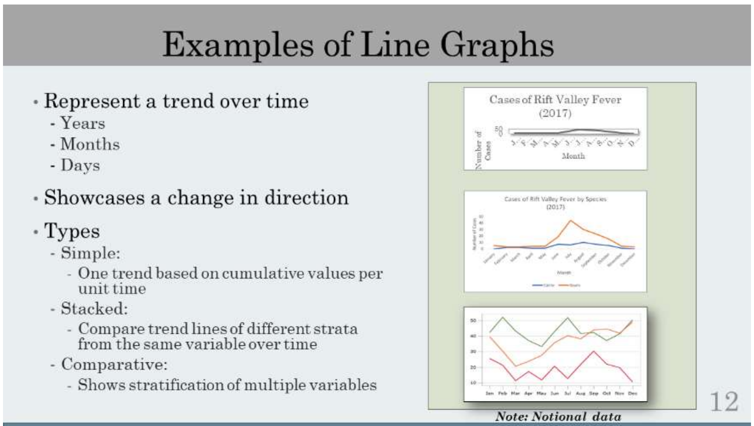
SCRIPT / KEY POINTS:

Exercise 10 instructions: Display Data in a Table.

- Review handouts for PivotTables in MS Excel before starting the Exercise.
- This exercise should take 30 minutes.
- Open the Exercise 10 MS Word participant document located in your Exercise 10 participant folder on your flash drive.
- Work in pairs.
- Construct tables in MS Excel using the dataset provided in Exercise 10.

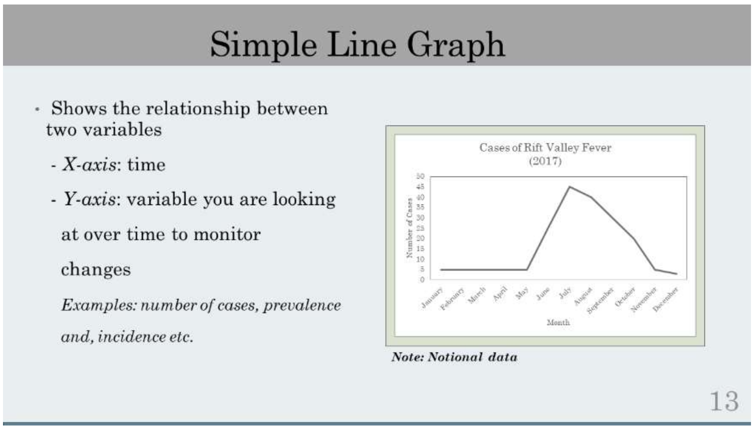
Instructors:

- See instructor manual for answers.
- **Refer to MS Excel YouTube Video #7 Creating a Pivot Table**



Lesson 6 – Display Data for Decision-Making, Slide 12

SCRIPT / KEY POINTS:
Line graphs display a change in direction, while bar graphs display a change in magnitude. Line graphs are used to display the comparison between two variables which are plotted on the horizontal x- and vertical y-axis of a grid. The x-axis usually represents measures of time, while the y-axis usually represents percentage or measures of quantity. Therefore, line graphs are commonly used as time series graphs that show differences in direction.

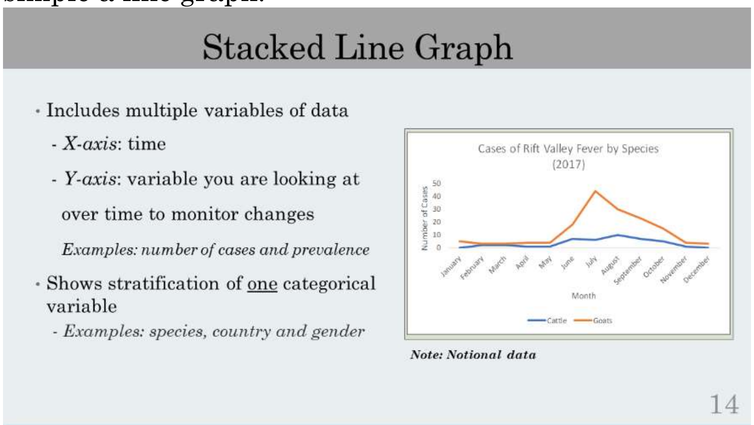


Lesson 6 – Display Data for Decision-Making, Slide 13

SCRIPT / KEY POINTS:
Simple line graphs are used for showing the relationship between two variables. One of these variables is usually time (i.e., X-axis) but they can also show other factors.

This type of graph showcases a change in a variable (i.e, number of positive cases or prevalence of disease over time).

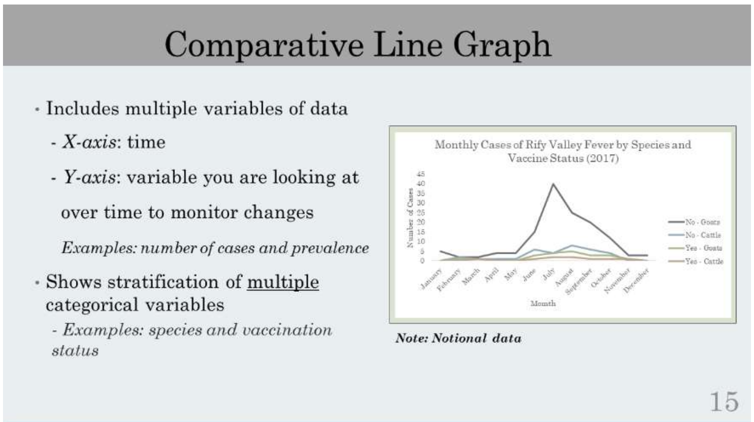
The following graph illustrates a simple line graph of disease cases for Rift Valley fever by month during 2017. This graph takes into account the entire population in the dataset over a 1-year period. In the next few slides, we will explore how information can be hidden or misleading based on the data originally presented in simple a line graph.



Lesson 6 – Display Data for Decision-Making, Slide 14

SCRIPT / KEY POINTS:
A stacked line graph will consist of the same structure as a simple line graph but will consist of more than one line plotted on a graph. Each line represents a different category within a variable. A good time to do this is when you want to stratify your data to make comparisons over certain trends or to see the magnitude of a specific variable at different time points. The lines on this type of graph do not overlap.

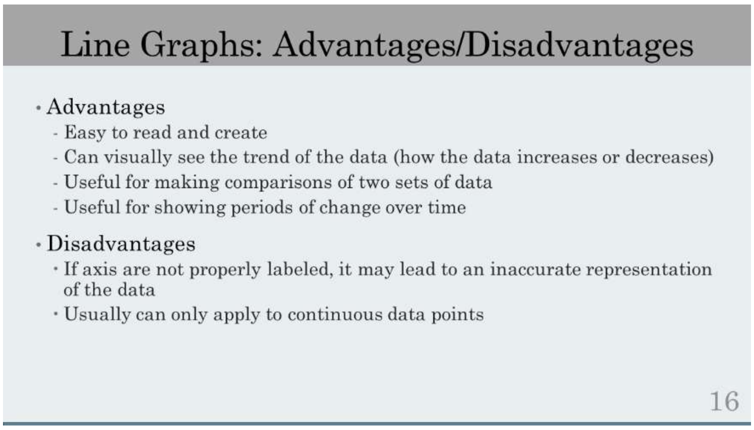
From this example disease patterns in cattle and goats are different, but the number of cases is generally lower in cattle. However, toward the middle of the period, the number of disease cases grew faster in goats than in cattle.



Lesson 6 – Display Data for Decision-Making, Slide 15

SCRIPT / KEY POINTS:
A stacked line graph will consist of the same structure as a simple line graph but will consist of more than one line plotted on a graph. Instead of stratifying by one categorical variable, it may stratify it by multiple categorical variables.

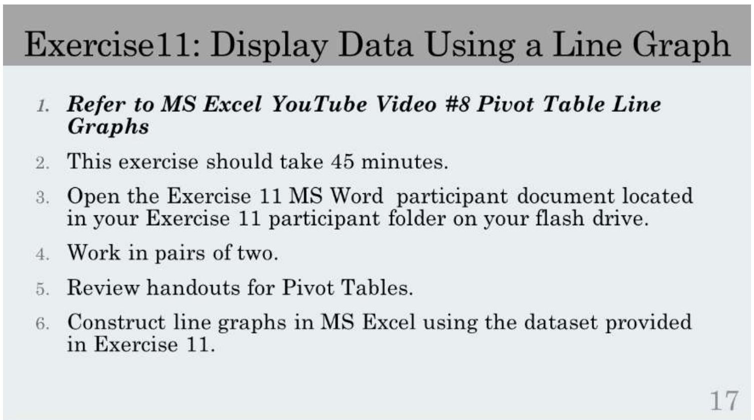
What happens when we further divide the data by vaccination status? When the data is stratified by vaccination, it becomes apparent that the decrease occurred only in vaccinated animals while the increase occurred in non-vaccinated goats.



Lesson 6 – Display Data for Decision-Making,
Slide 16

SCRIPT / KEY POINTS:
Line graphs have several advantages and disadvantages. Line graphs are easy to read and create. They allow the viewer to visually see trends in data over time.

They can be useful for making comparisons of two set of data or for showing periods of change over time. However, only continuous data should be used when developing a line graph.



Lesson 6 – Display Data for Decision-Making,
Slide 17

SCRIPT / KEY POINTS:
Exercise 11 instructions: Display Data Using a Line Graph.

- This exercise should take 45 minutes.
- Open the Exercise 11 MS Word participant document located in your Exercise 11 participant folder on your flash drive.
- Work in pairs of two.
- Review handout for Pivot Tables.
- Construct tables in MS Excel using the dataset provided in Exercise 11.

Instructors:

- See instructor manual for answers.
- **Refer to MS Excel You Tube Video #8 Pivot Table Line Graphs**

Histograms

- Graph of the frequency distribution of a quantitative variable
- Useful for summarising statistical properties of the data set, including the shape of the frequency distribution, modality, and symmetry
- Columns are adjoining
- Height of each column is proportional to number of observations in that interval

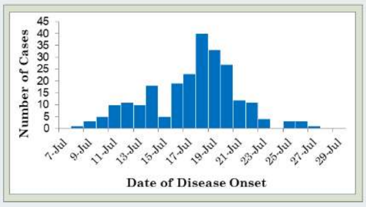
18

Lesson 6 – Display Data for Decision-Making,
Slide 18

SCRIPT / KEY POINTS:
Histograms are generally used to show the number of reported cases of a disease over a specific time period, most often plotted from onset of disease.

Frequency Histogram

- Epidemiologic curves are histograms that show the frequency of cases over time
- They are fundamental tools of an outbreak investigation

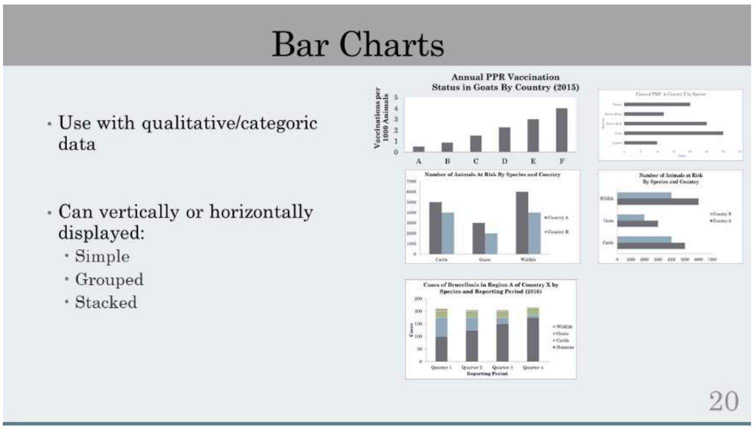


Note: Notional data

19

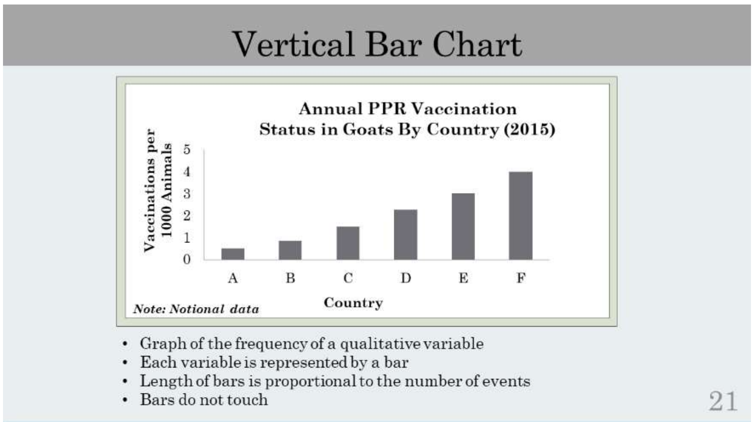
Lesson 6 – Display Data for Decision-Making,
Slide 19

SCRIPT / KEY POINTS:
Epidemiologic curves are histograms that show the frequency of cases over time where each bar is relatively close together. They are fundamental tools of an outbreak investigation. We will go more into detail for how to develop epidemiologic curves later in the course.



Lesson 6 – Display Data for Decision-Making,
Slide 20

SCRIPT / KEY POINTS:
Read slide.



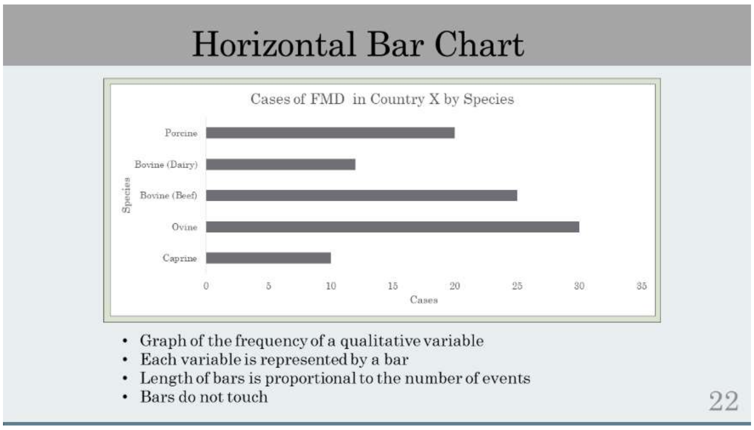
Lesson 6 – Display Data for Decision-Making,
Slide 21

SCRIPT / KEY POINTS:
This is an example of a simple bar graph. Qualitative data, such as countries, should be displayed in a bar graph rather than a histogram. Remember histograms are used for quantitative variables.

In addition, this type of data could also be displayed in a table format. While this example is for educational purposes, the amount of data presented is relatively low, and important data such as the number of vaccinations is lost when a graph is used instead of a table. In general, the frequency of qualitative data is best presented in a table.

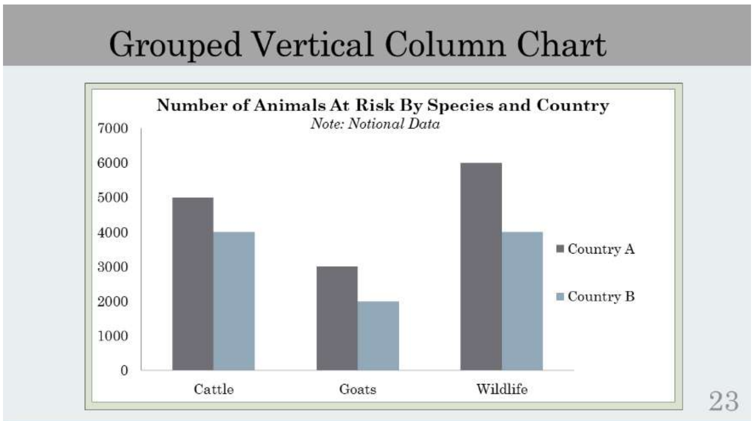
Bar charts are used to present and compare data. There are two main types of bar graphs: horizontal and vertical. They are easy to understand, because they consist of rectangular bars that differ in height or length according to their value or frequency. Bar charts display a change in magnitude, and not in direction like line graphs.

A vertical bar chart consists of an x-axis, and a vertical bar graph consists of a y-axis. The numbers on the axes are known as the scales. Each bar is represents a numeric or categorical variable.



Lesson 6 – Display Data for Decision-Making, Slide 22

SCRIPT / KEY POINTS:
Horizontal bar chart variables are off the y-axis.

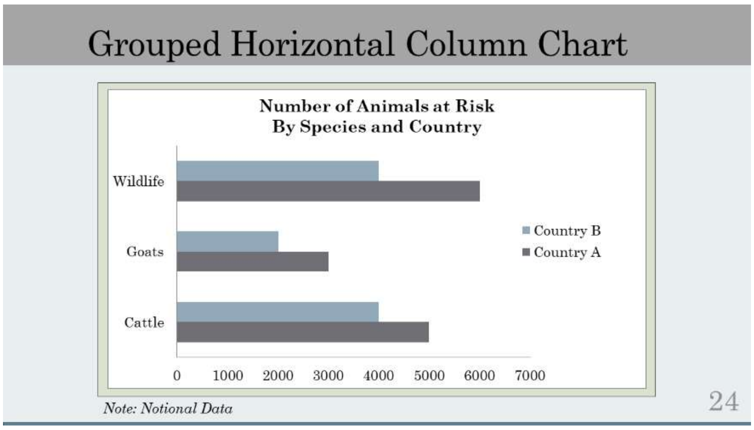


Lesson 6 – Display Data for Decision-Making, Slide 23

SCRIPT / KEY POINTS:
A grouped bar graph (grouped vertical column chart) shows the frequency of a qualitative variable, but the qualitative variable is divided into subcategories.

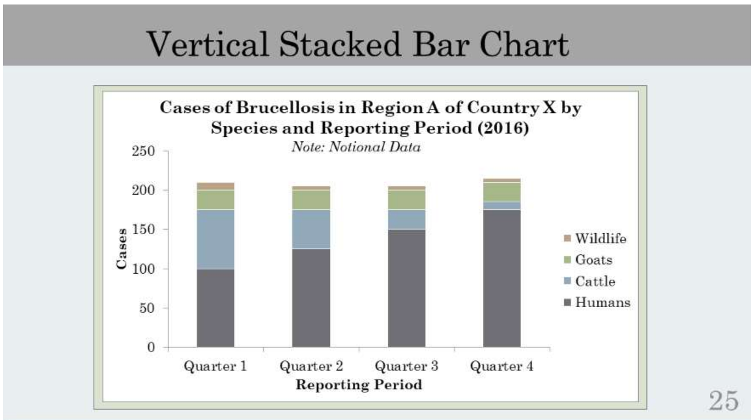
Here notice that species type is qualitative data. Therefore, the horizontal axis does not represent any scale, it is merely a placeholder for the species type. The vertical axis represents data on a continuous scale, but does not represent a second variable.

From this graph, we can deduce that Country A has more cattle, goats, and wildlife than Country B.



Lesson 6 –Display Data for Decision-Making, Slide 24

SCRIPT / KEY POINTS:
This is the same data as the previous graph. Instead the categorical variable is grouped on the vertical axis while the continuous variable is on the horizontal axis.

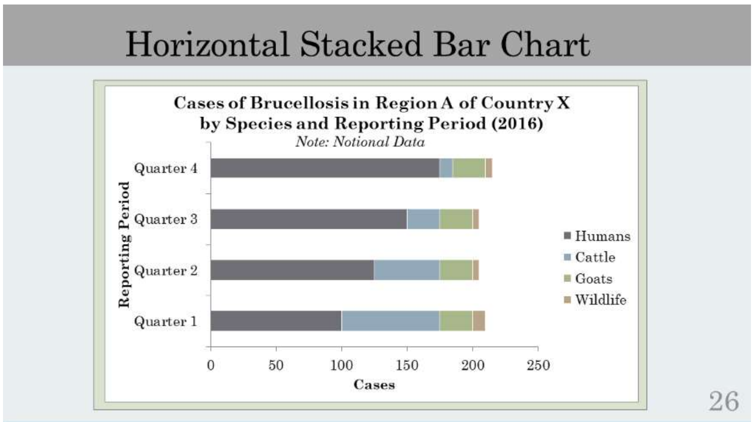


Lesson 6 – Display Data for Decision-Making, Slide 25

SCRIPT / KEY POINTS:
A stacked bar chart is used to show additional variables on bar. In this example, the bars have been stacked to indicate species. Notice a stacked bar chart can be difficult to interpret, except for the bottom component (cases).

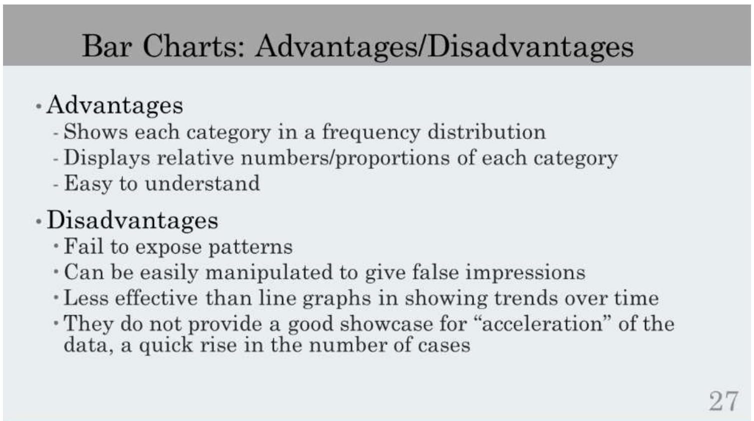
Because the other components (cattle, goats, and wildlife) do not rest on the baseline we have to do extra math to interpret the chart.
For each quarter, the total number of cases of Brucellosis was about 225. Of all cases, the human cases increased while cases in cattle decreased.

Horizontal and vertical bar graphs may exist in several forms. Double and group bar graphs, whether vertical or horizontal, are used to compare data about the same location or things. These graphs make it possible to compare several features at once. However, they can become puzzling if they contain too many sets of data.



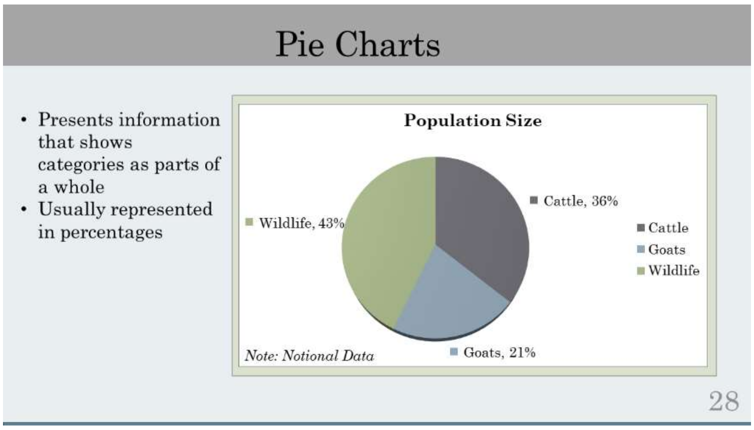
Lesson 6 – Display Data for Decision-Making, Slide 26

SCRIPT / KEY POINTS:
Same graph, just a different view in horizontal.



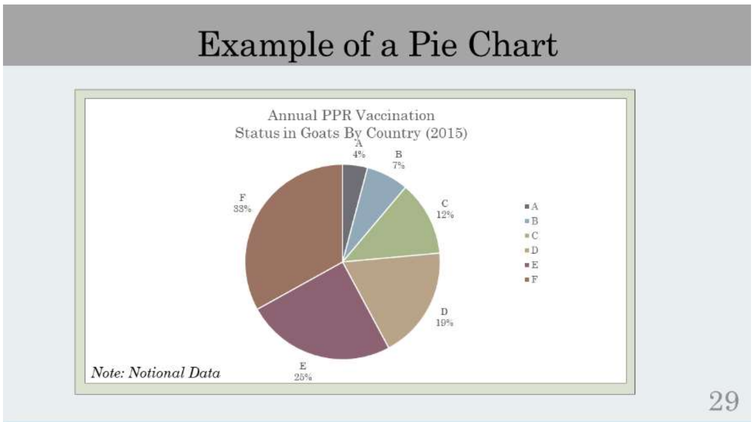
Lesson 6 – Display Data for Decision-Making, Slide 27

SCRIPT / KEY POINTS:
Bar charts show categories in a frequency distribution. They display relative numbers and proportions of each category. However, they do not showcase patterns or trends. They are not good to show a quick rise in the number of cases over time.



Lesson 6 – Display Data for Decision-Making, Slide 28

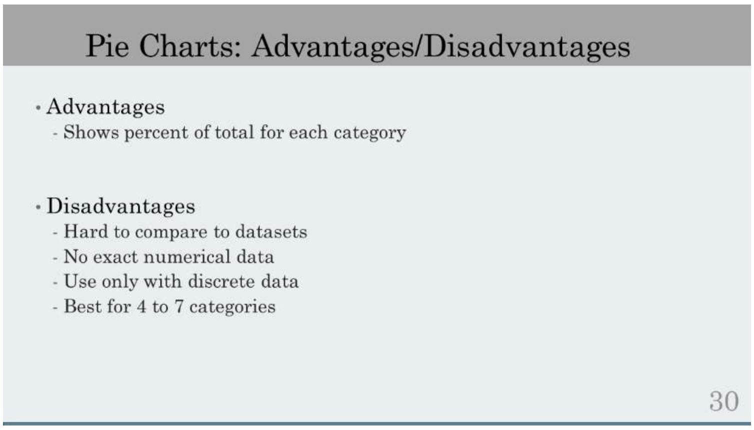
SCRIPT / KEY POINTS:
Another example of a pie chart with labels and percentages for each category



Lesson 6 – Display Data for Decision-Making, Slide 29

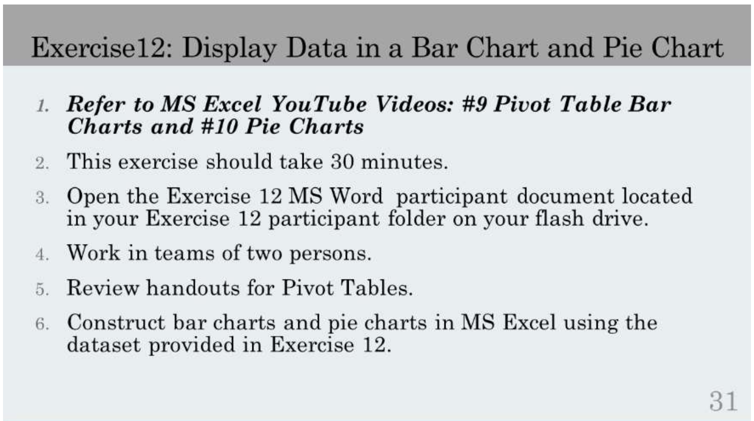
SCRIPT / KEY POINTS:
Pie charts are used to represent categorical data or values of variables. They are basically circles that are divided into segments or categories which reflect the proportion of the variables in relation to the whole. Percentages are used to compare the segments, with the whole being equal to 100%.

It is also recommended to write percentage and category labels next to each segment, so that users are not required to refer to the legend each time they want to identify a segment.



Lesson 6 – Display Data for Decision-Making, Slide 30

SCRIPT / KEY POINTS:
Pie charts show a percent of the total for each category. They can only be used with discrete data. It is best to use them with a small number of categories



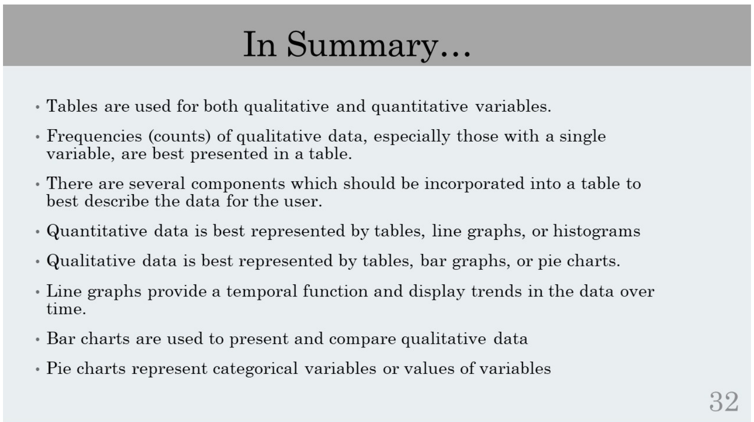
Lesson 6 – Display Data for Decision-Making, Slide 31

SCRIPT / KEY POINTS:
Exercise 12 instructions: Display Data Using a Bar Chart and Pie Chart

- This exercise should take 30 minutes.
- Open the Exercise 12 MS Word participant document located in your Exercise 12 participant folder on your flash drive.
- Work in teams of two persons.
- Review handout for Pivot Tables.
- Construct tables in MS Excel using the dataset provided in Exercise 12.

Instructors:

- See instructor manual for answers.
- ***Refer to MS Excel YouTube Videos: #9 Pivot Table Bar Charts and #10 Pie Charts***



Lesson 6 – Display Data for Decision-Making, Slide 32

SCRIPT / KEY POINTS:
In summary,

- Tables are used for both qualitative and quantitative variables.
- Frequencies (counts) of qualitative data, especially those with a single variable, are best presented in a table.
- There are several components which should be incorporated into a table to best describe the data for the user.
- Quantitative data is best represented by tables, line graphs, or histograms
- Qualitative data is best represented by tables, bar graphs, or pie charts.
- Line graphs provide a temporal function and display trends in the data over time.
- Bar charts are used to compare qualitative data.
- Pie charts represent categorical variables or values of variables.

Lesson 6 – Display Data for Decision-Making, Slide 33

SCRIPT / KEY POINTS:
Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

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Exercise 10 – Display Data in a Table

Description of Exercise:

Use the tables provided to construct an appropriate two-variable and multi-variable table of brucellosis and theileriosis (east coast fever) cases by species, local area, region, and test results. Should you have any questions over the exercise, please ask a trainer for clarification.

Allotted Time: 30 minutes

Exercise Components and Structure:

1. You have 30 minutes to complete this exercise.
2. Construct the following tables based on the data provided
    a. Two-variable table
    b. Multi-variable table

- Work in pairs for this exercise;
- Each pair should review the provided tables for brucellosis and theileriosis (east coast fever) field testing;
- Create the appropriate two-variable and multi-variable tables from the data table provided.
- Copy and paste the data tables from this exercise into an MS Excel worksheet.

Materials, Data or Information:

1. MS Word
2. MS Excel
3. Paper and pen

Expected Outputs and Deliverables of Each Participant:

1. Depict animal-place-time by creating tables using MS Excel.

Brucellosis Data

Village ID	Local area	Species	Total Animals	Total Blood Samples	Total Milk Samples	Card Test	Brucellosis confirmation	*Brucella* Strain Typed
1	Luwero	Goat	5	4	2	+	+	*B. Melitensis*
2	Luwero	Sheep	7	7	4	+	+	*B. Melitensis*
3	Luwero	Dairy Cattle	10	10	5	+	+	*B. abortus*
4	Luwero	Goat	15	15	10	+	+	*B. Melitensis*
5	Luwero	Goat	12	12	8	-	-	-----
6	Luwero	Sheep	10	10	6	+	+	*B. Melitensis*
7	Luwero	Sheep	5	4	3	+	+	*B. Melitensis*
8	Luwero	Beef Cattle	3	3	----	+	+	*B. Abortus*
9	Luwero	Dairy Cattle	9	6	4	+	+	*B. Melitensis*
10	Luwero	Dairy Cattle	6	5	4	+	+	*B. Melitensis*
11	Luwero	Goat	9	9	6	+	+	*B. Melitensis*
12	Luwero	Sheep	3	3	1	-	+	*B. Melitensis*
13	Luwero	Sheep	7	7	5	+	-	-----
14	Luwero	Goat	12	12	4	+	-	-----
15	Luwero	Goat	15	15	9	-	+	*B. Melitensis*
16	Kayunga	Goat	17	17	15	+	+	*B. Melitensis*
17	Kayunga	Dairy Cattle	9	9	6	+	+	*B. Abortus*
18	Kayunga	Dairy Cattle	4	4	2	+	+	*B. Melitensis*
19	Kayunga	Goat	3	3	----	+	+	*B. Melitensis*
20	Kayunga	Sheep	5	5	2	+	+	*B. Melitensis*
21	Kayunga	Dairy Cattle	7	7	4	+	+	*B. Melitensis*
22	Kayunga	Goat	15	15	10	+	+	*B. Melitensis*
23	Kayunga	Sheep	10	7	5	-	+	*B. Melitensis*
24	Kayunga	Sheep	10	7	5	+	+	*B. Melitensis*
25	Nakasake	Beef Cattle	5	4	----	+	+	*B. Abortus*
26	Nakasake	Beef Cattle	7	6	----	+	+	*B. Abortus*
27	Nakasake	Beef Cattle	3	3	----	+	+	*B. Abortus*
28	Nakasake	Beef Cattle	4	4	----	-	+	*B. Abortus*
29	Nakasake	Beef Cattle	5	4	----	-	-	-----
30	Nakasake	Beef Cattle	2	2	----	-	-	-----

Data Dictionary

Variable	Description	Variable Type	Coding
Village ID	Village number	Quantitative, Discrete	None
Local area	Name of local area where sample was collected	Qualitative, Nominal	1 = Luwero; 2= Kayunga; and 3 = Nakasake
Species	Species	Qualitative, Nomina1	1 = Goat; 2 = Sheep; 3 = Dairy Cattle; 4 = Beef Cattle
Total Animals	The total number of animals in the herd	Quantitative, Discrete	None
Total Blood Samples	The total number of blood samples collected	Quantitative, Discrete	None
Total Milk Samples	The total number of milk samples collected	Quantitative, Discrete	None
Card Test	A positive or negative reading of the brucellosis card test from field collection	Qualitative, Categorical	1 = +; 0 = -
Brucellosis Confirmation	Laboratory confirmation of a brucellosis positive case	Qualitative, Categorical	1 = +; 0 = -
Brucella Strain Typed	Laboratory confirmation of the *Brucella* strain typed	Qualitative, Nominal	1 = *B. Melitensis*; 2 = *B. Abortus*

1. Open a new MS Excel workbook and enter the above data into the spreadsheet.

Instructor Note: In the instructor spreadsheet there are eight worksheet tabs which correspond to each question. The brucellosis dataset and answer worksheet tabs are highlighted in green and the east coast fever dataset and answer worksheet tables are highlighted in peach. Each dataset has a highlighted column in yellow for new categories that participants should add to the dataset while working through the exercise. A separate PivotTable has been developed for each question for both the brucellosis and east coast fever datasets.

2. Using the sort and filter function in MS Excel, group total animals into the following categories. Insert a new variable in the spreadsheet titled operation size.

Category	Total Animals
1 – No animals	0
2 – Small operation	1-10
3 – Medium operation	11-20
4 – Large operation	>21

Instructor Note: Have each participant use the filter function in MS Excel for each of the variables.

3. Construct an appropriate table showing all confirmed cases of brucellosis by *Brucella* strain type. Copy and paste your table from MS Excel into this document.

Table 1. Number of Cases of Brucellosis by *Brucella sp.*

Brucella sp.	Number of Cases
B. Abortus	7
B. Melitensis	18
	25

Instructor Note: Participants should build their tables in Excel based on the table graphics provided in Lesson 3, but instructors should show participants how to use the PivotTable function in MS Excel to sort count data. A separate PivotTable should be developed by each participant for each question in the exercise. Review Q3 worksheet tab of Exercise 10 instructor spreadsheet for PivotTable.

4. Construct an appropriate table showing all confirmed cases of brucellosis stratified by operation type and local area. Copy and paste your table from MS Excel into this document.

Table 2. Cases of Brucellosis for Each Local area Stratified by Operation Size

Operation Size	Number of Cases: Kayunga	Luwero	Nagasake
No Animals	0	0	0
Small Operation (1-10 animals)	7	10	4
Medium Operation (11-20 animals)	2	2	0
Large Operation (>21 animals)	0	0	0
	9	12	0

Instructor Note: See Q5 worksheet tab of Exercise 10 instructor spreadsheet for PivotTable.

5. Construct and appropriate table showing the total number of animals sampled by blood stratified by species and local area. Copy and paste your table from MS Excel into this document.

Table 3. Total Blood Samples for Each Species Stratified by Local area

Species	Number of Blood Samples: Kayunga	Luwero	Nagasake
Dairy Cattle	3	3	0
Beef Cattle	0	1	6
Goat	3	6	0
Sheep	3	5	0
	9	15	6

Instructor Note: See Q5 worksheet tab of Exercise 10 instructor spreadsheet for PivotTable.

East Coast Fever (Theileriosis) Laboratory Submissions Dataset

Sample ID	Local area	Species	Gender	ECF[1] Positive Lab Confirmation
1	Dokolo	Cattle	Male	-
2	Dokolo	Cattle	Male	+
3	Dokolo	Cattle	Female	+
4	Dokolo	Cattle	Male	+
5	Dokolo	Cattle	Female	-
6	Dokolo	Cattle	Female	-
7	Dokolo	Cattle	Female	-
8	Kibuku	Cattle	Female	-
9	Kibuku	Cattle	Male	-
10	Kibuku	Cattle	Female	-
11	Kibuku	Cattle	Male	-
12	Kiruhura	Cattle	Female	-
13	Kiruhura	Cattle	Male	+
14	Kiruhura	Cattle	Male	-
15	Kiruhura	Cattle	Female	+
16	Kiruhura	Cattle	Male	+
17	Kiruhura	Cattle	Female	+
18	Kiruhura	Cattle	Female	+
19	Kiruhura	Cattle	Female	-
20	Budaka	Cattle	Male	+
21	Budaka	Cattle	Female	+
22	Budaka	Cattle	Female	+
23	Luwero	Cattle	Male	+
24	Luwero	Cattle	Female	+
25	Luwero	Cattle	Male	-
26	Luwero	Cattle	Female	+
27	Budaka	Cattle	Female	+
28	Isingiro	Cattle	Male	+
29	Isingiro	Cattle	Male	+
30	Isingiro	Cattle	Male	+
31	Luwero	Cattle	Female	+
32	Luwero	Cattle	Male	-
33	Luwero	Cattle	Female	-
34	Luwero	Cattle	Female	-
35	Luwero	Cattle	Female	+
36	Luwero	Cattle	Male	+
37	Luwero	Cattle	Female	+
38	Amolatar	Cattle	Female	+
39	Amolatar	Cattle	Male	+
40	Amolatar	Cattle	Male	+
41	Amolatar	Cattle	Female	+
42	Amolatar	Cattle	Male	+

[1] = ECF (East Coast Fever)

Data Dictionary

Variable	Description	Variable Type	Coding
Sample ID	Sample number	Quantitative, Discrete	None
Local area	Name of local area where sample was collected	Qualitative, Nominal	1 = Dokolo; 2= Kibuku; and 3 = Kiruhura; 4 = Budaka; 5 = Luwero; 6 = Isingiro; 7 = Amolatar
Species	Species	Qualitative, Nominal	1 = Cattle
Gender	The gender of the species	Quantitative, Discrete	1 = Male; 2 = Female
ECF Positive Lab Confirmation	Laboratory confirmation of east coast fever	Qualitative, Nominal	None

6. Open a new worksheet in your MS Excel Workbook and enter the above East Coast Fever Data.

7. Using the sort and filter function in MS Excel, group local area into the following categories.

Category	Local area
1 – Northern region	Amolatar and Dokolo
2 – Central region	Luwero and Nakasongola
3 – Western region	Kiruhura and Isingiro
4 – Eastern region	Budaka and Kibuku

Instructor Note: Have each participant use the filter function in MS Excel for each of the variables.

8. Construct an appropriate table showing cases of East Coast Fever (Theileriosis) by gender. Copy and paste your table from MS Excel into this document.

Table 4. Number of Cases of East Coast Fever by Gender

Gender	Number of Cases
Female	14
Male	13
	27

Instructor Note: See Q8 worksheet tab of Exercise 10 instructor spreadsheet for PivotTable.

9. Construct an appropriate table showing cases of East Coast Fever (Theileriosis) by region. Copy and paste your table from MS Excel into this document.

Table 5. Number of Cases of East Coast Fever by Region

Region	Number of Cases
Northern Region	8
Central Region	7
Western Region	8
Eastern Region	4
	27

Instructor Note: See Q9 worksheet tab of Exercise 10 instructor spreadsheet for PivotTable.

Exercise 11 – Display Data Using a Line Graph

Description of Exercise:

Use the tables provided to construct line graphs from cases of brucellosis and theileriosis (east coast fever) in a quarterly fashion and over a ten-year period. Should you have any questions over the exercise, please ask a trainer for clarification.

Allotted Time: 45 minutes

Exercise Components and Structure:

1. You have 45 minutes to complete this exercise.
2. Work in pairs of two for this exercise.
3. Each pair should review the provided tables for brucellosis and east coast fever field testing and create the appropriate line graphs from the data table provided.
4. Manipulate data to calculate prevalence and prepare data for graphical display.

5. Construct the line graph based on the data provided using MS Excel graphing function.
    a. Line graph (prevalence of brucellosis stratified by species over 7 quarters)
    b. Line graph (theileriosis (east coast fever) cases over a 10-year period) in several local areas

6. Construct the line graph based on the data provided using MS Excel PivotTable function.
    a. Line graph prevalence of brucellosis stratified by species over 7 quarters
    b. Line graph theileriosis (east coast fever) cases over a 10-year period

Materials, Data or Information:

1. MS Word
2. MS Excel
3. Paper and pen

Expected Outputs and Deliverables of Each Participant:

1. Depict animal-place-time by creating line graphs using MS Excel.

Brucellosis Cases in Luwero Local area (January 2017 – September 2018) for Dairy Cattle, Sheep, and Goats

2017									
Month	Dairy Cattle			Sheep			Goats		
	Total Cases	Total Population (Herds)	Prevalence (%)	Total Cases	Total Population (Herds)	Prevalence (%)	Total Cases	Total Population (Herds)	Prevalence (%)
January	25	1000		50	1000		60	1000	
February	35	1000		65	1000		85	1000	
March	22	1000		55	1000		65	1000	
April	10	1000		45	1000		75	1000	
May	45	1000		25	1000		65	1000	
June	30	1000		25	1000		65	1000	
July	25	1000		45	1000		80	1000	
August	45	1000		35	1000		80	1000	
September	40	1000		33	1000		80	1000	
October	37	1000		30	1000		80	1000	
November	35	1000		25	1000		75	1000	
December	29	1000		24	1000		50	1000	
2018									
Month	Dairy Cattle			Sheep			Goats		
	Total Cases	Total Population (Herds)	Prevalence (%)	Total Cases	Total Population (Herds)	Prevalence (%)	Total Cases	Total Population (Herds)	Prevalence (%)
January	25	1000		18	1000		45	1000	
February	23	1000		15	1000		35	1000	
March	20	1000		10	1000		33	1000	
April	15	1000		5	1000		30	1000	
May	18	1000		2	1000		22	1000	
June	11	1000		1	1000		20	1000	
July	5	1000		0	1000		10	1000	
August	2	1000		0	1000		7	1000	
September	0	1000		0	1000		7	1000	
October	----	----	----	----	----	----	----	----	----
November	----	----	----	----	----	----	----	----	----
December	----	----	----	----	----	----	----	----	----

Data Dictionary

Variable	Description	Variable Type	Coding
Year	Year sample collected	Quantitative, Discrete	None
Month	Month sample collected	Qualitative, Nominal	1 = January; 2 = February; 3 = March; 4 = April; 5 = May; 6 = June; 7 = July; 8 = August; 9 = September; 10 = October; 11 = November; 12 = December
Species	Species	Qualitative, Nominal	1 = Dairy Cattle; 2 = Sheep; 3 = Goats
Total Cases	Total cases positive	Quantitative, Discrete	None
Total Population (Herds)	Total population in herd	Quantitative, Discrete	None
Prevalence	Prevalence	Quantitative, Continuous	None

1. Open a MS Excel Workbook and enter in the aforementioned data into the spreadsheet.

Instructor Note: In the instructor spreadsheet there are eight worksheet tabs which correspond to each question. The brucellosis dataset and answer worksheet tabs are highlighted in green and the east coast fever dataset and answer worksheet tables are highlighted in peach. Each dataset has a highlighted column in yellow for new categories that participants should add to the dataset or conduct calculations on while working through the exercise. A separate PivotTable and corresponding line graph has been developed for each question for both the brucellosis and east coast fever datasets.

2. Conduct data manipulation and insert columns to where you six variables across the top row with the necessary data from the above tables in each column by variable. Identify those six variables.

    a. Year
    b. Month
    c. Species
    d. Total Cases
    e. Total Population
    f. Prevalence

3. In your spreadsheet, calculate the prevalence of cases for each species by month. Prevalence should be showcased as a percentage in the spreadsheet.

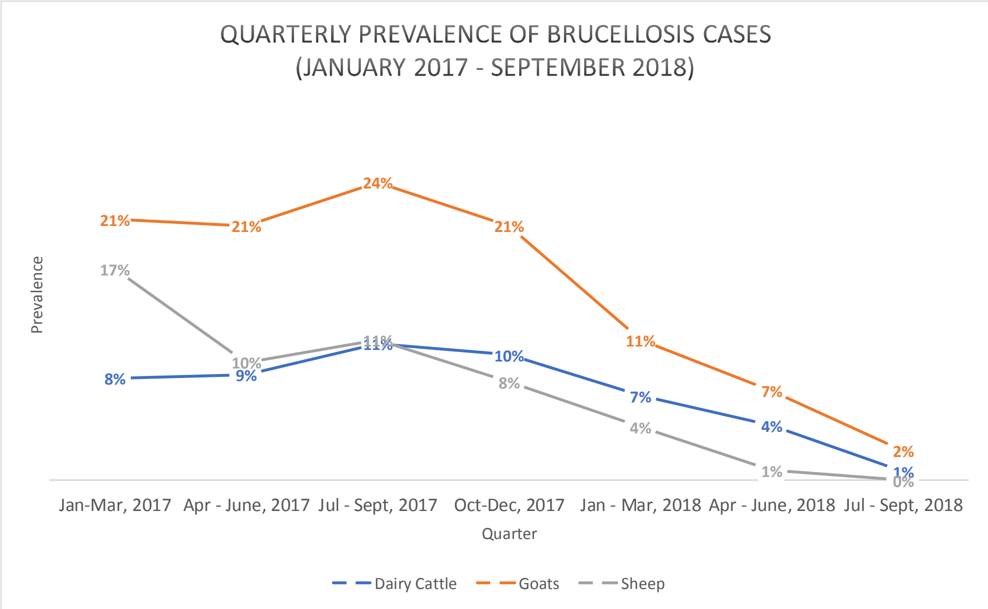
2017 and 2018 Prevalence by Species						
	Dairy Cattle		Sheep		Goats	
	2017	2018	2017	2018	2017	2018
January	3%	3%	5%	2%	6%	5%
February	4%	2%	7%	2%	9%	4%
March	2%	2%	6%	1%	7%	3%
April	1%	2%	5%	1%	8%	3%
May	5%	2%	3%	0%	7%	2%
June	3%	1%	3%	0%	7%	2%
July	3%	1%	5%	0%	8%	1%
August	5%	0%	4%	0%	8%	1%
September	4%	0%	3%	0%	8%	1%
October	4%	-----	3%	-----	8%	-----
November	4%	-----	3%	-----	8%	-----
December	3%	-----	2%	-----	5%	-----

4. In Excel, add a new variable to your spreadsheet. Use the sort and filter function to code the new “Quarter Variables” by the following numbers.

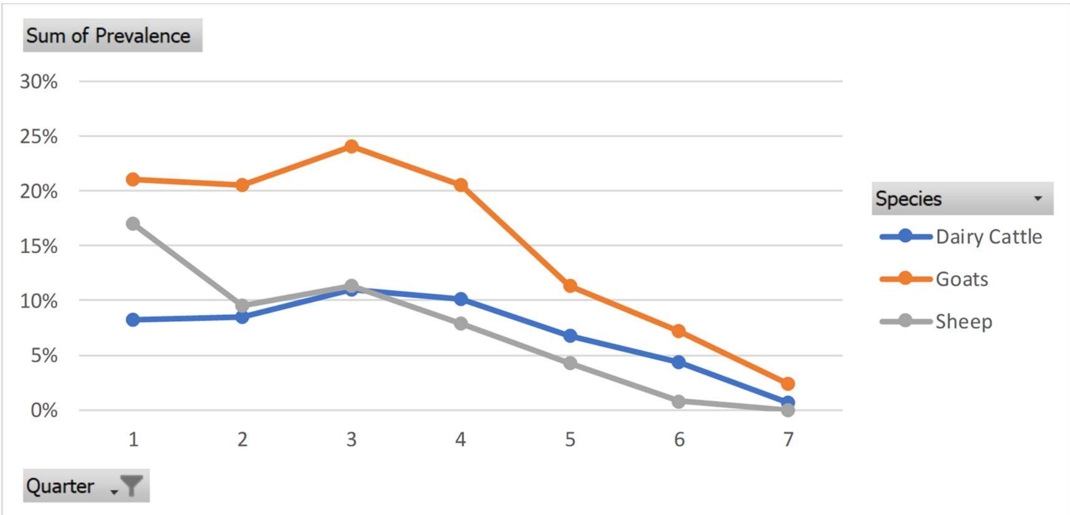
Variable Code Category	
1 – Quarter 1	January – March, 2017
2 – Quarter 2	April – June, 2017
3– Quarter 3	July – September, 2017
4– Quarter 4	October – December, 2017
5– Quarter 5	January – March, 2018
6– Quarter 6	April – June, 2018
7– Quarter 7	July – September 2018

5. Construct a line graph which demonstrates the prevalence of brucellosis stratified by species over a seven-quarter period. Title the graph “Quarterly Prevalence of Brucellosis Cases (January 2017 – September 2018)”. The x axis should be labeled “Prevalence” and the y axis should be labeled “Cases”. Copy and paste your answer into this document.

a) *Use the MS Excel line graph function to develop this.*



b) *Use the MS Excel PivotTable function to develop this. Refer to Pivot Table handout for how to use this function in Excel.*



Cases of Theileriosis (East Coast Fever) from 2008-2017

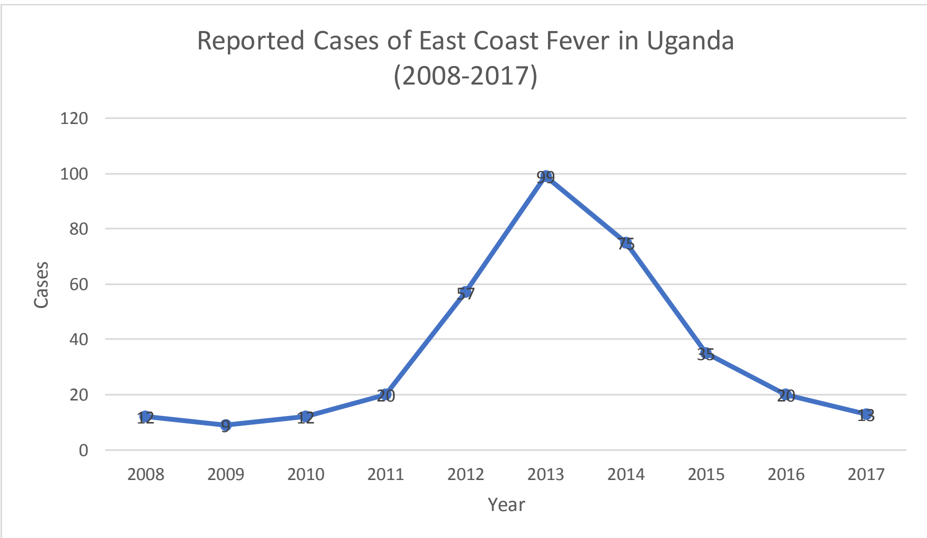
Region	Local area	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Northern	Amolatar	0	0	0	0	0	20	15	5	2	0
Northern	Dokolo	0	0	0	0	10	15	12	7	3	1
Central	Luwero	0	0	0	5	10	7	0	0	0	3
Central	Nakasongola	0	0	3	5	15	20	10	5	2	1
Eastern	Budaka	5	4	4	5	12	15	13	4	4	4
Eastern	Kibuku	7	5	5	5	10	22	7	6	6	3
Western	Kiruhuna	0	0	0	0	0	0	10	5	2	0
Western	Isingiro	0	0	0	0	0	0	8	3	1	1

6. Click on a new Excel worksheet in your MS Excel workbook and enter in the above data into the spreadsheet.

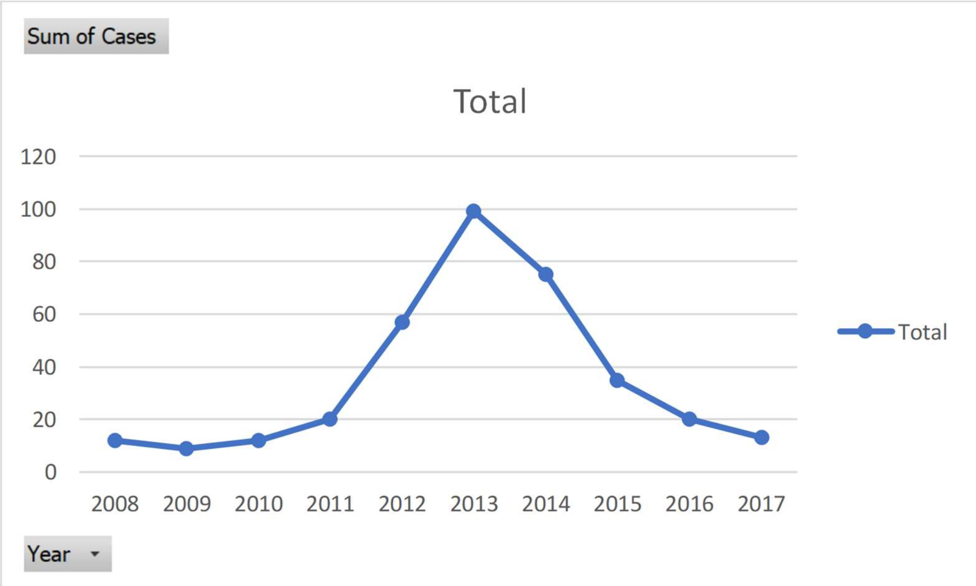
Instructor notes: Based on the above data, participants will have to develop 4 new variables to obtain the correct line graph. These variables include: Region, Local area, Year, and Cases. Participants will have to transpose their count data from a horizontal presentation to a vertical presentation. Instructors will need to show participants where the transpose function is in MS Excel. The highlighted transposed data can be found in Q6 of the Line Graphs Instructor Excel Spreadsheet.

7. Construct a line graph which demonstrates the cases of Theileriosis (East Coast Fever) across all regions over a 10-year period. Title the graph "Reported Cases of East Coast Fever in Uganda (2008 – 2017)". The x axis should be labeled "Year" and the y axis should be labeled "Cases" Copy and paste your answer into this document.

a.) Use the MS Excel line graph function to develop this.



b.) *Use the MS Excel PivotTable function to develop this.*


Sum of Cases
Total
120
100
80
60
40
20
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Total
Year

Exercise 12 – Display Data Using a Bar Chart and Pie Chart

Description of Exercise:

Based on the information provided in each of the following tables, use the following exercise to develop and display a bar chart and pie chart. Should you have any questions over the exercise, please ask a trainer for clarification.

Allotted Time: 30 minutes

Exercise Components and Structure:

- You have 30 minutes to complete this exercise
- Work in pairs for this exercise;
- Each pair should review the provided tables for brucellosis and east coast fever field testing;
- Create the appropriate bar graphs and pie charts from the data table provided.
- Copy and paste the line graphs from this exercise into an MS Excel worksheet.

Materials, Data or Information:

1. MS Word
2. MS Excel
3. Paper and pen

Expected Outputs and Deliverables of Each Participant:

1. Depict animal-place-time by creating bar and pie charts using MS Excel.

Brucellosis Data

Dairy Cattle									
Sample ID	**Local area**	**Region**	**Country**	**Year**	**Rose Bengal**	**ELISA**	**Brucellosis Confirmed**	**Farmer Consumes Raw Milk**	**Farmer Boils Raw Milk**
1	Luwero	Central	Uganda	2016	+	+	+	+	-
2	Luwero	Central	Uganda	2016	-	+	+	+	-
3	Luwero	Central	Uganda	2016	+	+	+	+	-
4	Isingiro	Western	Uganda	2016	+	+	+	+	-
5	Marsabit	Eastern	Kenya	2016	-	-	-	-	+
6	Marsabit	Eastern	Kenya	2016	+	+	+	+	-
7	Nyeri	Central	Kenya	2016	+	+	+	+	-
8	Nyeri	Central	Kenya	2016	+	+	+	+	+
9	Chifra	Afar	Ethiopia	2016	-	+	+	+	-
10	Chifra	Afar	Ethiopia	2016	-	+	+	-	-
11	Dubti	Afar	Ethiopia	2016	-	+	+	-	-
12	Banja	Amahara	Ethiopia	2016	-	-	-	-	+
13	Longido	Arusha	Tanzania	2016	+	+	+	+	-
14	Longido	Arusha	Tanzania	2016	+	+	+	+	-
15	Longido	Arusha	Tanzania	2016	+	+	+	+	+
16	Luwero	Central	Uganda	2017	+	+	+	+	+
17	Luwero	Central	Uganda	2017	+	+	+	+	-
18	Isingiro	Western	Uganda	2017	+	+	+	+	-
19	Meru	Eastern	Kenya	2017	+	+	+	-	-
20	Meru	Eastern	Kenya	2017	-	+	+	-	-
21	Meru	Eastern	Kenya	2017	+	+	+	+	-
22	Nyeri	Central	Kenya	2017	+	+	+	+	-
23	Nyeri	Central	Kenya	2017	+	+	+	+	-
24	Nyeri	Central	Kenya	2017	+	+	+	+	+
25	Banja	Amahara	Ethiopia	2017	+	+	+	+	+
26	Banja	Amahara	Ethiopia	2017	+	+	+	+	+
27	Longido	Arusha	Tanzania	2017	+	+	+	-	-
28	Longido	Arusha	Tanzania	2017	+	+	+	+	+
29	Longido	Arusha	Tanzania	2017	+	+	+	+	+

Brucellosis Data Continued

Goats									
Sample ID	**Local area**	**Region**	**Region**	**Year**	**Rose Bengal**	**ELISA**	**Brucellosis Confirmed**	**Farmer Consumes Raw Milk**	**Farmer Boils Raw Milk**
30	Isingiro	Western	Uganda	2016	+	+	+	+	-
31	Isingiro	Western	Uganda	2016	-	+	+	+	-
32	Marsabit	Eastern	Kenya	2016	+	+	+	+	-
33	Nyeri	Central	Kenya	2016	+	+	+	+	-
34	Nyeri	Central	Kenya	2016	-	-	-	-	+
35	Nyeri	Central	Kenya	2016	+	+	+	+	-
36	Marsabit	Eastern	Kenya	2016	+	+	+	+	-
37	Marsabit	Eastern	Kenya	2016	+	+	+	+	+
38	Dubti	Afar	Ethiopia	2016	-	+	+	+	-
39	Dubti	Afar	Ethiopia	2016	-	+	+	-	-
40	Dubti	Afar	Ethiopia	2016	-	+	+	-	-
41	Karatu	Arusha	Tanzania	2016	-	-	-	-	+
42	Karatu	Arusha	Tanzania	2016	+	+	+	+	-
43	Karatu	Arusha	Tanzania	2016	+	+	+	+	-
44	Karatu	Arusha	Tanzania	2016	+	+	+	+	+
45	Luwero	Central	Uganda	2017	+	+	+	+	+
46	Luwero	Central	Uganda	2017	+	+	+	+	-
47	Luwero	Central	Uganda	2017	+	+	+	+	-
48	Marsabit	Eastern	Kenya	2017	+	+	+	-	-
49	Marsabit	Eastern	Kenya	2017	-	+	+	-	-
50	Marsabit	Eastern	Kenya	2017	+	+	+	+	-
51	Nyeri	Central	Kenya	2017	+	+	+	+	-
52	Nyeri	Central	Kenya	2017	+	+	+	+	-
53	Nyeri	Central	Kenya	2017	+	+	+	+	+
54	Karatu	Arusha	Tanzania	2017	+	+	+	+	+
55	Dubti	Afar	Ethiopia	2017	+	+	+	+	+
56	Dubti	Afar	Ethiopia	2017	+	+	+	-	-
57	Dubti	Afar	Ethiopia	2017	+	+	+	+	+
58	Karatu	Arusha	Tanzania	2017	+	+	+	+	+

Data Dictionary

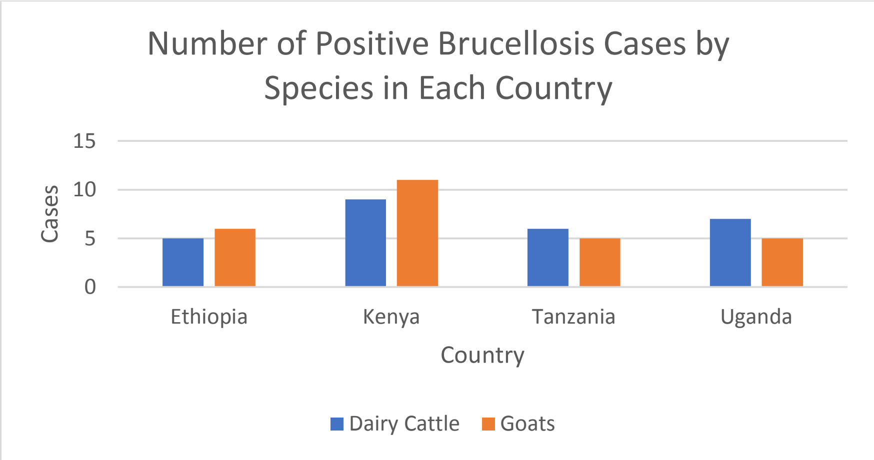
Variable	Description	Variable Type	Coding
Sample ID	Sample ID number	Quantitative, Discrete	None
Local area	Local area sample collected in	Qualitative, Nominal	1 = Luwero; 2 = Isingiro; 3 = Marsabit; 4 = Nyeri; 5 = Chifra; 6 = Banja; 7 = Longido; 8 = Marsabit; 9 = Dubti; 10 = Karatu
Region	Region local area is located in	Qualitative, Nominal	1 = Central; 2 = Eastern; 3 = Afar; 4: Amahara; 5: Arusha
Year	Year	Quantitative, Discrete	1 = +; 0 = -
Rose Bengal	Positive Pose Bengal test	Qualitative, Binary	1 = +; 0 = -
ELISA	Positive ELISA test	Qualitative, Binary	1 = +; 0 = -
Confirmed Brucellosis	Confirmed Brucellosis positive	Qualitative, Binary	1 = +; 0 = -
Farmer Consumes Raw Milk	Farmer consumes raw milk from herd	Qualitative, Binary	1 = +; 0 = -
Farmer Boils Raw Milk	Farmer boils raw milk collected from herd	Qualitative, Binary	1 = +; 0 = -

1. Open a MS Excel Workbook and enter in the above data into the spreadsheet.

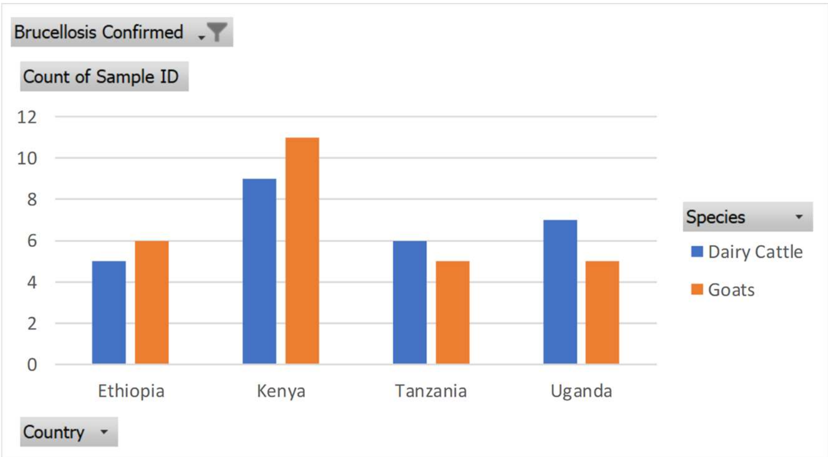
Instructor Note: In the instructor spreadsheet there are eight worksheet tabs which correspond to each question. The brucellosis dataset and answer worksheet tabs are highlighted in green and the east coast fever dataset and answer worksheet tables are highlighted in peach. Each dataset has a highlighted column in yellow for new categories that participants should add to the dataset or conduct calculations on while working through the exercise. A separate pivot table and corresponding bar graph has been developed for each question for both the brucellosis and east coast fever datasets.

2. Develop a bar graph to display the relationship of Species to the number of cases of diagnosed brucellosis through confirmatory testing stratified by country. Show countries separately from each other. Title the graph "Number of Positive Brucellosis Cases by Species in each Country" The X axis should be titled " Country" and the Y axis should be titled "Cases" The legend should include each species.

a. *Use the MS Excel bar graph function to develop this.*

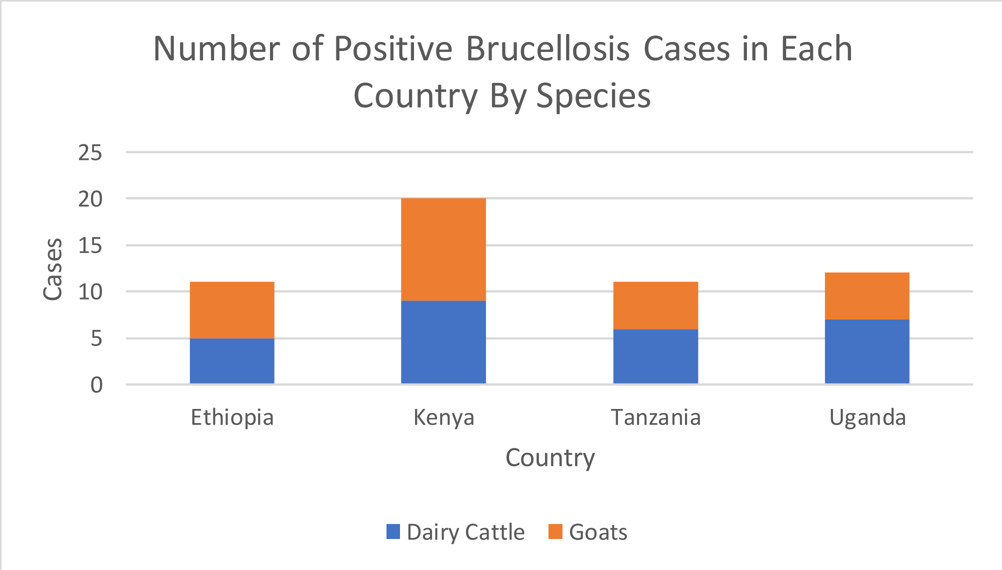


b. *Use the MS Excel PivotTable function to develop this.*

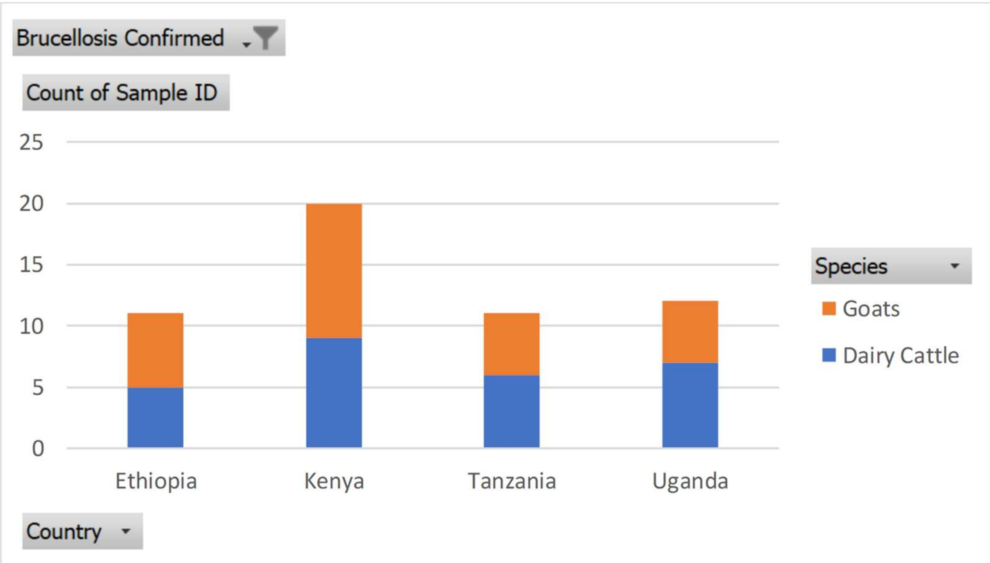


3. Develop a bar graph to display the relationship of Species to the number of cases of diagnosed brucellosis through confirmatory testing stratified by country. Show countries separately from each other. Title the graph "Number of Positive Brucellosis Cases by Species in each Country" The X axis should be titled " Country" and the Y axis should be titled "Cases" The legend should include each species.

a. *Use the MS Excel stacked bar graph function to develop this.*

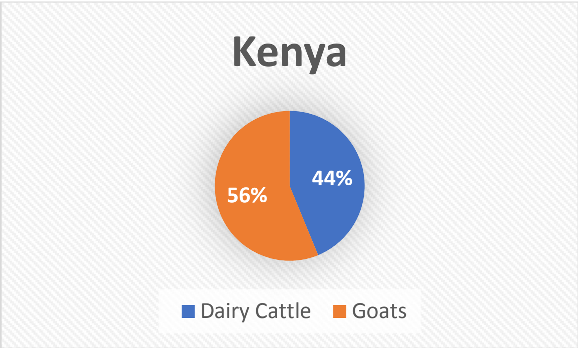


b. *Use the MS Excel PivotTable function to develop this.*

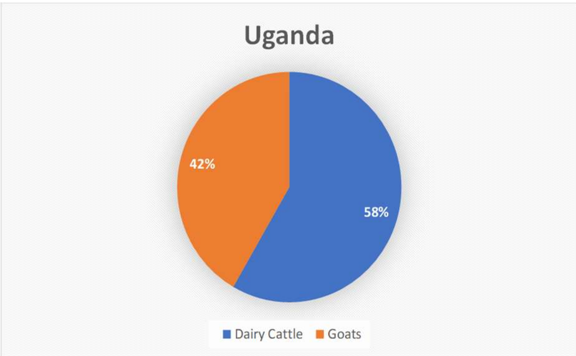


4. Develop a pie graph that shows the percentage of farmers who consumed raw milk from all herds that were brucellosis positive by species for each country.

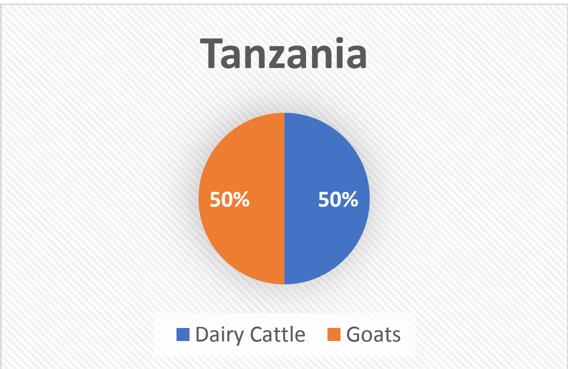
   a. Kenya:



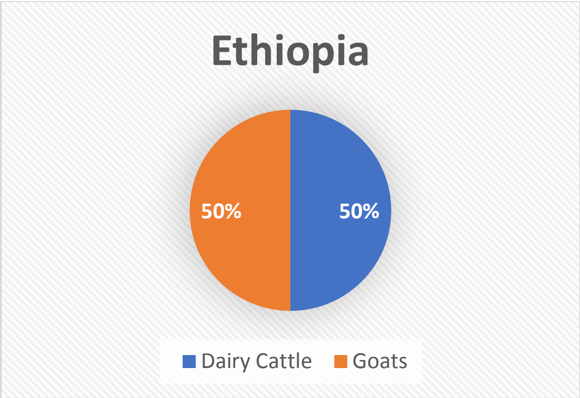
   b. Uganda:



   c. Tanzania:



   d. Ethiopia:


Ethiopia
50%
50%
Dairy Cattle
Goats

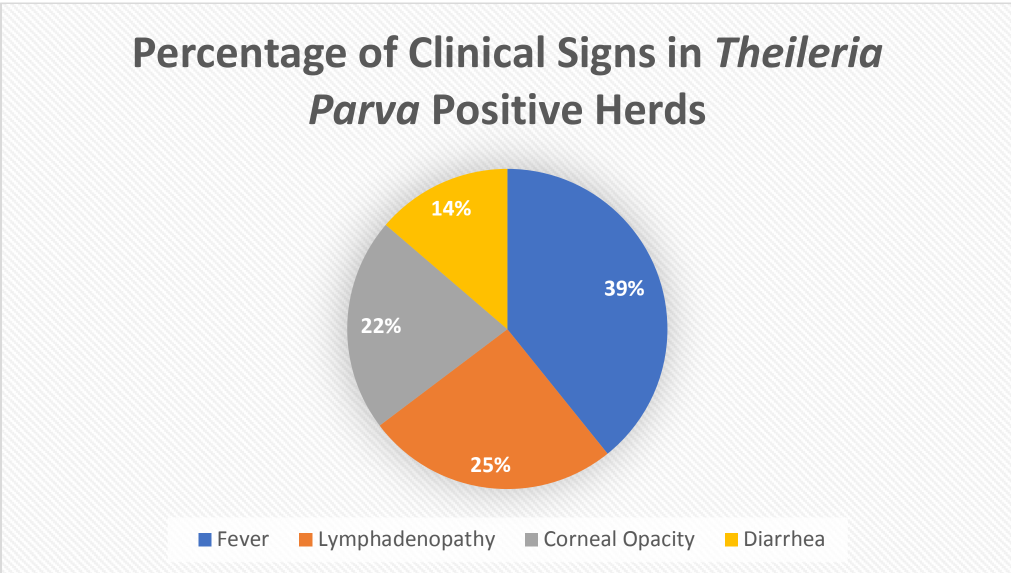
Theileriosis (East Coast Fever) Data

Herd ID	Fever	Lymphadenopathy	Corneal Opacity	Diarrhoea	*Theileria parva sp.* Positive
1	+	+	+	-	+
2	-	-	+	-	-
3	+	-	+	-	+
4	+	-	+	-	+
5	+	-	+	-	+
6	+	+	+	-	+
7	+	+	+	-	+
8	+	+	+	-	+
9	-	+	+	-	-
10	+	+	+	-	+
11	+	+	-	-	+
12	+	+	-	-	+
13	+	+	-	-	+
14	+	+	-	-	+
15	+	-	-	-	+
16	+	-	-	+	+
17	+	-	-	+	+
18	+	+	-	+	+
19	+	+	-	-	-
20	-	+	-	-	-
21	+	+	-	-	-
22	+	-	-	-	-
23	+	-	-	-	-
24	-	+	-	-	-
25	+	+	-	+	-
26	+	-	-	+	+
27	-	-	-	+	-
28	+	+	+	+	+
29	+	+	+	+	+
30	+	+	+	+	+

Data Dictionary

Variable	Description	Variable Type	Coding
Herd ID	Herd ID number	Quantitative, Discrete	None
Fever	Local area sample collected in	Qualitative, Binary	1 = +; 0 = -
Lymphadenopathy	Region local area is located in	Qualitative, Binary	1 = +; 0 = -
Corneal Opacity	Year	Quantitative, Discrete	1 = +; 0 = -
Diarrhoea	Positive Pose Bengal test	Qualitative, Binary	1 = +; 0 = -
Theirleria parva sp. positive	Positive ELISA test	Qualitative, Binary	1 = +; 0 = -

5. Develop a pie graph that shows the percentage of clinical signs (i.e., fever, lymphadenopathy, corneal opacity and diarrhea) which were in *theileria parva* positive herds.



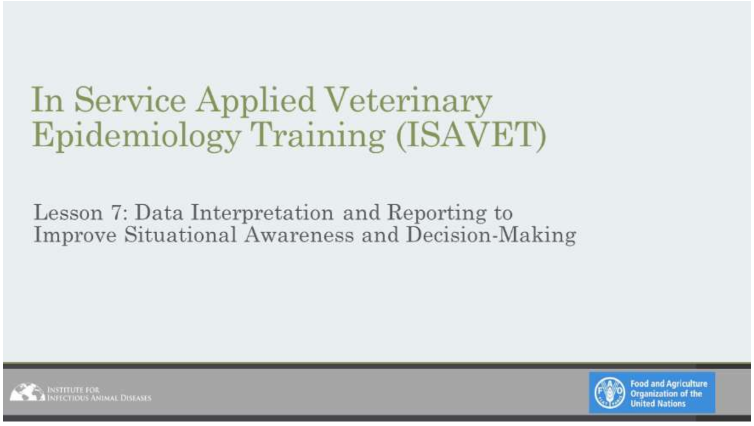
Case Study 1: PPR

Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making

Estimated Lesson and Exercise Time	2 hours
Instructor Materials	Frontline ISAVET Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making.pptx
	Frontline ISAVET Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making Instructor Guide.doc
	Computer
	Microsoft Word and Excel
Participant Materials	Frontline ISAVET Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making Participant Guide.PDF

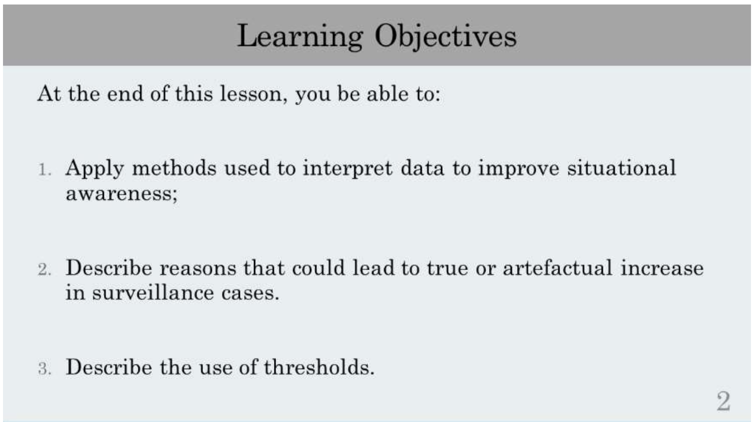
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

FAO	Food and Agriculture Organisation of the United Nations
ISAVET	In Service Applied Veterinary Epidemiology Training



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making,
Slide 1

SCRIPT / KEY POINTS:
Welcome to Lesson 7 titled, "Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making".



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making,
Slide 2

SCRIPT / KEY POINTS:
In this lesson, we will:

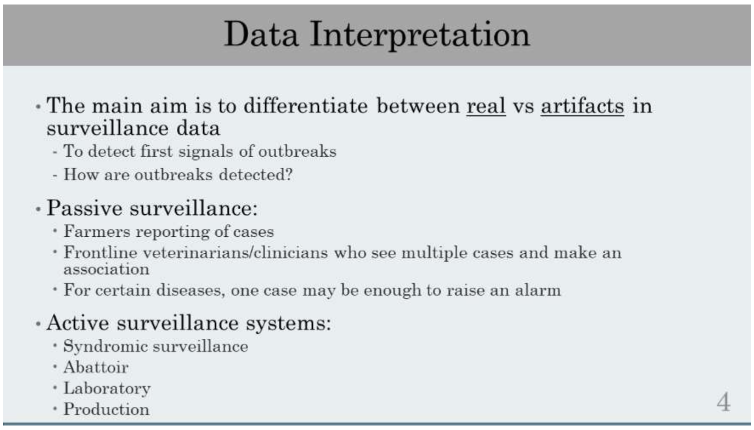
- Apply methods used to interpret data to improve situational awareness;
- Describe signals and thresholds, and how they are used to make recommendations for action; and
- Describe the challenges in interpreting thresholds and making recommendations.

Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 3

SCRIPT / KEY POINTS:
Surveillance is a cyclical process that is iterative and ongoing. The circular line connecting each part of the surveillance cycle is representative of communication and coordination required to maintain the effective flow of surveillance data.
Let's consider each component of the surveillance cycle:

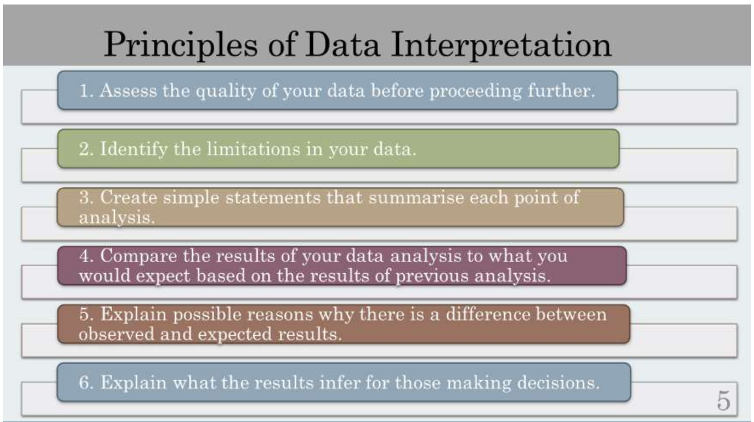
1. **Detect disease:** Farmers, animal owners, veterinarians, animal health workers, abattoir workers as well as animal traders and marketers are the first to recognise changes from normal in either live or dead animals. Syndromic disease detection and laboratory confirmation are important to establish a disease diagnosis. Each of these players may notice clinical signs and post-mortem signs of disease depending on their previous training or experience. They may also recognise that animal milk, meat and egg production has declined and may suspect that subclinical disease could be present (examples include: mastitis, immune suppressive diseases of animals).
2. **Report disease and collect data:** Suspicion of disease needs to be reported for further action to be taken to prevent and control animal diseases. Data must be collected immediately from the primary caretaker of the animals in order to understand the event in question. Data is only useful if it is reflects true events. It must be of high quality and protected so that is can be used and shared further. The data that is collected must describe Animal-Place-Time characteristics of the affected population in order to be useful for disease prevention and control.
3. **Analyse and interpret data:** The data that is collected is first assessed and cleaned to ensure that it is of high quality for further analysis and use. Measures of central tendency and disease occurrence are analysed to describe the disease or production event. Data is then interpreted to explain the meaning of each finding of the analysis.
4. **Take action:** The explanation provided by the results of the data analysis informs the required action to be taken to prevent and control the disease. Remember, without action, the surveillance system is really a monitoring system. Action includes coordination, risk communication and risk mitigation to prevent and control the animal disease.

5. **Evaluate to improve:** Targets for improvement include the: 1) quality of the data; 2) function of the surveillance system; and 3) detection and response for animal diseases.



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 4

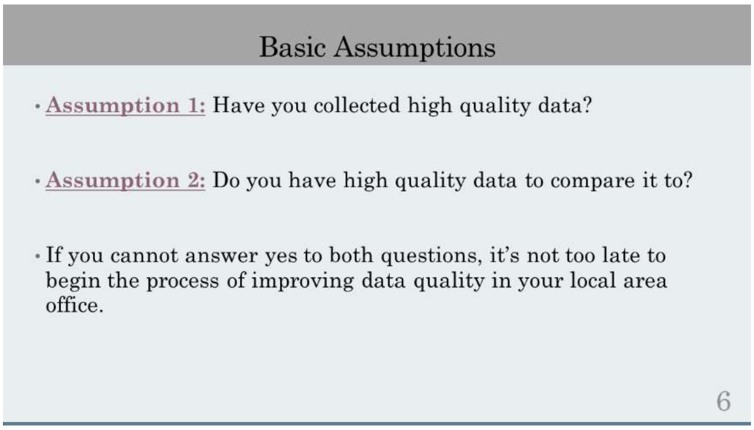
SCRIPT / KEY POINTS:
When working with surveillance data, the main aim is to detect signals from the data to determine if a true outbreak is occurring. Outbreaks are generally detected from passive surveillance, but aggregated active surveillance data also contributes.



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 5

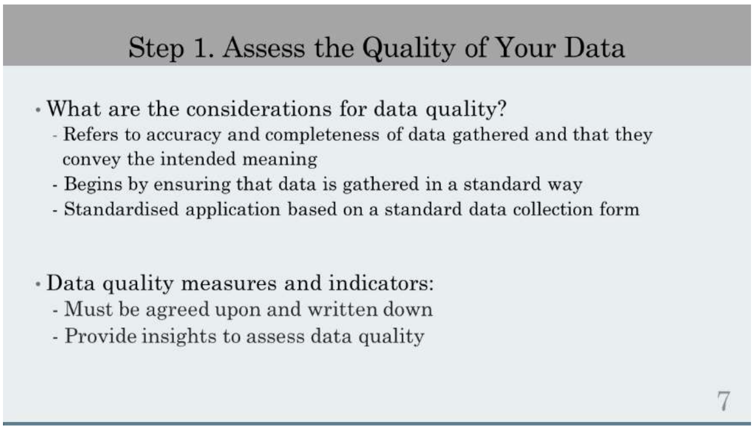
SCRIPT / KEY POINTS:
Once you have analysed and displayed the data, the next step is to make sense of what the data means in simple and clear language that anyone can understand.
Here are some simple principles to follow in order to correctly interpret your data:

1. Assess the quality of your data before proceeding further.
2. Identify the limitations in your data.
3. Create simple statements that summarise each point of analysis.
4. Compare the results of your data analysis to what you would expect based on the results of your previous analysis.
5. If your data is different from what you would have expected based on previous results, explain possible reasons why the difference may be occurring (i.e., Is this truly a disease event?)
6. Explain possible implications for those making decisions based on this data.



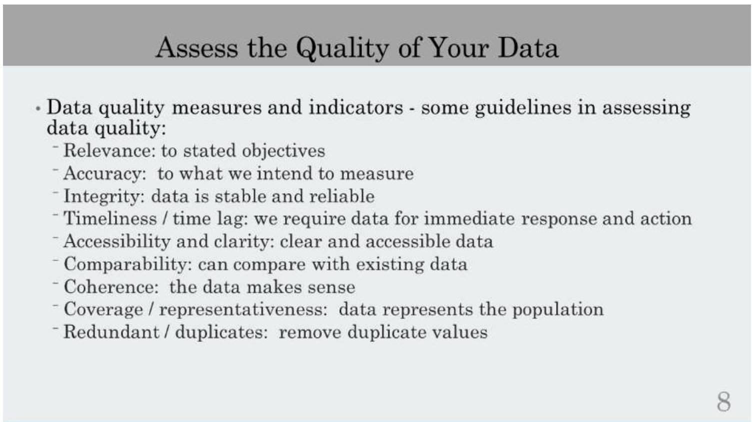
Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 6

SCRIPT / KEY POINTS:
Decision-making relies upon high quality data. You need to assess this before you are able to make decisions based on sound evidence. If the data is not of high quality, then begin the process of improving the quality of your data and over time you will see improvements that lead to evidence for decision-making.



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making,
Slide 7

SCRIPT / KEY POINTS:
This slide reviews what data quality means. Data must be collected in a standardised way including the data collection form and the way that is used. Data quality measures and indicators must be agreed upon and written down. Provide insights to assess data quality.



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making,
Slide 8

SCRIPT / KEY POINTS:

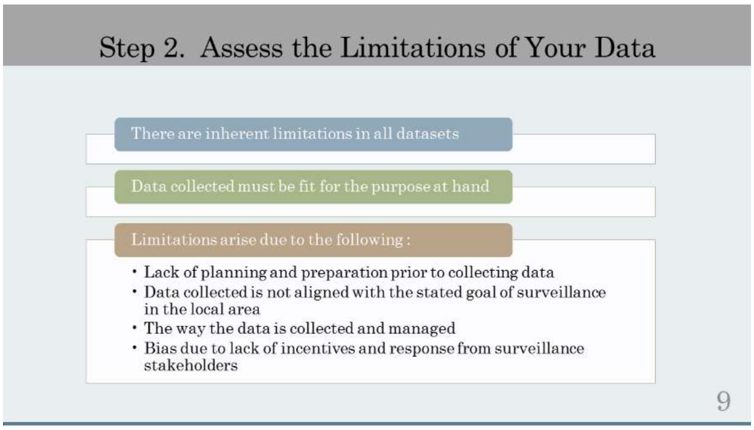
Quality measures are those items that directly provide some insights on the usefulness of the data and this is challenging.

Make the decision to begin the process to improve data quality in your local area today.

The indicators noted are used to assess the quality of data to support rapid action.

- Relevance - the data collected is relevant to the stated objectives;
- Accuracy – the data reflect what we intend to measure;
- Integrity – ensures that the data is stable and reliable for use;
- Timeliness / time lag – data is meant to support rapid action and response. Delayed data sharing impedes needed action.;

- Accessibility and clarity – data must be in an accessible and clear form to those who need to use it;
- Comparability – data must be presented in a format that can be compared with other existing data to be of use;
- Coherence – the data must make sense;
- Coverage / representativeness – the data must represent the populations from which it is taken; and
- Redundant / duplicates – duplicate data must be removed and causes for duplication are corrected.

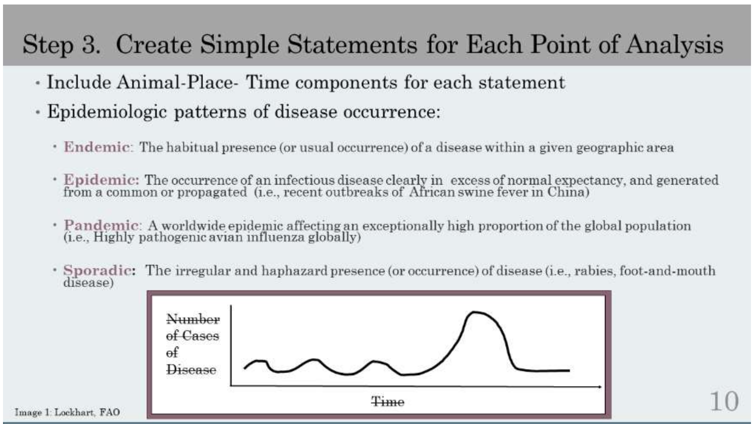


Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 9

SCRIPT / KEY POINTS:

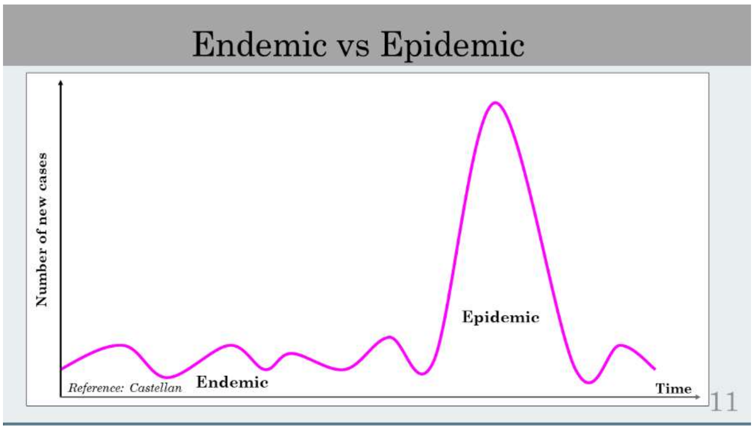
Next, you need to assess the limitations of your data. There are inherent limitations in all datasets. Data collected must be fit for purpose. Specific limitations include:

- No planning or preparation before collecting your data;
- The data collected is not aligned with the stated goal of surveillance in the local area;
- The way the data is collected and managed; and
- Bias due to lack of incentives and response from surveillance stakeholders.



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 10

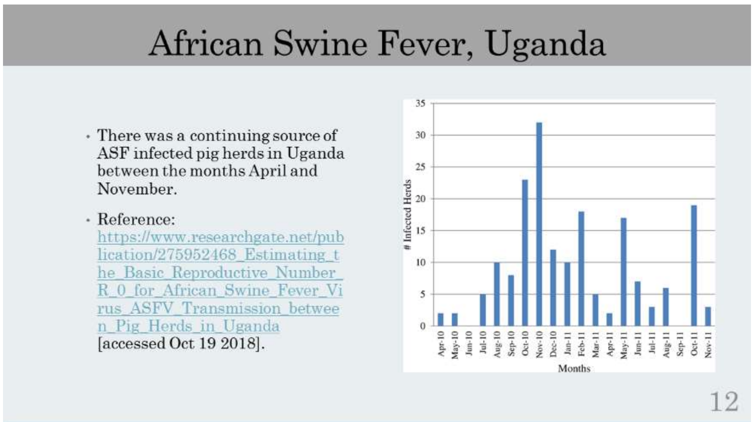
SCRIPT / KEY POINTS:
Epidemiological measures of disease occurrence with examples are presented in the next three slides.
Photo:
Image 1: Lockhart, FAO



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 11

SCRIPT / KEY POINTS:
Remember, endemic means that the disease is continually circulating in the population, whereas, epidemic means that the infectious disease exceeds what is normally occurring in the population.

Reference: Castellan
?

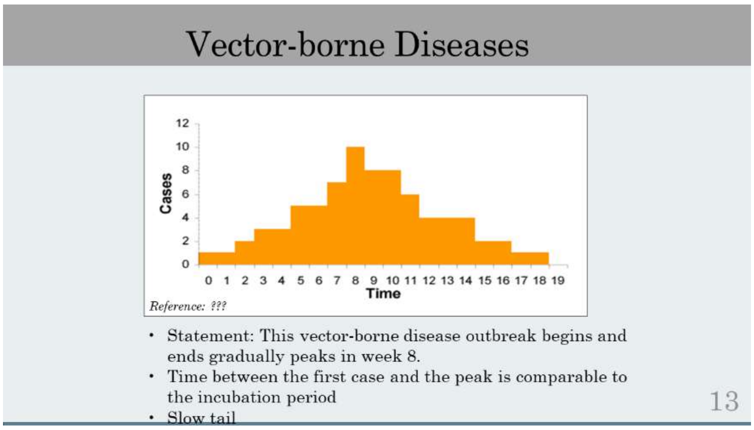


Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 12

SCRIPT / KEY POINTS:
There was a continuing source of ASF infected pig herds in Uganda between the months April and November.

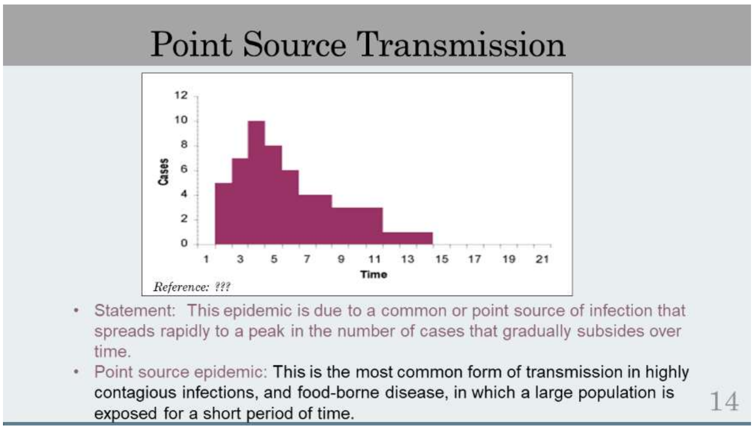
Monthly incidence and trend of African swine fever (ASF) in Uganda indicates fluctuating endemicity with monthly peak incidents. Is there evidence of seasonality?

Reference: Barongo MB, Ståhl K, Bett B, Bishop RP,Fèvre EM, Aliro T, et al. (2015) Estimating the BasicReproductive Number (R0) for African Swine FeverVirus (ASFV) Transmission between Pig Herds inUganda. PLoS ONE 10(5): e0125842. doi:10.1371/journal.pone.0125
(PDF) Estimating the Basic Reproductive Number (R 0) for African Swine Fever Virus (ASFV) Transmission between Pig Herds in Uganda. Available from: https://www.researchgate.net/publication/275952468_Estimating_the_Basic_Reproductive_Number_R_0_for_African_Swine_Fever_Virus_ASFV_Transmission_between_Pig_Herds_in_Uganda [accessed Oct 19 2018].



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 13

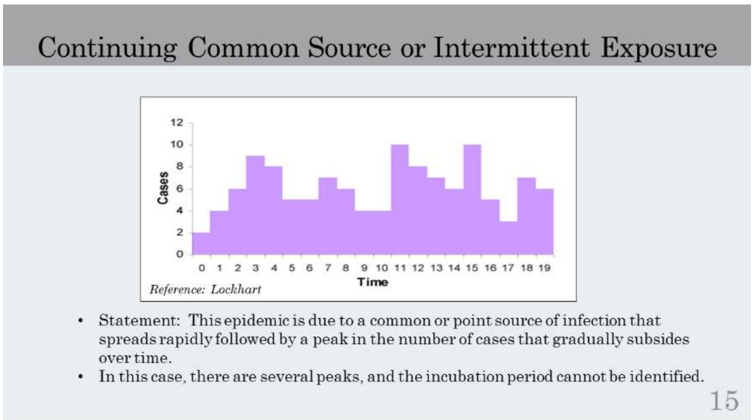
SCRIPT / KEY POINTS:
Statement: This vector-borne disease outbreak begins and ends gradually peaks in week 8.
Starts slowly
Time between the first case and the peak is comparable to the incubation period
Slow tail



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 14

SCRIPT / KEY POINTS:
Statement: This epidemic is due to a common or point source of infection that spreads rapidly followed by a peak in the number of cases that gradually subsides over time.

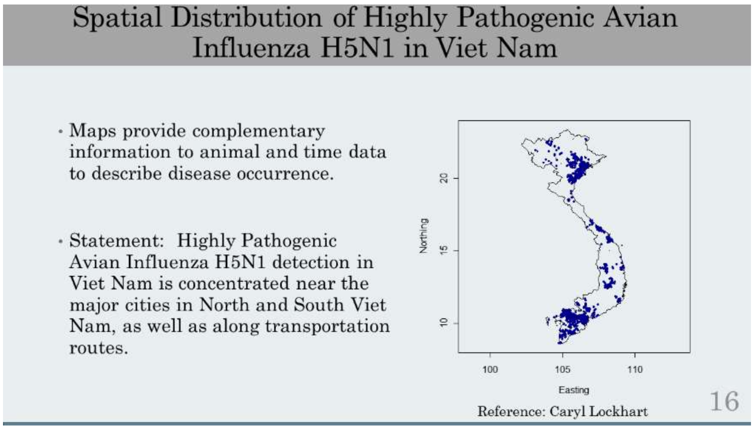
Point source epidemic: This is the most common form of transmission in highly contagious infections, and food-borne disease, in which a large population is exposed for a short period of time.



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 15

SCRIPT / KEY POINTS:
Statement: This epidemic is due to a common or point source of infection that spreads rapidly followed by a peak in the number of cases that gradually subsides over time.

When the disease spreads through intermittent exposure, there are several peaks, and the incubation period cannot be identified.



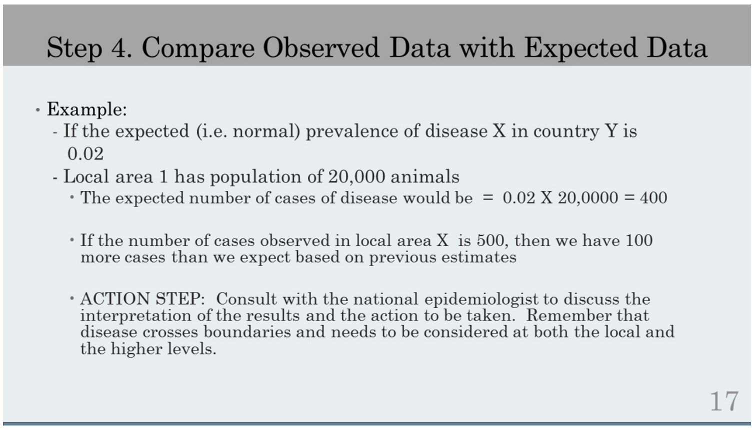
Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making,
Slide 16

SCRIPT / KEY POINTS:
Statement: Highly Pathogenic Avian Influenza H5N1 detection in Viet Nam is concentrated near the major cities in North and South Viet Nam, as well as along transportation routes.

Maps provide complementary information to animal and time data to describe disease occurrence.

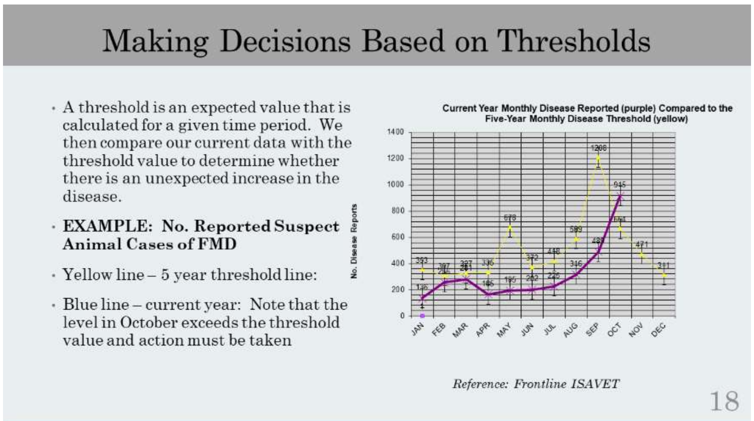
Interpretation: In the map we see the point location of disease or reports , but difficult to say where disease is clustered.

Reference: Caryl Lockhart



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 17

SCRIPT / KEY POINTS:
An example is presented to illustrate the comparison of observed data vs expected data. Explain the results clearly and simply for your supervisor.



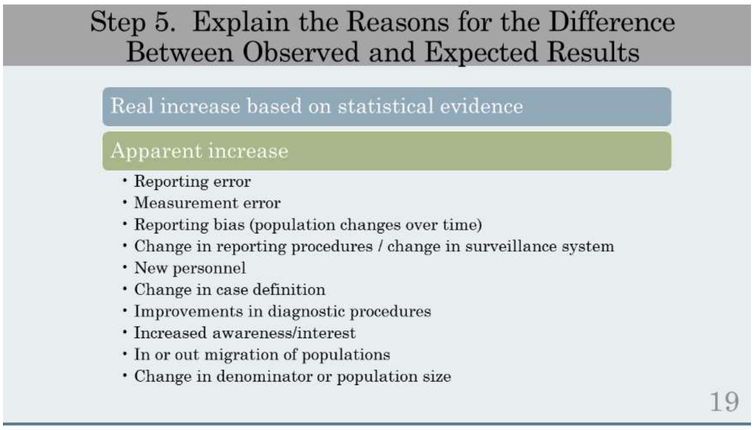
Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 18

SCRIPT / KEY POINTS:
Definition of Threshold *(Oxford Dictionary)*
"The magnitude or intensity that must be exceeded for a certain reaction, phenomenon, result, or condition to occur or be manifested."
A threshold is the expected value and we calculate over a given time period. We compare our current data with the threshold value to determine whether there is an unexpected increase in the disease.

Decisions are made on the basis of whether what is occurring is "normally expected" or "different from" what is normally expected. This is just an introduction to thresholds and we will discuss thresholds more in coming lessons.

Reference: Frontline ISAVET

In this example. The number of animal cases of FMD in October of this year exceeds the 5 year average and action must be taken!



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 19

SCRIPT / KEY POINTS:
This slide compares the reasons for the differences between observed and expected results.

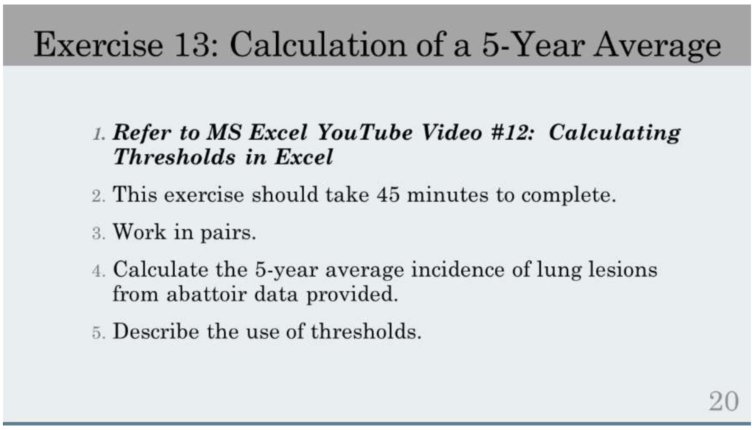
It is important to consider sources of bias in the data or in the way that data is collected. If bias has occurred, then the differences are apparent, rather than being due to real differences.

Even if the current number of reported cases exceeds the expected number, the excess may not necessarily indicate an outbreak. Reporting may be due rise of reporting errors, or an increased interest in disease, or to increased awareness. New personnel in the Area who report cases more consistently, when in fact there has been no change in the actual number of the disease. Changes in local reporting practices or changes in case definition might result in increase of cases.

Other factors that can resulting increase of cases might be migration of significant number of population, particularly from endemic Area of particular disease, or Area with sudden changes in population size.

Changes in numerator (number of reported changes cases) may simply reflect changes in the denominator (size of population).

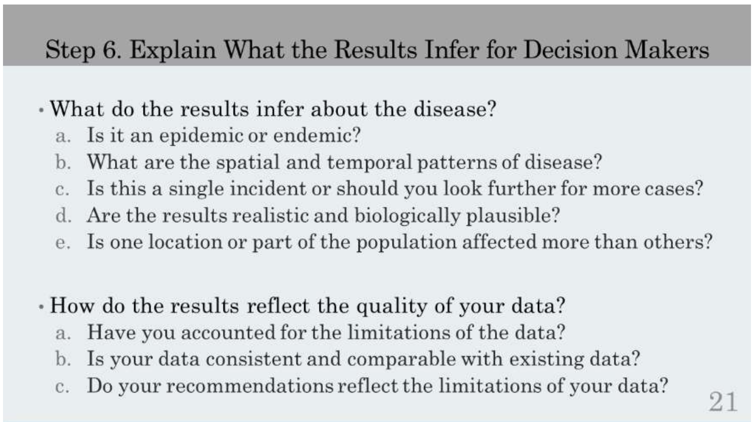
Nonetheless, we should consider an apparent increase real until proven otherwise.



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making,
Slide 20

SCRIPT / KEY POINTS:
Exercise 13 instructions: Calculation of a 50 Year Average
- This exercise should take 45 minutes to complete.
- Work in pairs.
- Calculate a 5-year average incidence rate from abattoir data provided.
- Describe the use of thresholds.

Instructors:
- Review the instructor guide for answers.



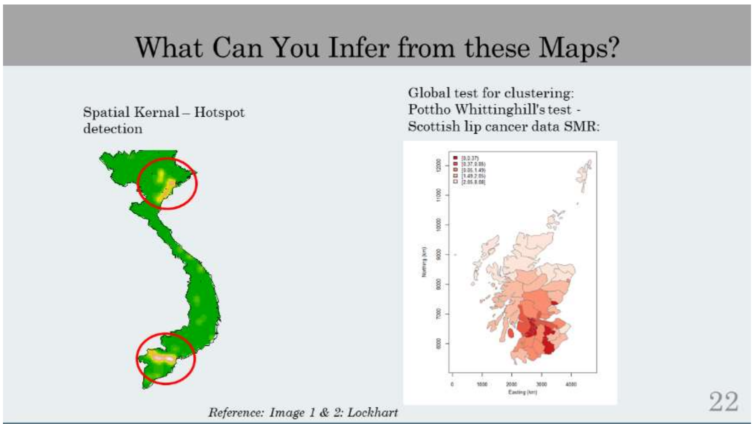
Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making,
Slide 21

SCRIPT / KEY POINTS:
What do the results infer about the disease situation itself?
What do the results infer about the quality of the surveillance data and how it can improved?

What do the results infer about the disease?
- Is it an epidemic or endemic in the region based on what is observed and what expected?
- What are the spatial and temporal patterns of disease?

- Is this a single incident or should you look further for more cases?
- Are the results realistic and biologically plausible?
- Is one location or part of the population affected more than others?

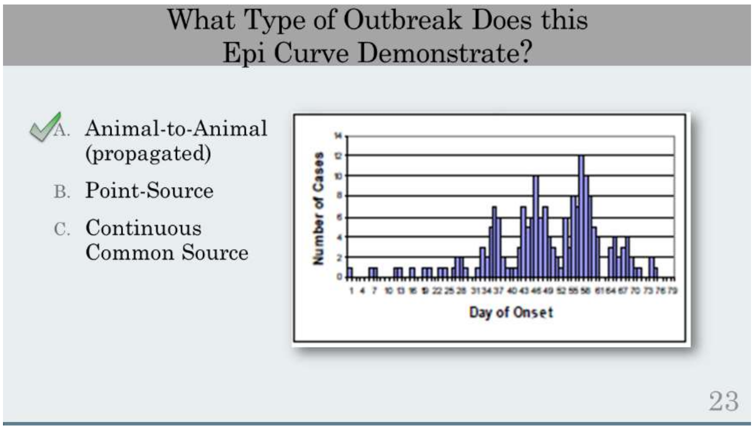
How do the results reflect the quality of your data?
- Have you accounted for the limitations of the data?
- Is your data consistent and comparable with existing data?
- Do your recommendations reflect the limitations of your data?



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 22

SCRIPT / KEY POINTS:
Spatial analyses can also be used to assess spatial patterns in data including spatial clustering. This can be used to assess data quality as well as whether events are spatially random or represents a true occurrence of disease.

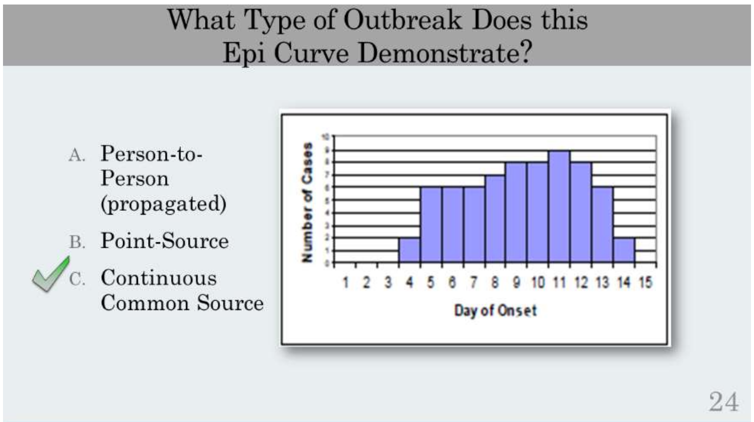
In map 1: we see that disease is clustered in the Area in dark red
In Map 2: We see that disease is clustered in one Area
Photo:
Image 1: Caryl Lockhart
Image 2: Caryl Lockhart



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 23

SCRIPT / KEY POINTS:
What type of outbreak does this epi curve demonstrate?

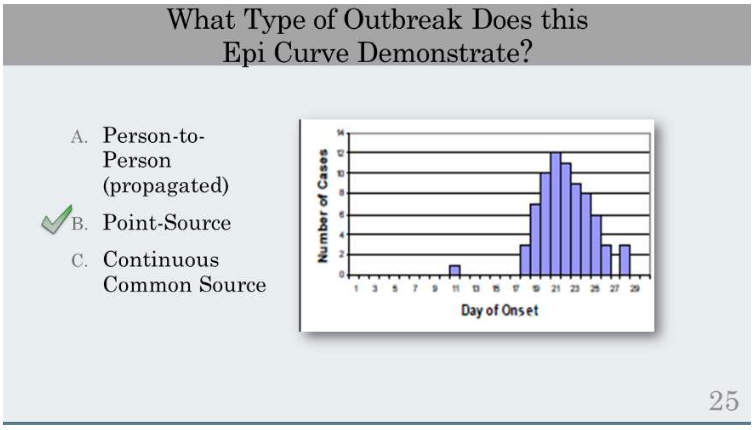
Correct Answer: A



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 24

SCRIPT / KEY POINTS:
What type of outbreak does this epi curve demonstrate?

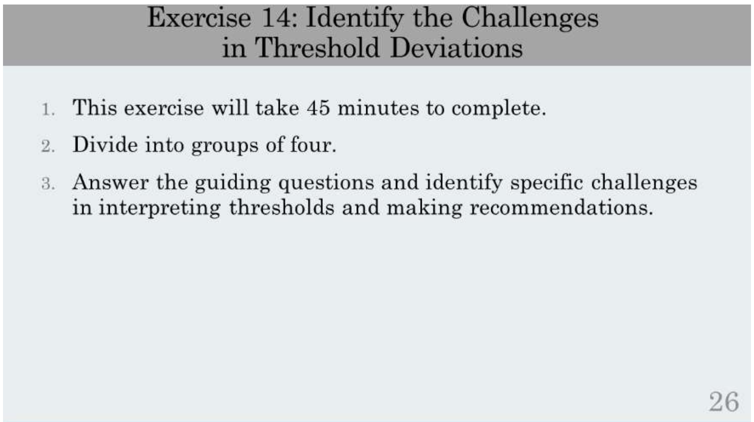
Correct Answer: C



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 25

SCRIPT / KEY POINTS:
What type of outbreak does this epi curve demonstrate?

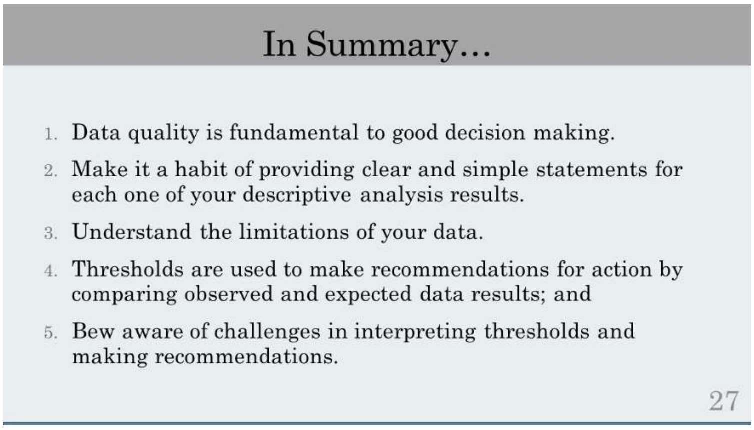
Correct Answer: B



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 26

SCRIPT / KEY POINTS:
Exercise 14 instruction: Identify challenges in Threshold Deviations
- This exercise will take 45 minutes to complete.
- Divide into four groups.
- Identify specific challenges in interpreting thresholds and making recommendations.

Instructors:
Review instructor guide for answers.



Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 27

SCRIPT / KEY POINTS:
In summary,

- Thresholds are used to make recommendations for action by comparing observed and expected data results; and
- Describe the challenges in interpreting thresholds and making recommendations.

Lesson 7 – Data Interpretation and Reporting to Improve Situational Awareness and Decision-Making, Slide 28

SCRIPT / KEY POINTS:
Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 13 – Calculation of a 5-Year Average

Description of Exercise:

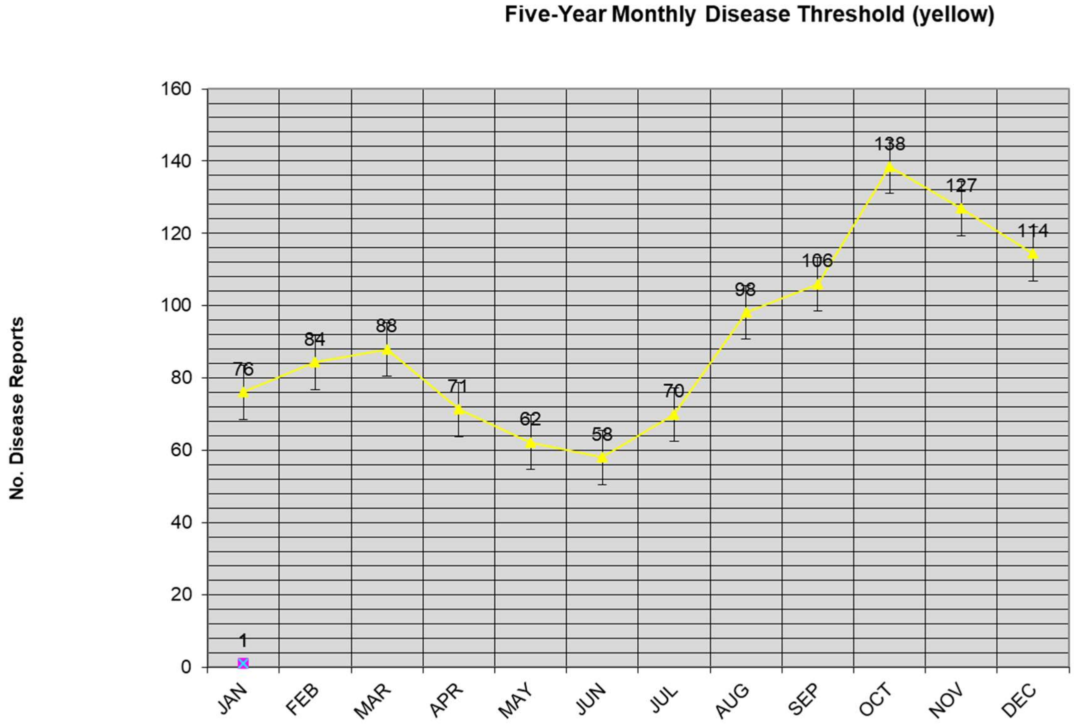
Calculate a 5-year average of the lung lesion disease count from the abattoir data provided. Should you have any questions over the exercises, please ask a trainer for clarification before, during, and after the exercises.

Allotted Time: 45 minutes

Exercise Components and Structure:

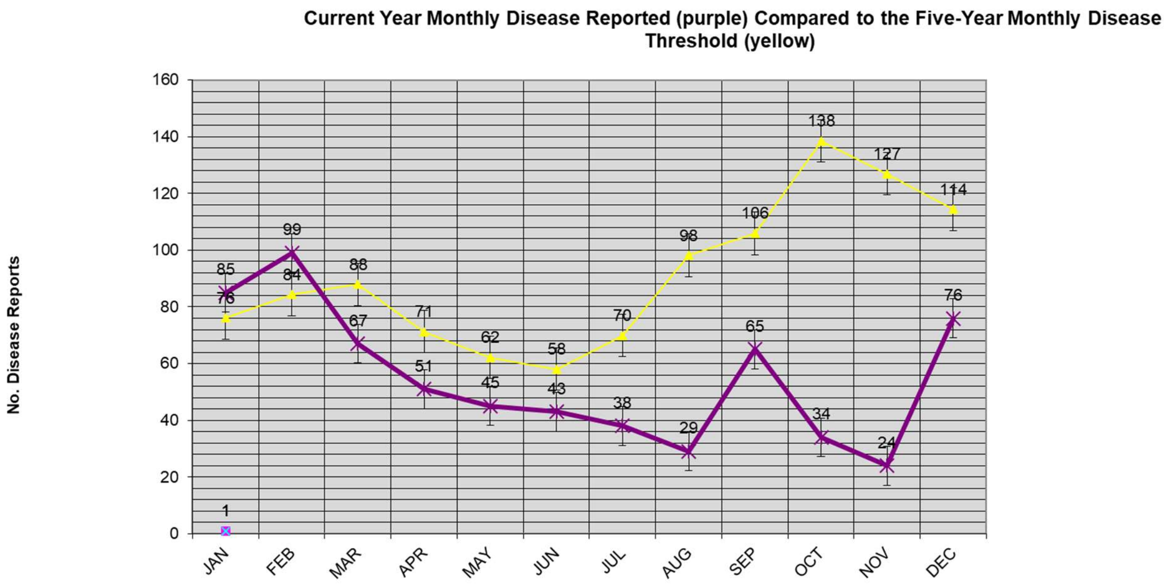
1. Refer to MS Excel YouTube Video #12: Calculating Thresholds in Excel
2. This exercise should take 45 minutes to complete.
3. Work in pairs.
4. Calculate a 5-year average incidence of lung lesions from abattoir data provided.
5. Describe the use of thresholds.
6. Copy data into the MS Excel spreadsheet provided as follows:
    a. Copy the following number of cases of cattle lung lesions for each month between 2000 and 2004 below.

Number of Cattle with Lung Lesions												
Year	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
2000	45	34	42	56	48	38	29	26	27	23	23	24
2001	31	39	47	54	57	50	37	30	27	30	36	38
2002	50	56	65	63	57	39	27	19	19	25	28	34
2003	57	73	77	68	55	35	34	55	66	99	88	91
2004	66	61	65	57	57	52	66	86	88	103	99	82



b. Copy the number of cases of cattle lung lesions for the current year below:

Current year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	85	99	67	51	45	43	38	29	65	34	24	76



7. Using the MS Excel spreadsheet, titled "ISAVET Exercise 13 Participant", calculate the 5-year average disease counts from abattoir data.

Intstructor Note: The output line graphs for the data are provided above

Materials, Data or Information:

1. Data set
2. MS Excel File: L7_Ex13
3. Using the MS Excel spreadsheet, titled "ISAVET Exercise 13 Participant", calculate the following.

Exercises 14 – List the Challenges in Recognizing Deviations Above Thresholds

Description of Exercise:

Identify the challenges in recognising deviations above the threshold. Should you have any questions over the exercises, please ask a trainer for clarification before, during, and after the exercises.

Allotted Time: 45 minutes

Organisation of Group Work:

- Divide into groups of four.

Exercise Objective(s):

1. Apply methods used to interpret data to improve situational awareness.
2. Describe signals and thresholds, and how they are used to make recommendations for action.
3. Answer the guiding questions and identify specific challenges in interpreting thresholds and making recommendations.

Exercise Components and Structure:

1. Discuss and list the challenges in recognising deviations above thresholds.

Guiding Questions:

1. Which months of the current year recorded the highest number of lung lesions?

Response: January and February

2. List possible reasons for the decline in the number of lung lesions from September to November in the current year as compared with the five year average?

Responses: 1. Decline in the number of animals being slaughtered this year. 2. Reduced counting of cases due to poorly trained staff, manpower shortage, etc. 3. Could be a real decline in the number of lung lesions this year due to better sourcing of cattle from healthier herds/Area. 4. Changing the case definition. 5. Changes in the population size. Other

3. At this stage, how would you interpret the results of this year's lung lesions to your supervisor?

Response: The reasons for the decline in the number of lung lesions detected between September and November in the current year are not clear and must be determined.

4. What additional information do you need to assess in order the determine if the results reflect a real change in the number of lung lesions or if they reflect a change in how we detect lung lesions?

Response Checklist:

- ☐ Reporting error
- ☐ Measurement error
- ☐ Reporting bias (population changes over time)
- ☐ Change in reporting procedures / change in surveillance system
- ☐ New personnel and the need for training
- ☐ Change in case definition
- ☐ Improvements in diagnostic procedures
- ☐ Deccreased awareness/interest
- ☐ In or out migration of populations
- ☐ Change in denominator or population size
- ☐ Other

Lesson 8 – Elements of a Surveillance Report

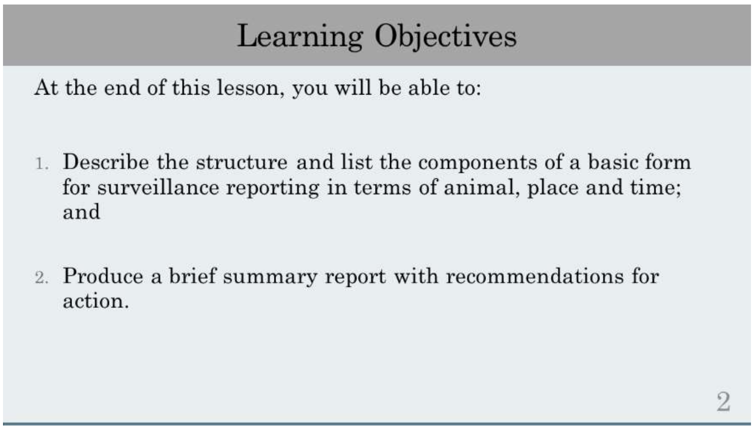
Estimated Lesson and Exercise Time	2 hours
Instructor Materials	Frontline ISAVET Lesson 8 Elements of a Surveillance Report.pptx
	Frontline ISAVET Lesson 8 Elements of a Surveillance Report Instructor Guide.doc
	Computer
	Microsoft Word and Excel
Participant Materials	Frontline ISAVET Lesson 8 Elements of a Surveillance Report Participant Guide.PDF

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

A-P-T	Animal, Place and Time
BSE	Bovine Spongiform Encephalopathy
HPAI	Highly Pathogenic Avian Influenza
ISAVET	In Service Applied Veterinary Epidemiology Training
No.	Number
OIE	World Organisation for Animal Health

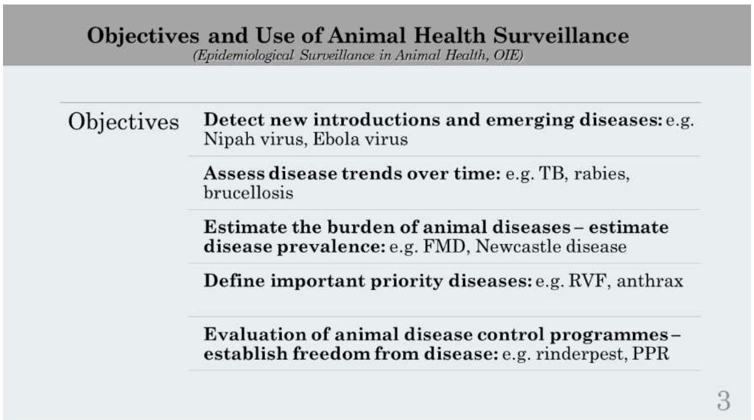
Lesson 8 – Elements of a Surveillance Report, Slide 1

SCRIPT / KEY POINTS:
Welcome to Lesson 1 titled, "Elements of a Surveillance Report". In this lesson, we will discuss the specific elements which are included in a field surveillance report.



Lesson 8 – Elements of a Surveillance Report, Slide 2

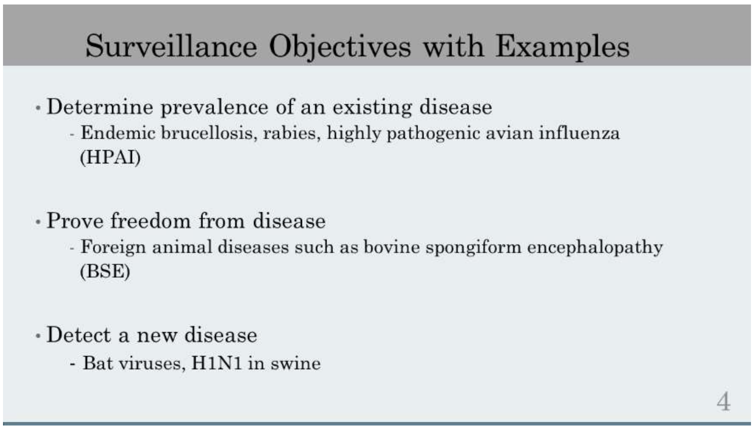
SCRIPT / KEY POINTS:
In this lesson, we will:
- Describe the structure and list the components of a basic surveillance report in terms of animal, place and time; and
- Produce a summary report with recommendations for action.



Lesson 8 – Elements of a Surveillance Report, Slide 3

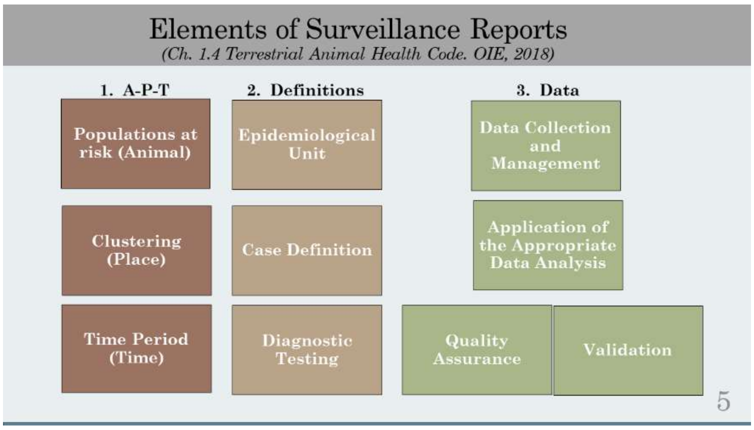
SCRIPT / KEY POINTS:
Let's now consider how animal disease surveillance data can be used, namely to:
- **Detect new introductions and emerging diseases**; e.g. Nipah virus, Ebola virus
- Assess disease trends over time; e.g. TB, rabies, brucellosis
- Estimate the burden of animal diseases – **estimate disease prevalence**; e.g. FMD, Newcastle disease
- Define important priority diseases; e.g. RVF, anthrax
- Evaluation of animal disease control programmes – **establish freedom from disease**. e.g. rinderpest, PPR

For each animal disease in your local area and country, what are the objectives of your animal health surveillance system?
Reference: Epidemiological Surveillance in Animal Health, OIE



Lesson 8 – Elements of a Surveillance Report, Slide 4

SCRIPT / KEY POINTS:
Examples of three common objectives for conducting surveillance are presented in this slide.

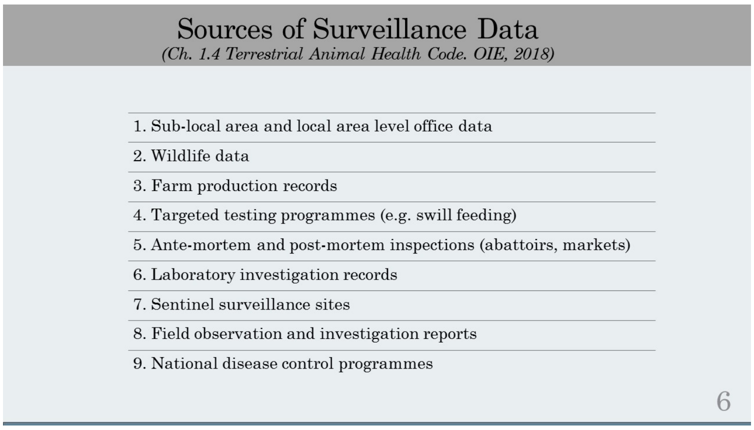


Lesson 8 – Elements of a Surveillance Report, Slide 5

SCRIPT / KEY POINTS:
The World Organisation for Animal Health (OIE) specifies the minimal elements of animal disease surveillance reports.
There are three elements in a surveillance report:

1. **Animal-Place-Time**
   - Populations at risk: It is important to define the larger population, as well as, the subpopulations involved. Zones and compartments need to be defined.
   - Timeframe: Account for short-term, as well as, seasonal and long-term factors that may influence the occurrence of disease.
   - Clustering: Account for spatial concentrations of disease (spatial clustering). Clustering can also refer to grouping of disease events in a time period (temporal clustering).
2. **Definitions**
   - Clear definitions are needed for an epidemiological unit, a case and test results (preliminary screening test or confirmatory test).
3. **Data**
   - Data collection and management must preserve the original “raw” data, so that it can be shared for additional analysis. Data analysis must be useful to meet the objectives of surveillance. Data quality assurance is important to remove transcription and formatting errors and detect missing data. Data must be validated to make sure to avoid bias that may over-estimate or under-estimate the occurrence of a disease.

Reference:
Ch. 1.4 Terrestrial Animal Health Code. OIE, 2018

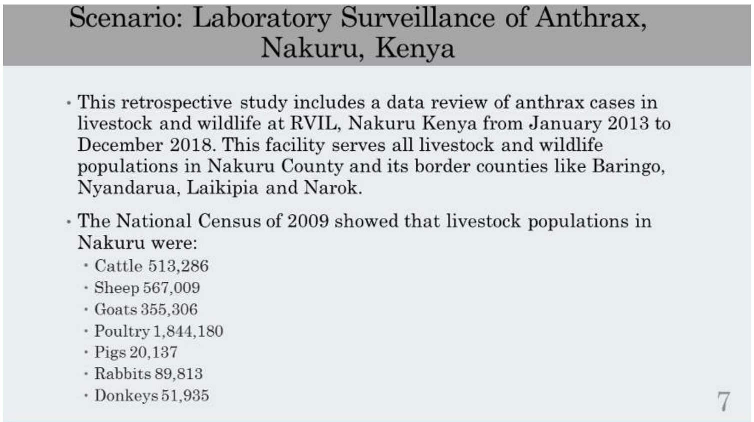


Lesson 8 – Elements of a Surveillance Report, Slide 6

SCRIPT / KEY POINTS:
This OIE list includes many sources of animal disease data.
As a local area veterinarian or veterinary paraprofessional responsible for animal disease surveillance, can you name two sources that are available for you to use for the following diseases:

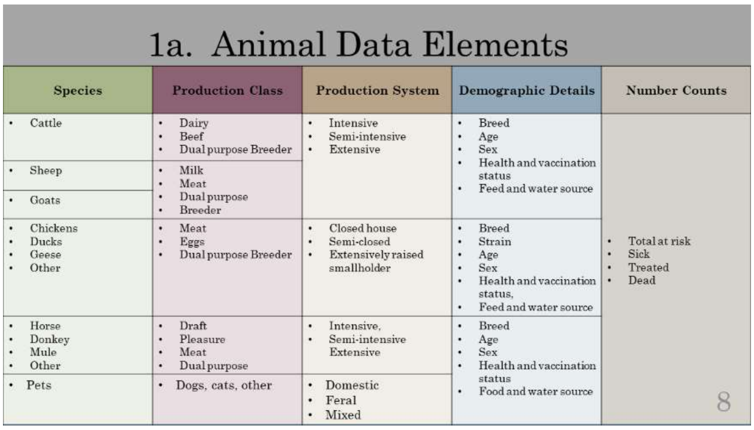
- Avian influenza in poultry
- Trypanosomiasis in cattle
- African swine fever in pigs
- Rabies in dogs

Reference:
Ch. 1.4 Terrestrial Animal Health Code. OIE, 2018



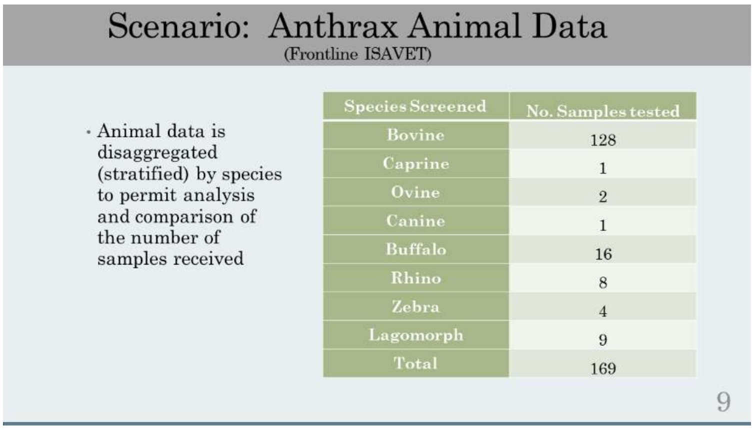
Lesson 8 – Elements of a Surveillance Report, Slide 7

SCRIPT / KEY POINTS:
Read slide.



Lesson 8 – Elements of a Surveillance Report, Slide 8

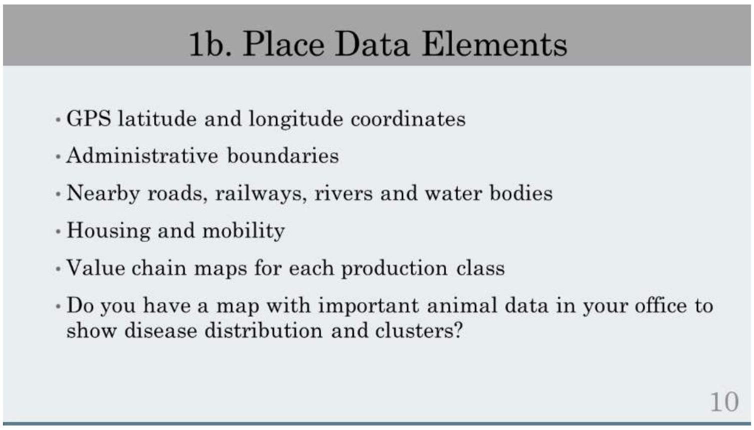
SCRIPT / KEY POINTS:
Surveillance data should fully describe all the animal host characteristics. Here is a table of animal data elements to refer to when for designing your local area surveillance report. Descriptive data includes species, breed class, type of production system and demographic details. Number counts need to describe how many of each kind of animal are at risk, sick, have received a treatment and dead at a specific time.



Lesson 8 – Elements of a Surveillance Report, Slide 9

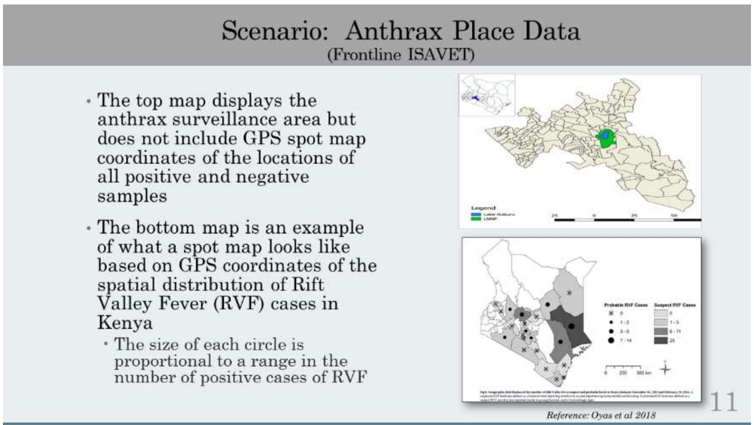
SCRIPT / KEY POINTS:
Note that the animal data is disaggregated and lists each type of animal tested. The number (count) of samples tested for each species is shown.

Reference:
Frontline ISAVET



Lesson 8 – Elements of a Surveillance Report, Slide 10

SCRIPT / KEY POINTS:
Surveillance data should fully describe all the animal host characteristics. Here is a of place data elements to refer to when for designing your local area surveillance report. It is important for a local area to have a map with important animal data in your office to show the value chains and nodes, as well as, disease distribution and clusters. These maps are extremely useful and important to prepare for and respond effectively to animal disease outbreaks.



Lesson 8 – Elements of a Surveillance Report, Slide 11

SCRIPT / KEY POINTS:
An Area map based on administrative regions is shown with an inset map of Kenya. GPS coordinates should be collected and mapped for the location of each sample, including both positive and negative samples.

The top map displays the study Area but lacks GPS spot map coordinates of the locations of all positive and negative samples.

The bottom map is an examples of what a spot map looks like based on GPS coordinates using the spatial distribution of Rift Valley Fever in Kenya.

Reference:
Oyas et al 2018

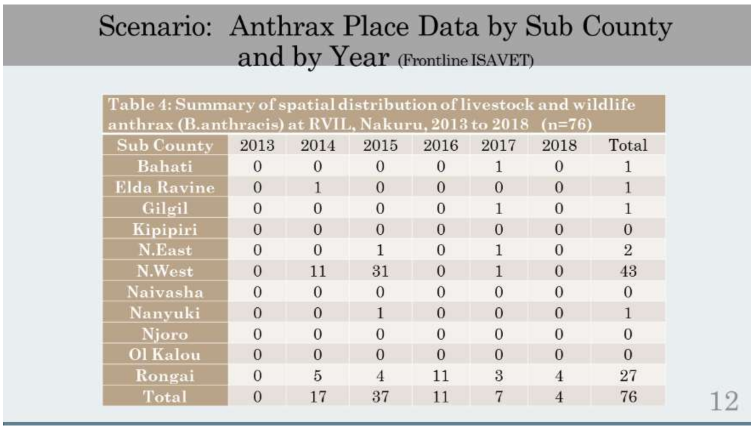


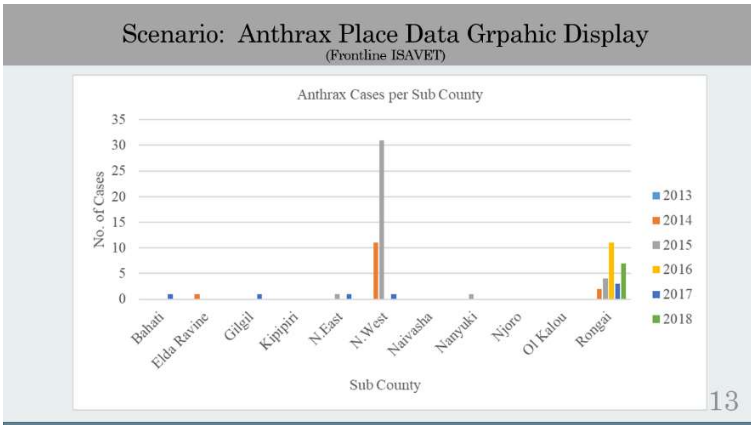
Table 4: Summary of spatial distribution of livestock and wildlife anthrax (B.anthracis) at RVIL, Nakuru, 2013 to 2018 (n=76)

Sub County	2013	2014	2015	2016	2017	2018	Total
Bahati	0	0	0	0	1	0	1
Elda Ravine	0	1	0	0	0	0	1
Gilgil	0	0	0	0	1	0	1
Kipipiri	0	0	0	0	0	0	0
N.East	0	0	1	0	1	0	2
N.West	0	11	31	0	1	0	43
Naivasha	0	0	0	0	0	0	0
Nanyuki	0	0	1	0	0	0	1
Njoro	0	0	0	0	0	0	0
Ol Kalou	0	0	0	0	0	0	0
Rongai	0	5	4	11	3	4	27
Total	0	17	37	11	7	4	76

Lesson 8 – Elements of a Surveillance Report, Slide 12

SCRIPT / KEY POINTS:
Create a frequency table of positive anthrax cases by year and by Sub county

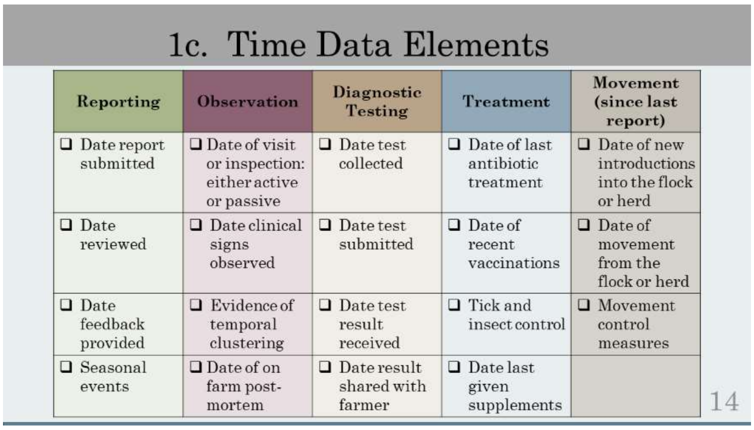
Reference:
Frontline ISAVET



Lesson 8 – Elements of a Surveillance Report, Slide 13

SCRIPT / KEY POINTS:
Create a bar graph of positive anthrax cases by year and by Sub county

Reference:
Frontline ISAVET



1c. Time Data Elements

Reporting	Observation	Diagnostic Testing	Treatment	Movement (since last report)
❑ Date report submitted	❑ Date of visit or inspection: either active or passive	❑ Date test collected	❑ Date of last antibiotic treatment	❑ Date of new introductions into the flock or herd
❑ Date reviewed	❑ Date clinical signs observed	❑ Date test submitted	❑ Date of recent vaccinations	❑ Date of movement from the flock or herd
❑ Date feedback provided	❑ Evidence of temporal clustering	❑ Date test result received	❑ Tick and insect control	❑ Movement control measures
❑ Seasonal events	❑ Date of on farm post-mortem	❑ Date result shared with farmer	❑ Date last given supplements	

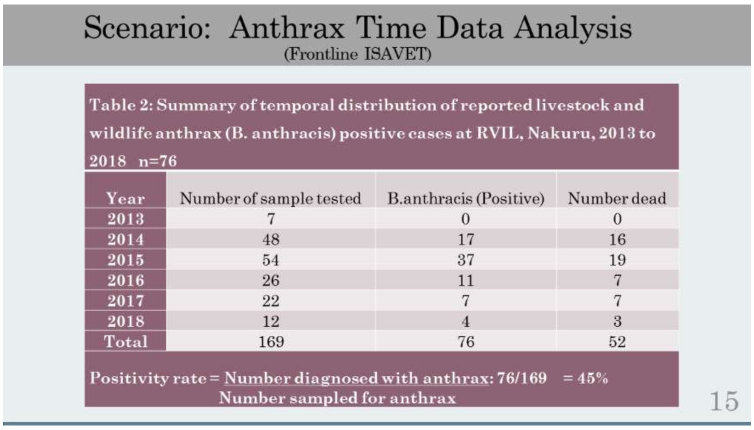
14

Lesson 8 – Elements of a Surveillance Report, Slide 14

SCRIPT / KEY POINTS:
Surveillance data should fully describe all the animal host characteristics. Here are time data elements to refer to when for designing your local area surveillance report. The types of data elements include dates that fall under five categories related to the following: reporting, observation, diagnostic testing, treatment, and movement.

Let's consider why these are important to consider:

- **Reporting:** The local area should measure the timeliness of processing the surveillance system reports.
- **Observation:** The local area should measure the following: 1) the frequency and dates of active or passive farm visits and other inspections, 2) the date that clinical signs were observed (if any) and post-mortems performed and 3) evidence of temporal clustering
- **Diagnostic Testing:** The local area should measure the timeliness of processing laboratory tests.
- **Treatment:** The local area should record the dates of the most recent administration of vaccines, antibiotics, tick and insect control treatments. Artificial insemination and other supplements such as probiotics which may be related to laboratory test results and interpretation.
- **Movement:** For all farm visits, the local area should record and report the dates of all movements either into and out of the flock or herd. Movement control measures such as quarantines or re-routing traffic should be noted.

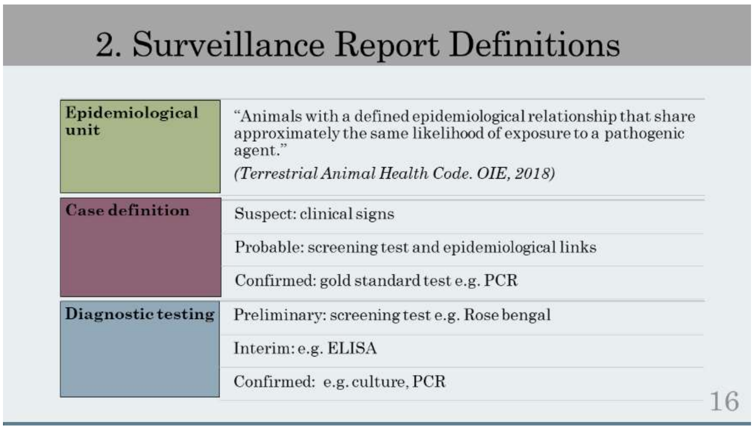


Year	Number of sample tested	B.anthracis (Positive)	Number dead
2013	7	0	0
2014	48	17	16
2015	54	37	19
2016	26	11	7
2017	22	7	7
2018	12	4	3
Total	169	76	52

Lesson 8 – Elements of a Surveillance Report, Slide 15

SCRIPT / KEY POINTS:
The number of samples tested and the number of samples positive for anthrax are summarized for each yearly time period.

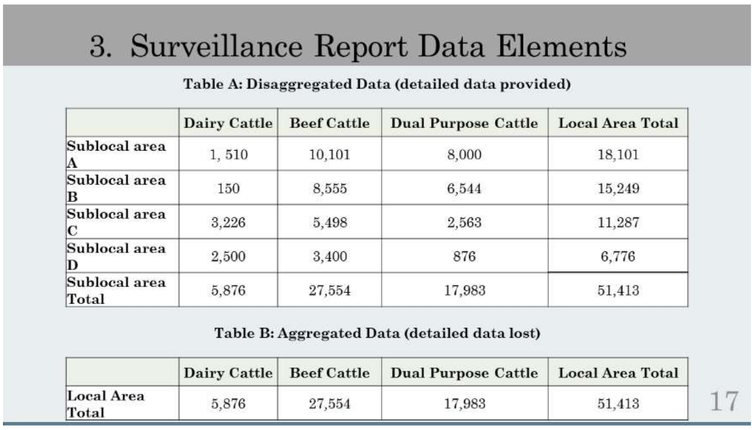
Reference:
Frontline ISAVET



Lesson 8 – Elements of a Surveillance Report, Slide 16

SCRIPT / KEY POINTS:
For each local area disease surveillance report, we should have a clear definitions of the epidemiological unit, the case definition and the type of laboratory test being used. These definitions can be developed in collaboration with the national authority and kept at the local area as a reference guide for anyone to understand how to interpret surveillance reports.

Reference:
Terrestrial Animal Health Code. OIE, 2018



3. Surveillance Report Data Elements

Table A: Disaggregated Data (detailed data provided)

	Dairy Cattle	Beef Cattle	Dual Purpose Cattle	Local Area Total
Sublocal area A	1, 510	10,101	8,000	18,101
Sublocal area B	150	8,555	6,544	15,249
Sublocal area C	3,226	5,498	2,563	11,287
Sublocal area D	2,500	3,400	876	6,776
Sublocal area Total	5,876	27,554	17,983	51,413

Table B: Aggregated Data (detailed data lost)

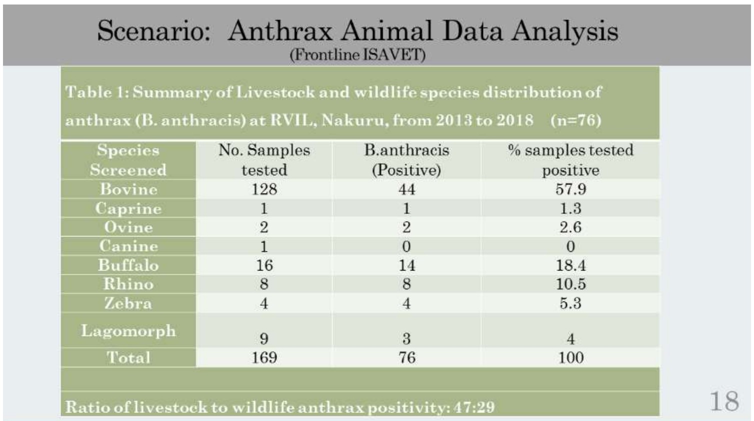
	Dairy Cattle	Beef Cattle	Dual Purpose Cattle	Local Area Total
Local Area Total	5,876	27,554	17,983	51,413

17

Lesson 8 – Elements of a Surveillance Report, Slide 17

SCRIPT / KEY POINTS:
Here are examples of disaggregated and aggregated animal data. Which of these can you perform descriptive statistics on?

The disaggregated data is required to perform descriptive statistics.
Other lectures cover data quality and data validation



Scenario: Anthrax Animal Data Analysis

(Frontline ISAVET)

Table 1: Summary of Livestock and wildlife species distribution of anthrax (B. anthracis) at RVIL, Nakuru, from 2013 to 2018 (n=76)

Species Screened	No. Samples tested	B.anthracis (Positive)	% samples tested positive
Bovine	128	44	57.9
Caprine	1	1	1.3
Ovine	2	2	2.6
Canine	1	0	0
Buffalo	16	14	18.4
Rhino	8	8	10.5
Zebra	4	4	5.3
Lagomorph	9	3	4
Total	169	76	100

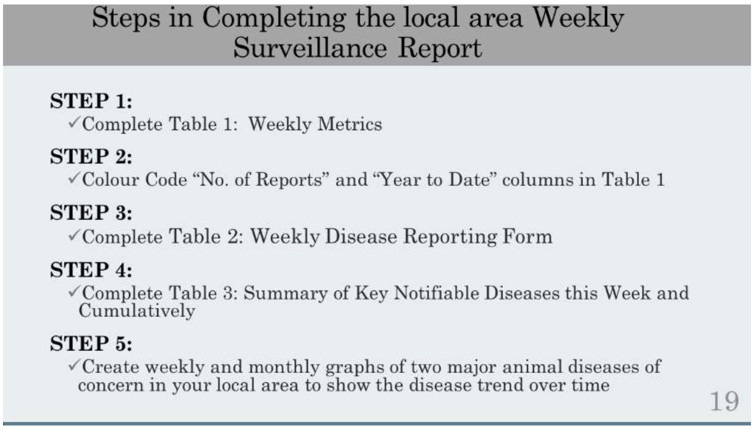
Ratio of livestock to wildlife anthrax positivity: 47:29

18

Lesson 8 – Elements of a Surveillance Report, Slide 18

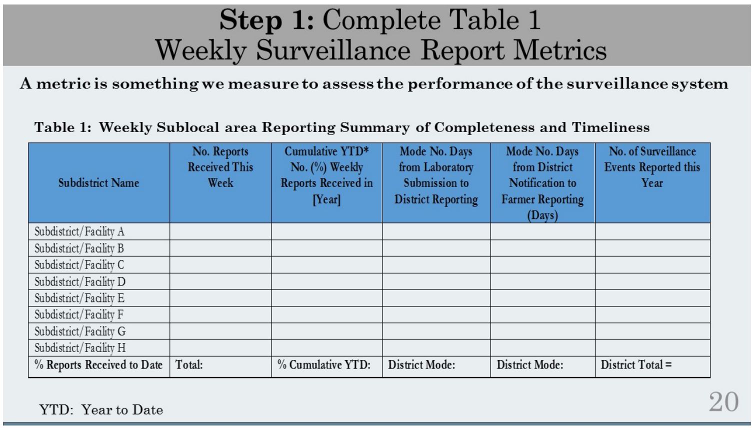
SCRIPT / KEY POINTS:
Note that the animal data is disaggregated and lists each type of animal tested. Both the number (count) and percentage positive for each species are shown in Table 1.

Reference:
Frontline ISAVET



Lesson 8 – Elements of a Surveillance Report, Slide 19

SCRIPT / KEY POINTS:
Read slide.



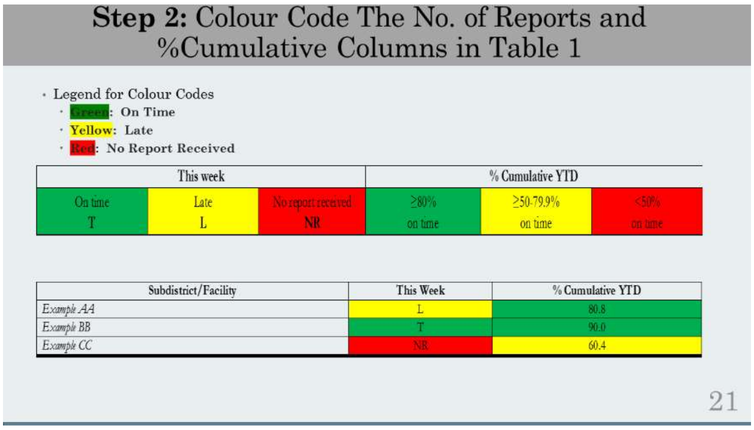
Subdistrict Name	No. Reports Received This Week	Cumulative YTD* No. (%) Weekly Reports Received in [Year]	Mode No. Days from Laboratory Submission to District Reporting	Mode No. Days from District Notification to Farmer Reporting (Days)	No. of Surveillance Events Reported this Year
Subdistrict/Facility A					
Subdistrict/Facility B					
Subdistrict/Facility C					
Subdistrict/Facility D					
Subdistrict/Facility E					
Subdistrict/Facility F					
Subdistrict/Facility G					
Subdistrict/Facility H					
% Reports Received to Date	Total:	% Cumulative YTD:	District Mode:	District Mode:	District Total =

Lesson 8 – Elements of a Surveillance Report, Slide 20

SCRIPT / KEY POINTS:
Local area can improve their monthly surveillance by keeping a record of the following metrics (measures):

- The number of monthly reports to date this year from each sublocal area.
- The average number of days from laboratory submission to reporting to the local area.
- The average number of days between the local area being informed and reporting to the farmer.
- Recording the number of surveillance activities in each sublocal area over the previous month.

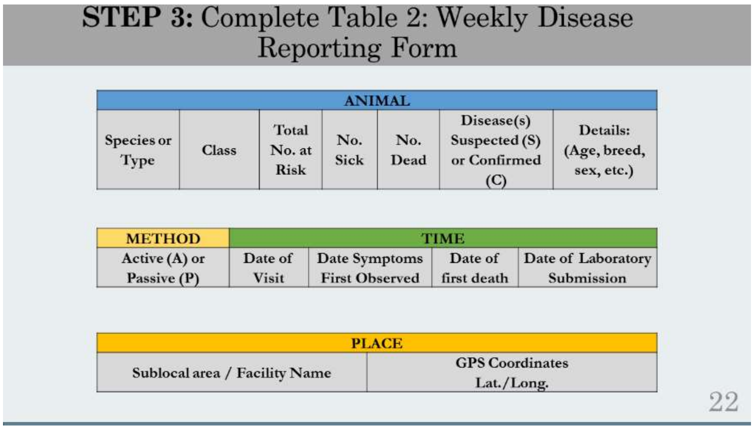
Review the slide to prepare for Exercise 15a.



Lesson 8 – Elements of a Surveillance Report, Slide 21

SCRIPT / KEY POINTS:

Read slide.



Lesson 8 – Elements of a Surveillance Report, Slide 22

SCRIPT / KEY POINTS:
The data collected in these tables can contain disaggregated data directly gathered from the sublocal area level. This will permit detailed epidemiological analysis to be performed upon which action can be taken.
Review the slide to prepare for Exercise 15a.

STEP 4: Summary of Key Notifiable Diseases this Week

1. List the key notifiable diseases in your local area
2. Count and record the number of suspected and confirmed cases
3. Count and record the number of deaths due to the disease
4. Calculate the case-fatality rate (No. deaths / No. of Cases)

	Current Week No.			Cumulative Weekly No.		
Disease	Cases	Deaths	Case Fatality Rate	Cases	Deaths	Case Fatality Rate

23

Lesson 8 – Elements of a Surveillance Report, Slide 23

STEP 5: Create weekly and monthly graphs of two major animal diseases

- First create a table to record the total number of tests and number of positives by month and by year
- Source: Frontline ISAVET

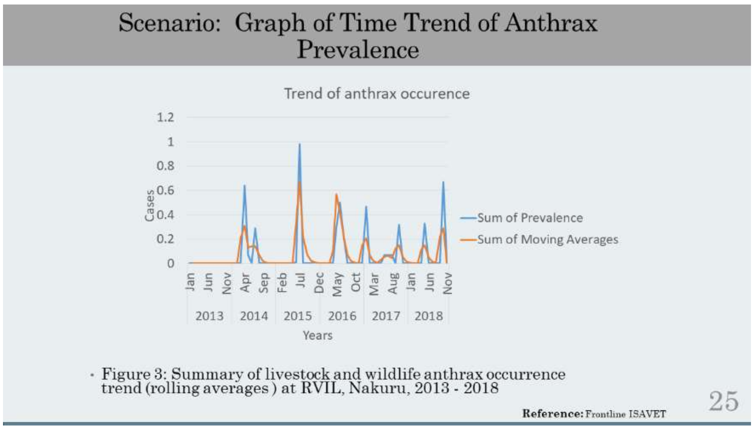
Table 3: Summary of livestock and wildlife anthrax occurrence trend at RVIL, Nakuru, 2013 to 2018 n=76

YM	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		T	+
	T	+	T	+	T	+	T	+	T	+	T	+	T	+	T	+	T	+	T	+	T	+	T	+		
2013	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	5	0	0	0	7	0
2014	0	0	5	5	11	4	7	2	9	4	0	0	6	2	0	0	7	0	0	0	3	0	0	0	48	17
2015	0	0	5	0	1	0	1	0	0	0	2	2	39	34	1	0	2	0	0	0	1	1	2	0	54	37
2016	0	0	0	0	1	0	2	0	7	3	7	5	5	3	2	0	0	0	2	0	0	0	0	0	26	11
2017	6	2	3	0	2	0	0	0	0	0	1	1	1	1	3	1	2	0	4	2	0	0	0	0	22	7
2018	0	0	0	0	3	0	0	0	4	2	0	0	1	0	0	0	0	0	4	2	0	0	0	0	12	4
Total	6	2	13	5	18	4	10	2	20	9	10	8	53	40	6	1	11	0	11	4	9	1	2	0	169	76

Y= Year, M= Month, T= Total number of samples tested and += samples positive

24

Lesson 8 – Elements of a Surveillance Report, Slide 24



Lesson 8 – Elements of a Surveillance Report, Slide 25

SCRIPT / KEY POINTS:
Read slide.

Reference:
Frontline ISAVET

Exercise 15a: Weekly Surveillance Report

1. This exercise will take 60 minutes.
2. Form yourselves into groups of roughly equal size.
3. Create a surveillance report with the information provided.
4. Each group will make comments on what the data reveals.

26

Lesson 8 – Elements of a Surveillance Report, Slide 26

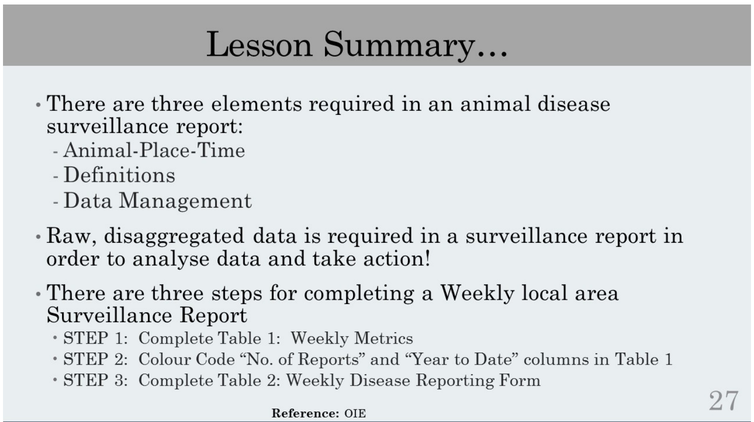
SCRIPT / KEY POINTS:
EXERCISE 15a. Instructions: Surveillance Report
This exercise will take 60 minutes.
Form yourselves into groups of roughly equal size.
Create a surveillance report with the information provided.
Each group will make comments on what the data reveals.

Instructors:
See instructor guide for answers.

INSRUCTOR COMMENTS:

The data collected in these tables can contain disaggregated data directly gathered from the sublocal area level. This will permit detailed epidemiological analysis to be performed upon which action can be taken.

Review the slide to prepare for Exercise 15a.

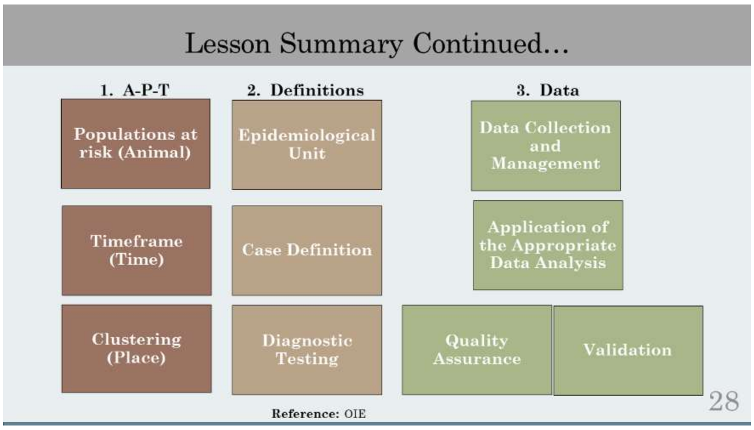


Lesson 8 – Elements of a Surveillance Report, Slide 27

SCRIPT / KEY POINTS:
OIE defines three elements of a surveillance report that we should be able to explain and use:

Animal-Place-Time
Definitions
Data Management

Remember that disaggregated data is required in order to be analysed whereas combined/aggregated data cannot be analysed further.



Lesson 8 – Elements of a Surveillance Report, Slide 28

SCRIPT / KEY POINTS:

The World Organisation for Animal Health (OIE) specifies the minimal elements of animal disease surveillance reports.

There are three elements in a surveillance report::

1. **Animal-Place-Time**
   - Populations at risk: It is important to define the larger population, as well as, the subpopulations involved. Zones and compartments need to be defined.
   - Timeframe: Account for short-term, as well as, seasonal and long-term factors that may influence the occurrence of disease.
   - Clustering: Account for spatial concentrations of disease (spatial clustering). Clustering can also refer to grouping of disease events in a time period (temporal clustering).
2. **Definitions**
   - Clear definitions are needed for an epidemiological unit, a case and test results (preliminary screening test or confirmatory test).
3. **Data**
   - Data collection and management must preserve the original “raw” data, so that it can be shared for additional analysis. Data analysis must be useful to meet the objectives of surveillance. Data quality assurance is important to remove transcription and formatting errors and detect missing data. Data must be validated to make sure to avoid bias that may over-estimate or under-estimate the occurrence of a disease.

Lesson 8 – Elements of a Surveillance Report, Slide 29

SCRIPT / KEY POINTS:
Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 15a – Local Area Disease Surveillance Report

Description of Exercise:

Create a surveillance report from information provided in tables below. Determine what the data reveals and provide comments in the surveillance report. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 1 hour

Exercise Components and Structure:

1. This exercise will take 60 minutes to complete.
2. Form yourselves into 5 groups of roughly equal size.
3. Review the below local area disease surveillance report.
4. Conduct calculations from report data.
5. Conduct calculations from animal-place-time data.
6. Develop definitions from data provided in the local area disease surveillance report.

Materials, Data or Information:

1. Computer
2. Microsoft Word
3. Microsoft Excel
4. Pen or Pencil

Expected Outputs and Deliverables of Each Participant:

- Surveillance report.

Local Area Disease Surveillance Report

1. Monthly local area reporting summary (Table 1):

Monthly Data and Metrics

Sublocal area Name	No. Monthly Reports Received in 2020	No. Days from Laboratory Submission to Local area Reporting	No. Days from Local area Notification to Farmer Reporting (Days)	No. of Surveillance Events this Month
Sublocal area A	5	2	1	1
Sublocal area B	1	1		
Sublocal area C	4	3	5	5
Sublocal area D	5		1	
Sublocal area E	3	2		
Sublocal area F	5	2	1	
Sublocal area G	4	2	1	
Sublocal area H	0	0		5
% Reports Received to Date	67.5%	Mode: 2	Mode: 1	11

A. With the data provided from the Monthly Reporting Summary (Table 1):

1. Calculate the percentage of Reports received to date in 2020. 67.5%
2. Calculate the mode for the No. of days from laboratory submission to local area reporting. 2
3. Calculate the mode for the No. of days from local area notification to farmer reporting (days). 1
4. Calculate the total No. of surveillance events this month in the local area. 11

INSTRUCTOR COMMENTS:

- Answers to the calculations are provided in the table.
- Sublocal area H has not submitted any monthly reports this year and has 5 surveillance events this month.
  QUESTION: How do you explain this?
  RESPONSE: The local area officer in sublocal area H may be too busy to write his reports because he is too busy to do so.
- Sublocal area D has not recorded the number of days from laboratory submission to local area reporting. Follow up is needed.
- Sublocal area B, E and H have not recorded the No. of days from local area notification to farmer reporting (days). Follow up is needed.
- Only 3 of 8 sublocal area have reported surveillance events this past month.

2. Active (A) and Passive (P) surveillance data by animal-place-time (Table 2):

ANIMAL							Active (A) or Passive (P)	TIME				PLACE	
Species or Type	Class	Total No. at Risk	No. Sick	No. Dead	Disease(s) Suspected (S) or Confirmed (C)	Notes: (Age groups, breed and sex, etc.)		Date of Visit	Date Symptoms First Observed	Date of first death	Date of Laboratory Submission	Sublocal area Name	GPS Coordinates
Cattle	Dairy												
	Beef	45	2	0	Trypanosomiasis (S)	Mature cows	P	June 10	June 9	NA	June 10	C	
	Dual purpose	82	4	2	Trypanosomiasis (S)	Mature cows	A	June 6	June 5	June 5	None	C	
	Breeder												
Sheep	Meat												
	Milk												
	Dual purpose												
	Breeder												
Goats	Meat												
	Milk												
	Dual purpose												
	Breeder	150	10	5	PPR (S)	5 dead kids	P	June 11	June 5	June 5	None	H	
Poultry	Meat												
	Eggs												
	Dual Purpose	5,000	0	2	Marek's Disease (S)	50-week old layers (daily mortality)	P	June 5	Not applicable (NA)	June 5	None	B	
	Breeder												
Equine	Horse												
	Donkey												
	Mule												
	Other												
Pets	Dog												

ANIMAL							Active (A) or Passive (P)	TIME				PLACE	
Species or Type	**Class**	**Total No. at Risk**	**No. Sick**	**No. Dead**	**Disease(s) Suspected (S) or Confirmed (C)**	**Notes: (Age groups, breed and sex, etc.)**		**Date of Visit**	**Date Symptoms First Observed**	**Date of first death**	**Date of Laboratory Submission**	**Sublocal area Name**	**GPS Coordinates**
	Cat	1	1	0	Rabies (S)	1 feral dog	P	June19	June 18	NA	June 19	E	
	Other												
Wildlife	Specify												

B. Review Table 2 with the surveillance data provided according to animal-place-time:

1. Calculate the percent (%) mortality for:

   a. Suspected Trypanosomiasis reports in Beef in June 2020. 1.6%

   2/(45+82) = 1.6%

   b. Suspected PPR in Goats in June 2020. 3.3%

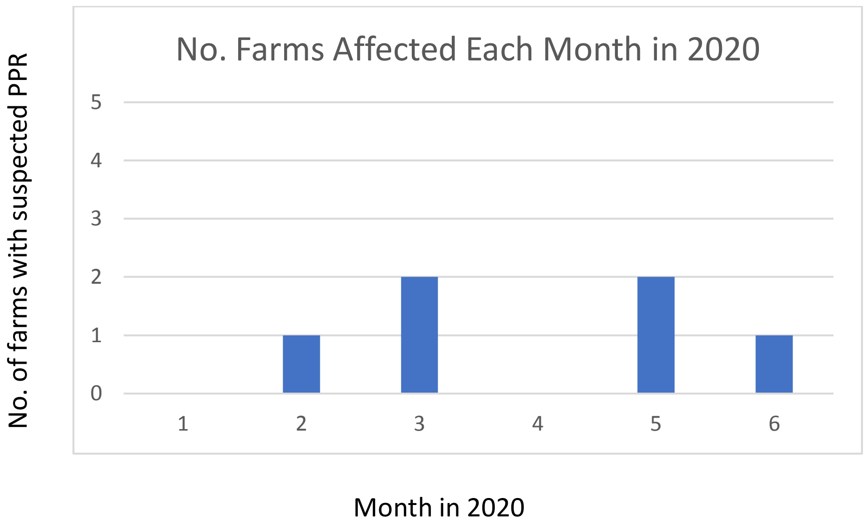
   5/150 = 3.3%

INSTRUCTOR COMMENTS:

- It is important to combine disease data from monthly reports to evaluate disease trends in your local area the number of suspected cases of PPR occurs sporadically from January to June in 2010 and that the disease may be endemic, but a survey or ongoing surveillance is needed. Samples should be sent for laboratory confirmation. If PPR is confirmed, prevention and control measures need to be put into place.
- A master template copy of Table 2 can be found on the participant and instructor flashdrives in the Lesson 8 folder.

2. Interpret the following graph of PPR in the local area for Goats so far in 2020. What pattern do you observe and what does it mean for the occurrence of PPR in the local area?

   The vertical axis is the number of farms suspected of being affected by PPR. The horizontal axis is the month in 2020 (1=January, etc.). The number of farms affected was highest in March and May.



INSTRUCTOR COMMENTS:

- Sublocal area C conducted active surveillance on for suspected trypanosomiasis on June 5 and a second farm was found passively on June 10. This tells us that active surveillance was not continued in the sublocal area afterwards, reflecting the disease may be under-reported in the Area.

3. Definitions (Table 3):

Disease	Species	Epidemiological Unit	Case Definition	Diagnostic Testing

C. Review the definitions table (Table 3).

Try to gradually complete the definitions table with the assistance of a veterinary epidemiologist from your national animal health agency (Ministry of Agriculture).

Answers will vary based on group discussions with instructor.

Lesson 9 – Making Recommendations for Animal Disease Prevention and Control

Estimated Lesson and Exercise Time	2 hours
Instructor Materials	Frontline ISAVET Lesson 9 Making Recommendations for Animal Disease Prevention and Control.pptx
	Frontline ISAVET Lesson 9 Making Recommendations for Animal Disease Prevention and Control Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	Frontline ISAVET Lesson 9 Making Recommendations for Animal Disease Prevention and Control Participant Guide.PDF MS Excel Exercise 15b

LESSON ACRONYMS AND ABBREVIATIONS

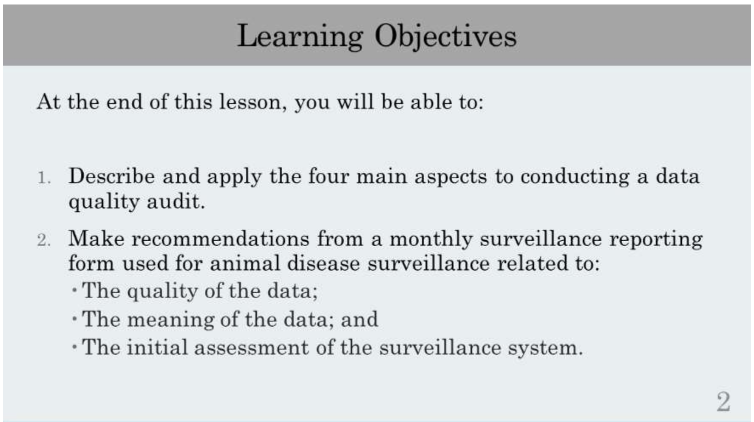
CRD	Chronic Respiratory Disease
ISAVET	In Service Applied Veterinary Epidemiology Training
RVF	Rift Valley Fever
PPR	Peste Des Petit Ruminants
OIE	World Organisation for Animal Health

Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 9 titled, "Making Recommendations for Animal Disease Prevention and Control".



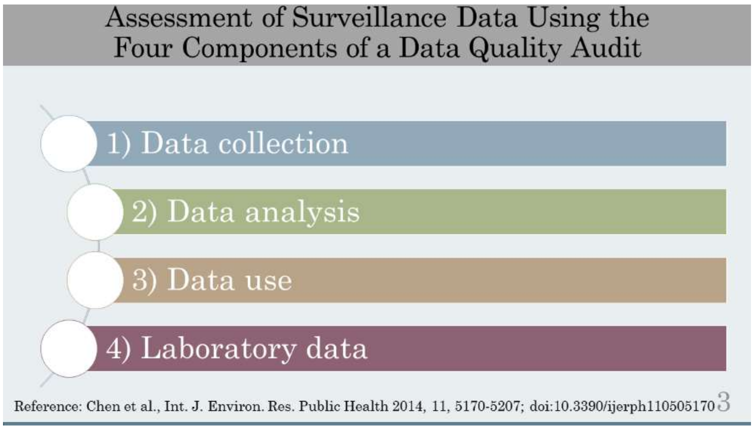
Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

1. Describe and apply the four main aspects to conducting a data quality audit.
2. Make recommendations from a monthly surveillance reporting form used for animal disease surveillance related to:
    - The quality of the data;
    - The meaning of the data; and
    - The initial assessment of the surveillance system.



Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 3

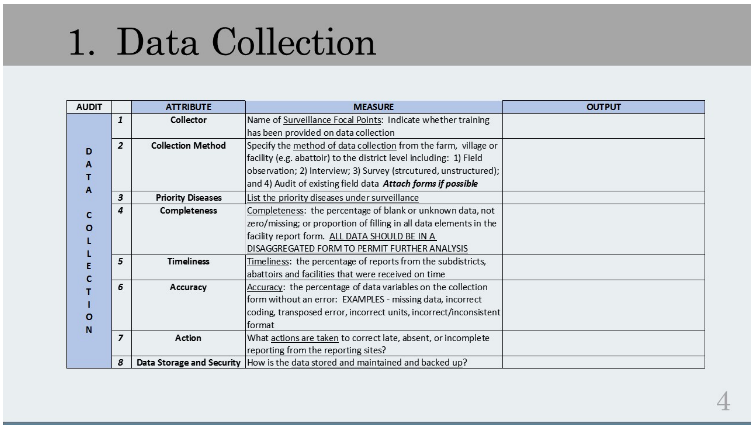
SCRIPT / KEY POINTS:

Assess the timeliness and completeness of the surveillance reports received from the sublocal area level.

There are four main aspects to conducting a data quality audit: 1) Data collection; 2) Data analysis; 3) Data use; and 4) Laboratory Data

For assessment, there are multiple recommended ways to improve the surveillance system, which includes: training, providing regular meetings, reviewing the surveillance format and asking for technical assistance from the national level.

Reference: Chen et al., Int. J. Environ. Res. Public Health 2014, 11, 5170-5207; doi:10.3390/ijerph110505170



1. Data Collection

AUDIT		ATTRIBUTE	MEASURE	OUTPUT
DATA COLLECTION	1	**Collector**	Name of Surveillance Focal Points: Indicate whether training has been provided on data collection	
	2	**Collection Method**	Specify the method of data collection from the farm, village or facility (e.g. abattoir) to the district level including: 1) Field observation; 2) Interview; 3) Survey (strcutured, unstructured); and 4) Audit of existing field data ***Attach forms if possible***	
	3	**Priority Diseases**	List the priority diseases under surveillance	
	4	**Completeness**	Completeness: the percentage of blank or unknown data, not zero/missing; or proportion of filling in all data elements in the facility report form. ALL DATA SHOULD BE IN A DISAGGREGATED FORM TO PERMIT FURTHER ANALYSIS	
	5	**Timeliness**	Timeliness: the percentage of reports from the subdistricts, abattoirs and facilities that were received on time	
	6	**Accuracy**	Accuracy: the percentage of data variables on the collection form without an error: EXAMPLES - missing data, incorrect coding, transposed error, incorrect units, incorrect/inconsistent format	
	7	**Action**	What actions are taken to correct late, absent, or incomplete reporting from the reporting sites?	
	8	**Data Storage and Security**	How is the data stored and maintained and backed up?	

4

Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 4

SCRIPT / KEY POINTS:

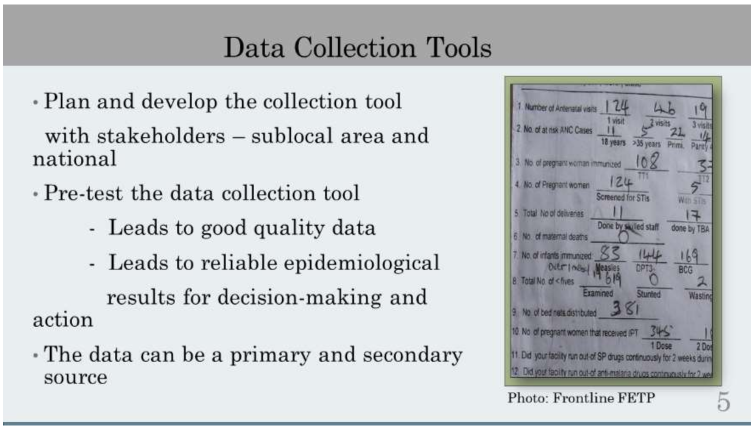
The following provides information for monthly surveillance report metrics. A data collection sheet can be utilised to collate information for annual reporting in each sublocal area. This allows you at the regional or local level to better understand where underreporting is occurring.

The following attributes are assessed:

- Collector or the surveillance focal point
- Collection Method
- Priority Diseases
- Completeness of data
- Timeliness of data collection
- Accuracy of data
- Action taken
- Data Storage and Security

INSTRUCTOR NOTE: Explore each column heading and ask these questions:

1. Why is it important to measure each metric?
2. How can these metrics help to improve the surveillance system, recalling that surveillance must always result in action being taken.



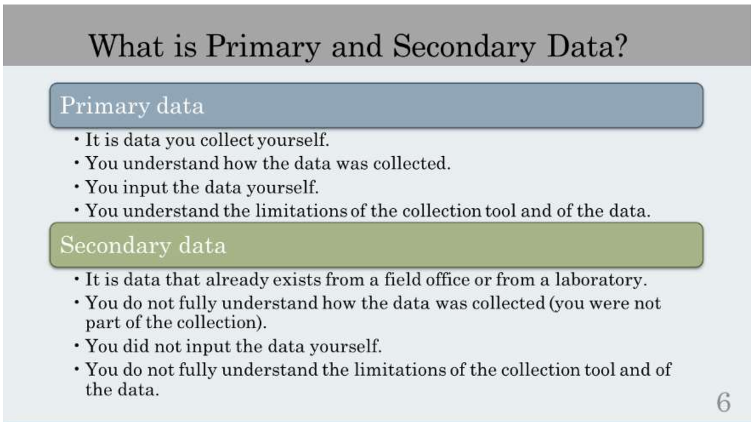
Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 5

SCRIPT / KEY POINTS:

Proper collection tools should be used which allow for data quality. It is extremely important to plan and develop your data collection tool with stakeholders at the sublocal area and national level. You should always pre-test (beta test) the data collection tool before conducting your study. This will lead to good quality data and more reliable epidemiological results for decision-making and action.

Photo: Frontline FETP

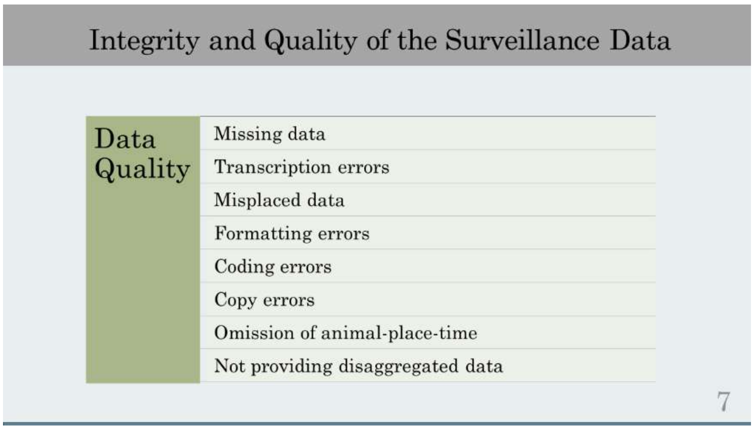


Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 6

SCRIPT / KEY POINTS:

There are two types of data, which includes primary and secondary data. For primary data, you collect and input the data yourself. You understand how the data was collected and the limitations for the collection tool and data. With secondary data, you do not collect or input the data yourself. The data already previously exists, either from your field office or local area laboratory. Therefore, you do not fully understand how the data was collected, since you were not part of the collection.



Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

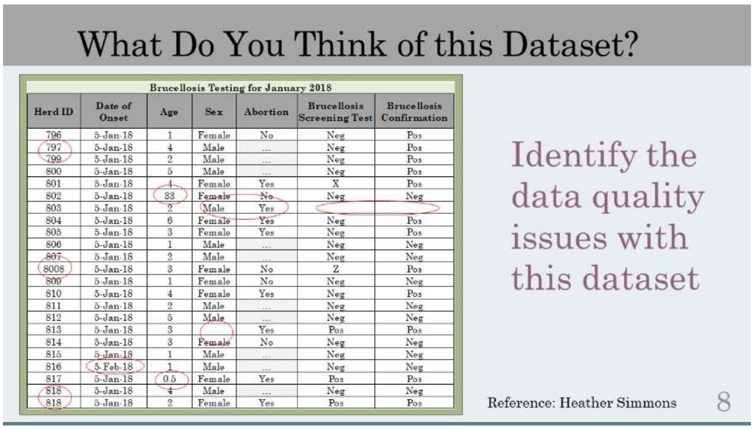
Slide 7

SCRIPT / KEY POINTS:

The following slide provides common issues that can affect the integrity and quality of your surveillance data. It is best to have two individuals check over the dataset before analysis occurs.

Specific data quality issues include:

- Missing data;
- Transcription errors;
- Misplaced data;
- Formatting errors;
- Coding errors;
- Copy errors;
- Omission of animal-place-time; and
- Not providing disaggregated data



Brucellosis Testing for January 2018

Herd ID	Date of Onset	Age	Sex	Abortion	Brucellosis Screening Test	Brucellosis Confirmation
796	5-Jan-18	1	Female	No	Neg	Pos
797	5-Jan-18	4	Male	...	Neg	Pos
799	5-Jan-18	2	Male	...	Neg	Pos
800	5-Jan-18	5	Male	...	Neg	Pos
801	5-Jan-18	4	Female	Yes	X	Pos
802	5-Jan-18	33	Female	No	Neg	Neg
803	5-Jan-18	2	Male	Yes		
804	5-Jan-18	6	Female	Yes	Neg	Pos
805	5-Jan-18	3	Female	Yes	Neg	Pos
806	5-Jan-18	1	Male	...	Neg	Neg
807	5-Jan-18	2	Male	...	Neg	Neg
8008	5-Jan-18	3	Female	No	Z	Pos
809	5-Jan-18	1	Female	No	Neg	Neg
810	5-Jan-18	4	Female	Yes	Neg	Pos
811	5-Jan-18	2	Male	...	Neg	Neg
812	5-Jan-18	5	Male	...	Neg	Neg
813	5-Jan-18	3		Yes	Pos	Pos
814	5-Jan-18	3	Female	No	Neg	Neg
815	5-Jan-18	1	Male	...	Neg	Neg
816	5-Feb-18	1	Male	...	Neg	Neg
817	5-Jan-18	0.5	Female	Yes	Pos	Pos
818	5-Jan-18	4	Male	...	Neg	Neg
818	5-Jan-18	2	Female	Yes	Pos	Pos

Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 8

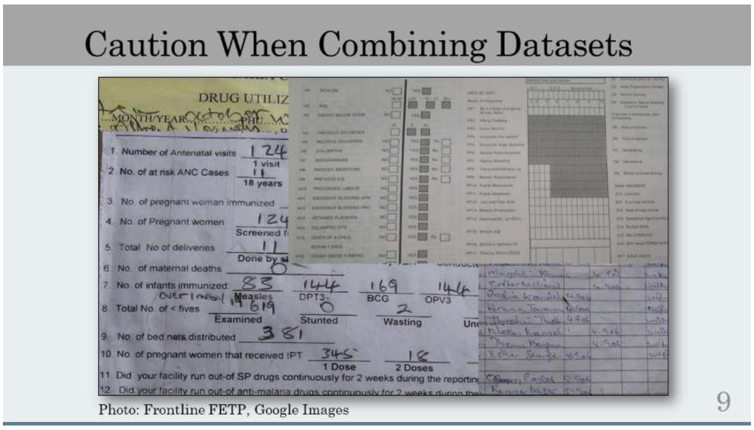
SCRIPT / KEY POINTS:

The following dataset provides data quality issues.

Examples include:

- Skipping of record numbers so it is not in a continuous fashion (i.e., 797 to 799)
- Inaccurate numbers of record numbers (i.e., 8008)
- Double entry of a record number (i.e., 818)
- Incorrect dates for the reporting period (i.e., February date during a January reporting period)
- Outliers in age based on the rest of the dataset (i.e., 2-year old and 98-year old)
- Incorrect answers between gender and pregnancy
- Missing data
- Incorrect labelling of “Yes” or No for the type of test.

Reference: Heather Simmons



Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

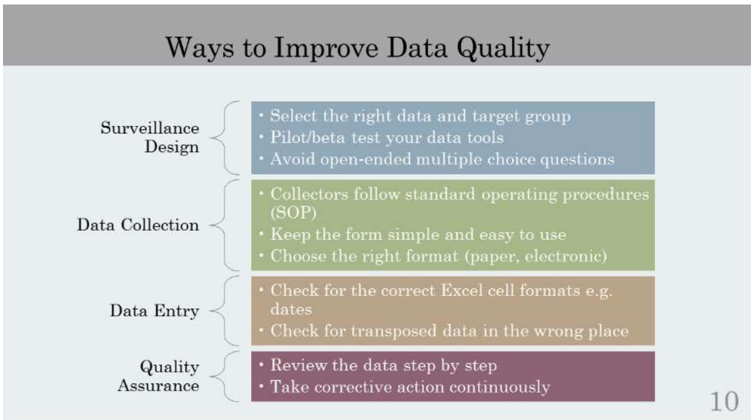
Slide 9

SCRIPT / KEY POINTS:

When combining datasets from multiple collection tools, it is essential that you understand what specific issues may occur related to the data quality and to link and use the same kind of data from different sources. For example, one database may measure age in weeks and another database may measure age in months.

Having a systematic approach to how you will enter data in from your data collection tools is an integral part to ensure the integrity and quality of the data.

Photo: Frontline FETP, Google Images

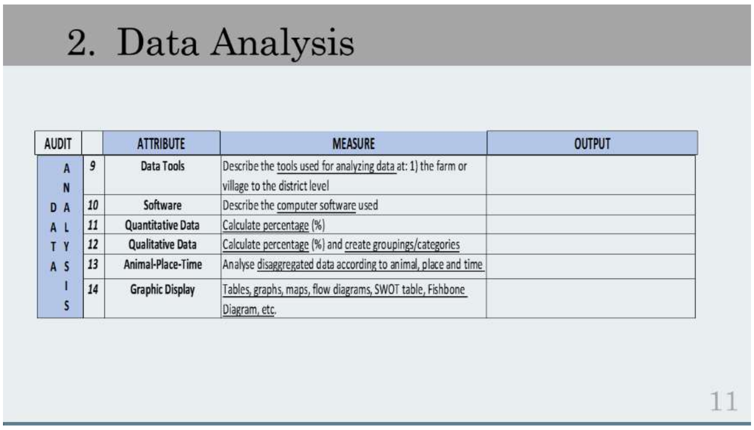


Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 10

SCIPT / KEY POINTS

Read slide.



AUDIT		ATTRIBUTE	MEASURE	OUTPUT
DATA ANALYSIS	9	Data Tools	Describe the tools used for analyzing data at: 1) the farm or village to the district level	
	10	Software	Describe the computer software used	
	11	Quantitative Data	Calculate percentage (%)	
	12	Qualitative Data	Calculate percentage (%) and create groupings/categories	
	13	Animal-Place-Time	Analyse disaggregated data according to animal, place and time	
	14	Graphic Display	Tables, graphs, maps, flow diagrams, SWOT table, Fishbone Diagram, etc.	

Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 11

SCRIPT / KEY POINTS:

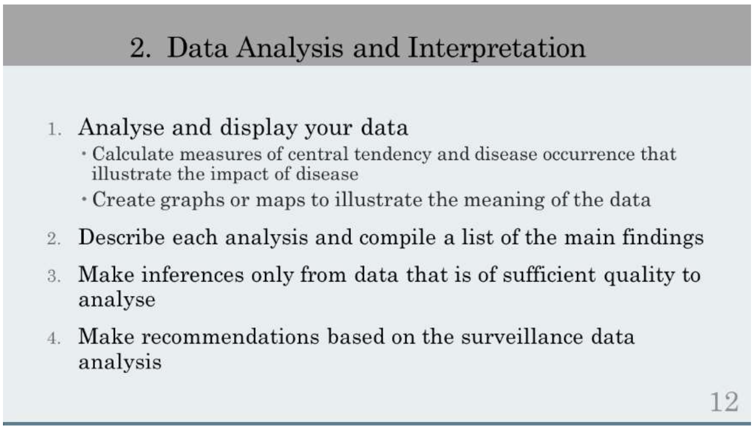
The following provides information for monthly surveillance report metrics related to data analysis.

The attributes to consider include:

- Data Tools used
- Software used
- Quantitative Data
- Qualitative Data
- Animal-Place-Time Data
- Graphic Display

INSTRUCTOR NOTE: Explore each column heading and ask these questions:

1. Why is it important to measure each metric?
2. How can these metrics help to improve the surveillance system, recalling that surveillance must always result in action being taken.

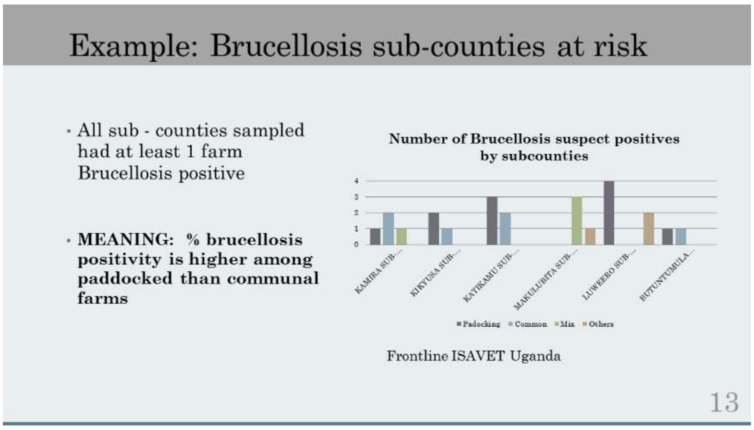


Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 12

SCRIPT / KEY POINTS:

In analysing surveillance data, you will want to calculate and report specific measures of central tendency. This includes the mean, median,and mode. In addition, you should create line graphs or histograms to illustrate the meaning of the data. Remember that line graphs and histograms are used for quantitative variables and bar charts and pie graphs are used for qualitative data. Next, make a list of the main findings, so you can make inferences to determine if the data is of sufficient quality to analyse. From this, you can make prevention recommendations based on the surveillance data you have collected or received.



Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

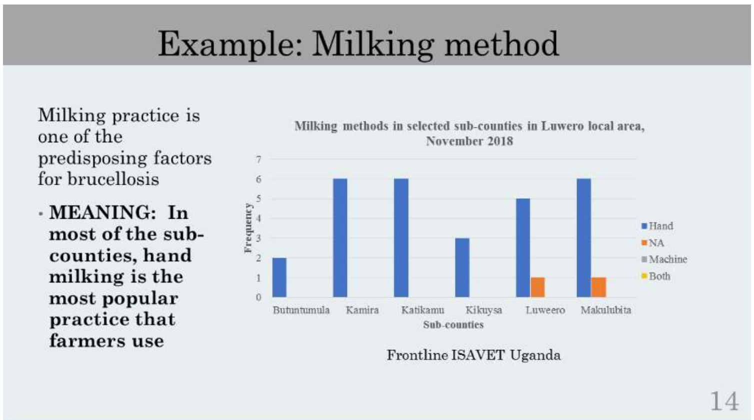
Slide 13

SCRIPT / KEY POINTS:

In this example for brucellosis, the predominant pattern described is that the proportion of positive cattle tends to be higher in paddocked animals in the majority of subcounties sampled.

Reference:

Frontline ISAVET Uganda



Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

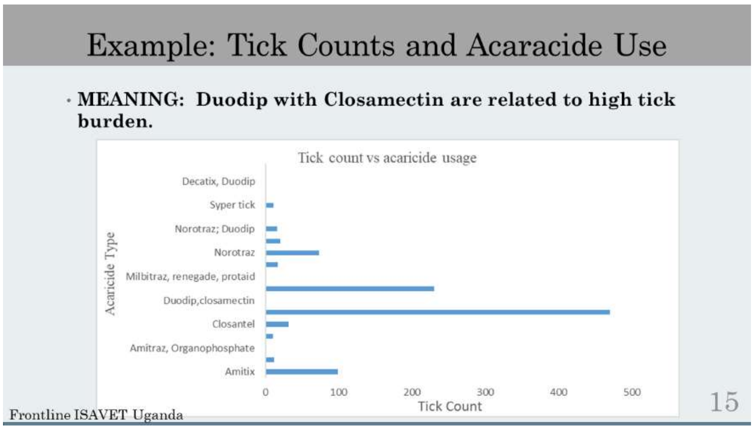
Slide 14

SCRIPT / KEY POINTS:

Furthermore, milking by hand is associated with a higher risk of positive animals in a herd, demonstrating that transmission is linked to hand milking

Reference:

Frontline ISAVET Uganda



Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

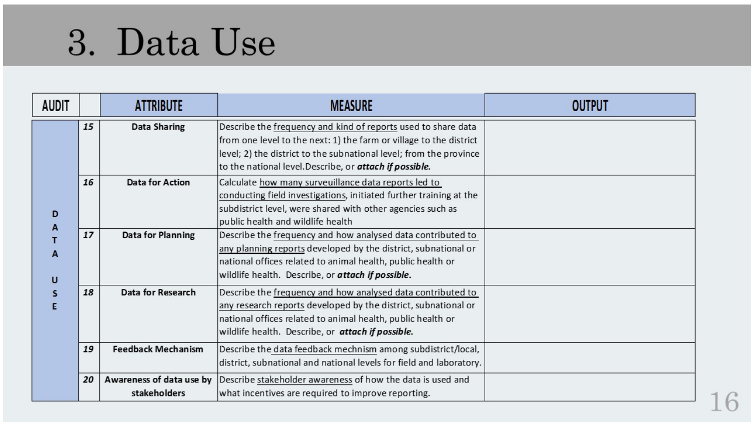
Slide 15

SCRIPT / KEY POINTS:

In this example, high tick counts are associated with one particular acaricide, Closamectin

Reference:

Frontline ISAVET Uganda


3. Data Use

AUDIT		ATTRIBUTE	MEASURE	OUTPUT
DATA USE	15	Data Sharing	Describe the frequency and kind of reports used to share data from one level to the next: 1) the farm or village to the district level; 2) the district to the subnational level; from the province to the national level.Describe, or ***attach if possible.***	
	16	Data for Action	Calculate how many surveuillance data reports led to conducting field investigations, initiated further training at the subdistrict level, were shared with other agencies such as public health and wildlife health	
	17	Data for Planning	Describe the frequency and how analysed data contributed to any planning reports developed by the district, subnational or national offices related to animal health, public health or wildlife health. Describe, or ***attach if possible.***	
	18	Data for Research	Describe the frequency and how analysed data contributed to any research reports developed by the district, subnational or national offices related to animal health, public health or wildlife health. Describe, or ***attach if possible.***	
	19	Feedback Mechanism	Describe the data feedback mechnism among subdistrict/local, district, subnational and national levels for field and laboratory.	
	20	Awareness of data use by stakeholders	Describe stakeholder awareness of how the data is used and what incentives are required to improve reporting.	

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Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 16

SCRIPT / KEY POINTS:

The following provides information for monthly surveillance report metrics related to data use.

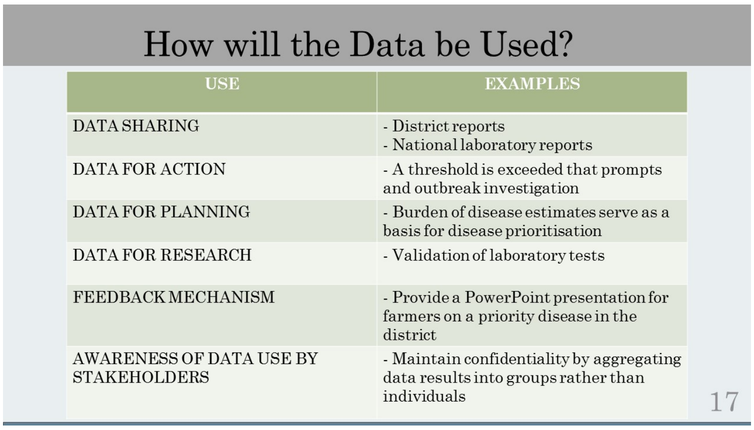
The attributes to consider include:

- DATA SHARING
- DATA FOR ACTION
- DATA FOR PLANNING

- DATA FOR RESEARCH
- FEEDBACK MECHANISM
- AWARENESS OF DATA USE BY STAKEHOLDERS

INSTRUCTOR NOTE: Explore each column heading and ask these questions:

1. Why is it important to measure each metric?
2. How can these metrics help to improve the surveillance system, recalling that surveillance must always result in action being taken.



How will the Data be Used?

USE	EXAMPLES
DATA SHARING	- District reports - National laboratory reports
DATA FOR ACTION	- A threshold is exceeded that prompts and outbreak investigation
DATA FOR PLANNING	- Burden of disease estimates serve as a basis for disease prioritisation
DATA FOR RESEARCH	- Validation of laboratory tests
FEEDBACK MECHANISM	- Provide a PowerPoint presentation for farmers on a priority disease in the district
AWARENESS OF DATA USE BY STAKEHOLDERS	- Maintain confidentiality by aggregating data results into groups rather than individuals

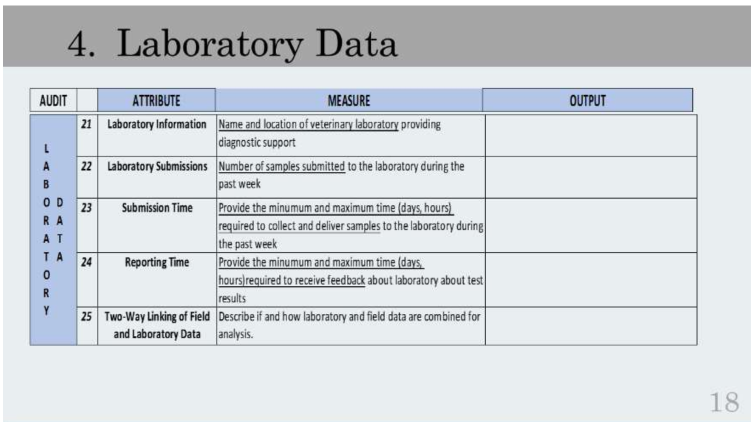
17

Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 17

SCRIPT / KEY POINTS:

The final use of the data will determine data collection and data analysis methods that are most appropriate.



4. Laboratory Data

AUDIT		ATTRIBUTE	MEASURE	OUTPUT
LABORATORY DATA	21	Laboratory Information	Name and location of veterinary laboratory providing diagnostic support	
	22	Laboratory Submissions	Number of samples submitted to the laboratory during the past week	
	23	Submission Time	Provide the minumum and maximum time (days, hours) required to collect and deliver samples to the laboratory during the past week	
	24	Reporting Time	Provide the minumum and maximum time (days, hours)required to receive feedback about laboratory about test results	
	25	Two-Way Linking of Field and Laboratory Data	Describe if and how laboratory and field data are combined for analysis.	

18

Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 18

SCRIPT / KEY POINTS:

The following provides information for monthly surveillance report metrics related to laboratory data.

The attributes to consider include:

- Laboratory Information
- Laboratory Submissions
- Submission Time
- Reporting Time
- Two-Way Linking of Field and Laboratory Data

INSTRUCTOR NOTE: Explore each column heading and ask these questions:

1. Why is it important to measure each metric?
2. How can these metrics help to improve the surveillance system, recalling that surveillance must always result in action being taken.

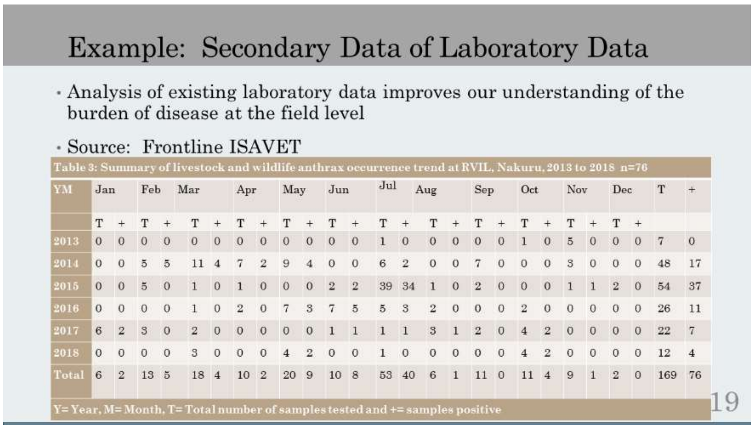


Table 3: Summary of livestock and wildlife anthrax occurrence trend at RVIL, Nakuru, 2013 to 2018 n=76

YM	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		T	+
	T	+	T	+	T	+	T	+	T	+	T	+	T	+	T	+	T	+	T	+	T	+	T	+		
2013	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	5	0	0	0	7	0
2014	0	0	5	5	11	4	7	2	9	4	0	0	6	2	0	0	7	0	0	0	3	0	0	0	48	17
2015	0	0	5	0	1	0	1	0	0	0	2	2	39	34	1	0	2	0	0	0	1	1	2	0	54	37
2016	0	0	0	0	1	0	2	0	7	3	7	5	5	3	2	0	0	0	2	0	0	0	0	0	26	11
2017	6	2	3	0	2	0	0	0	0	0	1	1	1	1	3	1	2	0	4	2	0	0	0	0	22	7
2018	0	0	0	0	3	0	0	0	4	2	0	0	1	0	0	0	0	0	4	2	0	0	0	0	12	4
Total	6	2	13	5	18	4	10	2	20	9	10	8	53	40	6	1	11	0	11	4	9	1	2	0	169	76

Y= Year, M= Month, T= Total number of samples tested and += samples positive

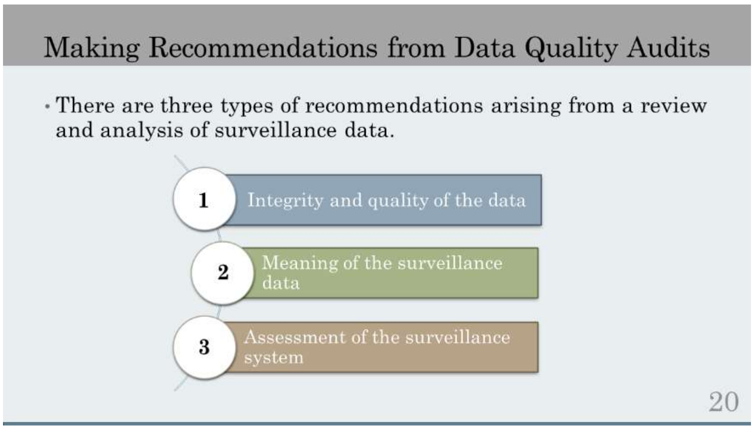
Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 19

SCRIPT / KEY POINTS:

Here is an example of laboratory test results for anthrax which provides a numerator (No. test positives) divided by the denominator (total number of samples tested).

Analysis of existing secondary laboratory data improves our understanding of the burden of disease at the field level



Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

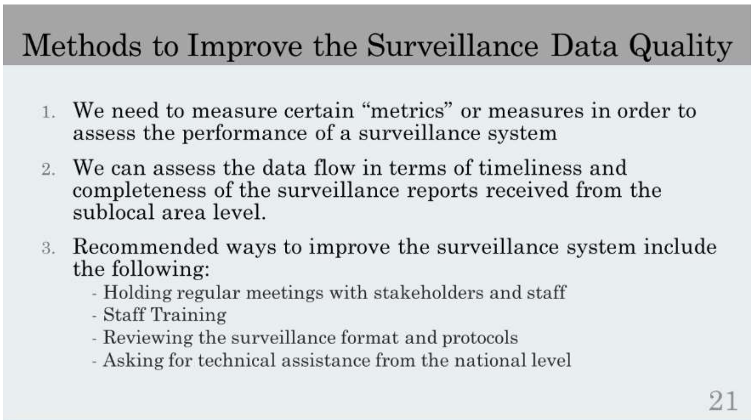
Slide 20

SCRIPT / KEY POINTS:

There are three types of recommendations arising from a review and analysis of surveillance data.

This includes:

- The integrity and quality of the data;
- The meaning of the surveillance data; and
- Assessment of the surveillance system.

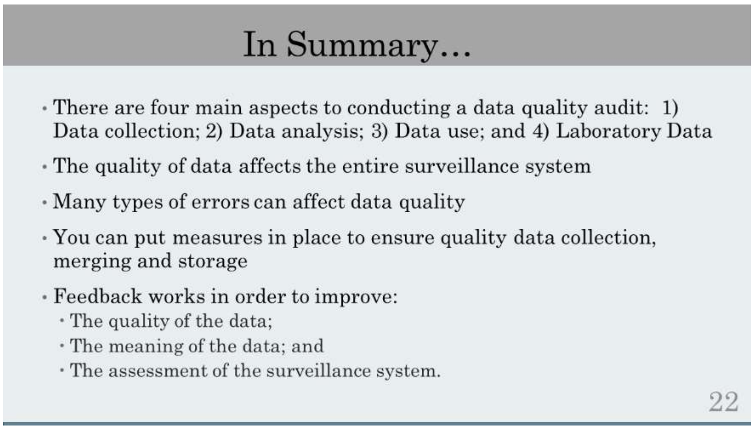


Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 21

SCRIPT / KEY POINTS:

Assess the timeliness and completeness of the surveillance reports received from the sublocal area level. For assessment, there are multiple recommended ways to improve the surveillance system, which includes: training, providing regular meetings, reviewing the surveillance format and asking for technical assistance from the national level.



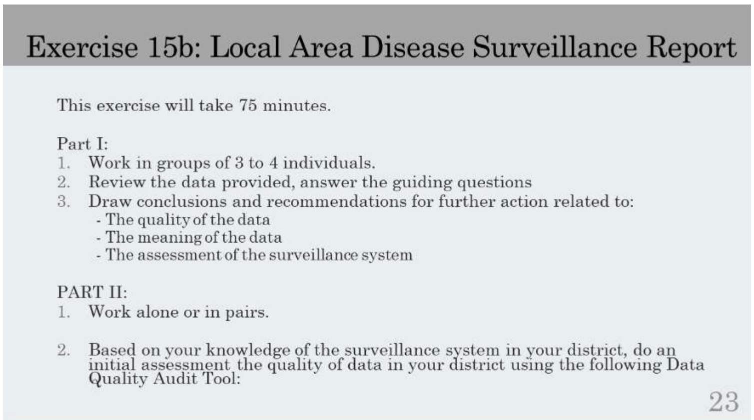
Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 22

SCRIPT / KEY POINTS:

In summary,

- The quality of data affects the entire surveillance system;
- Many types of errors can affect data quality;
- You can put measures in place to ensure quality data collection, merging and storage; and
- Feedback works!



Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 23

SCRIPT / KEY POINTS:

Exercise 15b instructions: Local area Disease Surveillance Report

This exercise will take 75 minutes.

Work in groups of 3 to 4 individuals.

Review the data provided and draw conclusions and recommendations for further action.

Draw conclusions and recommendations for further action related to the:

Quality of the data;

Meaning of the data; and

Assessment of the surveillance system.

Instructors:

See instructor guide for answers.

Lesson 9 – Making Recommendations for Animal Disease Prevention and Control,

Slide 24

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 15b – Local Area Disease Surveillance Report

Description of Exercise:

Review a local area disease surveillance report and draw conclusions and recommendations for further action related to the quality of the data, the meaning of the data, and assessment of the surveillance system. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 1.25 hours

Exercise Components and Structure:

1. You have 1 hour and 15 minutes to complete this exercise
2. Work in groups of 3-4 individuals and answer the questions in the exercise.
3. Review the exercise and work in groups to assess the quality of the local area surveillance report.

Materials, Data or Information:

1. Microsoft word
2. Pen and paper

Expected Outputs and Deliverables of Each Participant:

1. Applying critical thinking for making conclusions and recommendations.

Local Area Disease Surveillance Report

4. Monthly local area reporting summary (Table 1):

Annual Data and Metrics

December 31, 2020

Sublocal area Name	No. Monthly Reports Received in 2020	No. Days from Laboratory Submission to Local area Reporting	No. Days from Local area Notification to Farmer Reporting (Days)	No. of Surveillance Events this Year
Sublocal area A	11	2	1	12
Sublocal area B	1			1
Sublocal area C	8	3	5	2
Sublocal area D	12	2	3	5
Sublocal area E	7	2	3	3
Sublocal area F	12	2	0	15
Sublocal area G				2
Sublocal area H	0	Not applicable		12
% Reports Received to Date	53.1%	Mode: 2 d Mean = 2.2 d	Mode:	Total =

1. Make the calculations on the bottom row of the table. Assess the surveillance system in this local area with regards to:

   a) Timeliness
      - The benchmarks/targets for reporting have not been given. However, the time for the local area to notify the farmer is greater than the time for the laboratory to provide results to the local area. The local area must take action to provide feedback to the farmers since this will negatively influence future cooperation to report disease.

   b) % Reports Received to Date
      - 51/96 = 53.1%.
      - Only half of the reports were received during the past 12-months. Some sublocal area have responded well, but most either responded infrequently or not at all. Action need to be taken to identify the reasons.

   c) Give your assessment of surveillance in each sublocal area listed below.

Sublocal area A – Reliable reporting, timely response following laboratory submission with consistent reporting once monthly (example)

Sublocal area B – For this sublocal area, very limited reporting is occurring, so action needs to be taken. Making a visit to the sublocal area to discuss reasons and challenges faced by the sublocal area should be conducted.

Sublocal area C – This sublocal area only had 2 surveillance events during the previous year, so it is unknown why the reporting is so limited. A visit to the sublocal area is needed to initiate further corrective action. The timeliness of the local area providing feedback to the farmer should be investigated needs to be improved through follow-up action. The receipt of laboratory reports following submission is delayed and follow-up action needs to be taken with the laboratory or in dealing with sample submission (e.g., transportation is slow).

Sublocal area D – This sublocal area has reliable reporting. Timely response following laboratory submission is noted, with delayed reporting to the farmer with consistent reporting once monthly.

Sublocal area E – This sublocal area only had 3 surveillance events during the previous year, so it is unknown why the reporting is so limited. A visit to the sublocal area is needed to initiate further corrective action. The timeliness of the local area providing feedback to the farmer should be investigated needs to be improved through follow-up action.

Sublocal area F – This sublocal area has reliable reporting, timely response following laboratory submission and rapid reporting of feedback to farmers with consistent reporting once monthly.

Sublocal area G – Almost no data has been submitted except perhaps some informal reports of 2 surveillance events in the past year. The human resource issues may be influencing the reporting or perhaps operational issues within the chain of command. Follow-up action is urgent.

Sublocal area H – The situation is similar to Sublocal area G, but the reasons may be quite different. Since laboratory timeliness is not applicable, it may be an isolated sublocal area with limited access to transportation options to submit samples. Follow-up action is needed.

ANIMAL							Active (A) or Passive (P)	TIME				PLACE	
Species or Type	**Class**	**Total No. at Risk**	**No. Sick**	**No. Dead**	**Disease(s) Suspected (S) or Confirmed (C)**	**Notes: (Age groups, breed and sex, etc.)**		**Date of Visit**	**Date Symptoms First Observed**	**Date of first death**	**Date of Laboratory Submission**	**Sublocal area Name**	**GPS Coordinates Lat./Long.**
Cattle	Dairy	1251 822	3 5	2	Trypanosomias (S) RVF (C)	Mature cow Mature	P P	12/2/20 12/20/20	11/29/20 12/20/20	11/3/20 12/20/20	12/2/20 Not applicable (NA)	A	
	Beef	744		10	Anthrax (C)	Mature Females	P	12/12/20	12/7/20	12/7/20	12/12/20	A	
	Dual purpose												
	Breeder	5	0	1	Brucellosis (S)	Bull	S	1212/20	11/24/20	12/12/20	NA	H	
Sheep	Meat												
	Milk												
	Dual purpose	230	1	1	PPR (C)	Lamb on pasture	P	12/3/20	12/3/20	12/3/20	NA	D	
	Breeder												
Goats	Meat												
	Milk												
	Dual purpose	451	3	2	PPR (S)	Kids on tether	P	12/17/20	12/15/20	12/17/20	NA	E	
	Breeder												
Poultry	Meat	4525	62	45	Newcastle disease (S)	28 day broilers	A	12/5/20	12/5/20	12/5/20	12/5/20	F	
	Eggs												
	Dual Purpose												
	Breeder												
Equine	Horse												
	Donkey												
	Mule												

ANIMAL							Active (A) or Passive (P)	TIME				PLACE	
Species or Type	**Class**	**Total No. at Risk**	**No. Sick**	**No. Dead**	**Disease(s) Suspected (S) or Confirmed (C)**	**Notes: (Age groups, breed and sex, etc.)**		**Date of Visit**	**Date Symptoms First Observed**	**Date of first death**	**Date of Laboratory Submission**	**Sublocal area Name**	**GPS Coordinates Lat./Long.**
	Other												
Pets	Dog	23	0	1	Rabies (S)	4-month puppy	P	12/31/20	12/25/20	12/31/20	12/31/20	F	
	Cat												
	Other												
Wildlife	Specify												

2. Assess the data quality for each disease line item in the December local area report.

Sublocal area:

A –

- There is timely response to a suspected Trypanosomiasis event. Age should be specified and included.
- For the anthrax event, the number dead should be included in the number sick, since this is always the case prior to death. The OIE requires that the sick include sick animals of both living and dead animals. Therefore, the number of sick should always be greater than the number dead. If you observe 5 sick living animals and there are 10 dead, then the total number of sick is actually 15. Training of staff is needed at the sublocal area level to record data properly according to OIE standards. Age is missing and needs to be added. This is a training issue requiring follow-up action.

B –

- The number dead is missing. Although RVF is confirmed, the date of the laboratory submission is missing. The age of the animals should be specified and included.

H –

- For the Brucellosis event, the number dead should be included in the number sick, since this is always the case prior to death. The OIE requires that the sick include sick animals of both living and dead animals. Therefore, the number of sick should always be greater than the number dead. If you observe 0 sick living animals and there is 1 dead, then the total number of sick is actually 1. Training of staff is needed at the sublocal area level to record data properly according to OIE standards.
- The age of the bull is missing.
- An error was made when recording the type of surveillance conducted (S instead of A or P).

D –

- Although PPR is confirmed, the date of the laboratory submission is missing.
- The age of animals is missing.

F –

- For the Newcastle event, the laboratory samples have been submitted and this is a potential public health event which MUST include laboratory submission.
- The precise age is important to record since we need to correlate real disease from vaccine reaction to live Newcastle vaccine that was previously provided improperly (a rolling reaction resulting in chronic respiratory disease, also called, CRD).
- For the rabies event, the number dead should be included in the number sick, since this is always the case prior to death. The OIE requires that the sick include sick animals of both living and dead animals. Therefore, the number of sick should always be greater than the number dead. If you observe 0 sick living animals and there is 1 dead, then the total number of sick is actually 1. Training of staff is needed at the sublocal area level to record data properly according to OIE standards.
- The age of the bull is missing.
- There was rapid response to the disease report and the samples were sent immediately to the laboratory – this is a sound response to the report.

Can you find other errors?

3. What is the meaning of the data following your analysis?

- Some morbidly and mortality proportions cannot be made due to data entry errors.

- Here are the results we can calculate (remember, the morbidity count includes both living and dead affected animals):

Disease	**Morbidity**	**Mortality**
Trypanosomias (S) RVF (C)	= 3/1251 = 0.2%	= 2/1251 = 0.1%
Anthrax (C)	Unable to calculate	= 10/744 = 1.3%
Brucellosis (S)	Unable to calculate	= 1/5 = 20%
PPR (C) - sheep	= 1/230 = 0.4%	= 1/230 = 0.4%
PPR (C) - goats	= 3/451 = 0.7%	= 2/451 = 0.4%
Newcastle disease (S)	= 62/4525 = 1.4%	= 45/4525 = 1.0%
Rabies (S)	Unable to calculate	= 1/23 = 4.3%

4. What is the disease with the highest impact in this local area? Please explain your answer.

- Brucellosis had the greatest impact on mortality, but the population at risk included only 5 animals. Therefore, 1 dead animal had a high impact in that breeding group with valuable animals.
- Broiler producers normally expect less than 0,05% mortality at 28-days of age. Therefore, both morbidity and mortality are above the threshold and samples

should immediately be sent to the laboratory to confirm the presence or absence of avian influenza virus, and to exclude a vaccine reaction which can occur at this age.

- The economic and possible health impacts of each event must also be considered in the impact assessment and is not included in this response

5. What type of surveillance is most commonly used in the local area? Why is this important to record and what does it say about the ability to have early disease detection?

   Six of 7 (86%) properly entered responses were reported passively. The reliance on passive surveillance methods will limit the ability for rapid detection and response. For this reason, markets, abattoirs and sales yards can be a good place to improve more rapid detection and response through efficient targeted active surveillance.

6. What do you recommend for improving the surveillance in this local area?

   Responses:

   - Timeliness of local area feedback to the farmer needs to be improved through follow up discussions concerning human resources and time management.
   - Data errors need to be improved through follow up training for all sublocal area in order to standardise data collection, recoding and data sharing.
   - Failing to enter morbidity data properly means that disease impact information will be missing to more fully describe the disease event.
   - Reliance on passive surveillance means that there are opportunities to use more targeted risk-based surveillance with limited human resources.

Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control

Estimated Lesson and Exercise Time	2 hours and 30 minutes
Instructor Materials	Frontline ISAVET Lesson 10 Sharing Surveillance Information in a Network for Animal Disease Prevention and Control.pptx
	Frontline ISAVET Lesson 10 Sharing Surveillance Information in a Network for Animal Disease Prevention and Control Instructor Guide.doc
	Flip chart
	Markers
Participant Materials	Frontline ISAVET Lesson 10 Sharing Surveillance Information in a Network for Animal Disease Prevention and Control Participant Guide.PDF

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

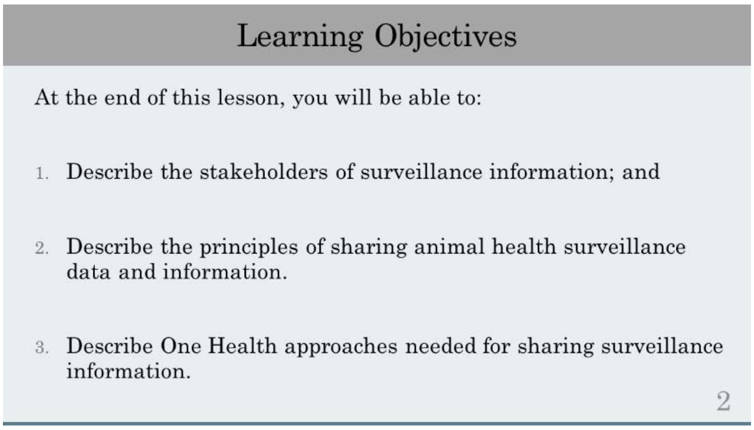
ISAVET	In Service Applied Veterinary Epidemiology Training

Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 10 titled, "Sharing Surveillance Information in a Network for Animal Disease Prevention and Control".



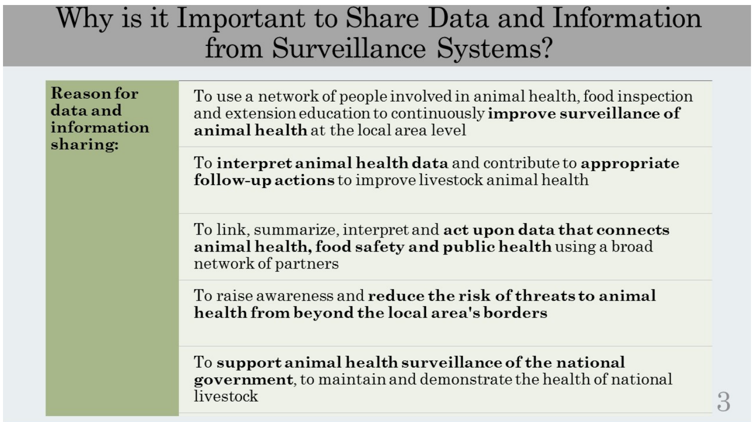
Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 2

SCRIPT / KEY POINTS:

At the end of this lesson, you will be able to:

- Describe the stakeholders of surveillance information; and
- Describe the principles of sharing animal health surveillance data and information.
- Describe One Health approaches needed for sharing surveillance information.



Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

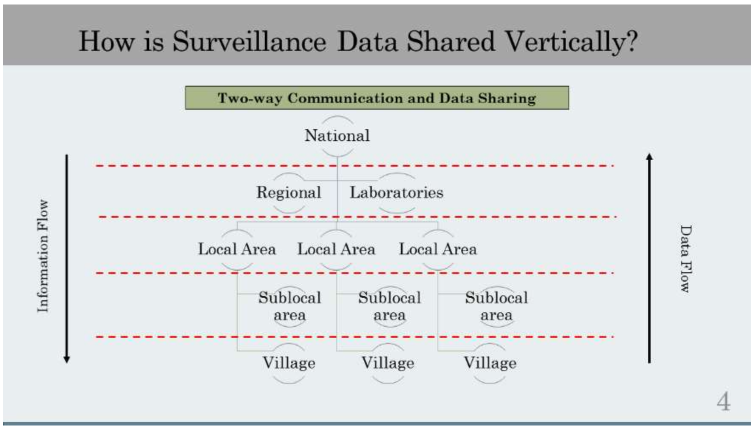
Slide 3

SCRIPT / KEY POINTS:

Why is it important to share data information from surveillance systems?

There are many reasons why you would want to share data information. Specific objectives include:

- To improve surveillance of animal health;
- To interpret animal health data and provide the appropriate follow-up actions;
- To take action upon data that connects animal health, food safety and public health;
- To reduce transboundary risks to animal health across borders;
- To support animal health surveillance of the national government.



Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

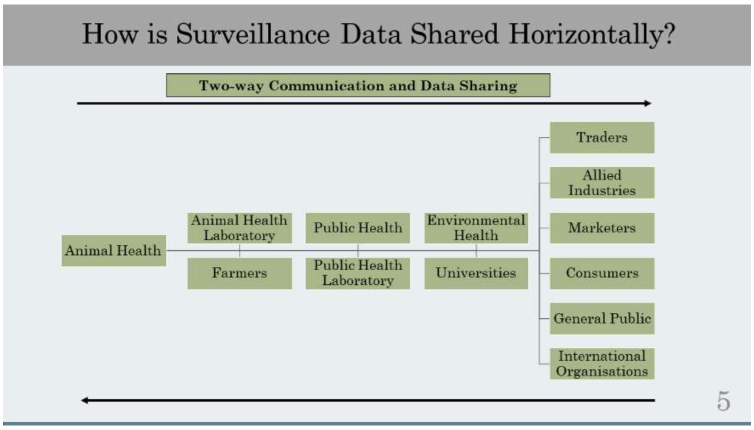
Slide 4

SCRIPT / KEY POINTS:

Two-way communication and data sharing is integral to a functional surveillance system. Local levels should contribute raw disaggregated data up to the national level.

The national level analyses of data and provides information sometimes including laboratory results back to the local levels. In the illustration above, data flow goes upstream and information flow goes downstream among animal health, public health and wildlife partners under a One Health approach.

- Data flow: Village → Sublocal area → Local area → Regional/Laboratories → National
- Information flow: National → Regional/Laboratory → Local area → Sublocal area → Village



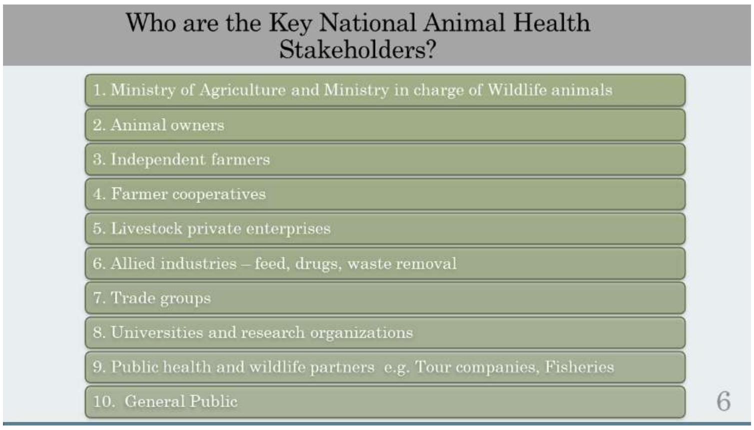
Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 5

SCRIPT / KEY POINTS:

In addition to vertical information sharing within the government ministry, horizontal information with key stakeholders is also important in order to improve coordination and collaboration for taking action on surveillance data and information under a One Health approach.

This is an example of horizontal surveillance data sharing among animal health authorities and key stakeholders.

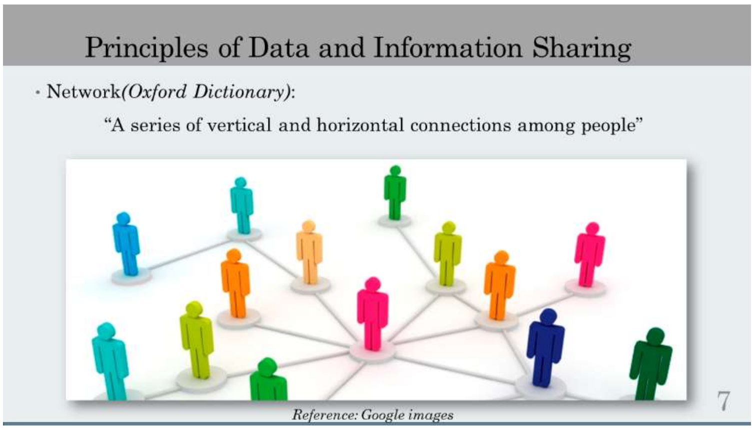


Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 6

SCRIPT / KEY POINTS:

The following are key national animal health stakeholders who need to be included in information sharing for surveillance. Can you identify others within your country under a One Health approach?



Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

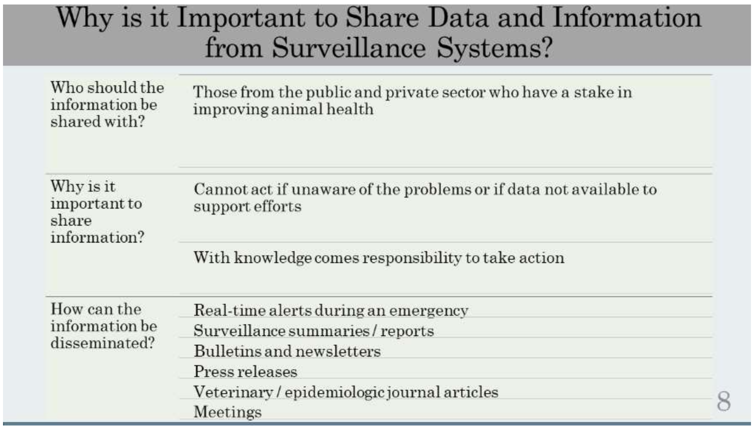
Slide 7

SCRIPT / KEY POINTS:

The Oxford Dictionary defines a network as a series of vertical and horizontal connections among people.

Photo:

Image 1: Google



Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

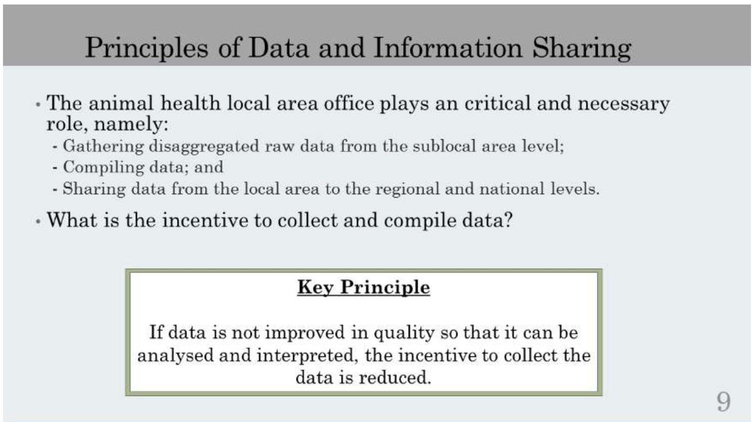
Slide 8

SCRIPT / KEY POINTS:

Why is it important to share data information from surveillance systems?

There are many reasons why you would want to share data information. Specific objectives include:

- To improve surveillance of animal health;
- To interpret animal health data and provide the appropriate follow-up actions;
- To take action upon data that connects animal health, food safety and public health;
- To reduce transboundary risks to animal health across borders;
- To support animal health surveillance of the national government.



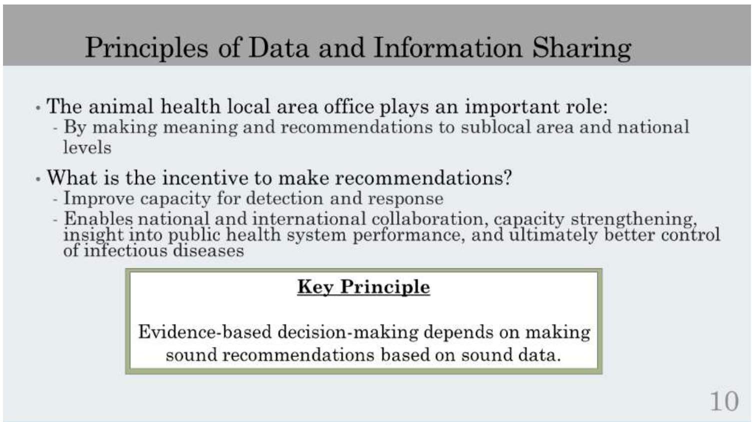
Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 9

SCRIPT / KEY POINTS:

If data is not improved in quality so that it can be analysed, the incentive to collect the data is reduced.

Realise that you play a vital role in making sure that data will have meaning and will be of use at all levels of the government.

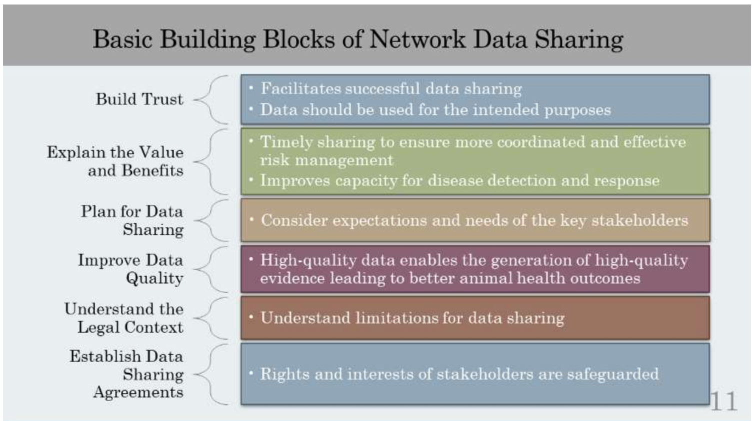


Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 10

SCRIPT / KEY POINTS:

Realise that you play a vital role in making sure that data will have meaning and will be of used to make evidence-based decision making at all levels of the government.



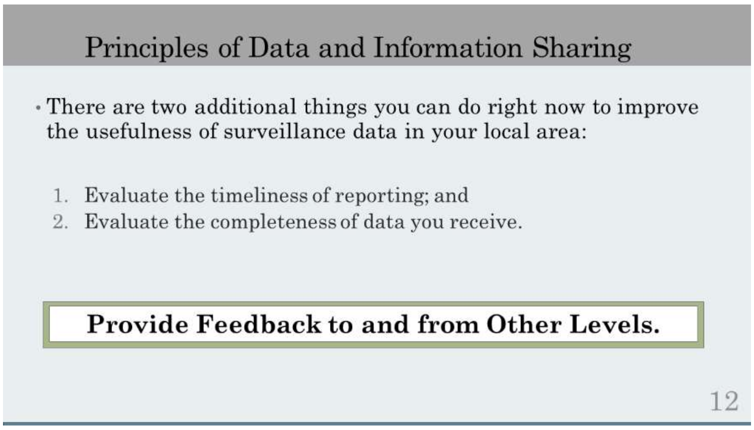
Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 11

SCRIPT / KEY POINTS:

Basic principles in data sharing includes:

- Building trust;
- Articulating the value and benefits;
- Planning for data sharing;
- Achieving data quality;
- Understanding the legal context; and
- Creating data sharing agreements.



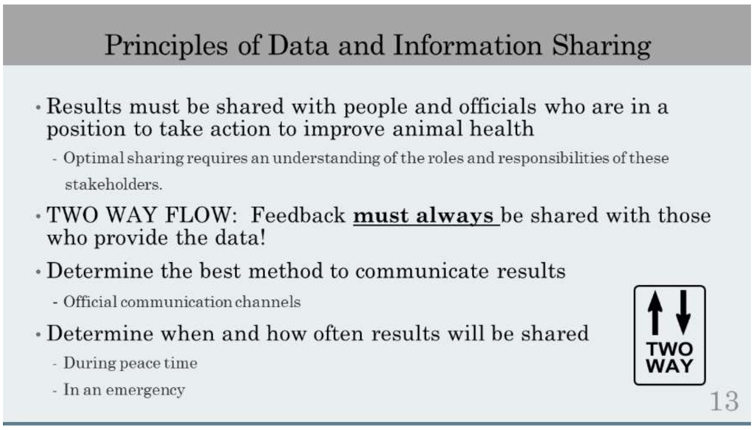
Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 12

SCRIPT / KEY POINTS:

Improvements in surveillance system can only occur if all levels provide feedback and act on the issues identified. Surveillance is a two way process to improve the actions that are taken.

Timeliness and completeness are two key measures to improve surveillance.



Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

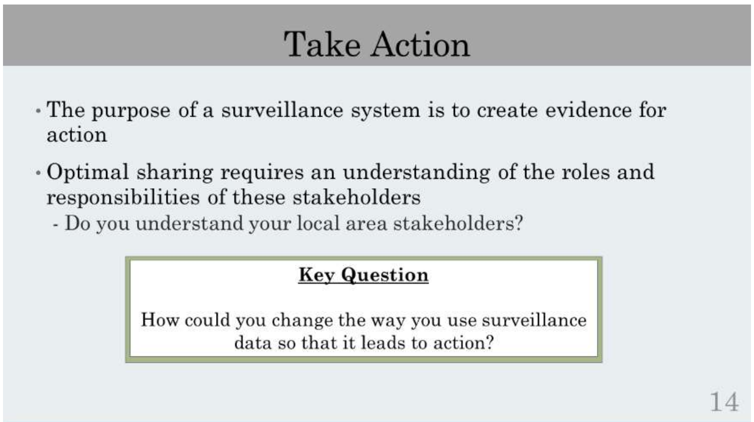
Slide 13

SCRIPT / KEY POINTS:

Important considerations for information to promote taking action include:

1. Share information with those who are in a position to improve animal health
2. Feedback must always be shared to those providing data. Failure to do so will eliminate the incentive for stakeholders to provide information.
3. Choose the right way to communicate results, including reports, bulletins, meetings, etc.

Determine the frequency and timing to communicate data and information in both routine and emergency situations



Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

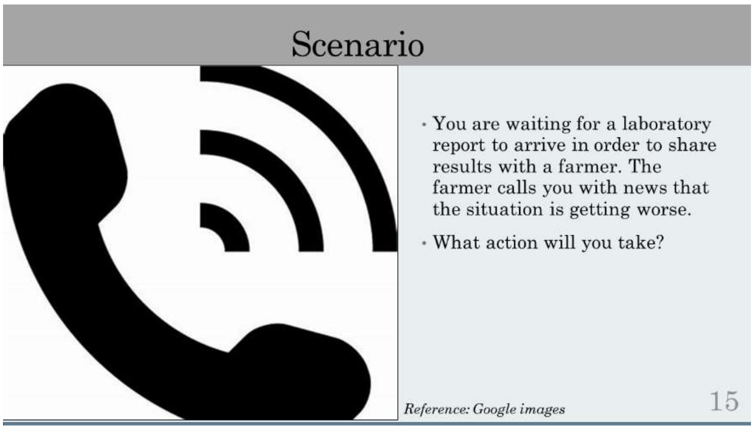
Slide 14

SCRIPT / KEY POINTS:

The purpose of a surveillance system is to create evidence for action. Optimal sharing requires and understanding of the roles and responsibilities of these stakeholders. You need to identify who your local area stakeholders are.

Let's take a few answers to this question. How could you change the way you use surveillance data so that it leads to action?

The following slide describes an example to further explore these ideas.



Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 15

SCRIPT / KEY POINTS:

Let's review the following scenario. You are waiting for a laboratory report to arrive in order to share with a farmer. The farmer calls you with news that the situation is getting worse. What action will you take?

Take a few responses for this question noted above.

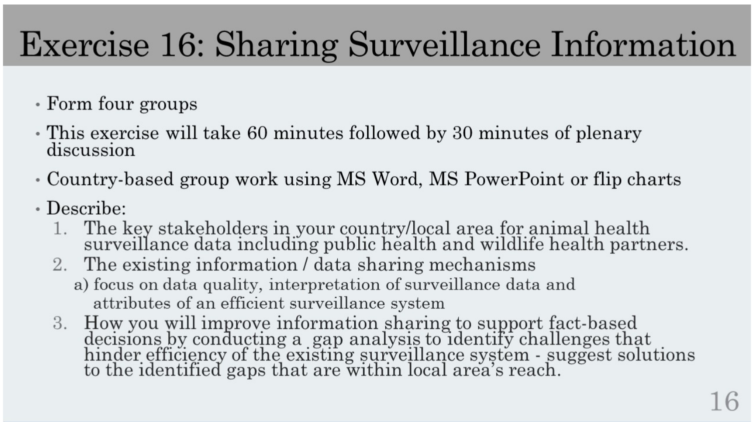
Action you could take could include the following options:

1. Contact the farmer to let them know that you will call the laboratory to try and get results immediately.

2. Send a team to the farm to further investigate the current situation.
3. Contact your supervisor to inform him of the situation in case action is needed and incase there are similar situations in surrounding local area.

Photo:

Image 1: Google



Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 16

SCRIPT / KEY POINTS:

Exercise 16 introduction: Sharing surveillance information:

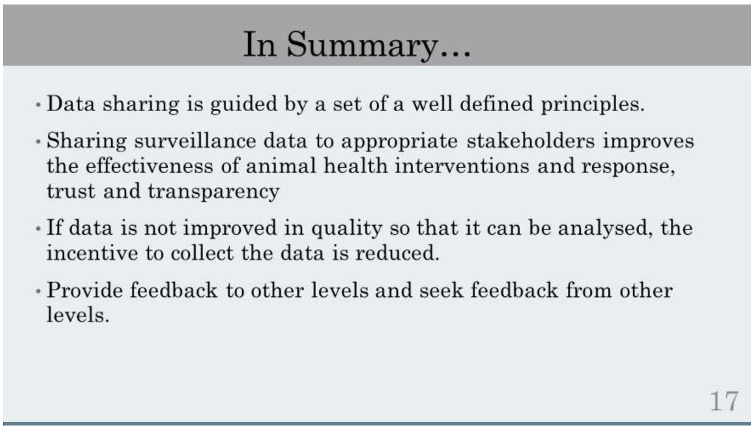
- This exercise will take 60 minutes to complete.
- This will be done through country-based group work using MS Word, MS PowerPoint or flip charts. This is on information sharing among stakeholders and ways to improve information sharing in your country to support decision-making.
- Describe:
    1. The key stakeholders in your country/local area for animal health surveillance data.
    2. The existing information / data sharing mechanisms in your country

a) Focus on: data quality, interpretation of the surveillance data, and attributes of an efficient surveillance system

1. Describe how you will improve information sharing to support fact-based decisions.

Instructors

Review instructor manual for answers.



Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 17

SCRIPT / KEY POINTS:

In summary,

- Data sharing is guided by a set of well-defined principles;
- Sharing surveillance data improves the effectiveness of animal health interventions and response;
- If data is not improved in quality so that it can be analysed, the incentive to collect is reduced; and
- Provide feedback to other levels and seek feedback from other levels.

Lesson 10 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control,

Slide 18

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 16 – Sharing Surveillance Information in a Network for Animal Disease Prevention and Control

Description of Exercise:

Participants will describe the key stakeholder in your country/local area for animal health surveillance data while focusing on data quality, meaning of the surveillance data and discussion of attributes on an efficient surveillance system. Should you have any questions over the exercise, please ask a trainer for clarification.

Allotted Time: 60 minutes + 30 minutes for plenary

Exercise Components and Structure:

- Form into four groups will

Materials, Data or Information:

1 .MS Word, MS PowerPoint or Flip charts

2. Markers

Expected Outputs and Deliverables of Each Participant:

1.List the key stakeholders who need animal surveillance information in your country and show how surveillance data is shared.

2.Provide suggestions on how to improve sharing surveillance information in your country under a One Health approach.

1. .Describe the key stakeholders in your country for animal health surveillance data including public health and wildlife health partners.

The trainees can list at least five relevant stakeholders, depending on the local context.

These may include:

a. Producers/Farmers
b. Producers' associations
c. Local area /regional agriculture / vet services department
d. One Health platform
e. Department of wildlife
f. Academia
g. International organisations that are present within the country (i.e., CDC in Uganda).

2. Describe the existing information / data sharing mechanisms in your country.

This is better done by drawing a schematic flow of information from the producer/farmer to the final consumer of the data. In this case, the flow of information will begin at the Chief Veterinary Officer for the country with flow diagram arrows showcasing how the Chief Veterinary Officer shares data with other departments and relevant international bodies. It is important that the participants draw the direction of the information flow and feedback from the top down to the bottom up.

Data Quality	• Linking with the laboratory for field data. • Well managed data collection tools for data input • Looking for completeness of surveillance information
Meaning of the Surveillance Data	• Well-kept database at the local area level • Understanding the data needed for the surveillance system objectives
Attributes of an Efficient Surveillance System	• Validated • Timeliness • Appropriate reporting mechanisms

3. Describe how you will improve information sharing to support fact-based decisions by conducting a gap analysis to identify challenges that hinder efficiency of the existing surveillance system - suggest solutions to the identified gaps that are within local area's reach.

This requires a clear understanding of: 1) data quality, 2) meaning /how to tell a good story out of the surveillance data, and 3) what makes a given surveillance system to be meaningful, and efficient.

Some of these elements may include:

a. Timelines – rapid response to farmer's call, rapid data collection, analysis and provision of the relevant report;
b. Use of a well-designed and standardised data collection methodology and tool;
c. Completeness of the filled in surveillance tool which will include content and relevance of the captured information;
d. Ability to link the surveillance tool to well-collected and managed laboratory/diagnostic samples;
e. Good analytical skills – descriptive / analytical epidemiology – to extract the story from the data;
f. Provision of feedback;
g. Sharing information with the relevant stakeholders; and
h. Formation of multi-sectorial local area surveillance teams – where appropriate.
i. Personal and team improvement – keep on learning and practicing new surveillance skills – e.g. application of GIS, Value chain principles, and risk analysis / assessment

Lesson 11 – Assessing Surveillance in Your Local Area to Improve Response to Animal Disease and Health Events

Estimated Lesson and Exercise Time	1 hour and 30 minutes
Instructor Materials	ISAVET Lesson 11 Assessing Surveillance in Your Local Area to Improve Response to Animal Disease and Health Events.pptx
	ISAVET Lesson 11 Assessing Surveillance in Your Local Area to Improve Response to Animal Disease and Health Events Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 11 Assessing Surveillance in Your Local Area to Improve Response to Animal Disease and Health Events Participant Guide.doc

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

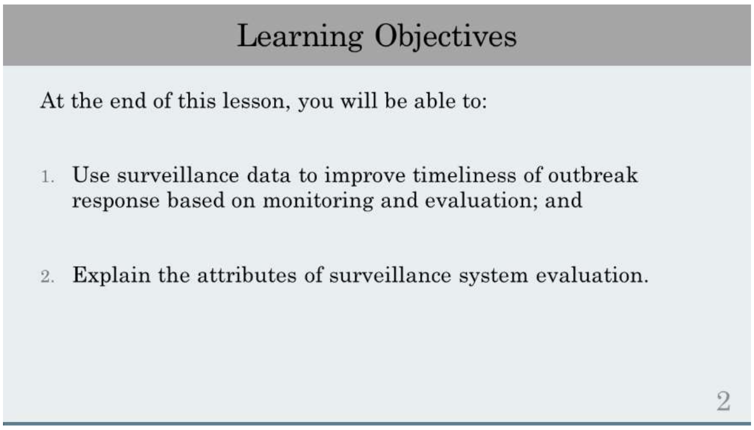
ISAVET	In Service Applied Veterinary Epidemiology Training
MAIFF	Ministry of Agriculture, Animal Industry and Fisheries
PM	Post-Mortem

Lesson 11 – Assessing Surveillance in Your Local Area to Improve Response to Animal Disease and Health Events,

Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 11 titled, "Assessing Surveillance in Your Local area to Improve Response to Animal Disease Events"



Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 2

SCRIPT / KEY POINTS:

At the end of this lesson, you will be able to:

- Use surveillance data to improve timeliness of outbreak response based on monitoring and evaluation; and
- Explain the attributes of surveillance system evaluation.

Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 3

SCRIPT / KEY POINTS:

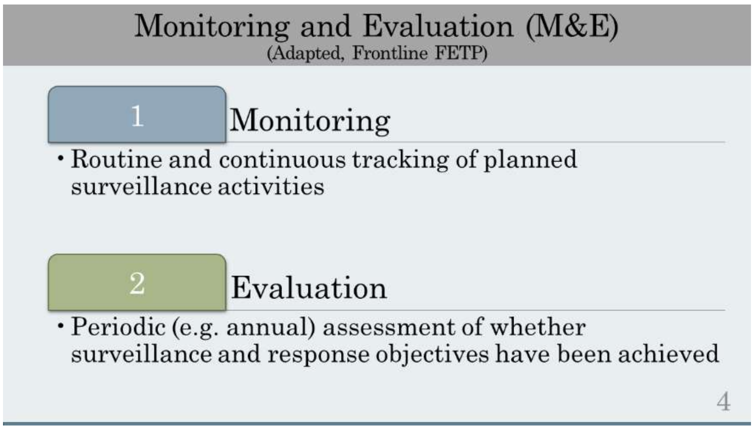
Surveillance is a cyclical process that is iterative and ongoing. The circular line connecting each part of the surveillance cycle is representative of communication and coordination required to maintain the effective flow of surveillance data.

Let's consider step 5: Evaluate to improve:

Targets for improvement include:

- The quality of the data which we have already dealt with;
- The function of the surveillance system; and

The detection and response for animal diseases.

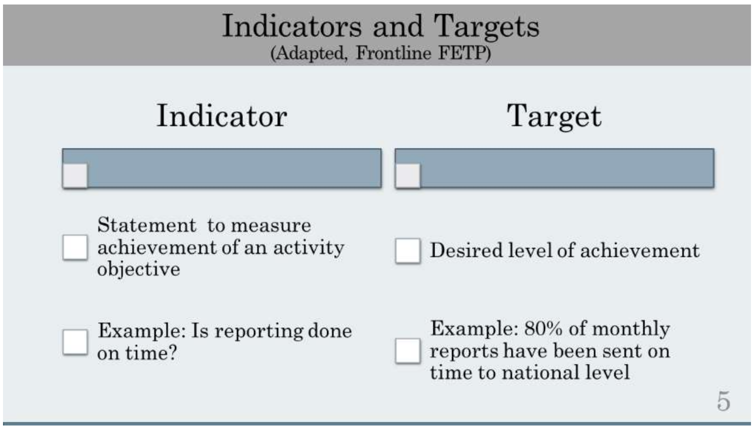


Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 4

SCRIPT / KEY POINTS:

Monitoring is the routine and continuous tracking of planned surveillance activities. Evaluation is the periodic (e.g., annual) assessment of whether surveillance and response objectives have been achieved.

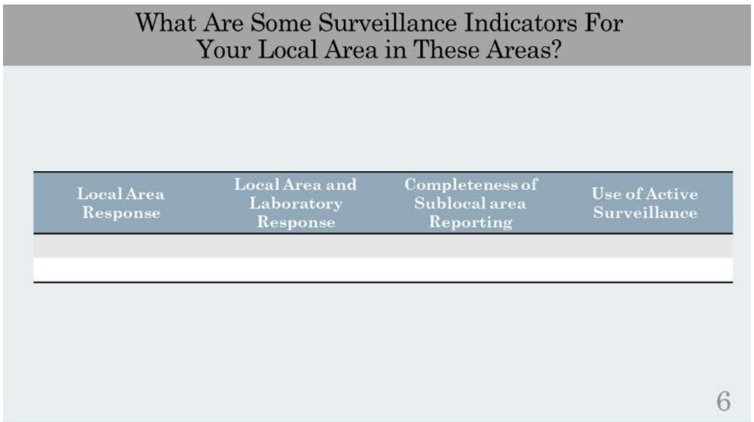


Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 5

SCRIPT / KEY POINTS:

The principle for monitoring and evaluation is that you can only improve the function and performance of a surveillance system if you measure baseline performance and then follow through each month. In order to do this, we use indicators and targets. Indicators are specific statements that are developed to measure and activity objective within the surveillance system. Whereas, a target is a desired level of achievement.



Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 6

SCRIPT / KEY POINTS:

Here are four examples of surveillance indicators that provide data to measure a baseline and trends over time, so that we can measure progress over time. The indicators are chosen based on the problems previously identified so that they are measured to address specific deficiencies.

The principle for monitoring and evaluation is that you can only improve the function and performance of a surveillance system if you measure baseline performance and then follow through each month.

What Are Some Surveillance Indicators in Your Local Area?

Local Area Response	Local Area and Laboratory Response	Completeness of Sublocal area Reporting	Use of Active Surveillance
Time to respond to farmer request for field investigation	Time from sample collection to laboratory reporting	Percentage of monthly reports received from sublocal area offices	Median number of active surveillance samples collected per month
Percentage of local area field investigations with a complete report	Time from laboratory report received by local area until farmer notification	Percentage of complete disease data from each sublocal area.	Number of secondary field investigations generated from a primary field investigation

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Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 7

SCRIPT / KEY POINTS:

Here are eight specific examples of surveillance indicators that provide data to measure baseline and trends for both timeliness and completeness over time at several points in the surveillance system including linkages among the surveillance system components.

Begin developing the indicators and targets now, so that you can measure progress over time.

What Are Some Surveillance Indicators in Your Local Area?

Local Area Response	Target	Local Area and Laboratory Response	Target	Completeness of Sublocal area Reporting	Target	Use of Active Surveillance	Target
Time to respond to farmer request for field investigation	4 hours	Time from sample collection to laboratory reporting	48 hours	Percentage of monthly reports received from sublocal area offices	80%	Median number of active surveillance samples collected per month	200
Percentage of Local Area field investigations with a complete report	80%	Time from laboratory report received by Local Area until farmer notification	4 hours	Percentage of complete disease data from each sublocal area	60%	Percentage of secondary field investigations generated from a primary field investigation	20%

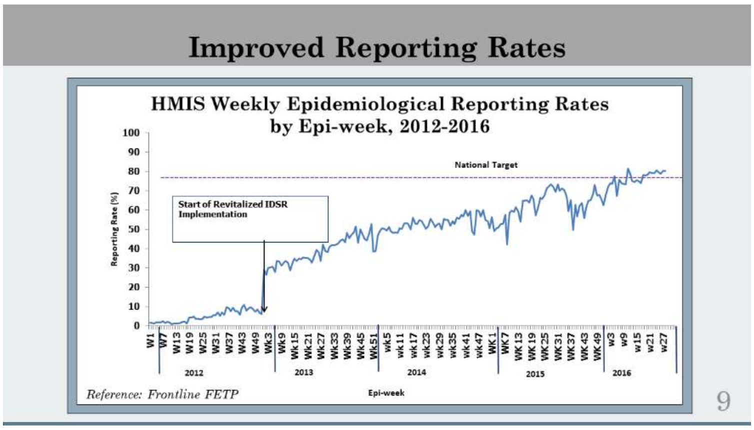
8

Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 8

SCRIPT / KEY POINTS:

Here are eight examples of surveillance indicators with targets that provide data to measure baseline and trends over time so that we can measure progress over time. These measures can be graphed to show trends over time.



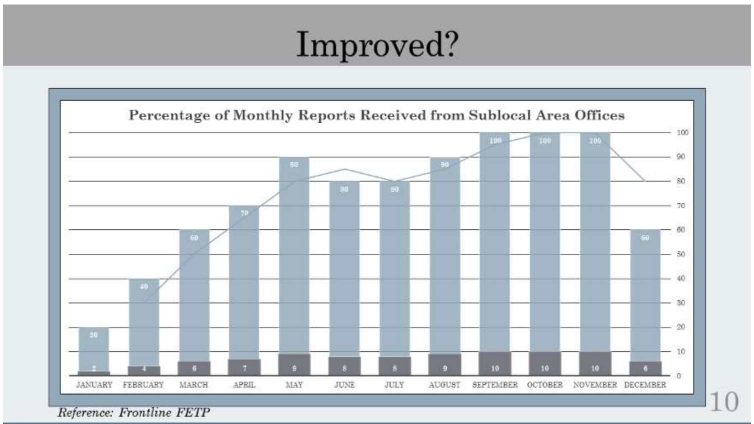
Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 9

SCRIPT / KEY POINTS:

The following showcases an increase in reporting rates after implementation of a new programme.

Photo Image 1: Reference: Frontline FETP



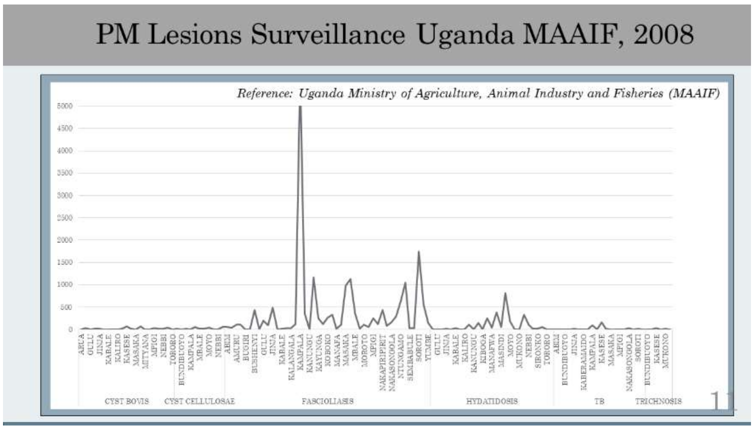
Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 10

SCRIPT / KEY POINTS:

Example graphs for reporting indicators are shown in the graph above; however, there is a recent downturn evident in the most recent month. Follow-up action is needed to assess this downward trend.

Image: Photo 1: Reference: Frontline FETP



Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

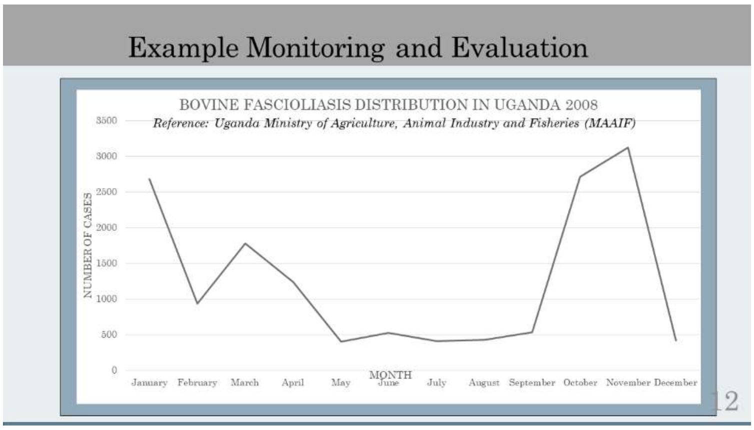
Slide 11

SCRIPT / KEY POINTS:

Review the trendline in this graph. What do the periodic spikes (including one large spike) tell you about:

1) The ability of the surveillance target value to detect increases above the threshold incidence? The target value is sufficiently sensitive to detect changes; however, the target may need to be decreased to assess if it is still missing other cases, especially on a seasonal basis.

Reference: Uganda Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)



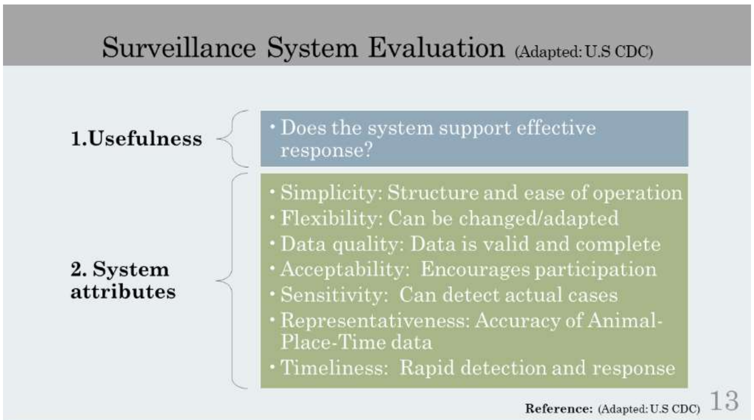
Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 12

SCRIPT / KEY POINTS:

Here is an example of the number of cases for bovine fascioliasis distribution in Uganda in 2008. This data can be compared with monthly averages from the previous five years to see if the number of cases in 2008 exceeds the monthly thresholds.

Photo: Image 1: Reference: Uganda Ministry of Agriculture, Animal Industry and Fisheries (MAAIF)



Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

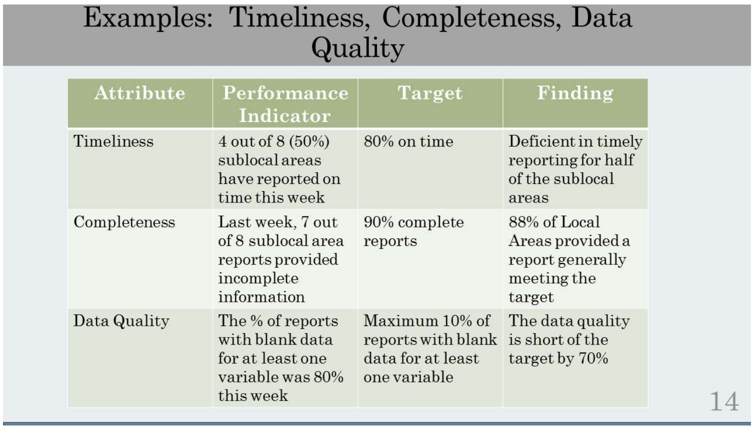
Slide 13

SCRIPT / KEY POINTS:

Principles of Surveillance System Evaluation (Adapted: U.S CDC)

1. Assess the usefulness of the surveillance
2. Describe system attributes

- Simplicity
- Flexibility
- Data quality
- Acceptability
- Sensitivity
- Predictive Value Positive
- Representativeness
- Timeliness
- Stability

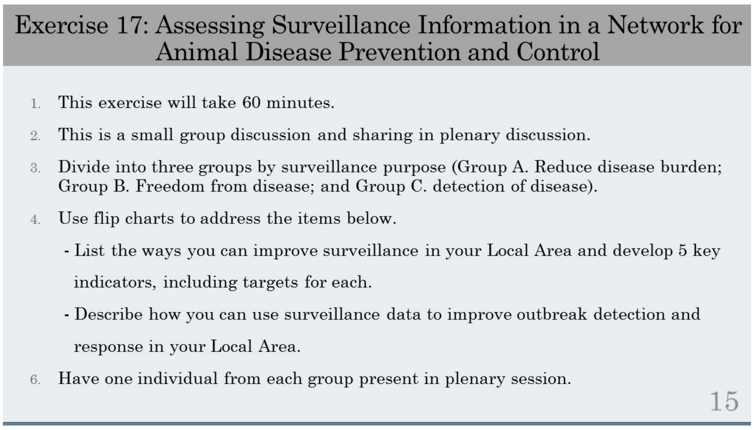


Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 14

SCRIPT / KEY POINTS:

Here are three examples of assessing timeliness, completeness and data quality that we will use in Frontline ISAVET field activities.



Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 15

SCRIPT / KEY POINTS:

Exercise 17 introduction: Surveillance Monitoring and Evaluation

Small group discussion and sharing in plenary discussion:

1. This exercise will take 60 minutes.
2. This is a small group discussion and sharing in plenary discussion.
3. Divide into three groups by surveillance purpose (reduce disease burden, freedom from disease and detection of disease).
4. Each group should develop 2 objectives for their surveillance system.
5. Use flip charts to address the below items.

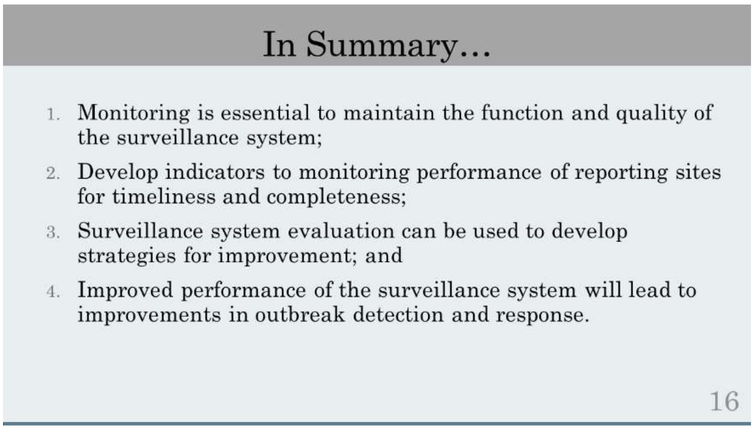
- List the ways you can improve surveillance in your local area and develop 5 key indicators, including targets for each.

- Describe how you can use surveillance data to improve outbreak detection and response in your local area.

1. Have one individual from each group present in plenary session.

Instructors:

- Please review instructor guide for answers.



Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 16

SCRIPT / KEY POINTS:

In summary,

- Monitoring is essential to maintain quality;
- Established indicator are available for monitoring performance of reporting sites;
- Monitoring and evaluation should be used to develop strategies for improvement; and
- Improved surveillance will lead to improvements in outbreak detection and response.

Lesson 11 – Assessing Surveillance in Your Local area to Improve Response to Animal Disease and Health Events,

Slide 17

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa. Are there any questions.

Exercise 17 – Assessing Surveillance Information in a Network for Animal Disease Prevention and Control

Description of Exercise:

Participants will develop five indicators and targets for specific surveillance objectives. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 60 minutes

Exercise Components and Structure:

1. You have 60 minutes to complete this exercise.
2. Divide into 3 groups by surveillance purpose.
    - Group A: Reduce disease burden
    - Group B: Freedom from disease
    - Group C: Detection of disease in an Area previously not known to have a disease burden
3. Each group should develop 2 objectives for their surveillance system. They can choose the disease of their choice.
4. Use flip charts to:
    - List the ways you can improve surveillance in your local area and develop 5 key indicators, including targets for each.
    - Describe how you can use surveillance data to improve outbreak detection and response in your local area.

Materials, Data or Information:

1. Flip chart and markers
2. Pen and paper

Expected Outputs and Deliverables of Each Participant:

1. A list of the ways to improve surveillance in your local area.
2. Describe how you can use surveillance data to improve outbreak response in your local area.

1. List up to five ways you can improve surveillance in your local area**.**

Instructor note: The following are examples, but the answers will vary based on participant responses.

Surveillance Purpose	Surveillance Objectives
Reducing Disease Burden	a) To assess disease trends. b) To assess interventions for disease control and prevention. c) To inform decisions regarding ongoing interventions. To inform policy and planning for disease control at the local area. d) To contribute to assessment of burden of disease in the population.
Freedom from Disease	a) To provide information for action on disease progress for eradication. b) To allow for future trade of agricultural products. c) Provide evidence for disease freedom through well kept disease registers. d) To rapidly respond and identify new emerging diseases episodes. e) To analyse surveillance data towards demonstrating zero cases.
Detection of Disease (Area previously does not have a disease burden)	a) To establish sentinel surveillance for the disease. b) To detect early disease emergency for response. c) To identify population at risk (PAR) for targeted prevention measures. d) To generate a hypothesis for further research on the disease.

2. Identify 5 indicators with specific targets for your groups surveillance system.

Instructor note: The following are examples, but the answers will vary based on participant responses.

Group A: Surveillance System Purpose: Reducing Disease Burden	
Indicator(s)	**Target(s)**
Indicator 1: Proportion of local area with case definitions	Target 1: 80% of local area have a case definition with a 3-tier case classification.
Indicator 2: Proportion of local area with a standardised disease register for which data has been correctly filled in.	Target 2: 80% of local area have a disease register.
Indicator 3: Proportion of local area with evidence of data analysis by animal, place and time.	Target 3: 80% of data collected includes information in the line listing related to animal, place and time for analysis.
Indicator 4: Proportion of local area that have submitted local area reports on time.	Target 4: 80% of local area have submitted their local area reports on the first of every month.
Indicator 5: Proportion of local area where cases of disease x have been reduced due to prevention and control measures or educational awareness.	Target 5: 5% reduction in the number of cases of disease x by local area each month.

Group B: Surveillance System Purpose: Freedom from Disease	
Indicator(s)	**Target(s)**
Indicator 1: Number of monthly active surveillance reports from all local area	Target 1: 80% for all local area
Indicator 2: Number of monthly active surveillance reports from high risk border local area	Target 2: 100% of high risk local area
Indicator 3: Follow up investigations and interventions are conducted for events that are suspected to be positive	Target 3: 100% for all local area.

Indicator(s)	Target(s)
Indicator 4: Field staff are trained to collect epidemiological and laboratory data	Target 4: 100% of all field staff are trained to collect the appropriate field data and laboratory samples including new staff members
Indicator 5: Surveillance samples are collected and sent to the laboratory on a timely basis	Target 5: 95% of all samples are received by the laboratory within 24 hours of collection.

Group C: Surveillance System Purpose: Disease Detection	
Indicator(s)	**Target(s)**
Indicator 1: Risk based surveillance is conducted at all selected sales and market locations each month	Target 1: 100% of all selected sales and market locations are sampled monthly.
Indicator 2: Number of hours from a suspected outbreak report until field investigation is conducted	Target 2: 12 hours
Indicator 3: Number of local area staff trained and assigned to surveillance in a disease rapid response team	Target 3: At least one trained epidemiologist can conduct a suspect outbreak investigation as part of the rapid response team
Indicator 4: The laboratory surge capacity is able to test samples from suspected cases	Target 4: At least 200 samples can be tested and processed daily
Indicator 5: Case finding and value chain related risk based surveillance is initiated immediately upon suspicion of disease	Target 5: 100% of all suspicious reports are surveilled immediately

3. Describe how you can use surveillance data to improve outbreak detection and response in your local area

Surveillance data can be used for outbreak detection and response by conducting an analysis of the data. By analysing data by animal, place and time; one can easily identify trends or unexpected peaks above set thresholds which can be indictors of outbreaks.

The following actions can be taken to improve detection and response:

- Modify case definitions to increase sensitivity
- It is best to examine the threshold value of a disease from surveillance data during a time interval through use of calculating the moving (i.e., rolling) average. It is up to you to decide the time period for this calculation, but the moving average is commonly done on a quarterly-basis for each year.
    - This can be done by observing the case counts over time and plotting them on a histogram and then calculating the moving average over time and plotting that on the histogram over the case counts for the year in your local area.
    - It is important to note that not every increase in case counts is an indicator of an outbreak, why? It is because of daily variation in the data. To go above the threshold, the case count needs to be 2 standard deviations above the rolling average for that specific data point.

- Measure timeliness of:
    - Initial field response following receipt of a report from a surveillance location
    - Field response to laboratory submission
    - Laboratory reporting to mobilization of the surveillance rapid response team
    - Case finding and value chain tracing

- Measure laboratory surge capacity

Section II: Week 2 – Field Investigation and Response

Lesson 12 – Animal Field Investigations

Estimated Lesson and Exercise Time	2 hours
Instructor Materials	ISAVET Lesson 12 Animal Field Investigations.pptx
	ISAVET Lesson 12 Animal Field Investigations Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 12 Animal Field Investigations Participant Guide.doc

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

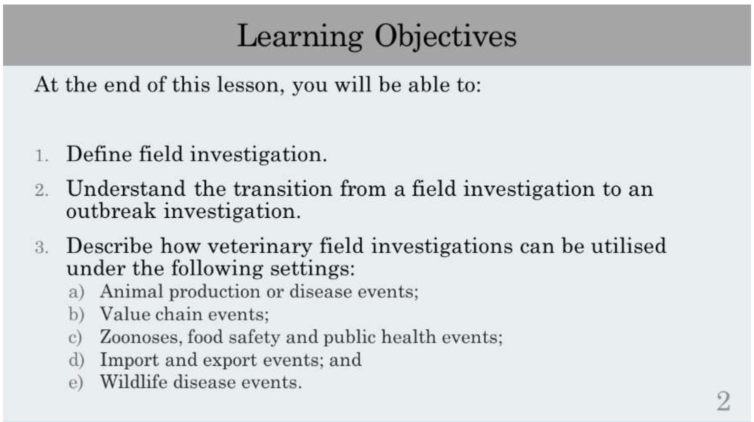
FMD	Foot-and-Mouth Disease
HPAI	Highly Pathogenic Avian Influenza
ISAVET	In Service Applied Veterinary Epidemiology Training
KAP	Knowledge, Attitude and Practices
LPAI	Low Pathogenic Avian Influenza
PPE	Personal Protective Equipment
PPR	Peste des Petits Ruminants
RT-PCR	Reverse Transcriptase Polymerase Chain Reaction
SCC	Somatic Cell Count
SOPs	Standard Operating Procedures
TADs	Transboundary Animal Diseases

Lesson 12 – Animal Field Investigations,

Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 12 titled, “Animal Field Investigations”.



Lesson 12 – Animal Field Investigations,

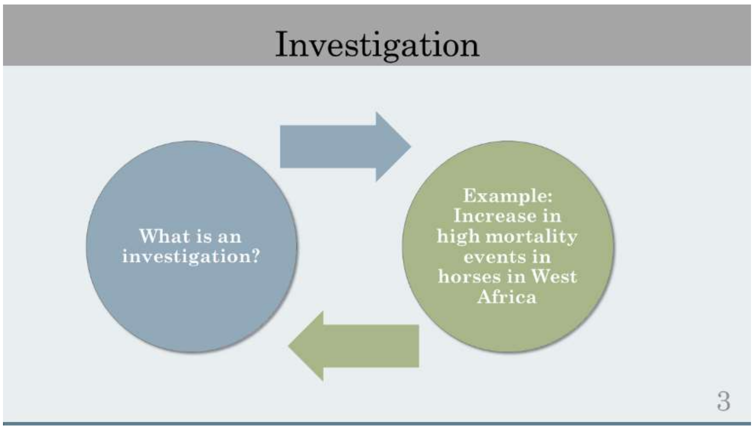
Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

- Define field investigation.
- Understand the transition from a field investigation to an outbreak investigation.
- Describe how veterinary field investigations can be utilised under the following settings:
    - Animal production or disease events
    - Value chain events

- Zoonoses, food safety and public health events
- Import and export events
- Wildlife disease events



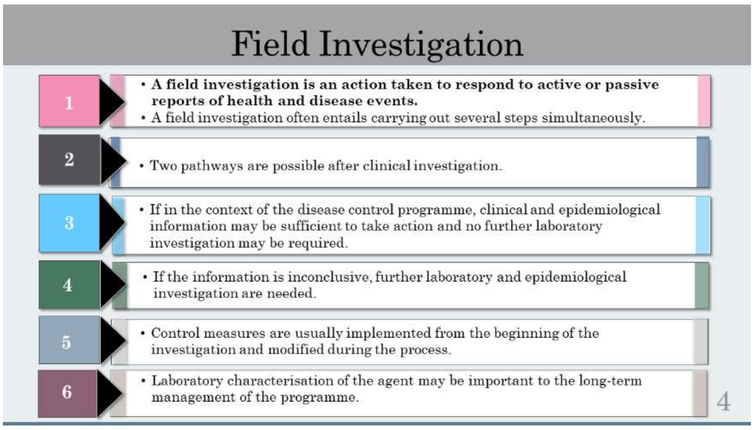
Lesson 12 – Animal Field Investigations,

Slide 3

SCRIPT / KEY POINTS:

Question:

- How do you define investigation? To observe and or study by **close examination** and **systematic inquiry**.



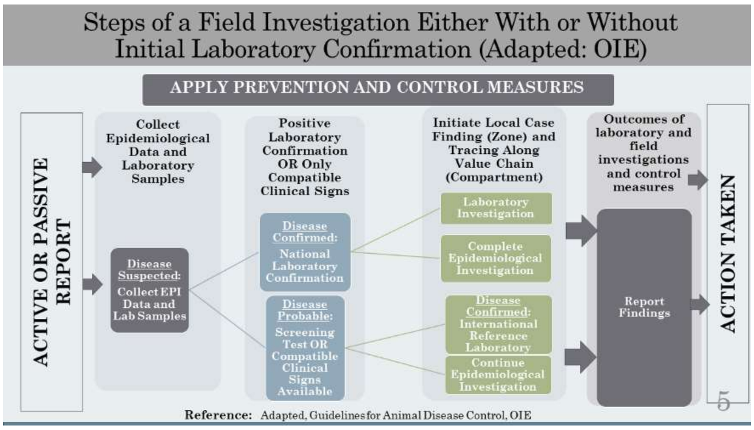
Lesson 12 – Animal Field Investigations,

Slide 4

SCRIPT / KEY POINTS:

A field investigation is an action taken to respond to active or passive reports of health and disease events.

Field investigation often entails carrying out several steps simultaneously. Two pathways are possible after clinical investigation. If in the context of the disease control programme, clinical and epidemiological information may be sufficient to take action and no further laboratory investigation may be required. If the information is inconclusive, further laboratory and epidemiological investigation are needed. Control measures are usually implemented from the beginning of the investigation and modified as appropriate during the process. Laboratory characterisation of the agent may be important to the long-term management of the programme.



Lesson 12 – Animal Field Investigations,

Slide 5

SCRIPT / KEY POINTS:

1. Initiation a Field Investigation: An investigation begins with a report which may be reported actively or passively.

When an animal or zoonotic disease event or antimicrobial resistance pattern is suspected, field epidemiology and laboratory investigations must be launched immediately without delay.

2. Field Investigation:

SCENARIO 1a: If the national laboratory can perform confirmatory diagnosis for the suspect disease, the epidemiological investigation can be immediately launched along with the authority to implement prevention and control measures (e.g. quarantine, movement controls, etc.).

SCENARIO 1b: A negative laboratory result may end the investigation or require further follow up testing.

SCENARIO 2a: If the national laboratory can only perform a screening test or must rely on the presence of compatible clinical signs, then the disease is considered as probable, but samples must be sent to an internationally recognized reference laboratory for confirmation. Note that additional confirmatory tests at an international reference center may also be required to perform a detailed molecular diagnosis. Pending confirmation, a full epidemiological investigation may be delayed but can still be initiated depending on the circumstances in the country. Once the international reference laboratory confirms the presence of the disease, the investigation will continue and expand.

SCENARIO 2b: Again, a negative laboratory result may end the investigation or require further follow up testing.

3. Outcome of a field investigation: An investigation always leads to action being taken address prevention and control efforts.

Reference: Adapted, Guidelines for Animal Disease Control, OIE

Objectives and Methods Used for Various Types of Investigations

Investigation Type	Objectives	Methods	Action Taken
Animal production	Determine reasons for drops in reproductive performance	Nutrition and disease and production history	Review historical surveillance records to assess trends Conduct a survey to estimate the burden of disease
Priority national endemic diseases	Determine the cause for increased morbidity and mortality	Conduct an investigation: measure the impact of disease; review records	Address methods of disease entry and transmission; disease
Priority national zoonotic diseases	Confirm and contain the disease from spreading	Apply biosafety and biosecurity practices; collect and submit samples	Sample collection using PPE; Test samples and respond by taking preventive action
Internationally reportable high-impact animal diseases	Investigate a potentially high-impact disease	Treat the investigation as a potential high-impact animal disease; Follow the standard steps for an animal disease outbreak investigation	Farm quarantine; Area movement controls; Aggressive case finding Detailed epidemiological investigation of index farm; Notification of farmers; Preparation for possible ring vaccination.

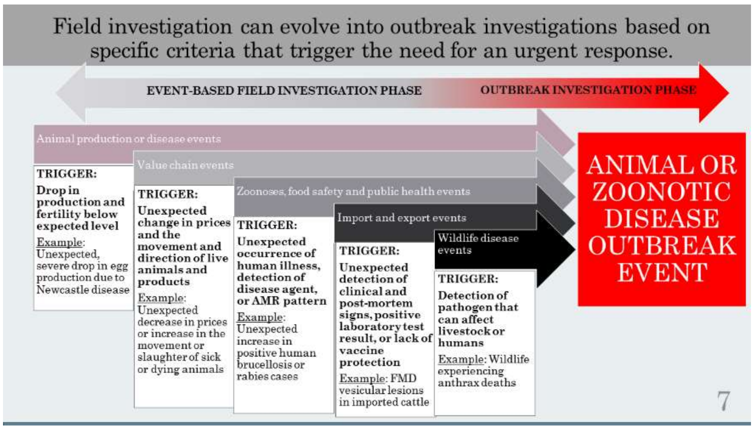
6

Lesson 12 – Animal Field Investigations,

Slide 6

SCRIPT / KEY POINTS:

Priority diseases in a country may be related to animal production, endemic diseases, zoonotic diseases and internationally reportable diseases. The objectives, methods and action taken for each type of field investigation will be different.



Lesson 12 – Animal Field Investigations,

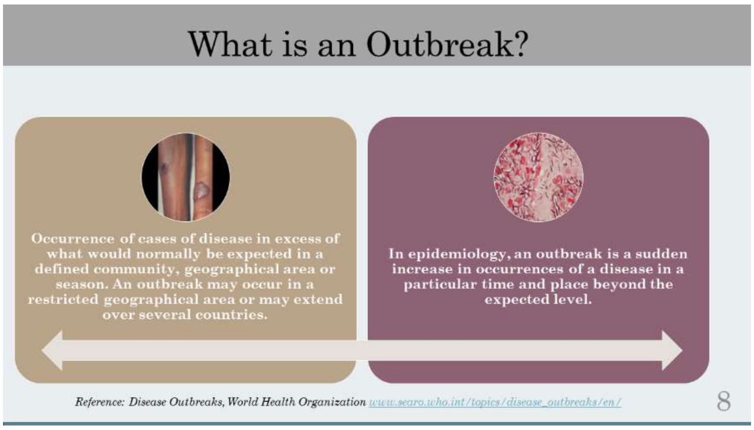
Slide 7

SCRIPT / KEY POINTS:

Note that animal health and disease events are referred to as “field investigations” and that public health commonly refers to these sorts of events such as “case investigations” which often involve one or more individuals.

Field investigation events may be related to any of the following circumstances that may trigger an outbreak investigation which we will consider in Lesson 16:

1. Animal production events
2. Value chain events
3. Food safety and public health including antimicrobial resistance (AMR) events
4. Animal import and export events
5. Wildlife disease events



Lesson 12 – Animal Field Investigations,

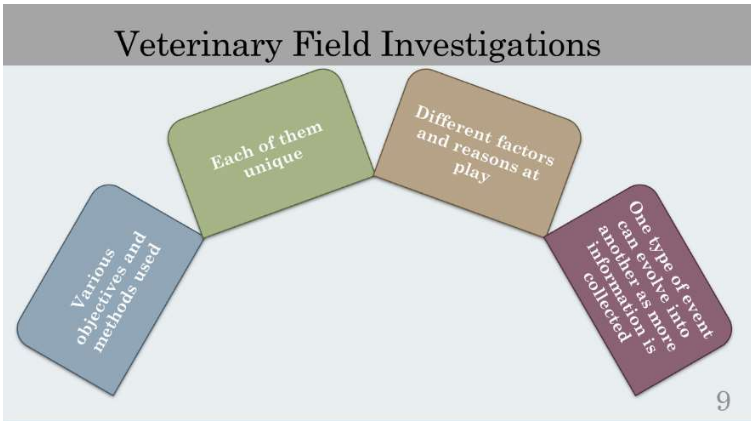
Slide 8

SCRIPT / KEY POINTS:

Occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical Area or season. An outbreak may occur in a restricted geographical Area or may extend over several countries. In epidemiology, an outbreak is a sudden increase in occurrences of a disease in a particular time and place beyond the expected level.

Reference:

Disease Outbreaks, OIE



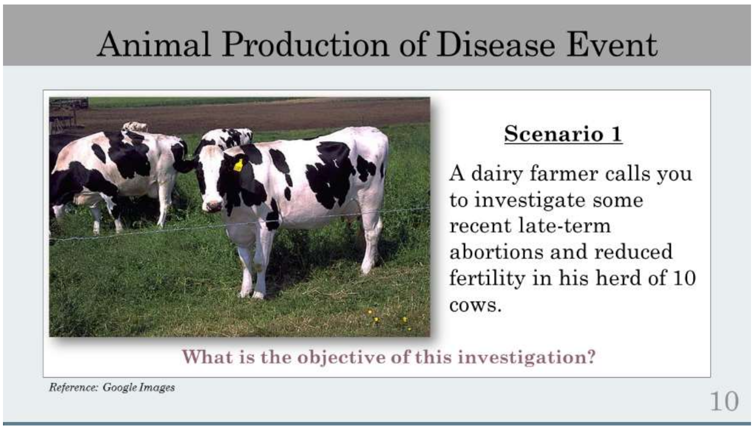
Lesson 12 – Animal Field Investigations,

Slide 9

SCRIPT / KEY POINTS:

Are the objectives and methods used for all veterinary field investigations the same? Each investigation is unique in and of itself, and no two are alike. Indeed, veterinarians are often asked to do a farm visit to investigate a concern from the farmer to discover that other issues have been raised outside of the original complaint or request for assistance.

In a general sense, there are different reasons and different factors at play each time a veterinary field epidemiologist received a call for assistance. These include: animal production, endemic diseases, zoonotic diseases and internationally reportable high-impact animal diseases. There is often no clear line between these types of investigations requiring flexibility in the approach to each call.



Lesson 12 – Animal Field Investigations,

Slide 10

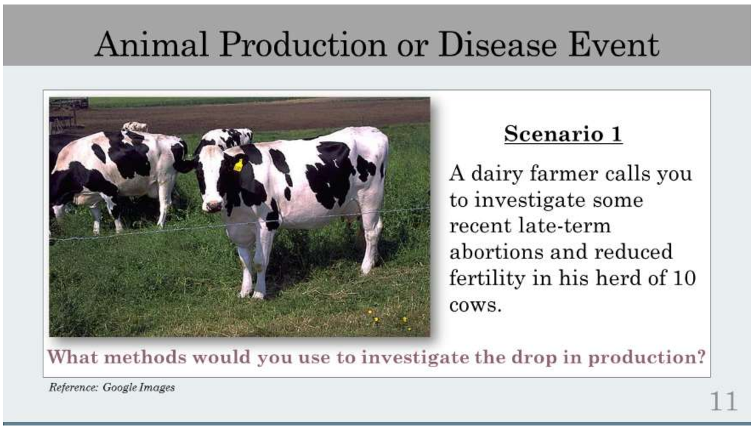
SCRIPT / KEY POINTS:

Scenario 1: A dairy farmer calls you to investigate some recent late-term abortions and reduced fertility in his herd of 10 cows.

What is the objective of this investigation?

- The objective of this investigation is to determine the reasons for drops in reproductive performance.
- This is a case investigation.

Photo: Google Images



Lesson 12 – Animal Field Investigations,

Slide 11

SCRIPT / KEY POINTS:

Scenario 1: What methods would you use to investigate the drop in production?

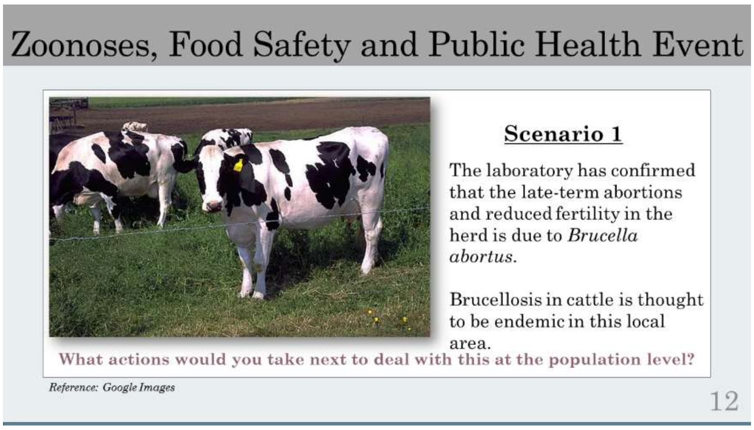
You might include the at least the following methods:

- Collect the history of reproductive issues including abortions, repeat and delayed breeding at the individual and herd levels.
- Determine what proportion of dairy cows of have has abortions throughout their adult life.
- Movement of animals in and out of the herd.
- Use and source of artificial insemination and natural breeding in the herd.
- Collect samples to confirm the diagnosis from a list of differential diagnoses based on clinical signs and presentation.

What actions would you take next?

- This could be a problem in this herd to be a part of a larger problem in the local area.
- Would a survey be helpful to determine the occurrence of this problem?

Photo: Google Images



Lesson 12 – Animal Field Investigations,

Slide 12

SCRIPT / KEY POINTS:

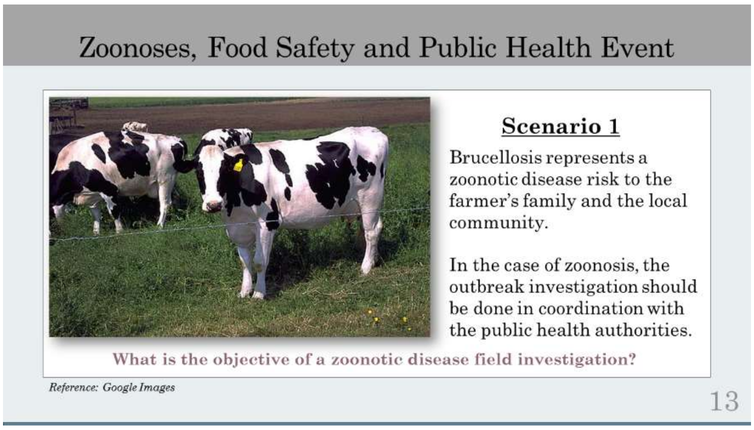
Scenario 1: The laboratory has confirmed that the late-term abortions and reduced fertility in the herd is due to *Brucella abortus*. Brucellosis in cattle is thought to be endemic in this local area.

What actions would you take next to deal with this at the population level?

Possible responses include:

- Review historical surveillance records in the local area office and laboratory to assess Brucellosis trends over time.
- Conduct a survey in the local area to estimate the burden of disease through a sero-prevalence survey.
- Other options?

Photo: Google Images



Lesson 12 – Animal Field Investigations,

Slide 13

SCRIPT / KEY POINTS:

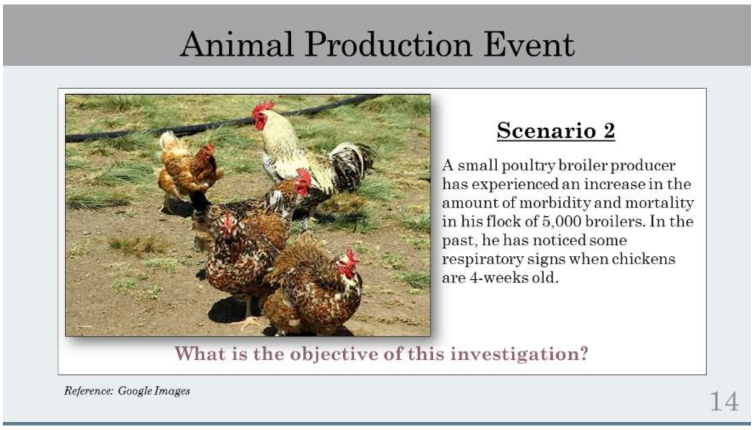
Scenario 1: Brucellosis represents a zoonotic disease risk to the farmer's family and the local community. The objective of the field investigation has now changed from investigating a herd health reproductive problem to a public health concern. The health department has recently been investigating human cases of brucellosis in the local area.

The objective of the field investigation is now to determine the sources of brucellosis in relation to human cases reported in the local area.

Methods to achieve the objective could include the following:

- Communicate with local public health epidemiologists to share information regarding human cases and the prevalence in cattle.
- Discuss the need to conduct field studies that are needed to estimate the burden of disease.
- The epidemiological investigation also needs to be broadened to conducting active surveillance in breeding bulls that are used with beef herds in the local area.
- Discuss the need to conduct field intervention studies that are needed to assess knowledge, attitudes and practices (KAP).
- Discuss the need for joint risk communication messages to farmers and the general public consuming beef and milk products.

Photo: Google Images



Lesson 12 – Animal Field Investigations,

Slide 14

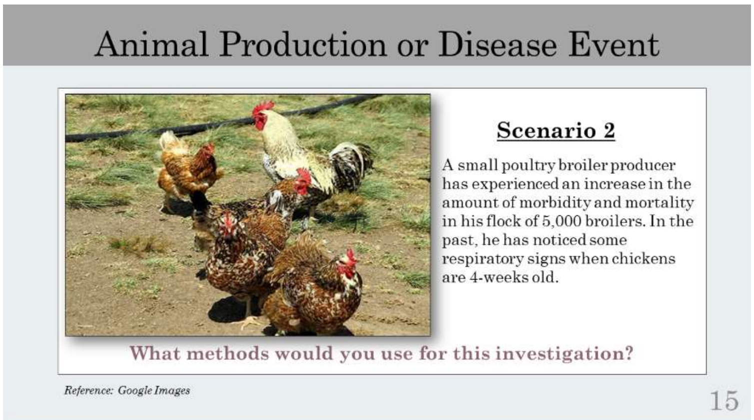
SCRIPT / KEY POINTS:

Scenario 2: A small poultry broiler producer has experienced an increase amount of morbidity and mortality in his flock of 5,000 broilers. He has noticed some respiratory signs when they are 4 weeks of age.

What is the objective of this investigation?

- The objective of this investigation is to determine the reason for increased morbidity and mortality related to respiratory disease in the broiler flock.
- This is a case investigation.

Photo: Google Images



Lesson 12 – Animal Field Investigations,

Slide 15

SCRIPT / KEY POINTS:

Scenario 2: What methods would you use for this investigation?

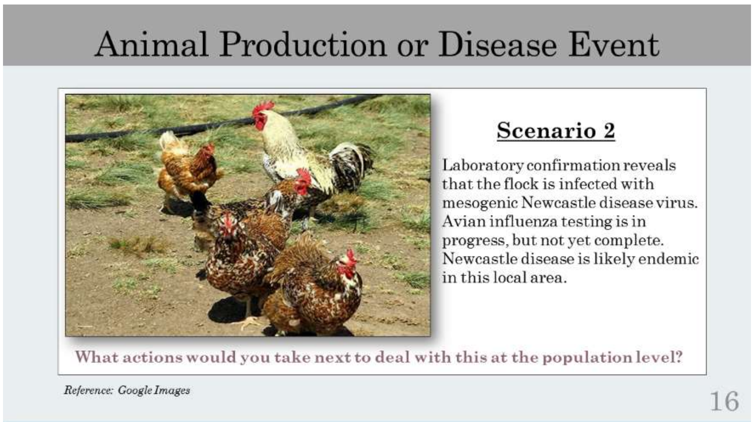
Here are some <u>methods</u> you might use to investigate this farm:

- Measure the impact of disease in the flock by calculating flock level morbidity and mortality rates.
- Review any flock records that are available to confirm the history of respiratory disease at this farm.
- Review flock vaccination records. It is possible that respiratory problems may be due to recently repeated Newcastle disease vaccination using live vaccine not being properly administered.
- Observe the flock and select sick and dead chickens for laboratory submission.

Other actions to take include:

- Confirm differential diagnoses – avian influenza, Newcastle disease, etc.

Photo: Google Images



Lesson 12 – Animal Field Investigations,

Slide 16

SCRIPT / KEY POINTS:

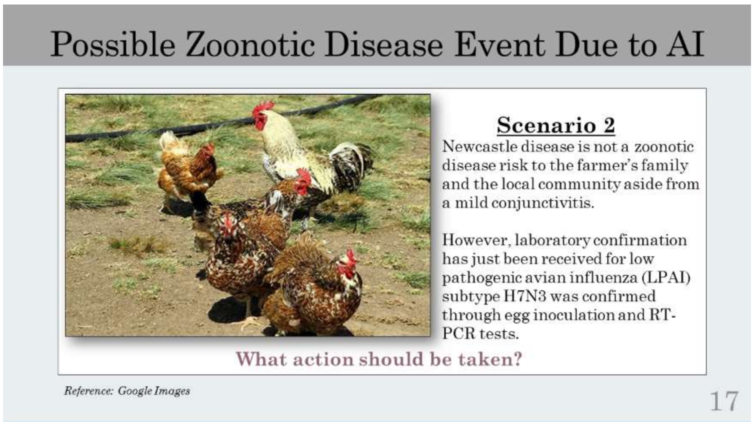
Scenario 2: Laboratory confirmation reveals that the flock is infected with mesogenic Newcastle disease virus and avian influenza testing is in progress but not yet complete. Newcastle disease is likely endemic in this local area.

What actions would you take next to deal with this at the population level?

Possible actions include:

- Review historical surveillance records in the local area office and laboratory to assess Newcastle trends over time.
- Conduct a survey in the local area to estimate the burden of disease through a sero-prevalence survey.
- Conduct an intervention study to assess the vaccination practices of broiler farmers in the local area to see if some programs are more effective than others.

Photo: Google Images



Lesson 12 – Animal Field Investigations,

Slide 17

SCRIPT / KEY POINTS:

Scenario 2: The objective of the field investigation has now changed from investigating a flock health respiratory problem to a public health concern. The health department has recently been investigating human cases of influenza H1N3 in the local area.

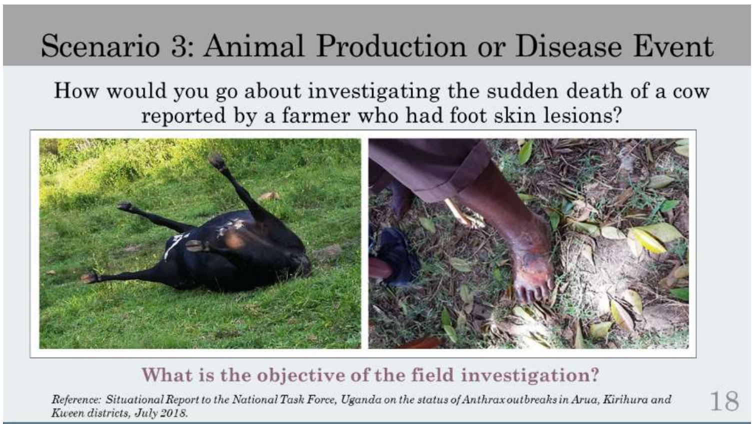
The **objective** of the field investigation is now to **determine the risk of in LPAI H7N3 in poultry and humans in the local area**. The major concern is the assess the possibility of recombination of H7N3 and H1N3 influenza subtypes that are circulating in poultry and humans respectively, in the local area.

Methods to achieve the objective could include the following:

- Communicate with local public health epidemiologists to share information regarding human and poultry influenza viruses isolated by the respective laboratories during the past year.
- Discuss the need to conduct field studies that are needed to estimate the burden of disease regarding H7N3 in poultry in the local area.
- The epidemiological investigation also needs to be broadened to conduct active surveillance in egg layer chickens and village chickens in the local area.
- Discuss the need for conducting a joint risk assessment by animal health and public health agencies.

Further action includes conducting a joint risk assessment for influenza transmission and risk communication regarding the safety of eating poultry meat and eggs.

Photo: Google Images



Lesson 12 – Animal Field Investigations,

Slide 18

SCRIPT / KEY POINTS:

Scenario 3: A case of a priority zoonotic disease in Uganda (July 2018) which was confirmed to be anthrax.

- What is the objective?

Lesson 12 – Animal Field Investigations,

Slide 19

SCRIPT / KEY POINTS:

Scenario 3: A case of a priority zoonotic disease in Uganda (July 2018)

- What type of field investigation should be conducted?

Lesson 12 – Animal Field Investigations,

Slide 20

SCRIPT / KEY POINTS:

Scenario 3: A case of a priority zoonotic disease in Uganda (July 2018)

- What type of field investigation should be conducted?
- The steps for the investigation:

1. Take biosafety and biosecurity precautions because you suspect it could be anthrax.
2. Confirm the diagnosis by taking and submitting a sample for diagnosis.
3. Alert the farmer, your supervisor and the public health officer about the suspicion of anthrax at this farm.
4. Initiate preventive action noted in the following slide.

Photos: ***Reference: Situational Report to the National Task Force, Uganda on the status of Anthrax outbreaks in Arua, Kirihura and Kween districts, July 2018.***

Lesson 12 – Animal Field Investigations,

Slide 21

SCRIPT / KEY POINTS:

Scenario 3: A case of a priority zoonotic disease in Uganda (July 2018)

Identify three field components to conduct during a zoonotic disease investigation?

- Sample collection using PPE;
- Testing of samples; and
- Respond by taking preventive action (Awareness creations, communication, treatment, vaccination).

Photos: ***Reference: Situational Report to the National Task Force, Uganda on the status of Anthrax outbreaks in Arua, Kirihura and Kween districts, July 2018.***

Lesson 12 – Animal Field Investigations,

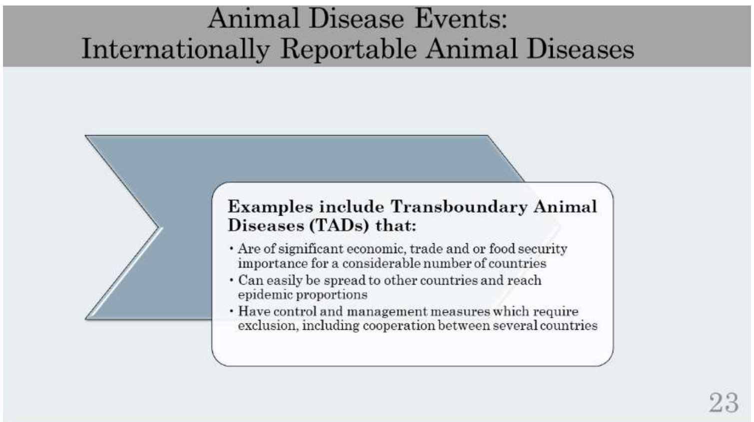
Slide 22

SCRIPT / KEY POINTS:

Scenario 3: A case of a priority zoonotic disease of anthrax in Uganda (July 2018)

Creating awareness in the community through community group engagement.

Photos: ***Reference: Preliminary Report on Suspected Anthrax Outbreak, Kween District, Ministry of Health, 26/07/2018 to the National Task Force. Prepared by: Esther Kisaakye and Kenneth Bainomugisha, Supervised by: Lilian Bulage. Report to the One health Platform, Uganda.***

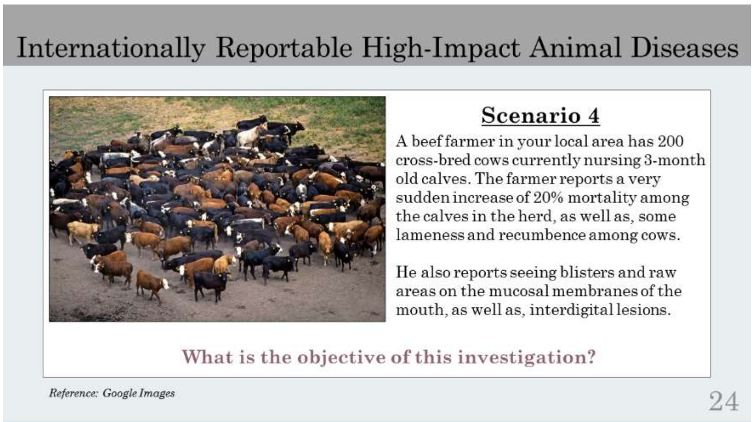


Lesson 12 – Animal Field Investigations,

Slide 23

SCRIPT / KEY POINTS:

Transboundary Animal Diseases (TADs) are of significant economic, trade and/or food security importance for a considerable number of countries. These types of diseases can spread rapidly to other countries and reach epidemic proportions. The specific control and management measures for TADs include, exclusion, requiring cooperation between several countries.



Lesson 12 – Animal Field Investigations,

Slide 24

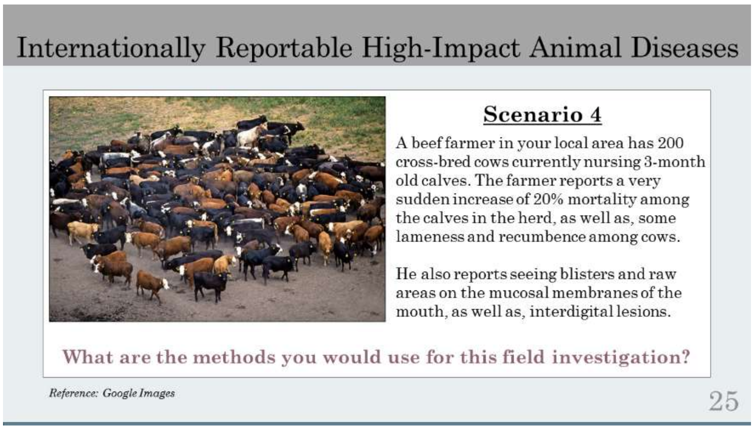
SCRIPT / KEY POINTS:

Scenario 4: A beef farmer in your local area has 200 cross-bred beef cows currently nursing 3-month old calves. The farmer reports as very sudden increase of 20% mortality among the calves in the herd as well as some lameness and recumbency among the cows. He also reports seeing blisters and raw Area on the mucosal membranes of the mouth as well as interdigital lesions.

What is the objective of this field investigation?

- The objective is to investigate a potentially high-impact disease that causes a sudden increase in mortality in beef cattle.

Photo: Google Images



Lesson 12 – Animal Field Investigations,

Slide 25

SCRIPT / KEY POINTS:

What are the methods you would use for this field investigation? Methods could include the following:

- Treat the investigation as a potential high-impact animal disease with sudden onset of high mortality and morbidity in a beef herd;
- Follow the standard steps for an animal disease outbreak investigation;
- Prepare personal protective equipment (PPE) and laboratory supplies for an emergency response;
- Communicate with the laboratory and prepare to collect samples;
- Contact your supervisor to advise him of the possibility that foot-and-moth disease (FMD) is a prime rule out for this disease outbreak;
- Instruct the farmer to stop all movement into or from the farm until further notice.

Photo: Google Images

Lesson 12 – Animal Field Investigations,

Slide 26

SCRIPT / KEY POINTS:

Scenario 4: The original field investigation objective and methods may remain. Alternatively, the field investigation may turn into an outbreak investigation with different objectives and methods.

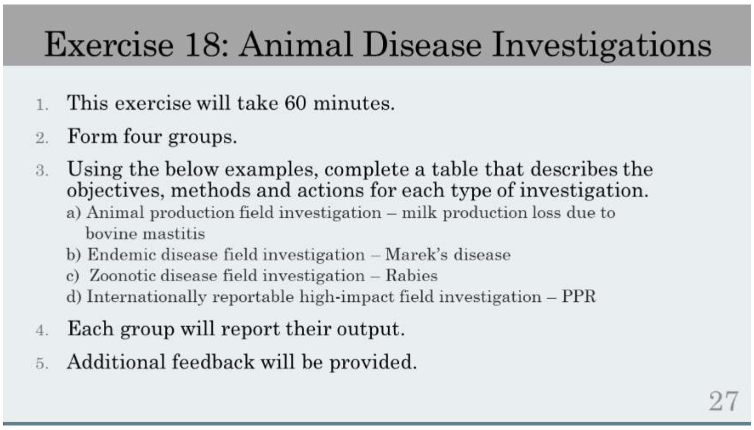
Further action will need to consider action to prevent and control potential FMD disease transmission including:

- Farm quarantine.
- Area movement controls.
- Aggressive case finding and active surveillance.
- Detailed epidemiological investigation of the index farm.
- Notification of farmers to increase biosecurity practices.
- Preparation for possible ring vaccination once confirmed as FMD.

When a field investigation becomes an outbreak investigation here are some things that require attention:

- Communication and coordination with relevant stakeholders;
- Preparedness of field staff for emergency outbreak investigation;
- Supplies and logistical arrangements with the laboratory and field staff should be prepared in advance; and
- Maps of production system value chains should be made and available to guide prevention and control efforts.

Photo: Google Images



Lesson 12 – Animal Field Investigations,

Slide 27

SCRIPT / KEY POINTS:

Exercise 18 instructions: Animal Disease Investigations:

- This exercise will take 60 minutes.
- Form four groups.
- Using the below examples, complete a table that describes the objectives, methods and actions for each type of investigation.
    - Animal production field investigation – Milk production loss due to bovine mastitis;
    - Endemic disease field investigation – Marek's disease;
    - Zoonotic disease field investigation - Rabies; and
    - Internationally reportable high-impact field investigation - PPR.
- Each group will report their output and additional feedback is provided.
- Follow the instruction sheet for formatting the exercise.

Lesson 12 – Animal Field Investigations,

Slide 28

SCRIPT / KEY POINTS:

In summary,

1. A field investigation is an action taken to respond to active or passive reports of health and disease events.
2. A field investigation can evolve into an outbreak investigation based on specific criteria that trigger the need for an urgent response.
3. There are five (5) types of veterinary field events:
    a) Animal production or disease events;
    b) Value chain events;
    c) Zoonoses, food safety and public health events;
    d) Import and export events; and

Wildlife disease events.

Lesson 12 – Animal Field Investigations,

Slide 29

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 18 – Animal Field Investigations

Description of Exercise:

Determine the objectives methods and actions for four different field investigation types. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 1 hour

Organisation of Group Work:

Divide into four groups of roughly equal size.

Exercise Objective(s):

1. Describe four (4) types of veterinary field investigations including, objectives and the methods and actions to be taken for each.

Exercise Components and Structure:

1. Complete a table that describes the objectives, methods and actions for each type of investigation.
    a) Animal production field investigation – Milk production loss due to bovine mastitis
    b) Endemic disease field investigation – Marek's disease
    c) Zoonotic disease field investigation – Rabies
    d) Internationally reportable high-impact field investigation – PPR
2. Each group will report their output and additional feedback will be provided.

Materials, Data or Information:

1. Word and PPT

Expected Outputs and Deliverables of Each Participant:

1. Description of the types of investigation related to:
    a) Animal health and production – Milk production loss due to bovine mastitis
    b) Endemic diseases affecting trade – Marek's disease
    c) Zoonotic diseases – Rabies
    d) Internationally reportable diseases – Peste des Petits Ruminants (PPR)

Situation/issue	Objective	Methods	Action
Milk production loss due to mastitis	Assess the productivity losses resulting from the infection	• Monitor productivity (milk/cow /day) • Determine the SCC • Quantify milk production resulting from the infection • Monitor production	• Institute corrective measures • Improvement biosecurity measures • Improve the milking hygiene • Treat the infected cases
Endemic Marek's disease field investigation	Understand / estimate the prevalence of Marek's disease	• Cross-sectional survey (serology) • Collect blood samples • Laboratory confirmation • Analyse the results	• Institute control measures aiming at elimination / eradication • Conduct vaccination as appropriate • Communicate/document findings
Rabies disease field investigation	Conduct outbreak investigation following disease outbreak	• Outbreak investigation (10 stages of investigation as outlined in Table 1 below) • Joint risk assessment (multi-sectoral)	• Purchase adequate vaccine • Institute vaccination measures with aim of control /eradication / elimination
High impact disease investigation	Assess the impact of PPR in the outbreak population / area following outbreaks	• Determine the mortality and morbidity rates • Assess the pre and post vaccination prevalence • Conduct risk assessment on the occurrence of PPR	• Institute appropriate disease control measures that include vaccination, quarantine, restriction of small ruminants movement • Conduct post vaccination monitoring

Table 1. Stages of Outbreak Investigation and Response

Outbreak Investigation	Outbreak Response

1. Preparation
2. Surveillance
3. Outbreak investigation
    a. Confirmation and assessment
    b. Observation and description
4. Full investigation
    a. Analytical component
    b. Environmental component
    c. Laboratory component
	1. Outbreak control
	2. Outbreak communication
	3. Outbreak documentation

Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission

Estimated Lesson and Exercise Time	1 hour and 30 minutes
Instructor Materials	ISAVET Lesson 13 Investigation Strategies for Early Prevention and Control of Animal Disease Transmission.pptx
	ISAVET Lesson 13 Investigation Strategies for Early Prevention and Control of Animal Disease Transmission Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 13 Investigation Strategies for Early Prevention and Control of Animal Disease Transmission Participant Guide.PDF

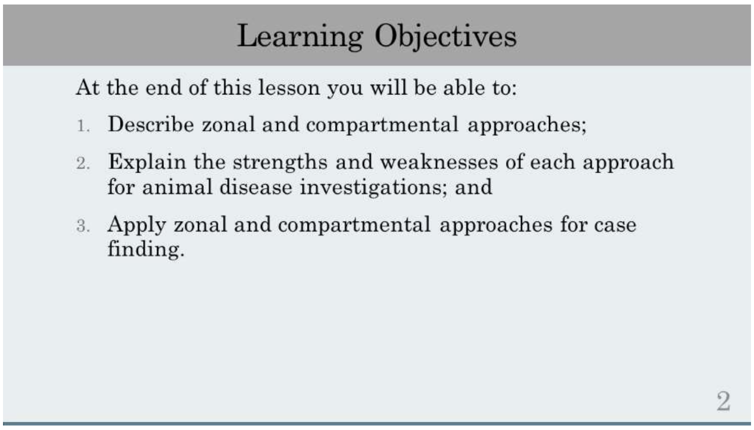
INSTRUCTOR COMMENT: LESSON ACRONYMS AND ABBREVIATIONS

AI	Avian Influenza
ASF	African Swine Fever
CBPP	Contagious Bovine Pleuropneumonia
FETPV	Field Epidemiology Training Program for Veterinarians
FMD	Foot and Mouth Disease
ISAVET	In Service Applied Veterinary Epidemiology Training
OIE	World Organisation for Animal Health

Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 13 titled, “Investigation Strategies for Early Prevention and Control of Animal Disease Transmission”.

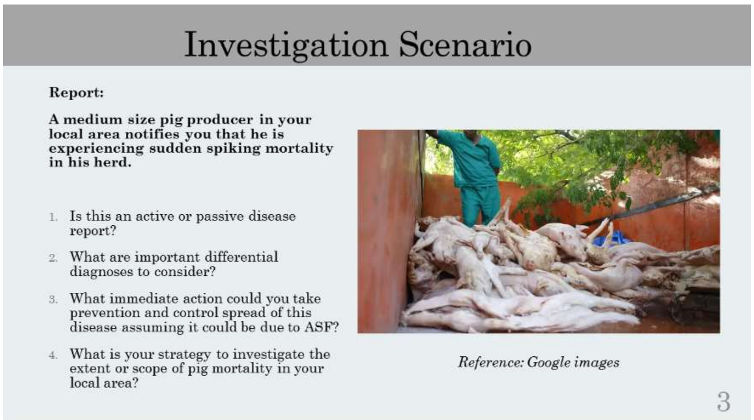


Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 2

SCRIPT / KEY POINTS:

At the end of this lesson you will be able to:

- Describe zonal and compartmental approaches;
- Explain the strengths and weaknesses of each approach for animal disease investigations; and
- Apply zonal and compartmental approaches for case finding.



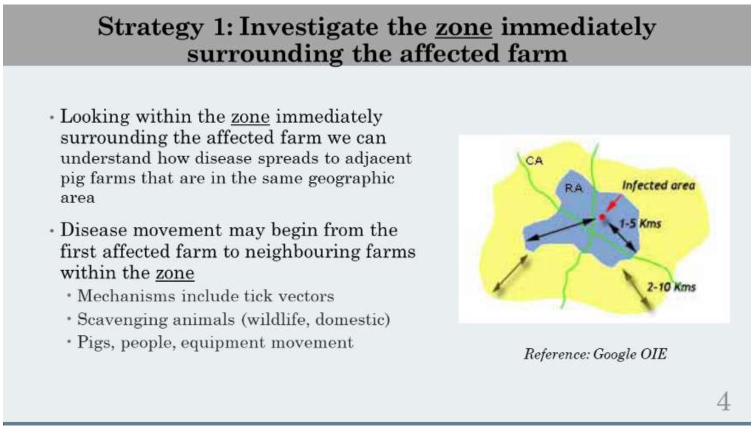
Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 3

SCRIPT / KEY POINTS:

Instructors notes and responses:

1. Is this an active or passive disease report? **Response: Passive reporting from the farmer**
2. What are important differential diagnoses to consider? **Response: This could be African swine fever (ASF) which occurs in four clinical forms in pigs including peracute, acute, subacute or chronic forms. The incubation period is between 5 and 21 days in susceptible pigs having direct contact with infected pigs, but it can be less than 5 days after exposure to ticks. Acute disease typically appears in 3 to 7 days (20). The OIE advises that since "*ASF cannot be differentiated from classical swine fever (hog cholera; Classical Swine Fever) by either clinical or post-mortem examination…laboratory tests are essential to distinguish between these diseases" (3).* Ornithodoros ticks and wild pig species act as reservoirs and biological vectors of ASFV and wild pigs remain asymptomatically infected. Infected pigs that survive infection can act as carriers for months.**
3. What immediate action could you take prevention and control spread of this disease assuming it is due to ASF? **Response: 1. Since laboratory test results are not yet available, quarantine this farm on suspicion of ASF 2. Assess farms in the Area 3. Trace movements into and from this farm during the previous 30 days. 4. Other responses…**
4. What is your strategy to investigate the extent or scope of pig mortality in your local area? **Response: 1. Look first at pig farms in the immediate surrounding Area: Zone 2. Look next at pig markets and abattoirs further away to see if this problem is widespread.**

Photo: Google Images



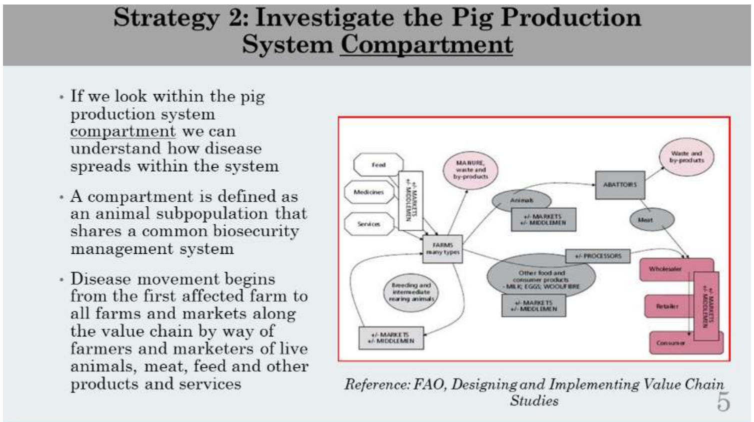
Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 4

SCRIPT / KEY POINTS:

A Zone is applied to an animal SUB-POPULATION defined in a geographic Area.

Example: Pigs in a local area.

Photo: Google Images, OIE



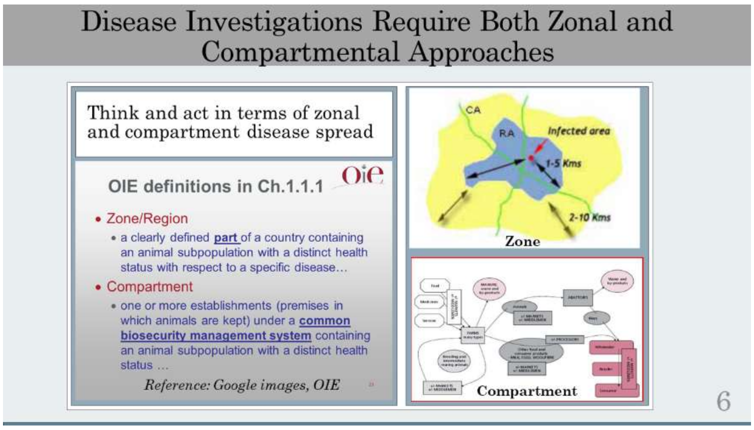
Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 5

SCRIPT / KEY POINTS:

A Compartment is defined as an animal SUB-POPULATION defined in common biosecurity management system.

Example: Pigs that are part of a pig meat value chain.

Reference: FAO. 2012. Designing and Implementing Value Chain Studies



Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 6

SCRIPT / KEY POINTS:

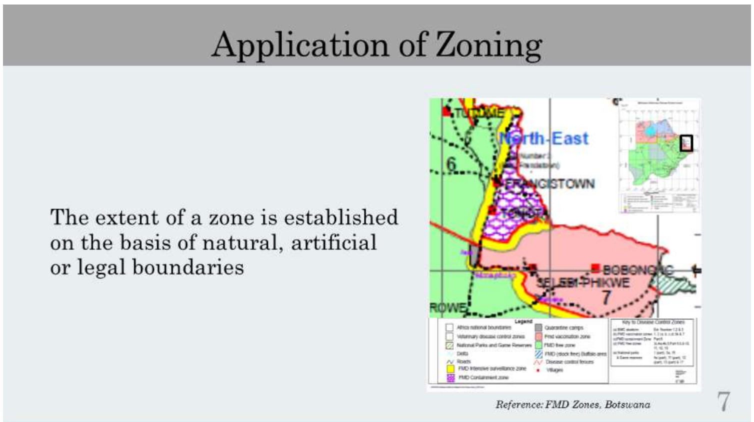
Zoning refers to a geographic perspective on disease control.

Compartments are biosecurity systems based on value chains and the movement that lie outside of a zone. Both approaches are useful and necessary to approach disease prevention and control.

Photo:

Image 1: OIE

Image 2: Google



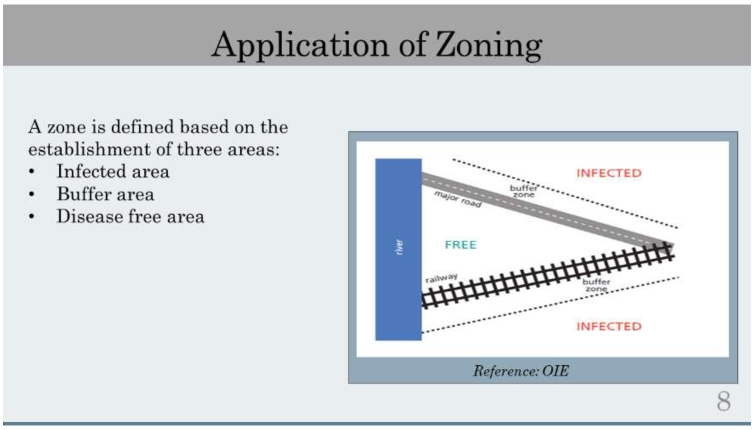
Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 7

SCRIPT / KEY POINTS:

The extent of a zone is defined by natural, artificial or legal boundaries. Whereas, compartments are defined based on management practices related to biosecurity.

Photo:

Image 1: FMD Zones, Botswana



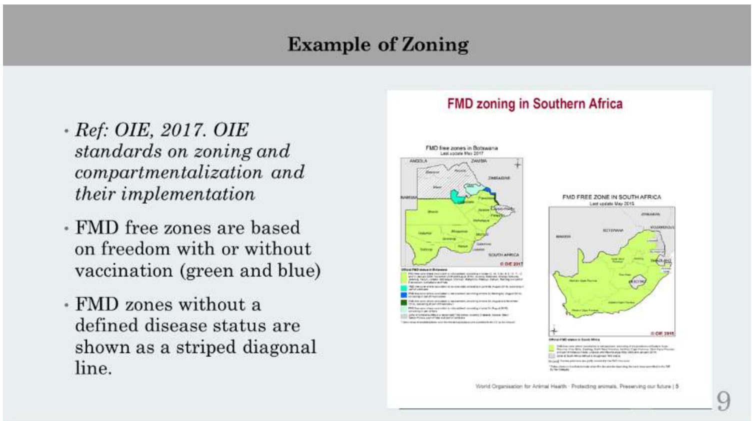
Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 8

SCRIPT / KEY POINTS:

The following slide illustrates a pictorial representation of a compartment. You can see that roads, railways, and the river are can either be barriers or means of spreading disease along the value chain between the free and infected area. A buffer zone is found in between the free and infected area.

Photo:

Image 1: OIE

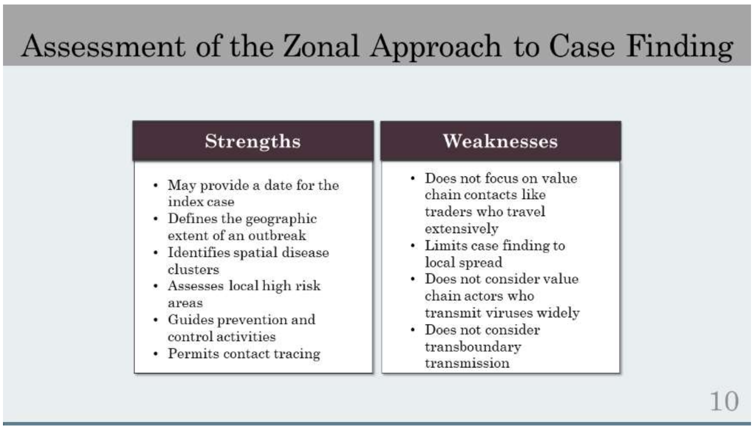


Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 9

SCRIPT / KEY POINTS:

The subpopulation considered in Botswana and South Africa is extensively raised cattle. Note that free zones are subdivided based on vaccination status and Area not yet assessed through surveillance and based on a history of outbreaks are still not characterised. Movement permits and documentation would be necessary to maintain FMD status for each free zone.

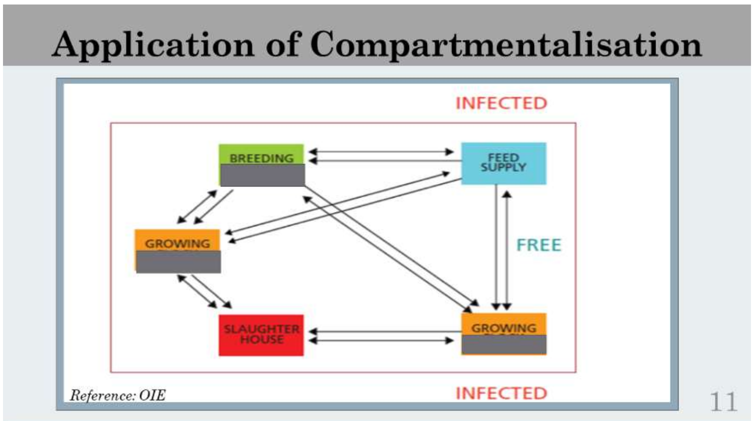
Reference: OIE, 2017. OIE standards on zoning and compartmentalization and their implementation



Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 10

SCRIPT / KEY POINTS:

It is critical to remember that disease transmission can spread from farm to farm in one geographic Area but also through value chains and animal movement. The following slide illustrates the strengths and weaknesses of the zonal approach to case finding that makes the compartmental approach necessary.



Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 11

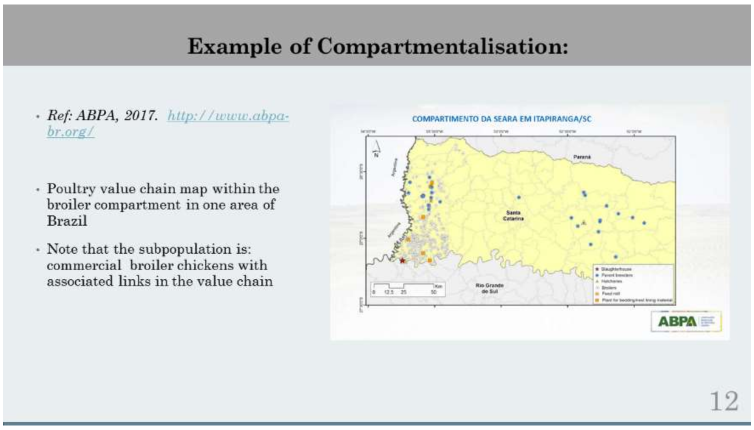
SCRIPT / KEY POINTS:

The following slide illustrates a pictorial representation of a compartment. Remember a compartment is defined as a subpopulation that shares a common biosecurity management system.

In this example, the pig feed supply, breeding herd, growing herd, and slaughterhouse of this compartment are considered to be free. All other compartments are considered infected.

Remember that a compartment is built on the principles of a value chain system built on inputs (feed, etc.) , production systems and outputs (meat, etc.)

Image 1: OIE



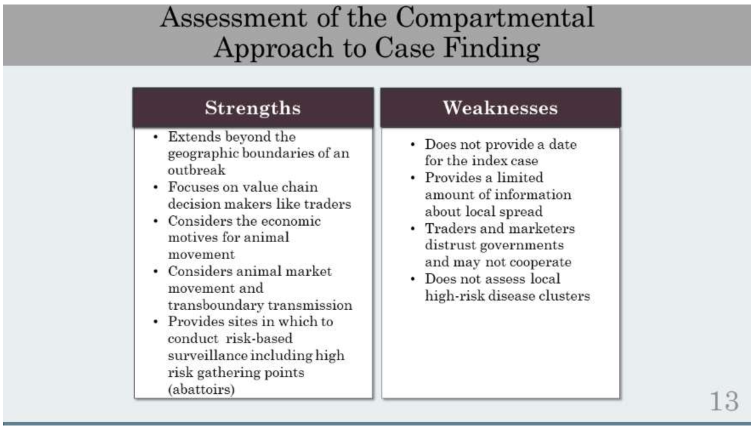
Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 12

SCRIPT / KEY POINTS:

A compartmentalisation initiative in Brazil was coordinated between the Government of Brazil and the Cobb-Vantress Broiler Company. The location of each kind of value chain player is included so that should disease be detected, it can be traced along the value chain components rapidly based on the contacts that occurred among infected and un-infected farms.

The compartmentalization model will assure that surveillance and outbreak response will be effective to reduce the impact of outbreaks and permit trade to importing countries.

Reference: ABPA, 2017



Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 13

SCRIPT / KEY POINTS:

It is critical to remember that disease transmission can spread through value chains and animal movement, as well as from farm to farm in one geographic Area. The following slide illustrates the strengths and weaknesses of the compartmental approach to case finding that makes the compartmental approach necessary.

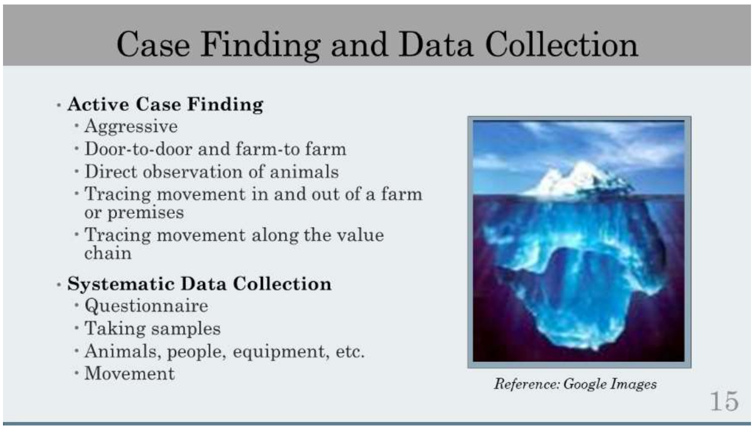
Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 14

SCRIPT / KEY POINTS:

The iceberg principle is the observation that in many (if not most) cases only a very small amount (the 'tip') of information is available or visible about a situation or phenomenon, whereas the 'real' information or bulk of data is either unavailable or hidden.

Photo:

Image 1: Google



Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 15

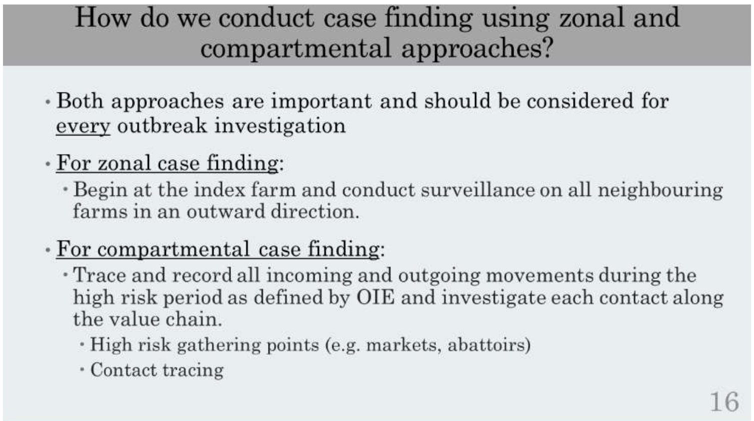
SCRIPT / KEY POINTS:

Case finding is the most important role of an veterinary field epidemiologist during an outbreak. This means conducting intensive, door-to-door and farm-to-farm searches for cases.

Collect field investigation data based on animal-place-time and possible risk factors to permit further data analysis.

Photo:

Image 1: Google



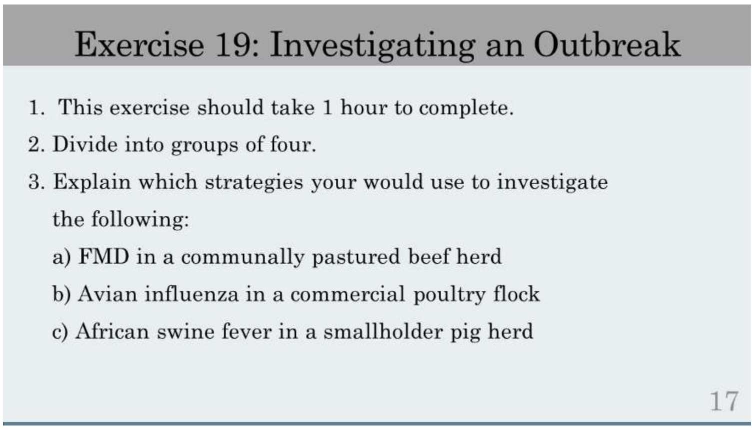
Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 16

SCRIPT / KEY POINTS:

The application of zones and compartmentalisation depends on:

- The epidemiology of the disease;
- Specific environmental factors;

- Necessary surveillance;
- Appropriate and applicable biosecurity measures;
- Quality of veterinary services/other competent authority; and
- Cooperation between governments and private sector (livestock producers) for compartments.



Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 17

SCRIPT / KEY POINTS:

Exercise 19 instructions: Investigating and Outbreak

Working in groups, explain which strategies you would use to investigate the following:

- FMD in a communally pastured beef herd;
- Avian influenza in a commercial poultry flock; and
- African swine fever in a smallholder pig herd.

Instructors:

- See instructor manual for answers.

In Summary….

- Disease investigation in a zone is based upon finding disease in a subpopulation in a geographic area.
- Disease investigation in a compartment is based upon finding disease links in a subpopulation that are part of the same biosecurity system along the value chain.
- Know the advantages and disadvantages of each approach and use both methods to increase the chance of finding the disease when it exists.
- Case finding should be conducted using both zonal and compartmental approaches to get a more complete picture of the extent of the disease transmission.

18

Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 18

SCRIPT / KEY POINTS:

Case finding should be conducted using both approaches in order to get a more complete picture of the extent of the disease transmission that has occurred at any point in time.

Remember – don't just think in terms of circles or Area, think in terms of how animals move within the compartment and value chain!

It is important to map value chains in your local area before an outbreak occurs and use this information to inform surveillance to anticipate where disease may have spread.

Lesson 13 – Investigation Strategies for Early Prevention and Control of Animal Disease Transmission, Slide 19

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 19 – Investigating an Outbreak

Description of Exercise:

Explain the strategies you would use to investigate different disease situations by production type. Should you have any questions over the exercise, please ask a trainer for clarification.

Allotted Time: 1 hour

Organisation of Group Work:

Divide into three groups.

Exercise Objective(s):

Working in groups, explain which strategies you would use to investigate the following:

1. FMD in a communally pastured beef herd
2. Avian influenza (AI) in a commercial poultry flock
3. African swine fever (ASF) in a smallholder pig herd

Exercise Components and Structure:

1. Flip Chart

Materials, Data or Information:

1. No data

Expected Outputs and Deliverables of Each Participant:

1. Description of traditional zonal case finding and tracing approach.

- Description of compartmental approach including value chain mapping.

1. Explain which strategies you would use to investigate FMD in a communally pastured beef herd.

2. Explain which strategies you would use to investigate avian influenza in a commercial poultry flock.

3. Explain which strategies you would use to investigate African swine fever in a smallholder pig herd.

Suggested Answer:

Review the steps of an outbreak investigation;

There is no single "right" list, but every field epidemiologist ought to have a systematic approach to an outbreak investigation. The benefit of having a list is that, in the heat of the investigation, you will not overlook some critical step.

- The steps are not fixed in order. In some situations, control measures (listed as step 10 below) can and should be implemented immediately. Verification of the diagnosis may come at the same time as verification of an epidemic, or laboratory confirmation may come weeks after the investigation is over.
- Many components are dynamic: case definitions, line listings, descriptive epidemiology, and hypotheses all can (and sometimes should) change with additional information.

Steps of an outbreak investigation:

1. Identify potential investigation team and resources / Prepare for field work (e.g., administration, clearance, travel, contacts, designation of lead investigator, etc.).
2. Confirm the existence of an epidemic.
3. Verify the diagnosis.
4. Construct a working case definition.
5. Find cases systematically.
6. Perform descriptive epidemiology.
7. Characterise the cases and population at risk by tabulating and orienting the data in terms of time, place, and animal characteristics.
8. Develop hypotheses.
9. Evaluate hypotheses, usually through analytic epidemiology, e.g., test hypotheses with a case control study or other analytic study. As necessary, reconsider / refine hypotheses and execute additional studies.
    a. Additional epidemiologic studies
    b. Other types of studies (e.g., laboratory, environmental)
10. Implement control and prevention measures (as early as possible).

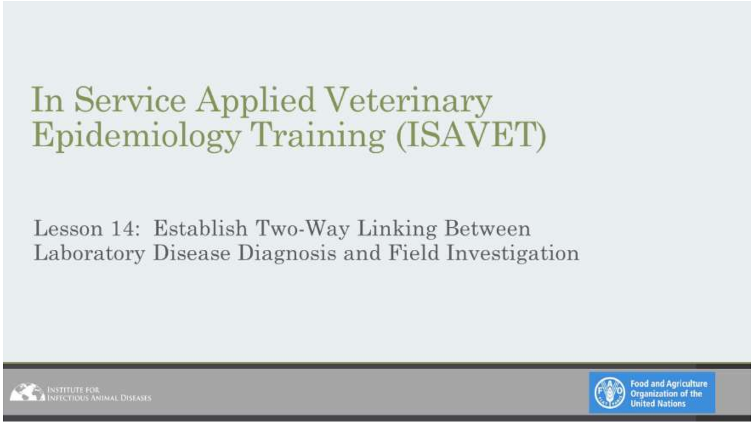
11. Communicate findings.
12. Summarizse investigation for requesting authority.
13. Prepare written report(s).
14. Maintain surveillance to monitor occurrence of cases and to evaluate intervention measures.

Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation

Estimated Lesson and Exercise Time	2 hours and 30 minutes
Instructor Materials	Frontline ISAVET Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation.pptx
	Frontline ISAVET Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation.doc
	Computer
	Microsoft Word
Participant Materials	Frontline ISAVET Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation.PDF

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

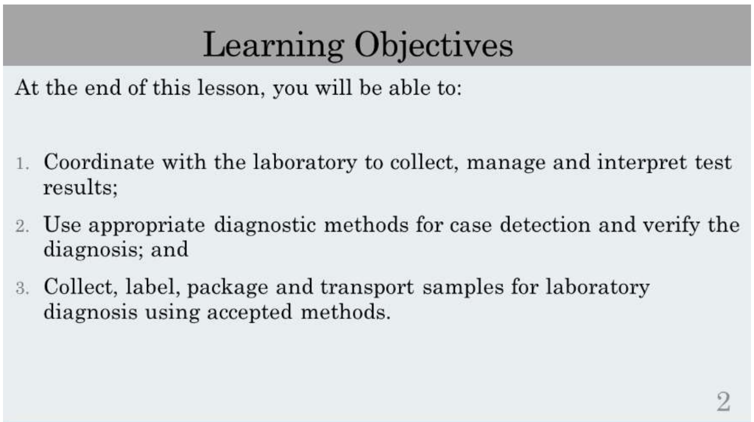
BSE	Bovine Spongiform Encephalopathy
ECF	East Coast Fever
ELISA	Enzyme Linked Immunisorbent Assay
FAO	Food and Agriculture Organization of the United Nations
ISAVET	In Service Applied Veterinary Epidemiology Training
OIE	World Organisation for Animal Health
PCR	Polymerase Chain Reaction
PPR	Peste des Petits Ruminants
RVF	Rift Valley Fever
RVFV	Rift Valley Fever Virus
VTM	Viral Transport Media
WHO	World Health Organization



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 14 titled, “Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation”.

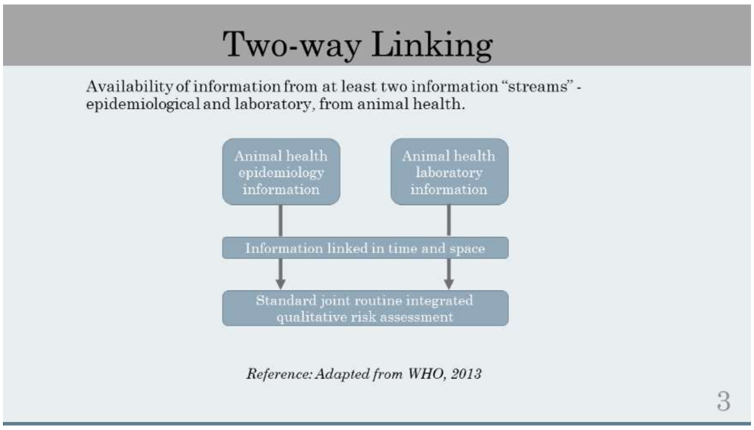


Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

- Coordinate with the laboratory to collect, manage and interpret test results;
- Use appropriate diagnostic methods for case detection and verify the diagnosis; and
- Collect, label, package and transport samples from the laboratory diagnosis using accepted methods.



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 3

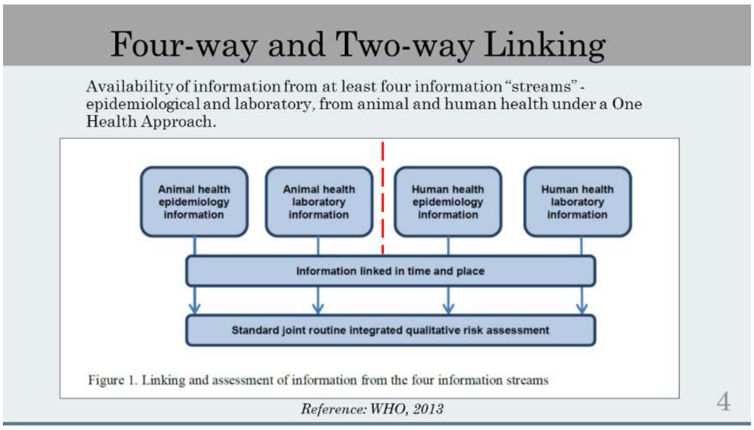
SCRIPT / KEY POINTS:

As a Frontline Veterinarian or Para-veterinarian, you will coordinate with the laboratory to collect, manage, and interpret test results. This coordination between epidemiological information from the field and test results from the laboratory is referred to as two-way linking.

The process of two-way linking is essential for real time detection and response efforts within the animal health system.

Figure:

Adapted from WHO, 2013



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 4

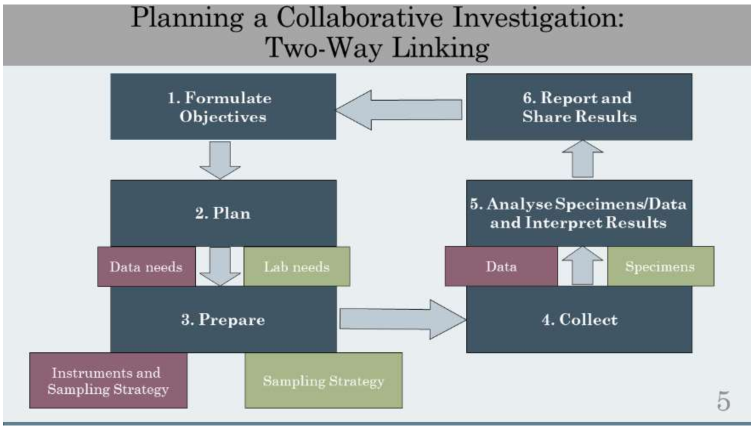
SCRIPT / KEY POINTS:

The crisis of avian influenza and other zoonotic diseases in Asia led animal health and public health sectors to improve cross-sectoral collaboration by committing to improve information sharing from field and laboratory sources. The process of four-way linking is essential for real time detection and response efforts.

While this is important, it assumes that each sector has two-way linking first.

Photo:

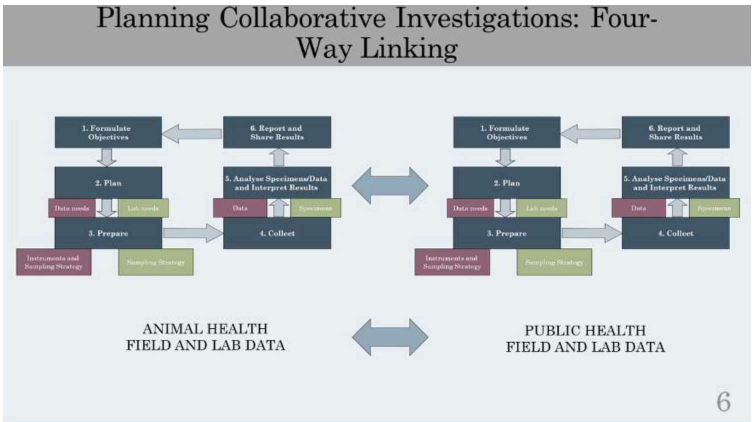
Image 1: WHO



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 5

SCRIPT / KEY POINTS:

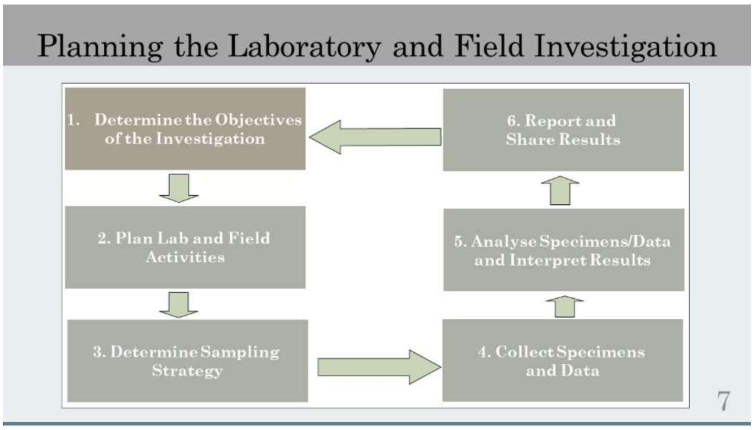
It is this two-way linking that allows for a collaborative investigation between both the laboratory and field. Pre-planning between both sides will allow for a more effective and efficient surveillance system and/or outbreak investigation.



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 6

SCRIPT / KEY POINTS:

It is this four-way linking that allows for a collaborative investigation between both the laboratory and field. Pre-planning between both sides will allow for a more effective and efficient surveillance system and/or outbreak investigation.

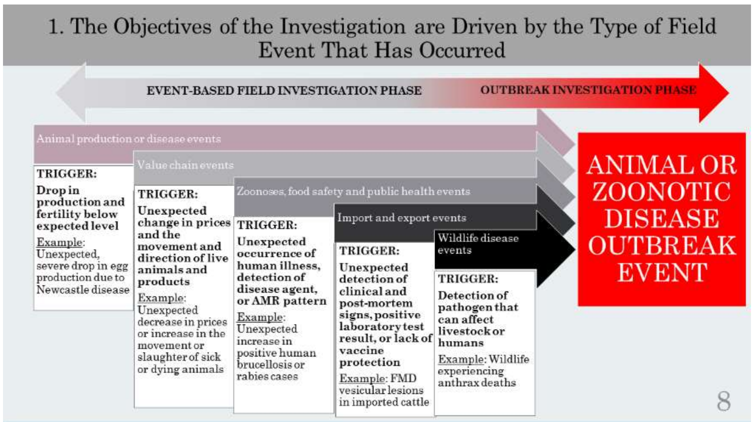


Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 7

SCRIPT / KEY POINTS:

In a laboratory investigation, you first want to formulate your objectives as to why you would like to conduct the investigation. Objectives may include, but are not limited to:

- Determining if disease is present;
- Confirmation of disease; and
- Testing to see if the disease burden has been decreased.



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 8

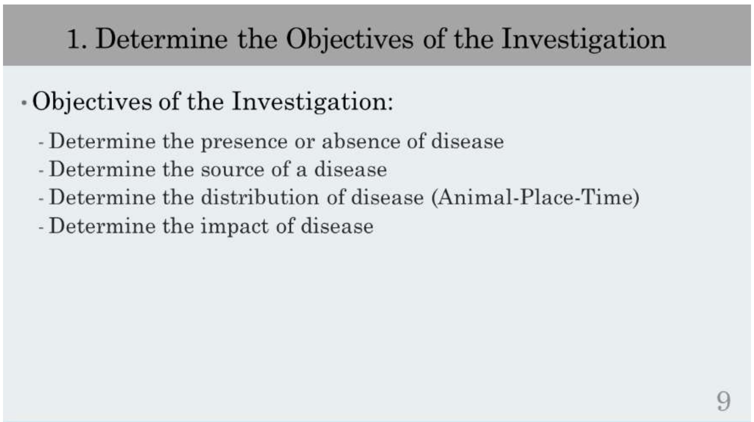
SCRIPT / KEY POINTS:

Note that animal health and disease events are referred to as "field investigations" and that public health commonly refers to these sorts of events such as "case investigations" which often involve one or more individuals.

The Objectives of the Field investigation are specific to each type of field event that is occurring.

Field investigation events may be related to any of the following circumstances that may trigger an outbreak investigation which we will consider in Lesson 16:

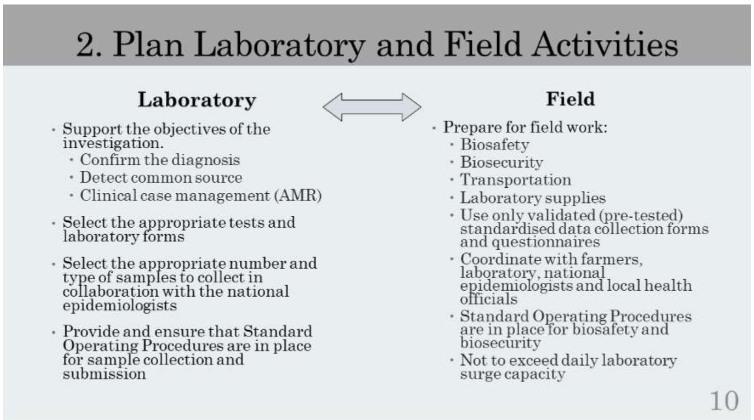
1. Animal production events
2. Value chain events
3. Food safety and public health including antimicrobial resistance (AMR) events
4. Animal import and export events
5. Wildlife disease events



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 9

SCRIPT / KEY POINTS:

In defining your objectives, it is best to consider the scope of what will be required for the laboratory investigation. Is it for surveillance or outbreak purposes or are you looking to use the laboratory investigation for research purposes. A hypothesis should be developed.



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 10

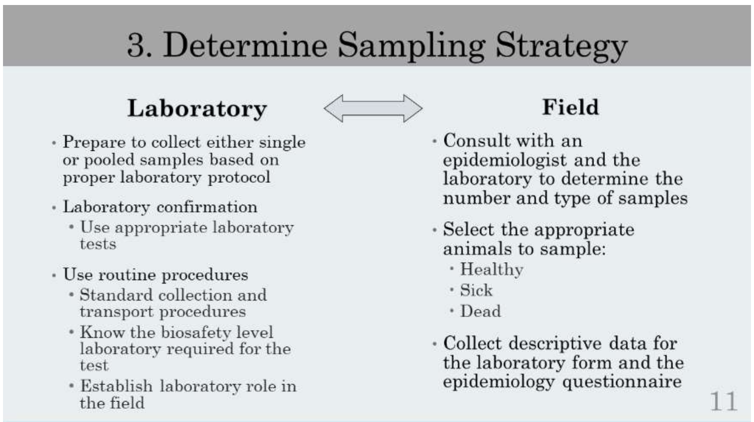
SCRIPT / KEY POINTS:

Planning the laboratory investigation is critical. We do this to confirm a diagnosis which will document an infection in the field, determine a common source of where the disease is located, and to provide information to help with clinical management of the disease while in the field.

It is important to determine which laboratory tests should be utilised for field screening and diagnostic confirmation based on the objectives of the investigation. Communicating with the laboratory will help you identify the specific specimens which will be required for laboratory confirmation. Finally, both the field and the laboratory need to determine the type of sampling strategy that should be conducted to show statistical significance.

Field activities MUST consider:

- Biosafety
- Biosecurity
- Transportation
- Laboratory supplies
- Use only validated (pre-tested) standardised data collection forms and questionnaires
- Coordinate with farmers, laboratory and national epidemiologists and animal health supervisors and local health officials

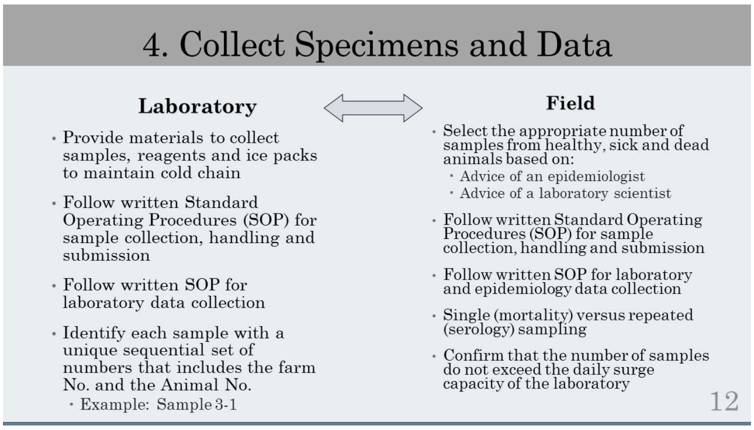


Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 11

SCRIPT / KEY POINTS:

When determining your sampling strategy, you will need to collect certain specimens based on the disease. It is best to identify what are the suspected pathogens occurring in your local area. You will need to provide any clinical signs noted. From this, the laboratory can help you determine what tests are available to identify the suspected pathogens. Not all laboratories conduct the same testing, so

it is important to know which tests can be run at the provincial level compared to the national reference laboratory for a country.
Field veterinarians should collect 1) Data for the Laboratory using a standardised form; and 2) Epidemiological data using a pre-tested standardised questionnaire.



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 12

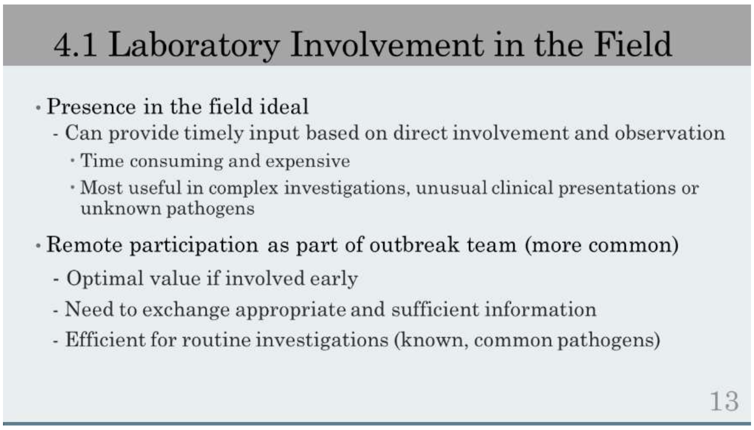
SCRIPT / KEY POINTS:

What samples should you take? And how?

Blood, stools, swabs, water, food items, etc…

How should you process and ship the samples?
Harvesting serum?
Fixing blood smears?
Fixing tissues?
If viral samples require VTM?
Is cooling necessary?
For infectious and biohazardous samples: consider require “Box in a box in a box principle?”
Ask the lab and inform on processing and shipping requirements
Provide SOPs and when samples are arriving!

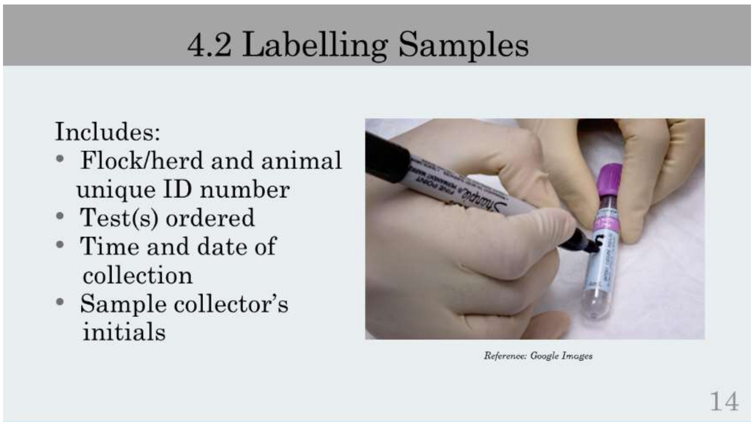
Field data should be collected following established SOP for laboratory and epidemiology purposes. Epidemiologists and laboratory scientists must be consulted to ensure that there is two-way linking of information at local and national levels.



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 13

SCRIPT / KEY POINTS:

It is ideal that laboratory personnel should be in direct communication with field personnel when conducting an animal health investigation or research project. Communication with laboratory personnel can provide timely input into what samples should be collected. It is best to include the laboratory as early as possible during the planning phase as both sides will need to exchange appropriate and sufficient information.



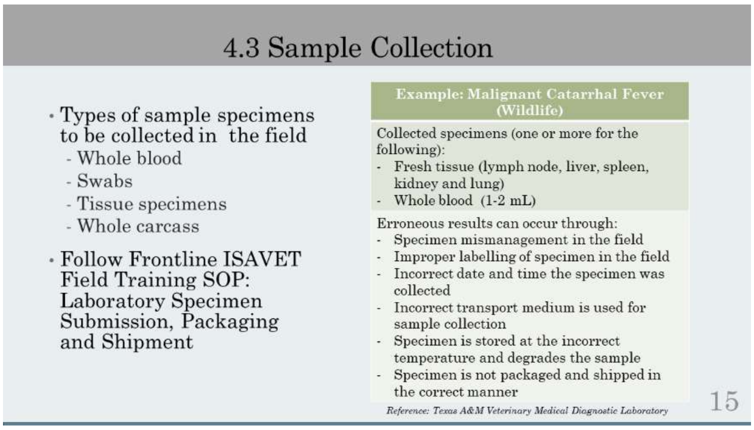
Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 14

SCRIPT / KEY POINTS:

Some information to collect include:

- Flock/animal unique ID number
- Test (s) ordered
- Time and date of collection
- Sample collector's initials

Photo: Google Images



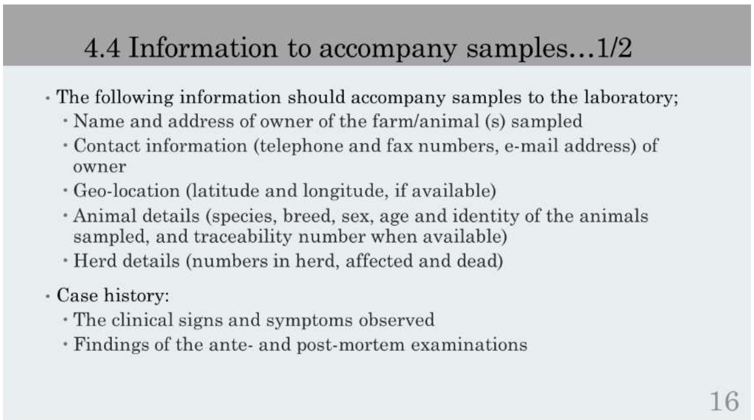
Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 15

SCRIPT / KEY POINTS:

Several different specimens can be collected from the field. The main types include whole blood, swabs, tissue specimens and the whole carcass. They types of samples collected is dependent upon the disease. It is a foundational principle for any laboratory test procedure that the value of the test is compromised or even negated by using specimens that have not been properly collected, labelled, handled or stored prior to and during the testing process.

An infectious systemic disease, Malignant Catarrhal Fever (MCF) affects ruminants. Worldwide, cases of MCF have been diagnosed in white-tailed deer, antelope species, exotic hoofstock, sheep, goats, bison, and cattle. Clinical signs of MCF include fever, nasal discharge, ocular discharge, edema or corneal opacity, diarrhea, dermatitis, oral erosions, among other signs. Diagnostic testing is needed to definitively identify which strain of the MCF is affecting an animal.

Reference: Texas A&M Veterinary Medical Diagnostic Laboratory



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 16

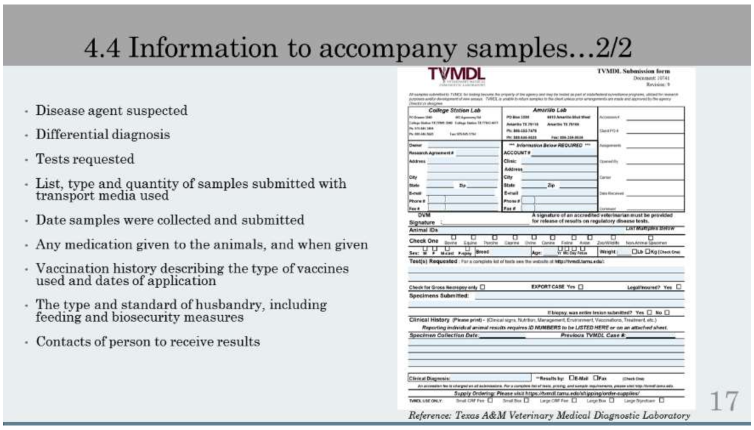
SCRIPT / KEY POINTS:

The following information should accompany samples to the laboratory;

Name and address of owner of the farm/animal (s) sampled
Contact information (telephone and fax numbers, e-mail address) of owner
Geo-location (latitude and longitude, if available)
Animal details (species, breed, sex, age and identity of the animals sampled, and traceability number when available)
Herd details (numbers in herd, affected and dead)

Case history:

The clinical signs and symptoms observed
Findings of the ante- and post-mortem examinations



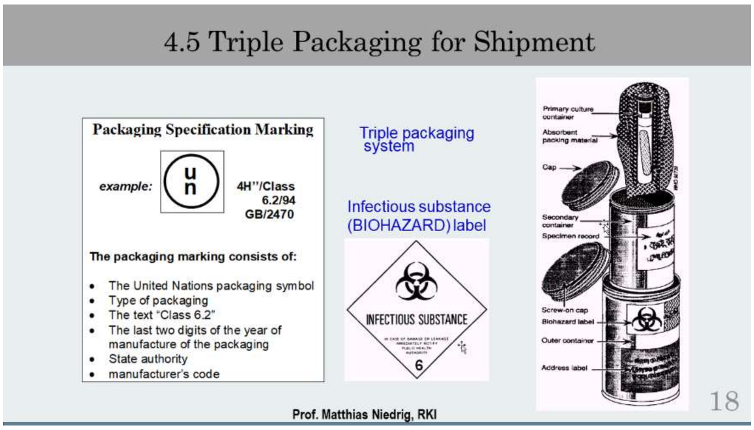
Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 17

SCRIPT / KEY POINTS:

Other information includes:

- Disease agent suspected
- Differential diagnosis
- Tests requested
- List, type and quantity of samples submitted with transport media used
- Date samples were collected and submitted
- Any medication given to the animals, and when given
- Vaccination history describing the type of vaccines used and dates of application
- The type and standard of husbandry, including feeding and biosecurity measures
- Contacts of person to receive results

Reference: Texas A&M Veterinary Medical Diagnostic Laboratory



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 18

SCRIPT / KEY POINTS:

Consider triple packaging of all specimens to ensure that all specimens are secure and cannot pose a risk to animals or humans and MAINTAIN THE COLD CHAIN. The packaging must consist of three components: a primary receptacle, secondary packaging, and a rigid outer packaging.

- Primary receptacles must be packed in secondary packaging in such a way that, under normal conditions of transport, they cannot break, be punctured, or leak their contents into the secondary packaging.
- Secondary packaging must be secured in outer packaging with suitable cushioning material. Any leakage of the contents must not compromise the integrity of the cushioning material or of the outer packaging.
- An itemised list of contents should be enclosed between the secondary and outer packaging. A properly completed laboratory submission form may be used for this purpose.

Reference: Prof. Matthias Niedrig, RKI

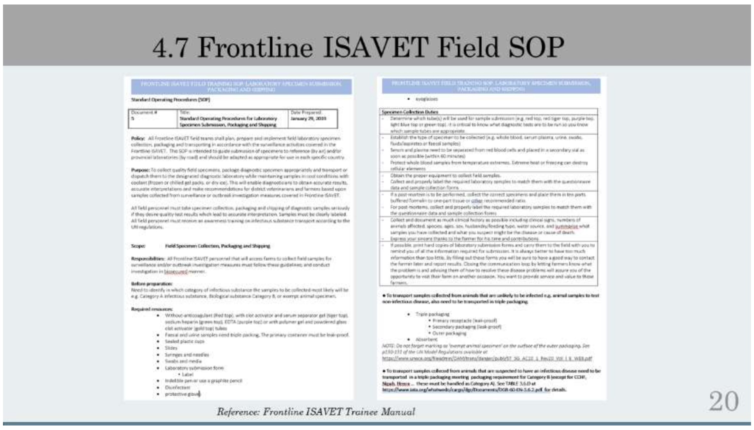
Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 19

SCRIPT / KEY POINTS:

There are four steps to safely packaging a sample to send to a diagnostic laboratory. Adhering to these four steps helps to ensure a package arrives safely to a diagnostic laboratory.

Step 1: Prepare a rigid outer package that contains secondary packaging. Use a cold pack if specimen must remain at a refrigerated temperature.
Step 2: Ensure blood tubes have adequate cushioning and are bagged to prevent leakage. Add a layer of filler between the cold packs and specimens. Package the paperwork in its own bag.
Step 3: Add additional filler to decreased empty space. Secure the entire package with tape.
Step 4: Label the package in accordance to the specimens classification.

Reference: Texas A&M Veterinary Medical Diagnostic Laboratory

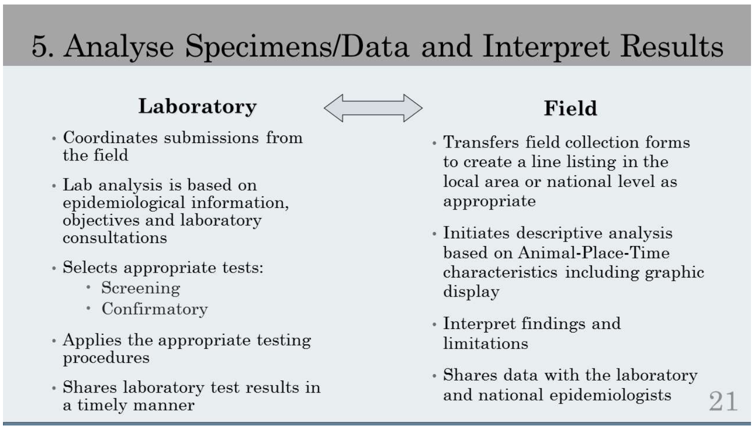


Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 20

SCRIPT / KEY POINTS:

During the 4th week, you will be working with the following field SOP for collection, packaging and submission of field specimens.

Reference: Frontline ISAVET Trainee Manual

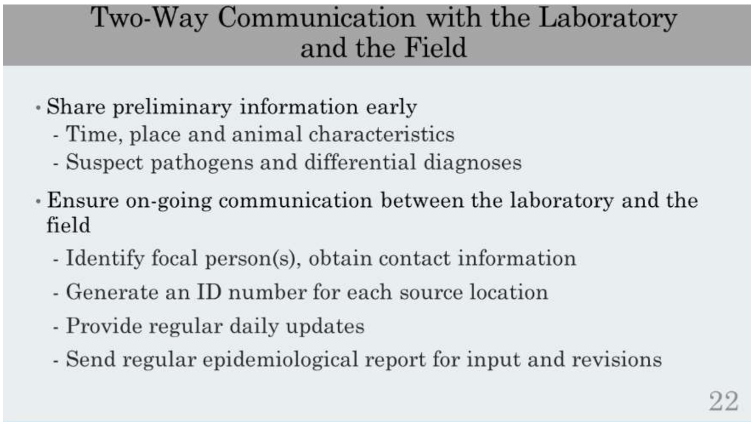


Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 21

SCRIPT / KEY POINTS:

Specimen analysis is based on epidemiological information, the objectives of the investigation and laboratory consultations. Laboratory personnel and epidemiologists can determine the best testing algorithms for screening and confirmation. Depending on the objectives, testing can be conducted in series or parallel.

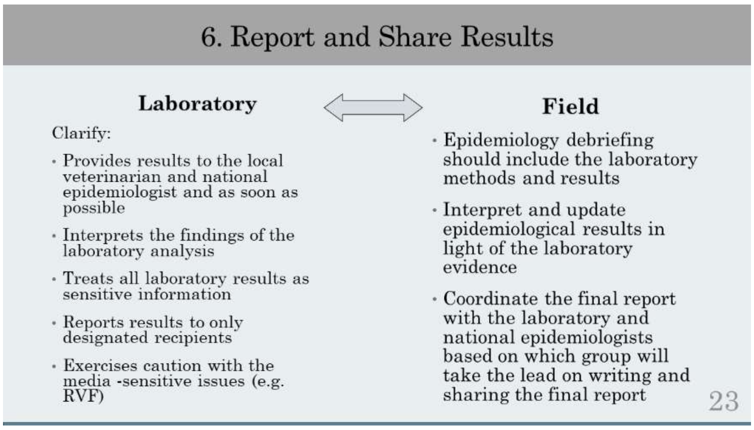
The field level should make a copy of the laboratory submission form and link it with the standardised questionnaire when entering data into Excel to ensure integrity of the line list data. Ongoing two-way data sharing is MANDATORY to ensure effective two-way linking.



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 22

SCRIPT / KEY POINTS:

When communicating with the laboratory, share your initial information early. Provide field information in animal-place-time on laboratory submission forms. Ensure that on-going communication with the laboratory occurs before, during and after an outbreak. It is best to provide regular updates over the situation between field and laboratory personnel. Identify a focal person from the field who will have direct communication with the laboratory.

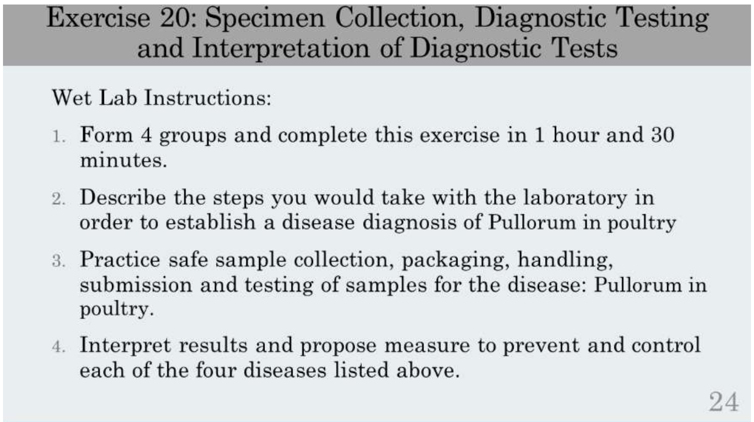


Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 23

SCRIPT / KEY POINTS:

The laboratory and field components must closely coordinate with national epidemiologists to coordinate:

- All information will be treated as confidential unless cleared for release by the CVO or higher official
- Who will take the lead to write the final report
- Agree to review and agree on the findings and conclusions of the report
- Deal with the media



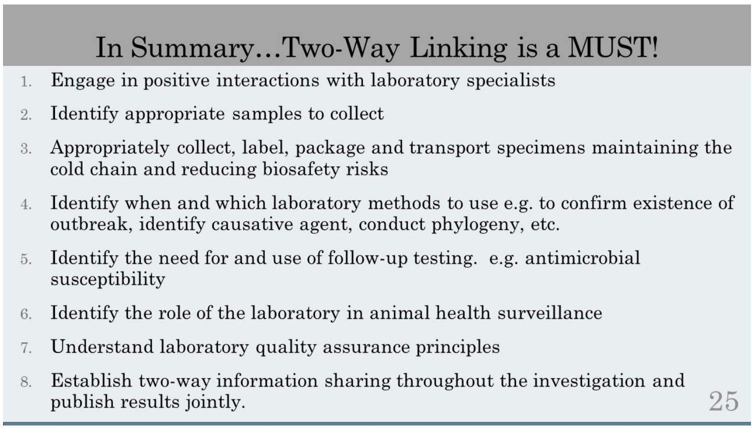
Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 24

SCRIPT / KEY POINTS:

Exercise 20: Specimen Collection, Diagnostic Testing and Interpretation of Diagnostic Tests

- Describe the steps you would take with the laboratory in order to establish a disease diagnosis;
- Practice each step to follow accepted sample collection methods; and

- Construct suspect, probable and confirmed case definitions for a disease your group is assigned.



Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 25

SCRIPT / KEY POINTS:

The following provides 8 practices to strengthen laboratory and epidemiology collaboration.

- Engage in positive interactions with laboratory specialists
- Identify appropriate samples to collect
- Appropriately collect, label, package and transport specimens maintaining the cold chain and reducing biosafety risks
- Identify when and which laboratory methods to use e.g. to confirm existence of outbreak, identify causative agent, conduct phylogeny, etc.
- Identify the need for and use of follow-up testing. e.g. antimicrobial susceptibility
- Identify the role of the laboratory in animal health surveillance
- Understand laboratory quality assurance principles
- Establish two-way information sharing throughout the investigation and publish results jointly.

Lesson 14 – Establish Two-Way Linking Between Laboratory Disease Diagnosis and Field Investigation, Slide 26

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 20 – Specimen Collection, Diagnostic Testing and Interpretation of Diagnostic Tests

Description of Exercise:

This exercise, is a wet lab that will be supervised by a laboratory diagnostician and two assistants and where you will discuss specimen collection, packaging shipment and diagnostic testing and interpretation for *Salmonella pullorum*. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Trainer Note: Pullorum was chosen since it is endemic in many countries, is not zoonotic and can be collected from poultry in many locations. Other diseases and SOPs would need to be developed if trainers want to conduct a wet lab for testing other diseases in other species.

Time: 1 hour and 30 minutes

Organisation of Group Work:

Assemble into four groups.

Wet Lab Instructions:

1. Describe the steps you would take with the laboratory in order to establish a disease diagnosis of Pullorum in poultry.
2. Discuss the information that would need to be included on the laboratory submission form from the field.
3. Practice safe sample collection, packaging, handling, submission, shipment and testing of samples for pullorum.
4. Interpret results and describe how you will report and share information that links the laboratory and the field activities.

Exercise Components and Structure:

Wet Lab Demonstration and Discussion:

Group A: Pullorum disease in poultry

1. The laboratory supervisor will review the laboratory diagnosis of pullorum disease and then a Frontline ISAVET field trainer demonstrate how to handle the chickens, select and prepare the site and then collect blood.
2. The laboratory supervisor will review a laboratory submission form and demonstrate the specific information that should be included and how to properly label and secure this information, so it does not get damaged during transport.
3. The laboratory supervisor will demonstrate how to perform, interpret and record the pullorum test and trainees will then perform, interpret and record the results of the slide agglutination test themselves.
4. The laboratory supervisor will demonstrate how to safely prepare and protect the quality of a blood sample tube for labelling, packing, handling and submission.
5. Based on the learning objectives of Lesson 14, the laboratory supervisor will ask trainees to explain how to report and share the findings of laboratory tests between

laboratory and field including farmers, national epidemiologists and other stakeholders. Two trainees will be asked to volunteer to take notes to record all group discussion.

Materials, Data or Information:

1. Microsoft Word
2. Penn State video on recommended blood sample collection from chickens.
3. Standard Operating Procedure (SOP) for collection of blood from poultry
4. SOP for pullorum diagnostic testing in poultry
5. SOP for proper sampling handling, packaging and shipping.

Expected Outputs and Deliverables of Each Participant:

- Explain the laboratory diagnosis of a specific disease (e.g. Pullorum);
- Conduct steps of safe sample collection, packaging, handling, submission and testing of samples; and
- Interpret results and how to report and share the findings of laboratory tests between laboratory and field including farmers, national epidemiologists and other stakeholders.

TRAINER CONCEPTS:

- Review the diagnostic tests available at the local level and recognise design characteristics that may affect specimen collection, transportation and storage.
- Explain the advantages and disadvantages of different diagnostic tests for the most common etiologic agents.
- Define criteria for collecting samples in an animal health event or surveillance.
- Interpret data derived from laboratory production data.

Pullorum Disease

Part 1: Diagnostic Testing for Pullorum Disease

OIE Terrestrial Manual Chapter 2.3.1

Description and importance of the disease: Pullorum disease of chickens is a bacterial infection caused by Salmonella enterica subspecies enterica serovar Gallinarum biovar Pullorum (Salmonella Pullorum). At this time the serovar is referred to as Gallinarum in some parts of the world and Pullorum in others; in this chapter the serovar will be referred to as Gallinarum or Pullorum according to the biovar under discussion as this is more meaningful from a clinical and
epidemiological perspective.

In its acute form, Pullorum disease is almost exclusively a septicaemic disease of young chickens. However, the organism may also be associated with disease in turkey poults and may be carried subclinically or lead to reduced egg production and hatchability, plus a range of atypical signs in older birds. Ovarian transmission is a major route by which the organism can spread. Game birds and 'backyard' poultry flocks may act as reservoirs of infection, and wild birds may act as vectors for the organism and as such are important in the epidemiology of the disease.

Fowl typhoid in chickens and turkeys is caused by S. Gallinarum biovar Gallinarum and is more often observed in the later growing period and in mature stock. Disease is often characterised by rapid spread with high morbidity and acute or subacute mortality. Red mites may be involved in the transmission of disease and persistence in poultry houses. Clinical signs in chicks and poults include anorexia, diarrhoea, dehydration, weakness and death. In mature birds, Pullorum disease is less severe but decreased egg production, poor hatchability and some increased mortality may occur. Fowl typhoid is a more acute septicaemic condition which mainly affects mature birds and may be particularly severe in commercial laying flocks.

Identification of the agent: Samples should not be taken from birds or eggs that have recently been treated with antimicrobial drugs. Swabs or aseptically collected samples from infected tissues, or intestinal and cloacal contents should be used for diagnostic testing. Other materials that may be sampled include eggs, embryos, faecal droppings and hatcher debris, especially fluff, dust and broken eggshells and chick box linings. Samples of tissues such as caecal tonsils, liver, gall bladder and spleen from infected birds are preferable to faecal and environmental samples. Tissue samples should be inoculated into non-selective and selective enrichment broths and on selective agar medium, such as brilliant green agar, as soon as possible after collection.

In case of delay, samples should be stored at 4°C. Typical colonies can be identified by serological and biochemical
tests. Molecular approaches can also be used to identify and differentiate S. Gallinarum and S. Pullorum. Final serological confirmation of suspect isolates can normally only be completed in a Salmonella Reference Typing Laboratory.

Serological tests: These are satisfactory for identifying the presence and estimating the prevalence of infection within a flock. The test used in the field is the rapid whole blood plate agglutination test. This test is unreliable in turkeys and ducks as many uninfected birds may give positive reactions. In the laboratory a serum agglutination test is used, either as a rapid plate test or
as a tube test. These can be applied as macro- or microagglutination tests, though the latter may be more likely to give false-positive results with turkey sera. Any positive reactors should be confirmed as being infected by culture at post-mortem examination. Enzyme-linked immunosorbent assays have been reported but no commercial test is available.

The use of vaccines to control S. Enteritidis or S. Gallinarum infections in chickens may cause problems in the interpretation of serological results.

Requirements for vaccines: Live and inactivated vaccines are available for fowl typhoid in some countries. The most commonly used vaccine is a commercial live vaccine derived from the stable rough strain of S. Gallinarum known as '9R'.

Part 2: Specimen Collection- Implications for Testing

Instructions

Please review the information on specimen collection provided below. After carefully reading the information, provide written answers for questions that follow (All Groups).

Specimen Collection

<u>Planning for Specimen Collection</u>

The process of collecting, storing, and transporting a clinical specimen directly affects the quality of the specimen and the ability to produce quality results from a laboratory test. Many outbreak investigations will involve the collection of animal clinical specimens from outbreak-associated cases. Laboratory confirmation of an aetiologic agent is a critical component to a successful outbreak investigation. For this reason, it is important to remember that the ability of a laboratory to successfully identify a pathogen depends on appropriate specimen collection and transportation. Communication with the laboratory before specimen collection is critical to ensure appropriate collection technique and maintenance of sample so that accurate results can be obtained.

<u>Performing Specimen Collection</u>

It is important to obtain an adequate amount of the specimen and handle it with care, as this may be the only opportunity to obtain a specimen during the outbreak. A sample must be collected properly in order to ensure that the pathogen or infectious agent can be recovered in a viable form for laboratory analysis. Again, communication with the laboratory is vital.

<u>Labelling and Identification:</u>

Ensuring that specimens are accurately labelled at collection time is absolutely essential. Misidentification of a specimen leads to misidentification of a patient, which can result in improper diagnosis and treatment.

<u>Storage and Transportation:</u>

Appropriate storage of specimens before and during transportation must be maintained in order to preserve the integrity of the specimen. Most specimens need to be transported in sterile containers, although containers for faeces do not need to be sterile. Specimens transported in incorrect containers (e.g. non-sterile when sterility is required) may be rejected by the laboratory. Remember, all specimen containers should be closed tightly. Laboratories may reject the specimen if it shows signs of leakage/seepage, since this could potentially expose laboratory personnel to the contents.

Packaging of clinical specimens must comply with regulations (e.g., mail and commercial) for transport of infectious material. These regulations depend upon the type of transport (like ground or air delivery) and should be determined in consultation with the laboratory and carrier prior to specimen collection. Finally, before transport, the receiving laboratory should be notified of the pending shipment so that they can prepare the facilities and workforce to handle the samples.

Guiding Questions

1. Before collecting a specimen:

    a. How do you determine what clinical and/or other samples you will need to collect?

    b. How do you determine which laboratory you will send your specimen(s) to?

    c. What logistics do you need to consider in terms of collection, packing, and transportation of the specimen?

    d. List the safe handling procedures of using the pullorum antigen in the field.

Suggested answer:

a) The type of clinical and other samples that need to be collected will be largely be dependent on the outbreak in question. You must use the clinical and epidemiological data that are available to you to hypothesize about the possible causative agents. Once you formulate a hypothesis about what the causative agent might be, you can then determine what clinical specimens and other sample types will be needed for laboratory-confirmed diagnosis. For example, in an outbreak of FMD, you probably may want to obtain epithelial scrapings from the lesions in the mouth and feet in addition to obtain whole blood from suspect cases.

b) Knowing where to send your specimen(s) is something that should be determined prior to any sample collection taking place. A laboratory must be selected to perform testing and analysis. This may, in part, be determined by the test(s) needed. Routine laboratory tests, such as those used for the detection of East coast fever (ECF) may be performed by most laboratories. However, the laboratory capability to test for some agents, e.g. RVFV or culture for Brucellosis may be more limited.

c) All aspects of the specimen collection process (including sample type, materials needed, local vs. on-site processing, transportation and communication of results) should be organised with the laboratory before specimen collection begins. Transportation details such as the timing/delivery of the collection, required transport media, transit route, shipping requirements, documentation (i.e. chain of custody forms) and temperature requirements should also be discussed. Packaging and transportation requirements (which must comply with national regulations for transporting infectious material) should also be reviewed with the transport service.

d)

1. The antigen should be store in a refrigerator at 45 degrees Fahrenheit.
2. The antigen should be room temperature for conducting the test.
3. The antigen should be immediately placed back in the refrigerator upon completion of field testing.
4. Review the label to ensure the antigen is not expired. False positive reactions can occur from using old antigen that becomes to sensitive.

5. Ensure the antigen has been properly stored before using.

2. When is the best time to collect a specimen from sick animal (s) during a course of an outbreak?

Suggested answer: Ideally, collection of specimens will occur as soon as possible once the outbreak has been identified. Specimens obtained early, particularly before commencement of treatment (e.g., antimicrobials administration) are more likely to yield the pathogen. In certain situations specimen collection after an animal recovers from infection may be equally important. This is due to the ability to detect the presence of antibody levels in serum samples post-illness which can confirm whether or not an animal's infection was in fact related to the outbreak in question.

3. Why is proper sample collection technique so important to the laboratory?

Suggested answer: Appropriate specimen collection technique is important because the laboratory may otherwise reject the specimen. If there is insufficient sample quantity or contamination of the specimens, the laboratory may not be able to process the specimens. For example, it is inadvisable to collect most fungal cultures with swabs because the swab fibers can interfere with interpretation of the results.

4. What pieces of information should be included when labelling/identifying a laboratory specimen?

Suggested answer: While specific laboratories may have different requirements, in general, labels should be affixed to the specimen container(s) and should include the following: Animal ID, a unique identification number (optional), date and place of collection (location of the farm up to the smallest administrative unit, use geo-coordinates if possible), type of sample, clinical history of animal(s), differential diagnosis and name of the specimen collector. Some laboratories may require additional forms that should accompany clinical specimens.

5. If a specimen contains a particularly dangerous or infectious organism, should this be noted in the labeling and identification process? Should the laboratory be notified in advance about what type of specimens to expect?

Suggested answer: Yes. Although laboratories handle all specimens as potentially infectious, specimens that are known to contain a particularly dangerous pathogen should be clearly marked as such. Additionally, the laboratory should be made aware of the impending arrival of these dangerous specimens in advance so that the necessary preparations can be made to handle the specimens in a manner that ensures utmost safety for laboratory facilities and personnel. It is also important to note that not all laboratories are equipped and/or trained to accept and test all infectious organisms, making advance notice is especially important. By notifying the laboratory ahead of time, you can avoid any problems (e.g. lost time due to need to re-route specimens to another laboratory, loss of sample integrity, etc.) that might result from delivering specimens to a laboratory that lacks the necessary capability and capacity to deal with the agent in question.

6. True or False: Most specimens stored at room temperature are suitable (or remain suitable) for laboratory diagnostic testing. Explain.

Suggested answer: Absolutely false! Since microorganisms are living beings, their environmental conditions can affect their maintenance and survival. If they multiply or die during collection, transport or storage, they no longer represent the disease process in the animal from whom the specimen was taken. For this reason, storage in appropriate media and maintenance of proper temperatures is critical. These requirements will depend on the type of specimen and sample and should be determined in consultation with the laboratory before specimen collection begins.

Part 3: Interpreting and Reporting Laboratory Data

Group A: Poultry

Instructions

1. Interpret and record the test results in the following table:

Chicken	Test Result

2. How would you interpret, report and share the results from this flock?

Suggested answer: One way to report the individual results is as they are listed above initially but the flock test results should be shared and integrated into a local area line listing of poultry farms. Positive tests must be interpreted carefully since false positive cross-reaction with other bacterial antigens is common, especially in turkeys and ducks.

3. You have a flock that has 9 of 10 poultry that have tested positive in the field. None of the birds are showing clinical signs. You are suspicious that the test may be producing false positive results. What are some reasons for why the test result might be unreliable under field circumstances.

Suggested answer:

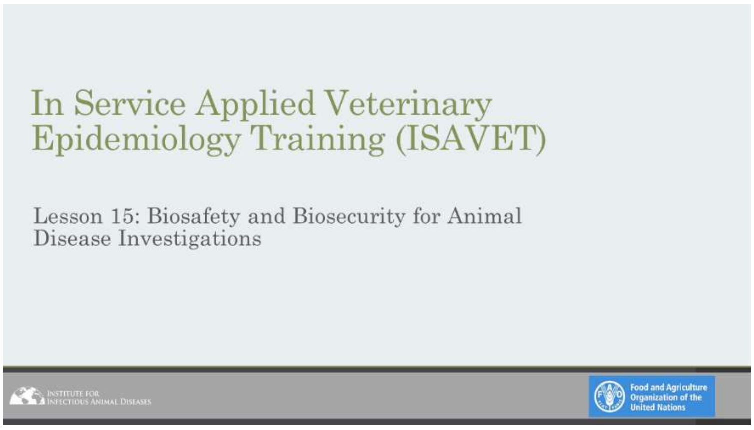
- It is critical to for the veterinarian to understand that proper handling of the pullorum antigen while in the field is important for obtaining accurate test results. Use of old or improperly stored antigen increases the likelihood of unreliable results.
- Expired test kit being used.
- Blood samples left in heat to where the blood contents degrade while outside.
- Interpreter error and misrecording of the laboratory result.
- Improper labelling of sample

Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations

Estimated Lesson and Exercise Time	2 hours and 30 minutes
Instructor Materials	ISAVET Lesson 15 Biosafety and Biosecurity for Animal Disease Investigations.pptx
	ISAVET Lesson 15 Biosafety and Biosecurity for Animal Disease Investigations Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 15 Biosafety and Biosecurity for Animal Disease Investigations Participant Guide.doc

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

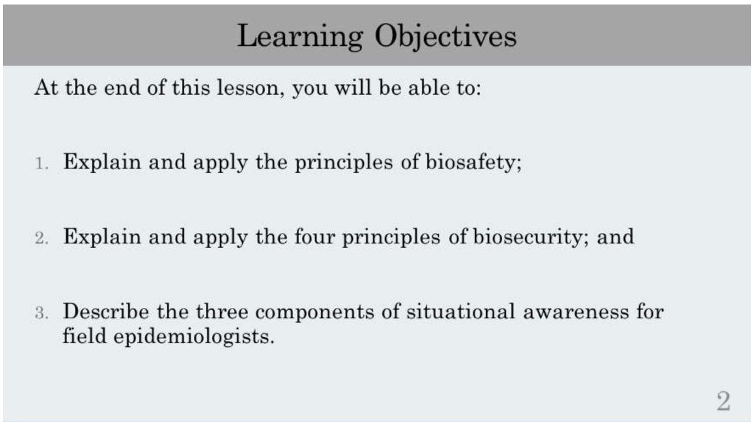
FAO	Food and Agriculture Organization of the United Nations
HPAI	Highly Pathogenic Avian Influenza
ISAVET	In Service Applied Veterinary Epidemiology Training
OIE	World Organisation for Animal Health
PPE	Personal Protective Equipment
SOP	Standard Operating Procedure
USDA	United States Department of Agriculture
WHO	World Health Organization



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 15 titled, “Biosafety and Biosecurity for Field Animal Disease Investigations”. In this lesson, we will discuss biosafety and biosecurity principles when conducting a field animal disease investigation.

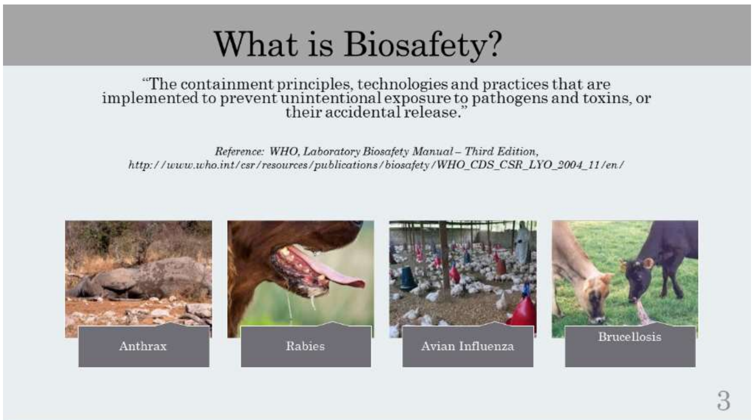


Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

- Understand, explain and apply the principles of biosafety;
- Understand, explain and apply the four principles of biosecurity; and
- Describe the three components of situational awareness for field epidemiologists.



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 3

SCRIPT / KEY POINTS:

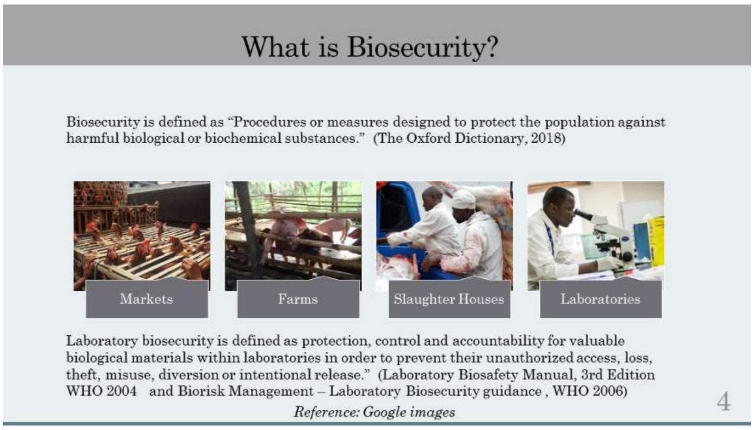
Your field work at the local includes many examples that show the need to protect your self from zoonotic diseases such as anthrax, rabies, avian influenza and brucellosis. You should never put yourself in harms way in the performance of your duties!

Therefore we need to conduct our field work in a way that ensures that we are not exposed to zoonotic disease pathogens through the application of Biosafety Principles.

Biosafety is defined as the containment principles, technologies and practices that are implemented to prevent unintentional exposure to pathogens and toxins, or their accidental release.

The same definition is used for laboratory biosafety.

Reference: *WHO, Laboratory Biosafety Manual – Third Edition, http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/*



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 4

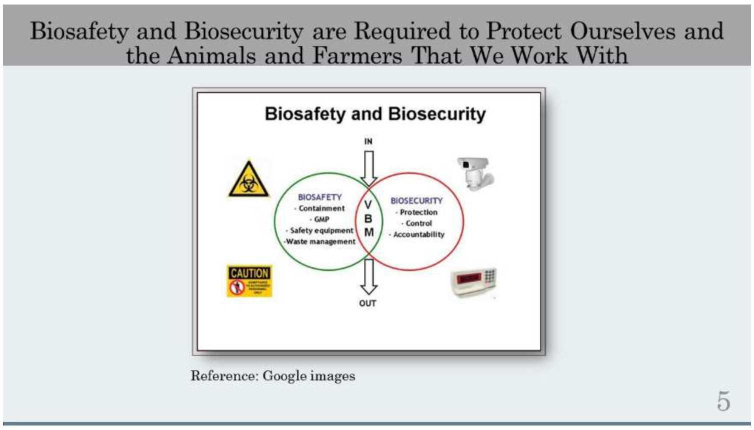
SCRIPT / KEY POINTS:

Biosecurity is really measures we take to protect living organisms. The Oxford dictionary defines biosecurity as procedures or measures designed to protect the population against harmful biological or biochemical substances.

Your field work involves visiting more than one location each day. How should be conduct ourselves to avoid spreading animal disease agents from farm to farm? Your daily movements performing field investigations, vaccinations, treatments and visits to animal markets, slaughter houses and laboratories are high risk activities that require preventive action to avoid spreading disease agents.

Therefore veterinarians and paraveterinarians need to conduct our field work in a way that ensures that we are not exposed to zoonotic disease pathogens through the application of Biosecurity Principles.

References: (The Oxford Dictionary, 2018)
Photos: Google images

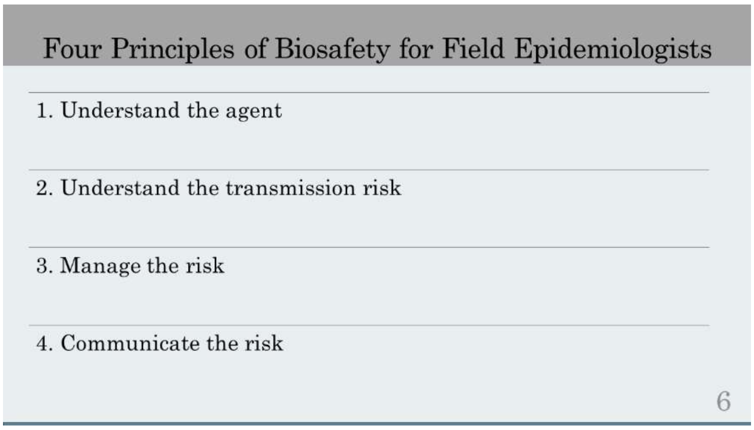


Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 5

SCRIPT / KEY POINTS:

Read slide.

Photo: Google images



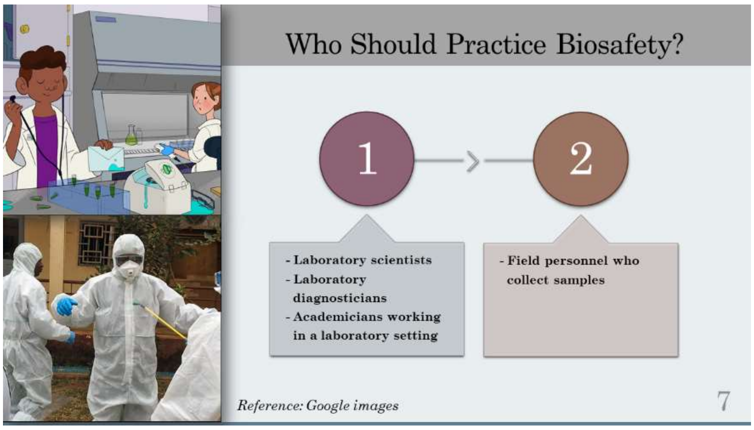
Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 6

SCRIPT / KEY POINTS:

The following includes four specific biosecurity principles that any field personnel should understand and apply when conducting an animal disease investigation. For field investigations, biosafety and biosecurity usually overlap.

Principles include:

- Understanding the agent
- Understanding the transmission risk
- Managing the risk
- Communicating the risk



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 7

SCRIPT / KEY POINTS:

Anyone who collects samples, prepares and analyses samples for laboratory diagnosis is at risk for zoonotic animal disease pathogens.

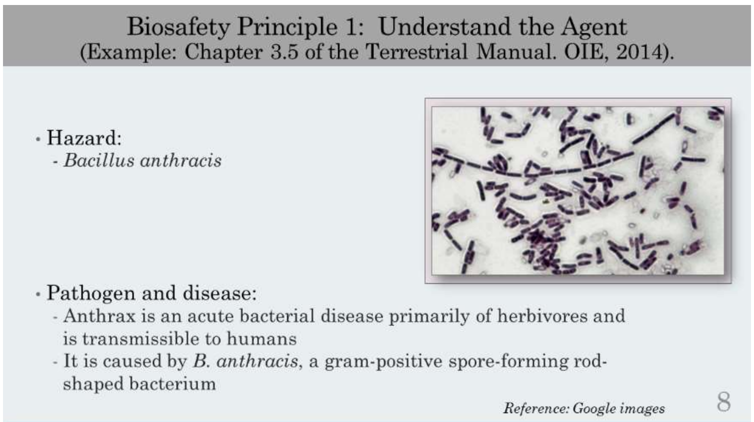
We will now focus on biosafety practices for field veterinarians and veterinary paraprofessionals who collect and submit samples to the laboratory.

Additional details presented on the following slides are from the Chapter 3.5 of the Terrestrial Animal Manual from the World Organisation for Animal Health (OIE), 2014.

Photos:

Image 1: Google

Image 2: Google



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 8

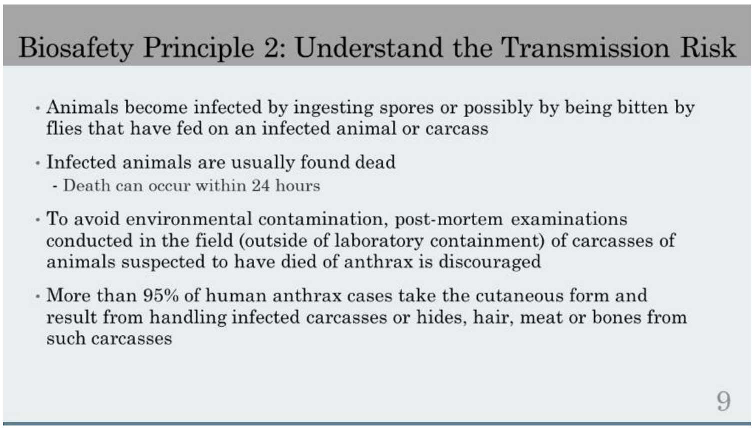
SCRIPT / KEY POINTS:

The following example is from Chapter 3.5 of the Terrestrial Animal Manual. OIE, 2014.

The first principle is to understand the biology of the disease agent. In this case, we are focusing on anthrax. The hazard is the etiologic agent. In this example, anthrax has been reported in a country that is not usually endemic, however freedom from disease is not a status by the country that is reported to the OIE. Anthrax is zoonotic and a bacterial pathogen.

Photo:

Image 1: Google



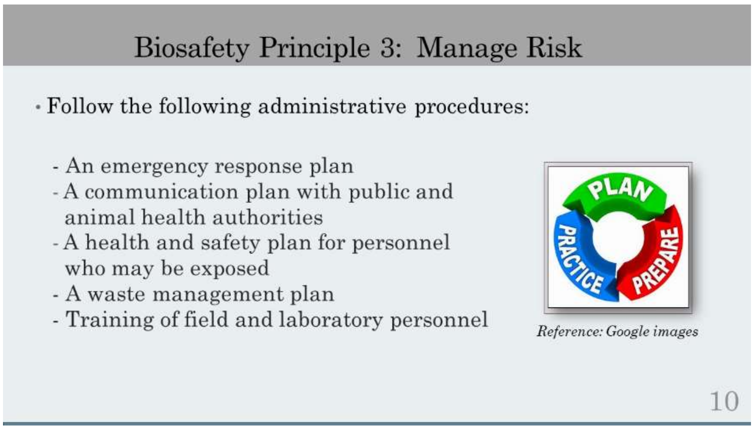
Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 9

SCRIPT / KEY POINTS:

Next, we have to understand the transmission risks for anthrax. The priority is to interrupt anthrax transmission pathways. In order to do this, field epidemiologists need to identify the transmission pathways.

For this pathogen, this includes:

- Infection through ingestion of spores or through vectors pathways
- Dead animals are seen in the field
- Environmental contamination
- Zoonotic potential



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 10

SCRIPT / KEY POINTS:

Administrative arrangements must be in place before the anthrax events occur, to help manage risk within the country.

Specific procedures include:

- Development of response plans
- A communications plan
- Health and safety plan
- Waste management plan
- Training
- Photo: Google images

Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 11

SCRIPT / KEY POINTS:

Standard operating procedures (SOP) ensure that all personnel are aware of and practice approved procedures consistently. Specific ways to manage risk in the field include:

Do not conduct a post-mortem in the field on anthrax suspected animals

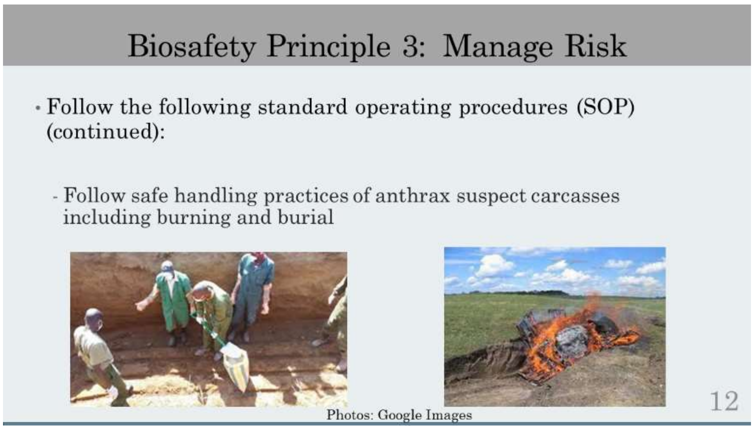
Understand the proper handling, storage, and disposal methods for potentially contaminated materials from dead carcasses

Obtain the correct regulatory approvals and certifications for packaging and shipping an anthrax suspect specimen

Disinfection

Personal protective equipment (PPE)

Photo: Google images

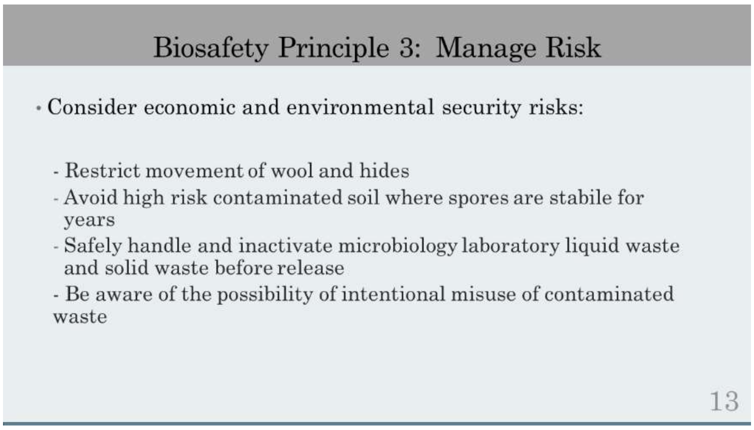


Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations, Slide 12

SCRIPT / KEY POINTS:

In addition, SOP for handling suspect carcasses should be conducted to help manage risk against anthrax. This includes movement from a post-mortem area to a holding area. Decontamination and destruction of potentially contaminated hides/carcasses to insure no release to landfill or rendering facilities.

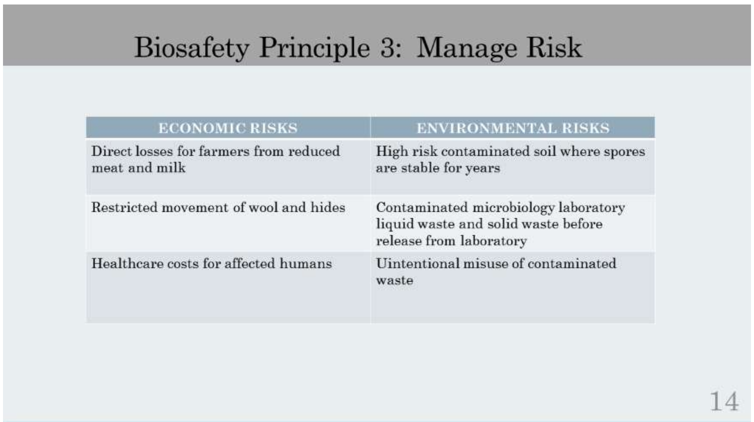
Photo: Google Images



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 13

SCRIPT / KEY POINTS:

Anthrax has economic, environmental and security risks for the animal health authority to consider. To manage risk, the country should identify specific high risk situations for which anthrax could enter. This slide suggests some of these mechanisms.

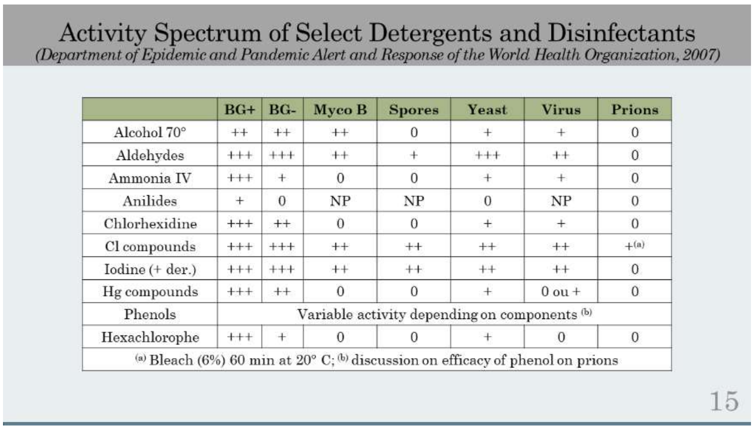


ECONOMIC RISKS	ENVIRONMENTAL RISKS
Direct losses for farmers from reduced meat and milk	High risk contaminated soil where spores are stable for years
Restricted movement of wool and hides	Contaminated microbiology laboratory liquid waste and solid waste before release from laboratory
Healthcare costs for affected humans	Uintentional misuse of contaminated waste

Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 14

SCRIPT / KEY POINTS:

Read slide.



Activity Spectrum of Select Detergents and Disinfectants

(Department of Epidemic and Pandemic Alert and Response of the World Health Organization, 2007)

	BG+	BG-	Myco B	Spores	Yeast	Virus	Prions
Alcohol 70°	++	++	++	0	+	+	0
Aldehydes	+++	+++	++	+	+++	++	0
Ammonia IV	+++	+	0	0	+	+	0
Anilides	+	0	NP	NP	0	NP	0
Chlorhexidine	+++	++	0	0	+	+	0
Cl compounds	+++	+++	++	++	++	++	+[a]
Iodine (+ der.)	+++	+++	++	++	++	++	0
Hg compounds	+++	++	0	0	+	0 ou +	0
Phenols	Variable activity depending on components [b]						
Hexachlorophe	+++	+	0	0	+	0	0

[a] Bleach (6%) 60 min at 20° C; [b] discussion on efficacy of phenol on prions

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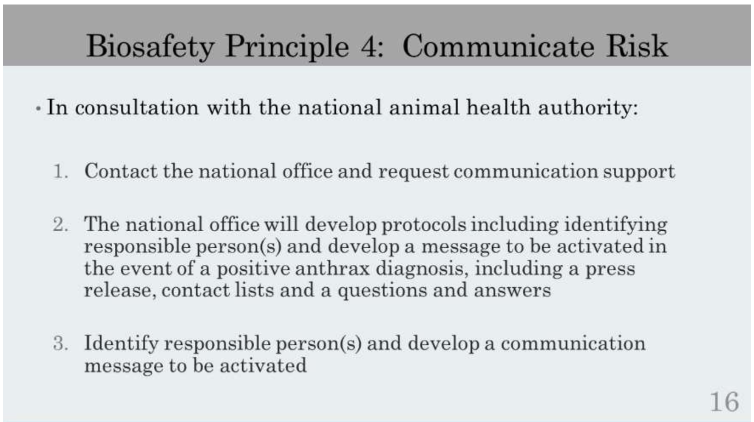
Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 15

SCRIPT / KEY POINTS:

Note that spores are highly resistant to commonly available disinfectants. Chlorine and iodine compounds are moderately effective against anthrax spores.

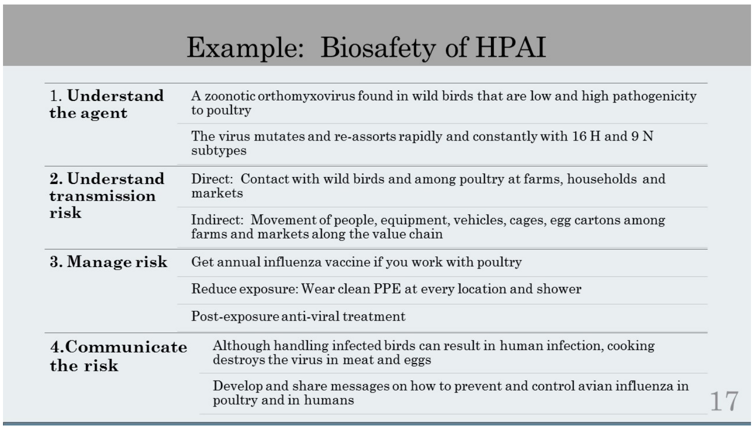
Reference: (Department of Epidemic and Pandemic Alert and Response of the World Health Organization, 2007)



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 16

SCRIPT / KEY POINTS:

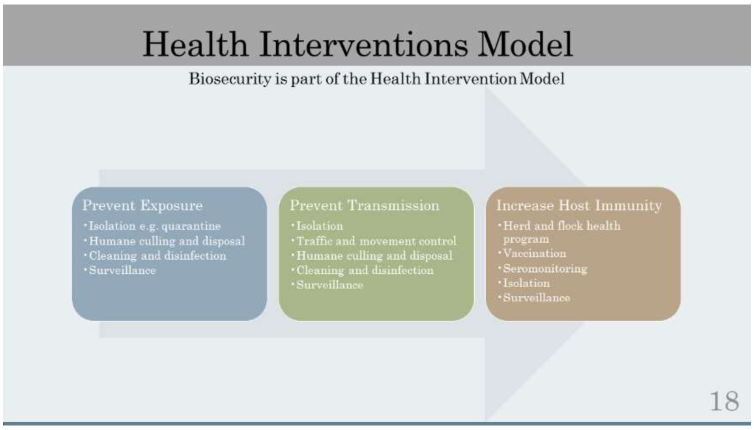
Risk communication specialists are often not employed by national health authorities. In some instances, it may be possible to collaborate with public health agencies who may have additional resource persons on hand to support risk communication.



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 17

SCRIPT / KEY POINTS:

Read slide.



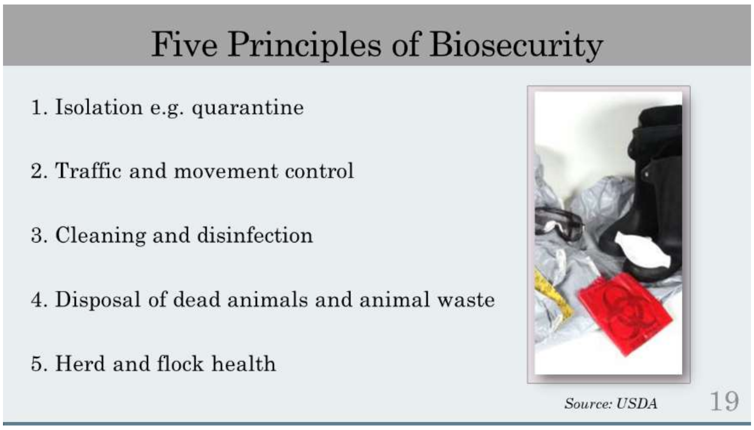
Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 18

SCRIPT / KEY POINTS:

Biosecurity is the most effective procedure to protect animal health and is part of a broader health interventions model to prevent exposure, prevent transmission and to promote host immunity. Note that biosecurity in animal health is common to preventing exposure and disease transmission. as well as. protecting host immunity. As an example, a good veterinarian practices biosecurity by cleaning and disinfecting equipment between uses to prevent the introduction of disease and pathogens.

Biosecurity is Part of the Health Intervention Model

When considering avian influenza in poultry, vaccination does not result is sterilising immunity. Therefore, biosecurity is a necessary intervention to reduce shedding and further transmission.



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 19

SCRIPT / KEY POINTS:

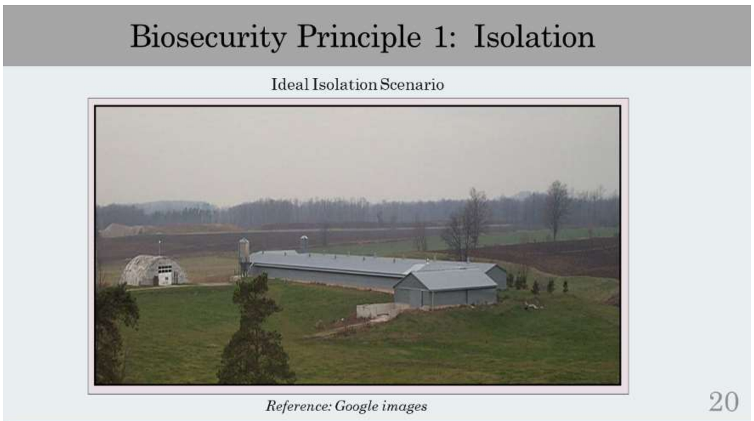
The five principles of biosecurity include the following:

- Isolation;
- Traffic control;
- Sanitation;
- Disposal of dead animals and animal waste; and
- Herd and flock health.

Let us consider each one in turn.

Photo:

Image 1: USDA



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 20

SCRIPT / KEY POINTS:

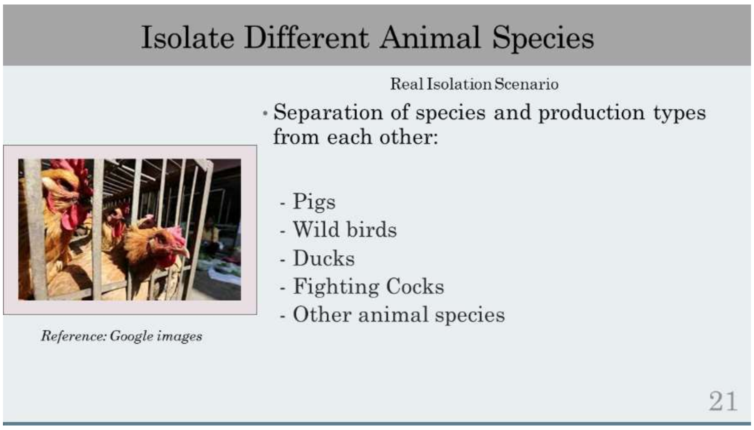
Although ideal, isolation is most often not achievable. Yet, it stands as the best defense again the introduction of disease pathogens.

Conduct yourself so as to isolate farms through your actions. When a field veterinarian visits such a farm, he/she can become an agent for disease transmission and can introduce disease despite the isolation of a farm. Biosecurity, therefore, must be seen as a series of links in a chain of protection which must remain linked together through sound policies and practices.

Do farms in your Area have a written biosecurity plan? If not, they should do so.

Photo:

Image 1: Google



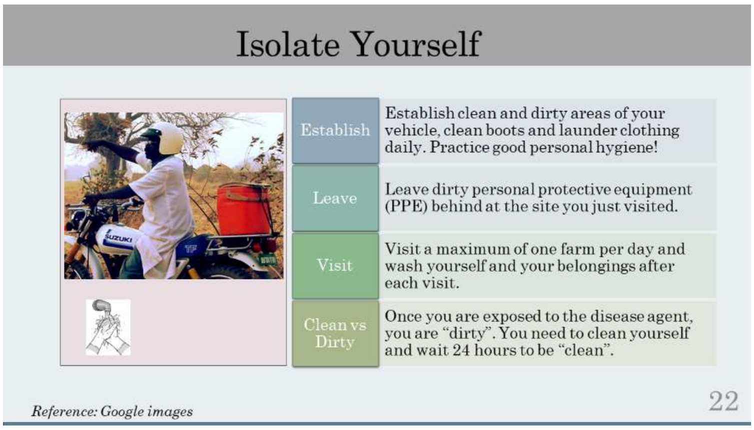
Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 21

SCRIPT / KEY POINTS:

Separating different animal species can avoid mechanical transmission and forming a species bridge for pathogens to cross (e.g. influenza).

Photo:

Image 1: Google



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations, Slide 22

SCRIPT / KEY POINTS:

We can isolate ourselves in the following ways:

- Through separation of clean and dirty belongings, clean your boots, clothing and yourself;
- Practice good personal hygiene;
- Leaving dirty things behind at the farm just visited;
- Use time as your ally; and
- Visit a maximum of one farm per day and wash yourself and your belongings after each visit.

Demonstrate professional behaviour and be a role model to all farmers and community members.

Photo:

Image: Google

Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations, Slide 23

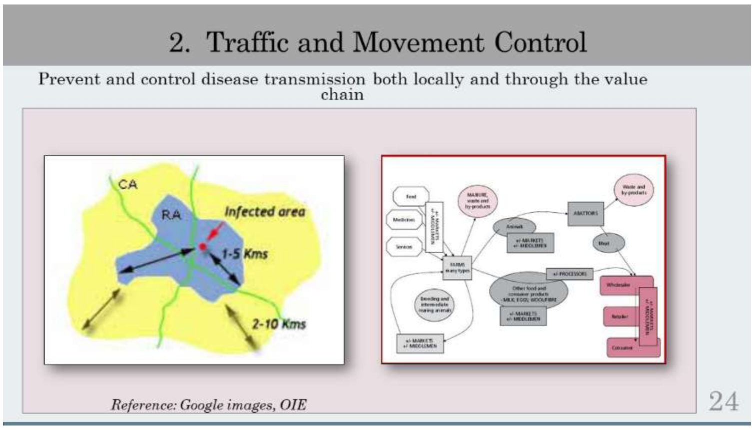
SCRIPT / KEY POINTS:

Remember that veterinarians have often been implicated in the spread of animal diseases through disease prevention and control programmes!

Demonstrate professional behaviour and be a role model to all farmers and community members.

Photo:

Image: USDA



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 24

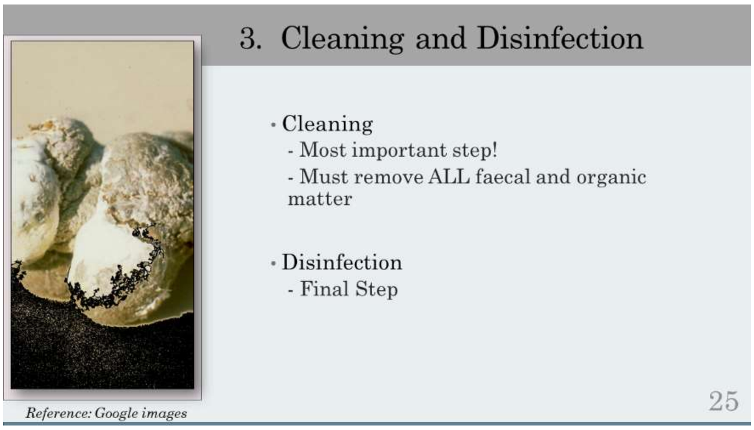
SCRIPT / KEY POINTS:

Zoning refers to a geographic perspective on disease control. Compartments are biosecurity systems based on value chains and the movement that lie outside of a zone. Both approaches are useful and necessary to approach disease prevention and control.

Photos:

Image 1: Google

Image 2: OIE



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 25

SCRIPT / KEY POINTS:

Studies show that cleaning is the most important step in the process. All organic matter must be removed to permit the sanitising agent to effectively destroy animal disease pathogens.

Photo:

Image 1: Google

Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 26

SCRIPT / KEY POINTS:

The slide provides references of international recommendations for the selection of approved disinfectants for the control of animal diseases.

- References: FAO

  MANUAL ON PROCEDURES
  FOR DISEASE ERADICATION
  BY STAMPING OUT
  http://www.fao.org/docrep/004/Y0660E/Y0660E03.htm

- OIE

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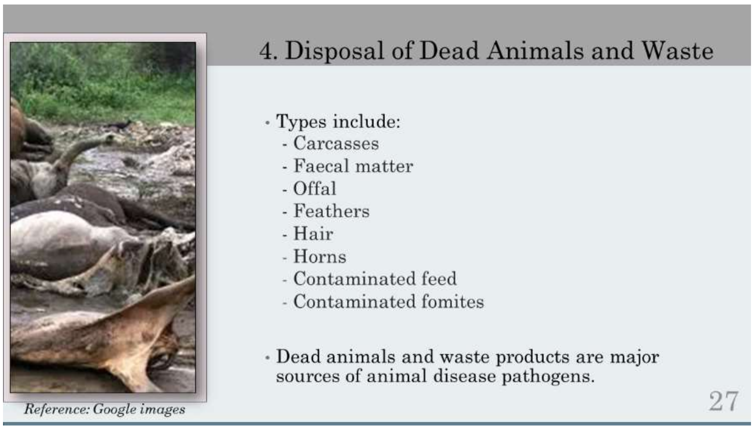
CHAPTER 4.13.
GENERAL RECOMMENDATIONS ON
DISINFECTION AND DISINFECTION
http://www.oie.int/fileadmin/Home/eng/Health_standards/tahc/current/chapitre_disinfect_disinsect.pdf

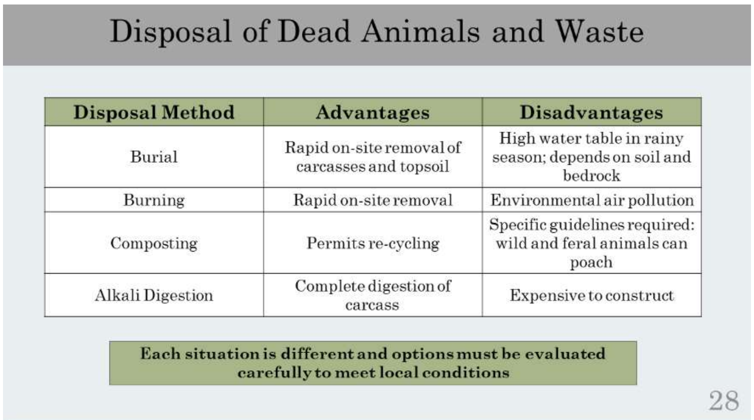


Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 27

SCRIPT / KEY POINTS:

Dead animals and waste products are major sources of animal disease pathogens and contribute to significant degree of continuing disease transmission to susceptible populations.

Reference: Google images



Disposal Method	Advantages	Disadvantages
Burial	Rapid on-site removal of carcasses and topsoil	High water table in rainy season; depends on soil and bedrock
Burning	Rapid on-site removal	Environmental air pollution
Composting	Permits re-cycling	Specific guidelines required: wild and feral animals can poach
Alkali Digestion	Complete digestion of carcass	Expensive to construct

Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 28

SCRIPT / KEY POINTS:

Dead animals and waste products are major sources of animal disease pathogens and contribute to significant degree of continuing pathogen transmission. Common methods for disposal with advantages and disadvantages are listed in the table.

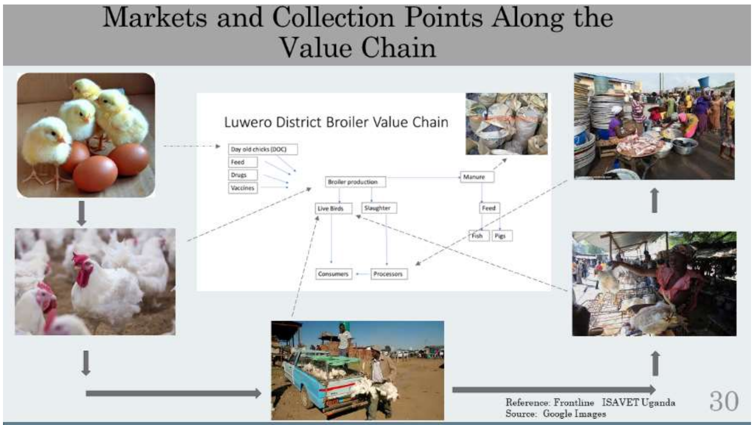
Each situation is different and options must be evaluated carefully to meet local conditions.

Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 29

SCRIPT / KEY POINTS:

Biosecurity includes preventive practices practiced through extension services. Prevention lies at the heart of biosecurity by engaging animal owners as a part of the team. According to the disease interventions model, biosecurity prevents:

- Exposure to disease;
- Disease transmission; and
- Susceptibility of the herd and flock to disease challenge.



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 30

SCRIPT / KEY POINTS:

Livestock and poultry production and trading through value chains are an important means of disease transmission over vast distances beyond the original focus of infection. Surveillance at high risk nodes along the value chain is an effective and efficient method for early detection to: 1) prevent introduction into new Area; 2) Reduce transmission; and 3) Reduce exposure to susceptible populations.

Photo Source: Google Images

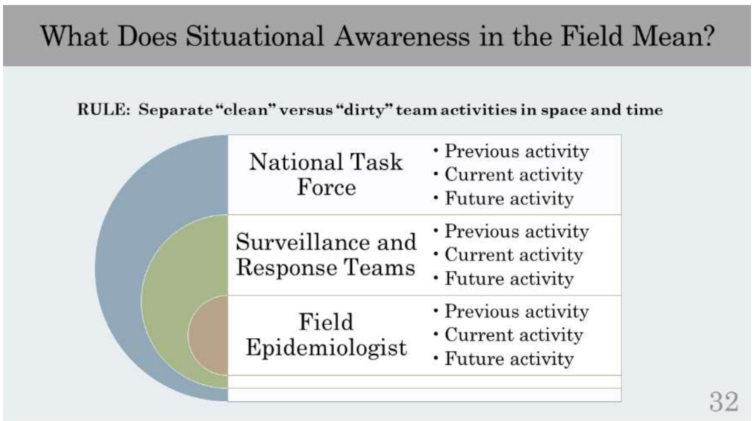
Reference: Frontline ISAVET Uganda

Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 31

SCRIPT / KEY POINTS:

Barriers to restrict access may include fences, walls, and other barriers to prevent entry onto farms. In addition the farmer may need to feed cattle in an intensive feeding system instead of pasturing animals where they may have contact with vectors such as ticks that can carry over disease pathogens.

Photos: Reference: Eur J Wildl Res (2007) 53:241–256 DOI 10.1007/s10344-007-0098-y
Source: Google Images



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 32

SCRIPT / KEY POINTS:

Situational awareness during an investigation is crucial to avoid and prevent disease transmission by the animal health response teams.

The main rule to follow is to separate "clean" versus "dirty" team activities in space and time.

It implies three levels of awareness that can prevent disease transmission by the veterinary investigation team. At the individual team and national levels, it is important to assess which interventions methods are needed to prevent disease transmission.

They are, namely:

- Self-awareness;
- Team awareness;
- Task force awareness; and
- The common question at all three levels is to relate previous, current and coming activities in relation to the infected, restricted and surveillance Area.

Communication and coordination are necessary conditions to prevent disease spread by veterinary field epidemiologists and response personnel.

Examples of Situational Awareness

Level	Sequence of Events and Interventions
1. Individual	➢ You came from a "clean" location ➢ You just entered an "infected" location ➢ You must take action to clean yourself and clothing before visiting other farms
2. Field Team	➢ Your field team is doing case finding for FMD ➢ You enter a farm with infected animals ➢ Your team is now considered "dirty" and may be assigned to culling duties or other action
3. National Task Force	➢ A positive case is discovered in the "surveillance" zone without a previous case ➢ The area is now designated as "infected" zone ➢ All teams and individuals in this "infected" zone must take interventions as noted above

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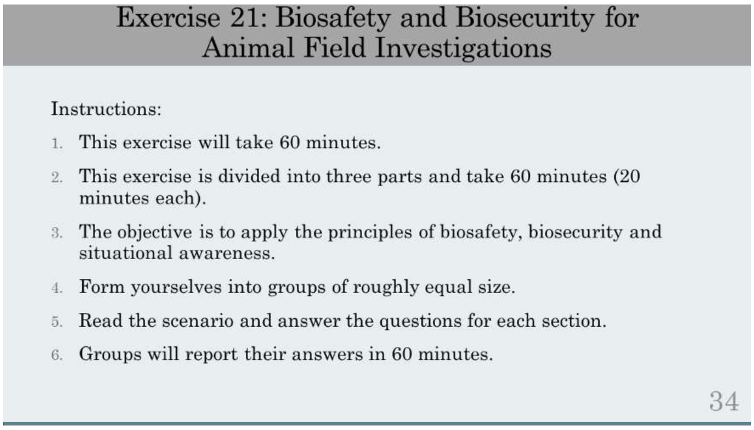
Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations, Slide 33

SCRIPT / KEY POINTS:

Three examples of situational awareness are given at individual, team and national levels. Communication and coordination and essential in order to adjust the biosecurity at all three levels based on the presence or absence of disease which changes over time.



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 34

SCRIPT / KEY POINTS:

Exercise 21 instruction: Biosafety and Biosecurity for Animal Disease Investigations

This exercise will take 60 minutes.

This exercise is divided into three parts and take 60 minutes (20 minutes each).

The objective is to apply the principles of biosafety, biosecurity and situational awareness.

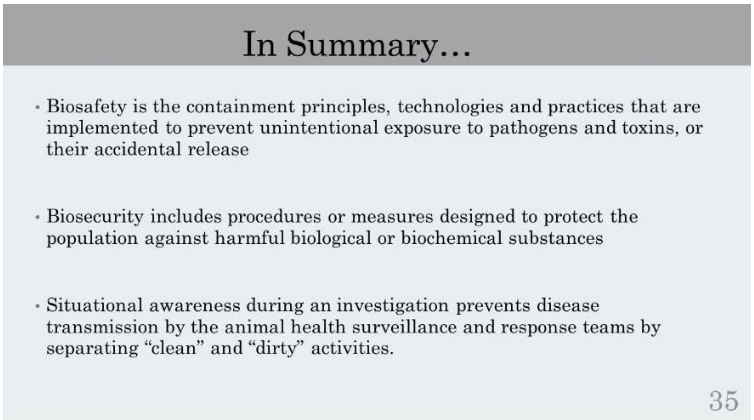
Form yourselves into groups of roughly equal size.

Read the scenario and answer the questions for each section.

Groups will report their answers in 60 minutes.

Instructors:

Review instructor guide for answers.



Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 35

SCRIPT / KEY POINTS:

In summary,

- There are four principles of biosafety;
- Biosafety is the containment principles, technologies and practices that are implemented to prevent unintentional exposure to pathogens and toxins, or their accidental release;
- There are five principles of biosecurity;
- Biosecurity includes procedures or measures designed to protect the population against harmful biological or biochemical substances; and
- Situational awareness during an investigation prevents disease transmission by the animal health surveillance and response teams.

Lesson 15 – Biosafety and Biosecurity for Animal Disease Investigations,
Slide 36

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 21 – Biosafety and Biosecurity for Animal Disease Investigations

Description of Exercise:

Review the following three scenarios and answer biosafety and biosecurity questions with respect to situational awareness and decision-making. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 60 minutes and an additional 30 minutes for plenary discussion

Organisation of Group Work:

- Form yourselves into 5 groups of roughly equal size.

Exercise Objective(s):

1. Explain the principles of biosafety.
2. Explain the four principles of biosecurity.
3. Describe three components of situational awareness for field epidemiologists.

Exercise Components and Structure:

1. Review each of the 3 scenarios (20 minutes/scenario).
2. Apply the principles of biosafety, biosecurity and situational awareness.
3. Answer the questions from each scenario within the allotted time of 20 minutes for each scenario.

Materials, Data or Information:

1. Computer
2. Microsoft Word
3. Pen or Pencil

Expected Outputs and Deliverables of Each Participant:

1. Understand decision-making processes for biosafety and biosecurity while in the field.

Scenario 1

You are aware of a large die-off of wild birds that has been confirmed as highly pathogenic avian influenza (HPAI) subtype H5N1 at a lake near a Community X poultry cooperative with 20,000 egg layers. You are asked to investigate the death of the some of the egg layers that has just been reported by the sublocal area officer.

A. Biosafety in the field

1. Using the 4 principles of biosafety, explain how you would how would you protect field epidemiologists investigating the poultry mortality?

   a) The agent:
   Highly pathogenic avian influenza (HPAI) is a zoonotic influenza Type A virus characterised by a high mutation rate and high mortality in wildlife and poultry. It kills approximately 63% of confirmed human cases.

   b) Disease transmission:
   HPAI is transmitted directly and indirectly through the movement of people, poultry, equipment, vehicles, poultry products and may be introduced into an Area through infected wild birds.

   c) Risk management:
   Includes surveillance, quarantine, movement control, biosecurity along the value chain, selective and humane culling, disposal of contaminated materials, cleaning and disinfection and vaccination.

   d) Risk Communication:
   Includes public awareness, advocacy and creating risk messages directed to farmers, traders, marketers, consumers and government animal health, public health and wildlife agencies.

2. Before you leave to go to the field, give three ways you would you prepare yourself to ensure biosafety, assuming the poultry could be infected with avian influenza virus:

   a) Review your contingency plan about the disease, control and prevention and control measures including standard operating procedures for biosafety and biosecurity.

   b) Prepare for field work by bringing supplies such as sampling equipment, personal protective equipment (PPE).

   c) Prepare a plan of action once you get to the field and what you will do to ensure field personnel and are protected.

Other reasonable answers are also accepted.

B. Biosecurity in the field

Scenario 2

You are in Community X that is experiencing pig mortality due to African Swine Fever and you learn that the pig farms in Community X sell pigs regularly to markets in nearby villages and in Town A located nearby.

1. Using the five principles of biosecurity, give one example of control measures you would take for each of the following:

   a) Isolation:

   Quarantine affected premises pending receipt of laboratory confirmation. Restrict access to Community X to one field epidemiologist and an assistant within 1 km of the poultry, since Community X is a suspected positive Area.

   b) Traffic and movement control:

   Stop all pig trade movement in and out of Community X. Restrict movement of farmers to prevent movement to other holdings outside of Community X.

   c) Cleaning and sanitation:

   Clean and disinfect all vehicles moving pigs and pig products. Install wash stations, clean clothes and boots for people who wish to exit an infected premises.

   d) Disposal of dead animals and animal waste:

   Bury and dispose of all pig mortality and pig waste. Investigate options for safe on-site disposal methods or an acceptable landfill site with precautions for immediate burial.

   e) Herd health:

   Take samples and conduct an epidemiological investigation that includes access to vaccination and production records.

   Other reasonable answers are also accepted.

2. State one prevention measure you would take to prevent transmission of African Swine Fever virus to:

   a) Other pigs:
   Inform other communities of the outbreak and the need to report pig mortality immediately. Stop the movement of pigs, pig meat, waste products and people who trade in these products.

b) Humans working at the local markets:
Create risk communication messages directed at farmers, traders, marketers, consumers and the general public. Personal hygiene and cleaning and disinfection educational materials are shared.

c) Consumers:
Educate the public that African Swine Fever is not dangerous for humans, on safe food handling and not to feed garbage waste to pigs in relation to African Swine Fever. Personal hygiene and cleaning and disinfection educational materials are shared.

C. Situational awareness in the field

Scenario 3

Foot and Mouth Disease outbreaks have been occuring recently in your local area. Dead and sick cattle have not yet been reported in Town A due to Foot and Mouth Disease (FMD), near to the cattle market. You are asked to lead a surveillance team to investigate beef and dairy cattle of unknown health status atthe market near to Town A.

1. Before going to Town A, you recall that you have just returned from investigating Foot and Mouth Disease (FMD) positive infected cattle in Town B where cattle were sick and dying. Using your knowledge of situational awareness, what will you do next? Is it safe to conduct surveillance in the market near to Town A?
If you have been exposed to FMD in Town B, then you are now considered "dirty".

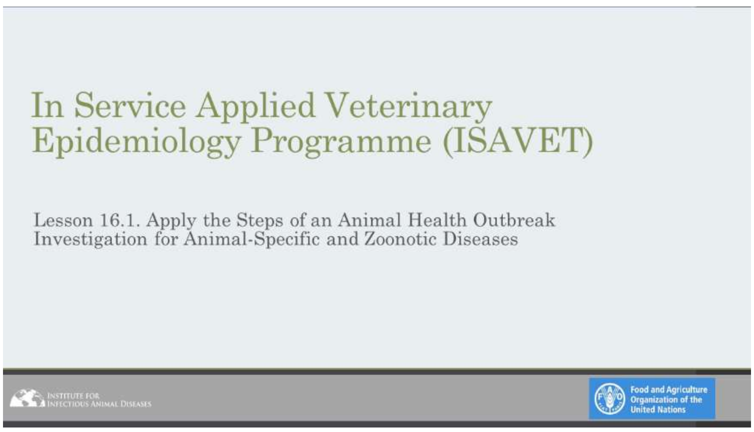
You must take at least the following risk interventions:
- Do not travel to Town A or any other location to do epidemiological field work.
- Change your PPE clothing immediately before leaving the Community, leaving it behind and disinfecting your vehicle.
- Take a shower and thoroughly wash yourself including your eyes, ears and nose.
- Restrict your field duties for the next 24 hours, especially if you are asked to go into an unknown Area which could be "clean" or "dirty".
- Assign a "clean" field epidemiologist to do the remaining field work for the next 24 hours.

Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases

Estimated Lesson and Exercise Time	3 hours and 30 minutes
Instructor Materials	ISAVET Lesson 16a Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific Diseases Version 4.pptx
	ISAVET Lesson 16a Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific Diseases Instructor Guide Version 4.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 16a Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific Diseases Participant Guide Version 4.doc

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

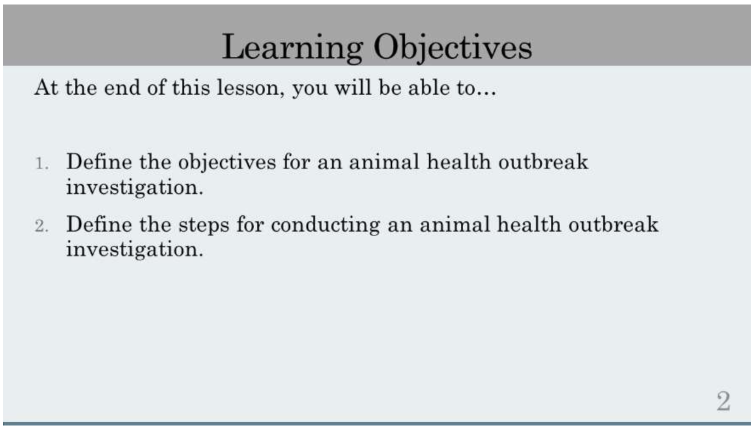
EID	Emerging Infectious Disease
ISAVET	In Service Applied Veterinary Epidemiology Training
OIE	World Organisation for Animal Health
SRRT	Surveillance Rapid Response Teams
TAD	Transboundary Animal Disease



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 16.1 titled, “Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases”.

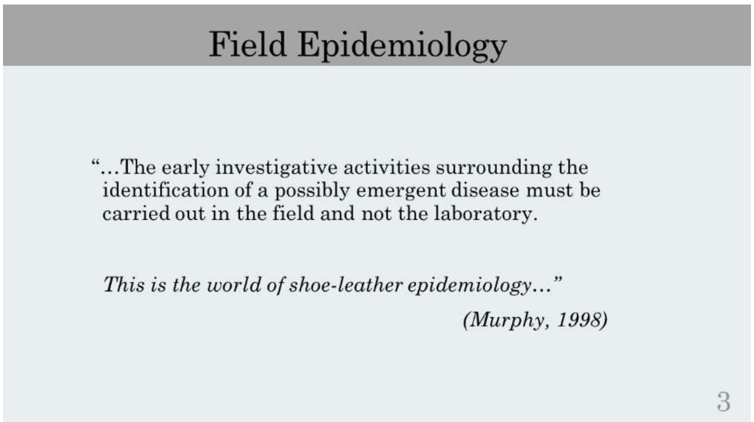


Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 2

SCRIPT / KEY POINTS:

At the end of this lesson, you will be able to…

- Define the objectives for an animal health outbreak investigation.
- Define the steps for conducting an animal health outbreak investigation.

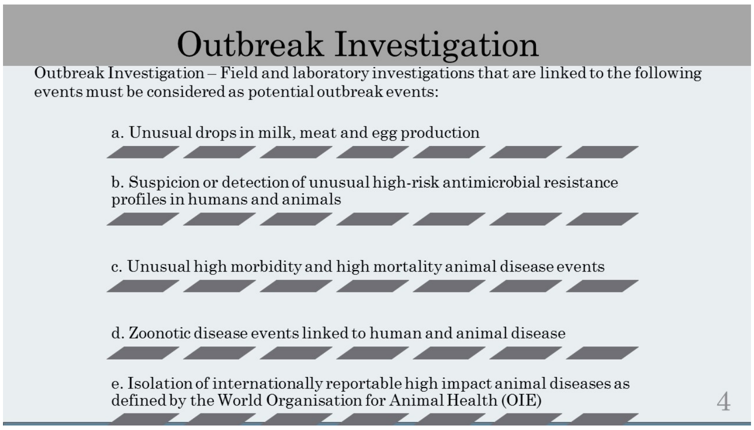


Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 3

SCRIPT / KEY POINTS:

Field epidemiologists are at the leading edge of disease discovery! Understanding how to apply investigation steps in the field will enhance the capacity to detect emerging infectious diseases (EID), zoonotic, and/or transboundary animal diseases (TAD).

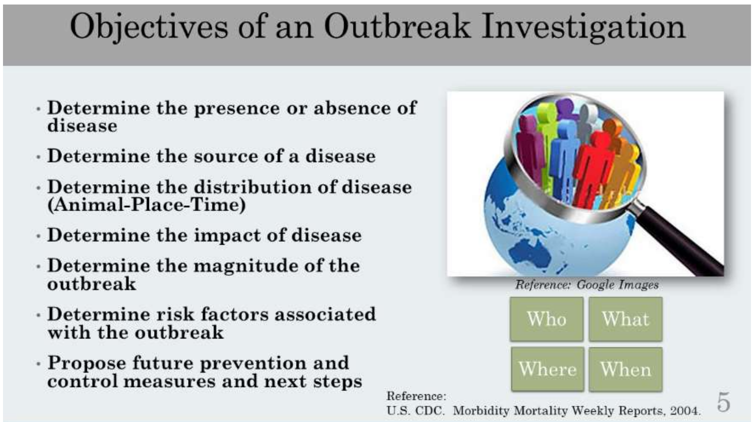
Reference: Murphy, 1998



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 4

SCRIPT / KEY POINTS:

Understanding and recognizing potential outbreak events will lead to early detection and proper planning for an outbreak investigation. Potential outbreak events are listed here in items a-e. Note, the presence of one of these events does not necessarily mean there is a disease outbreak.



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 5

SCRIPT / KEY POINTS:

Descriptive epidemiology looks at the who, what, where, and when of any field investigation of an animal health or zoonotic disease event.

In general, the uses of descriptive epidemiology are presented including the following:

- Individual case studies are conducted in the field to detect disease in populations;
- The size (magnitude) of outbreaks in populations can and must be determined;
- The social, economic and health impacts of disease must be measured;
- How disease spread (transmission) occurs; and

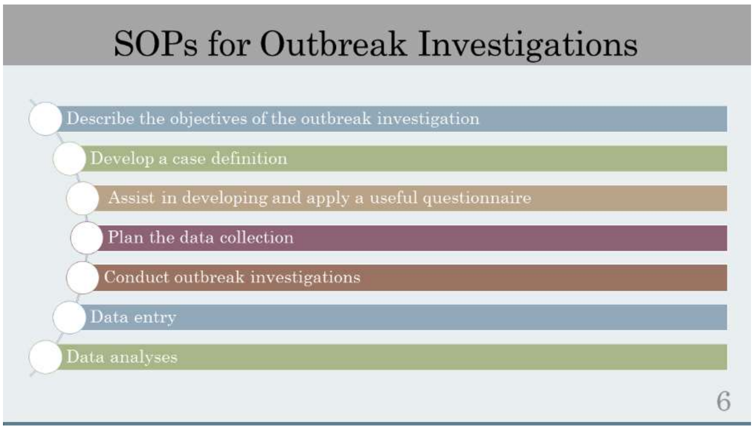
- Which animal subpopulations are most affected.

Reference:

U.S. CDC. Morbidity Mortality Weekly Reports, 2004.

Photo:

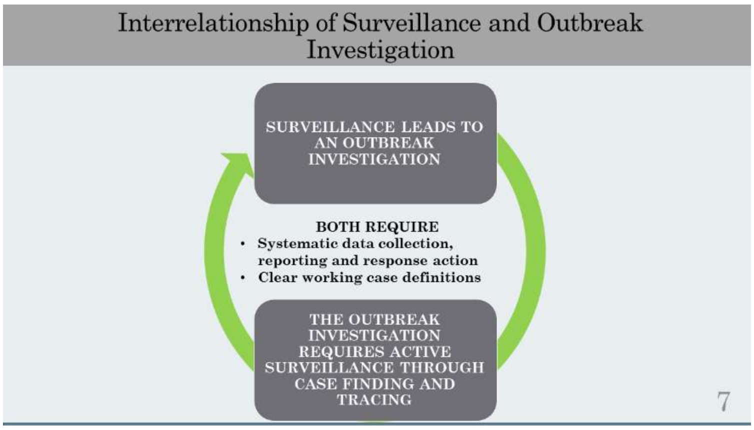
Image 1: Google



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 6

SCRIPT / KEY POINTS:

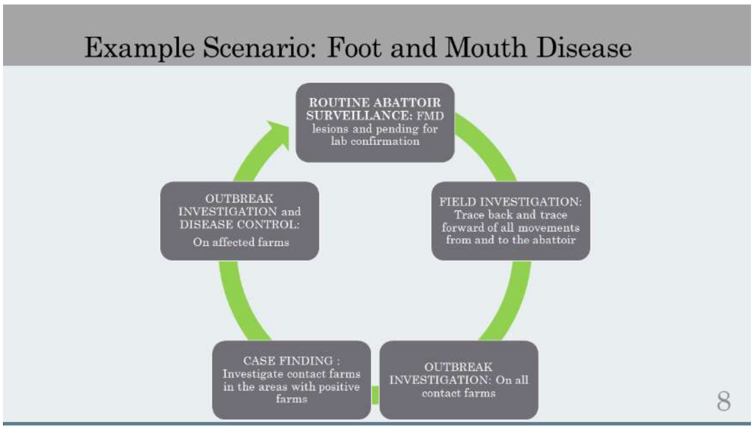
These are the basic standard operating procedures (SOPS) for conducting outbreak investigations. First, you need to describe the objectives of the outbreak investigation. Next, it is important to develop a clear case definition. You will then assist in developing and applying a useful questionnaire. Next, you will plan the data collection for the field. An outbreak investigation will be conducted in the area where the disease is present. Data entry and analyses will occur with delivery of a report to the local area office.



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 7

SCRIPT / KEY POINTS:

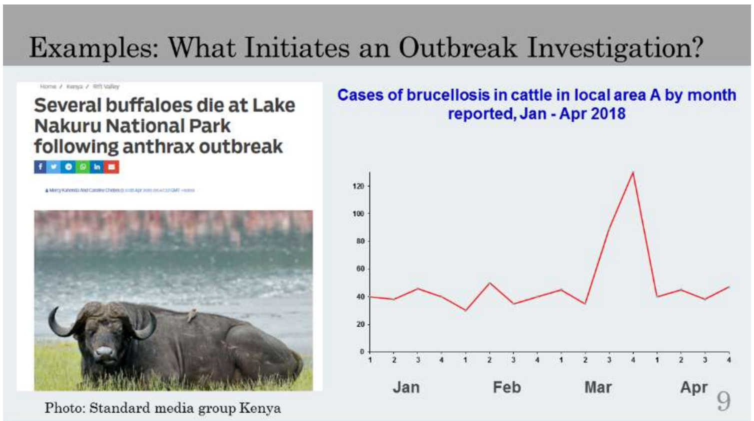
In this scenario, we see that initial surveillance at an abattoir leads to outbreak investigations which then require further active surveillance to detect all possible sources of FMD virus.



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 8

SCRIPT / KEY POINTS:

In this scenario, we see that initial surveillance at an abattoir leads to outbreak investigations which then require further active surveillance to detect all possible sources of FMD virus.

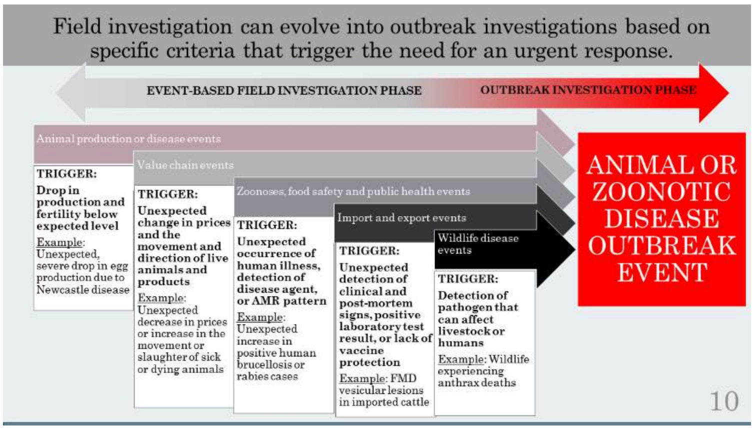


Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 9

SCRIPT / KEY POINTS:

Photo 1: standard media group Kenya

Pictorial display of how media and analysis of surveillance data can lead to initiation of outbreak investigation



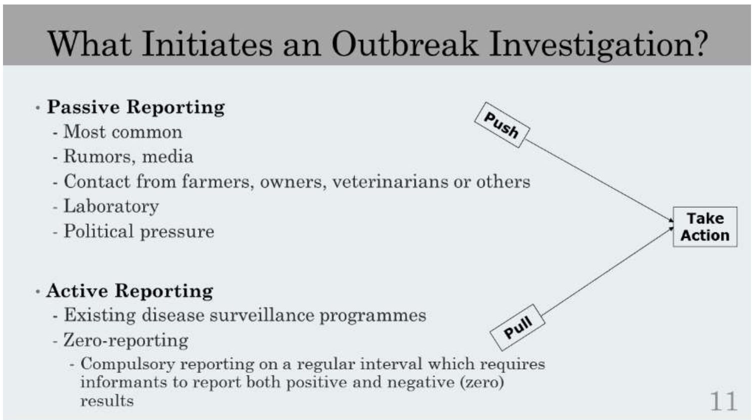
Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 10

SCRIPT / KEY POINTS:

Note that animal health and disease events are referred to as "field investigations" and that public health commonly refers to these sorts of events such as "case investigations" which often involve one or more individuals.

Field investigation events may be related to any of the following circumstances that may trigger an outbreak investigation which we will consider in Lesson 16:

1. Animal production events
2. Value chain events
3. Food safety and public health including antimicrobial resistance (AMR) events
4. Animal import and export events
5. Wildlife disease events

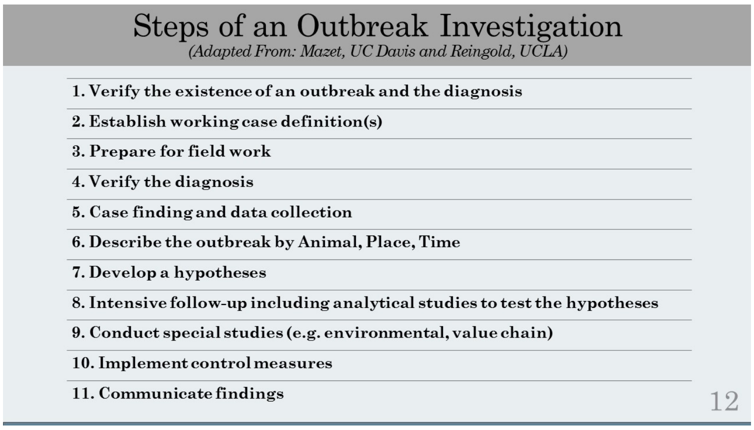


Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 11

SCRIPT / KEY POINTS:

Either active or passive data collection methods can lead to an investigation. Passive reporting is most commonly the cause for undertaking an outbreak investigation and usually occurs from contact with farmers, owners or veterinarians. Active reporting usually occurs through existing disease surveillance systems.

Zero-reporting refers to compulsory reporting on a regular interval which requires informants to report both positive and negative (zero) results. Duding an outbreak zero-reporting assures that the surveillance stakeholders are accountable to report both positive and negative cases based on the case definition.

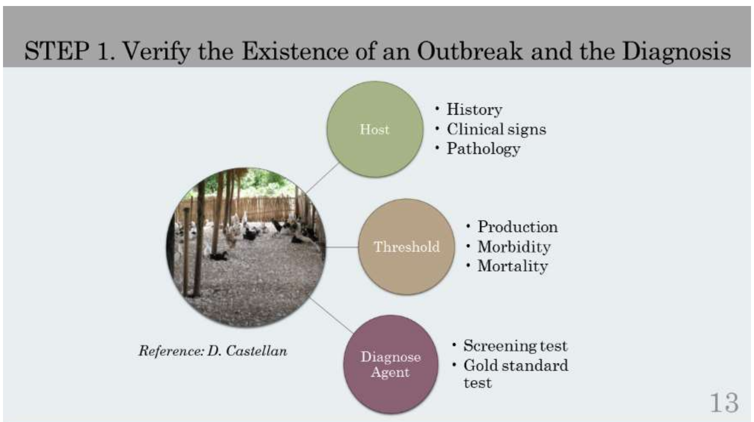


Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 12

SCRIPT / KEY POINTS:

Here are the 11 steps of an outbreak investigation. Note that the diagnosis is confirmed twice. Note also that control measures are initiated from the beginning and continuously throughout the disease event.

Every outbreak is unique and different. Therefore, not all steps may be followed sequentially or included based on what is appropriate for each investigation.



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 13

SCRIPT / KEY POINTS:

The first step to a outbreak investigation is to verify the existence of an outbreak. This is done by considering negative impact of host response, declines below normal production threshold and testing to identify the agent in the population. Changes in the disease agent and host characteristics may suggest changes from normal and to conclude that an outbreak exists.

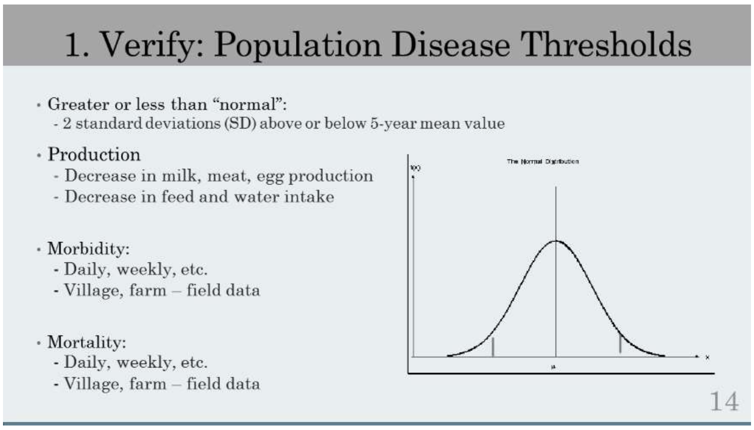
Host characteristics include a history, clinical signs and specific pathology.

Production measures, morbidity and mortality are measured to determine thresholds.

Screening and confirmatory laboratory tests are used to verify the existence of a disease agent in the population.

Photo:

Image 1: D. Castellan



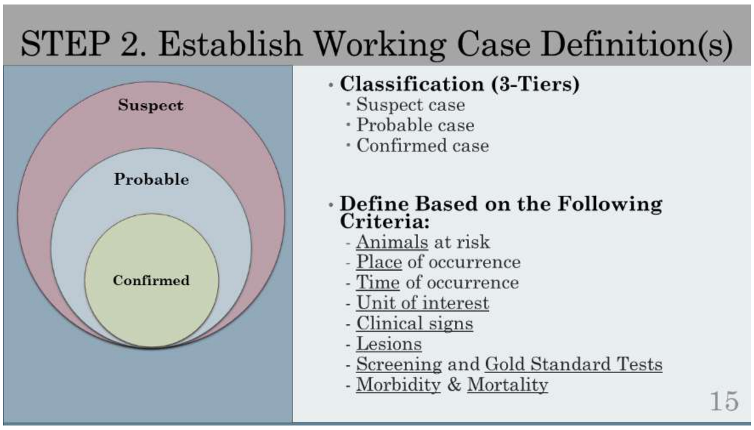
Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 14

SCRIPT / KEY POINTS:

We can use animal production data to tell when abnormal changes are occurring in the population health status. This includes looking at field data on animal production, morbidity and mortality.

If an outbreak or epidemic is more cases than expected, what is expected? How do you figure out what's the expected level of disease? For reportable notifiable diseases, use local surveillance data. If no local data are available, you can look at data from neighboring area, if available, or national data.

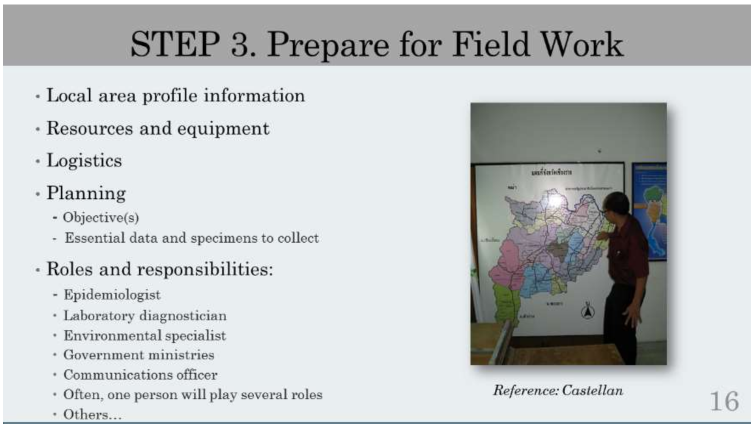
Real versus artifact – not all apparent increases in disease reflect true increases. Some are due to artifacts of reporting – change in diagnostic test or case definition, improved reporting, heightened awareness, etc. Evaluate to find out if the seen increase is real or artifact



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 15

SCRIPT / KEY POINTS:

Case definitions are based on objective criteria. We must be precise in the terms we use including defining the unit of interest and interpretation of the diagnostic test results used to support suspect, probable or confirmed



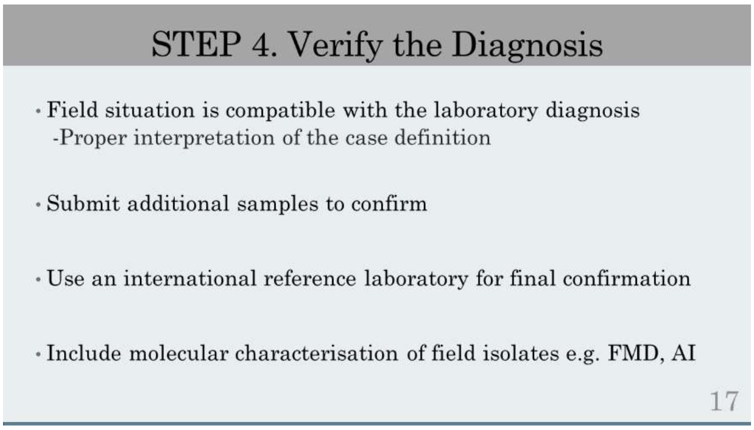
Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 16

SCRIPT / KEY POINTS:

This is a very important step to follow. It is time well spent before you leave for the field so that you have all the information you need to conduct an effective field investigation. During this planning phase, you will identify all local area profile information, determine specific resources and equipment, plan all logistical measures to conduct your field work and identify specific information that should be collected while out in the field. In addition, specific roles and responsibilities for all team members will be determined.

Photo:

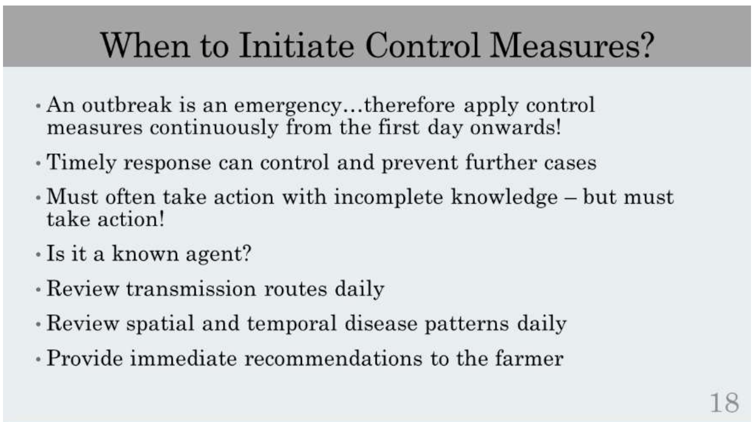
Image 1: David Castellan



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 17

SCRIPT / KEY POINTS:

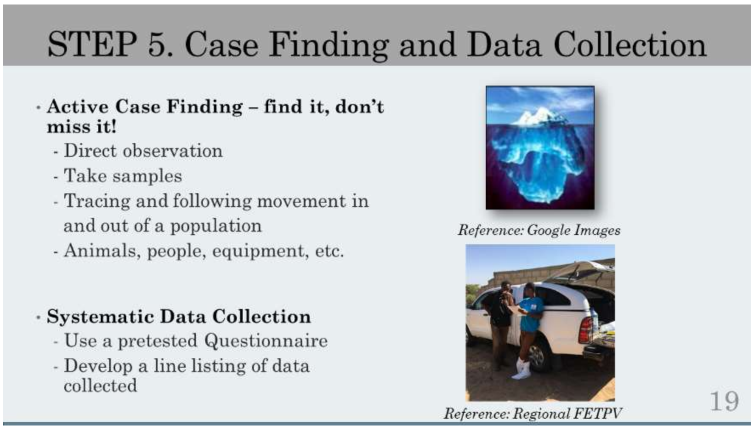
Verify the diagnosis and confirm with an international reference laboratory. When required, submit additional samples to the laboratory. Obtain molecular characterization of field isolates.



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 18

SCRIPT / KEY POINTS:

Control is initiated continuously throughout an animal disease event. Timely response can control and prevent further cases. Sometimes, you must work with incomplete knowledge when you initiate your control measures.



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 19

SCRIPT / KEY POINTS:

Case finding is the most important role of a veterinary or veterinary paraprofessional field epidemiologist during an outbreak. This means conducting intensive, door-to-door and farm-to-farm searches for cases.

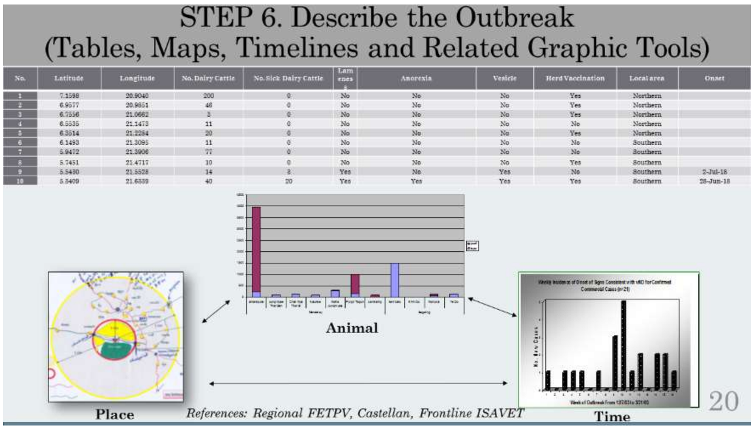
Collect field investigation data based on animal-place-time and possible risk factors to permit further data analysis.

Active case finding is the most important activity to define the distribution and size of a disease outbreak event.

Collecting data purposefully is required based on the objectives of the field investigation at hand.

Photos:

- Image 1: Google
- Image 2: Regional FETPV



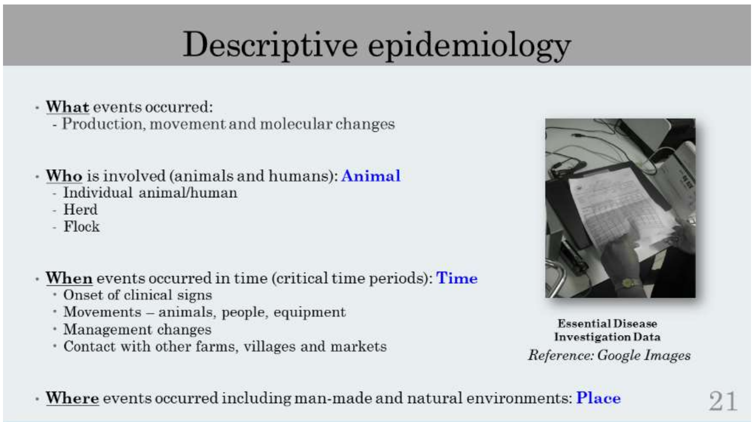
Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 20

SCRIPT / KEY POINTS:

Collect field investigation data in a line list based on animal-place-time and possible risk factors to permit further data analysis.

This includes constructing bar charts to describe animal factors, spot maps to define the spatial distribution and an outbreak histogram to depict the incidence of new cases over time.

References: Regional FETPV (Image 2) , Castellan (Images 2 and 3) Frontline ISAVET (Image 1)



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 21

SCRIPT / KEY POINTS:

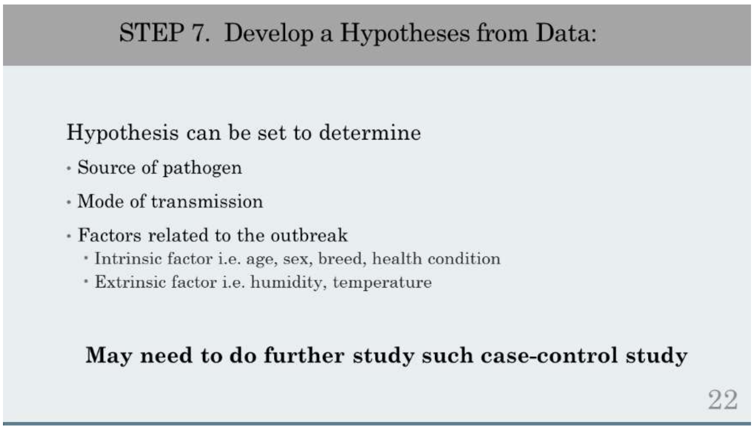
Veterinary field epidemiologists must apply the 4 W's in order to create a systematic investigation:

- What;
- Who;

- When; and
- Where.

Photo:

Image 1: Google



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 22

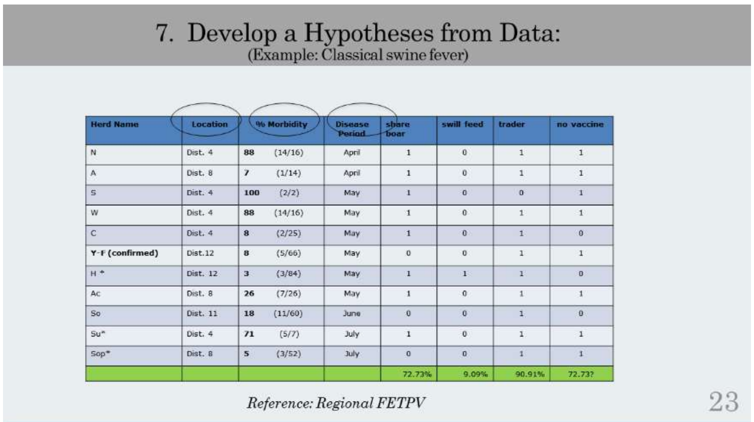
SCRIPT / KEY POINTS:

Disaggregated field data is required in order to perform descriptive statistics and develop a hypothesis. What initial patterns do we detect in terms of Animal, Place and Time?

Animal: Herd size ranges from 2 to 84 pigs. WE observe initially that the % mortality seems to be highest among the smaller sized herds with fewer than 20 pigs.

Place: We observe that local area 4 has herds that have experience the highest mortality, however the confirmed case is located in local area 12.

Time: We observe also that the majority (6/11 or 55%) of suspect pig herds were detected in May.



Herd Name	Location	% Morbidity	Disease Period	share boar	swill feed	trader	no vaccine
N	Dist. 4	**88** (14/16)	April	1	0	1	1
A	Dist. 8	**7** (1/14)	April	1	0	1	1
S	Dist. 4	**100** (2/2)	May	1	0	0	1
W	Dist. 4	**88** (14/16)	May	1	0	1	1
C	Dist. 4	**8** (2/25)	May	1	0	1	0
Y-F (confirmed)	Dist.12	**8** (5/66)	May	0	0	1	1
H *	Dist. 12	**3** (3/84)	May	1	1	1	0
Ac	Dist. 8	**26** (7/26)	May	1	0	1	1
So	Dist. 11	**18** (11/60)	June	0	0	1	0
Su*	Dist. 4	**71** (5/7)	July	1	0	1	1
Sop*	Dist. 8	**5** (3/52)	July	0	0	1	1
				72.73%	9.09%	90.91%	72.73?

Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 23

SCRIPT / KEY POINTS:

Disaggregated field data is required in order to perform descriptive statistics and develop a hypothesis. What initial patterns do we detect in terms of Animal, Place and Time?

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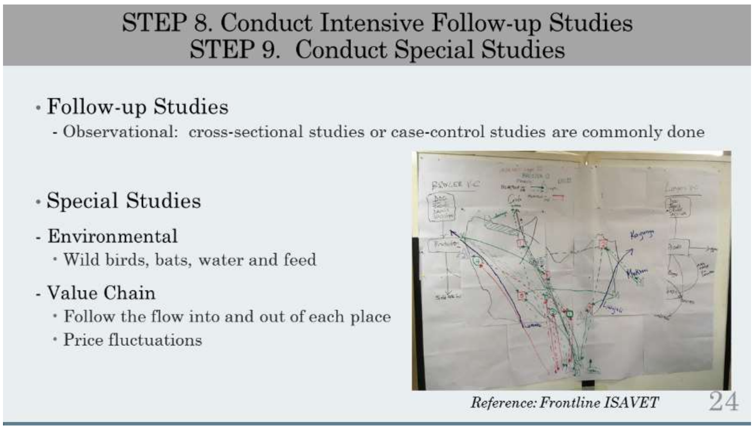
Reference: Regional FETPV



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 24

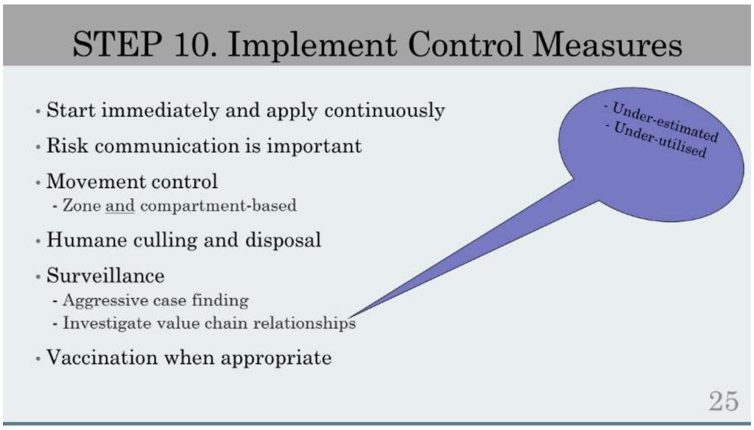
SCRIPT / KEY POINTS:

Case-control and cross-sectional studies can generate new hypotheses to test.

Special studies provide the influence and impact of environmental and human animal marketing on the occurrence of disease.

Photo:

Image 1: Frontline ISAVET



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 25

SCRIPT / KEY POINTS:

The following control measures are important to initiate early and apply continuously:

Risk Communication;

Movement Control:

- Zone and compartmental-based;

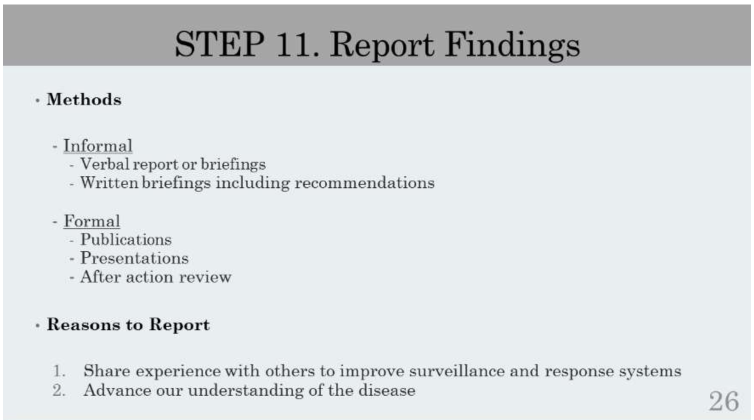
Humane Culling;

Disposal

Surveillance:

- Case finding
- Investigate value chain relationships

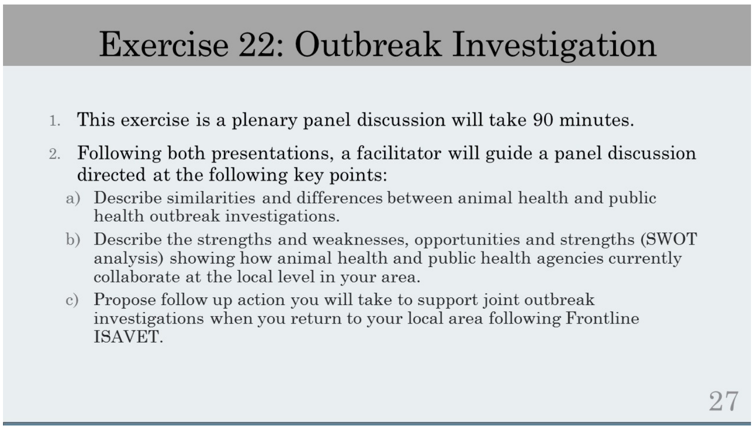
Vaccination.



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 26

SCRIPT / KEY POINTS:

Always report your findings. Reports should be communicated to both technical and non-technical audiences through publications and presentations. It is best to share your experiences to help provide lessons learned for the next field investigations. Reporting and sharing information advances the Frontline ISAVET personnel with an advanced understanding of the disease dynamics occurring in a population.



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 27

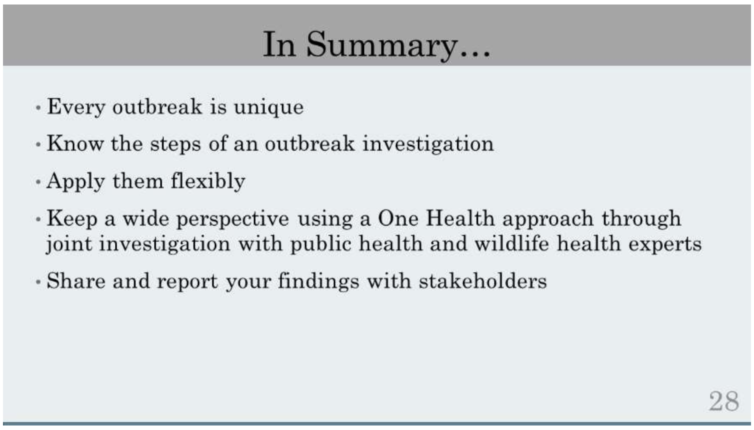
SCRIPT / KEY POINTS:

Exercise 22: Outbreak Investigation

- This exercise will take 90 minutes.
- Form yourselves into groups of roughly equal size.
- The objective of this exercise is to describe which local area stakeholders and the methods you will use to collaborate on an outbreak investigation for an animal disease event.
- Complete the table provided to record the local area stakeholders, their roles and responsibilities and how they can coordinate their activities, including with the national level.
- Groups will report their answers in plenary discussion.

Instructors:

- Review the instructor manual for answers.



Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 28

SCRIPT / KEY POINTS:

In summary,

•Every outbreak is unique;
•Know the steps of an outbreak investigation;
•Apply these steps flexibly;
•Keep a wide perspective using a One Health approach; and
•Share and report your findings with stakeholders.

Lesson 16.1 – Apply the Steps of an Animal Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases, Slide 29

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Lesson 16.2 – Apply the Steps of a Public Health Outbreak Investigation for Animal-Specific and Zoonotic Diseases

Estimated Lesson and Exercise Time	
Instructor Materials	ISAVET Lesson 16.2 Apply the Steps of a Public Health Outbreak Investigation for Animal-Specific Diseases.pptx
	ISAVET Lesson 16.2 Apply the Steps of a Public Health Outbreak Investigation for Animal-Specific Diseases Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 16.2 Apply the Steps of a Public Health Outbreak Investigation for Animal-Specific Diseases Participant Guide.doc

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

Exercise 22 – Field Investigation and Response

Description of Exercise:

Identify key stakeholders who will need to be involved in an animal disease outbreak in your local area and at the national level. Should you have any questions, please ask a trainer for clarification.

Allotted Time: 90 minutes

Exercise Objective(s):

1. Describe the stakeholders in your local area and national level and the methods you will use to collaborate on an outbreak investigation for an animal disease event.

Exercise Components and Structure:

1. This exercise will take 90 minutes.
2. Form groups of equal size.
3. Complete the table provided to:
    a) list the local area level stakeholders;
    b) their roles and responsibilities; and
    c) how they coordinate their activities together to deal with an animal disease event in your local area and with the national level.
4. Groups will report their answers in plenary discussion.

Materials, Data or Information:

1. Computer
2. MS Word or MS PowerPoint
3. Pen or Pencil

Expected Outputs and Deliverables of Each Participant:

1. List of stakeholders.
2. Coordination mechanisms.

Instructor Notes:

Work with each group to determine specific stakeholders, roles and responsibilities and coordination mechanisms at the local and national levels.

Coordination of Animal Disease Events at local area and National Levels

Local Stakeholders	Roles and Responsibilities of LocalStakeholders	Coordination Mechanisms at Local and National Levels
Answers will vary based on each group.	Answers will vary based on each group.	Answers will vary based on each group.

Case Study 2: Highly Pathogenic Avian Influenza

Case Study of an Outbreak Investigation: Highly Pathogenic Avian Influenza

Acknowledgements:

This scenario was originally developed by the Faculty of Veterinary Medicine, Kasetsart University and the Thailand Department of Livestock Development. The scenario for the outbreak investigation for this exercise is adapted from an outbreak situation in which only 3 households were involved. The names and places in the exercise are fictional and have been modified from their original version for teaching purposes. The views expressed in this exercise are solely those of the authors.

General Instructions:

This is a table-top outbreak investigation exercise that will take three hours to complete.

Audience: This case study is designed for Frontline In-service Applied Veterinary Epidemiology Training (ISAVET) trainees.

Level of Training: Basic level (frontline) training in epidemiology

Language: English and French

Prerequisites:

1. Enrollment in Frontline ISAVET, Week 2, Field and Outbreak Investigation.
2. Knowledge of avian influenza virus.
3. Skills in descriptive epidemiology to analyse animal-place-time components related to an outbreak investigation.

Time Required: Approximately 3 hours

Learning Objectives:

At the end of this case study, participants will follow the steps of an outbreak investigation and be able to:

1. Verify the existence of an outbreak and the diagnosis
2. Establish working case definition(s)
3. Prepare for field work
4. Verify the diagnosis
5. Case finding and data collection
6. Describe the outbreak by Animal, Place, Time
    a. Develop an epidemic curve
    b. Calculate the impact of disease – morbidity and mortality
7. Develop a hypotheses for risk factors
8. Suggest follow-up studies including analytical studies to test the hypotheses
9. Implement control measures

Part I - Background

Highly pathogenic avian influenza (HPAI) subtype H5N1 is an infectious disease which can cause high mortality rates in poultry and restricts international trade in poultry products. Outbreaks of HPAI were first reported in Africa in February 2006. The disease has been classified as a notifiable disease under national health law. Passive and active surveillance systems are in place along with control and preventive measures that include cleaning and disinfection, education, farm bio-security, compartmentalization, movement control, fighting cock identification, stamping out and compensation.

Scenario – Outbreak Investigation of Avian Influenza

Place: Village 1, Crater Subdistrict, Volcano District, Island Region

On 28 October 2010, the Volcano District Livestock Office was informed by a local livestock health inspector of high mortality from an unknown cause in poultry in Village 1, Crater subdistrict, Volcano district, Island region. The inspector asked about the symptoms the birds exhibited before they died and the owner (Mr. A) reported that the affected chickens were depressed with torticollis and had swollen heads, cyanotic wattles and combs, and respiratory dyspnea. There was also some morbidity and mortality in chickens near to Mr. A's house. The District Livestock Office therefore informed the Regional Livestock Office of the event.

Question 4.1a: In the aforementioned scenario, are Regional or National Veterinary Officers required to investigate this report of disease?

A. Yes
B. No
C. Not sure

Answer:

4.1a A. Yes, all poultry deaths should be investigated according to national policy and law.

Question 4.1b: Is this an outbreak? Please provide any reasons to support your selection.

Answer:

4.1b This event should be reported, but it is not clear yet if this is an outbreak.

Question 4.2: The district livestock officer collected and sent samples to the laboratory. It will take 24 hours before confirmatory results are available using RT-PCR. Poultry mortality was not limited in only one household and seemed to have spread. This disease event needs to be investigated, What would not be a priority objective of the disease investigation?

A. Search for the cause of the disease outbreak.
B. Identify the magnitude of outbreak.
C. Perform disease control measures to stop any spread of the disease.

D. Set up protocols for prevention of future outbreaks.

Answer:

4.2 D. Not enough is known yet to prevent further outbreaks.

Next, the investigator needs to specify what the 'case definition' is. In order to do that, the officer must go to the outbreak area to examine affected animals and collect the epidemiological information that helps to characterise this particular disease event.

Preliminary findings in the affected area:

The affected area is in Village 1, Crater subdistrict, Volcano district, Island region. The villagers were predominantly crop farmers and their houses were scattered throughout the village. The poultry were mainly backyard chickens. Within a radius of 3 km from the notified case. There were 50 households with poultry, having a total of 800 chickens. The notified case was in Mr. A's property which is 16,000 m^2 in area. Mr. A. had forty (40) backyard chickens and six (6) beef cattle. He had no activities related to cock fighting and he had not gone to the cock fighting arena. On 27 October 2017, he observed that four (4) chickens died from an unknown cause and that egg production was reduced. On 28 October 2017, there were 11 more deaths and all of the 11 dead chickens had swollen heads and cyanotic wattles and combs. Mr. A, therefore promptly notified the district veterinary officer on the same day. After the investigation team entered the affected area, they also found dead chickens at Mr. D's house. Of 10 mature chickens, five (5) showed dyspnoea, lacrimation and swollen faces prior to their death. Some also has petechia on their shanks. Two chicks are still healthy with no signs of disease.

Question 4.3a: From the information provided, what is your preliminary "case definition"?

Answer:

Determination of case definition:

4.3a In this exercise, the Suspect Case Definition was determined using the following criteria.

(1) At least 5% of mortality threshold within 2 days for backyard poultry;
(2) Poultry have at least one of the following sets of symptoms:
   - Respiratory symptoms such as dyspnoea, swollen head, lacrimation;
   - Nervous signs such as torticollis and depression;
   - Enteric signs such as diarrhoea and inappetence;
   - Reproductive symptoms including decreased egg production and misshapen eggs deformities;
   - Haemorrhage with cyanotic wattles and combs and petechiae on shanks.

Probable case definition:

- Suspect case with post mortem hemorrhages and necrosis in the trachea, ceca, lungs, intestines, cloaca
- AI Rapid antigen test positive

Confirmed Case Definition:

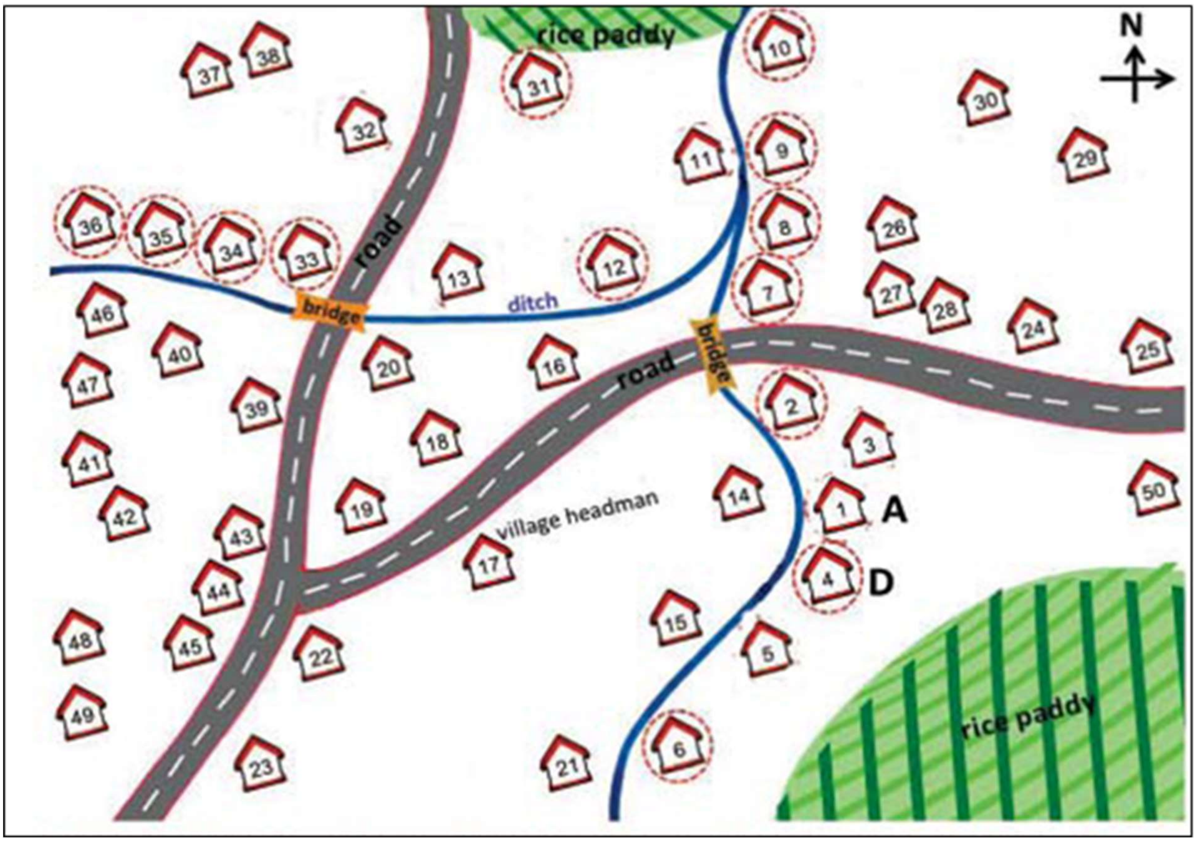
- A suspect or probable case that is positive by the gold standard test, RT-PCR or virus isolation using HA/HI test

__Question 4.3b:__ What poultry diseases are among your primary differential diagnoses?

Answer:

4.3b Signs are consistent with avian influenza and virulent Newcastle disease (you may also include infectious bronchitis and fowl cholera).

Before entering the affected area to investigate, you are called from the neighbouring district to assist. You want to get the history of recent poultry disease events and the district livestock officer from the Volcano District provided you with a map. The local livestock health care volunteer has also circled the locations of places on the map, where the cases were preliminarily reported.



Question 4.4: *You want to collate the information about the outbreak that is set out on the disease investigation forms for individual households. You need to do this to obtain a better understanding of the epidemiology of the outbreak. What information do you need to collect from poultry owner?*

Answer:

4.4 Responses should include but are not limited to the following data:

Animal data:

- Population size in the village;
- Species affected – include domestic species and wild birds;
- Poultry type: fighting cocks, egg layers, broilers, dual purpose native poultry;
- Age and sex;
- Clinical signs observed;
- Rearing systems – intensive, semi-intensive, extensive rearing; and
- Value chain information including marketing.

Place data:

- Locations of affected and non-affected premises;
- Location of the index premises (the first observed premises affected);

- Source and destination locations for all incoming and outgoing poultry during the critical time period;
- Order in which premises were affected; and
- Location of the nearby poultry and egg markets.

Time data:
- Date on which the first house observed poultry clinical signs and death;
- Dates on which all incoming and outgoing poultry moved during the critical time period;
- Time from onset of onset of clinical signs until death; and
- Dates on which poultry were sold to traders and marketers.

Value Chain data:
- Value chain map, actors and recent price changes.

You have decided to visit all households in the affected area and investigation team was divided into 3 small sub-teams (A, B and C) after taking the clusters and locations of cases in the area into consideration.

Team A investigated the area that included house numbers 1 to 13. Team B was allocated house numbers 14 to 36, and Team C house numbers 37 to 49. The teams were instructed to enter only uninfected farms first to avoid contact with the virus and further spread.

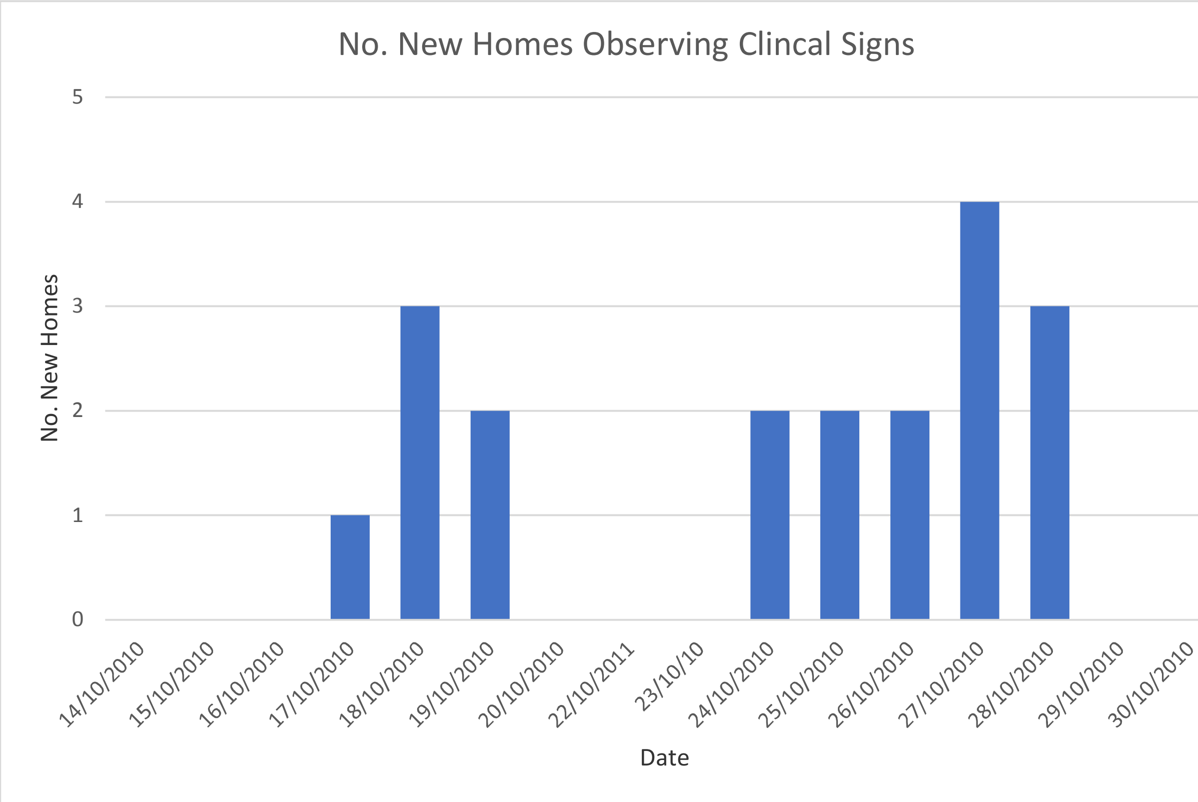
The assumption is made from the first data collected that the incubation period is 3 days.

House No.	House Name	No. Poultry at Risk	No. Adults	No. Chicks	Respiratory symptoms	Neurological symptoms	Gastroenteric symptoms	No. sick observed	No. dead observed	Date of Onset of Clinical Signs
1	A	40	30	10	11	0	0	11	15	27/10/2010
2	B	20	10	10	0	0	5	5	5	26/10/2010
3	C	38	20	18	0	20	0	15	20	25/10/2010
4	D	12	10	2	5	0	0	0	10	28/10/2010
5	E	18	10	8	8	0	0	8	8	27/10/2010
6	F	12	12	0	6	0	6	0	12	28/10/2010
7	G	16	8	8	8	4	0	0	16	26/10/2010
8	H	22	12	10	0	10	0	10	10	19/10/2010
9	I	17	10	7	0	4	0	4	10	18/10/2010
10	J	10	2	8	2	0	0	0	10	17/10/2010
11	K	10	2	8	2	4	4	0	10	18/10/2010
12	L	16	8	8	8	4	0	0	16	18/10/2010
13	M	18	10	8	6	0	0	6	10	19/10/2010
31	EE	40	35	5	15	5	5	15	25	24/10/2010
32	FF	14	10	4	6	0	0	6	8	27/10/2010
33	GG	15	10	5	8	7	0	0	15	24/10/2010
34	HH	16	10	6	5	0	5	0	16	25/10/2010
35	II	15	5	10	5	0	0	5	5	28/10/2010
36	JJ	10	8	2	2	2	0	2	8	27/10/2010

Question 4.5: An epidemic curve can be constructed at an early stage of the investigation and before laboratory confirmation. Please draw an epidemic curve using the data presented in the previous Table (Provide graph-drawing paper) and please interpret this epidemic curve. Correct X-axis interval: 1/3 of average incubation period (assume the incubation period is 3 days).

Answer:

4.5



The pattern of occurrence of the disease provides important epidemiological information about the time taken for spread of the disease and the efficacy of control measures. The pattern of spread over time can be visualised in an epidemic curve which is constructed by plotting the number of outbreaks cases on the Y axis against units of time on the X axis.

In this outbreak, there are two waves of affected homes. It appears that the second wave is a propagated outbreak that spread from house to house and between 24/10/2010 and 28/10/2010.

Question 4.6a: Calculate the total mortality rate for all affected houses for all chickens and chicks. Is the total mortality rate above the expected threshold of 5%?

Answer:

4.6a

Mortality rate for affected houses in Village 1 = Total No. Dead / Total at population risk at affected houses in Village 1

= 229 /359 = 64%

The mortality rate among chickens from affected houses in Village 1 between 17/10/2010 and 28/10/2010 is 64%.

This mortality rate at affected houses is 64%, much higher than the threshold of 5%.

Note that age specific mortality rates for adult chickens and chicks cannot be calculated since age specific deaths were recorded in the data provided. The survey questionnaire must include this information for it to be collected.

Investigations carried out within a radius of 3 km from the notified case found that there had been deaths of chickens at Mr. B's house. The house was located 300 meters away from Mr. A's house. Mr. B had 20 backyard chickens and had a retail restaurant business which involved cooking and food sales. There was a small ditch alongside his house and a pond behind. On 26 October 2010, 5 chickens with symptoms of white colored diarrhoea had died. Mr. B buried these dead chickens and did not notify the veterinary authorities.

The investigation team found that Mr. A (house number 1) usually visited the village shop belonging to Mr. B (house number 2), who had experienced chicken deaths in this backyard poultry. Mr. B told the investigation team that Mrs. EE (house number 31) had visited his shop to buy live chickens for slaughter one month before the death of Mr. B's chickens. He also reported that there had been some wild birds behind his house and that a flock of free-grazing ducks passed by the front of his house one week ago.

We decided that if we want to find the origin and cause of the outbreak we should start by investigating the first point of the outbreak, which was in Ms. J's house (House number 10). Ms. J was visited at her house and it was noticed that her house was located close to a 2 meter-wide ditch. The water passed through other neighbouring villages before going past her house. The rate at which the water flowed was rather strong through the outbreak village despite it being reduced after passing through a bifurcation. All villagers used the water from this ditch for their agricultural activities.

Ms. J did not know where her father worked. In the weekend, her father sometimes went to the cock fighting arena but he did not own any fighting cocks.

Before this outbreak, Ms. J's house had 10 backyard chickens and 2 of them showed dyspnea on 17 October 2010, and finally died. Other chickens died suddenly. The weather was rather cool at the time the chickens were affected and Ms. J disposed of all the dead chickens by throwing them into the ditch immediately after they died.

Mrs. H's house (House No. 8) used to have a flock of 1,000 free-grazing ducks which were kept for 6 months until they were sold on 21 October 2010. The ducks were apparently healthy and did not show any signs of illness or abnormalities. Because the ducks had been sold, it was not possible to test them for avian influenza related to the outbreak at Ms. J's house.

Question 4.6b: From the data in the Table, which would be the first household you should visit to collect some more information?

A. A's house
B. D's house
C. EE's house
D. J's house

Please provide an explanation to support your selection.

Answer:

4.6b Beginning with the index premises, Ms. J's house where the earliest clinical signs and deaths were observed. The index premises can provide important information about how the disease arrived into Village 1 and how it may have spread next within the village.

Every outbreak is unique and different. It is critical to spend time at the index premises to address disease transmission dynamics in every outbreak.

Question 4.7: Please describe the outbreak in terms of animal, place and time, in words with supportive evidence. Are there any value chain components to this outbreak?

What is your hypothesis or theory about what the risk factors for this outbreak should be assessed further?

What control measure should be put into place?

	Description	Supportive Evidence and Data
Animal		
Place		
Time		
Value Chain		

Answer:

4.7

	Description	Supportive Evidence and Data
Animal	- Both adults and chicks are affected - Free grazing ducks and wild birds were observed before the chicken deaths occurred - Some people in the village went to cock fights - Trading and marketing of chickens	- Mrs. H's house had 1,000 grazing ducks - Ms. J's father sometimes went to cock fights - Mrs. EE (house number 31) had visited his shop to buy live chickens for slaughter
Place	- Ms. J's house received water from a ditch connected to neighbouring villages before the water reaches other houses in Village 1 - Ms. J's father sometimes went to cock fights - Roads carry people and poultry go through village 1 - People visiting neighbours	- Map location - Need to confirm - Mrs. EE (house number 31) had visited his shop to buy live chickens for slaughter one month before the death of Mr. B's chickens
Time	- Ms. J's house was the first house affected (index premises) - Mrs. EE (house number 31) had visited his shop to buy live chickens for slaughter one month before the death of Mr. B's chickens	- Confirmation required
Value Chain	- Mr. B told the investigation team that Mrs. EE (house number 31) had visited his shop to buy live chickens	- Confirm the information by interviewing and cross-checking information

	for slaughter one month before the death of Mr. B's chickens. - Mrs. EE (house number 31) had visited his shop to buy live chickens for slaughter one month before the death of Mr. B's chickens	

Hypothesis for risk factors include the following:

- Proximity to Road
- Proximity to Ditch
- Cock Fighting
- New introductions to flocks
- Free ducks passing by
- Visiting neighbours and markets or restaurants

The following outbreak control measures were carried out throughout the investigation period based on the possible risk factors noted above.

- Whole suspected flock stamping out
- Movement restriction in the infected village and nearby village
- Disinfection
- Intensive surveillance

Question 4.8: From the descriptive information provided below, please calculate the proportion of each risk factors among the HPAI confirmed positive case homes and summarize some possible risk factors for this outbreak.

House No.	Name	No. Poultry	Adult	Chick	Proximity to Road	Proximity to Ditch	Cock Fighting	New Introduction	Free Ducks Passing By
1	A	40	30	10	0	1	0	1	1
2	B	20	10	10	1	1	0	0	1
3	C	38	20	18	1	1	0	0	0
4	D	12	10	2	0	1	0	0	1
5	E	18	10	8	0	1	1	0	1
6	F	12	12	0	0	1	1	0	1

7	G	16	8	8	1	1	0	0	1
8	H	22	12	10	0	1	0	0	1
9	I	17	10	7	0	1	0	0	0
10	J	10	2	8	0	1	1	1	0
11	K	10	2	8	0	1	1	0	0
12	L	16	8	8	0	1	1	0	0
13	M	18	10	8	1	1	0	0	0
31	EE	40	35	5	0	0	1	0	0
32	FF	14	10	4	1	0	0	1	0
33	GG	15	10	5	1	1	1	0	0
34	HH	16	10	6	0	1	0	0	0
35	II	15	5	10	0	1	1	0	0
36	JJ	10	8	2	0	1	0	0	0
Proportion									

Answers:

House No.	Name	No. Poultry	Adult	Chick	Proximity to Road	Proximity to Ditch	Cock Fighting	New Introduction	Free Ducks Passing By
1	A	40	30	10	0	1	0	1	1
2	B	20	10	10	1	1	0	0	1
3	C	38	20	18	1	1	0	0	0
4	D	12	10	2	0	1	0	0	1
5	E	18	10	8	0	1	1	0	1
6	F	12	12	0	0	1	1	0	1
7	G	16	8	8	1	1	0	0	1
8	H	22	12	10	0	1	0	0	1
9	I	17	10	7	0	1	0	0	0
10	J	10	2	8	0	1	1	1	0
11	K	10	2	8	0	1	1	0	0

12	L	16	8	8	0	1	1	0	0
13	M	18	10	8	1	1	0	0	0
31	EE	40	35	5	0	0	1	0	0
32	FF	14	10	4	1	0	0	1	0
33	GG	15	10	5	1	1	1	0	0
34	HH	16	10	6	0	1	0	0	0
35	II	15	5	10	0	1	1	0	0
36	JJ	10	8	2	0	1	0	0	0
Proportion					6/19	17/19	8/19	3/19	7/19

Results from the laboratory were sent back on 5 November 2010. Intestinal parasites were reported and E. coli was cultured from liver samples.

On the same day, avian influenza (H5) was confirmed by real-time PCR and by egg inoculation. The virus sequences were similar to those for the virus reported in two neighbouring provinces two years before and which had high virulence for chickens.

We have decided that a cross-sectional study would be the most appropriate study design to identify associations between possible (hypothetical) risk factors and occurrence of cases of disease caused by HPAI H5 virus in household poultry.

Crude Odds Ratios with 95% confident intervals were calculated to evaluate possible risk factors for this outbreak. Note that positive cases are more likely to be located near to the drainage ditch than negative, non-affected homes in Village 1.

Factors		Cases	Not Affected	Odds Ratios	95% CI
Proximity to road	Present	6	16	O.43	0.13 - 1.4
	Not present	13	15		
Proximity to ditch	Present	17	6	35.41	6.4-196.8
	Not present	2	25		
Having fighting cock activities (include entering fighting cock arena)	Present	8	9	1.77	0.54 – 5.9
	Not present	11	22		
Introduction of new poultry	Present	3	4	1.27	0.25 – 6.4
	Not present	16	27		

Having free grazing duck walking nearby the house	Present	7	9	1.36	0.4 – 4.6
	Not present	12	21		

Question 4.10: Are there any special studies that you would like to do to confirm the descriptive and analytic result?

Answer:

4.10 Intermediate and Advanced ISAVET courses will teach how to calculate odds ratios (OR). This information is provided so that you appreciate how important it is for Frontline ISAVET graduates to collect detailed information for further detailed analysis related to risk factors.

1. The ditch water in Village 1 and surrounding villages should be sampled to test it for avian influenza virus to further confirm an environmental source.
2. A survey of all villages in the district should be conducted to determine how poultry owners dispose of offal, litter and routine mortality from their flocks.

Question 4.11: What would be your recommendation to prevent and control the outbreak regarding to you descriptive and analytic results?

Answer:

4.11 Outbreak control measures were carried out throughout the investigation and include:

- Whole suspected flock stamping out
- Movement restriction in the infected village and nearby villages
- Disinfection
- Intensive surveillance

Lesson 17.1 – Managing Outbreak and Investigation Data: Collect Data and Create a Line Listing

Estimated Lesson and Exercise Time	1 hour
Instructor Materials	Frontline ISAVET Lesson 17.1 Managing Outbreak and Investigation Data: Collect Data and Create a Line Listing.pptx
	Frontline ISAVET Lesson 17.1 Managing Outbreak and Investigation Data: Collect Data and Create a Line Listing Instructor Guide.doc
	Computer
	Microsoft Word, MS Excel
Participant Materials	Frontline ISAVET Lesson 17.1 Managing Outbreak and Investigation Data: Collect Data and Create a Line Listing Participant Guide.PDF MS Excel Training Videos, on creating a line list (3.1, 3.2), and outbreak histogram (13.1, and 13.2).

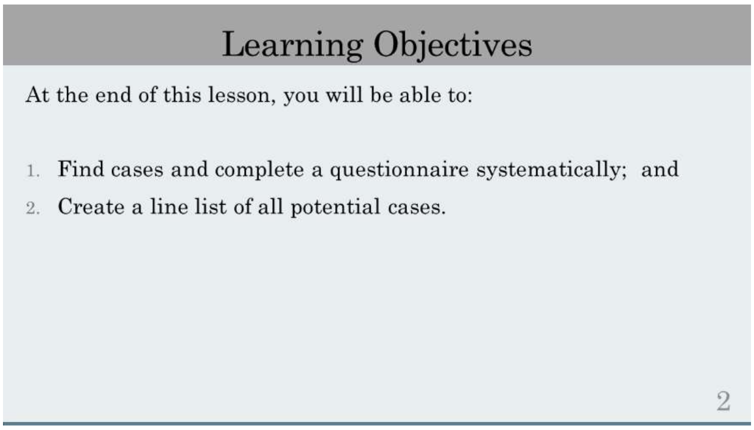
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

CFR	Case Fatality Rate
IR	Incidence Rate
ISAVET	In Service Applied Veterinary Epidemiology Training
PAR	Population at Risk

Lesson 17.1 – Managing Outbreak and Investigation Data: Collect Data and Create a Line Listing
Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 17.1 titled, "Managing Outbreak Investigation Data: Collect Data and Create a Line Listing".

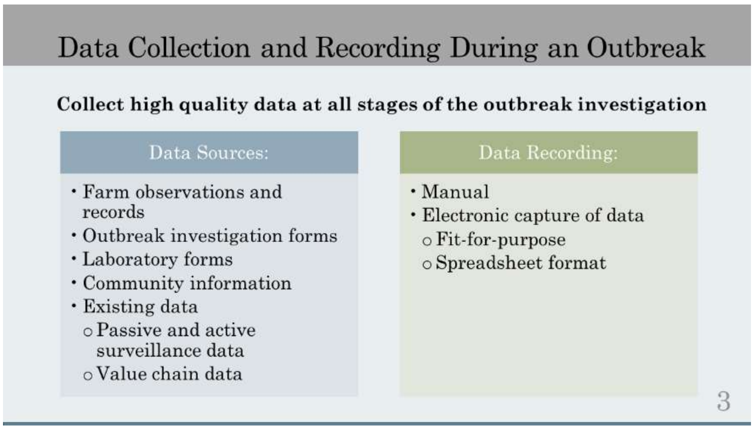


Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

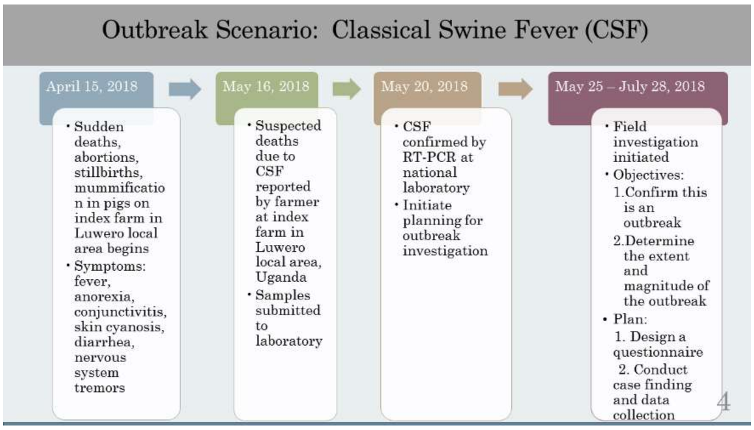
- Find cases and complete a questionnaire systematically;
- Create a line list of all potential cases;



Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 3

SCRIPT / KEY POINTS:

Read slide.



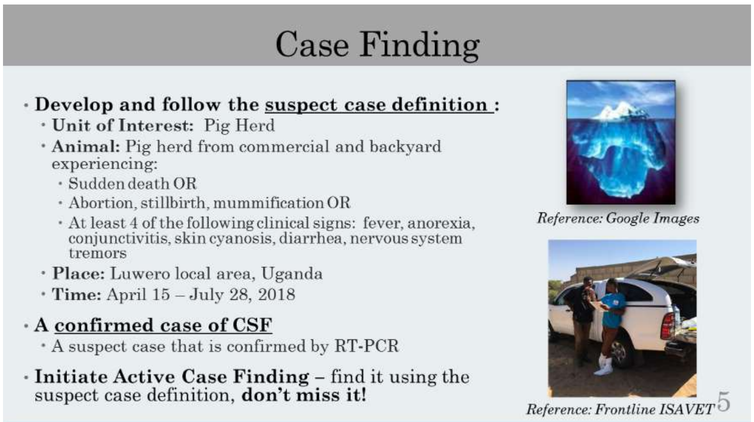
Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 4

SCRIPT / KEY POINTS:

In April 2018, a pig farm experienced signs and symptoms but did not report the problem until one month later. Samples were collected and found to be positive for Classical Swine Fever by RT-PCR. The Luwero Local area initiated plans to conduct a wider outbreak investigation in the local area.

The Objectives were to:

- Confirm this is an outbreak
- Questionnaire design
- Case finding and data collection



Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 5

SCRIPT / KEY POINTS:

Case finding is the most important role of a veterinary or veterinary paraprofessional field epidemiologist during an outbreak. This means conducting intensive, door-to-door and farm-to-farm searches for cases.

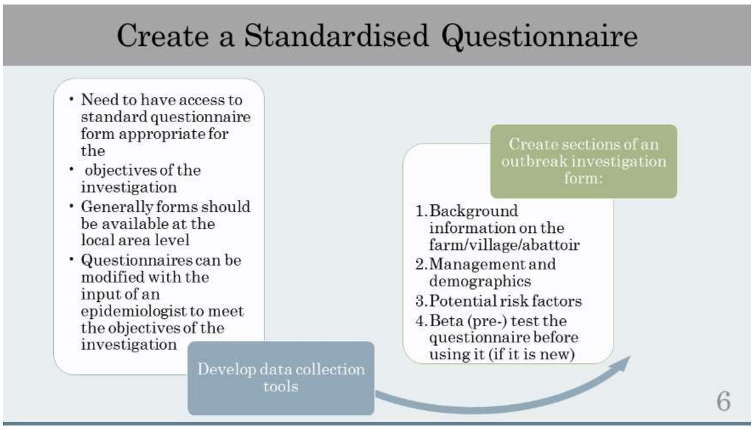
Collect field investigation data based on animal-place-time and possible risk factors to permit further data analysis.

Active case finding is the most important activity to define the distribution and size of a disease outbreak event.

Collecting data purposefully is required based on the objectives of the field investigation at hand.

Photos:

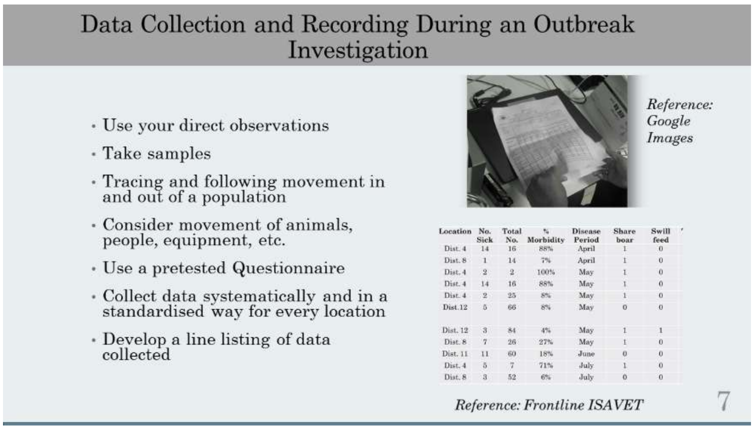
- Image 1: Google
- Image 2: Frontline ISAVET



Lesson 17.1 – Managing Outbreak and Investigation Data, Slide 6

SCRIPT / KEY POINTS:

During an outbreak investigation it is important to have access to a variety of data collection tools. The questionnaire forms should be developed and appropriate for the objectives of the outbreak investigation. Check with your local area level supervisor to obtain questionnaire forms. Questionnaires should be broken down into specific sections with relevant information in each section, such as, background information, management and demographics or potential risk factors. It is of critical importance to beta test the questionnaire before use in order to make sure all proper information is being collected.



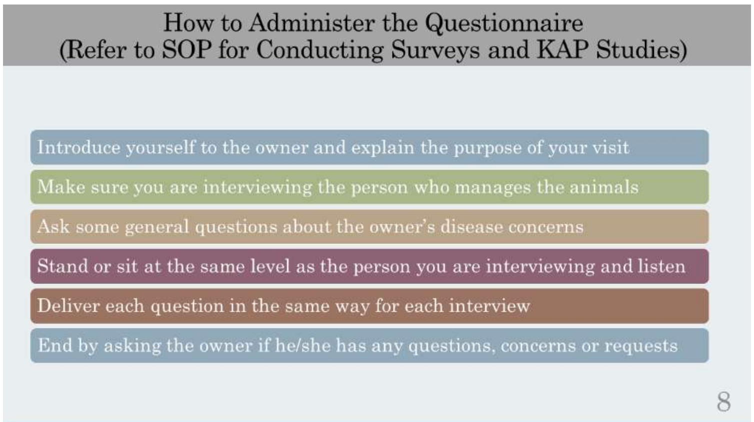
Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 7

SCRIPT / KEY POINTS:

Data collection and recording are critical during an outbreak investigation. Data collection occurs during different stages of the outbreak. Apply the following principles:

1. Use your direct observations
2. Take samples
3. Tracing and following movement in and out of a population
4. Consider movement of animals, people, equipment, etc.
5. Use a pretested Questionnaire
6. Collect data systematically and in a standardised way for every location
7. Develop a line listing of data collected

Reference: Frontline ISAVET

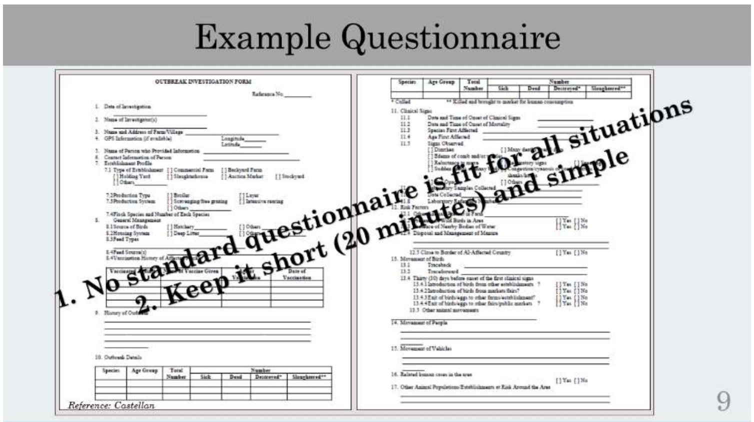


Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 8

SCRIPT / KEY POINTS:

Principles for administering a structured questionnaire.

1. The questionnaire should be developed by an epidemiologists and beta tested (trial run) before being used in the field. Make sure you can collect all of the information you need in about 20 minutes.
2. Act professionally, introduce yourself, the reason for your visit and treat the person respectfully. People are often under a great deal of stress when animals die or are sick during an outbreak.
3. Ask some general questions about the farm first, then request if you can ask some detailed information that may assist in assessing the outbreak.
4. Make sure you are interviewing the person who cares for and knows most about the animals so that you receive the most accurate information possible.
5. Use positive and supportive body language and verbally. If the person is sitting or crouching, be at their level and do not hover above the person responding.
6. After gathering the information, thank the respondent for their time and provide them with contact information if they have any further information or questions for you after you leave.
7. You will practice administering a questionnaire in this exercise.



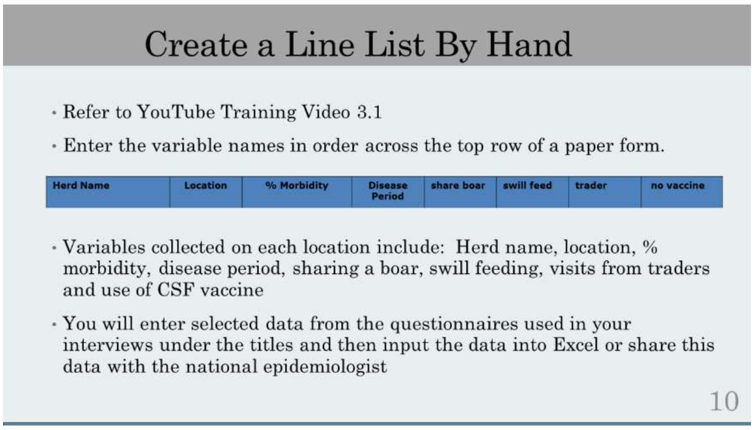
Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 9

SCRIPT / KEY POINTS:

Various investigation forms are used to gather standardised data on an outbreak. Here is an example for poultry.

Photo:

Image 1: Castellan, IIAD



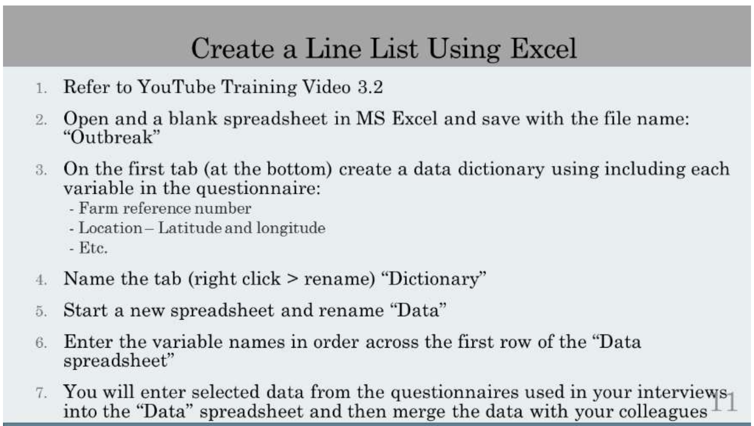
Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 10

SCRIPT / KEY POINTS:

In cases where you have no access to a computer and MS Excel, you can enter the data manually in paper format. It is important to avoid transcription errors in copying the data into Excel later on to maintain high quality data.

Refer to YouTube Training Video 3.1 for an example and further details you can practice.

1. Enter the variable names in order across the top row of a paper form.
2. Variables collected on each location include: Herd name, location, % morbidity, disease period, sharing a boar, swill feeding, visits from traders and use of CSF vaccine
3. You will enter selected data from the questionnaires used in your interviews under the titles and then input the data into Excel or share this data with the national epidemiologist



Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 11

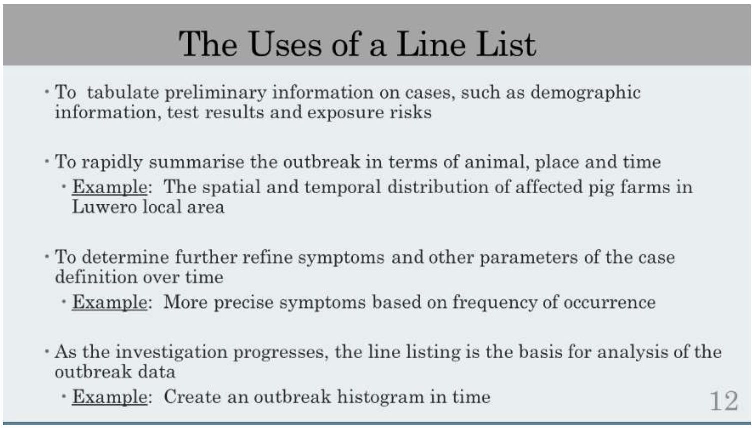
SCRIPT / KEY POINTS:

Step 1: Create a Spreadsheet

- Open and a blank spreadsheet in MS Excel and save with the file name: “Outbreak”.
- On the first tab (at the bottom) create a data dictionary using including each variable in the questionnaire:

- Farm reference number
- Location – Latitude and longitude
- Etc.

- Name the tab (right click > rename) “Dictionary”.
- Start a new spreadsheet and rename “Data”.
- Enter the variable names in order across the first row of the “Data spreadsheet”.
- You will enter selected data from the questionnaires used in your interviews into the “Data” spreadsheet and then merge the data with your colleagues.



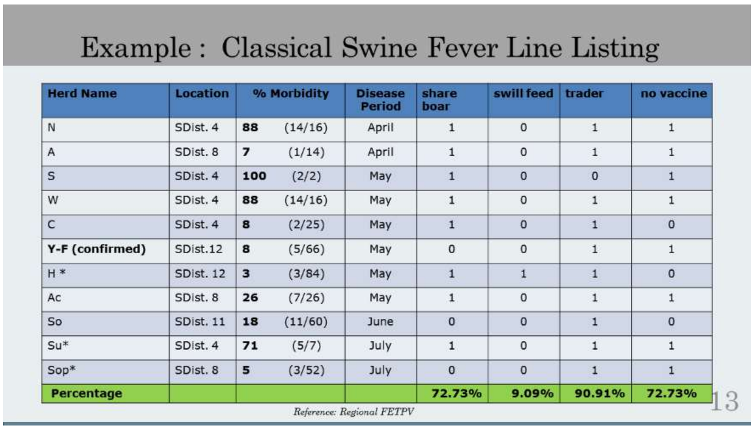
Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 12

SCRIPT / KEY POINTS:

The line list is at the heart of the outbreak investigation. It begins when the epidemiologist first begins finding out information on cases. As more information is learned about the outbreak, more questions will be added.

You begin interviewing cases based on what is known about the disease and host characteristics. As you interview, you discover that most of the cases also have diarrhea, so you add “diarrhoea” to one of the questions that you routinely ask. At a certain point, line lists are usually entered into a computer so they can be managed and analyzed more easily.

Depending on the size and complexity of the outbreak, the line list will essentially become an outbreak database, sometimes with hundreds of different variables.



Example : Classical Swine Fever Line Listing

Herd Name	Location	% Morbidity	Disease Period	share boar	swill feed	trader	no vaccine
N	SDist. 4	**88** (14/16)	April	1	0	1	1
A	SDist. 8	**7** (1/14)	April	1	0	1	1
S	SDist. 4	**100** (2/2)	May	1	0	0	1
W	SDist. 4	**88** (14/16)	May	1	0	1	1
C	SDist. 4	**8** (2/25)	May	1	0	1	0
Y-F (confirmed)	SDist.12	**8** (5/66)	May	0	0	1	1
H *	SDist. 12	**3** (3/84)	May	1	1	1	0
Ac	SDist. 8	**26** (7/26)	May	1	0	1	1
So	SDist. 11	**18** (11/60)	June	0	0	1	0
Su*	SDist. 4	**71** (5/7)	July	1	0	1	1
Sop*	SDist. 8	**5** (3/52)	July	0	0	1	1
Percentage				**72.73%**	**9.09%**	**90.91%**	**72.73%**

Reference: Regional FETPV

13

Lesson 17.1 – Managing Outbreak and Investigation Data,
Slide 13

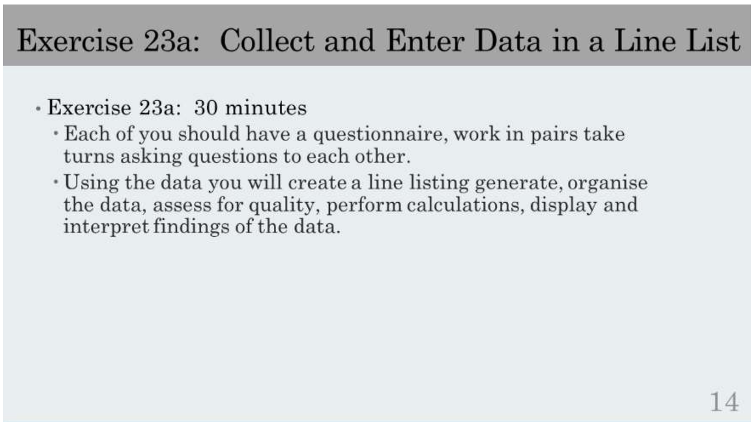
SCRIPT / KEY POINTS:

Here is the CSF outbreak line listing:

There are 11 suspect cases out of 31 total farms visited. Owner name, location, number sick, total herd size, % morbidity, month signs observed, sharing boar, swill feeding, recent trader contact number of vaccinations for CSF received are among the variables collected using the outbreak investigation questionnaire.

It should be noted that for notification at the local area level there could be two line-listings. We need to use the notifiable disease case definition for notification of national level authorities. But we may need a more sensitive case definition for the hypothesis generation and analysis phase (for developing an "outbreak line listing").

Reference: Regional FETPV



Lesson 17.1 – Managing Outbreak Investigation Data and Create a Line Listing,
Slide 14

SCRIPT / KEY POINTS:

Exercise 23:

1. Each person will receive a questionnaire to fill in asking questions of a classmate from the villagers.
2. Using the data provided, organise the data, assess for quality, perform calculations, display and interpret findings of the data.
3. Include: line listing, an outbreak histogram, measures of central tendency and measures of disease occurrence.

Exercise 23.a – Collect and Enter Data in a Line List

Description of Exercise:

A questionnaire will be provided for individuals to role-play the field investigator and the farmer. Information gleaned will be used to develop a frequency histogram in MS. Excel. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 30 minutes

Organisation of Group Work:

This exercise will be done independently.

Exercise Objective(s):

1. Each person will receive a questionnaire to fill in asking questions of a classmate from the villagers.
2. Develop a line listing in MS Excel. **Exercise Components and Structure:**
3. Questionnaire

MS Excel Training Videos, on creating a line list (3.1, 3.2),

Materials, Data or Information:

- MS Excel

Expected Outputs and Deliverables of Each Participant:

- Experience collecting data.
- Line listing.

OUTBREAK INVESTIGATION FORM

Farm Reference No.__________

1. Date of Investigation ____________________________________
2. Name of Investigator(s) ____________________________________
3. Name and Address of Farm/Village ____________________________________
4. GPS Information (if available)
   a. Latitude ________
   b. Longitude________
5. Name of Person who Provided Information ________________________________
6. Contact Information of Person ____________________________________
7. Establishment Profile

   1.1 Type of Establishment

   [ ] Commercial Farm

   [ ] Backyard Farm

   [ ] Holding Yard

   [ ] Slaughterhouse

   [ ] Auction Market

   [ ] Stockyard

   [ ] Others____________

   1.2 Production Type
   [ ] Broiler
   [ ] Layer

   1.3 Production System
   [ ] Scavenging/free grazing
   [ ] Intensive rearing
   [ ] Others _______________

   7.4 Flock Species and Number of Each Species

8. General Management

   8.1 Source of Birds

   [ ] Hatchery____________

   [ ] Others __________

   8.2 Housing System

[ ] Deep Litter___________

[ ] Slatted ________________

8.3 Feed Types

____

8.4 Feed Source(s)

____

8.4 Vaccination History of Affected Flocks

Vaccinated Against:	Name of Vaccine Given	Age at Vaccination	Date of Vaccination

9. History of Outbreak

____

____

____

____

10. Outbreak Details

Production Type	**Age (weeks)**	**Total Number**	**Number**			
			Morbidity	**Mortality**	Destroyed*	Slaughtered**
Meat						
Eggs						
Dual						

* Culled ** Killed and brought to market for human consumption

11. Clinical Signs

11.1 Date of Onset of Clinical Signs ____________________

11.2 Date of Onset of Mortality ____________________

11.3 Species First Affected ____________________________________

11.4 Age First Affected ____________________________________

11.5 Signs Observed

[ ] Diarrhea

[ ] Many deaths over 3 days

[ ] Edema of comb and/or wattles

[ ] Reluctance to move

[ ] Respiratory signs

[ ] Sneezing

[ ] Sudden deaths of many birds

[ ] Congestion/cyanosis of comb, wattles or shanks/hocks

[ ] Eye Opacity

[ ] Others ___________________________

11.6 Laboratory Samples Collected____

11.7 Date Collected____

11.8 Laboratory Reference Number ____

12. Risk Factors

12.1 Other Animals Present in Farm ____

12.2 Presence of Wild Birds in Area [ ] Yes [ ] No

12.3 Presence of Nearby Bodies of Water [ ] Yes [ ] No

12.4 Disposal and Management of Manure

____

____

12.5 Close to Border of AI-Affected Country [ ] Yes [ ] No

13. Movement of Birds

13.1 Traceback ____

13.2 Traceforward ____

13.4 Thirty (30) days before onset of the first clinical signs

13.4.1 Introduction of birds from other establishments? [ ] Yes [ ] No

13.4.2 Introduction of birds from markets/fairs? [ ] Yes [ ] No

13.4.3 Exit of birds/eggs to other farms/establishment? [ ] Yes [ ] No

13.4.4 Exit of birds/eggs to other fairs/public markets? [ ] Yes [ ] No

13.5 Other animal movements ____

14. Movement of People

____

____

15. Movement of Vehicles

____

____

16. Related human cases in the Area [ ] Yes [ ] No

17. Other Animal Populations/Establishments at Risk Around the Area

____

____

18. Additional Observations/Comments Other than Indicated

____

____

____

17. Map and Photos of the Area

Signature of Investigator: ________________________________

Lesson 17.2 – Managing Outbreak Investigation Data

Estimated Lesson and Exercise Time	1 hour
Instructor Materials	Frontline ISAVET Lesson 17.2 Managing Outbreak Investigation Data 4.pptx
	Frontline ISAVET Lesson 17.2 Managing Outbreak Investigation Data Instructor Guide Version 4.doc
	Computer
	Microsoft Word, MS Excel
Participant Materials	Frontline ISAVET Lesson 17.2 Managing Outbreak Investigation Data Participant Guide Version 4.PDF MS Excel Training Videos, on creating a line list (3.1, 3.2), and outbreak histogram (13.1, and 13.2).

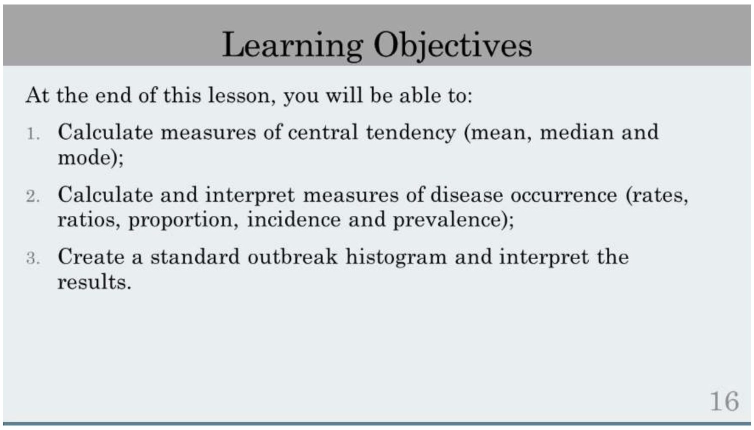
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

CFR	Case Fatality Rate
IR	Incidence Rate
ISAVET	In Service Applied Veterinary Epidemiology Training
PAR	Population at Risk

Lesson 17.2 – Managing Outbreak Investigation Data, Slide 15

SCRIPT / KEY POINTS:

Welcome to Lesson 17.2 titled, “Managing Outbreak Investigation Data”.

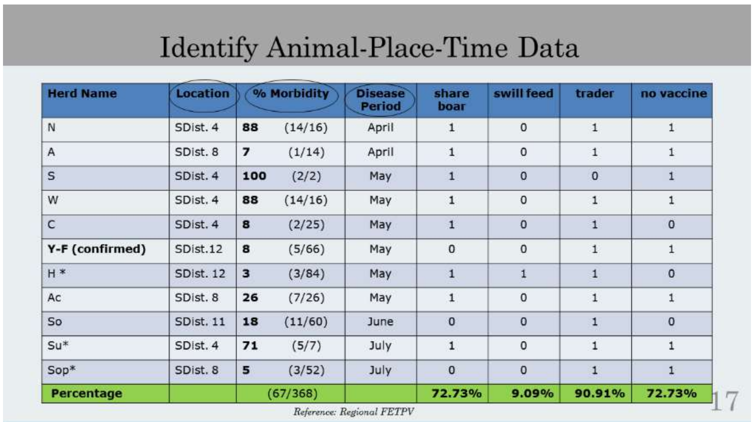


Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 16

SCRIPT / KEY POINTS:

At the end of this lesson, you will be able to:

- Calculate measures of central tendency (mean, median and mode);
- Calculate and interpret measures of disease occurrence (rates, ratios, proportion, incidence and prevalence);
- Create a standard outbreak histogram and interpret the results.



Herd Name	Location	% Morbidity	Disease Period	share boar	swill feed	trader	no vaccine
N	SDist. 4	**88** (14/16)	April	1	0	1	1
A	SDist. 8	**7** (1/14)	April	1	0	1	1
S	SDist. 4	**100** (2/2)	May	1	0	0	1
W	SDist. 4	**88** (14/16)	May	1	0	1	1
C	SDist. 4	**8** (2/25)	May	1	0	1	0
Y-F (confirmed)	SDist.12	**8** (5/66)	May	0	0	1	1
H *	SDist. 12	**3** (3/84)	May	1	1	1	0
Ac	SDist. 8	**26** (7/26)	May	1	0	1	1
So	SDist. 11	**18** (11/60)	June	0	0	1	0
Su*	SDist. 4	**71** (5/7)	July	1	0	1	1
Sop*	SDist. 8	**5** (3/52)	July	0	0	1	1
Percentage		(67/368)		**72.73%**	**9.09%**	**90.91%**	**72.73%**

Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 17

SCRIPT / KEY POINTS:

Here is the CSF outbreak line listing:

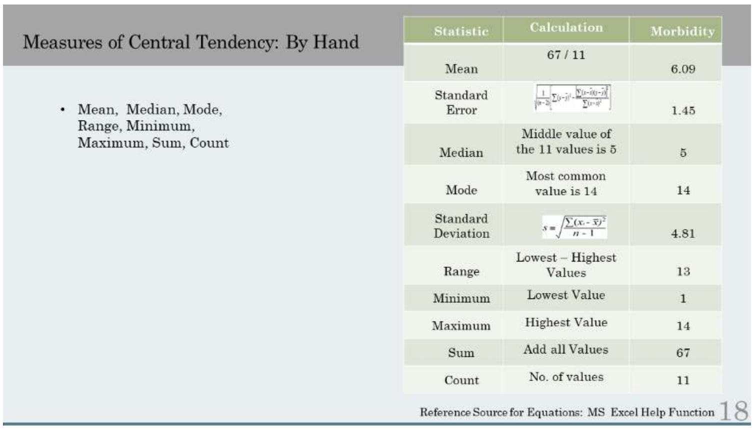
Animal-Place-Time Data are summarised below:

Animal -

There are 11 suspect cases out of 31 total farms visited. Owner name, location, number sick, total herd size, % morbidity, month signs observed, sharing boar, swill feeding, recent trader contact number of vaccinations for CSF received are among the variables collected using the outbreak investigation questionnaire.

It should be noted that for notification at the local area level there could be two line-listings. We need to use the notifiable disease case definition for notification of national level authorities. But we may need a more sensitive case definition for the hypothesis generation and analysis phase (for developing an "outbreak line listing").

Reference: Regional FETPV

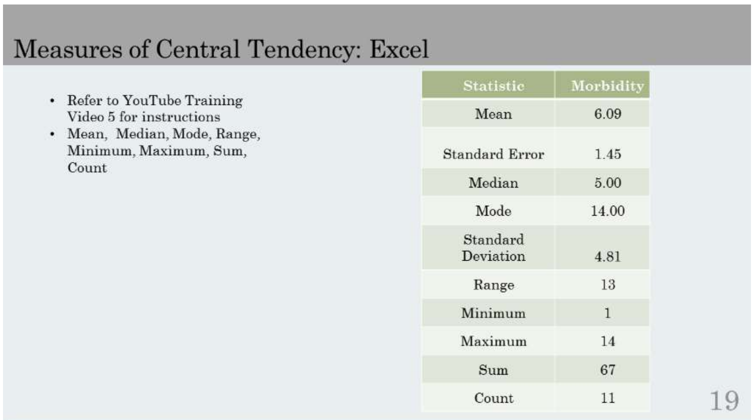


Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 18

SCRIPT / KEY POINTS:

We calculate the arithmetic mean when the trait is measured as continuous data such as weight, height, temperature, etc. We can also calculate the standard deviation (variability), median, mode, range, minimum and maximum values, the sum of all measurements and the count of all measurements.

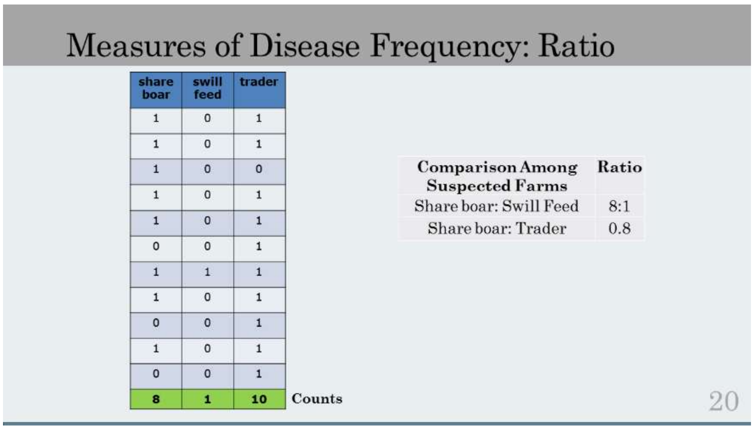
Reference source for equations: MS Excel Help Function



Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 19

SCRIPT / KEY POINTS:

We calculate the arithmetic mean when the trait is measured as continuous data such as weight, height, temperature, etc. We can also calculate the standard deviation (variability), median, mode, range, minimum and maximum values, the sum of all measurements and the count of all measurements.



Measures of Disease Frequency: Ratio

share boar	swill feed	trader	
1	0	1	
1	0	1	
1	0	0	
1	0	1	
1	0	1	
0	0	1	
1	1	1	
1	0	1	
0	0	1	
1	0	1	
0	0	1	
8	1	10	Counts

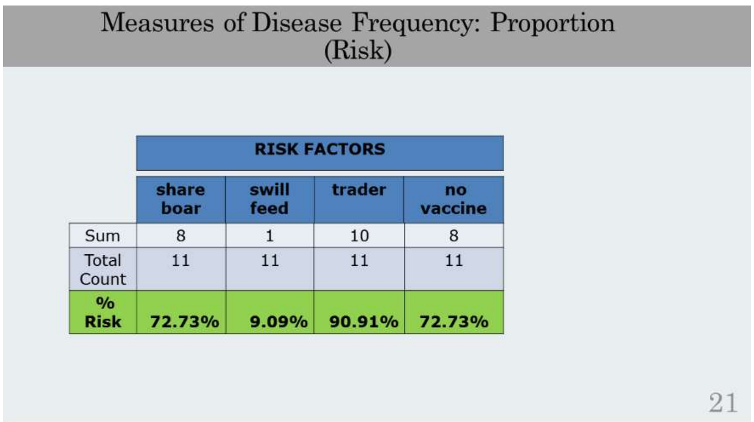
Comparison Among Suspected Farms	Ratio
Share boar: Swill Feed	8:1
Share boar: Trader	0.8

20

Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 20

SCRIPT / KEY POINTS:

A ratio compares two counts. It is expressed as a fraction where the numerator is separate from and not included in the denominator. Looking at the following examples, what is the ratio of share boars to swill feed in a village?



Measures of Disease Frequency: Proportion (Risk)

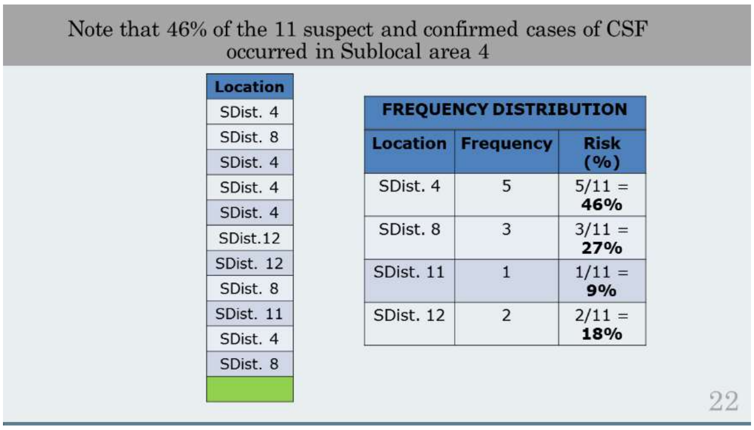
	RISK FACTORS			
	share boar	swill feed	trader	no vaccine
Sum	8	1	10	8
Total Count	11	11	11	11
% Risk	72.73%	9.09%	90.91%	72.73%

21

Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 21

SCRIPT / KEY POINTS:

A proportion compares one part to a larger population from which it comes. The numerator is also included in the denominator.

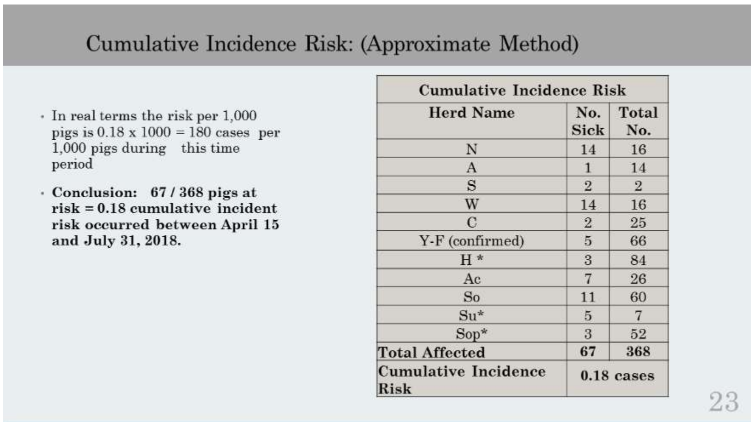


Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 22

SCRIPT / KEY POINTS:

A risk is expressed as a probability that is calculated during a given time period:

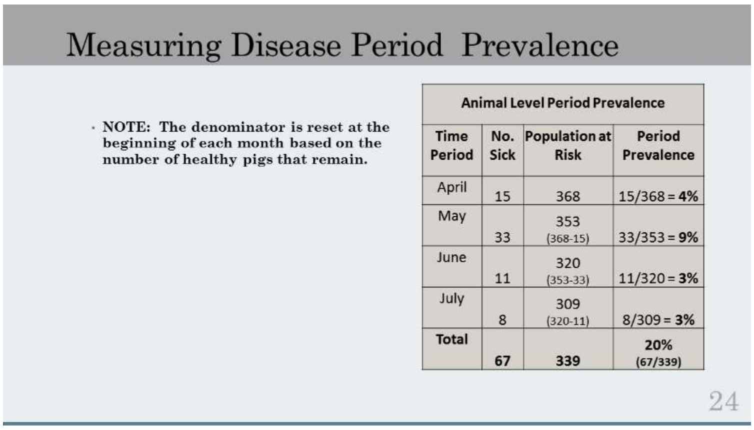
- Probability expressed through time



Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 23

SCRIPT / KEY POINTS:

Use when the population at risk (PAR) is changing frequently (open population) over a period of time.



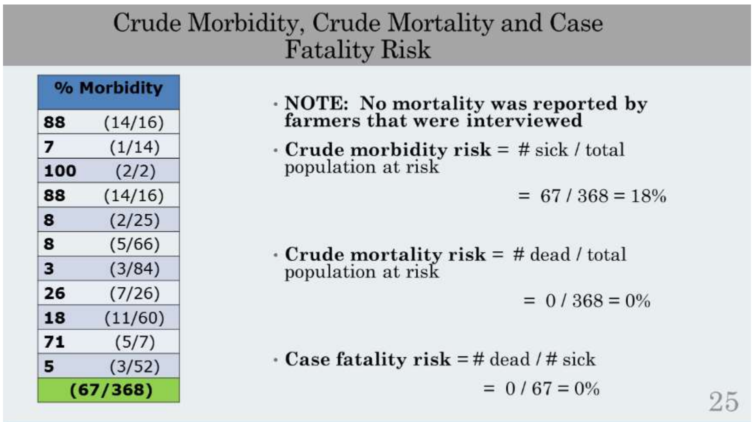
Animal Level Period Prevalence			
Time Period	No. Sick	Population at Risk	Period Prevalence
April	15	368	15/368 = **4%**
May	33	353 (368-15)	33/353 = **9%**
June	11	320 (353-33)	11/320 = **3%**
July	8	309 (320-11)	8/309 = **3%**
Total	**67**	**339**	**20%** (67/339)

Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 24

SCRIPT / KEY POINTS:

Prevalence: The number of existing cases including those previously existing and new cases that have developed at some point during a given time period.

There are two ways to calculate prevalence. These include point prevalence and period prevalence. An example of point prevalence would be the number of existing cases of classical swine fever on 1 May. Whereas the period prevalence would be the number of existing Classical swine fever cases between the dates of 1 May – 31 July.

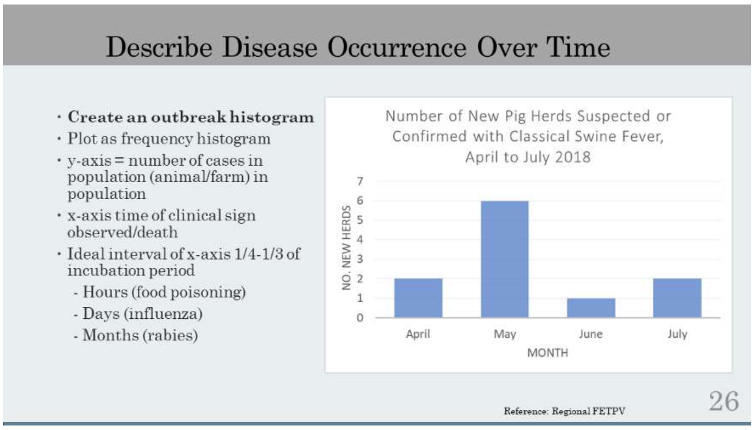


% Morbidity	
88	(14/16)
7	(1/14)
100	(2/2)
88	(14/16)
8	(2/25)
8	(5/66)
3	(3/84)
26	(7/26)
18	(11/60)
71	(5/7)
5	(3/52)
(67/368)	

Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 25

SCRIPT / KEY POINTS:

Crude rates describe the number of cases that are clinically affected in the population at risk over some identified time period.

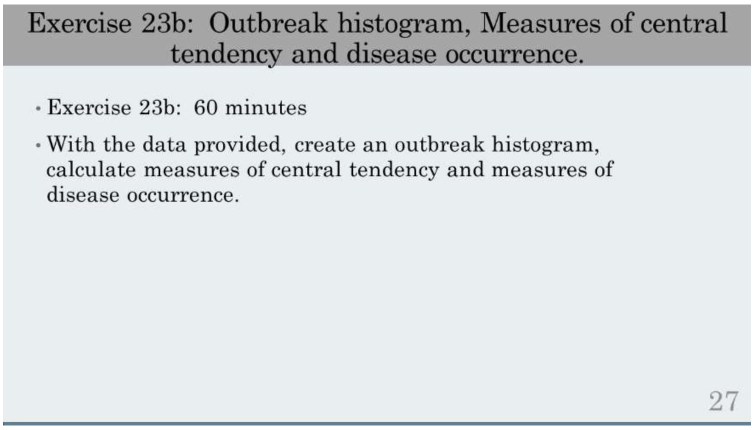


Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 26

SCRIPT / KEY POINTS:

1. When in calendar time did the problem actually begin?
   - April 15 2018 and the investigation ended July 31 2018. Note that the time interval is based on month since farmers could not provide an accurate date of when ick pigs were observed.
2. What is the pattern of disease occurence over time?
   - There was a rise from April until May and then reduction in June and small rise in July
3. Why is the x-axis time interval in months?
   - It is important to note that the incubation period varies for each disease and so the x-axis interval will also vary
   - For acute diseases such as bacterial infections from contaminated feed, the incubation may only be hours
   - For viral diseases such as avian influenza, the incubation period is usually in days
   - Some diseases such as rabies and tuberculosis have long incubation periods and may take months to develop clinical signs

Reference: Regional FETPV

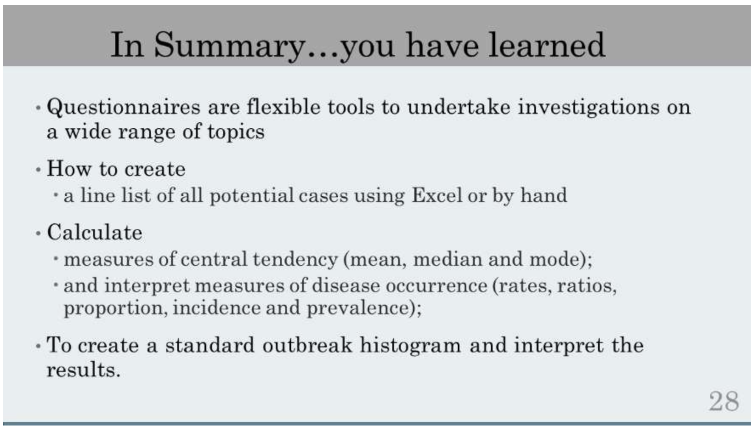


Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 27

SCRIPT / KEY POINTS:

Exercise 23:

1. Each person will receive a questionnaire to fill in asking questions of a classmate from the villagers.
2. Using the data provided, organise the data, assess for quality, perform calculations, display and interpret findings of the data.
3. Include: line listing, an outbreak histogram, measures of central tendency and measures of disease occurrence.



Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 28

SCRIPT / KEY POINTS:

In summary,

- Questionnaires are flexible tools to undertake investigation on a wide range of topics and provide data to enter into a line listing for further analysis including measures of central tendency, measures of disease occurrence and an outbreak curve which describes the dynamics of the outbreak over time.

Lesson 17.2 – Managing Outbreak and Investigation Data,
Slide 29

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 23b – Outbreak Histograms

Description of Exercise:

Using the data provided, organise the data, assess for quality, perform calculations, display and interpret findings of the data.Information gleaned will be used to develop a frequency histogram in MS. Excel. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 1 hour

Organisation of Group Work:

This exercise will be done independently or with a colleague.

Exercise Objective(s):

1. Using the data provided, organise the data, assess for quality, perform calculations, display and interpret findings of the data.

2. Create an outbreak histogram, measures of central tendency and measures of central tendency and measures of disease occurrence.

Exercise Components and Structure:

1. Data provided

2. MS Excel Training Video Creating an Outbreak histogram using MS Excel (13.1, and 13.2).

3. Development of a frequency histogram

Materials, Data or Information:

1. MS Excel

Expected Outputs and Deliverables of Each Participant:

1. Experience collecting data.

2. Outbreak histogram, measures of disease occurrence.

Lesson 18 – Follow-up Investigations and Special Studies

Estimated Lesson and Exercise Time	1 hour and 30 minutes
Instructor Materials	Frontline ISAVET Lesson 18 Follow-up Investigations and Special Studies.pptx
	Frontline ISAVET Lesson 18 Follow-up Investigations and Special Studies Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	Frontline ISAVET Lesson 18 Follow-up Investigations and Special Studies Participant Guide.doc

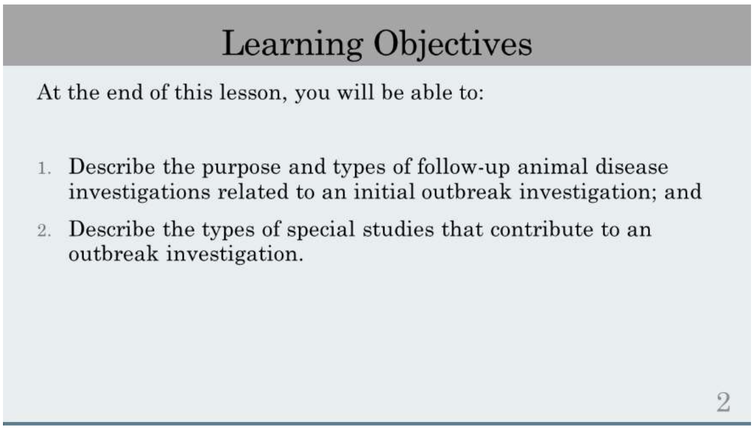
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

CSF	Classical Swine Fever
ISAVET	In Service Applied Veterinary Epidemiology Training

Lesson 18 – Follow-up Investigations and Special Studies, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 18 titled, "Follow-up Investigations and Special Studies".

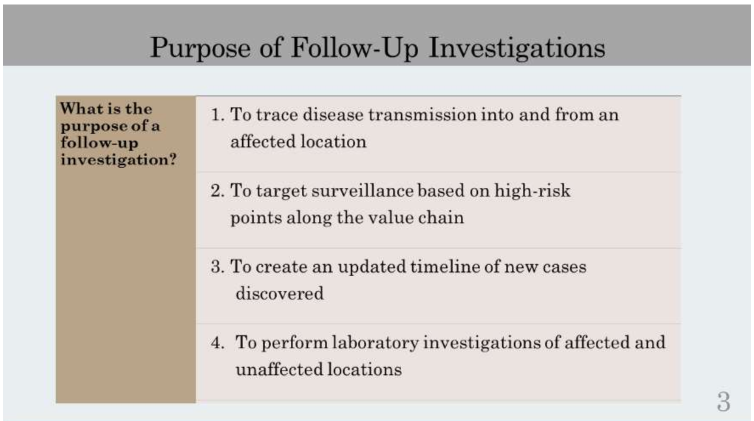


Lesson 18 – Follow-up Investigations and Special Studies,
Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

- Describe the purpose and types of follow up animal disease investigations related to an initial outbreak investigation; and
- Describe the types of special studies that contribute to an outbreak investigation



Lesson 18 – Follow-up Investigations and Special Studies,
Slide 3

SCRIPT / KEY POINTS:

Follow-up investigations are needed for many different reasons. However, human resources are often lacking to do them. It is important to develop interdisciplinary teams from Veterinary Services and reference laboratories, as well as, other agencies (i.e., public health and wildlife health) to fill the human resource needs.

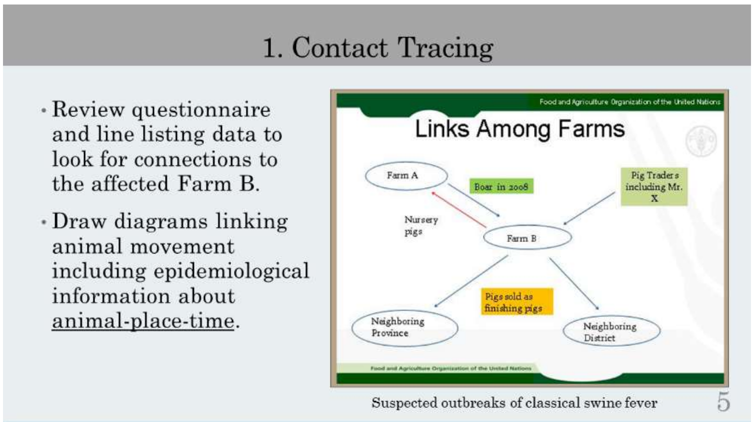
Targeting risk-based surveillance at high risk points along the value chain is a highly efficient and effective strategy to deal with human resource limitations and gain maximum disease intelligence.

Follow-up investigations are conducted for the following purposes:
Trace forward and trace backward;
Targeted risk-based surveillance;
Revision of index case; and
Observational studies.

Lesson 18 – Follow-up Investigations and Special Studies,
Slide 4

SCRIPT / KEY POINTS:

We will discuss these 4 types of follow up investigations one-by-one in this lesson.



Lesson 18 – Follow-up Investigations and Special Studies,
Slide 5

SCRIPT / KEY POINTS:

The diagram illustrates the links among pig farms during a suspected outbreak of classical swine fever (CSF).

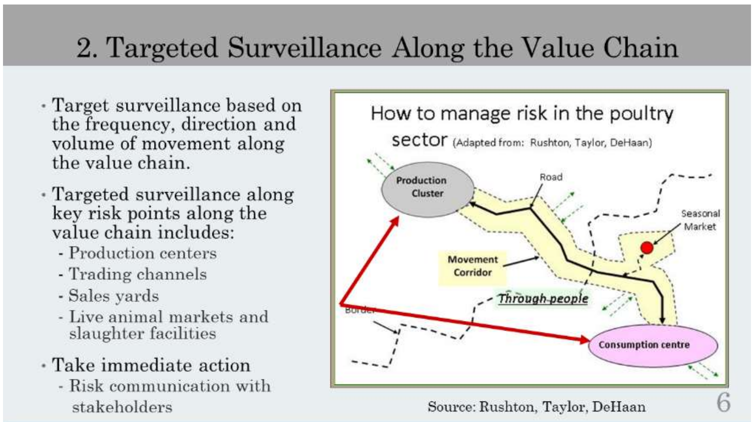
It is important to do the following steps:

1. **Step 1:** Review survey questionnaires and participatory epidemiology results for interconnections with the affected farm (Farm B).
2. **Step 2:** Review any line listing data results for interconnections with the affected farm (Farm B).
3. **Step 3:** Draw diagrams that illustrate the relationships, direction and movement among the farms with the affected premises.
4. **Step 4:** Include time-specific data related to the outbreak – in this case, a breeding boar was moved from Farm A to Farm B during the past year, before classical swine fever had be confirmed in Farm B.

What will you do now? Further contact tracing is needed in the neighbouring local area and neighbouring province.

Farm B trades pigs with Farm A, as well as, farms in the neighbouring local area and neighbouring province through transboundary trade.

Photo: Food and Agriculture Organization of the United Nations



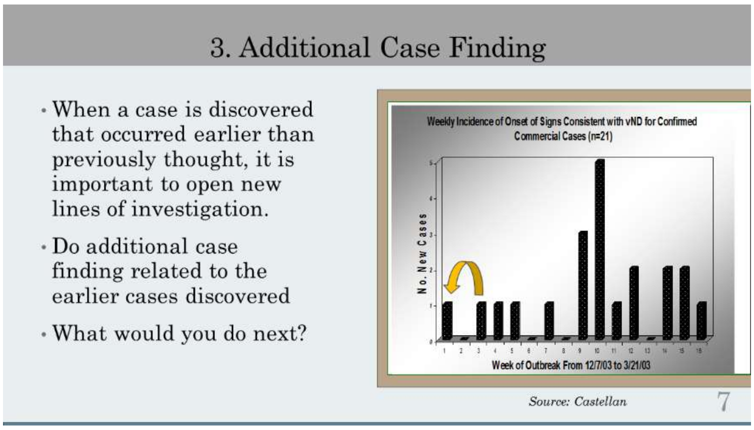
Lesson 18 – Follow-up Investigations and Special Studies,
Slide 6

SCRIPT / KEY POINTS:

Act preventatively using:

- Targeted risk-based surveillance along key risk points/nodes along the value chain; and
- Take immediate action and initiate risk communication with key stakeholders.

Photo: Rushton Taylor, DeHaan



Lesson 18 – Follow-up Investigations and Special Studies,
Slide 7

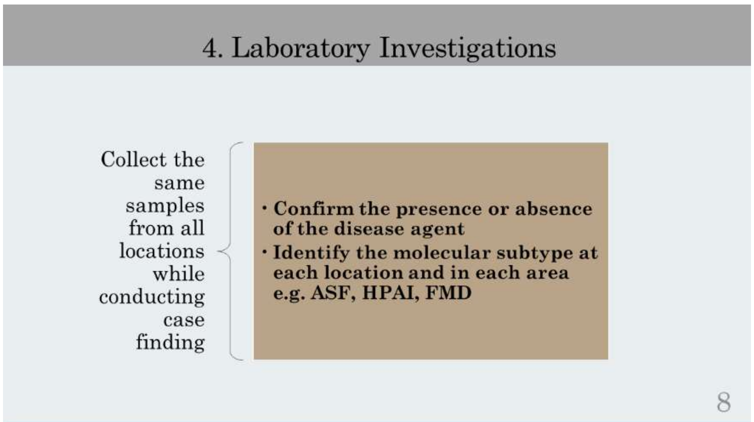
SCRIPT / KEY POINTS:

Follow the investigative trail back in time when it is warranted. The index case reveals a great deal about possible sources and should be aggressively investigated.

This may include:

- Verification of the time of onset at the new index case;
- Further upstream and downstream contact tracing including the previously identified index case; and
- Review of related value chain connections including traders and marketers.

Photo: Castellan, IIAD



Lesson 18 – Follow-up Investigations and Special Studies,
Slide 8

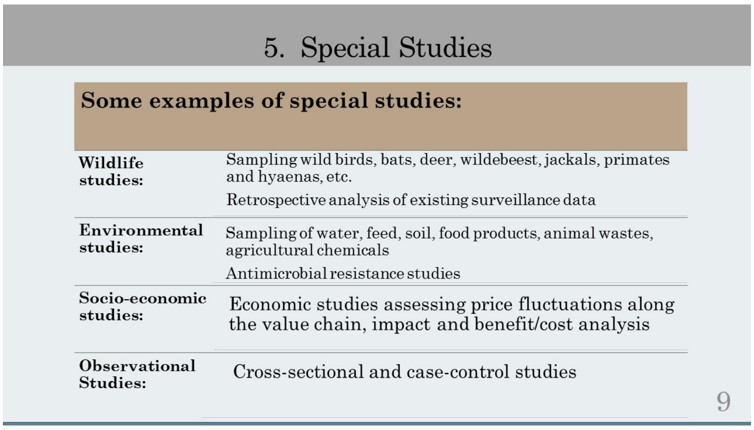
SCRIPT / KEY POINTS:

If you collect the same information from all farms, including known positive and known negative farms, observational studies can be conducted to assess the risk factors contributing to the outbreak.

Cross-sectional and case-control studies can be conducted during and following an epidemic event, respectively.

Both address the hypothesis developed through descriptive analysis and each study has strengths and limitations.

Work with your national epidemiologists to obtain as much knowledge about the outbreak so that together you can calculate risk factors involved in each outbreak.



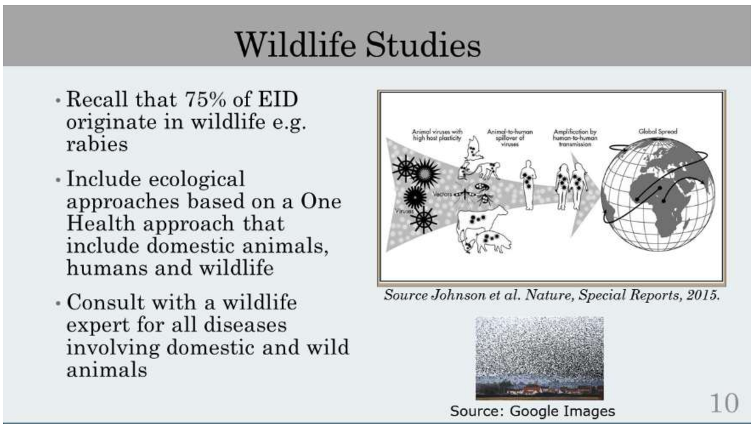
Lesson 18 – Follow-up Investigations and Special Studies,
Slide 9

SCRIPT / KEY POINTS:

Case-control and cross-sectional studies can generate new hypotheses to test.

Special studies provide the influence and impact of environmental and human animal marketing on the occurrence of disease.

Discuss with your supervisor, the need to involve experts from different disciplines under a One Health approach!



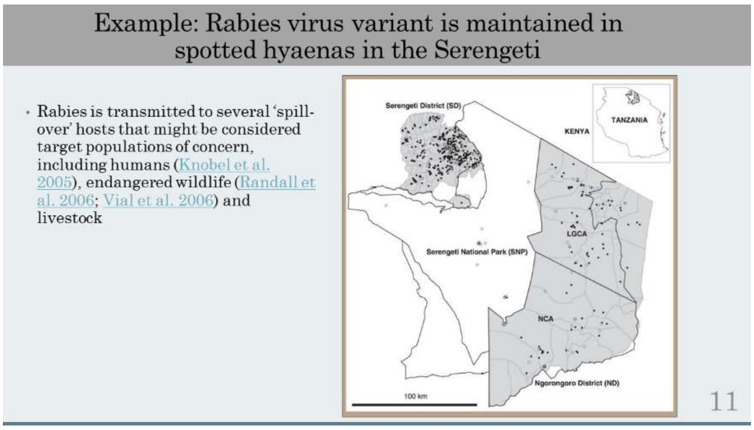
Lesson 18 – Follow-up Investigations and Special Studies,
Slide 10

SCRIPT / KEY POINTS:

Ecological studies on the disease drivers for spillover of disease among domestic animals, wildlife and humans are important to conduct. The majority of new emerging diseases are zoonotic, thus, further integration of ecological approaches should be considered while conducting follow-up investigations.

Photo(s): Johnson et al. Nature, 2015

Google Images



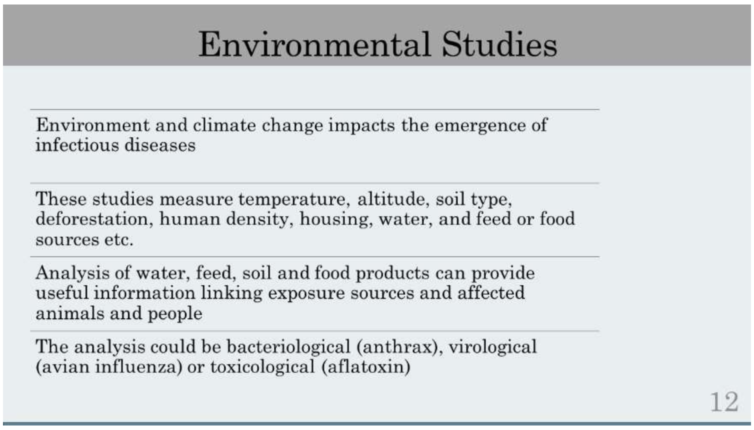
Lesson 18 – Follow-up Investigations and Special Studies,
Slide 11

SCRIPT / KEY POINTS:

Wild animals act as a reservoir of many important diseases for domestic animals and humans.

Reference: Exploring reservoir dynamics: a case study of rabies in the Serengeti ecosystem. J Appl Ecol. Author manuscript; available in PMC 2012 Mar 14.Published in final edited form as: J Appl Ecol. 2008 Aug; 45(4): 1246–1257. doi: 10.1111/j.1365-2664.2008.01468.x

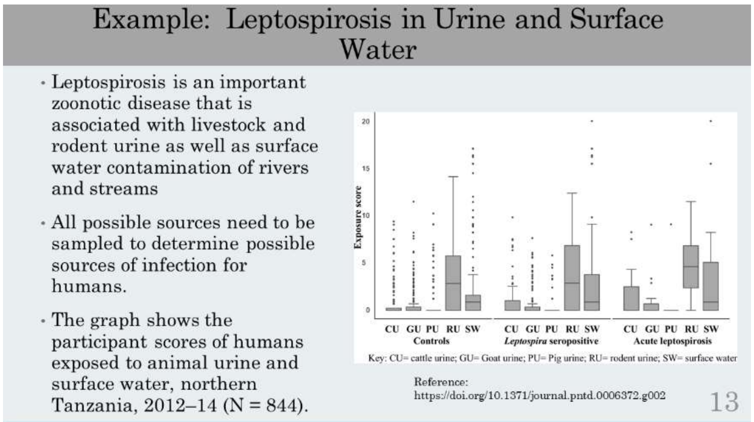
Photo: J Appl Ecol. 2008 Aug; 45(4): 1246–1257. doi: 10.1111/j.1365-2664.2008.01468



Lesson 18 – Follow-up Investigations and Special Studies,
Slide 12

SCRIPT / KEY POINTS:

Bacteriological, virologic and toxicological analysis of water, feed, soil and food products can provide useful linking exposure sources to domestic animals, wildlife and humans. Bacterial outbreaks such as leptospirosis often require environmental studies to investigate the ecology of the disease.



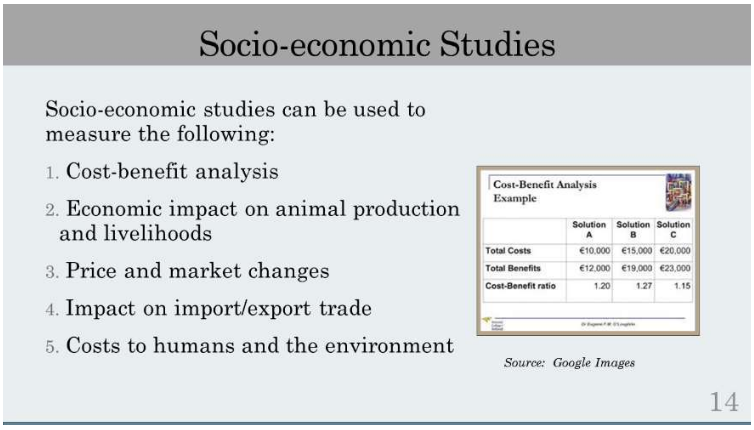
Lesson 18 – Follow-up Investigations and Special Studies,
Slide 13

SCRIPT / KEY POINTS:

Leptospirosis is an important zoonotic disease that is associated with livestock and rodent urine which may also be found in surface water of rivers and streams all of which need to be sampled to determine possible sources of infection for humans.

The graph shows the participant scores of humans exposed to animal urine and surface water, northern Tanzania, 2012–14 (N = 844).

Reference: https://doi.org/10.1371/journal.pntd.0006372.g002



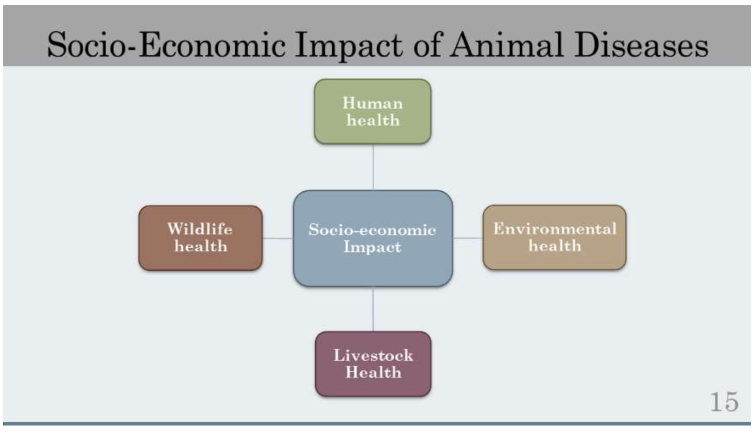
Lesson 18 – Follow-up Investigations and Special Studies,
Slide 14

SCRIPT / KEY POINTS:

Socio-economic studies can be conducted to measure the following:

- Cost-benefit studies;
- Economic impact on animal production and livelihoods;
- Price monitoring may correlate sudden price changes with increased movement of infected and sick animals through the value chain;
- Impact on export trade; and
- Costs to humans and the environment.

Photo: Google Images



Lesson 18 – Follow-up Investigations and Special Studies,
Slide 15

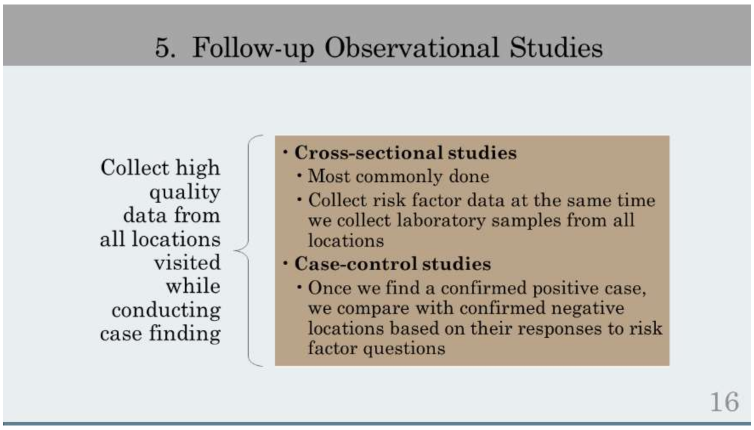
SCRIPT / KEY POINTS:

Animal diseases have potential impacts the following:

- Human health

- Environmental health
- Economic
- Wildlife health

Therefore, it is important to work under a One Health approach with public health, economists, environmental wildlife other specialists driven by the need to understand the biology and epidemiology of the disease.



Lesson 18 – Follow-up Investigations and Special Studies,
Slide 16

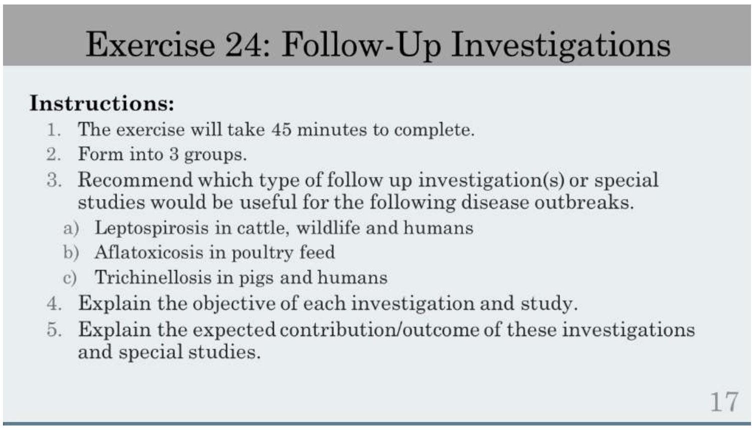
SCRIPT / KEY POINTS:

If you collect the same information from all farms, including known positive and known negative farms, observational studies can be conducted to assess the risk factors contributing to the outbreak.

Cross-sectional and case-control studies can be conducted during and following an epidemic event, respectively.

Both address the hypothesis developed through descriptive analysis and each study has strengths and limitations.

Work with your national epidemiologists to obtain as much knowledge about the outbreak so that together you can calculate risk factors involved in each outbreak.



Lesson 18 – Follow-up Investigations and Special Studies,
Slide 17

SCRIPT / KEY POINTS:

Exercise 24 instructions: Follow-Up Investigations

This exercise will take 45 minutes.

Form into 3 groups.

Recommend which type of follow up investigation(s) or special studies would be useful for the following disease outbreaks.

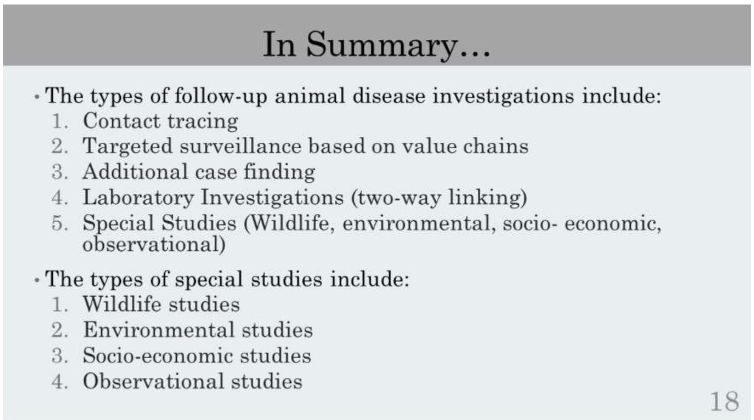
Leptospirosis in cattle, wildlife and humans

Aflatoxicosis in poultry in feed

Trichinellosis in pigs and humans

Explain the objective of each investigation and study.

Explain the expected contribution/outcome of these investigations and special studies.



Lesson 18 – Follow-up Investigations and Special Studies,
Slide 18

SCRIPT / KEY POINTS:

In summary,

- Follow-up investigations and special studies should always be considered under a One Health approach to determining the source and transmission mechanisms for each outbreak;
- The types of follow-up animal disease investigations include: 1) contact tracing; 2) targeted risk-based surveillance; 3) discovery of an earlier outbreak; and 4) follow-up observational studies; and
- The types of special studies include: 1) wildlife studies; 2) environmental studies; and c) socio-economic studies.

Lesson 18 – Follow-up Investigations and Special Studies,
Slide 19

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 24 – Follow-up Field Investigations

Description of Exercise:

This exercise will focus on different types of follow-up investigations and making recommendations for which type of follow-up investigation(s) or special studies should be conducted for various types of disease outbreaks. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 45 minutes

Organisation of Group Work: Form into three groups, one for each disease.

Exercise Objective(s):

1. Recommend which type of follow-up investigation(s) or special studies would be useful for the following disease outbreaks
    - Leptospirosis in cattle and humans
    - Aflatoxicosis in poultry in feed
    - Trichinellosis in pigs and humans
2. Explain the objective of each investigation and study
3. Explain the expected contribution/outcome of these investigations and special studies.
4. Choose a follow up investigation including:
    - Contact tracing investigations forward and tracing backwards
    - Targeted risk-based surveillance at high risk points along the value chain
    - When the timeline for the index case is revised through the discovery of an earlier outbreak
    - Observational studies – cross-sectional and case control
    - Other
5. Choose a special study including:
    - Wildlife studies
    - Environmental studies
    - Socio-economic studies
    - Other

Exercise Components and Structure:

1. Form into three (3) groups, one for each disease.
2 .Create and complete an electronic table for each disease noted above.

Materials, Data or Information:

1. Microsoft Word and PowerPoint

Expected Outputs and Deliverables of Each Participant:

1. Recommendations with justification

1. Using Microsoft Word or PowerPoint, create and complete and electronic table for your specific groups' disease.

The following responses include some suggested investigations and studies.

Group A: Leptospirosis in Cattle and Humans		
Type of Follow Up Investigations	**Objectives**	**Expected Outcomes**
• Contact tracing of positive cattle herds • Animal health and public health case-control study	• Determine the source of recent introductions • Determine exposure risks for cases compared to controls	• Relocate source herds from waterways used by humans • Take appropriate action based on exposure risk factors •
Type of Special Studies	**Objectives**	**Expected Outcomes**
• Wildlife study • Environmental study	• Wildlife study • Environmental study	• Rodent testing in and near homes • Test water sources

Group B: Aflatoxin in Poultry		
Type of Follow Up Investigations	**Objectives**	**Expected Outcomes**
• Toxicological study from affected farms • Value chain study	• Determine the presence of aflatoxin in poultry and feed • Trace along the animal feed value chain	• Remove the toxin source following verification • Isolate and remove the contaminated feed source
Type of Special Studies	**Objectives**	**Expected Outcomes**
• Socio-economic study	• Determine the economic impact to poultry production in the Area	• Take action to monitor feed safety

Group C: Trichinellosis in Pigs and Humans		
Type of Follow Up Investigations	**Objectives**	**Expected Outcomes**
• Risk communication • Enhanced abattoir surveillance	• Raise awareness and educate farmers and consumers • Post-mortem examination of slaughter pigs	• Mitigate risk behaviours and practices

Group C: Trichinellosis in Pigs and Humans		
		• Identification of infected sources and risk mitigation
Type of Special Studies	**Objectives**	**Expected Outcomes**
• KAP study • Cross-sectional study	• Determine the knowledge, attitudes and practices of farmers and consumers • Collect longitudinal samples and data simultaneously to determine risk factors	• Apply risk based mitigation measures based on evidence • Mitigate farm related risk factors

Lesson 19 – Surveillance Situation Assessment for Prevention and Control

Estimated Lesson and Exercise Time	1 hour and 30 minutes
Instructor Materials	Frontline ISAVET Lesson 19 Surveillance Situation Assessment for Prevention and Control.pptx
	Frontline ISAVET Lesson 19 Surveillance Situation Assessment for Prevention and Control Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	Frontline ISAVET Lesson 19 Surveillance Situation Assessment for Prevention and Control Participant.PDF

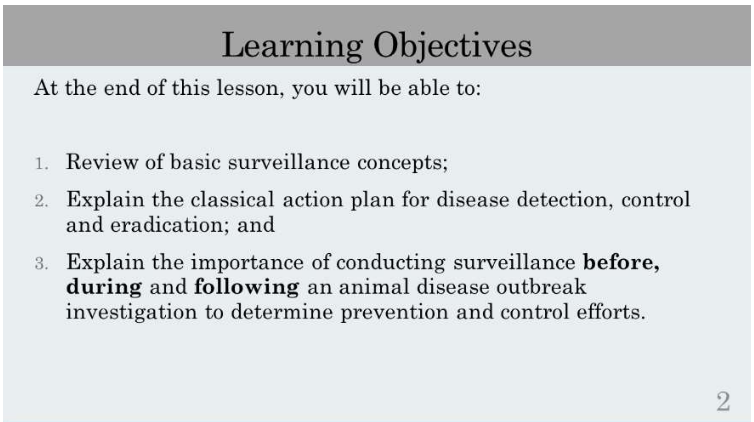
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

AI	Avian Influenza
ASF	African Swine Fever
CCA	Critical Control Area
CSF	Classical Swine Fever
FAO	Food and Agriculture Organization of the United Nations
FMD	Foot-and-Mouth Disease
GEMP	Good Emergency Management Practices
ISAVET	In Service Applied Veterinary Epidemiology Training
OIE	World Organisation of Animal Health
RVF	Rift Valley Fever
SSRT	Surveillance Rapid Response Teams
USDA	United Stated Department of Agriculture

Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 19 titled, “Surveillance Situation Assessment for Prevention and Control”.

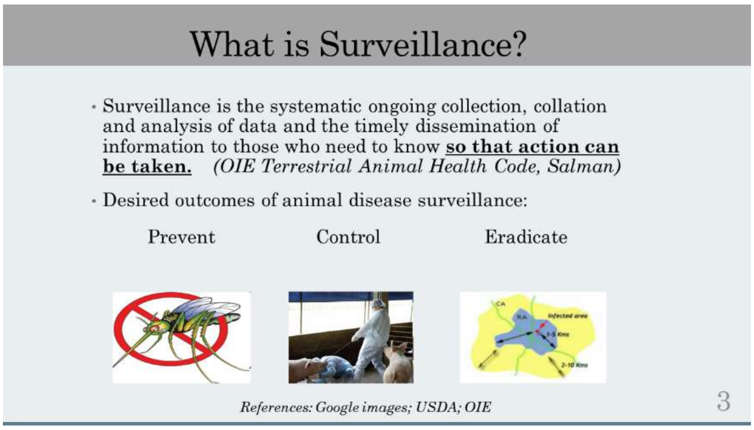


Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 2

SCRIPT / KEY POINTS:

At the end of this lesson, you will be able to:

- Review of basic surveillance concepts;
- Explain the classical action plan for disease detection, control and eradication; and
- Explain the importance of conducting surveillance **before, during** and **following** an animal disease outbreak investigation to determine prevention and control efforts.



Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 3

SCRIPT / KEY POINTS:

Action is the necessary outcome of a functional surveillance system.

Action refers to the measures that are required for the prevention, control and eradication of animal diseases that may affect domestic and wild animals as well as humans.

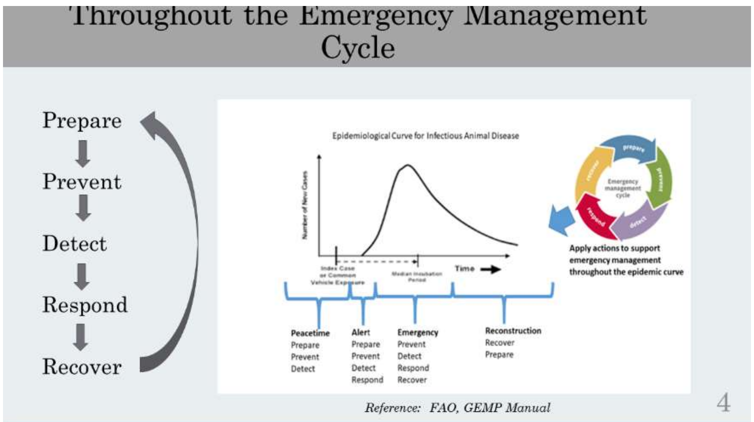
Remember that prevention and control activities can begin from the outset and throughout of an animal disease outbreak investigation.

We will apply surveillance to before, during and after an animal disease outbreak.

Photo 1: Google Images

Photo 2: USDA

Photo 3: OIE



Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 4

SCRIPT / KEY POINTS:

Preparedness is at the heart of the emergency management cycle. Surveillance must be tailored for each phase of the cycle.

GEMP stands for Good Emergency Management Practices (FAO). The GEMP consists of the following cycle: prepare, prevent, detect, respond, and recover.

Prepare:

Preparedness Is fundamental to all of the other elements and this is why it is in the centre of the circle. Developing and practicing (exercising) emergency plans are part of this stage.

Prevent: Having a good set of preventive measures will decrease disease frequency, e.g.

- Import quarantine policy based on import risk analysis
- Control of illegal imports which depends on good border security
- Developing good cross border relationships
- Control of feeding unprocessed meat products (swill)
- Monitors/control on Live animal/bird market systems
- Minimizing unconfined livestock, particularly pigs
- Limiting contact between livestock and wildlife
- Promotion of good on-farm biosecurity

Detect: Involves:

a. Good surveillance
    - Active surveillance in places of high risk.
    - Passive surveillance. Good educational campaigns and awareness of compensation policies will increase the effectiveness of passive surveillance
b. Regular relationships between field VS and livestock traders/farmers
c. Good laboratory diagnostic capabilities. Identifying laboratories that have the capability to confirm test results before an outbreak occurs is important

Respond: Three pillars of disease control

a. Find it Fast
b. Kill it quickly
c. Stop it spreading

Recover: Includes

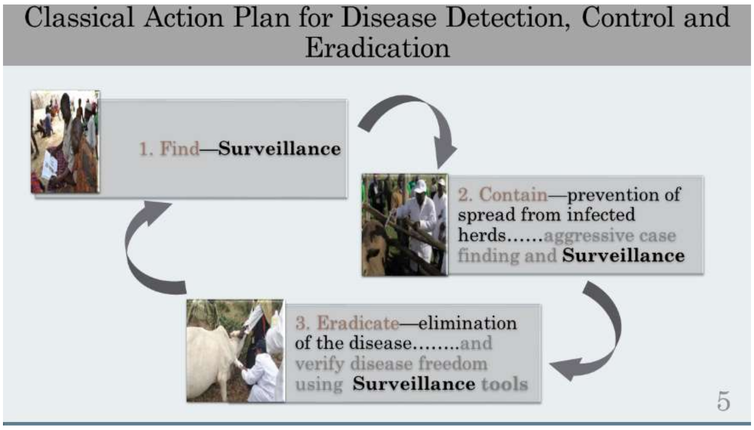
a. Verification of disease freedom
b. Rehabilitation of farming communities
c. Restocking

d. Psychological rehabilitation

e. Providing technical and financial support

f. Staying free of disease

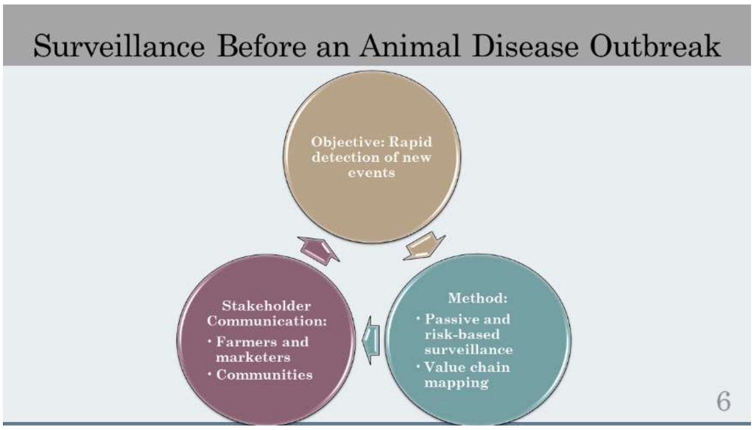
Photo: FAO



Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 5

SCRIPT / KEY POINTS:

A classical action plan for disease control and eradication includes three steps: find, contain, and eradicate. Traditional surveillance measures correspond with the first step. The next step is to contain the diseases. Elimination of the diseases include eradicating it from the population. An example of an eradicated livestock disease is Rinderpest. An eradicated human disease is: Small pox.



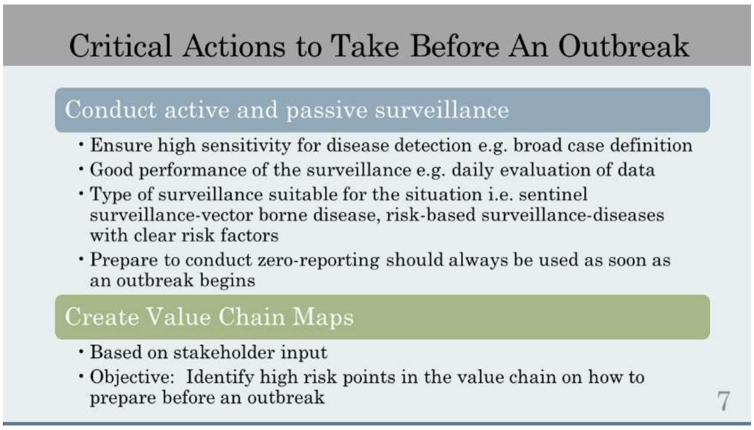
Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 6

SCRIPT / KEY POINTS:

The objective of conducting surveillance before an animal disease outbreak is the rapid detection and reporting of a suspicious disease events. This is only possible if routine and risk based surveillance is conducted in advance of an outbreak.

The case definition for surveillance should be established that includes compatible clinical signs i.e. clinical surveillance.

The stakeholders for early detection and rapid response before an animal outbreak disease outbreak should be consulted including farmers, abattoirs, marketers and communities.

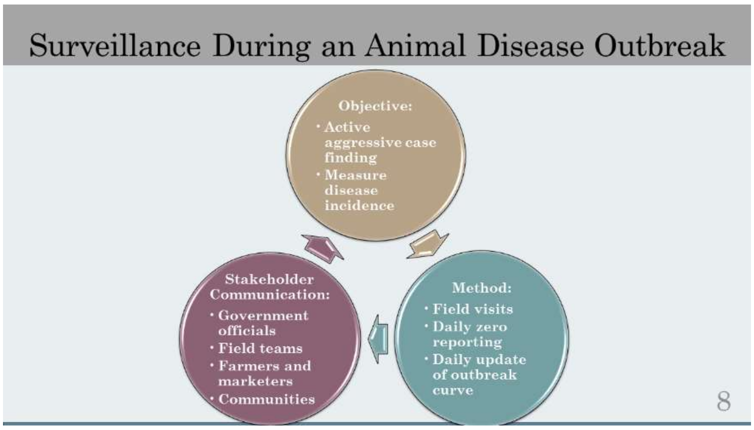


Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 7

SCRIPT / KEY POINTS:

Actions taken include:

- Draw maps of local value chains for each animal production system;
- Remember that disease moves both within zones and through value chains. Target high risk area in the local area as well as high risk nodes in value chains,
- Active and passive syndromic surveillance based on clinical signs at farms, by farmers and local area veterinarians and para-veterinarians;
- Targeted risk based syndromic surveillance of live animal markets and abattoirs in high risk area following risk assessments and value chain information;
- Enhanced sentinel surveillance for vector-borne disease;
- Awareness by educating the farmers/producers/pastoralists
- Risk communication with farmers, trader, marketers and consumers;
- Enhanced routine passive surveillance; and
- Zero reporting during high risk periods when there are epidemiological links to an existing outbreak either within or outside of the country.



Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 8

SCRIPT / KEY POINTS:

The first objective of conducting surveillance during an animal disease outbreak is the rapid detection and reporting of new cases, referred to as “Case finding”.

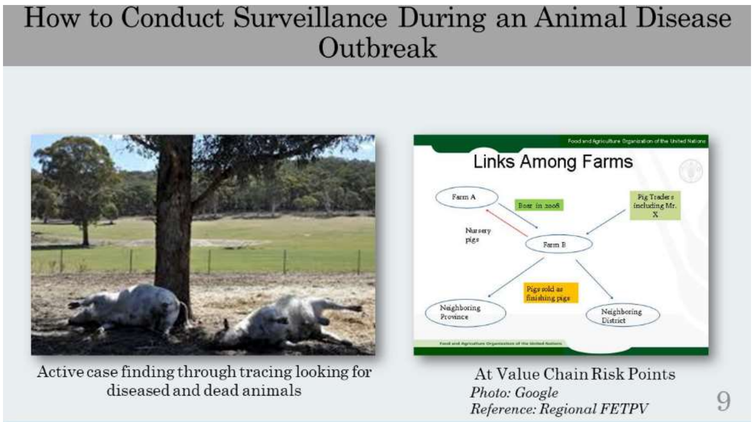
Case finding:

Strategy for targeting resources at animals or herds/flocks that are suspected to be at risk for a particular disease. It involves actively searching systematically for at risk animals before presentation with signs of active disease signs

Case finding is a strategy for targeting resources at individuals or groups who are suspected to be at risk for a particular disease. It involves actively searching systematically for at risk animals door–to-door and farm-to-farm, rather than waiting for them to occur.

The second objective of conducting surveillance during an animal disease outbreak is to estimate the incidence of new cases and the prevalence of the disease over time.

List the main stakeholders in the local area involved in surveillance during an animal disease outbreak.



Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 9

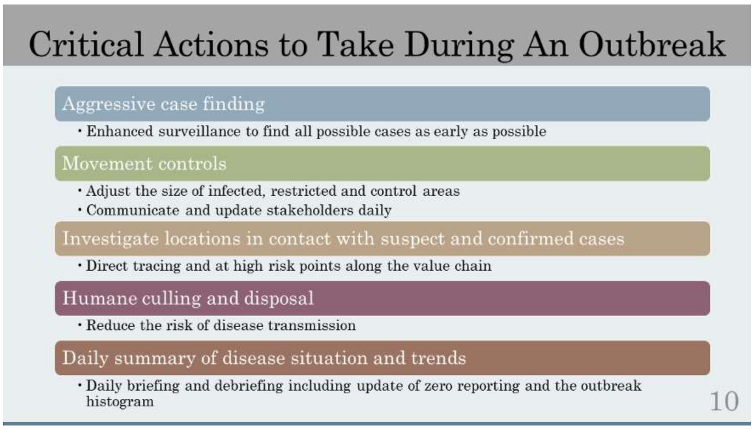
SCRIPT / KEY POINTS:

Surveillance methods used during an animal disease outbreak include:

1. Case finding involves aggressive door-to-door and farm-to-farm investigation and collecting information using a brief questionnaire (zonal approach).
2. Case finding also involves tracing high risk points (Critical Control Area –CCA) along the value chains like live markets to detect and trace the upstream origin and downstream destination of the disease animals (compartmental approach).
3. It is imperative that strict biosecurity protocols are followed to prevent transmission of disease by investigators.
4. Coordination and collaboration with the diagnostic laboratory and public health laboratory (for zoonotic diseases).

Photo 1: Google

Photo 2: Regional FETPV



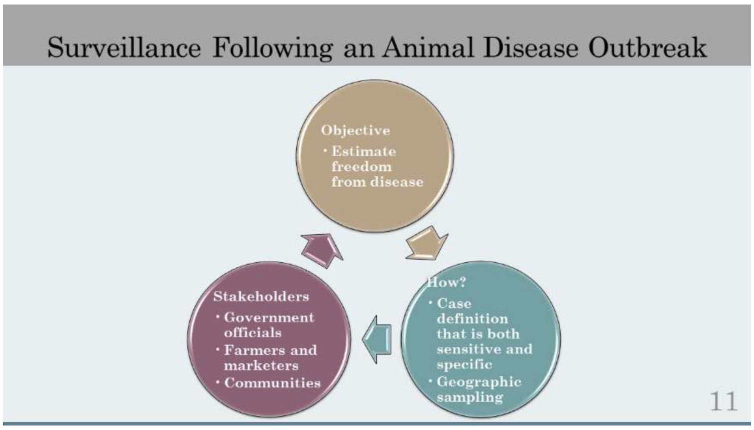
Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 10

SCRIPT / KEY POINTS:

Actions Taken:

- New cases detected result in adjusting the size of the infected area, the restricted area and the control area (zonal approach).
- In addition, surveillance will be required on "dangerous contacts" found by trace-back investigations and at high risk points along the value chain (compartmental approach). Use your local area value chain map to anticipate where the disease may be spreading to based on risks previously identified.
- Institute zero reporting on a daily basis from all sublocal area offices.

- Institute control measures such as humane culling based on actual surveillance findings and avoid mass culling based on arbitrary zonal recommendations.
- Disease trends provide a situation assessment regarding the duration and extent of an outbreak.



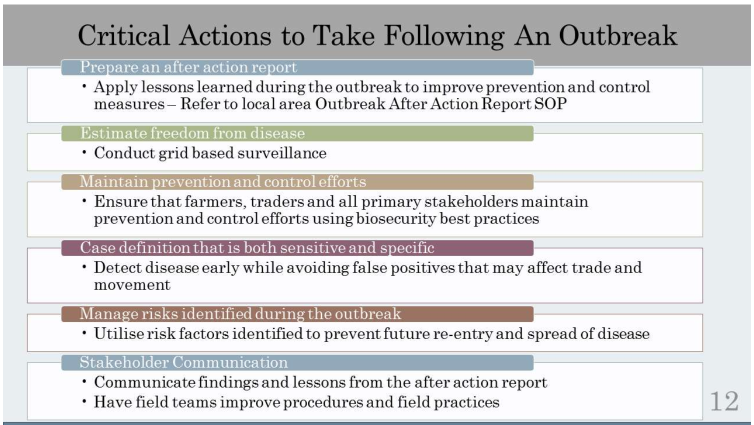
Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 11

SCRIPT / KEY POINTS:

The objective of conducting surveillance following an animal disease outbreak is to estimate freedom from disease.

The case definition for post-outbreak period surveillance should be clearly stated.

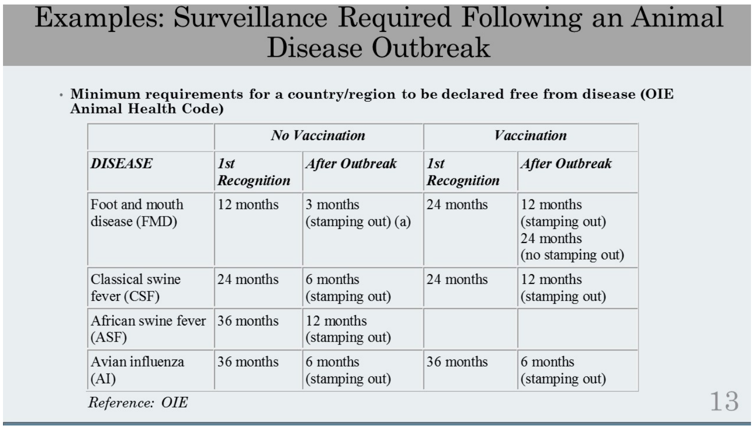
The stakeholders for estimating freedom from the disease should be consulted.



Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 12

SCRIPT / KEY POINTS:

It is critical to learn lessons of what has gone well and what needs to improve to prevent and control future outbreaks. It is very important to engage all stakeholder to discuss these points and prepare a brief after action report for future reference and information sharing with other local area so that they can learn from your experience! Farmers must be engaged so that they can have a hand in shaping the future prevention and control, efforts in the local area – after all, it is the farmers who manage the animals and are on the frontline of every outbreak.



	No Vaccination		*Vaccination*	
DISEASE	*1st Recognition*	*After Outbreak*	*1st Recognition*	*After Outbreak*
Foot and mouth disease (FMD)	12 months	3 months (stamping out) (a)	24 months	12 months (stamping out) 24 months (no stamping out)
Classical swine fever (CSF)	24 months	6 months (stamping out)	24 months	12 months (stamping out)
African swine fever (ASF)	36 months	12 months (stamping out)		
Avian influenza (AI)	36 months	6 months (stamping out)	36 months	6 months (stamping out)

Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 13

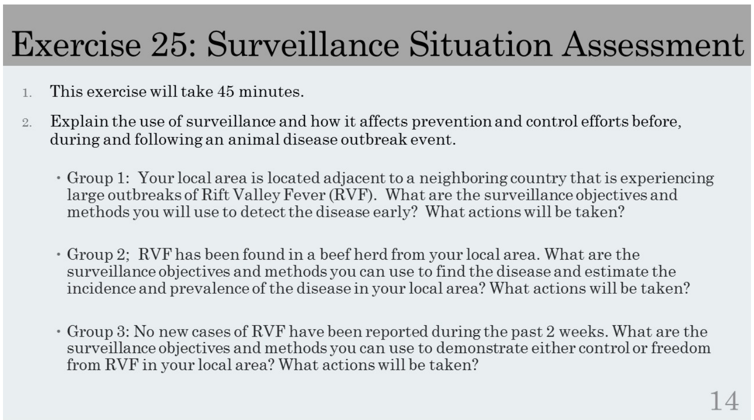
SCRIPT / KEY POINTS:

The methods for conducting surveillance following an animal disease outbreak is to estimate freedom from disease include:

1. Geographic freedom based on statistically based methods.

It is important to consult a national epidemiologist for further information.

Reference: OIE



Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 14

SCRIPT / KEY POINTS:

Exercise 25 instructions: Surveillance Situation Assessment

This exercise will take 45 minutes.

Explain the use of surveillance and how it affects prevention and control efforts before, during and following an animal disease outbreak event..

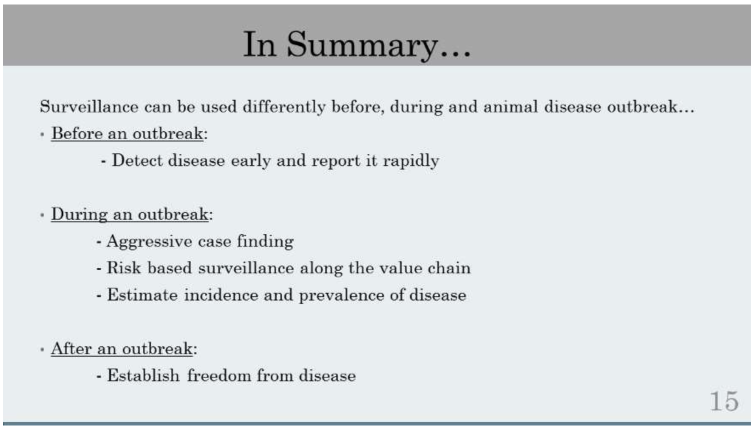
Group 1: Your local area is located adjacent to a neighboring country that is experiencing large outbreaks of Rift Valley Fever (RVF). What are the surveillance objectives and methods you will use to detect the disease early? What actions will be taken?

Group 2: RVF has been found in a beef herd from your local area. What are the surveillance objectives and methods you can use to find the disease and estimate the incidence and prevalence of the disease in your local area? What actions will be taken?

Group 3: No new cases of RVF have been reported during the past 2 weeks. What are the surveillance objectives and methods you can use to demonstrate either control or freedom from RVF in your local area? What actions will be taken?

Instructors:

See instructor guide for answers.



Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 15

SCRIPT / KEY POINTS:

Surveillance can be used differently before, during and animal disease outbreak…

<u>Before an outbreak</u>:

- Early detection and rapid reporting of a new disease;

<u>During an outbreak</u>:

- Aggressive case finding;
- Estimate incidence and prevalence of disease; and

After an outbreak:

- Establish freedom from disease.

Lesson 19 – Surveillance Situation Assessment for Prevention and Control, Slide 16

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 25 - Surveillance Situation Assessment

Description of Exercise:

Explain the use of surveillance and how it affects prevention and control efforts before, during and following an animal disease outbreak event. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Time: 45 minutes

Organisation of Group Work:

- Work in three groups for this exercise, one per each scenario.

Exercise Objective(s):

1. Explain the surveillance objectives in the scenario
2. Explain the methods that can be used to find disease in the scenario
3. Explain what actions that will be taken in each scenario

Exercise Components and Structure:

1. Form into three groups, one for each scenario
2. Answer the questions for each scenario

Explain the use of surveillance and how it affects prevention and control efforts before, during and following an animal disease outbreak event.

Materials, Data or Information:

1. MS Word
2. Paper and pen

Expected Outputs and Deliverables of Each Participant:

1. Surveillance objectives, methods of case findings and recommended actions for control and prevention.

2. Use Microsoft word or power point to record your responses

Scenario 1: Your local area is located adjacent to a neighboring country that is experiencing large outbreaks of Rift Valley Fever (RVF).

a.) What are the surveillance objectives and methods you will use to detect the disease early?

- Objective: Detect the disease early
- Methods:
  - Use a sensitive case definition
  - Use routine and risk based active and passive surveillance based on value chain information

b.) What actions will be taken?

- Institute zero reporting to make sure that cases are not missed
- Train all personnel to be able to recognize the clinical signs
- Work with farmers to be a part of the surveillance team
- Utilise sentinel farms as an early warning system

Scenario 2: RVF has been found in a beef herd from your local area.

a.) What are the surveillance objectives and methods you can use to find the disease and estimate the incidence and prevalence of the disease in your local area?

- Objectives:
  - Active aggressive case finding
  - Measure disease incidence
- Daily zero reporting
- Daily update of outbreak curve and spot map to measure spatial and temporal trends

b.) What actions will be taken?

Work with these partners to detect and respond to new cases early

- Government officials
- Farmers and marketers
- Communities
- Actions:
  - Movement controls
  - Adjust the size of infected, restricted and control Area
  - Investigate locations in contact with suspect and confirmed cases
  - Direct tracing and at high risk points along the value chain
  - Humane culling and disposal
  - Reduce the risk of disease transmission
  - Zero reporting

- Enhanced surveillance to find all possible cases
- Daily summary of disease situation and trends
- Daily briefing and debriefing

Scenario 3: No new cases of RVF have been reported during the past 2 weeks.

a.) What are the surveillance objectives and methods you can use to demonstrate either control or freedom from RVF in your local area?

- Objective: Estimate freedom from Disease
- Method:
  - Establish a case definition that is both sensitive and specific
  - Geographic based surveillance is needed to estimate the probability of being free

b.) What actions will be taken?

- When it is difficult to estimate the total population at risk, we use geographic methods by creating a grid-based surveillance approach
- Consult a national epidemiologist to determine how many samples required for each grid to estimate disease freedom

Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control

Estimated Lesson and Exercise Time	1 hour and 30 minutes
Instructor Materials	ISAVET Lesson 20 Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control.pptx
	ISAVET Lesson 20 Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 20 Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control Participant Guide.PDF

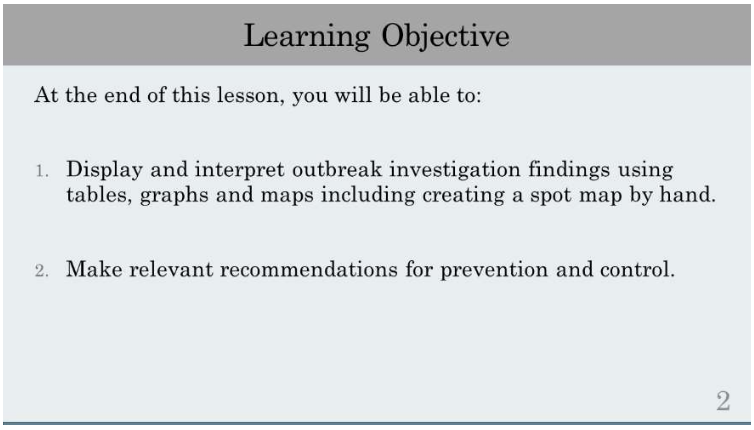
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

ISAVET	In Service Applied Veterinary Epidemiology Training

Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 20 titled, “Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control”.

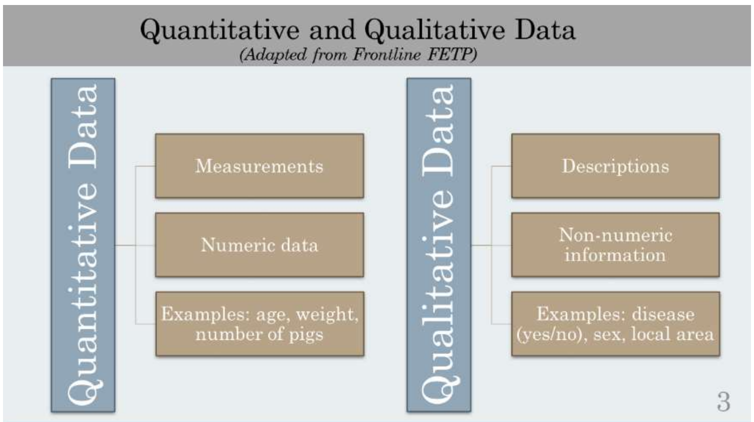


Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

1. Display outbreak investigation findings using tables, graphs and maps including creating a spot map by hand; and
2. Make relevant recommendations for prevention and control.



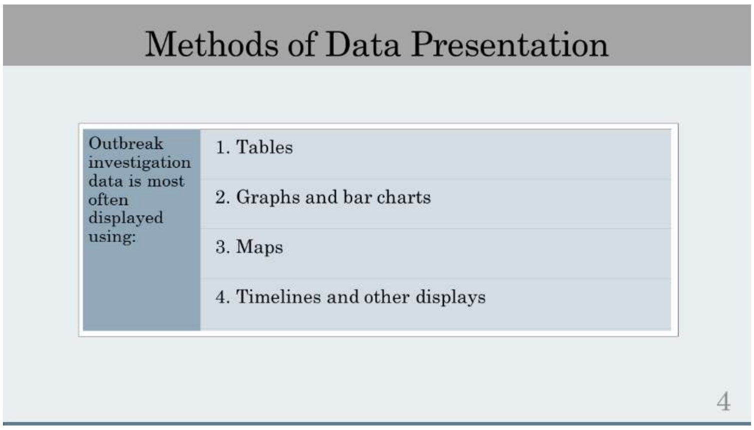
Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 3

SCRIPT / KEY POINTS:

When displaying the number of occurrences, qualitative and quantitative variables are presented in different ways. The following slide illustrates the type of variable and the type of data presentation that can be utilised to best describe the data. This includes:

- Qualitative (Categorical): Nominal, ordinal, and binary data are presented using charts or tables. This includes bar graphs, pie charts, and tables.
- Quantitative: Discrete and continuous data are presented using graphs or tables. This includes histograms, line graphs, or tables.

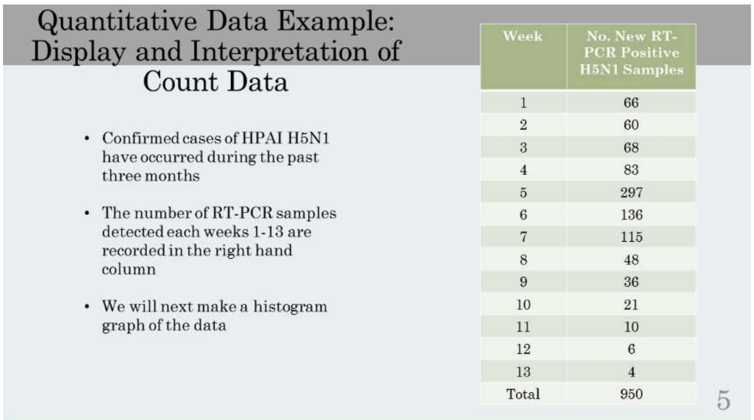
Reference: Frontline FETP



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 4

SCRIPT / KEY POINTS:

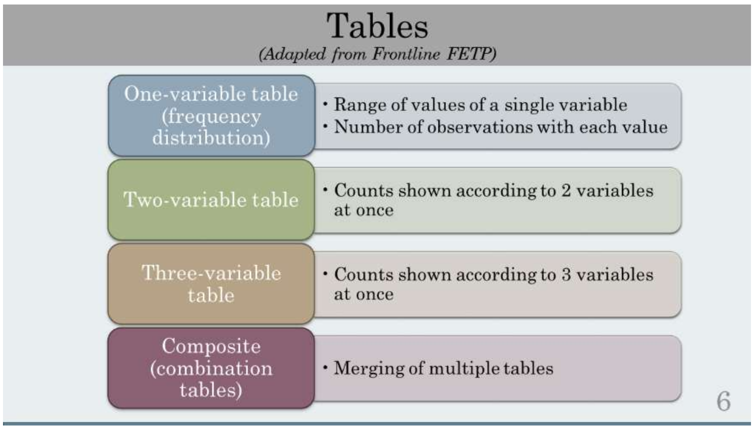
Like surveillance data, outbreak investigation data can be presented in tables, graphs, bar charts, and maps.



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 5

SCRIPT / KEY POINTS:

Read slide.



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 6

SCRIPT / KEY POINTS:

It is best to always start your data analysis by building tables first. Tables can be presented in multiple ways.

In some instances, tables are better than graphs for displaying data. Tables are used for both qualitative and quantitative variables. Tables should be designed to stand alone. You should not have to refer to a corresponding text in order to understand the variables, measurements, etc. The advantages of using tables and graphs to organise data include easy visualisation of statistics, poignant descriptions of data, and the provision of a summary of the overall work.

Reference: Frontline FETP

Example: One Variable Table of Brucellosis Prevalence at Sublocal area Level (Quantitative)

Sublocal area	Prevalence
B	33%
Kam	33%
Kat	25%
Kik	31%
L	7%
M	32%
Total	**26%**

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Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 7

SCRIPT / KEY POINTS:

Read slide.

Example: Two Variable Table of Frequency of Animal Purchases at Sublocal area Level (Quantitative)

Purchase of new animals in selected sub-counties

Sublocal area	Rarely	Sometimes
B	3%	3%
Kam	13%	7%
Kat	17%	3%
Kik	7%	3%
L	17%	3%
M	20%	0%
Total	**77%**	**20%**

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Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 8

SCRIPT / KEY POINTS:

Read slide.

Example: Two Variable Table of Frequency of Animal Purchases at Sublocal area Level (Qualitative)

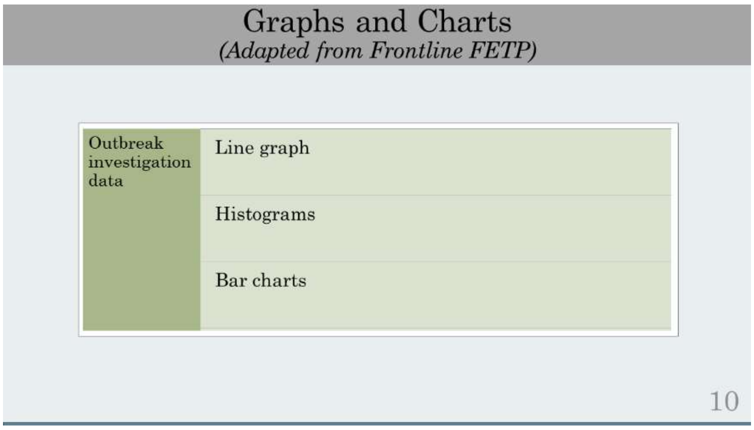
farmref_no	purch_freq	milk_how	wash_when
37	1	2	1
25	1	2	1
22	1	2	1
31	2	2	1
24	2	2	1
23	1	2	0

9

Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 9

SCRIPT / KEY POINTS:

Read slide.



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 10

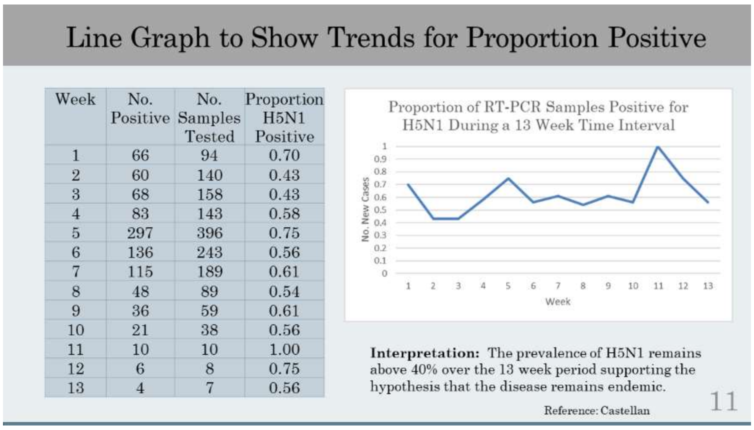
SCRIPT / KEY POINTS:

Graphs and charts are also used to describe the magnitude of an outbreak. This can be done through showing trends from a line graph, cases on a histogram or comparing qualitative data from a bar chart.

Line graphs display a change in direction, while bar graphs display a change in magnitude. Line graphs are used to display the comparison between two variables which are plotted on the horizontal x- and vertical y-axis of a grid. The x-axis usually represents measures of time, while the y-axis usually represents percentage or measures of quantity. Therefore, line graphs are commonly used as time series graphs that show differences in direction.

Histograms are generally used to show the number of reported cases of a disease over a specific time period, most often plotted from onset of disease. Qualitative data, such as countries, should be displayed in a bar graph rather than a histogram. Remember histograms are used for quantitative variables.

Reference: Frontline FETP



Week	No. Positive	No. Samples Tested	Proportion H5N1 Positive
1	66	94	0.70
2	60	140	0.43
3	68	158	0.43
4	83	143	0.58
5	297	396	0.75
6	136	243	0.56
7	115	189	0.61
8	48	89	0.54
9	36	59	0.61
10	21	38	0.56
11	10	10	1.00
12	6	8	0.75
13	4	7	0.56

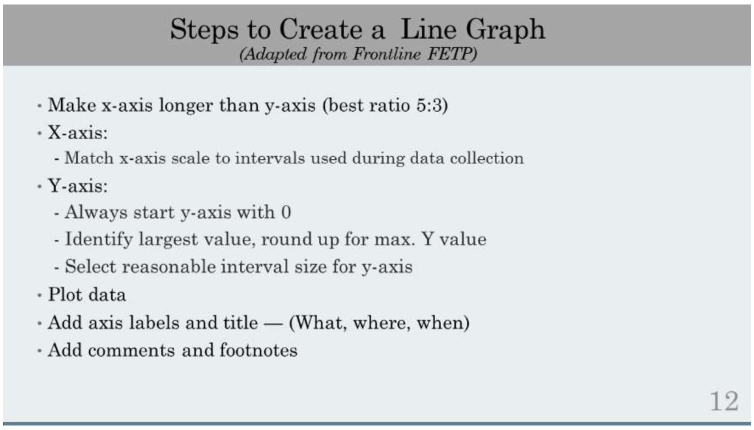
Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 11

SCRIPT / KEY POINTS:

The line graph shows us that when we divide the number of positive samples by the total number of samples tested each week, the weekly prevalence remains high.

The disease appears to be endemic. When we compare the number of positive samples to the total number of passive samples received, then we can better understand the situation and our limitations much better.

Reference: Castellan



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 12

SCRIPT / KEY POINTS:

The following slides illustrates each step in creating a line graph.

Step 1: Make x-axis longer than y-axis. This is done because you are plotting information over time.

Step 2: Ensure that the x-axis intervals are in correspondence with data collection methods (e.g., daily, weekly, monthly data collection).

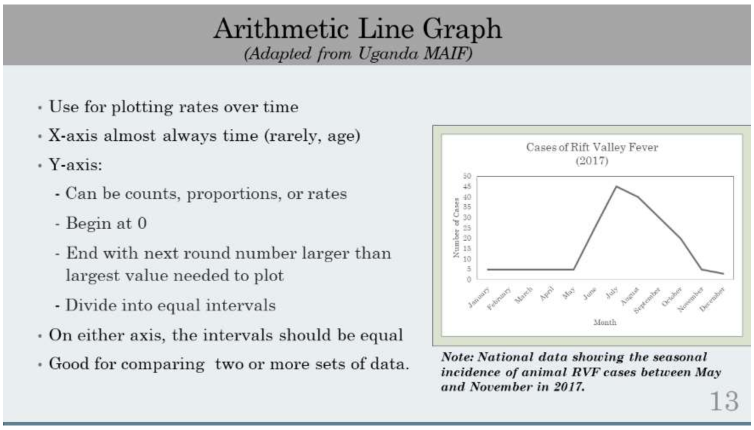
Step 3: The y-axis should always begin at 0. Determine the largest value from the data collected and round up to obtain the top of the axis.

Step 4: Plot the data.

Step 5: Add a horizontal and vertical axis label. The horizontal axis usually indicates a time period. The vertical axis states the number of cases.

Step 6: Include footnotes, where appropriate.

Reference: Frontline FETP

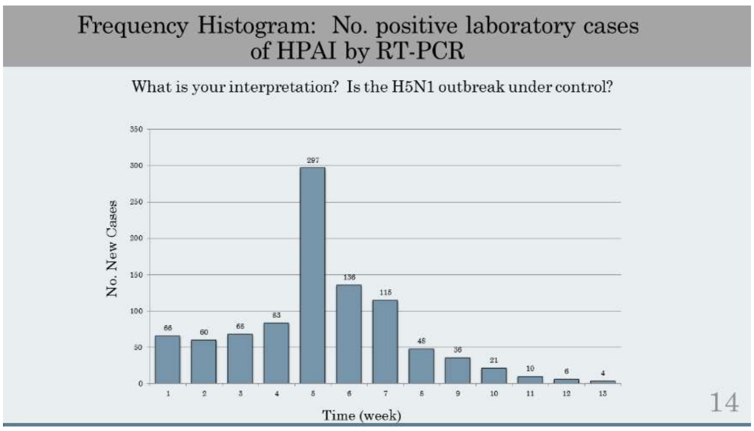


Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 13

SCRIPT / KEY POINTS:

Line graphs can be used for plotting rates over time. In epidemiology, your line graph is always time for the X axis. The Y axis is case counts, rates, proportions or prevalence. Make sure the axis is equal for both intervals. Line graphs are best used for comparing two or more datasets.

Reference: Uganda MAIF

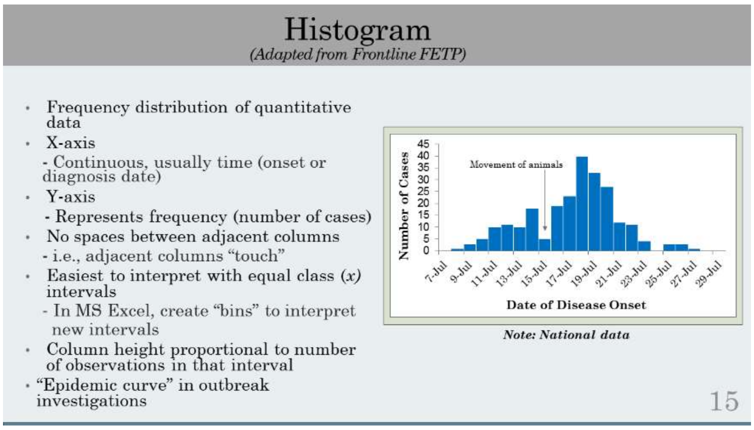


Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 14

SCRIPT / KEY POINTS:

It appears that the number of cases from a laboratory is decreasing over time.

Case counts of confirmed H5N1 from a national laboratory are presented in the graph over time. The following group exercise explores how simply counting cases can be misleading and that we must compare counts to some baseline measure in order to derive meaning from the counts.



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 15

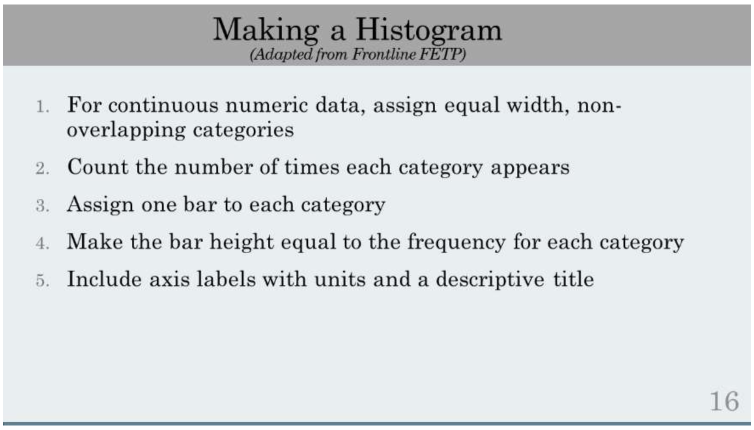
SCRIPT / KEY POINTS:

A histogram is a frequency distribution of quantitative day. Histograms are generally used to show the number of reported cases of a disease over a specific time period, most often plotted from onset of disease.

Epidemiologic curves are histograms that show the frequency of cases over time. They are fundamental tools of an outbreak investigation.

Important events can be added to the outbreak histogram to emphasise key risks or events that were found.

Reference: Frontline FETP



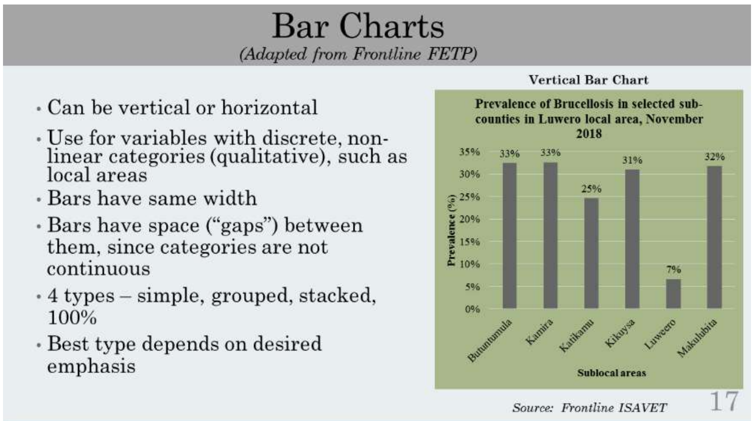
Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 16

SCRIPT / KEY POINTS:

To make a histogram:

- With continuous variable, determine non-overlapping categories (i.e., 0-1 years, 2-5 years and 6-9 years).
- In Excel use the filter function to count the number of times each category appears.
- Assign one bar or a "bin" to each category.
- Make the bar height equal to each category.
- Include axis labels with units and a descriptive title.

  Reference: Frontline FETP



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 17

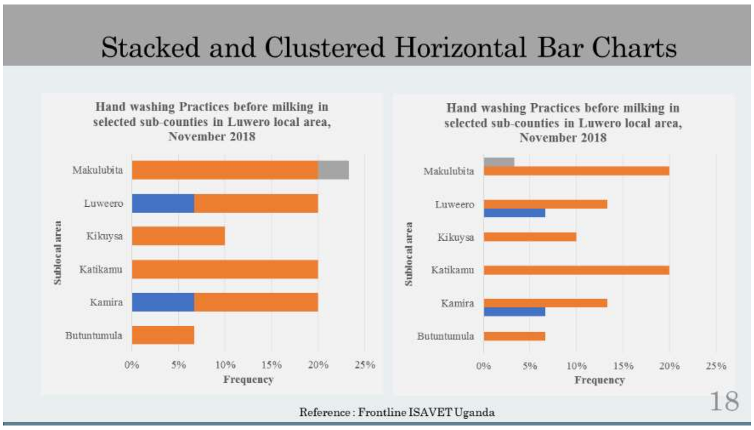
SCRIPT / KEY POINTS:

This is an example of a simple bar chart. Qualitative data, such as countries, should be displayed in a bar graph rather than a histogram. Remember histograms are used for quantitative variables.

Bar charts are used to present and compare data. There are two main types of bar graphs: horizontal and vertical. They are easy to understand, because they consist of rectangular bars that differ in height or length according to their value or frequency. Bar charts display a change in magnitude, and not in direction like line graphs.

A horizontal bar chart consists of an x-axis, and a vertical bar graph consists of a y-axis. The numbers on the axes are known as the scales. Each bar is represents a numeric or categorical variable. Vertical bar charts are off the y-axis.

Reference: Frontline FETP, Frontline ISAVET

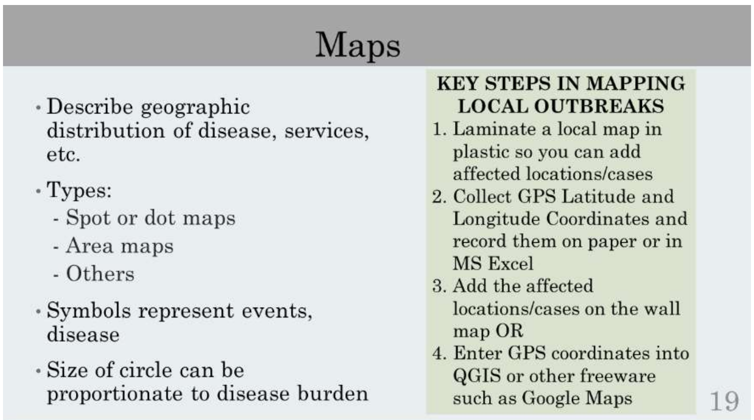


Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 18

SCRIPT / KEY POINTS:

Read slide.

Reference: Frontline ISAVET Uganda



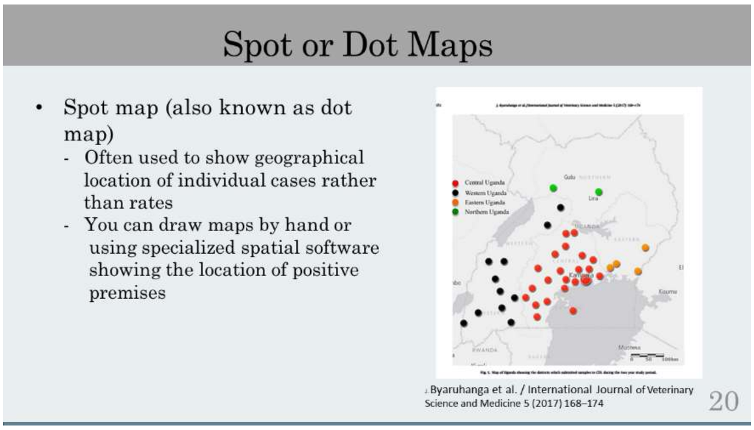
Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 19

SCRIPT / KEY POINTS:

Maps are very powerful tools that are used to:

- Summarise spatial distribution of positive disease cases
- Clearly shows likely disease clusters
- Can be used in conjunction with value chain maps to correlate high risk points along the value chain
- Communicate spatial and temporal information about the progression of a disease outbreak through animation
- Provide real time updates on the geographic extent of disease outbreaks

Examples of these types of maps are presented in the following slides.

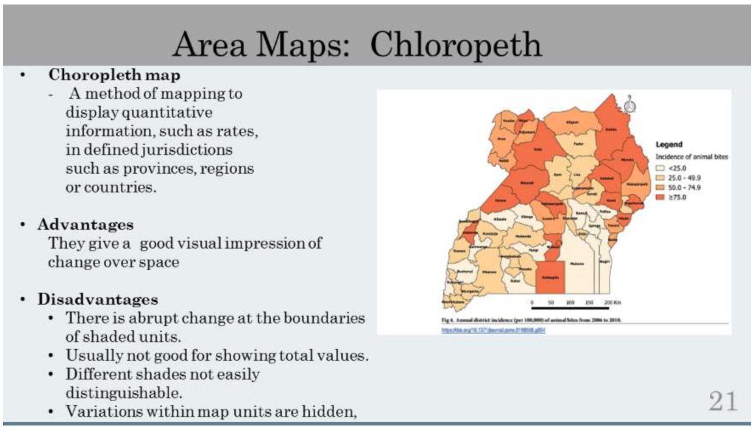


Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 20

SCRIPT / KEY POINTS:

In this typical spot map, the color dots are used to show the number of cases by region rather than rates.

Reference: J. Byaruhanga et al. / International Journal of Veterinary Science and Medicine 5 (2017) 168–174



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 21

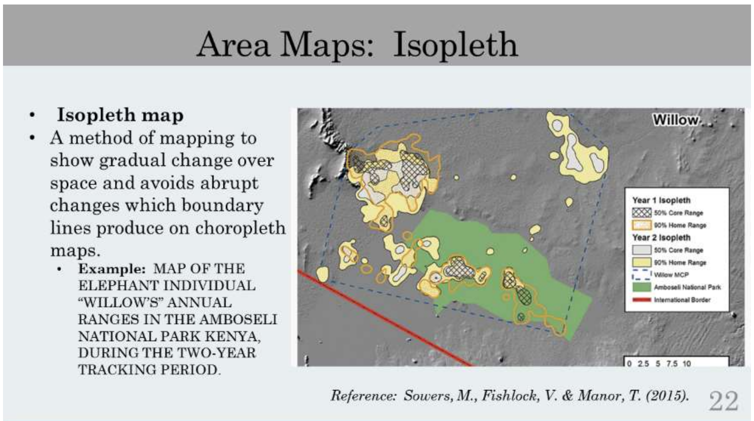
SCRIPT / KEY POINTS:

Advantages: They give a good visual impression of change over space

Disadvantages

- They give a false impression of abrupt change at the boundaries of shaded units.
- Often not suitable for showing total values. Proportional symbols overlays are one solution to this problem (pie charts)
- It can be difficult to distinguish between different shades.
- Variations within map units are hidden, and for this reason smaller units are better than large ones.

Reference:



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 22

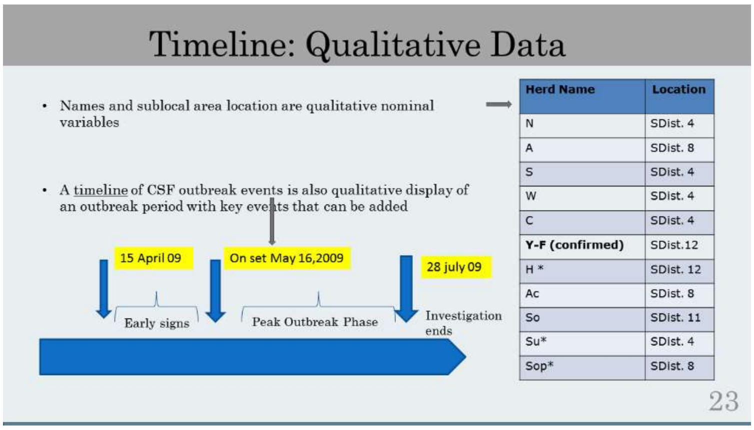
SCRIPT / KEY POINTS:

Isopleth map shows gradual change over space and avoids the abrupt changes which boundary lines produce on choropleth maps.

Temperature is good for this case since temperature exists at every point (is continuous), yet does not change abruptly at any point (like population density may do as you cross into another census zone).

Relief maps should always be in isopleth form for this reason.

Reference: Sowers, M., Fishlock, V. & Manor, T. (2015). Mapping a future for Kenya's Amboseli elephants. Available online: http://www.esri.com/esri-news/arcnews/summer15articles/mapping-a-future-for-kenyas-amboseli-elephants.

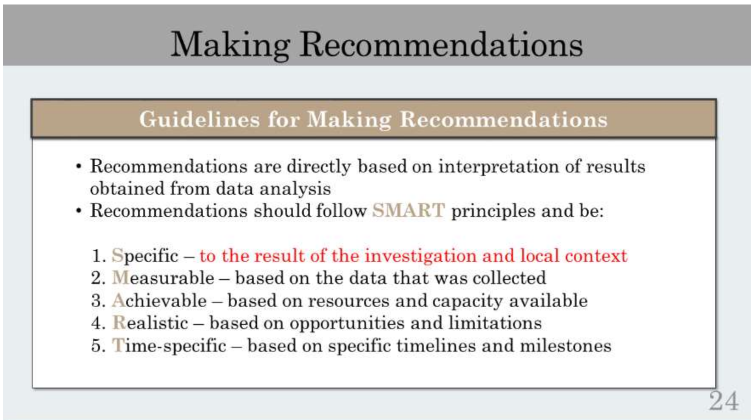


Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 23

SCRIPT / KEY POINTS:

Qualitative data includes variables such as:

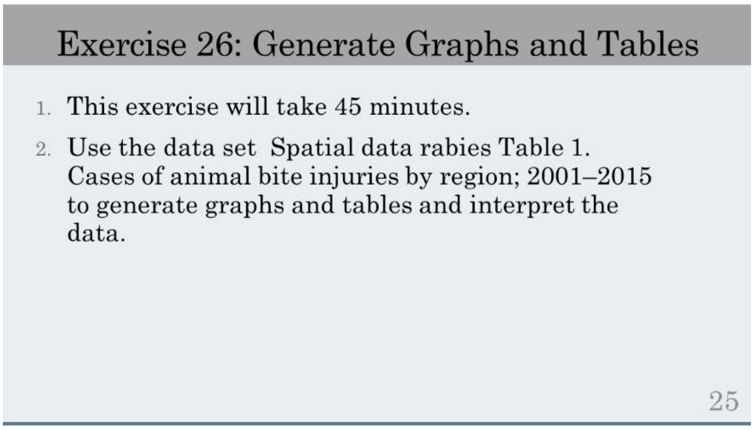
- names,
- Area,
- sex (male/female) and
- responses such as yes/no



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 24

SCRIPT / KEY POINTS:

Recommendations should follow SMART principles.



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 25

SCRIPT / KEY POINTS:

Exercise 26 instructions: Generate Graphs and Tables

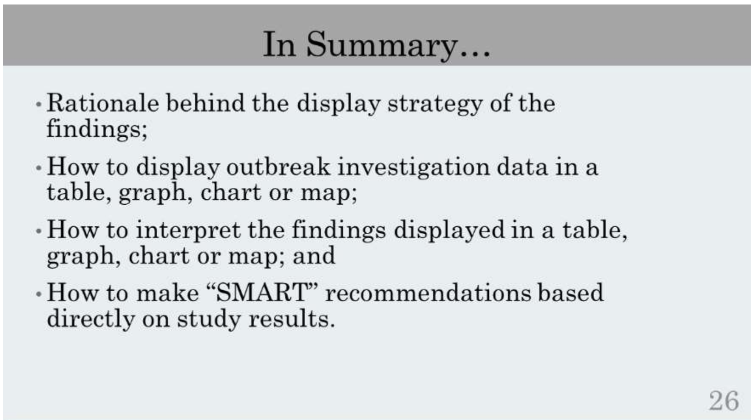
This exercise will take 45 minutes.

Use the data set Spatial data rabies Table 1. Cases of animal bite injuries by region; 2001–2015 to generate graphs and tables and interpret the data; and

Display data to be provided using tables, graphs and maps.

Instructors:

See instructor guide for answers.



Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 26

SCRIPT / KEY POINTS:

In summary,

- Rationale behind the display strategy of the findings;
- How to display outbreak investigation data in a table, graph, chart or map;
- How to interpret the findings displayed in a table, graph, chart or map; and
- How to make "SMART" recommendations.

Lesson 20 – Display Outbreak Investigation Findings and Make Relevant Recommendations for Prevention and Control, Slide 27

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 26 – Generate Tables and Graphs

Description of Exercise:

From the dataset, display findings and make relevant recommendation for prevention and control. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 45 minutes

Organisation of Group Work:

- Work in pairs of three.

Exercise Objective(s):

1. Display data to be provided.

Exercise Components and Structure:

1. Use the data set Spatial data rabies Table 1. Cases of animal bite injuries by region; 2001–2015 to generate graphs and tables and interpret the data.

Materials, Data or Information:

1. Microsoft PowerPoint
2. Microsoft Excel

Expected Outputs and Deliverables of Each Participant:

1. Generate tables, graphs and maps.

INSTRUCTOR COMMENTS:

- **Review variables of dataset with the group from the data dictionary provided for the dataset.**
- **Divide the class into four sections. Use one lead trainer to go through the exercise. Do not move forward to the next part of the exercise until all participants have completed each section.**

Instructions

1. Open the spreadsheet titled, "X". Review the variables in the data dictionary. Rotate the time lines to the left side of the table.

Solution to Number1:

		Regions		
Year	Central	Eastern	Western	Northern
2000-2001	1330	1601	953	1049
2001-2002	2194	2055	1392	1964
2002-2003	2601	2487	1958	3126
2003-2004	2963	2607	2947	3188
2004-2005	3296	2958	3272	3092
2005-2006	4381	2750	3105	3320
2006-2007	4341	3672	3411	3896
2007-2008	4725	3631	3434	4544
2008-2009	4175	4148	3923	4641
2009-2010	4633	4519	4269	4097
2010-2011	4684	3078	3683	4213
2011-2012	4008	3581	3954	4743
2012-2013	4230	2819	3778	4031
2013-2014	5030	3710	4059	5274
2014 -2015	4661	3126	4206	5204

INSTRUCTOR COMMENT:

- Do not move forward to the next section until all participants have rotated timelines in their spreadsheets.

2. Describe the measures of central tendency (Mean, Median, Mode, Range, Minimum and Maximum) for each region in the dataset.

INSTRUCTOR COMMENT

- In MS Excel, there are two ways which this can be done. Trainees can use the Fx function for each measure of central tendency or they can download the analysis toolpak to calculate these.
- Determine in advance which variables will be used to calculate the measures of central tendency

Using the Fx function:

- Mean Fx =AVERAGE(Cell:Cell)
- Median Fx =MEDIAN(Cell:Cell)
- Mode Fx =MODE(Cell:Cell)
- Range Ex =MAX(Cell:Cell)-MIN(Cell:Cell)
- Minimum Fx = MIN(Cell:Cell)
- Maximum Fx = Max (Cell:Cell)

Solution to number 2

Measures of central tendency for the regions – Note the solution used the Analysis Toolpak to obtain the answer rather than the Fx function.

	Central	Eastern	Western	Northern
Mean	3816.8	3116.133	3222.933	3758.8
Standard Error	281.5967	201.2011	263.5051	301.4981
Median	4230	3078	3434	4031
Mode	#N/A	#N/A	#N/A	#N/A
Standard Deviation	1090.619	779.2485	1020.551	1167.697
Sample Variance	1189451	607228.3	1041524	1363517
Kurtosis	0.312982	-0.15366	0.651834	0.747517
Skewness	-1.10762	-0.1142	-1.2548	-0.91746
Range	3700	2918	3316	4225
Minimum	1330	1601	953	1049
Maximum	5030	4519	4269	5274
Sum	57252	46742	48344	56382
Count	15	15	15	15

-

3. Display the following:

Line graphs

a) Line graph for the central region
b) Add the rest of the regions to the graph. Use mean values of each region to plot the graph

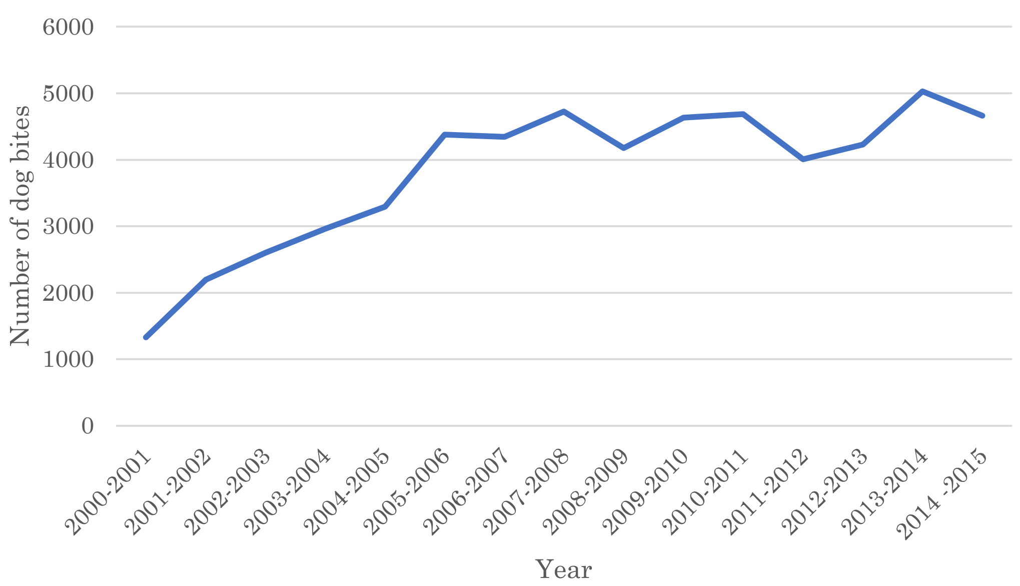
Bar graph

a) Plot a bar graph for the central region
b) Add the rest of the regions to the graph (simple, grouped, stacked_

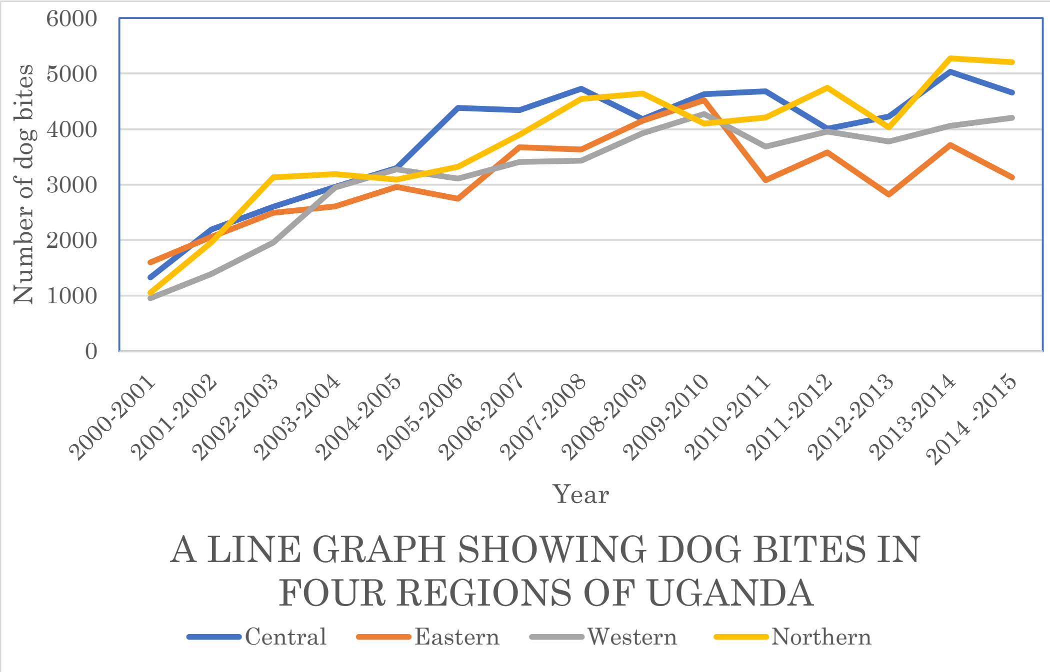
Pie charts

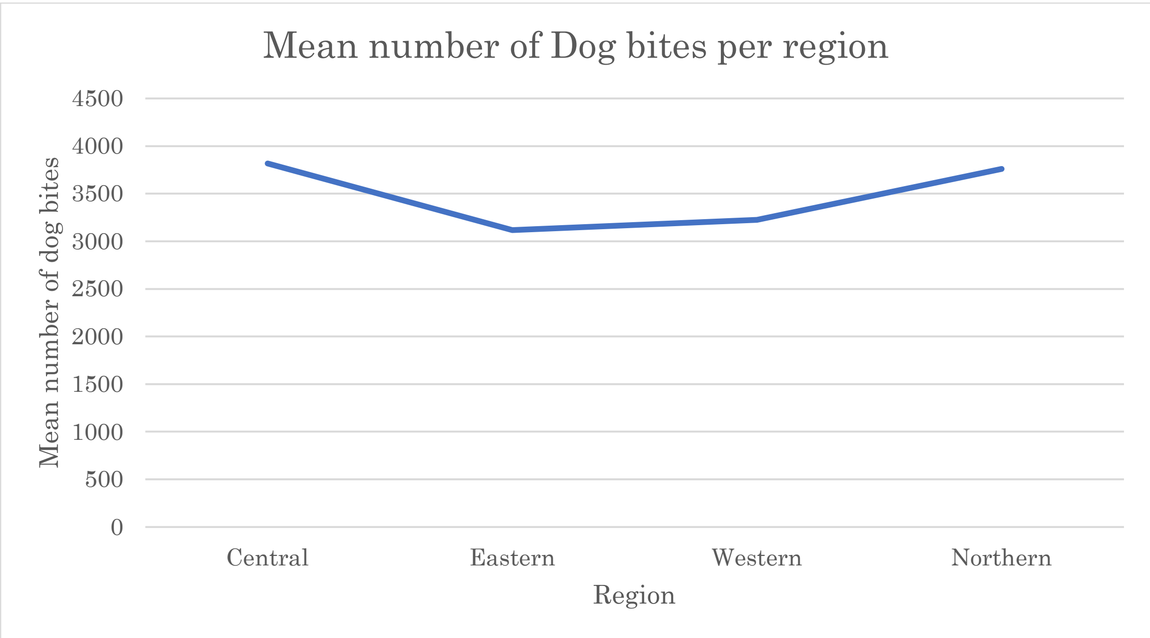
a. Compare the total number of dog bites per region using pie charts

Solution to Number 3:

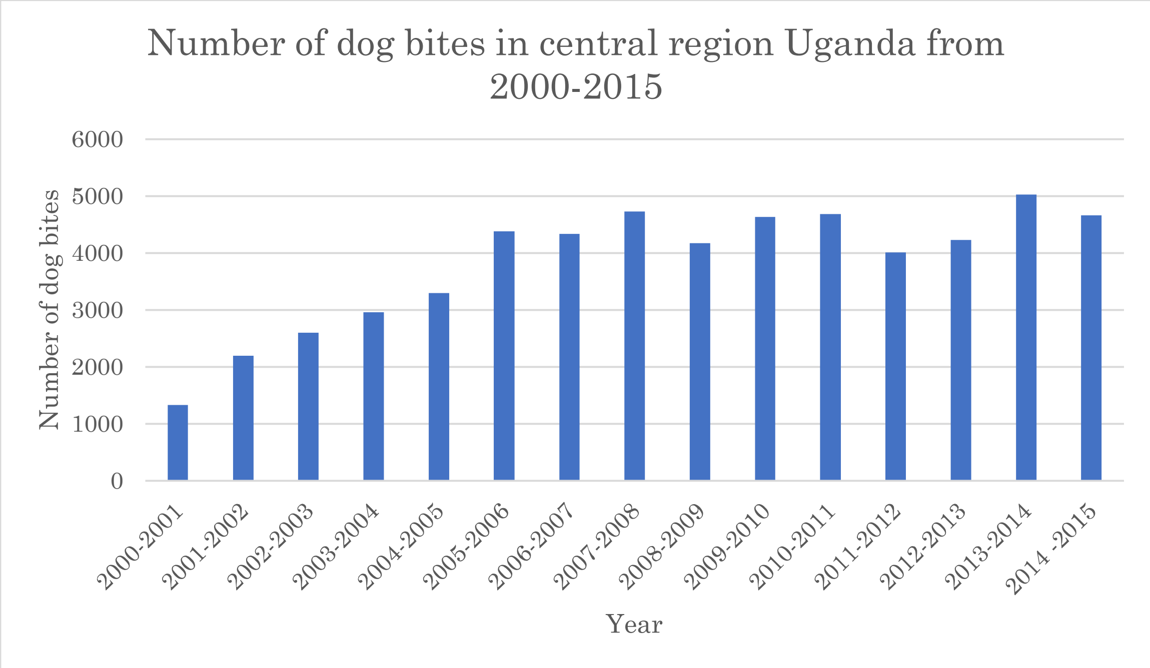


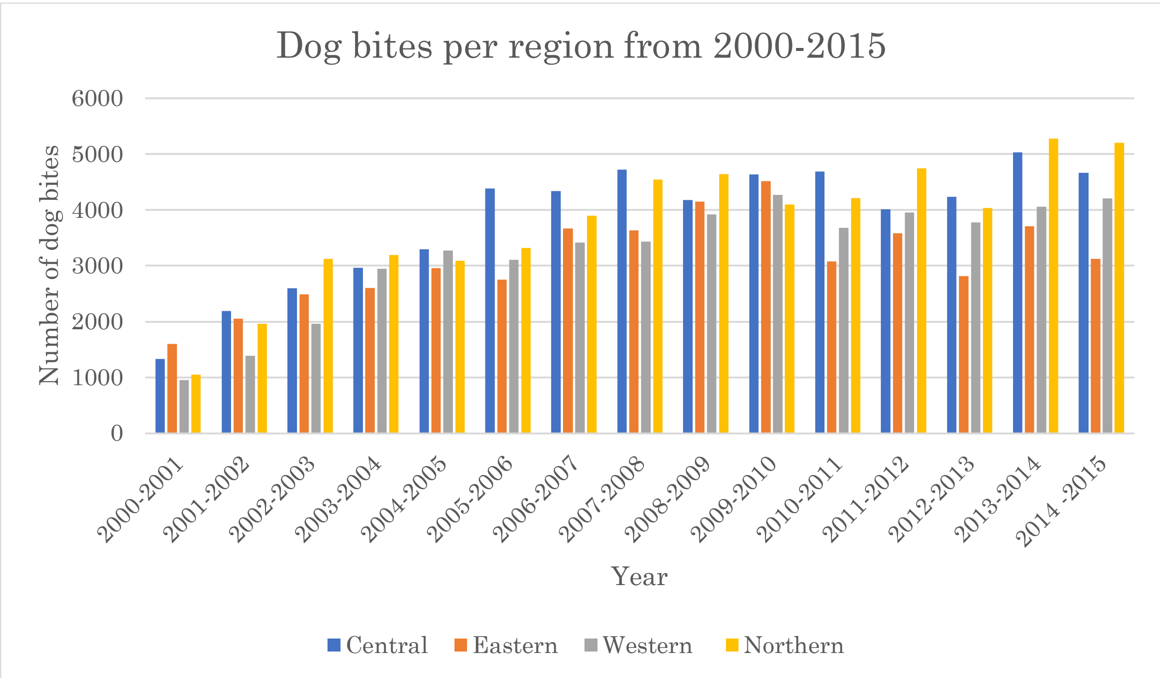
A line graph showing number of dog bites in central region Uganda


6000
5000
4000
3000
2000
1000
0
Number of dog bites
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014 -2015
Year
A LINE GRAPH SHOWING DOG BITES IN FOUR REGIONS OF UGANDA
Central
Eastern
Western
Northern

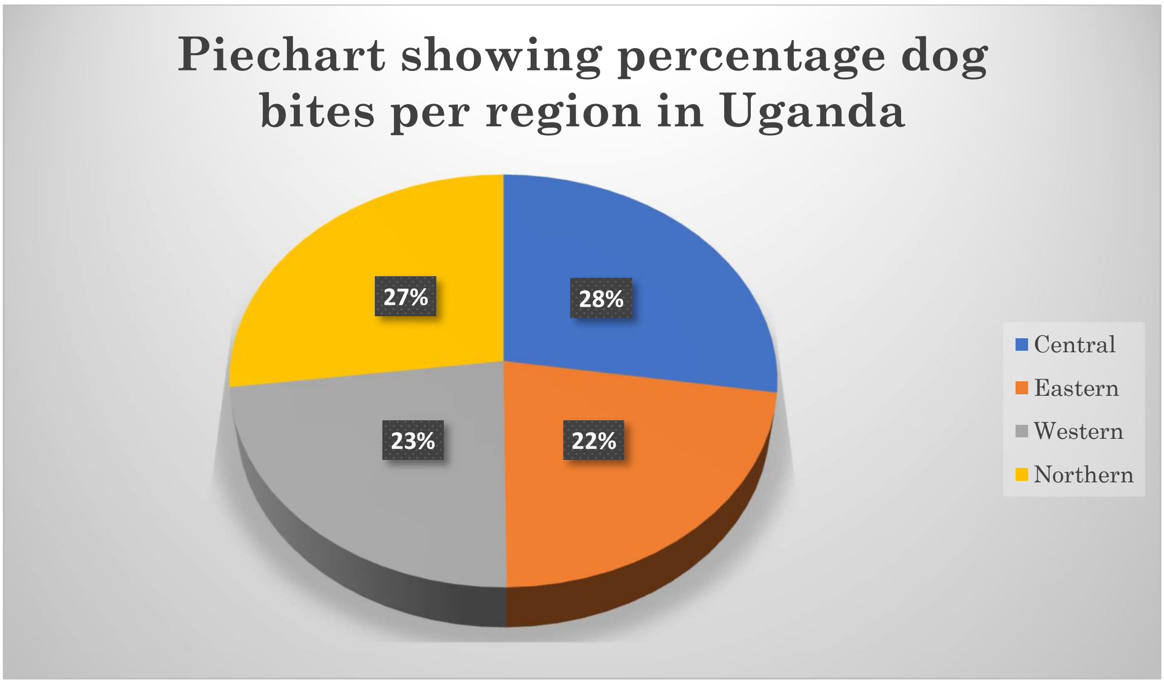

Mean number of Dog bites per region
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Mean number of dog bites
Central
Eastern
Western
Northern
Region

Bar charts


Number of dog bites in central region Uganda from 2000-2015
6000
5000
4000
3000
2000
1000
0
Number of dog bites
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014 -2015
Year


Dog bites per region from 2000-2015
6000
5000
4000
3000
2000
1000
0
Number of dog bites
2000-2001
2001-2002
2002-2003
2003-2004
2004-2005
2005-2006
2006-2007
2007-2008
2008-2009
2009-2010
2010-2011
2011-2012
2012-2013
2013-2014
2014 -2015
Year
Central
Eastern
Western
Northern

Pie charts


Piechart showing percentage dog bites per region in Uganda
27%
28%
23%
22%
Central
Eastern
Western
Northern

Lesson 21 – One Health Panel Discussion: Multi-disciplinary Outbreak Investigation

Estimated Lesson and Exercise Time	1 hour and 30 minutes
Participant Materials	ISAVET Lesson 21 One Health Panel Discussion: Multi-disciplinary Outbreak Investigation.doc
	Computer and Microsoft Word
	Pen or Pencil
Handout Materials for Exercises	

Description of Lesson:

Animal health, human health and wildlife/environmental experts will discuss One Health implementation gaps and opportunities and interact with ISAVET trainees to demonstrate why coordination of surveillance, outbreak investigation and response is essential at the human-animal-wildlife interface in Africa, at the regional, national and local levels.

Facilitator Instructions:

The facilitator is expected to cover all questions in this exercise within the time allotted. He/she will also summarize key points made during the discussion at the end of the session.

Allotted Time: 90 minutes

Organisation:
There will be brief overviews of important One Health activities in Africa followed by questions posed by the facilitator and ISAVET trainees.

Exercise Objective(s):

A. Panelist Input (45 minutes total or 15 minutes per panelist):

1. Describe One Health activities that are underway in East or West and Central Africa.

2. Identify gaps in the implementation of One Health:

    a. in Africa;
    b. in regional level;
    c. at the national level;
    d. at the local level.

3. Describe opportunities are present to use the One Health approach:

    e. in Africa;
    f. in regional level;

g. at the national level;
h. at the local level.

B. **Frontline ISAVET Trainees (30 minutes)**

1. Describe how Frontline ISAVET can contribute to One Health implementation in your local Area.
2. Describe your role as a Frontline ISAVET trainee when it comes to implementing One Health at the local level.

C. **General discussion (15 minutes)**

Exercise Components and Structure:

A. Facilitator guiding questions related to the participating countries as well as Africa as a whole:

1. Describe One Health activities that are underway in East or West and Central Africa.

2. Identify gaps in the implementation of One Health in Africa, in regional level, at the national level and at the local level.

3. Describe opportunities are present to use the One Health approach in Africa, in regional level, at the national level and at the local level.

4. Describe your role as a Frontline ISAVET trainee when it comes to implementing One Health at the local level.

B. Open the floor to questions, answers and further discussion.

Expected Outputs and Deliverables of Each Participant:

1. Active listening and participation in asking questions, providing examples related to the improved implementation of One Health in Africa.

Supplemental Resources for Facilitators:

Survey results of One Health activities in Africa, at the regional, national and local levels provided by FAO regional and country team members.

Lesson 22 – Preparing MS PowerPoint Presentations

Estimated Lesson and Exercise Time	2 hours
Instructor Materials	ISAVET Lesson 22 Preparing MS PowerPoint Presentations.pptx
	ISAVET Lesson 22 Preparing MS PowerPoint Presentations Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 22 Preparing MS PowerPoint Presentations Participant Guide.PDF

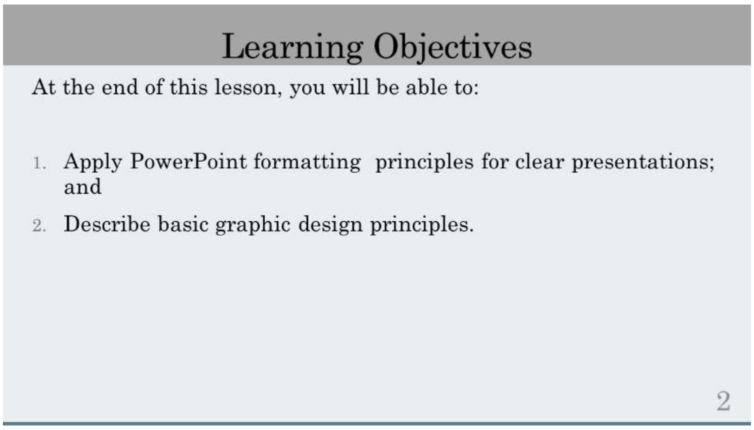
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

FMD	Foot and Mouth Disease
ISAVET	In Service Applied Veterinary Epidemiology Training
MS	Microsoft
RVF	Rift Valley Fever

Lesson 22 – Preparing MS PowerPoint Presentation, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 22 titled, "Preparing MS PowerPoint Presentations".

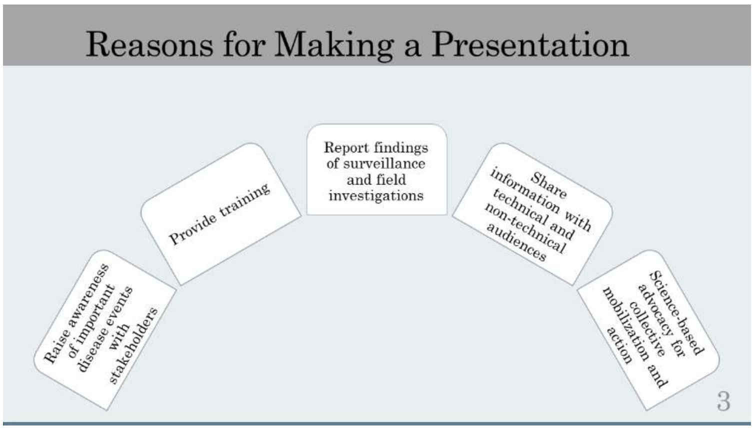


Lesson 22 – Preparing MS PowerPoint Presentation, Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

- Apply PowerPoint formatting principles for clear presentations; and
- Describe basic graphic design principles.



Lesson 22 – Preparing MS PowerPoint Presentation, Slide 3

SCRIPT / KEY POINTS:

PowerPoint or similar public presentations are opportunities to share information and mobilise stakeholders for action. Presentations must be simple, clear and brief to state only the most important information for the objective at hand.

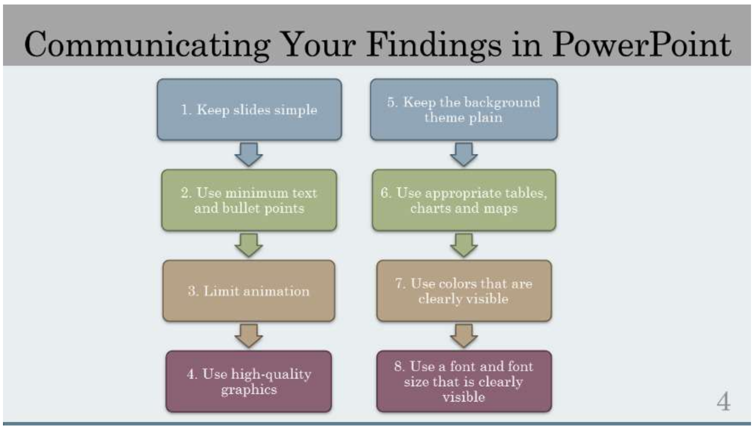
Raise awareness of important disease events with stakeholders

Provide training

Report findings of surveillance and field investigations

Share information with technical and non-technical audiences

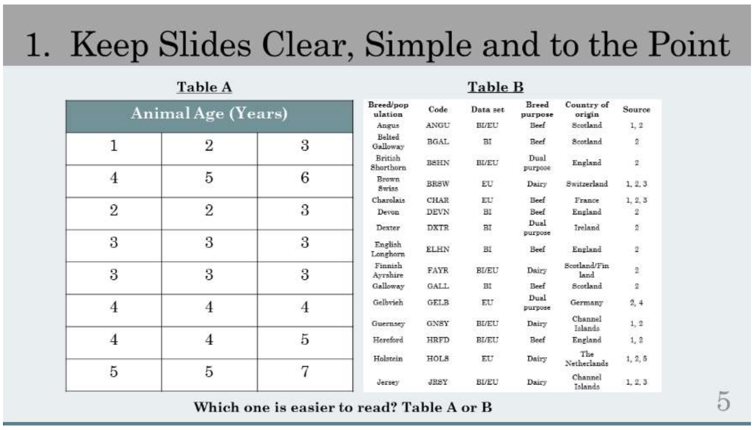
Science-based advocacy for collective mobilization and action



Lesson 22 – Preparing MS PowerPoint Presentation, Slide 4

SCRIPT / KEY POINTS:

1. Keep slides simple.
2. Use minimum text and bullet points.
3. Limit animation.
4. Use high-quality graphics.
5. Keep the background theme plain.
6. Use appropriate tables, charts and maps.
7. Use colors that are clearly visible.
8. Use a font and font size that is clearly visible.

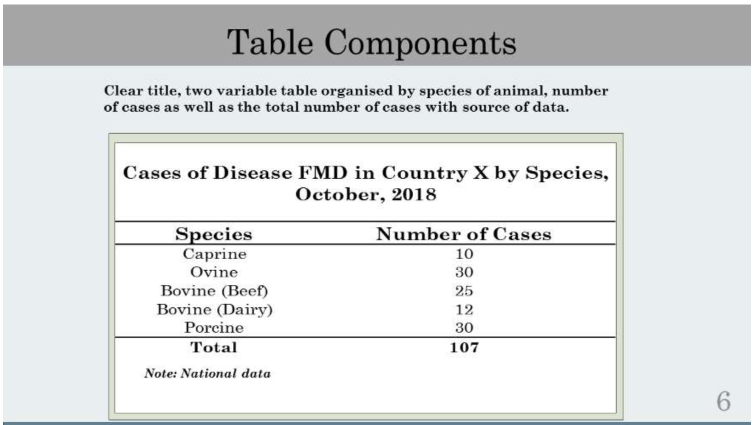


Lesson 22 – Preparing MS PowerPoint Presentation, Slide 5

SCRIPT / KEY POINTS:

The next few slides provides examples of what to avoid and what to do when communicating your results in a PowerPoint presentation.

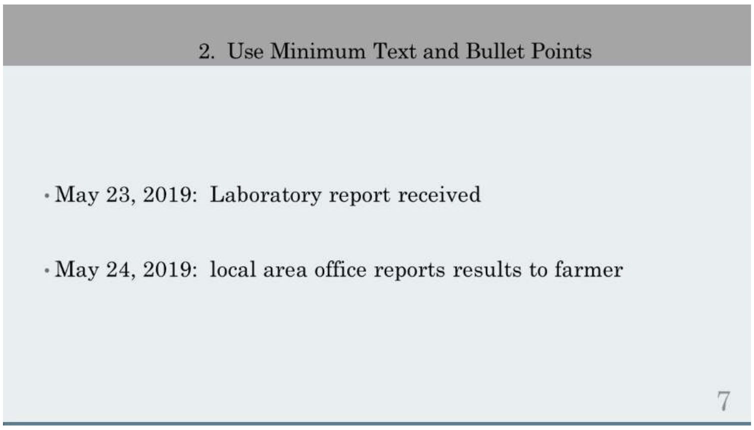
Which Table is easier to read? Neither one. Both Tables are hard to understand based on how the data is displayed to the viewer.



Lesson 22 – Preparing MS PowerPoint Presentation, Slide 6

SCRIPT / KEY POINTS:

This is an example of a clearly labelled table for a PowerPoint presentation. It allows you to communicate your results to your target audience in an easily obtainable manner. The title is clearly labelled. The audience understands that you are presenting the number of cases for a specific disease within each species tested. They also have a clear representation of the final total from the table information and that the source of the data is stated below the table.

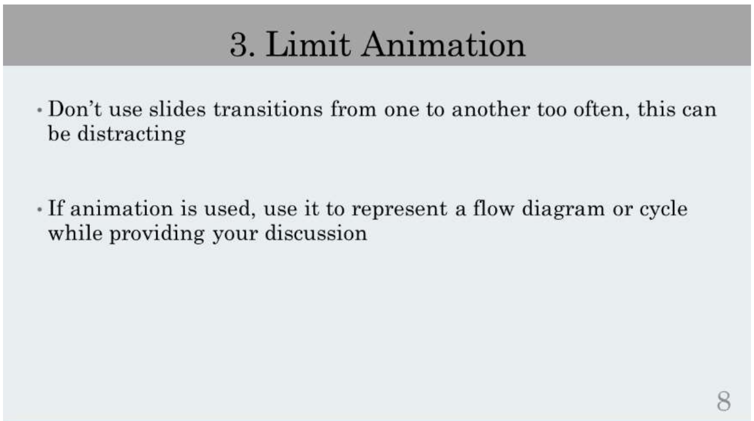


Lesson 22 – Preparing MS PowerPoint Presentation, Slide 7

SCRIPT / KEY POINTS:

Next, it is best to use minimum text and bullet points. As a presenter, MS PowerPoint will be a tool that you can use to communicate your results to different stakeholders. However, you are telling a story and the bullet points should be brief and to the point for when you are conveying your message. The bullet points should be the main points you want the audience to remember or come away with while giving your presentation.

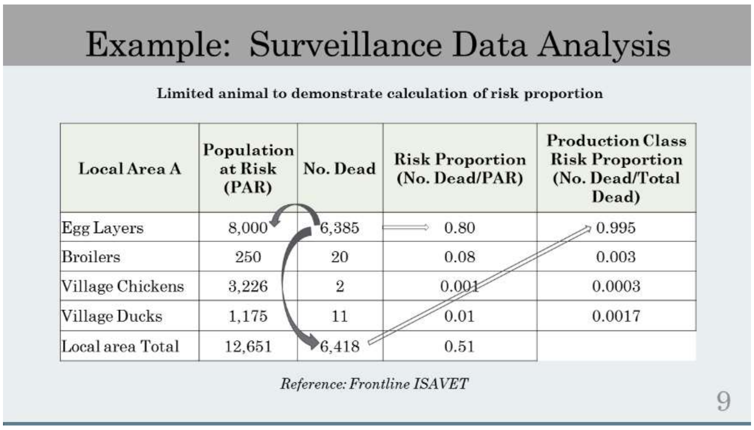
- Use bullets or short sentences, and try to keep each to one line; that is, without text wrapping.
- You want your audience to listen to you present your information, rather than read the screen.



Lesson 22 – Preparing MS PowerPoint Presentation, Slide 8

SCRIPT / KEY POINTS:

Animation should be limited, unless you are trying to showcase a process. Do not use slide transitions very often. This is distracting to the audience and you want them to pay attention to what you are presenting rather than watching animation occurring during your discussion.



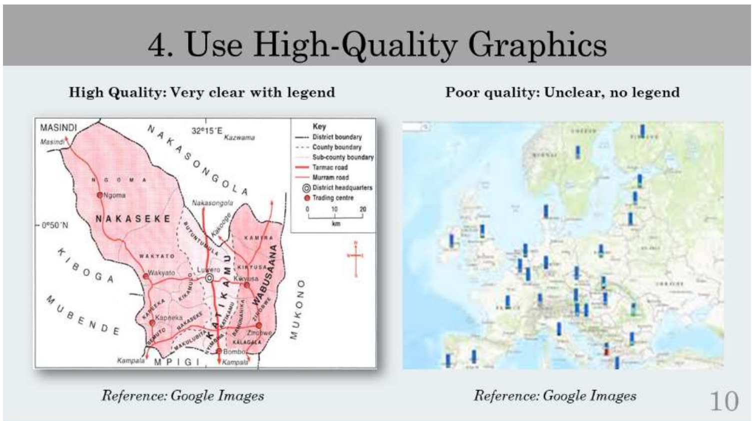
Local Area A	Population at Risk (PAR)	No. Dead	Risk Proportion (No. Dead/PAR)	Production Class Risk Proportion (No. Dead/Total Dead)
Egg Layers	8,000	6,385	0.80	0.995
Broilers	250	20	0.08	0.003
Village Chickens	3,226	2	0.001	0.0003
Village Ducks	1,175	11	0.01	0.0017
Local area Total	12,651	6,418	0.51	

Lesson 22 – Preparing MS PowerPoint Presentation, Slide 9

SCRIPT / KEY POINTS:

The following provides an illustration of animation that could occur when presenting a calculation to your stakeholder audience. Animation can occur while the presenter is discussing how to conduct the calculation of an attack rate from the following table.

Reference: Frontline ISAVET



Lesson 22 – Preparing MS PowerPoint Presentation, Slide 10

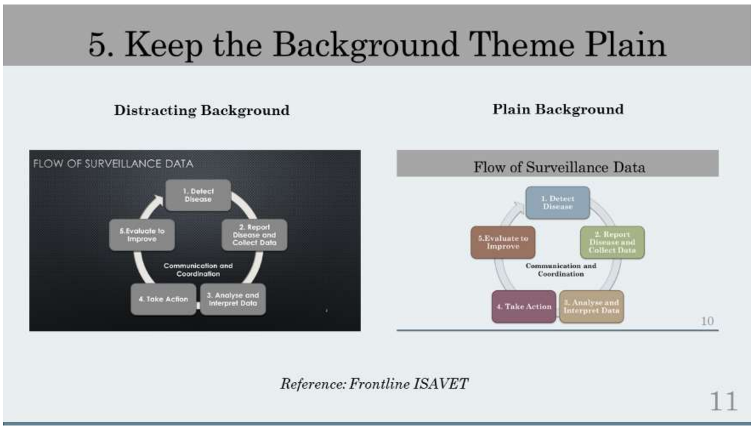
SCRIPT / KEY POINTS:

Providing graphics that are high-quality and not distorted is of key importance when presenting your data. Graphics should be clear, easy to read and understand.

Photo:

Image 1: Google Images

Image 2: Google images



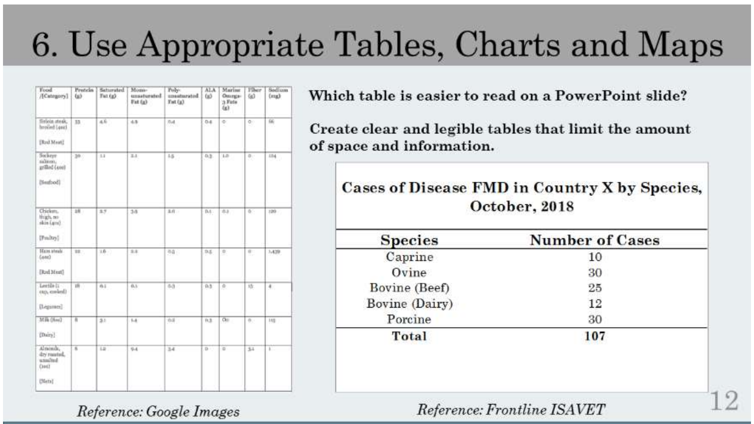
Lesson 22 – Preparing MS PowerPoint Presentation, Slide 11

SCRIPT / KEY POINTS:

Make slide backgrounds subtle and keep them consistent. Choose an appealing, consistent template or theme that is not too eye-catching. You don't want the background or design to detract from your message. The following is an example of what to avoid on this slide.

Photo:

Image 1: Frontline ISAVET



Lesson 22 – Preparing MS PowerPoint Presentation, Slide 12

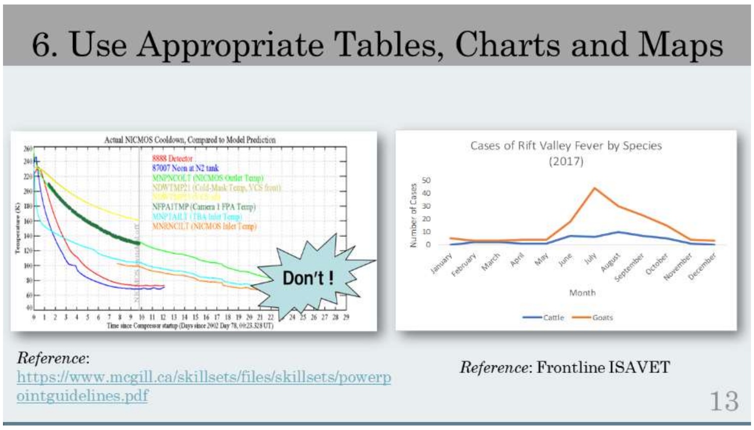
SCRIPT / KEY POINTS:

Make labels for charts and graphs understandable. Use only enough text to make label elements in a table, chart or graph comprehensible.

Photo:

Image 1: Google

Image 2: Frontline ISAVET



Lesson 22 – Preparing MS PowerPoint Presentation, Slide 13

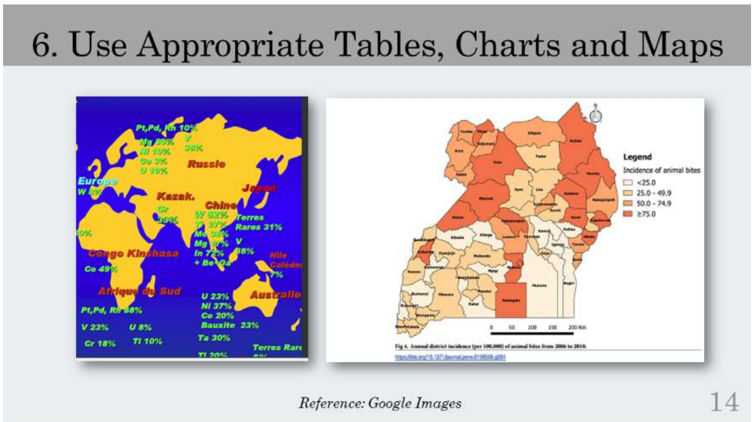
SCRIPT / KEY POINTS:

Can the person in the last row see the slide contents? Use art to help convey your message. Use graphics to help tell your story. Don't overwhelm your audience by adding too many graphics to a slide, however.

Photo:

Image 1: https://www.mcgill.ca/skillsets/files/skillsets/powerpointguidelines.pdf

Image 2 : Frontline ISAVET



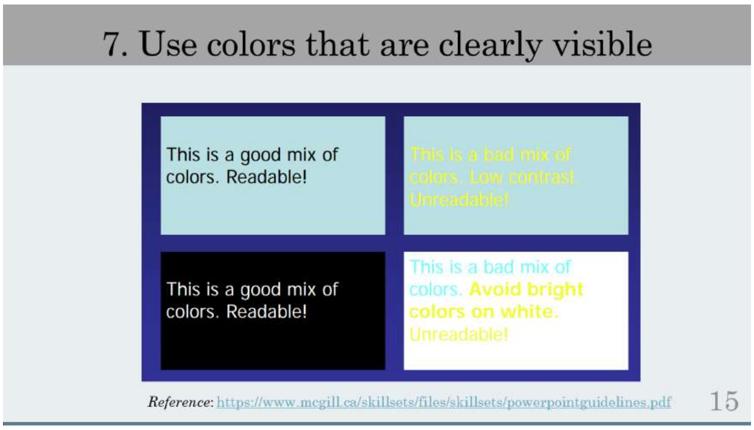
Lesson 22 – Preparing MS PowerPoint Presentation, Slide 14

SCRIPT / KEY POINTS:

Avoid busy maps with distracting backgrounds. The map on your left has multiple font colors and is hard to read. There is no legend for what is being represented on the map.

It is better to have data displayed by Area like the map on the right of the slide. This will allow for messages to become clearly evident to your target audience. In addition, a clearly labelled legend will help contextualise what you are trying to convey in a visually appealing manner.

Reference: Google Images



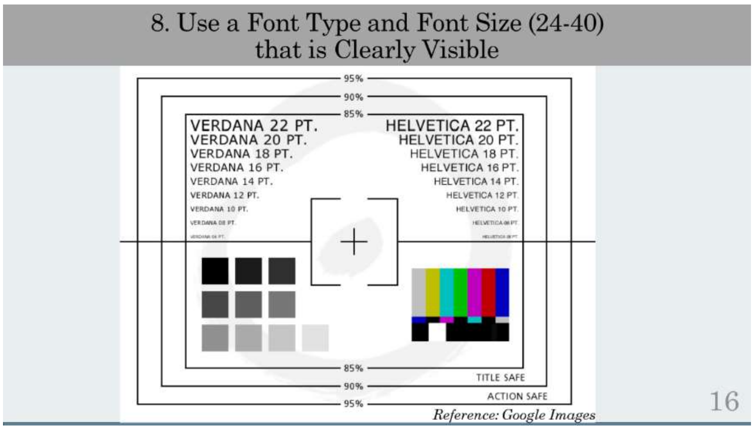
Lesson 22 – Preparing MS PowerPoint Presentation, Slide 15

SCRIPT / KEY POINTS:

Use high contrast between background color and text color. Themes automatically set the contrast between a light background with dark colored text or dark background with light colored text.

Photo:

Image 1: *Reference*:https://www.mcgill.ca/skillsets/files/skillsets/powerpointguidelines.pdf



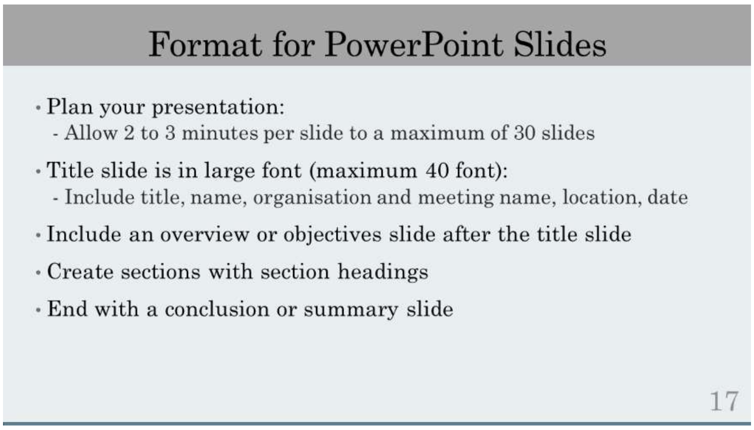
Lesson 22 – Preparing MS PowerPoint Presentation, Slide 16

SCRIPT / KEY POINTS:

Choose a font size that your audience can read from a distance. Choosing the right font size helps to get your message across. Choose a font style that your audience can read from a distance. Choosing the right font style, such as Helvetica or Arial, helps to get your message across. Avoid narrow fonts, such as Arial Narrow, and avoid fonts that include fancy edges, such as Times.

Photo:

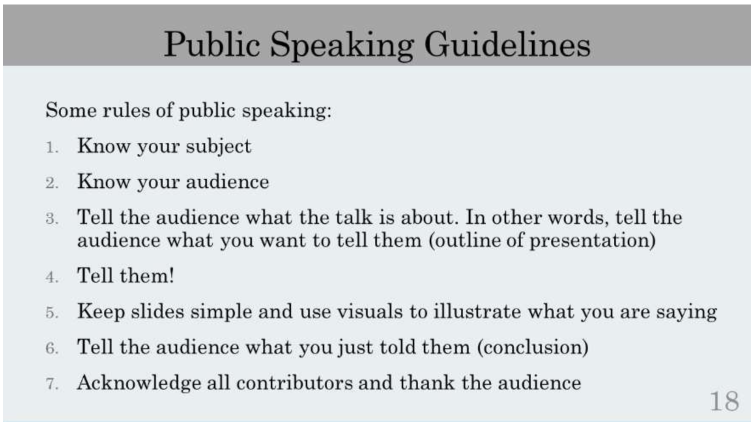
Image 1: Google



Lesson 22 – Preparing MS PowerPoint Presentation, Slide 17

SCRIPT / KEY POINTS:

To maintain a clear message and to keep your audience attentive and interested, keep the number of slides in your presentation to a minimum. Do not read the presentation, but rather plan your presentation to allow for 2-3 minutes for each slide. Make sure the title slide is an appropriate font size with the correct information. An overview slide should be developed to tell your audience what you will be speaking about. Create sections from titles from your report and conclude with a summary slide.



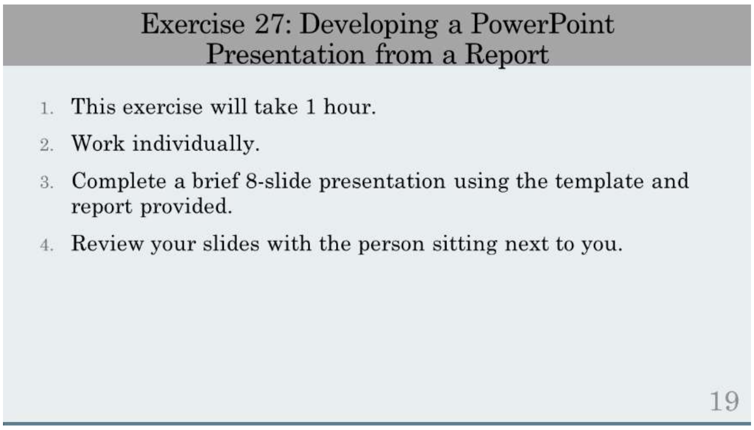
Lesson 22 – Preparing MS PowerPoint Presentation, Slide 18

SCRIPT / KEY POINTS:

The following slides provides some guidelines or best practices when speaking in public. These practices will help guide you in tailoring your presentations to the different stakeholder audiences you will communicate your field findings too.

These include:

- Understanding your subject;
- Knowing who your specific audience is;
- Providing an overview to let the audience know what the presentation is about, specifically the outline of the presentation; In other words, tell the audience what you want to tell them.
- Keeping slides simple and clear for your audience;
- Tell the audience what you just told them. State your conclusion; and
- Provide acknowledgements for the collaborators who helped you with your field study.



Lesson 22 – Preparing MS PowerPoint Presentation, Slide 19

SCRIPT / KEY POINTS:

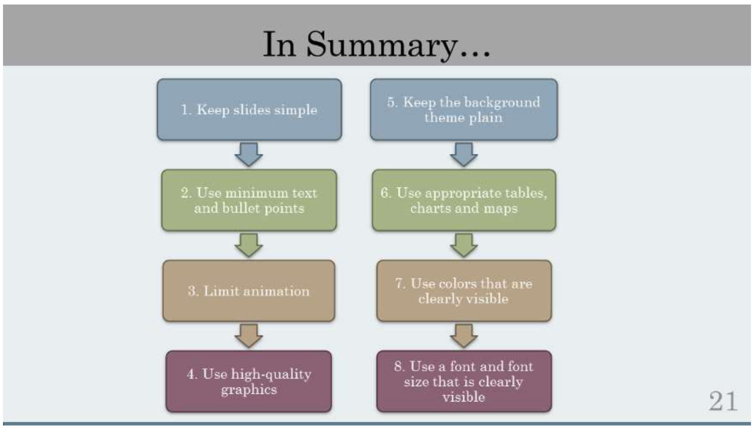
Exercise 27: Developing a PowerPoint Presentation from a Report

- This exercise will take 1 hour.
- Work individually.
- Complete a brief presentation using the template and data provided.
- Review your slides with the person sitting next to you.

Lesson 22 – Preparing MS PowerPoint Presentation, Slide 20

SCRIPT / KEY POINTS:

The following includes additional references for PowerPoint presentations.



Lesson 22 – Preparing MS PowerPoint Presentation, Slide 21

SCRIPT / KEY POINTS:

In summary,

1. Keep slides simple.
2. Use minimum text and bullet points.
3. Limit animation.
4. Use high-quality graphics.
5. Keep the background theme plain.
6. Use appropriate tables, charts and maps.
7. Use colors that are clearly visible.

8. Use a font and font size that is clearly visible.

Lesson 22 – Preparing MS PowerPoint Presentation, Slide 22

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 27 – Developing a PowerPoint Presentation from a Report

Description of Exercise:
Complete a brief 8-slide presentation using the template and data provided. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 1 hour

Organisation of Group Work:

- Work individually for this exercise.

Exercise Objective(s):

1. Apply PowerPoint formatting principles for clear presentation.
2. Describe basic graphic design principles.
3. Display data clearly using tables, graphs and maps.

Exercise Components and Structure:

1. Work individually.
2. Complete a brief PowerPoint presentation from the template provided.
3. Share your presentation with the individual sitting next to you.

Materials, Data or Information:

1. MS PowerPoint Template: "Frontline ISAVET Exercise 27.ppt"
2. Report on Anthrax Outbreak investigation: "RVF Kabale outbreak_report.pdf"
3. Paper and pen

Expected Outputs and Deliverables of Each Participant:

1. Complete a brief 8 slide presentation using the template and report provided.

1. Use Microsoft power point to create an 8 slide presentations based on the Rift Valley Fever Outbreak Report "RVF Kabale outbreak_report.pdf.

   Answers will vary based on report and trainee.

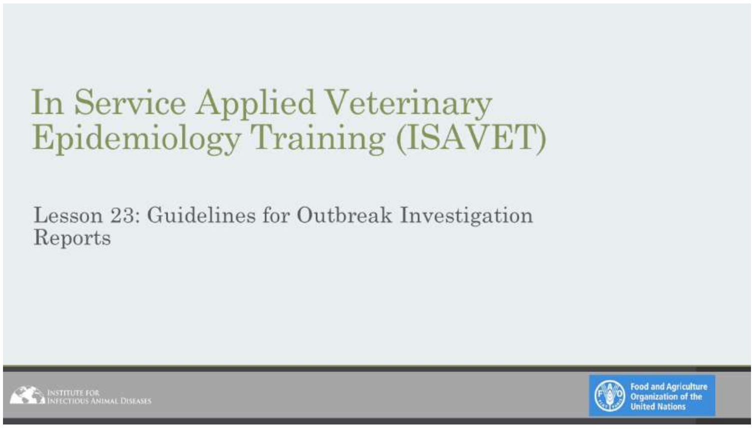
Lesson 23 – Guidelines for Outbreak Investigation Reports

Estimated Lesson and Exercise Time	1 hour

Instructor Materials	ISAVET Lesson 23 Guidelines for Outbreak Investigation Reports.pptx
	ISAVET Lesson 23 Guidelines for Outbreak Investigation Reports Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 23 Guidelines for Outbreak Investigation Reports Participant Guide.doc

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

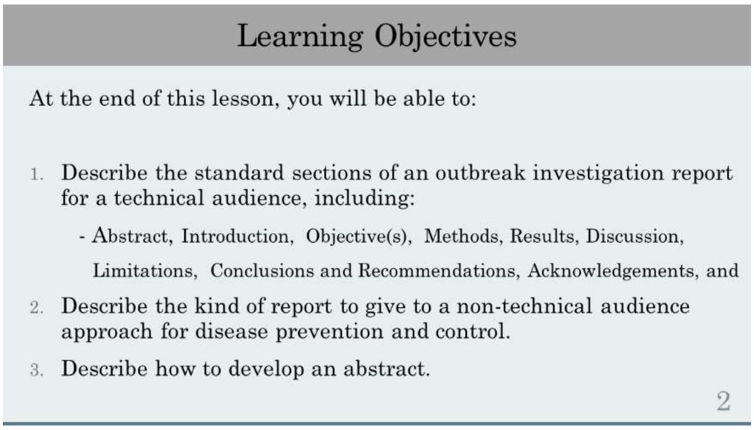
ISAVET	In Service Applied Veterinary Epidemiology Training
PAR	Population at Risk



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 23 titled, “Guidelines for Outbreak Investigation Reports”.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

1. Describe the standard sections of an outbreak investigation report for a technical audience, including:
    - Abstract
    - Introduction;
    - Objective(s)
    - Methods
    - Results
    - Discussion
    - Limitations
    - Conclusions
    - Recommendations
    - Acknowledgements

Describe the kind of report to give to a non-technical audience approach for disease prevention and control.

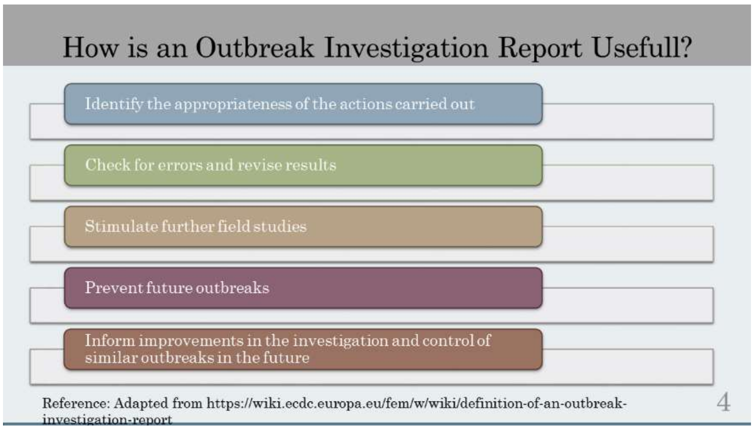
Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 3

SCRIPT / KEY POINTS:

Why should you prepare an outbreak investigation report? These reports inform decision makers, launch control and prevention measures, serve as a record of performance, showcase investigation summaries as well as helps determine strengths and limitations of the outbreak investigation.

In summary:

- Inform decision makers
- Justify prevention and control measures
- Serve as a record of the outbreak and the response
- Determine the strengths and weaknesses of the outbreak investigation and the response
- Reference: Adapted from ECDC (https://wiki.ecdc.europa.eu/fem/w/wiki/definition-of-an-outbreak-investigation-report)



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 4

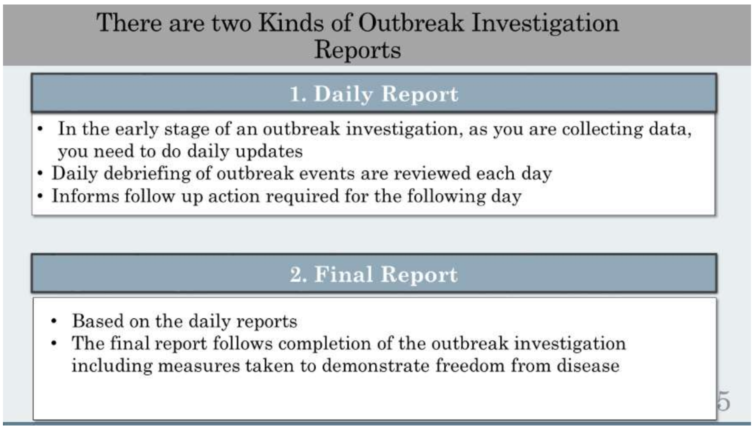
SCRIPT / KEY POINTS:

Preparing outbreak investigation reports also capture investigation methods and controls, identifies the appropriateness of actions being carried out, provides the opportunity to revise results and check errors, and assists in preventing future outbreaks.

In addition, the report:

- Identify the appropriateness of the actions carried out
- Check for errors and revise results
- Stimulate further field studies
- Prevent future outbreaks
- Inform improvements in the investigation and control of similar outbreaks in the future

Reference: ECDC (https://wiki.ecdc.europa.eu/fem/w/wiki/definition-of-an-outbreak-investigation-report)

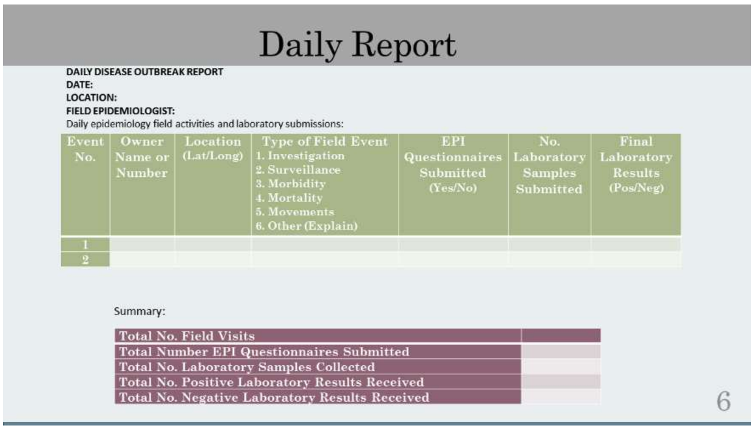


Lesson 23 – Guidelines for Outbreak Investigation Reports, Slide 5

SCRIPT / KEY POINTS:

Data and information are often lacking in the early stages of an animal disease outbreak. Yet even though data may be preliminary, reports may be requested at any time to assist decision makers at different stages of the outbreak investigation.

Recall that disease prevention and control efforts should be conducted throughout an animal disease outbreak investigation

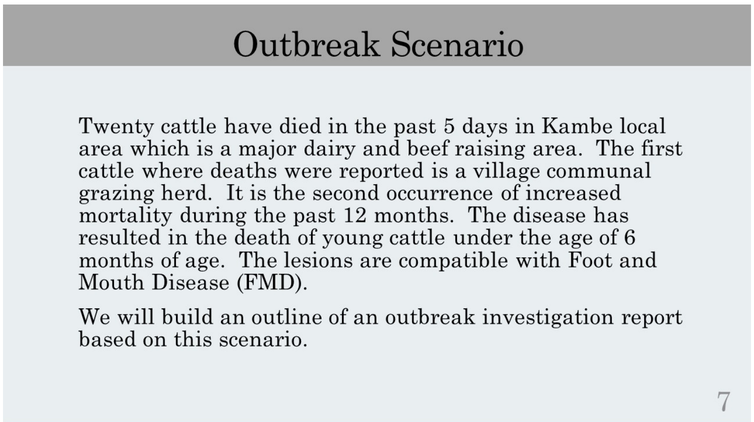


Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 6

SCRIPT / KEY POINTS:

It is important to keep daily record of events to validate and ensure high quality of the data that eventually becomes combined or aggregated. This example daily report records the following daily information during an outbreak investigation which can be added to the cumulative records for an outbreak event:

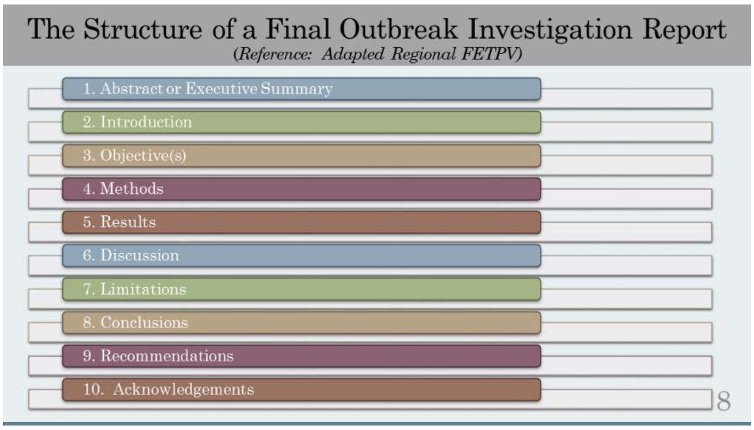
1. Event No.
2. Owner information
3. Location Information
4. Type of investigation
5. Questionnaires submitted
6. Laboratory samples submitted
7. Laboratory samples results



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 7

SCRIPT / KEY POINTS:

We will build an outline of an outbreak investigation report based on this scenario.



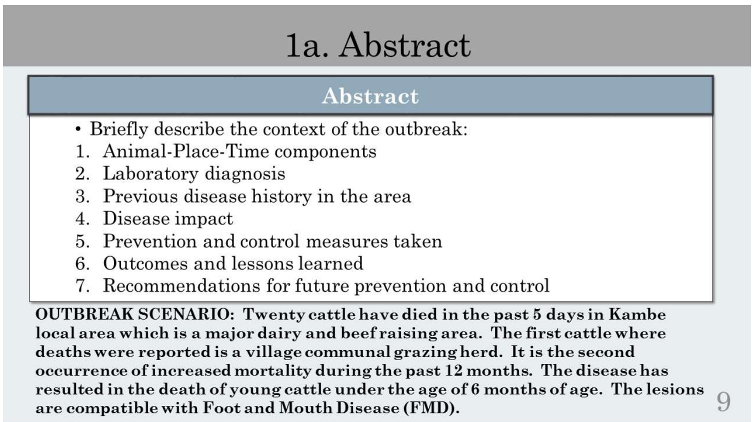
Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 8

SCRIPT / KEY POINTS:

There are nine sections for an outbreak investigation report. Let's review each section and discuss the items that are included in each section. Sections include:

- Abstract
- Introduction;
- Objective(s);
- Methods;
- Results;
- Discussion;
- Limitations;
- Conclusions;
- Recommendations; and
- Acknowledgements

Reference: Regional FETPV

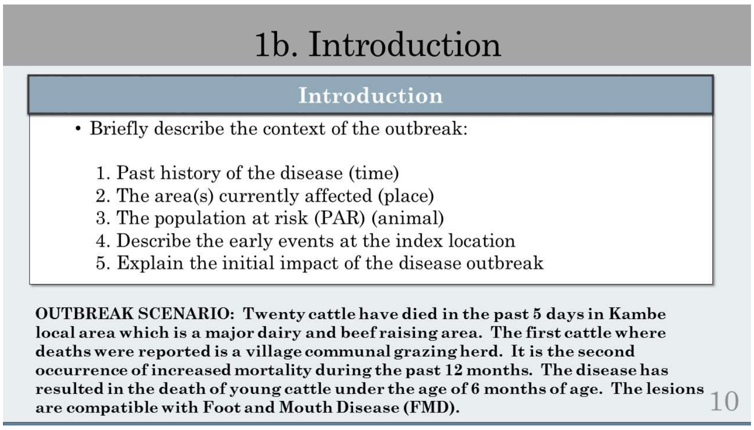


Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 9

SCRIPT / KEY POINTS:

An abstract (or executive summary) is a concise summary of the outbreak event. Include the following information in the abstract:

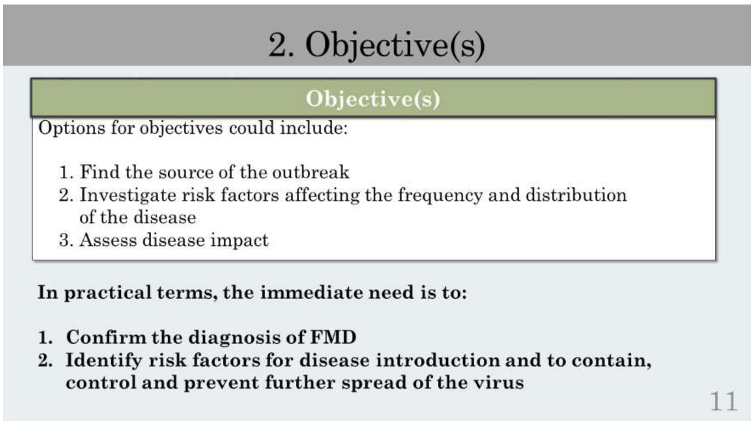
Animal-Place-Time components
Laboratory diagnosis
Previous disease history in the Area
Disease impact
Prevention and control measures taken
Outcomes and lessons learned
Recommendations for future prevention and control



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 10

SCRIPT / KEY POINTS:

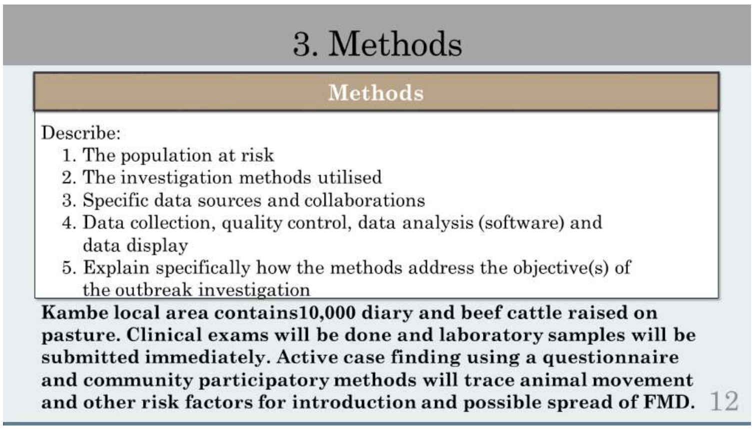
The first section of your report is the introduction. In this section you will describe the context of the outbreak. It will include elements for animal, place, and time. Information over the index case should be included. Furthermore, information of the economic or public health significance should be included to describe the disease outbreak.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 11

SCRIPT / KEY POINTS:

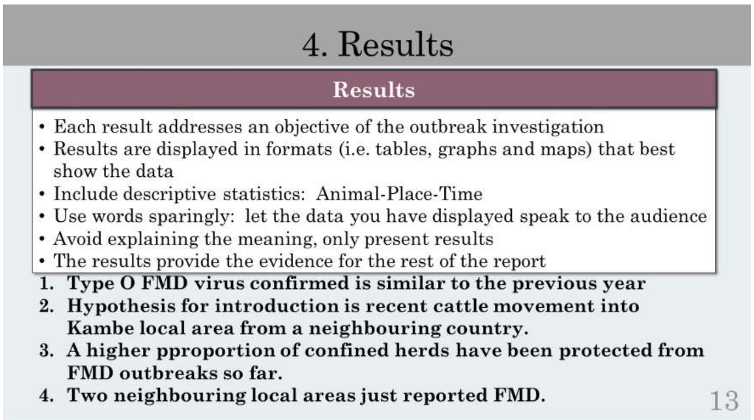
Next, the objectives of the report provided should be clear and specific. What are some examples of objectives that you would use in your own report?



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 12

SCRIPT / KEY POINTS:

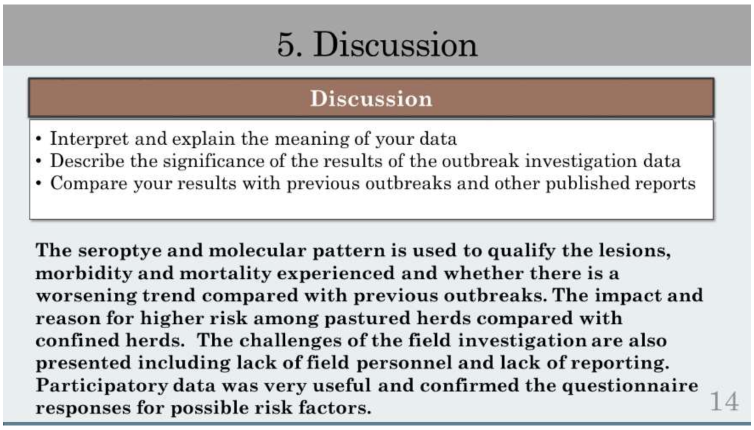
The methods section includes how the data will be collected. It specifically defines the population at risk, the type of investigation methods used and any specific data sources or collaborations. Information on quality control, data analysis, and data collection should also be included. It is important to explain in detail how the methods you have chosen will address the objective(s) of the outbreak investigation.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 13

SCRIPT / KEY POINTS:

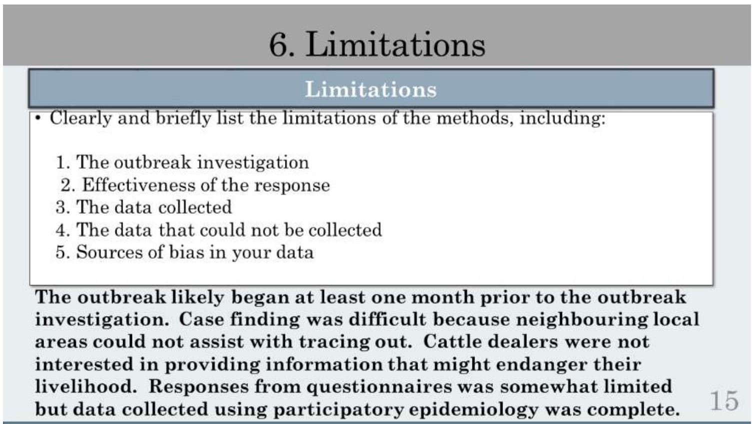
In the results section, it is important to display information in a table, graph, or map so the reviewer can easily follow what is occurring in the field. It is better to provide figures than multiple paragraphs of what is occurring in your local area. Only provide information of what is occurring at the time and avoid explaining the meaning of the results in your report.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 14

SCRIPT / KEY POINTS:

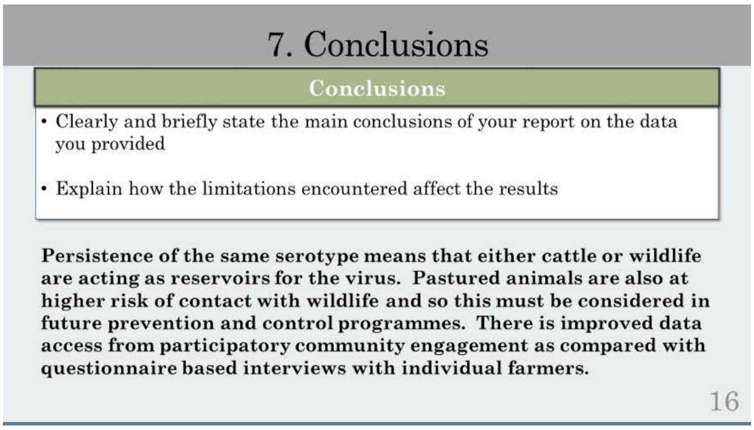
In the discussion section, interpret and explain the meaning of the results from your data. Describe the significance of the results from your outbreak investigation. Work with others to compare your results with previous outbreaks or other published results.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 15

SCRIPT / KEY POINTS:

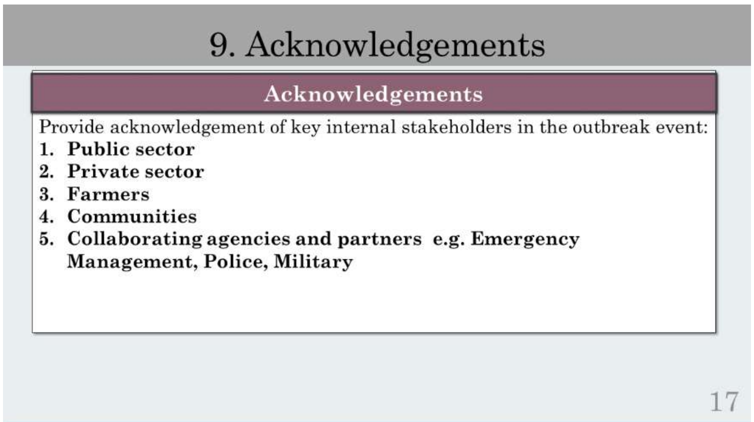
Another section is the report should include limitation. This section should be brief. Limitations should be provided for the outbreak investigation, the type of data that was collected, the data that could not be collected and any sources of bias that could occur from the data collection methods used.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 16

SCRIPT / KEY POINTS:

Clearly and briefly state the main conclusions of your report on the data your provided. Be transparent about the limitations encountered and how they affect the results.

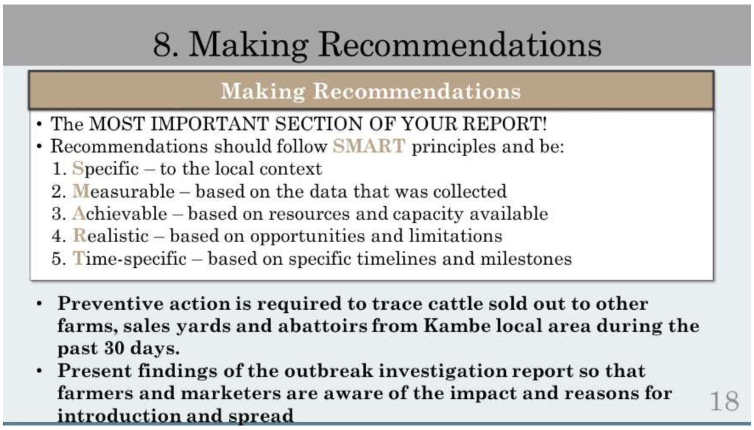


Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 17

SCRIPT / KEY POINTS:

Acknowledge the contributions of all those primarily involved or impacted in the outbreak to build relationships and to promote follow up action.

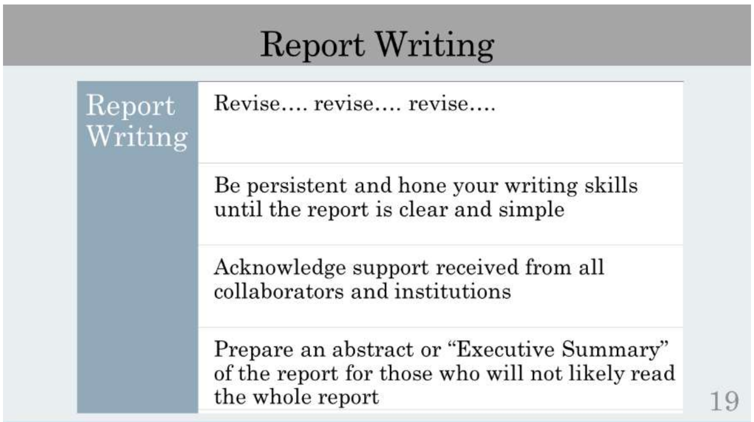
Your report will build consensus for the need for all stakeholders to work together to prevent a similar event from occurring again in the future.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 18

SCRIPT / KEY POINTS:

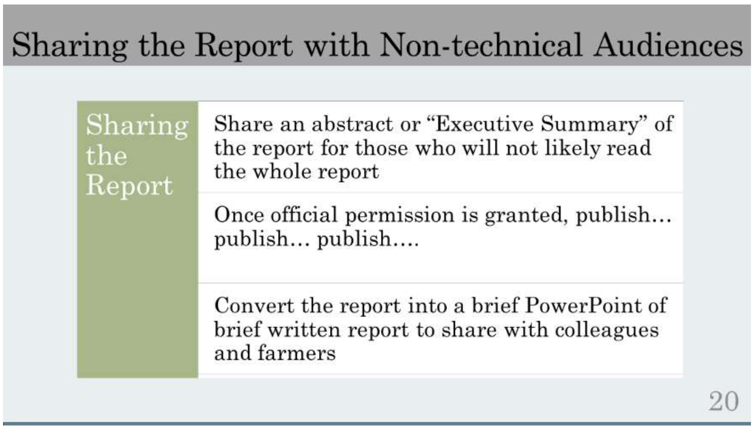
Recommendations should follow SMART principles and be based DIRECTLY on the data from this outbreak investigation and not a text book! It is always better to have the most specific and important recommendations noted for decision makers to act upon.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 19

SCRIPT / KEY POINTS:

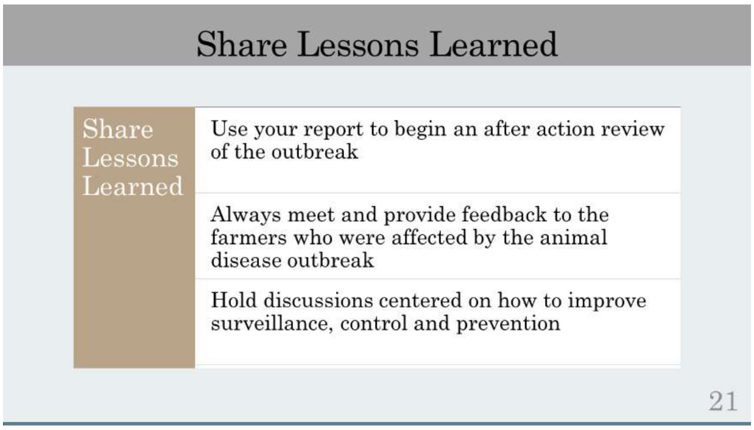
The following provides a list of important topics to consider when you are report writing. Never provide the first draft as your final report. Always revise the report a few times before submission for any issues with grammar. Make sure the report is succinct, clear, and simple for the reader. Remember to include acknowledgements from sponsors or collaborators. A 1-page synopsis of the report (i.e., abstract or executive summary) should be provided for individuals who may not have the time to read the entire report.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 20

SCRIPT / KEY POINTS:

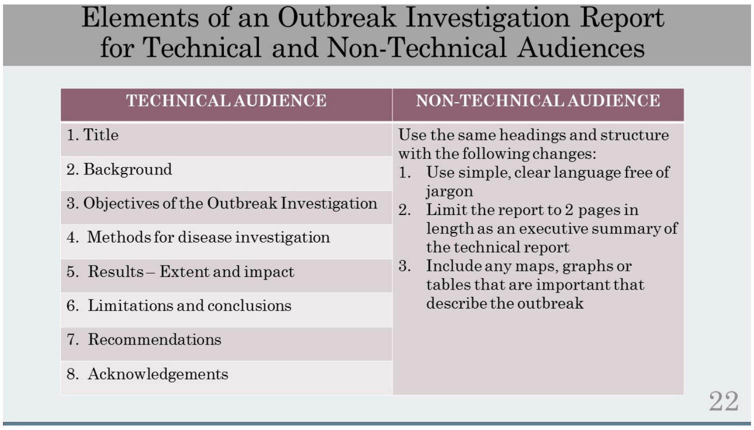
For non-technical audiences, provide the abstract of the report. If official permission is granted, then publish information from your report. In addition, convert the report into a brief PowerPoint that can be used to provide to non-technical audiences.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 21

SCRIPT / KEY POINTS:

Finally, use your report to share lessons learned with other individuals who have developed investigation reports in other local area. Always provide feedback to the farmers who were affected by the outbreak in your local area. Discussions should be centered around improving surveillance, control and prevention at the local area level.

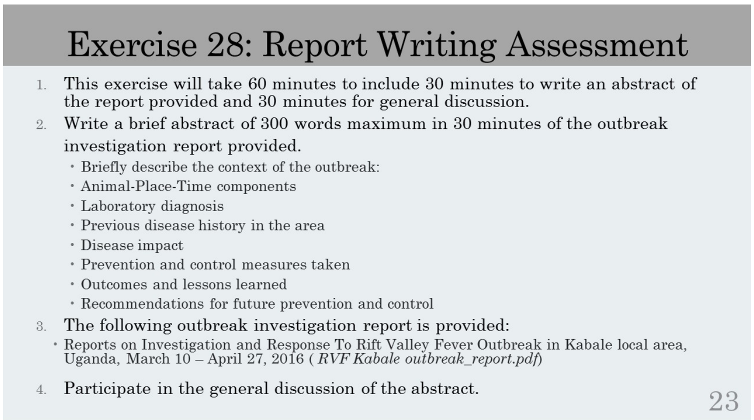


Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 22

SCRIPT / KEY POINTS:

TECHNICAL AUDIENCE

1. Title - Clear in scope
2. Background – Relevant disease history of the Area prior to and during the outbreak
3. Objective of the Outbreak Investigation – Specify whether it is to measure the extent, distribution and impact of the disease and the population at risk
4. Methods for disease investigation – Describe the investigation methods, surveillance and control measures undertaken
5. Results – Describe measures of central tendency, disease impact using the outbreak histogram, morbidity and mortality, attack rate, case fatality rate, incidence and prevalence
6. Limitations and conclusions – Describe limitations of the data and in conducting the field investigation
7. Recommendations – All recommendations must be related to the findings of the disease investigation
8. Acknowledgements – Include all stakeholders who contributed



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 23

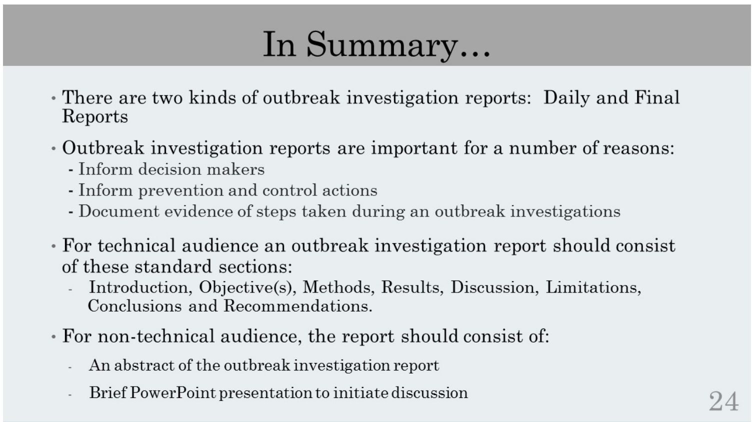
SCRIPT / KEY POINTS:

Exercise 28 instructions: Report Writing Assessment

- This exercise will take 60 minutes to include 30 minutes to write an abstract of the report provided and 30 minutes for general discussion.
- Write a brief abstract of 300 words maximum in 30 minutes of the outbreak investigation report provided.
- Briefly describe the context of the outbreak:
- Animal-Place-Time components
- Laboratory diagnosis
- Previous disease history in the Area
- Disease impact
- Prevention and control measures taken
- Outcomes and lessons learned
- Recommendations for future prevention and control
- The following outbreak investigation report is provided:
- Reports on Investigation and Response To Rift Valley Fever Outbreak in Kabale Local area, Uganda, March 10 – April 27, 2016 (RVF Kabale outbreak_report.pdf)
- Participate in the general discussion of the abstract.

Instructors:

- Review instructor guide to see answers.



Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 24

SCRIPT / KEY POINTS:

In summary,

Outbreak investigation reports are important for a number of reasons:

- Inform decision makers
- Inform prevention and control actions
- Document evidence of steps taken during an outbreak investigations

- For technical audience an outbreak investigation report should consist of these standard sections:
  - Introduction, Objective(s), Methods, Results, Discussion, Limitations, Conclusions and Recommendations.

- For non-technical audience, the report should consist of:

- An abstract of the outbreak investigation report

Lesson 23 – Guidelines for Outbreak Investigation Reports,
Slide 25

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 28 – Report Writing Assessment

Description of Exercise:
Group discussion including questions to provide reports to technical and non-technical audiences. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 1 hour

Organisation of Group Work:
Work in groups for this exercise.

Exercise Objective(s):

1. Describe the standard sections of an outbreak investigation report for a technical audience: Introduction, Objective, Methods, Results, Discussion, Limitations, Conclusion, and Recommendations

2. Describe the kind of report to give to a non-technical audience for disease control and prevention

Exercise Components and Structure:

1. Form into 3 groups
2. Review an example Outbreak Investigation Report provided

Materials, Data or Information:

1. The following Reports are provided:
   a. Reports on Investigation and Response To Rift Valley Fever Outbreak in Kabale Local area, Uganda, March 10 – April 27, 2016 (*RVF Kabale outbreak_report.pdf*)
   b. One Health Anthrax Surveillance In Arusha Local area, April 25 – May 4, 2018 (*Anthrax One Health Surveillance.pdf*)
2. Paper and pen

Expected Outputs and Deliverables of Each Participant:

1. Provide a review of an outbreak investigation report in terms of its content and

Two-outbreak investigation Reports are provided as follows:

c. Reports on Investigation and Response To Rift Valley Fever Outbreak in Kabale Local area, Uganda, March 10 – April 27, 2016 (*RVF Kabale outbreak_report.pdf*)
d. One Health Anthrax Surveillance In Arusha Local area, April 25 – May 4, 2018 (*Anthrax One Health Surveillance.pdf*)

Groups 1 + 2:

Reports on Investigation and Response To Rift Valley Fever Outbreak in Kabale Local area, Uganda, March 10 – April 27, 2016

Group 3:

One Health Anthrax Surveillance In Arusha Local area, April 25 – May 4, 2018

1. Assess the reports provided to see if the structure and components are presented and fulfill what is expected of a standard outbreak investigation report.
   a. Introduction
   b. Objective (s)
   c. Methods
   d. Results
   e. Discussion
   f. Limitations
   g. Conclusions
   h. Recommendations

Answers will vary by each report looked at from each group.

Section III: Week 3 – Preparedness, Disease Prevention and Response, Communication, Ethics, and Professionalism

Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences

Estimated Lesson and Exercise Time	2 hours
Instructor Materials	ISAVET Lesson 24 Communicating Disease Transmission Risk to Diverse Audiences.pptx
	ISAVET Lesson 24 Communicating Disease Transmission Risk to Diverse Audiences Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 24 Communicating Disease Transmission Risk to Diverse Audiences Participant Guide.PDF

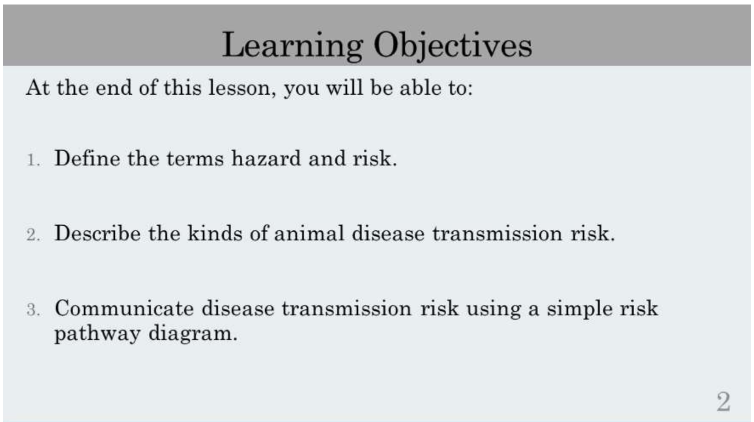
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

ASF	African Swine Fever
BT	Blue Tongue
DTR	Disease Transmission Risk
ELISA	Enzyme Linked Immunosorbent Assay
FETPV	Field Epidemiology Training for Veterinarians
FMD	Foot-and-Mouth Disease
HPAI	Highly Pathogenic Avian Influenza
ISAVET	In Service Applied Veterinary Epidemiology Training
LBM	Live Bird Market
NCD	New Castle Disease
OB	Outbreak
OIE	World Organisation for Animal Health
PPR	Peste des Petits Ruminants
RT-PCR	Reverse Transcriptase Polymerase Chain Reaction
RTPs	Risk Transmission Pathways
RVF	Rift Valley Fever
RVFv	Rift Valley Fever Virus
TB	Tuberculosis

Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 24 titled, "Communicating Disease Transmission Risk to Diverse Audiences".

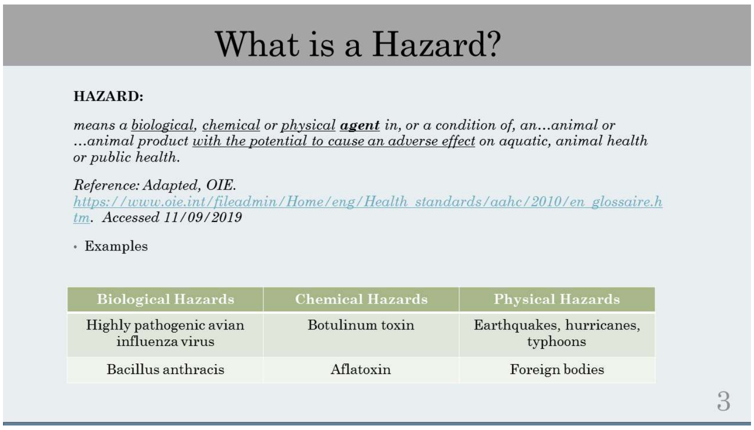


Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

- Describe the kinds of animal disease transmission risk; and
- Describe disease transmission risk using the Risk Analysis principles: hazard identification, risk assessment, risk communication and risk management.



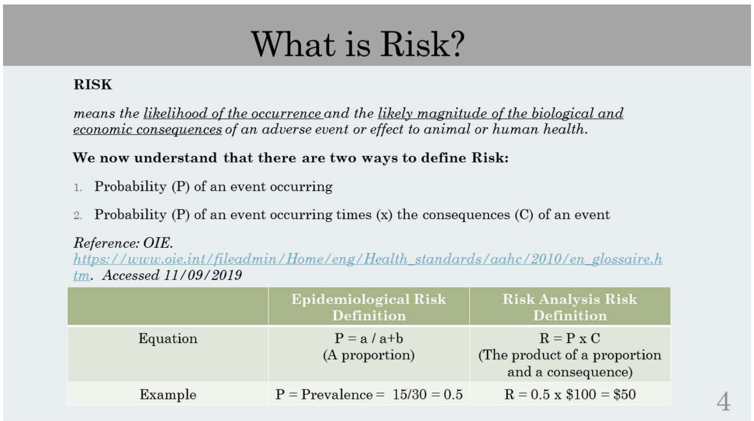
Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 3

SCRIPT / KEY POINTS:

A hazard means a biological, chemical or physical agent in, or a condition of, an animal or animal product with the potential to cause an adverse effects on aquatic, animal health or public health (adapted).

Can you provide other examples of biological, chemical and physical hazards?

In emergency planning and risk communication we should consider all three types of hazards under an **“all hazards approach”**.



Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 4

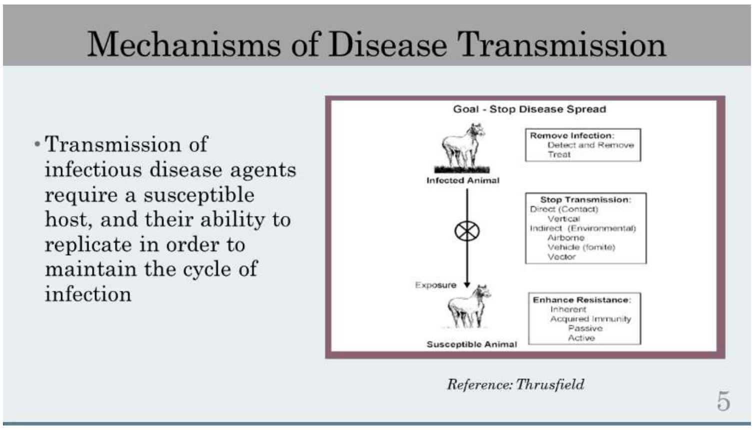
SCRIPT / KEY POINTS:

RISK

means the likelihood of the occurrence and the likely magnitude of the biological and economic consequences of an adverse event or effect to animal or human health.

Can you provide other examples of consequences?

Note that risk analysis builds on epidemiological definition of risk and also includes a measure of the consequences of a disease.



Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 5

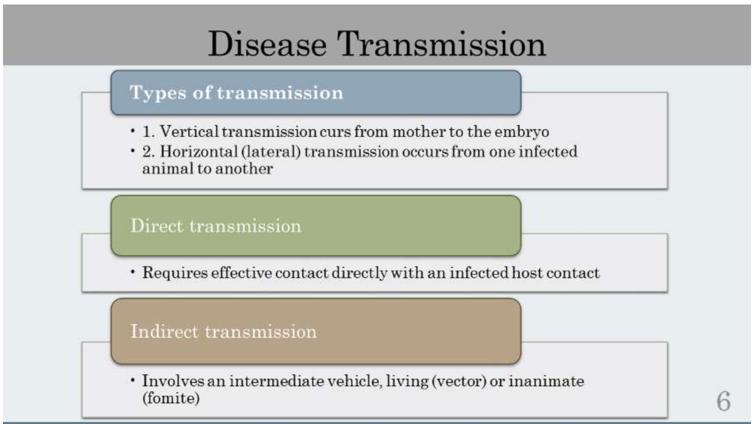
SCRIPT / KEY POINTS:

Knowledge about the life cycle of an infectious agent is important for disease control including the:

- Modes of transmission and maintenance of infection; and
- Ecological conditions that favour the survival and transmission of infectious agents.

Photo:

Image 1: Thrusfield

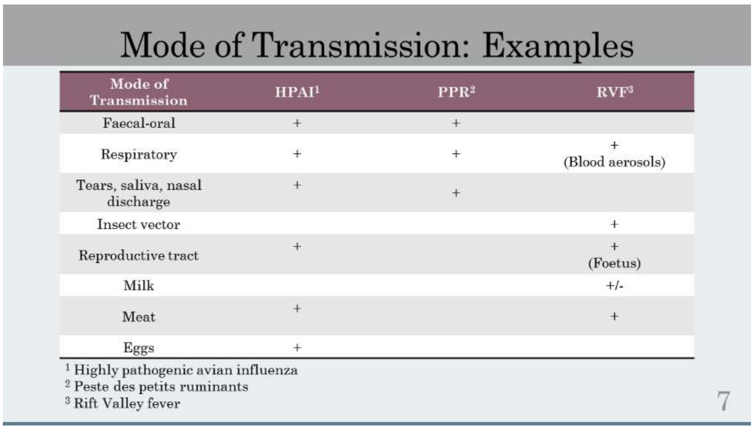


Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 6

SCRIPT / KEY POINTS:

There are two types of disease transmission, vertical and horizontal. Vertical transmission occurs through embryos and foetus from one generation to the next. Horizontal transmission occurs from infected to susceptible by direct or indirect contact.

Direct transmission occurs by physical contact with an infected host, whereas indirect contact occurs through a vector.


Mode of Transmission: Examples

Mode of Transmission	HPAI[1]	PPR[2]	RVF[3]
Faecal-oral	+	+	
Respiratory	+	+	+ (Blood aerosols)
Tears, saliva, nasal discharge	+	+	
Insect vector			+
Reproductive tract	+		+ (Foetus)
Milk			+/-
Meat	+		+
Eggs	+		

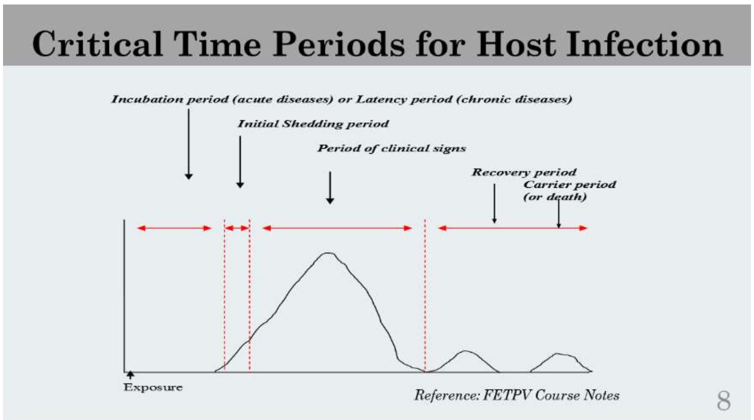
[1] Highly pathogenic avian influenza
[2] Peste des petits ruminants
[3] Rift Valley fever

7

Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences, Slide 7

SCRIPT / KEY POINTS:

The following table provides the modes of transmission for three specific viral diseases, highly pathogenic avian influenza (HPAI), peste des petits ruminants (PPR) and Rift Valley fever (RVF).



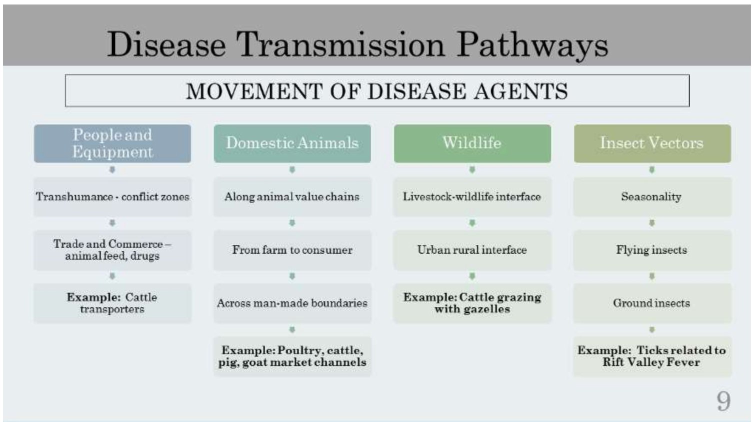
Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences, Slide 8

SCRIPT / KEY POINTS:

This graph shows the incubation, initial shedding, clinical signs and recovery period from the time of exposure for the host. These four periods represent critical times for host infection.

Photo:

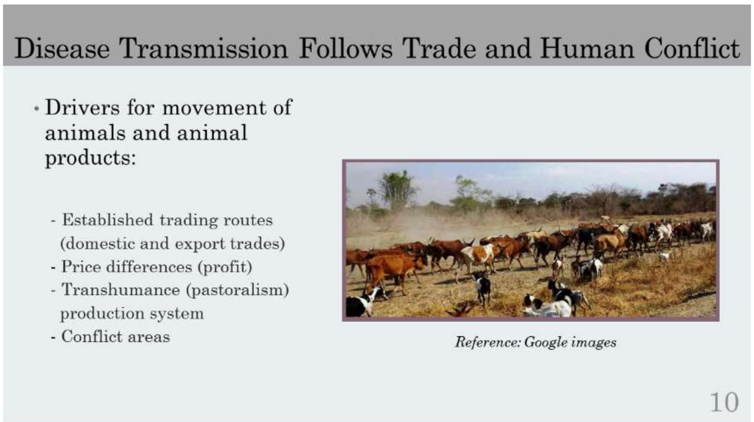
Image 1: FETPV course notes



Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 9

SCRIPT / KEY POINTS:

Read slide.



Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 10

SCRIPT / KEY POINTS:

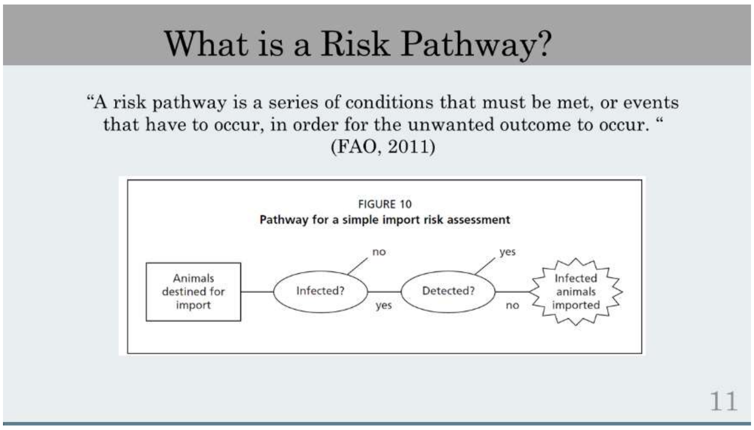
With disease transmission, the drivers for movement of animals and animal products include:

- Established trading routes from production to consumption centers;

- Price difference;
- Transhumance production system; and
- Conflict Area.

Photo:

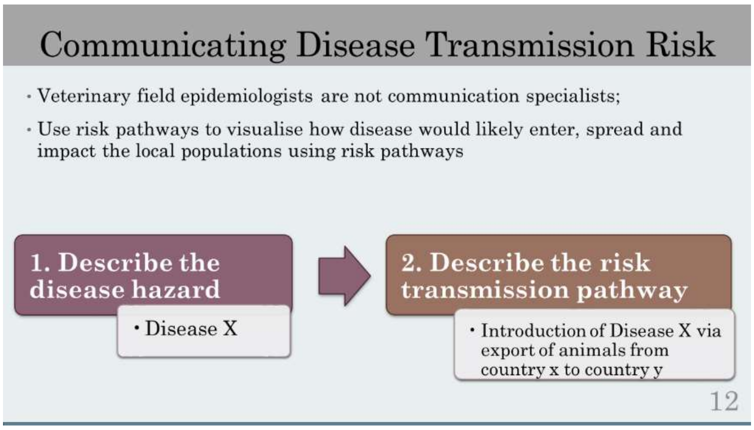
Image 1: Google



Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 11

SCRIPT / KEY POINTS:

Read slide.

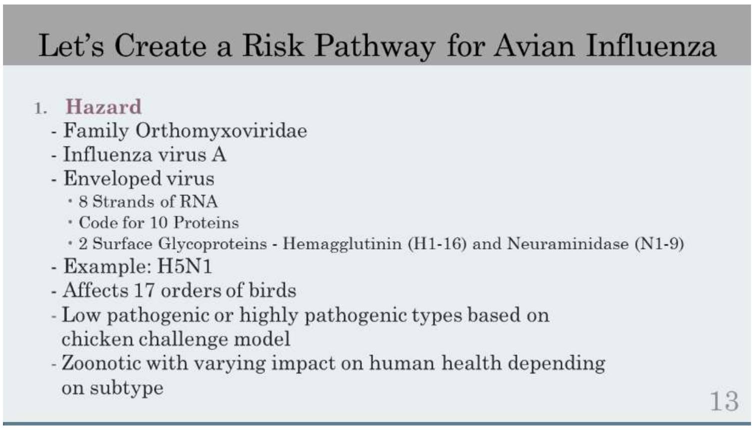


Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 12

SCRIPT / KEY POINTS:

It is critical to emphasise the importance of disease transmission risks to both technical and non-technical audiences. Use risk pathways to visualise how disease would likely enter, spread and impact the local populations using risk pathways You can use risk transmission pathways to share this information in a simplified manner in two steps:

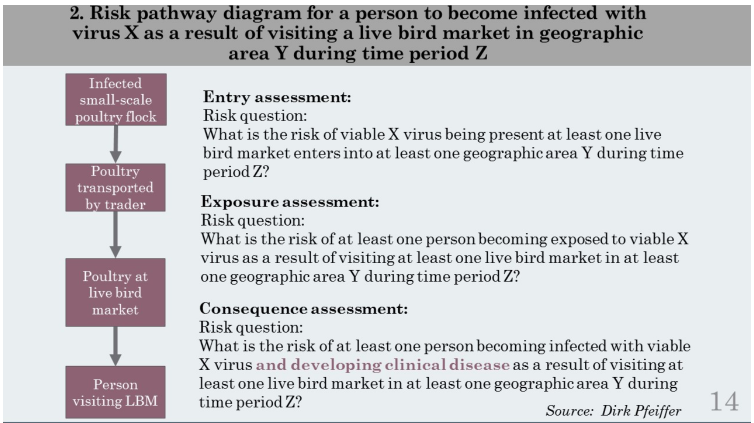
1. Describe the disease hazard
2. Describe the risk transmission pathway



Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 13

SCRIPT / KEY POINTS:

First, we define the hazard or disease that we are concerned about, especially considering its biological properties. This slide identifies a sample hazard such as avian influenza and its relevant factors and other pertinent information. For example, H5N1 affects 17 orders of birds.



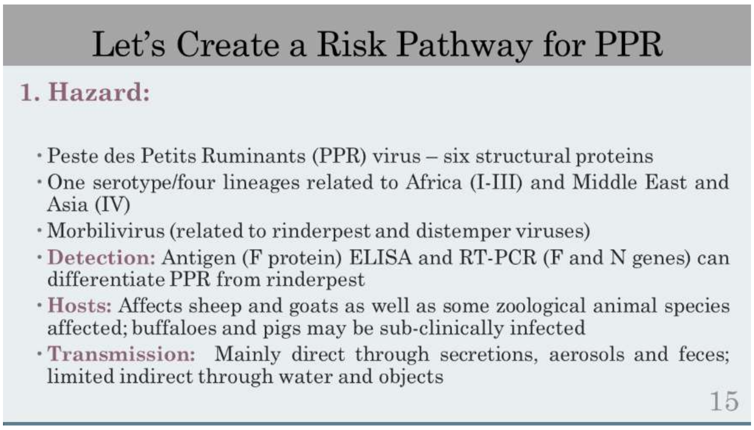
Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 14

SCRIPT / KEY POINTS:

A disease may move through a number of ways for the virus to be transmitted from the source to the destination locations.

Specific risk questions need to be addressed at each stage of movement.

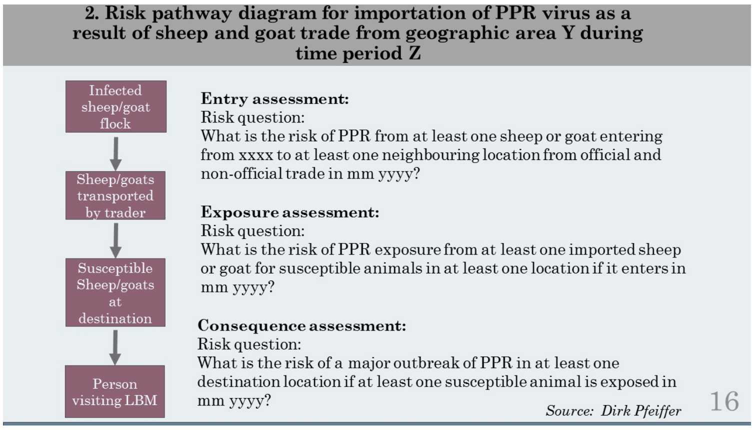
Reference: Dirk Pfeiffer



Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 15

SCRIPT / KEY POINTS:

This slide describes PPR as a hazard example. It describes methods of detection and transmission as well as susceptible hosts.

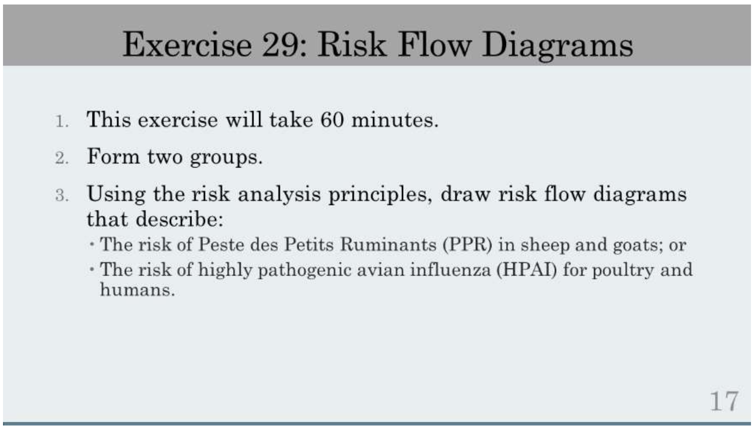


Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 16

SCRIPT / KEY POINTS:

We will now consider PPR as a disease example to frame risk assessment. It examines risk from and entry, exposure, and consequence perspective.

Reference: Dirk Pfeiffer



Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 17

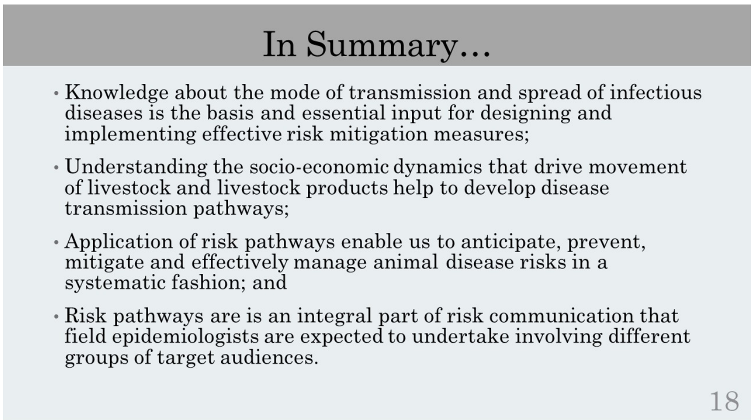
SCRIPT / KEY POINTS:

Exercise 29 instructions: Risk Flow Diagrams

- This exercise will take 60 minutes.
- Form two groups
- Using risk analysis principles, draw risk flow diagrams that describe:

The risk of PPR in sheep and goats (group 1)

Note: A pastoral flock of sheep and goat from region X regularly travels during dry season to the nearest region Y, which is a mid-altitude Area with relatively better pasture and water availability and where sheep and goat flocks graze in communal grazing and water in common watering bodies. Develop a risk pathway for possible spread of PPR from region X to region Y of country A during the dry season, which usually lasts for 2 months in region X.



Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 18

SCRIPT / KEY POINTS:

In summary,

- Knowledge about the mode of transmission and spread of infectious diseases is the basis and essential input for designing and implementing effective risk mitigation measures;
- Understanding the socio-economic dynamics that drive movement of livestock and livestock products help to develop disease transmission pathways;
- Application of risk analysis principles would enable to anticipate, prevent, mitigate and effectively manage animal disease risks in a systematic fashion; and
- Risk communication is an integral part of RA that field epidemiologists are expected to undertake involving different groups of target audiences.

Lesson 24 – Communicating Disease Transmission Risk to Diverse Audiences,
Slide 19

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 29 – Risk Flow Diagrams

Description of Exercise:

Develop risk flow diagrams for two infectious diseases. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 1 hour

Organization of Group Work:

Form into two groups.

Exercise Objective(s):

1. Describe the kinds of animal disease transmission risk.
2. Describe disease transmission risk using risk analysis principles: hazard identification, risk assessment, risk communication and risk management.

Exercise Components and Structure:

Using the risk analysis principles, draw risk flow diagrams that describe:

1. The risk of peste des petits ruminants (PPR); or
2. The risk of highly pathogenic avian influenza (HPAI) for poultry and humans.

Materials, Data or Information:

1. Microsoft Word
2. Microsoft PowerPoint

Expected Outputs and Deliverables of Each Participant:

1. Two disease risk flow diagrams.

Group 1: PPR

Scenario 1: The Risk of PPR in Sheep and Goats

A pastoral flock of sheep and goat from Region X regularly travels during dry season to the nearest Region Y, which is a mid-altitude Area with relatively better pasture and water availability and where sheep and goat flocks graze in communal grazing and water in common watering bodies. Develop a risk pathway for possible spread of PPR from Region X to Region Y of Country A during the dry season, which usually lasts for 2-months in Region X.

1. Create a risk pathway diagram for a sheep and goat population to become infected with PPR as a result of movement of live shoats from Region X to Region Y in Country A during the dry 2-months.

PPR infected flock in Region X

↓

Sheep and goat flock moves to Region Y

↓

Flock shares grazing/watering points with resident flocks in Region Y

↓

Slaughterhouse operator handles carcass

2. Develop one risk question that should be addressed for PPR when conducting the entry assessment, exposure assessment and consequence assessment.

Risk Analysis	Risk Question
Entry Assessment	What is the risk of at least one PPRv infected sheep or goat being present in at least one communal grazing/watering point in Region Y during July 2019?
Exposure Assessment	What is the risk of at least one sheep or goat becoming exposed to viable PPRv in at least one communal grazing and watering point with from Region X during July 2019?

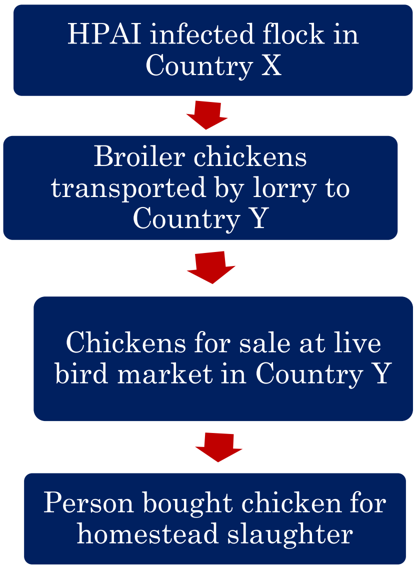
Consequence Assessment	What is the risk of at least one resident sheep or goat flock becoming infected with viable PPRv and developing clinical disease as a result of contact with flocks from Region X during July 2019?

Group 2: HPAI

Scenario 2: The Risk of HPAI for Poultry and Humans

Country X was hit by H5N8 HPAI involving 3 local area of its Region Y. As a result, the veterinary authorities imposed movement restrictions on poultry and poultry products from the affected local area and region. Despite the restriction, poultry producers smuggle, through informal markets, broilers into a neighbouring Country Z affected by political crisis. Please develop a risk transmission pathway for the likely introduction and risk of H5N8 HPAI spread to the poultry and human population of the neighbouring country through the informal trading of broiler chickens from the infected country for a period of 1 month until the situation was discovered and stopped by cooperative efforts of authorities in both countries.

1. Create a risk pathway diagram for a poultry and human population to become infected with H5N8 as a result of informal training of broiler chickens from a HPAI infected region of Country X neighbouring Country Y during time period Z.



2. Develop one risk question that should be addressed for PPR when conducting the entry assessment, exposure assessment and consequence assessment.

Risk Analysis	Risk Question
Entry Assessment	What is the risk of viable H5N8 introduced through at least one infected chicken in at least one live bird market in country Y during July 2019?
Exposure Assessment	What is the risk of at least one local broiler in at least one live bird market becoming exposed to viable H5N8 as a result of contact with at least one imported broiler from Country X during July 2019 ?
Consequence Assessment	What is the risk of at least one resident broiler in at least one live bird market becoming infected with viable H5N8 and developing clinical disease as a result of contact with at least one imported broiler from neighbouring Country X during July 2019?

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event

Estimated Lesson and Exercise Time	2 hours
Instructor Materials	Frontline ISAVET Lesson 25 Stakeholder Risk Communication Before, During and Following an Animal Disease Event.pptx
	Frontline ISAVET Lesson 25 Stakeholder Risk Communication Before, During and Following an Animal Disease Event Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	Frontline ISAVET Lesson 25 Stakeholder Risk Communication Before, During and Following an Animal Disease Event Participant Guide.PDF

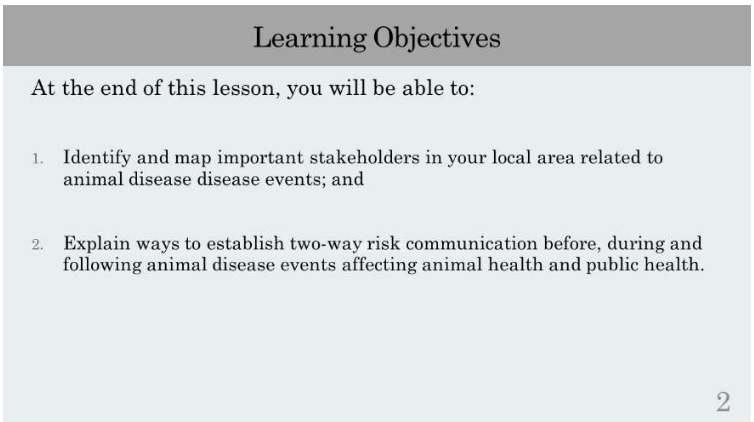
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

AU-IBAR	African Union InterAfrican Bureau for African Resources
CAHWs	Community Animal Health Workers
DAR	Directorate of Animal Resources
DVO	District Veterinary Officer
FAO	Food and Agriculture Organization of the United Nations
ISAVET	In Service Applied Veterinary Epidemiology Training
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
NARO	National Agricultural Research Organisation
NGOs	Non-governmental Organisations
OH	One Health
OIE	World Organisation for Animal Health
UVA	Uganda Veterinary Association
WHO	World Health Organization
ZDCO	Zoonotic Disease Coordination Office

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 25 titled, "Stakeholder Communication Before, During and Following an Animal Disease Event". In this lesson, we will learn methods of promoting two-way communication among important stakeholders.

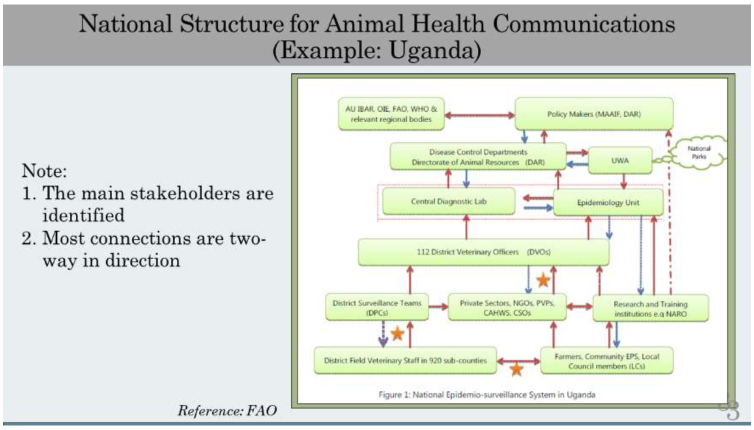


Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

1. Identify important stakeholders in your local area; and
2. Explain ways to establish two-way communication before, during and following animal disease events affecting animal health and public health.

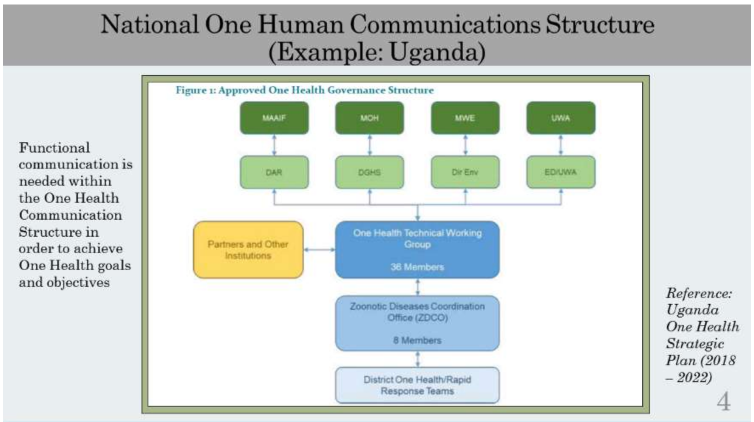


Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 3

SCRIPT / KEY POINTS:

This slide illustrates the national structure for animal health communications in Uganda. This organogram demonstrates 1) the main stakeholders for Animal Health Communication; and 2) that communication is in two directions

Reference: FAO



Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 4

SCRIPT / KEY POINTS:

This slide illustrates the National One Health communications structure. Functional communication is needed within the One Health Communication Structure in order to achieve One Health goals and objectives

Reference: Uganda One Health Strategic Plan (2018 – 2022)

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 5

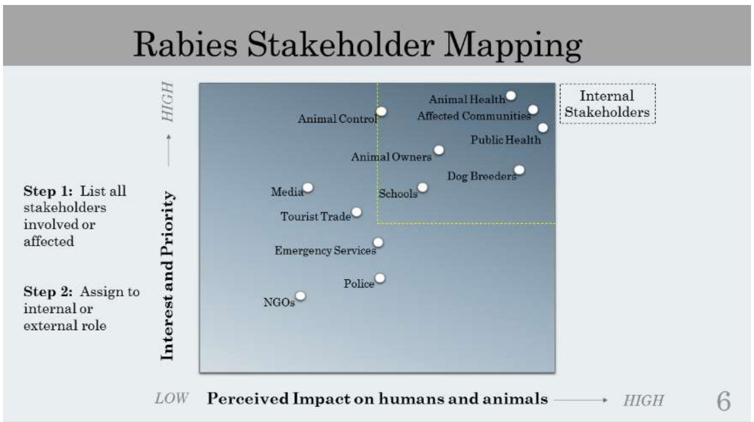
SCRIPT / KEY POINTS:

Who is involved in communications during an animal disease event? Specific people who are players in communication chains could include, but are not limited to, local area offices, the community, government, collaborators and partners.

Can you identify who should help with stakeholder communication in an animal disease event?

Photo:

Image 1: Google



Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 6

SCRIPT / KEY POINTS:

Follow this process for stakeholder mapping:

Step 1: List all stakeholders involved or affected about the disease

Step 2: Assign to internal or external role based on their perception of the impact of rabies on humans and animals as well as the interest and priority they assign to rabies.

INTERNAL:

Affected Community, Schools

Public Health

Animal Health

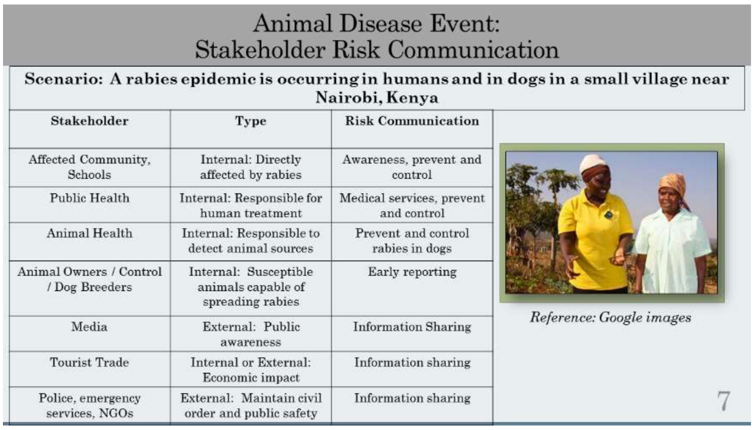
Animal Owners/Control/ Dog Breeders

EXTERNAL:

Media

Tourist Trade

Police, emergency services, NGOs



Stakeholder	Type	Risk Communication
Affected Community, Schools	Internal: Directly affected by rabies	Awareness, prevent and control
Public Health	Internal: Responsible for human treatment	Medical services, prevent and control
Animal Health	Internal: Responsible to detect animal sources	Prevent and control rabies in dogs
Animal Owners / Control / Dog Breeders	Internal: Susceptible animals capable of spreading rabies	Early reporting
Media	External: Public awareness	Information Sharing
Tourist Trade	Internal or External: Economic impact	Information sharing
Police, emergency services, NGOs	External: Maintain civil order and public safety	Information sharing

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 7

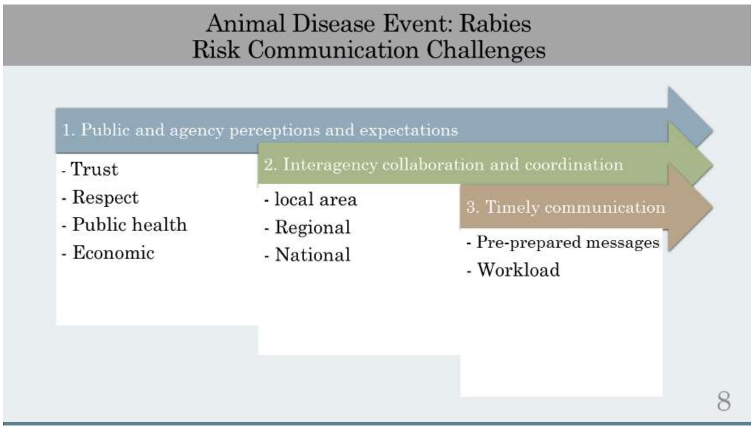
SCRIPT / KEY POINTS:

Who is involved in communications during an animal disease event? Specific people who are players in communication chains could include, but are not limited to, local area offices, the community, government, collaborators and partners.

Can you identify who should help with stakeholder communication in an animal disease event?

Photo:

Image 1: Google



Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 8

SCRIPT / KEY POINTS:

There are many challenges that can occur during an animal disease outbreak. These include public perception and expectations. Trust and respect must be built within the community. Transparency of public health issues and/or economic issues of specific transboundary and/or zoonotic diseases will build trust. Coordination should occur at the local area, regional, and national level among multiple agencies depending on the animal disease event that is occurring. Finally, another challenge is just the time and effort or workload of field staff who have to communicate specific messages to different stakeholder types.

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 9

SCRIPT / KEY POINTS:

The following slide illustrates some best practices for communicating with stakeholder audiences. This list is not exhaustive.

It is important to communicate in ways that will build, maintain, or restore trust. It is best to communicate early. If government veterinary officials are concerned, the public should be notified. Transparent communication should be complete, accurate and easily understood. Finally, it is important to listen to the concerns of your community.

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 10

SCRIPT / KEY POINTS:

Building trust: Do not be part of the problem. Apply patience where necessary. Be decisive on what is right and sensitive to cultural norms and practices. All approaches to building trust should be all inclusive and not exclusive.

Photo:

Image 1: Google

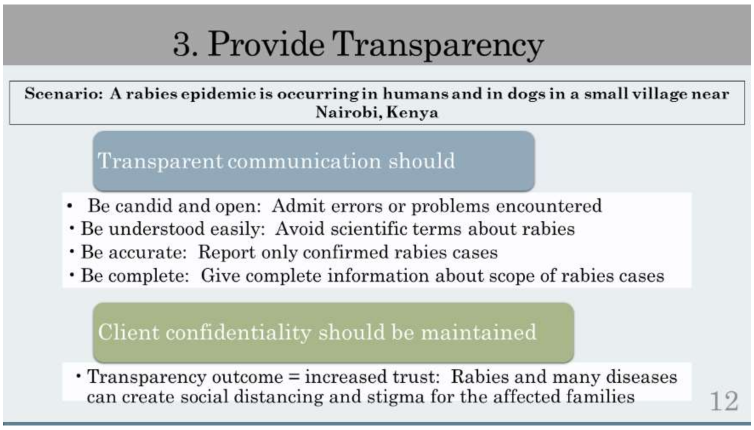
Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 11

SCRIPT / KEY POINTS:

When communicating with different groups, only discuss what you “know”. This will be important as you move forward during an animal disease event. In addition, you will want to dispel any wrong information that could be circulating within a community.

Photo:

Image 1: Makerere University



Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 12

SCRIPT / KEY POINTS:

The third best practice is to provide transparency. Transparent communication should be open, easily understandable, accurate and complete. It is important to maintain client confidentiality before, during and after an animal disease event.

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 13

SCRIPT / KEY POINTS:

Dialogue is important – try to be attentive and to respond to both positive and negative issues that arise.

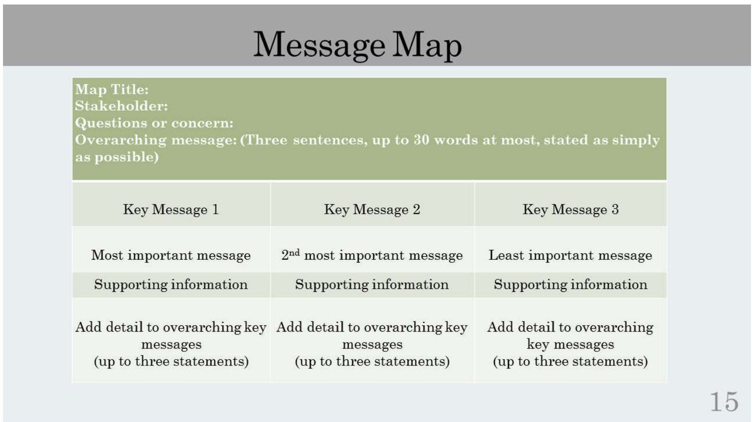
Photo:

Image 1: Google

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 14

SCRIPT / KEY POINTS:

Next, lets discuss developing messages. It is important to crease clear and concise messages to each stakeholder audience, no matter if it is before, during or after a disease outbreak. We will conduct an activity to develop a message map. A message map includes three key messages and supporting statements that you can use when talking with each stakeholder audience. Messages should be concise and brief, no more than 30 words. They should be understandable. Tailor them to the audience level. When developing messages, use positive terms.



Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 15

SCRIPT / KEY POINTS:

The following table illustrates a message map. It includes the stakeholder, the question you want to address and the overarching message you want communicated with that specific stakeholder. The first message is your most important message to that stakeholder. The 3rd message is the least important message. Brief supporting information is included for each key message in the message map.

Message Map: During a Rabies Outbreak in Village X near Nairobi, Kenya

Map Title: Rabies In Village X, near Niarobi
Stakeholder: Dog Owners
Questions or concern: What is the risk of rabies for my dog to my family during an outbreak?
Overarching message: Rabies is a fatal disease of humans and other mammals that is transmitted through the saliva of infected animals

Key Message 1	Key Message 2	Key Message 3
Rabies is fatal disease and has been confirmed in the village	Dogs and other mammals transmit rabies virus when symptoms appear	Rabies can be prevented by regular vaccination of humans and animals
Confirmed positive cases 2 humans and 1 dog are reported	Infected persons or animals carry rabies virus from 10 days to over 12 months before signs of the disease appear	In rabies endemic countries, domestic animals and humans working with animals require vaccination.
1. Mortality in humans is 100% if not treated early 2. There is no treatment for rabies in dogs 3. Report all animal bites	1. Rabies virus is transmitted via saliva to open wounds or mucous membranes 2. Report behavior changes in animals: dumb and furious forms	1. Rabies is preventable 2. Domestic animals in rabies endemic countries require an annual vaccination

16

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 16

SCRIPT / KEY POINTS:

The following table illustrates a message map. It includes the stakeholder, the question you want to address and the overarching message you want communicated with that specific stakeholder. The first message is your most important message to that stakeholder. The 3rd message is the least important message. Brief supporting information is included for each key message in the message map.

Example: Before the LPAI H7N9 Outbreak

Map Title: Luwero Local Area Before
Stakeholder: Poultry Farmers
Questions or concern: What is LPAI H7N9 and why should we be prepared?
Overarching message: 1. AI infects domestic and wild birds; 2) Humans can become infected; 3) Good farm biosecurity measures prevent infection.

Key Message 1	Key Message 2	Key Message 3
LPAI H7N9 is an influenza virus that may become established.	**LPAI H7N9 poses a serious threat to human health.**	**Good market biosecurity measures can prevent infection**
- The virus has been detected in a neighboring country. - Brisk cross-border trade increases the chances of infected birds entering the country.	- LPAI H7N9 poses a serious public health threat because infected poultry can pass the virus to human beings and cause serious disease and death.	- The country has a good chance of preventing or mitigating the effects of an incursion by systematically planning and preparing its response.
- LPAI H7N9 spreads rapidly among chicken ducks without causing sickness - Fear of LPAI H7N9 can cause panic and reducing demand for poultry, causing economic losses to the poultry industry.	- Market managers should be trained to explain the facts about LPAI H7N9 to vendors, traders, suppliers, transporters and slaughterers.	- Key poultry markets and collection points with poultry should be closed once or twice a month for cleaning and disinfection.

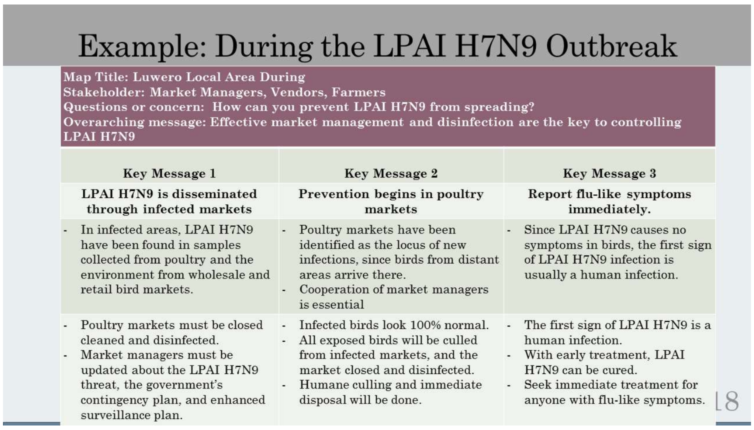
17

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 17

SCRIPT / KEY POINTS:

The following table provides an example of a message map for LPAI H7N9 virus. The stakeholder this message map is addressing is the farmer. We want to relate information on LPAI H7N9 virus. For the farmer, we have developed the following three key messages with supporting information.

Review the slide example.

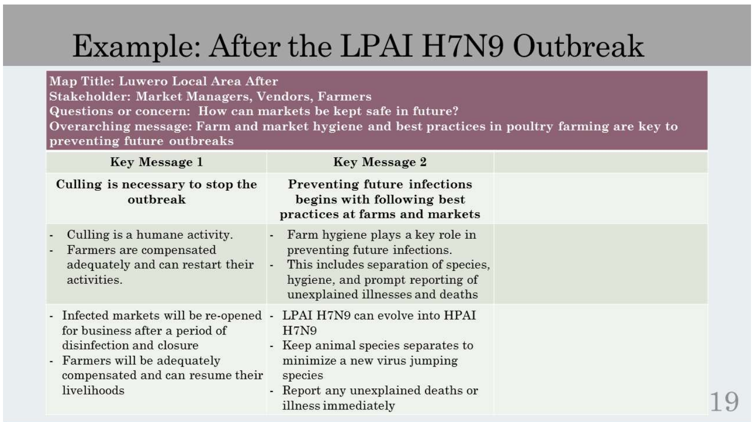


Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 18

SCRIPT / KEY POINTS:

The following table provides an example of a message map for LPAI H7N9 virus. The stakeholder this message map is addressing is the farmer. We want to relate information on LPAI H7N9 virus. For the farmer, we have developed the following three key messages with supporting information.

Review the slide example.

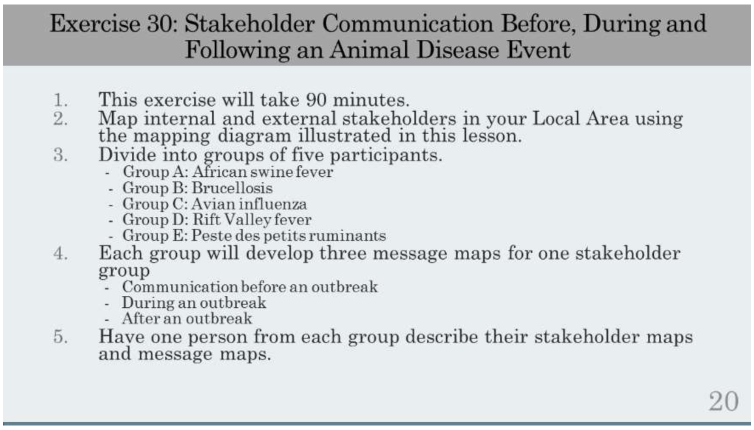


Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 19

SCRIPT / KEY POINTS:

The following table provides an example of a message map for exotic LPAI H7N9 virus. The stakeholder this message map is addressing is the farmer. We want to relate information on LPAI H7N9 virus. For the farmer, we have developed the following three key messages with supporting information.

Review the slide example.



Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 20

SCRIPT / KEY POINTS:

Exercise 30 instructions: Stakeholder Communication Before, During, and Following an Animal Disease Event

- This exercise will take 90 minutes.
- Make a list of important stakeholders in your local area under the categories noted in the lesson.
- Divide into groups of five participants.

Group A: African seine fever

Group B: Brucellosis

Group C: Avian influenza

Group D: Rift valley fever

Group E: Peste des petits ruminants

- Develop three message maps.

Communicate before an outbreak

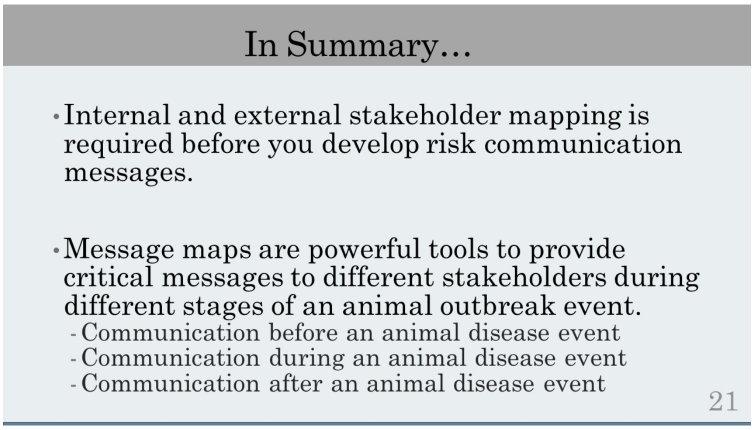
During an outbreak

After an outbreak

- Have one person from each group describe their message maps for each stakeholder group.

Instructors:

- See instructor manual for answers.



Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 21

SCRIPT / KEY POINTS:

In summary, it is important to communicate in ways that will build, maintain, or restore trust. It is best to communicate early. If government veterinary officials are concerned, the public should be notified. Transparent communication should be complete, accurate and easily understood. Finally, it is important to listen to the concerns of your community.

Message maps are powerful tools to provide critical messages to different stakeholders during different situations

- Communication before an animal disease event
- Communication during an animal disease event
- Communication after an animal disease event

Lesson 25 – Stakeholder Risk Communication Before, During and Following an Animal Disease Event, Slide 22

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa. Are there any questions?

Exercise 30 – Stakeholder Communication Before, During and Following an Animal Disease Event

Description of Exercise:

Develop a message map for a specific disease and identify a list of important stakeholders in your local area for communication of your messages. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Allotted Time: 1 hour and 30 minutes

Organisation of Group Work:

Divide into group of five participants -

- Group A: African swine fever
- Group B: Brucellosis
- Group C: Avian influenza
- Group D: Rift Valley fever
- Group E: Peste des petits ruminants

Exercise Objective(s):

1. Make a list of important stakeholders in your local area under the categories noted in the lecture.

2. Explain how communication differs before, during and following animal disease events.

Exercise Components and Structure:

1. Each group should develop three message maps for each stakeholder group.
2. Each message map should be tailored for each disease regarding communication before an outbreak, during an outbreak, and after an outbreak.
3. Have one person from each group describe their message maps to the entire group.

Materials, Data or Information:

1. MS Word

2. MS PowerPoint

Expected Outputs and Deliverables of Each Participant:

1. Inventory of local area stakeholders.

1. Identify a list of important stakeholders in your local area.

Category	Group or Name
Government personnel	Answers will vary by group and disease.
External audiences	Answers will vary by group and disease.
Collaborators and partners	Answers will vary by group and disease.
NGOs	Answers will vary by group and disease.
Media	Answers will vary by group and disease.

2. For your group, develop your message map over communication of your specific assigned disease topic before an outbreak.

   Answers will vary by group and disease for the stakeholder they are developing the message map for.

Message Map Title:____
Stakeholder:____
Questions of concern:____
Overarching message:____

Key Message 1	Key Message 2	Key Message 3
Supporting information	**Supporting Information**	**Supporting Information**
1.1:	2.1:	3.1:
1.2:	2.2:	3.2:
1.3:	2.3:	3.3:

3. For your group, develop your message map over communication of your specific assigned disease topic during an outbreak.

   Answers will vary by group and disease for the stakeholder they are developing the message map for.

Message Map Title:____
Stakeholder:____
Questions of concern:_____________________________________
Overarching message:_____________________________________

Key Message 1	Key Message 2	Key Message 3
Supporting information	**Supporting Information**	**Supporting Information**
1.1: __________	2.1: __________	3.1: __________
1.2: __________	2.2: __________	3.2: __________
1.3: __________	2.3: __________	3.3: __________

4. For your group, develop your message map over communication of your specific assigned disease topic after an outbreak.

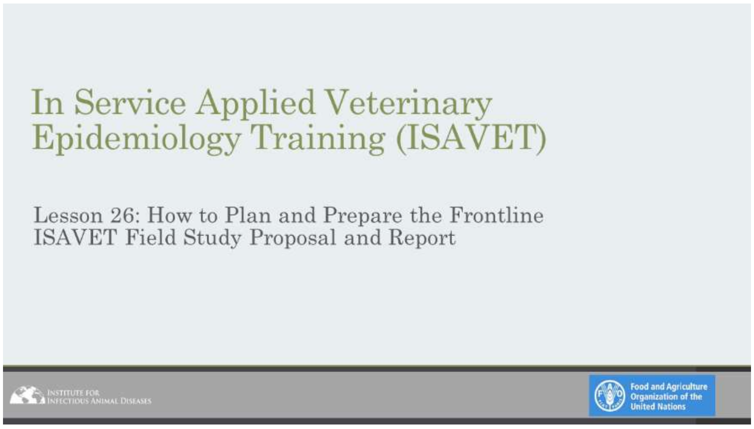
Answers will vary by group and disease for the stakeholder they are developing the message map for.

Message Map Title:____
Stakeholder:____
Questions of concern:______________________________________
Overarching message:______________________________________

Key Message 1	Key Message 2	Key Message 3
Supporting information	**Supporting Information**	**Supporting Information**
1.1: __________	2.1: __________	3.1: __________
1.2: __________	2.2: __________	3.2: __________
1.3: __________	2.3: __________	3.3: __________

Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report

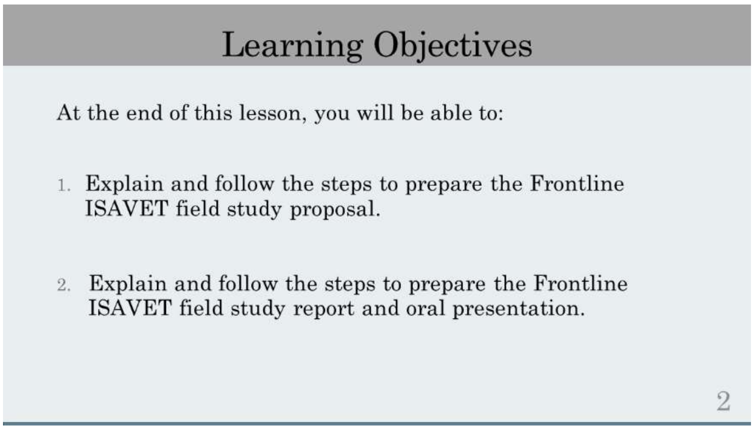
Estimated Lesson and Exercise Time	2 hours
Instructor Materials	ISAVET Lesson 26 How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report.pptx
	ISAVET Lesson 26 How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 26 Written and Oral Reports for Technical and Non-technical Audiences Participant Guide.PDF



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 26 titled, "How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report".

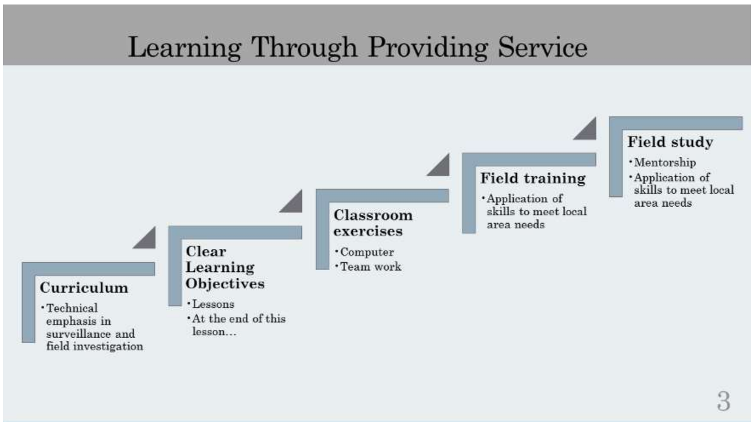


Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

1. Explain and follow the steps to prepare the Frontline ISAVET field study proposal.
2. Explain and follow the steps to prepare the Frontline ISAVET field study report and oral presentation.



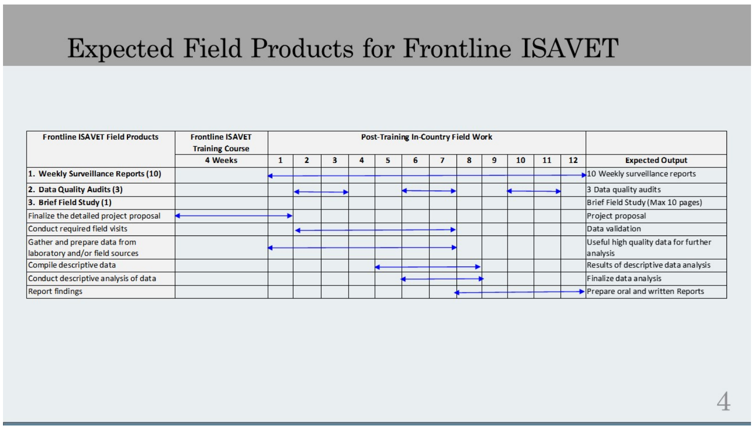
Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 3

SCRIPT / KEY POINTS:

Frontline ISAVET seeks to link the trainee's need for applied learning with the institutional needs to address the most pressing animal health and disease issues. Through this approach, the output of the field study will serve as an advocacy tool for administrative officials and decision makers to see the important contributions that applied field epidemiology training can make at local area and national levels.

The training is based on a curriculum with clear learning objectives that includes classroom lessons and exercises, field training and a field study in the home country.

Frontline ISAVET training is the first step to lifelong learning to improve pathogen detection, descriptive epidemiological analysis, response and decision making.



Frontline ISAVET Field Products	Frontline ISAVET Training Course	Post-Training In-Country Field Work												
	4 Weeks	1	2	3	4	5	6	7	8	9	10	11	12	Expected Output
1. Weekly Surveillance Reports (10)														10 Weekly surveillance reports
2. Data Quality Audits (3)														3 Data quality audits
3. Brief Field Study (1)														Brief Field Study (Max 10 pages)
Finalize the detailed project proposal														Project proposal
Conduct required field visits														Data validation
Gather and prepare data from laboratory and/or field sources														Useful high quality data for further analysis
Compile descriptive data														Results of descriptive data analysis
Conduct descriptive analysis of data														Finalize data analysis
Report findings														Prepare oral and written Reports

Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report, Slide

SCRIPT / KEY POINTS:

There are three required field products for Frontline ISAVET trainees to complete during the 12 weeks of in country field activities as follows:

Conduct <u>Two</u> Data Exercises: COMPULSORY

Weekly surveillance reports and systematic disease monitoring;

Data Quality Audits at the animal health office level (summarize findings through a SWOT Analysis or Problem Analysis using a Fishbone Diagram to produce a brief report e.g. case definition).

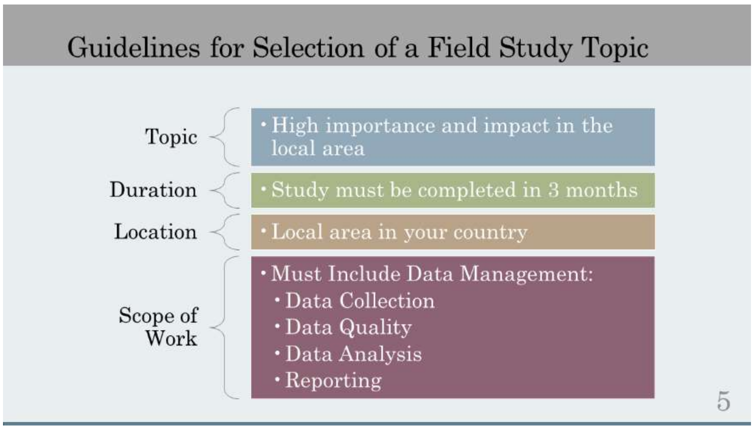
Conduct <u>One</u> Brief Field Study (maximum of 10 pages in length): COMPULSORY

Field or Outbreak investigation;

Survey or KAP study;

Secondary data analysis;

Other, including value chain mapping and risk pathway analysis.

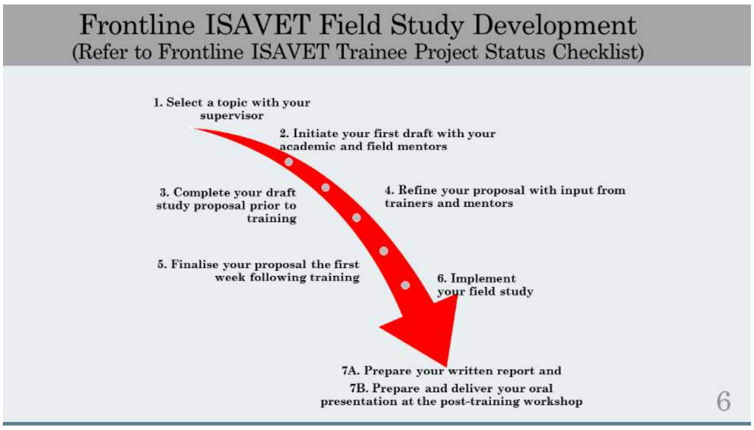


Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 5

SCRIPT / KEY POINTS:

The field study reflects the skills that you have gained through the Frontline ISAVET training and extends your learning further under mentorship.

The field study must reflect the need of the local Area, must be completed in 3 months and must include the application of data collection, data quality audit, data analysis and reporting.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 6

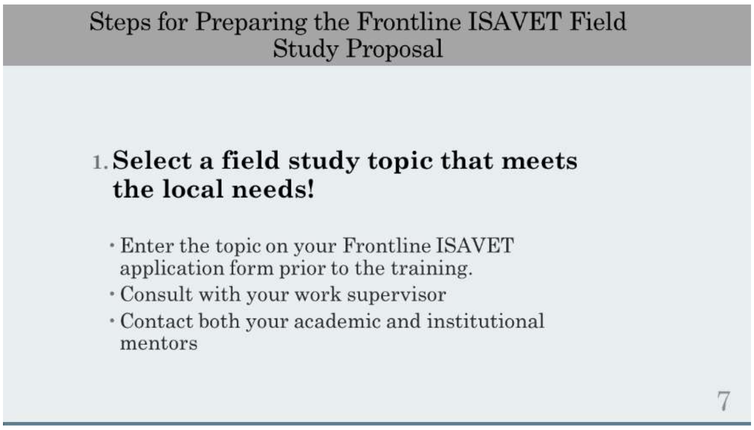
SCRIPT / KEY POINTS:

The initial steps in developing your field study proposal follows:

1. Select a topic with your supervisor
2. Contact your mentors
3. Draft your study proposal prior to training
4. Refine your proposal with input from trainers and mentors
5. Finalise your proposal the first week following training

6. Implement your field study

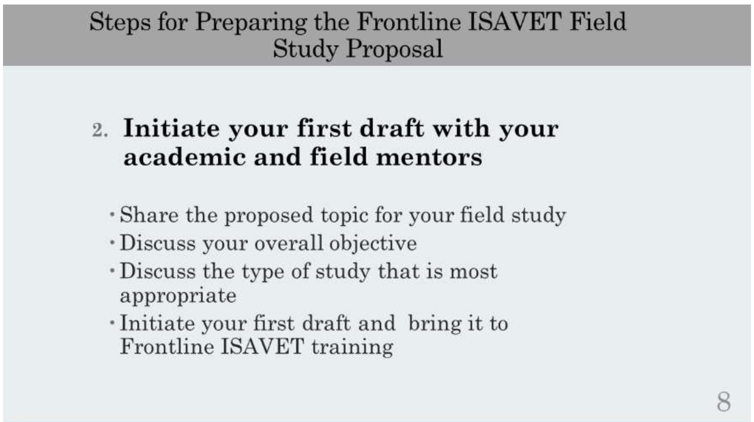
Development of the field study is based upon the Frontline ISAVET Trainee Project Status Checklist that is provided to you.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 7

SCRIPT / KEY POINTS:

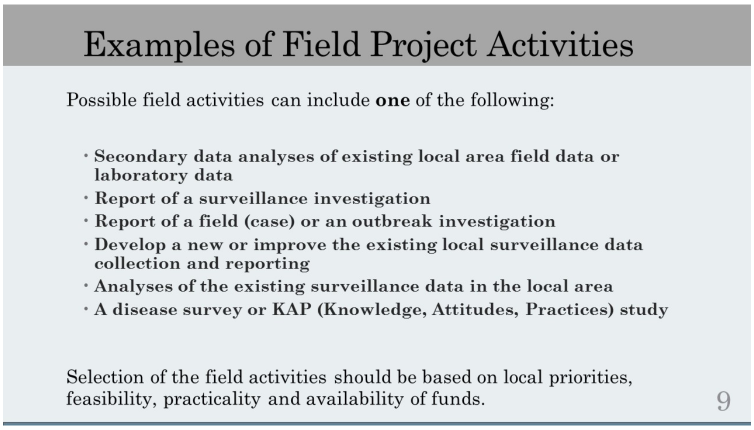
When you complete the application form for Frontline ISAVET you must indicate a topic of great importance in your local area in consultation with your work supervisor.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 8

SCRIPT / KEY POINTS:

It is then time to share your ideas including the overall objective with your academic and institutional mentors who will help you to determine the type of study that will meet your objective. The academic mentor will provide advice on technical matters in epidemiology while the institutional mentor can assist you to design a realistic and achievable study that you can complete during the 3 month field study period.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 9

SCRIPT / KEY POINTS:

The type of field study you can choose from are related to:

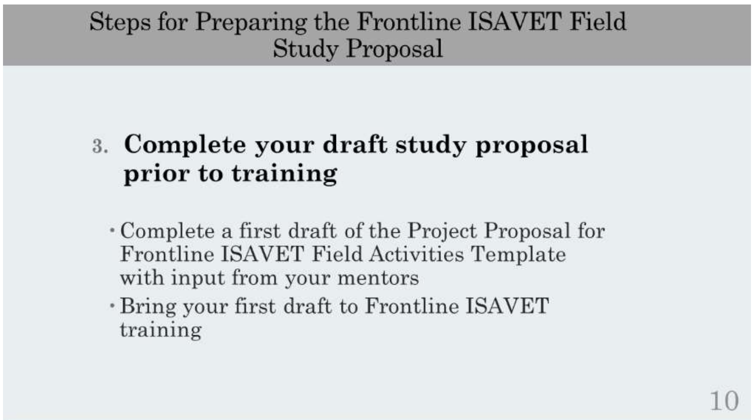
Surveillance: primary or secondary data; evaluation or establishment of local area surveillance

Surveys: primary or secondary data including seroprevalence surveys

KAP (knowledge, attitudes, practices) studies

Field (case) investigations: case study or case series

Outbreak investigations: formal outbreak investigation



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 10

SCRIPT / KEY POINTS:

Then, it is time to prepare a first draft and bring it with you to Frontline ISAVET training.

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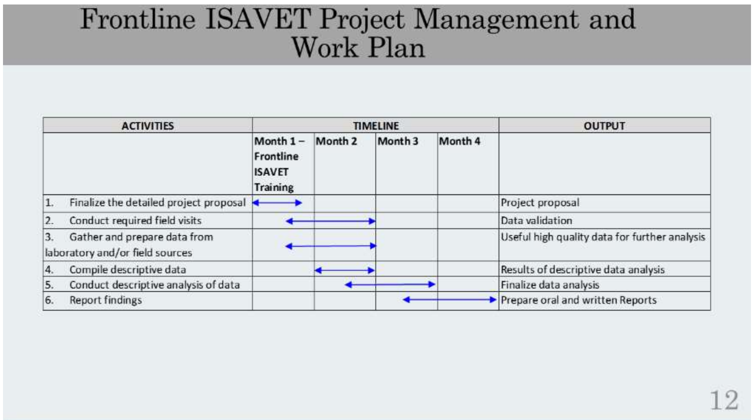
Slide 11

SCRIPT / KEY POINTS:

When you arrive for Frontline ISAVET training, you will meet with trainers to refine your proposal. Then you can share the revised versions with your mentors back home to also get their advice and approval.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 12

SCRIPT / KEY POINTS:

Please note that funding for field projects is not available through FAO at this time. However you are free to explore funding opportunities in your country before you arrive for training.

Make sure to complete a work plan how you can accomplish each part of your field study during the allotted time including:

1. Finalize the detailed project proposal
2. Conduct required field visits
3. Gather and prepare data from laboratory and/or field sources
4. Compile descriptive data
5. Conduct descriptive analysis of data
6. Report findings

1. Finalize the detailed project proposal
2. Conduct required field visits
3. Gather and prepare data from laboratory and/or field sources
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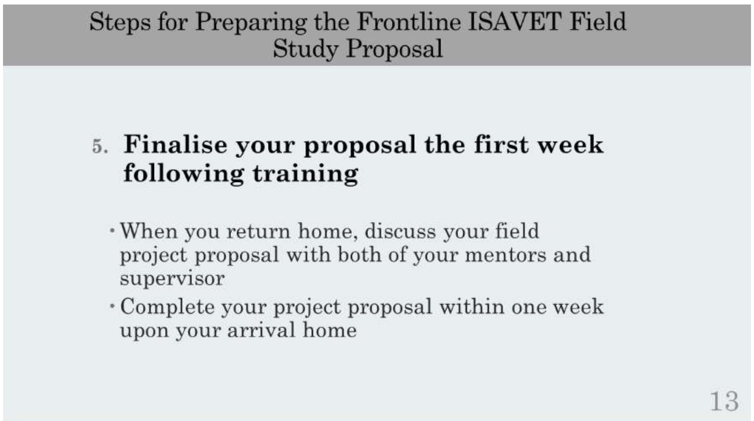
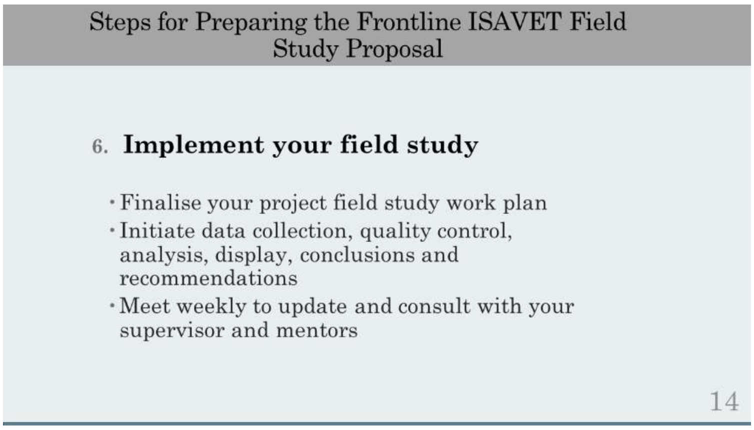


Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 13

SCRIPT / KEY POINTS:

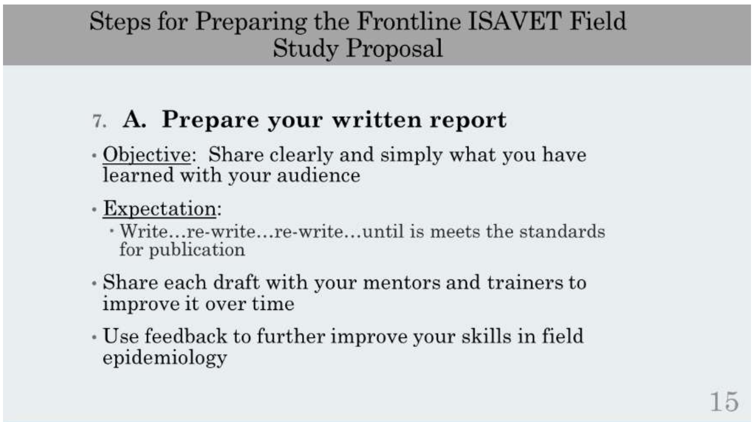
When you complete the Frontline ISAVET training, you should finalise the final draft of your project proposal within one week.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 14

SCRIPT / KEY POINTS:

Keep in touch with your mentors at least weekly until the project including the report has been completed. Contact your mentors, FAO coordinator or Frontline ISAVET trainers know if you require assistance or advice.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 15

SCRIPT / KEY POINTS:

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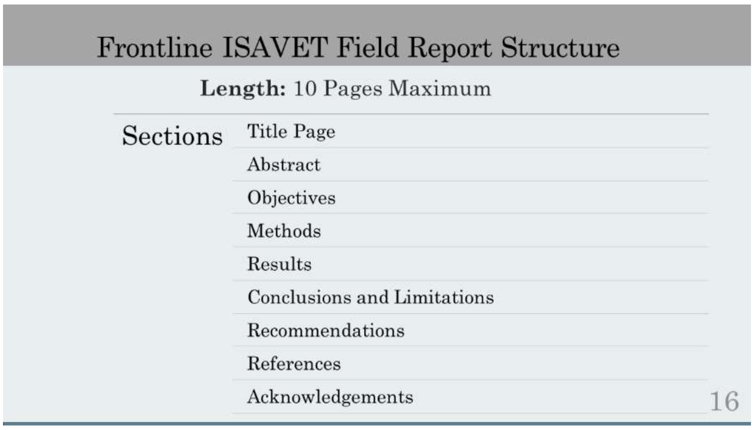

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Slide 16

SCRIPT / KEY POINTS:

A report is a methodical, well-organised document that defines and analyses a certain issue or a problem to provide information to its readers. Good reports are formatted in sections that keep ideas organised and help the reader absorb the information meant to be conveyed. Key report components include:

Title Page

Abstract

Objectives

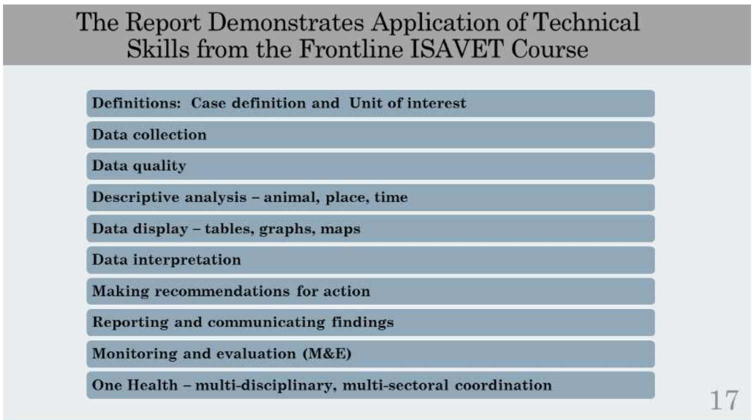
Methods

Results

Conclusions and Limitations

Recommendations

Acknowledgements



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
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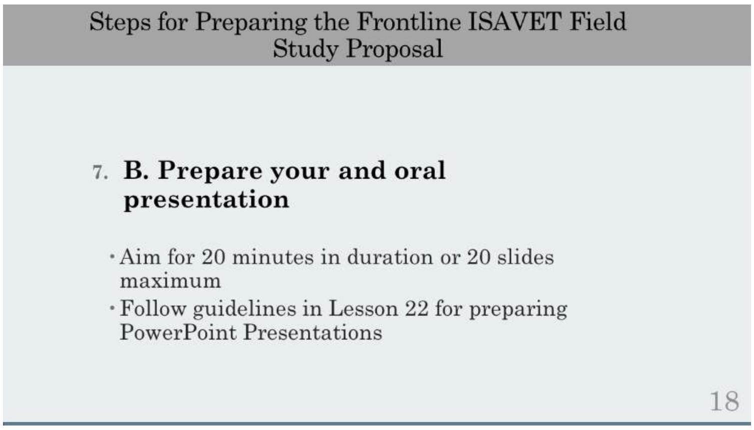
SCRIPT / KEY POINTS:

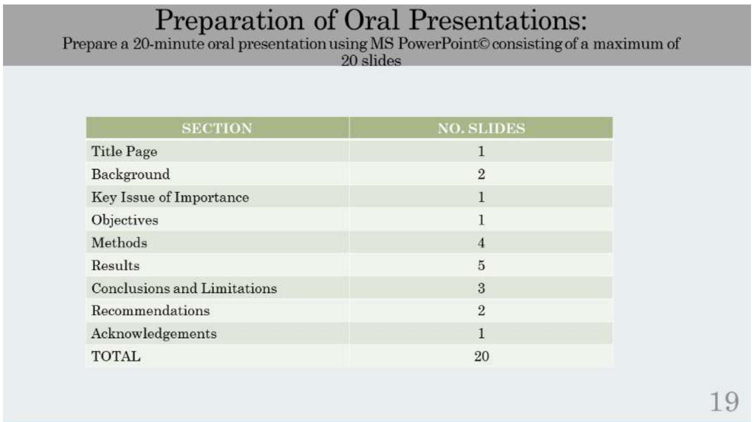
Apply the technical skills taught in Frontline ISAVET are applied in the three month field study. Trainers, mentors and trainees must all understand and all work together to make sure that these skills are truly applied to advance your knowledge and ability to fully describe epidemiological events that support evidence-based decisions.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 18

SCRIPT / KEY POINTS:

Keep in touch with your mentors at least weekly until the project including the report has been completed. Contact your mentors, FAO coordinator or Frontline ISAVET trainers know if you require assistance or advice.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
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SCRIPT / KEY POINTS:

Select the most important points to include in your brief but meaningful presentation:

The title should summarise the scope of the study in terms of animal-place and time.

The background should provide the context for the study historically and in the present time.

Explain the main issue the study needs to deal with.

Briefly state 1-3 objectives of the study.

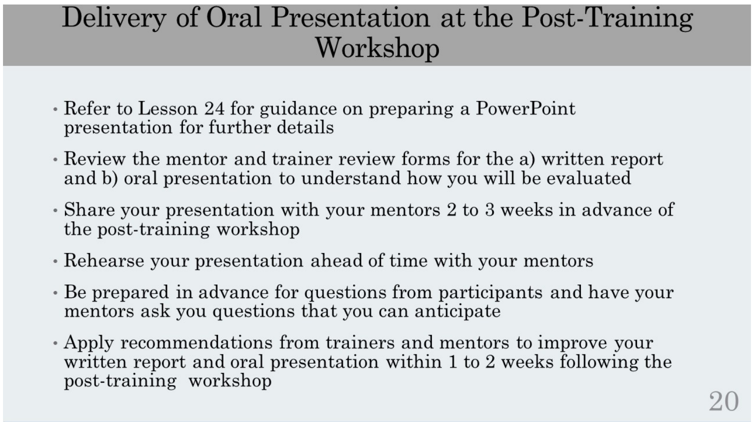
Carefully describe the methods used to achieve the objectives and include a case definition and the unit of interest. Also describe how you will assess data quality and analyse animal-place-time elements. Include any evaluation of the surveillance system.

Select and describe the most important descriptive results including temporal and spatial distribution as well as measures of disease impact.

Present the main limitations of the study and its main conclusions including the interpretation of the results.

Propose specific, measurable, achievable, realistic and timebound recommendations based only on the results and interpretation of of your data.

Acknowledge all those who have make significant contributions to your study.



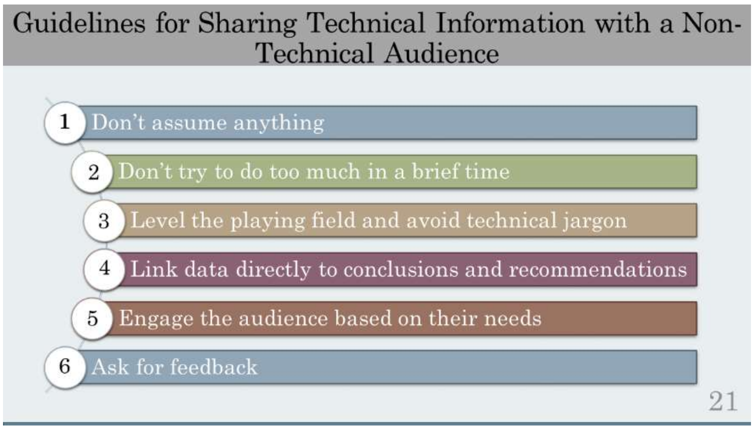
Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 20

SCRIPT / KEY POINTS:

Good communication skills are essential in delivery of technical information. These skills are complex, but can be developed and improved over many years.

There is need to:

Describe the audience: readers or attendees at conference. Describe the technical background that you expect the audience to have. Simple when everyone has the same background, more complex when the audience is mixed (i.e. some audience members know this, others know that, some are interested in this, some are more interested in that). Make a list of the concepts that you assume the audience is already familiar with, and a list of the concepts you have to introduce/explain in your writing. Describe the main points to convey in the paper/presentation i.e What Area of research are you discussing? (What is the general topic of your talk?) Why should anyone care about this Area of research? Provide motivation.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 21

SCRIPT / KEY POINTS:

Don't assume anything. Don't assume that your audience has some basic technical knowledge and avoid the use of technical jargon.

Don't try to do too much. Be realistic in how far you can move your audience in one session. You may need to hold regular meetings and plan a strategy for how information will unfold. Sometimes you may feel you're only making incremental progress, but to those who are unfamiliar with the subject, it may feel like an earthquake.

Meet them where they live. Your non-technical audience is going to be much more receptive to your information if they understand how it will help them do their jobs better or easier. Do your homework beforehand so you have a good picture of the hassles and headaches of attendees – then draft a presentation to specifically explain how this technology is the answer. Try to use many of the terms they may use in their everyday work so they feel more comfortable with the information being presented.

Level the playing field. Non-technical people may believe they're being talked down to when technical personnel present new information. That's why it's important to break the ice by letting your audience know that while you have technical expertise, you have no clue how to drive a forklift or how to deal with an angry customer. Those are the things they're good at, and you have respect for what they do. Let them know that you're there simply to help them understand technology better. Just because they're unfamiliar with technology does not mean they're stupid.

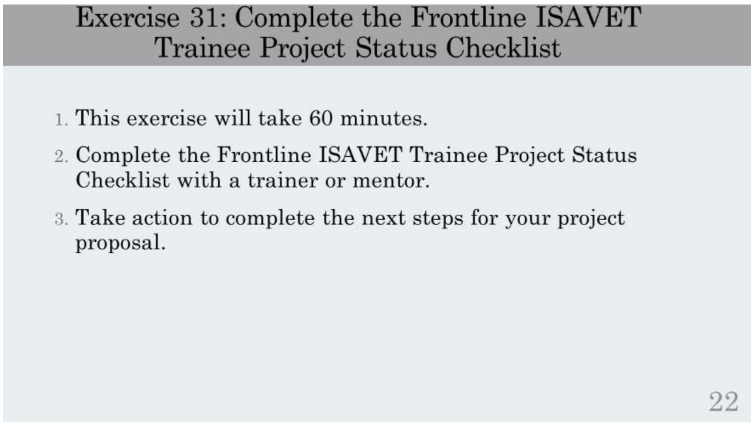
Link data directly to conclusions and recommendations. While data may be a head rush for you, the non-technical person is going to be less bothered by a bunch of statistics and random facts. Try to only include numbers if you can directly link them to something they need to know.

Pilot test your presentation before you deliver it to your intended audience. Ask a non-technical employee to sit through a dry-run of your presentation or training. Then, ask for an honest assessment (it helps to select someone who is outgoing and articulate). What went right? What went wrong? Where can you make improvements before unveiling it to a group? This non-technical person also can later provide a testimonial to the rest of the group, underscoring the value of the information and training you will be providing.

Engage them on all levels. While it's tempting to use technical slides full of charts and graphs, try to steer away from those in your presentation. Look for visuals that illustrate your point, such as photos from a field outbreak investigation. Many people are visual learners, so think of providing a diagram that shows how the new system will operate and eliminate inefficient practices.

Ask for feedback. People may be shy about asking questions, feeling like they're "dumb" questions. Provide multiple ways for people to meet with you or contact you, until they feel more comfortable asking the questions in a group. Assure them that your job is to teach them, not judge them.

Finally, to get inspired and give a more dynamic presentation or training session, try watching online promotions for high-tech equipment and how information is communicated, TV ads.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 22

SCRIPT / KEY POINTS:

Exercise 31 instructions: Technical Reports

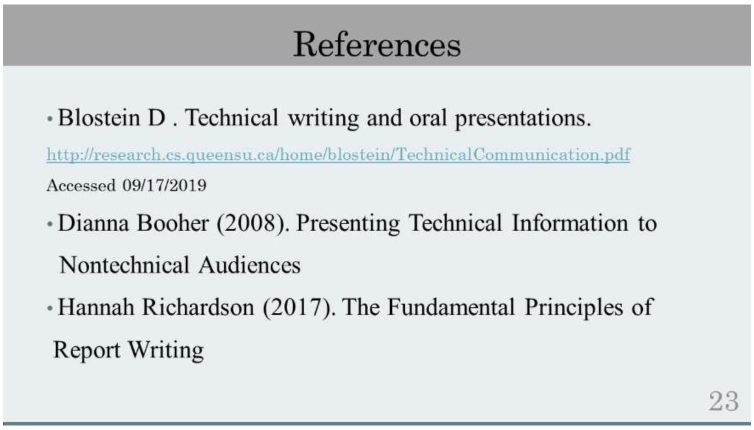
This exercise will take 60 minutes,

Create a draft introduction and objectives statement for East Coast Fever using the information provided.

Create a draft introduction and objectives statement for Brucellosis using the information provided.

Instructors;

Review instructor guide for answers.



Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
Slide 23

SCRIPT / KEY POINTS:

Please refer to these sources for further information for oral and written reports. All three are helpful resources.

Lesson 26 – How to Plan and Prepare the Frontline ISAVET Field Study Proposal and Report,
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SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 31 – Frontline ISAVET Trainee Project Status Checklist

Description of Exercise:

Develop the introduction and objectives section for a technical report in MS Word and MS PowerPoint. Should you have any questions over the exercise, please ask a trainer for clarification before, during, and after the exercise.

Allotted Time: 60 minutes

Organisation of Group Work:

Work individually or in pairs.

Exercise Objective(s):

1. Complete the Frontline ISAVET Trainee Project Status Checklist with a trainer or mentor.

Take action to complete the next steps for your project proposal.

Exercise Components and Structure:

1. The trainer will introduce the objectives of the exercise and hand out a copy of the Frontline ISAVET Trainee Project Status Checklist (see below).
2. Complete the Frontline ISAVET Trainee Project Status Checklist with a trainer or mentor.
3. Take action to complete the next steps for your project proposal.
4. Complete the Frontline ISAVET Trainee Project Status Checklist with a trainer or mentor.

Take action to complete the next steps for your project proposal.

Materials, Data or Information:

1. MS Word
2. MS PowerPoint

Expected Outputs and Deliverables of Each Participant:

1. Update of the status of the project proposal.
2. An action plan to complete the project proposal.

Frontline ISAVET Trainee Project Status Checklist

Trainee Name:
Country:
Date Survey Conducted with Trainee:

Project Input	Status	Date	Follow up Action Required
Project Proposal Period			
1. The subject of the ISAVET in-country project is selected by the trainee and the work supervisor prior to attending the training	☐ Not initiated ☐ Initiated but not finalised ☐ Finalised ☐ Unsure		
2. The ISAVET trainee has been contacted by the academic mentor	☐ Yes ☐ No ☐ Unsure		
3. The ISAVET trainee has been contacted by the institutional mentor	☐ Yes ☐ No ☐ Unsure		
4. The ISAVET trainee is familiar with the ISAVET project protocol	☐ Yes ☐ No ☐ Unsure		
5. The ISAVET trainee has developed a first draft of their project proposal according to the project protocol	☐ Not initiated ☐ Initiated but not finalised ☐ Finalised ☐ Unsure		
6. A first draft of the project proposal has been sent to the both academic and institutional mentors and feedback has been received by the trainee	☐ Not yet sent to both mentors ☐ Sent to both mentors but no feedback received by trainee ☐ Trainee has received feedback from only one mentor ☐ Trainee has received feedback from both mentors ☐ Unsure		
7. The trainee would like inputs from the ISAVET trainers before the end of the training course	☐ Yes ☐ No ☐ Unsure		
Project Completion Period			
8. The trainee has completed the collection of all data required	☐ Yes ☐ No		

Project Input	Status	Date	Follow up Action Required
to achieve the objectives of the project.	☐ Partially completed ☐ Unsure		
9. The trainee has produced at least one draft report of the project in MS Word according to the format provided by Frontline ISAVET.	☐ Yes ☐ No ☐ Partially completed ☐ Unsure		
10. A draft report from the trainee has been reviewed by both mentors or a trainer, and the trainee has received feedback.	☐ Not yet sent to both mentors ☐ Sent to both mentors but no feedback received by trainee ☐ Trainee has received feedback from only one mentor ☐ Trainee has received feedback from both mentors ☐ Trainee has received feedback from at least one trainer ☐ Unsure		
11. The trainee has produced at least one draft report of the project in MS PowerPoint (20 slides maximum) according to the format provided by Frontline ISAVET.	☐ Yes ☐ No ☐ Partially completed ☐ Unsure		
12. The trainee would like inputs from the ISAVET trainers before presenting the final report and PowerPoint presentation at the follow up report meeting.	☐ Yes ☐ No ☐ Unsure		

1. Create a draft introduction and objectives statement for East Coast Fever using the information provided.

   Introduction:

   Answers will vary by team and disease.

   Objectives Statement:

   Answers will vary by team and disease.

2. Create a draft introduction and objectives statement for Brucellosis using the information provided.

   Introduction:

   Answers will vary by team and disease.

   Objectives Statement:

   Answers will vary by team and disease.

Lesson 27 – FACE – Ethical Decision-Making Framework

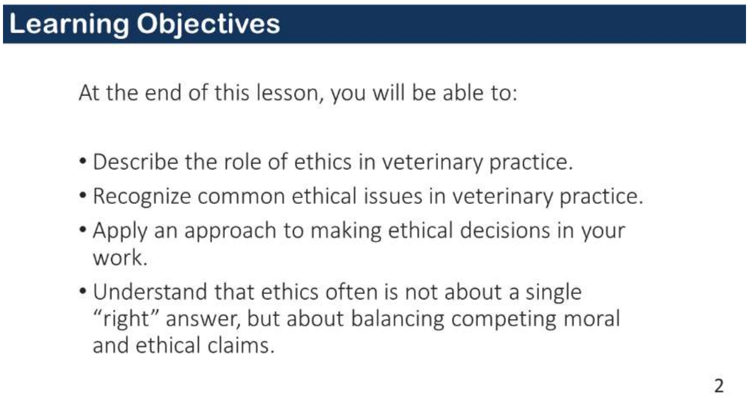
Estimated Lesson and Exercise Time	2 hours and 30 minutes
Instructor Materials	Frontline ISAVET Lesson 27 FACE - Ethical Decision-Making Framework pptx
	Frontline ISAVET Lesson 27 FACE – Ethical Decision-Making Framework.doc
	Computer
	Microsoft Word
Participant Materials	Frontline ISAVET Lesson 27 FACE – Ethical Decision-Making Framework.PDF

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 1

SCRIPT / KEY POINTS

This module should take about 2.5 hours to complete, including the case study. Throughout this instructor guide, information that is intended for you, the instructor, appears in italics.

Information that is intended for you to say to the participants appears in regular font like this. Today's session is about ethics in veterinary practice. We will discuss common ethical dilemmas and some principles we can use to help make decisions. We will also have some discussions and then a case study exercise at the end.



Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 2

SCRIPT / KEY POINTS

In this lesson, we will:

- Describe the role of ethics in veterinary practice;
- Recognize common ethical issues in veterinary practice; and
- Apply an approach to making ethical decisions in your work.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 3

SCRIPT / KEY POINTS

To begin, let's look at an example of an ethical dilemma reported recently in the news.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 4

BBC

The snipers trained to protect rhinos

7 February 2016

In Kenya's Borana nature reserve, drastic new measures are being taken to protect vulnerable rhinos from poachers who kill the animals for their horns.

"We lost 17 from a population of 90," says Borana's Michael Dyer. "We were outgunned and outwitted, so we had to up our game." Dyer recruited a former Special Forces instructor from the British army to train a hand-picked militia of local men, then gave them to right to use lethal force by enrolling them as Kenya police reservists.

The teams monitor 102 rhinos, but when they spot poachers, they don't arrest them. They don't even invite them to lay down their arms. Instead, they kill them - 19 so far, in split-second ambushes during which their victims probably never knew what hit them.

http://www.bbc.com/news/magazine-35503077

4

SCRIPT / KEY POINTS

The instructor will read aloud the news story on this slide or ask a participant to read it.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 5

Protecting the Rhinos

- Is this intervention ethical?
- Why or why not?
- What are your assumptions?
- Whose interests are at stake?

5

SCRIPT / KEY POINTS

Group discussion. Read each question and ask participants to share their answers. (This discussion should last about 10 minutes.) The exact content of the discussion will depend on the answers that the participants give. It's expected that different people will have different responses. However, below are some main ideas to consider.

Is this intervention ethical? Why or why not?

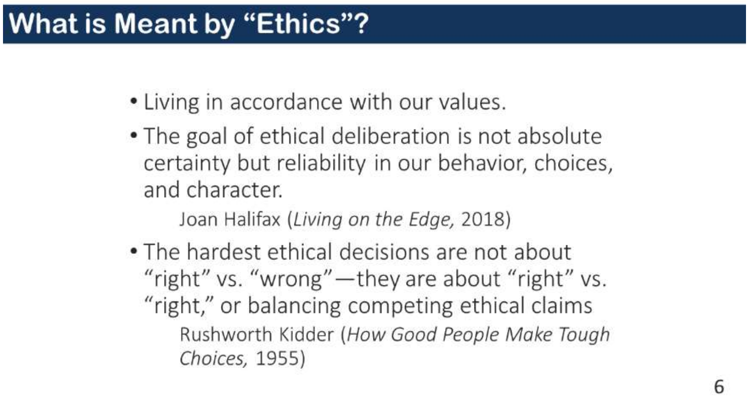
The poachers are people and the government must protect their rights and their lives. In this case, the poachers do not have the opportunity for a trial or due process and are killed on the spot. At the same time, the poachers are breaking the law, the government has an interest in protecting the rhinos, and they have exhausted other measures.

What are your assumptions?

Is the person's life is more important than a rhino's life? Or does the interest in following the law and protecting the rhinos outweigh the poachers' right to livelihood and life?

Whose interests are at stake?

The rhino's interest in staying alive. The government's interests in enforcing the law, conservation efforts to protect the rhinos, and the livelihood of the people working in ecotourism. The poachers' interests in earning money, as well as their interest in due process if they are accused of breaking the law.
At the end of 10 minutes, please say, "This news article raises many ethical questions. It highlights how we all approach ethical issues based on our background, our professional and personal responsibilities, and in some cases, our religious views. Today we will be examining a systematic approach to making ethical decisions."



Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 6

SCRIPT / KEY POINTS

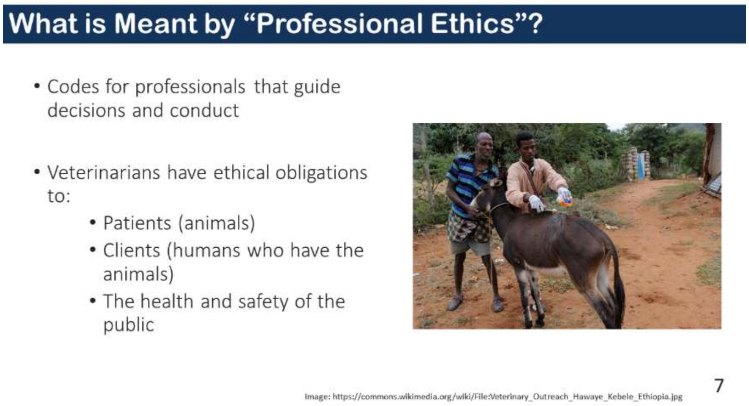
This example raises several questions about right and wrong, about how we value human and animal life, and about the implications of our actions. These are all matters of ethics.

But what is meant by ethics? Ethics can be defined several ways. We can think of ethics as being a guide for living in accordance with our values. Joan Halifax, an anthropologist, says that, "The goal of ethical deliberation is not absolute certainty, but reliability in our behavior, choices, and character." Halifax is saying that the process of thinking about ethics does not necessarily lead to one final or "right" answer. But considering ethics can help align our actions with our personal and professional values.

Rather than a "right" answer, ethical deliberation often involves weighing competing interests in a way that respects and aligns with our core values and supports the development of our moral character.
What are some competing claims?

- Truth vs. Loyalty
- Individual vs. Community
- Short-term vs. Long-term
- Justice vs. Mercy

(*Rushworth Kidder writes about these competing claims in his book, How Good People Make Tough Choices*)
In these situations, ethics helps us make decisions that follow our professional and personal values.



Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 7

SCRIPT / KEY POINTS

Professional ethics are codes that guide decisions and conduct. As veterinarians and veterinary officers, we are bound by a specific code of ethics. Veterinarians in most, if not all, countries have codes of ethics. You may know yours by heart. Typically, these codes highlight three specific groups to which veterinarians have ethical obligations:

- Their patients, or the animals.
- Their clients, or the humans who have the animals.
- And the health and safety of the public.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 8

SCRIPT / KEY POINTS

How might the welfare of the animal, the needs of the owner, and the health and safety of the public be in conflict? Think of some examples when you felt caught between these three competing claims on your loyalty as a veterinary officer.

Please lead a group discussion of the question: Have there been times when you felt the needs of these groups were in conflict? This discussion should last about 10 minutes. If the meaning of this question is not clear to participants, here are some alternative ways of asking the same question:

- How might the welfare of the animal, the needs of the owner, and the health and safety of the public be in conflict?
- Think of some examples when you felt caught between these three competing claims on your loyalty as a veterinary officer.

The goal for this discussion is the exchange of ideas. There is no "correct" or "best" example. The intent is to help the participants appreciate situations when their obligations to these three groups may come into conflict. The responses will vary depending on the experiences of participants present.

Recall that we previously discussed that in many cases, ethics is not about making one "right" decision, but instead about balancing ethical responsibilities to animals, clients and the public.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 9

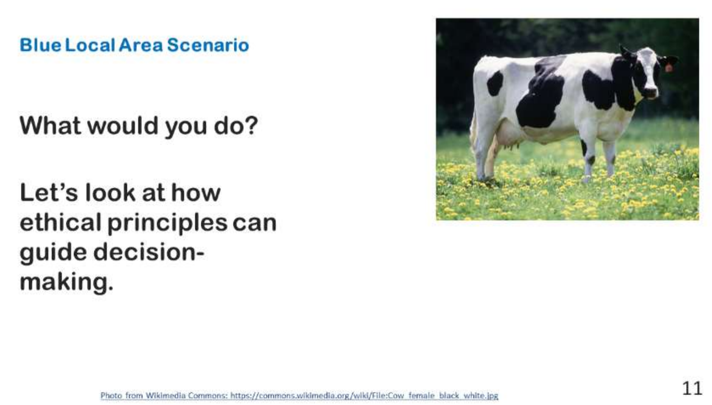
SCRIPT / KEY POINTS

Now let's look at an example from veterinary practice that raises ethical questions.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 10

SCRIPT / KEY POINTS

Please read the scenario aloud or ask a participant to read it aloud.



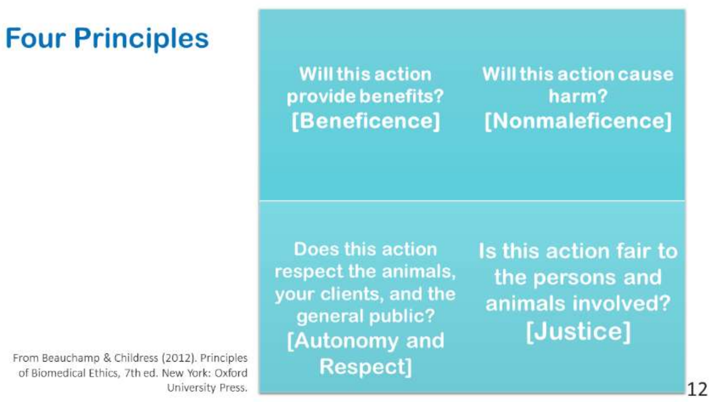
Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 11

SCRIPT / KEY POINTS

*Ask the group the question, "*What would you do?"

Lead a group discussion for approximately 10 minutes.
The goal for this discussion is the exchange of ideas. There is no single "correct" or "best" answer. If the participants offer different perspectives, feel free to ask follow-up questions to determine why the participant chose a particular course of action.

Thank the participants for sharing their ideas.
Now let's look at some principles that can be used to help make a decision.



Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 12

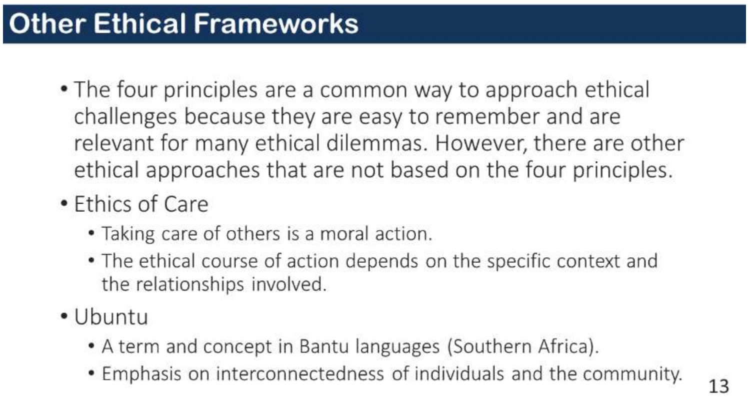
SCRIPT / KEY POINTS

Beneficence, which asks the question, "Will this action provide benefits?"

Nonmaleficence, which asks the question, "Will this action cause harm?"

Autonomy and Respect, which ask, "Does this action respect the animals, your clients, and the general public?"

And Justice, which asks, "Is this action fair to the persons and the animals involved?" Let's look at each of these principles separately, and think about how they can be applied to the Blue Local area scenario we discussed.



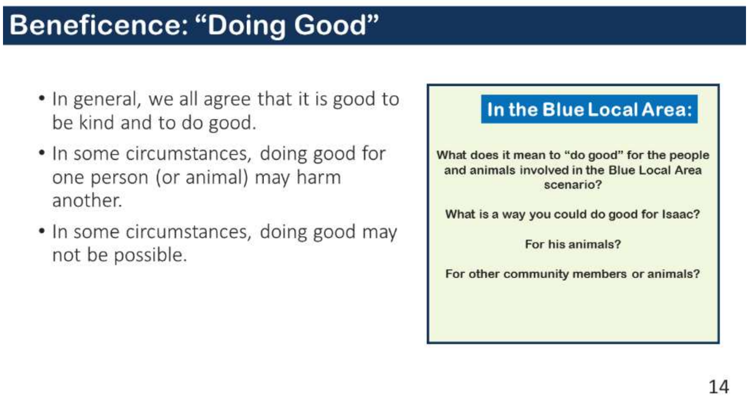
Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 13

SCRIPT / KEY POINTS

These four principles are a helpful way to look at ethical challenges. However, they are not the only way to think about these challenges.

The Ethics of Care, described by Carol Gilligan, emphasizes the central importance of care. It is based on lived experience, not abstract principles. In other words, the ethical course of action depends on the specific context and the relationships involved. There is not one "right" course of action that is true for all people in all places and in all times.

Ubuntu is a concept – a whole philosophy – that is common in Southern Africa. It can be summarized by Desmond Tutu's quote, "My humanity is caught up with and is inextricably bound to yours." It emphasizes interconnectedness and the importance of caring for other people in community.



Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 14

SCRIPT / KEY POINTS
Beneficence means “doing good.” All ethical, religious, and spiritual traditions affirm the need to “do good” for others—to be kind, for example. As human beings, we would not be alive today if others had not looked out for our welfare.
The challenge arises when doing good for one person or animal might have negative consequences for other persons or animals. Can you think of an example where this might occur?

→*Here, an example could be that doing good for Isaac (allowing him to move his herd) might harm someone else if any of his cows test positive for brucellosis and other cows become infected.*

In addition, we sometimes find ourselves in situations where we know the right thing to do to help someone, or to bring healing to a patient (animal), but because of our role, limited resources, or other circumstances, we are unable to do this. Can you think of such a situation?

→ *Examples: If a medication is scarce or unavailable, you may not be able to treat all (or any) animals despite knowing how to. Or if there is a client who refuses to treat their animals when they become ill, but you don’t have the authority to insist on treatment.*

Let’s think about the scenario we discussed earlier where you are the veterinary officer for Blue Local area, and Isaac the farmer wants you to certify that he can move his herd. What does it mean to “do good” for the people and animals here?
What is a way you could do good for Isaac? *(1-2 minutes per question, elicit responses from class)*

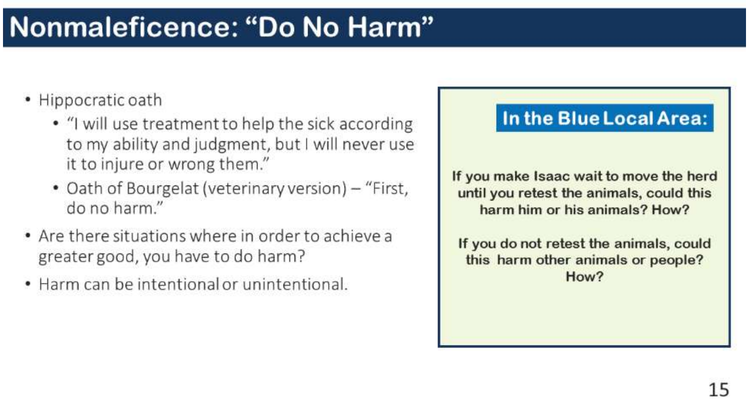
→ *You could do good for Isaac by allowing him to move his herd, which would help his livelihood.*

What is a way you could do good for Isaac’s animals?

→ *Moving the herd also would do good for Isaac’s animals because he’s presumably moving them to a location with better grazing land.*

What is a way you could do good for other community members or animals?

→ *Testing Isaac’s herd again could potentially protect other people and animals from brucellosis, in the event that any of Isaac’s cows have it.*



Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 15

SCRIPT / KEY POINTS

Non-maleficence means “not causing harm.” This too, is a principle that all ethical, religious, and spiritual traditions affirm. It is also a principle that is deeply important to the veterinary and human medical fields, including public health. For example, the Hippocratic oath and veterinary Oath of Bourgelat are often interpreted as “do no harm.”

As with beneficence, as a general principle this is easy to affirm. But in the messy circumstances of life, we face the question of whether it is possible to live – or to practice as a veterinarian – without doing harm.

Can you think of a situation in which inflicting harm – perhaps temporary – is necessary to achieve a greater good? For example, doing an examination on an animal that is in pain may temporarily make the pain worse, but is necessary to make a diagnosis and treat the animal.

Harm can be intentional or unintentional. Much harm is caused inadvertently, unintentionally, despite our good intentions.

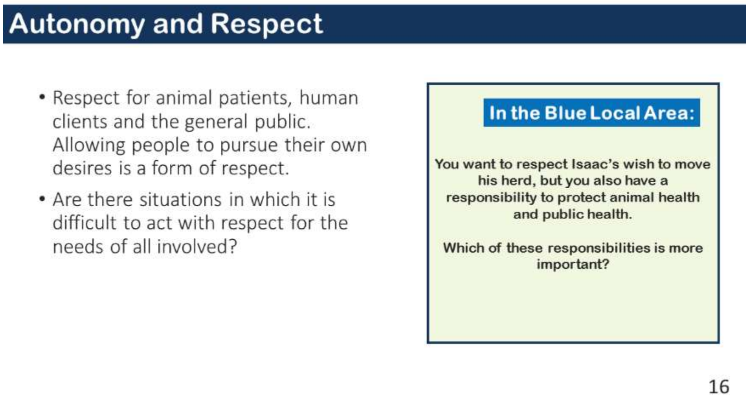
How can we do no harm—or as little harm as possible—in the Blue Local area scenario? *(1-2 minutes per question, elicit responses from class)*

If you make Isaac wait to move the herd until you retest the animals, will this cause harm to his herd? To his livelihood?

→ *it’s possible that a delay in moving the herd could cause harm to the herd or to Isaac’s livelihood. Most likely, this harm would be temporary.*

If you do not retest the animals, could you be harming other animals or people?

→ *If an animal in Isaac’s herd does have brucellosis, it could be very harmful both to other animals and to people – not to mention the other animals in Isaac’s herd.*



Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 16

SCRIPT / KEY POINTS

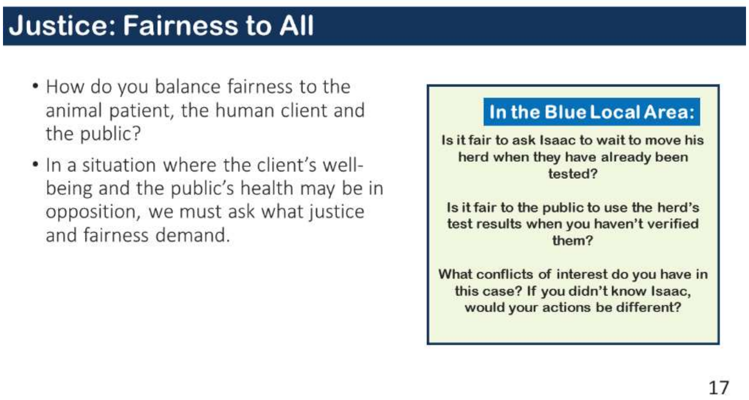
Respect is another core principle. In human medicine, this is often framed as autonomy – giving people the autonomy to make their own decisions about what is important to them. Both for human and veterinary medicine, respect for the wellbeing of others – especially our patients – is essential.

Veterinarians have responsibilities to act respectfully and ethically with regards to their patients (animals), their clients, and the health of the public. Can you imagine any situations in which it is difficult to act with respect for, or in the interests of, all three groups?

→ *This situation is a good example, but participants can also offer others. Any public health emergency where people must be treated against their will (or animals against their owners' will) would be another example. In this situation, the veterinarian must balance Isaac's interests (moving his herd), his cows' interests (better grazing land, being treated if they have brucellosis), and the public's interests (avoiding exposure to a communicable disease).*

How should we think about autonomy and respect in the Blue Local area scenario? You want to respect Isaac's wish to move his herd, but you also have a responsibility to protect public health. Which of these responsibilities is more important?

→ *Elicit answers from class. One possible answer would be: Public health needs are sometimes more important than individual preferences, especially if the individual preferences pose a strong risk to public safety (as may be the case here.) However, this isn't always true—for example, in human medicine, we don't force people to get flu shots, even though this would reduce the number of flu cases. Generally, the greater the risk to the population, the greater the need to prioritize public health over individual preferences.*



Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 17

SCRIPT / KEY POINTS

The final principle is justice or fairness. Sometimes what is fair for our patients may not seem fair to our clients or the general public. The news item at the beginning of this session is one example where fairness for the rhinos may be in conflict with justice or fairness for humans.

In situations where the client's or patient's wellbeing seems to be in opposition with the health of the public, what does justice or fairness demand?
Let's travel back to the Blue Local area one more time.

How can you act fairly in this situation and what are the options that are available?

→ *You can allow Isaac to use his unverified test results and move his herd. Or, you can tell him that he must do the test again and wait to move his herd until the results are confirmed.*

Is it fair to ask Isaac to wait to move his herd even though he has documentation showing that they have been tested?

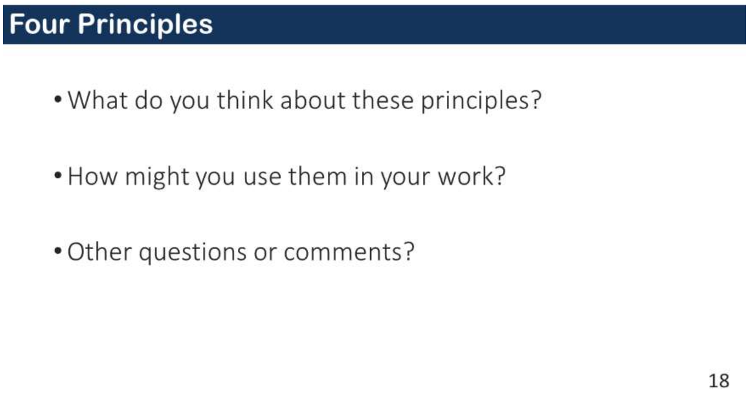
→ *Isaac says he has already tested his cows and they are negative. However, he is also worried about moving his herd soon, which may mean that he did not follow the procedure exactly (e.g. bringing blood samples to the vet). It is also possible that he took other measures to make it more likely the tests were negative (e.g. drawing samples from cows that seemed healthiest). From Isaac's standpoint, though, additional testing will likely feel unnecessary and like a waste of time, and he may be upset about the additional cost. He also may question your motives (e.g. safety vs. money).*

Is it fair to the public for you to use these results even though you have not verified them?

→*One test of fairness is to ask, "what if all farmers were able to move their herds based on unverified lab results?" If we would not want this to be done regularly, that would suggest that we should think twice about doing it here. If one of the cows does turn out to have brucellosis, animals (and people) could be seriously harmed. If you did not follow the complete procedure for verifying test results, you would bear much of the responsibility for this harm.*

What conflicts of interest might you have in this case (for example, might your previous relationship with Isaac make a difference in how you decided what action to take)?

→ *You know and trust the veterinarian who tested Isaac's cows, but this may mean that you are less willing to take all the steps necessary to ensure the cows are healthy. Additionally, if you are acting in a private capacity, you want to ensure that you keep Isaac's business in the future, so you may be less likely to insist that he test his cows again, since this will cost him more, take more time, and may make him upset.*

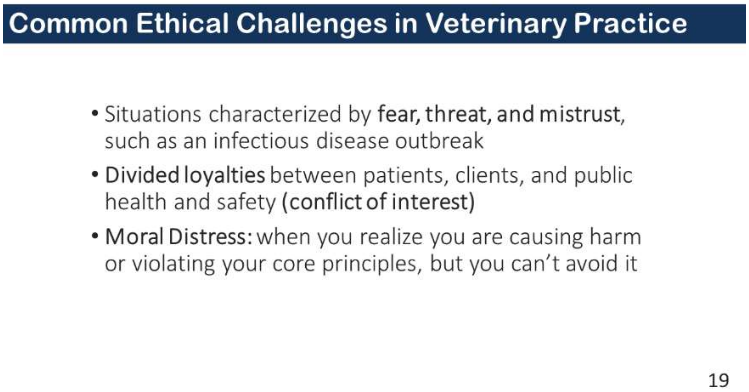


Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 18

SCRIPT / KEY POINTS

We've talked about the four principles, one possible approach to ethical questions. Here are some things to consider about the four principles. We will shortly do a case study where you will apply these principles.

Group discussion. If time, read each question and ask participants to share their answers.



Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 19

SCRIPT / KEY POINTS

When people feel threatened, either by an epidemic, or conflict, or financial ruin, or because they mistrust the intentions of people in authority (such as representatives of government), they tend to react in ways to maximize the safety and survival of themselves and their families. In moments of fear, it is more difficult to be concerned about the welfare of others.

Divided loyalties occur when we have obligations to more than one party, and that the interests of each one may be in conflict with each other.
(*If time allows:* Can anyone share an example of divided loyalties from their work?)
Moral distress occurs when we know what the ethical or "right" course of action is but are unable to do it. Moral distress is especially common in health care workers, who are committed to relieving suffering of their patients, but find themselves in situations where, because of their role, the rules of an organization or system, or scarcity of resources, they are unable to relieve suffering, and may seem to be actually contributing to it. (*If time allows:* Can you think of an example in which you experienced moral distress? What did you do?)

If time allows: Group discussion. Ask participants to share other examples of ethical dilemmas that they experience in their veterinary practice.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 20

SCRIPT / KEY POINTS

Return for a moment to professional ethics. As veterinary officers, you operate under certain laws and government regulations, and you are expected to practice according to ethical values of your profession. These laws, regulations, and values offer guidance in navigating ethical dilemmas.

Ask the group for examples of veterinary law and/or national veterinary ethical regulations in your country. (For example: does your country have a law that restricts or prohibits the use of certain antibiotics in animals?) If there are laws or standards in place, how regularly are they enforced? Are there corruption or other factors to consider?

Are there peer groups or ethics committees where challenges related to veterinary ethics can be discussed, and if so, are they helpful?

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 21

SCRIPT / KEY POINTS

Read slide.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 22

SCRIPT / KEY POINTS

Read slide.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 23

SCRIPT / KEY POINTS

Read slide.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 24

SCRIPT / KEY POINTS

Step 1: Understand and describe the situation.
What is at stake? Who are the stakeholders? These would usually be the animals, the clients, and the public. What information do you still need that would help you clarify the issue?

Step 2: Look inward. Ask yourself: what are my go-to principles and core values? What is my own self-interest in this situation? Do I have potential conflicts of interest—for example, do I have loyalties or conflicts with a particular client or another stakeholder in this situation? Also, what feelings (like anxiety or fear) are triggered or activated by this question or issue?

Step 3: Make a list of options. What options or courses of action would you consider, while keeping in mind potential benefits and harms of each option? (This step corresponds to the principles of beneficence and non-maleficence.) Here are some things you can ask yourself with each option:

- Who would benefit?
- Are the benefits well established?
- Who might be harmed?
- What unintended harm might be possible?
-

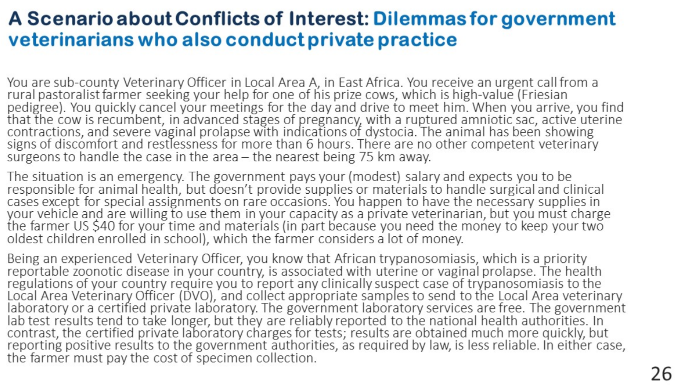
Step 4: For each proposed option, what steps can be taken to ensure respect and fairness? (This step corresponds to autonomy/respect and justice.) Here are some things you can ask yourself:
-Has the intervention been explained?
-Have persons affected been involved in the decision making?
-What provisions are in place to minimize harm?

Step 5: Review the options and decide on your course of action. Consider: why did you choose the option you did? What concerns do you still have? Who might oppose this course of action and how might their objections be addressed? Continue to consider what systems are in place to detect and address unintended negative consequences of your action. Also ask yourself what support you need for this action to be successful.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 25

SCRIPT / KEY POINTS

Read slide.



Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 26

SCRIPT / KEY POINTS

Ask for volunteers to read this scenario aloud, then split the class into small groups (no more than 4-5 participants per group) to discuss the case and decide how they would proceed, using the 5-step framework described on slide 24. The students have a copy of this framework in the Participant Notebook that they can use for reference.

While the participants are working in small groups, please feel free to move between groups and listen to the discussions. You can also answer questions and help ensure the participants continue to discuss the questions in the exercise.
Participants will have 45 minutes to work through this case, using the 5-step ethical decision-making framework discussed in slide 24. Please keep the time and make an announcement to let participants know when they have 10 minutes left.

At the end of the time, bring the participants together again into the large group.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 27

SCRIPT / KEY POINTS

During the large group discussion, you can use the remaining slides to prompt a discussion about each of the steps in the framework.
Please try to limit the discussion to 5 minutes per step.

For each step, call on one group to share their reflections and the course(s) of action they propose.
The objective of the discussion is to exchange of ideas and perspectives, not to arrive at one "correct" answer. Different groups and individuals will likely arrive at different decisions.

The "Case Scenarios" document includes questions and possible outcomes to help guide discussion, if necessary.

1. Understand the situation:

What is at stake?

- For the cow, i.e., the patient, her life and health are at stake.
- For the farmer, i.e., the client, his livelihood, and therefore his family's wellbeing, are at stake.
- For the public, what is at stake is protection from the risk of further transmission of trypanosomiasis.

Who are the stakeholders?

Stakeholders include the cow (the patient), the pastoralist farmer (the client), and the public (other farmers in the Area), as well as government authorities responsible for controlling disease. The veterinarian is also a stakeholder here, with interests and responsibilities.

What information do you still need?

The lack of reliable information is often at the heart of ethical dilemmas. What additional information could help clarify the issue? Many details that would influence ethical decision-making in this case are not specified. These include, for example:

- Are veterinary officers in this region legally allowed to act as private veterinarians?
- How sick is the cow, and therefore how likely is she (and her calf) to survive the surgery?
- How experienced is the veterinary officer in diagnosing disease and performing surgery?
- How much money does the farmer have—can he pay the $40 if he has to, or is he truly unable to pay?

2. Look inward:

There may **a conflict between the Veterinary Officer's role as a government employee and his or her role as a private practitioner**. Essentially, if the veterinarian is working for the government, he or she is primarily responsible for protecting public health, whereas if the veterinarian is working in a private capacity, his or her responsibility is primarily to the client and the patient. Some government veterinary officers may supplement their income by also working as private veterinarians. However, in doing so, their role as government veterinarians (protecting public health) may come into conflict with their private role (to care for their patients). "Dual role" arrangements like this may be legal and tolerated by the government, but ethical tensions can arise as a result of dual loyalties.

It is important to consider internal conflicts of interest because our **unconscious fears, attitudes, and emotions influence our ethical decision-making**. Being aware of them will help us recognize when they are influencing our thinking. Might our decision differ, for example, if the farmer is a relative? Some students may answer yes, on the basis that loyalty to family obligations trumps one's professional responsibility. Other students may disagree, appealing to the oath they took as Veterinary Officers. These questions are intended to provoke thought and to highlight that there may be divided loyalties. Divided loyalties cannot always be avoided, but if we are not aware of them, they can influence our decisions unconsciously, in which case it becomes difficult to make ethical decisions based on conscious reasoning, consistent with our core values.

3. Weigh potential options with respect to beneficence and maleficence:
There are two main actions to be taken in this scenario: **1) addressing the immediate emergency with the cow** and **2) addressing the health risk posed by suspected trypanosomiasis**. We suspect that the student groups will arrive at a decision to do surgery and to report the suspected case and send appropriate specimens to a laboratory. [However, see the attached "scenarios" document for a more detailed list of outcomes and considerations.] **The issues of benefit and harm for each of these actions should be explored: Who benefits? Who might be harmed? Does benefit outweigh harm?**

Surgery to address the emergency:
Who benefits?
Assuming that surgery is successful, the following would benefit: the patient, the client, the Veterinary Officer (through payment and reputation), the pregnant cow's calf, and the client's family (avoids loss of wealth). The benefit to public health is not as clear and direct, although one could make this argument.
Who is harmed?
If the surgery is not successful or supplies are not available, the patient would suffer the greatest harm, although since this is an emergency, the risk of action causing additional harm is negligible. Given the emergency nature of the situation, the benefits of action outweigh harm (assuming the surgeon is competent). This calculus would be different if the cow is already so sick that surgery would not be expected to save her life.

Reporting the case to public officials:
Who benefits?
Reporting the case potentially benefits to public health, other farmers in the Area (if quick action is needed to prevent transmission to their herds), the Veterinary Officer (being conscientious about his or her public responsibility), and, potentially, the farmer (if his cow has condition that might also affect other cows in the herd).
Who may be harmed?
The farmer and his family could be harmed if the results trigger public health measures that reduce the size of his herd or that incur other expenses.

Less clear, and perhaps less of an ethical issue, is whether to use a government or private lab. If the Veterinary Officer strongly suspects trypanosomiasis and knows that reporting from the private lab is spotty, then fidelity to his or her obligations to protect public health would favor using the public lab – and it will cost the farmer less. On the other hand, a rapid result may be more important for public health. But recommending that the farmer pay more for a private lab to avoid detection would be in conflict with the veterinary officer's ethical obligation to protect public health. We need more information on the quality of the respective labs.

This case highlights two additional points. First, our intentions have ethical implications; the motivation for our decisions are, at times, as important as the decisions themselves. Second, many ethical dilemmas are related to institutional policies rather than individual decisions. For example, vaccination of animals may be required by regulation, but not funded by the government.

4. Weigh how options can ensure respect/fairness:

There is a potential conflict between the veterinarian's role as a government employee and a private practitioner. As a government employee, the veterinary officer is supposed to report all notifiable diseases to the Local area Veterinary Officer and the Ministry of Agriculture and Animal Industries whenever diseases of public health importance occur. This obligation is consistent with the principle of fairness to all farmers – and to the public. However, as a private practitioner, the veterinarian may feel pressure not to report the case, since doing so might create financial hardship for the specific farmer.

Dual roles sometimes lead to conflicting loyalties. This is a client who the veterinarian knows well, and to whom he is loyal. In cases like this, it's helpful to consider what would happen if everyone did likewise: what if all veterinarians did not report cases because they did not want to lose business or did not want to inconvenience their friends? Actions that seem justifiable in individual cases can cause big problems if they become widely practiced.

5. Review the options and decide:

As a competent veterinarian with an obligation to the wellbeing of animals, beneficence demands that a Caesarian section be performed, the fetus delivered, and the vaginal prolapse surgically corrected. Post-operative care and treatment against secondary bacterial infections would also be expected. However, if the cow is very unlikely to survive, it may not be appropriate to do surgery to correct the vaginal prolapse, especially if the client cannot afford this additional cost.

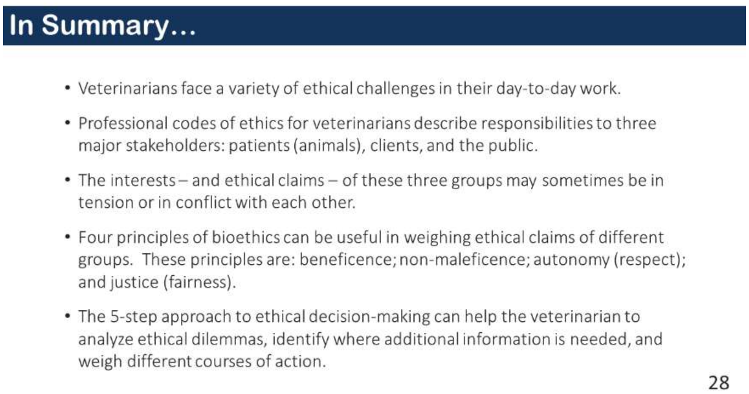
As a government Veterinary Officer, the veterinarian has an obligation to protect the public and to report the suspected case and obtain the proper samples. However, the laboratory that you choose to do this (public vs. private) will depend on the urgency of a diagnosis (e.g. if you suspect many others are at risk you may be more likely to choose the private lab) and the ability of the client to pay (e.g. if client is very poor, may choose public lab to minimize the costs).

Depending on the course of action proposed, the instructor might question "what if" other things happen, or ask the students to consider what other factors might affect their decision
and if so, on what ethical basis (what principle is invoked?). For example:

- If the veterinarian encounters unintended surgical problems or post-surgical complications and the cow died, would this be an ethical problem for the Veterinary Officer? No, not if he or she were a competent surgeon (not operating above his or her level of training), and took all standard precautions. But this experience should inform the Veterinary Officer's clinical decision-making in the future.
- If the test results are positive, what financial implications might this have for the farmer and his family, and for neighboring farms? Public health would be served, but how could the Veterinary Officer (or the animal health system) minimize the financial impact on the farmer? Does the government have any compensation programs for these situations?

Note: the intent here is not to "prove" that one response is right or wrong but to emphasize that even ethical decisions, using all the best available data – which are incomplete – may cause result in harm to some persons.

Ethics is not about right vs. wrong, decided once and for all – it's about continuously refining our decisions and improving our systems to maximize benefits, minimize harm, equitably distribute harms and benefits, and promote justice through this equitable distribution of harms and benefits.

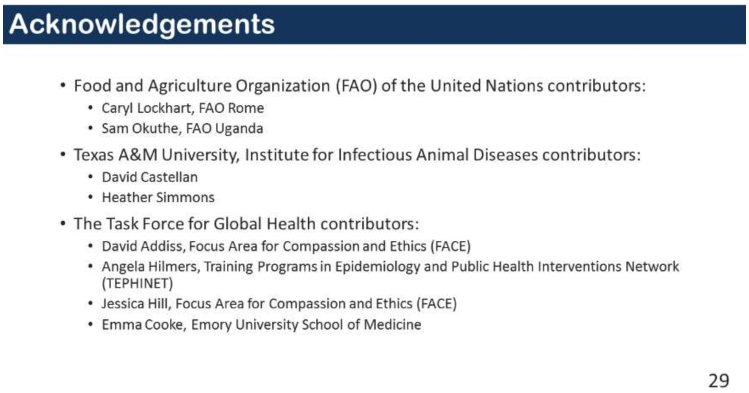


Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 28

SCRIPT / KEY POINTS

Please call on one participant to read each one of the takeaways.

Lesson 27 - FACE – Ethical Decision-Making Framework, Slide 29



SCRIPT / KEY POINTS

The following contributors are listed on the slide.

Are there any questions?

Case Study 3: Practical Ethics for Veterinarians

CASE STUDY: POSSIBLE SCENARIOS

For use with the "ISAVET Practical Ethics for Veterinarians" curriculum.

This sheet should not be distributed until the end of the discussion of the case study in the ethics module. It can be used to help participants consider possible outcomes of their decision-making process during the case study.

These scenarios represent some (but not all) of the ways that the case study described in the presentation could unfold, as well as some ethical considerations for each of these possibilities. Keep in mind that these do not indicate the "right" answer, but simply describe some of the considerations to bear in mind while making a decision.

What if the farmer can't or won't pay the money?

The farmer may not have $40 to spend, or he may feel that the cow is likely to die and the money is therefore probably wasted. You (as the farmer) can…

-*Do the surgery for free or at a discounted rate.* This will benefit the cow and calf, since it will give them at least a chance of survival, and it will benefit the farmer, who will receive veterinary care without having to pay (or having to pay less). However, it could affect you and your family, since you will have lost part or all of the day's income. Additionally, if you set a precedent of providing discounted care, other farmers may ask you to do the same, which may be difficult to negotiate and could further reduce your income.

-*Agree not to do the surgery.* If you truly believe the cow and calf are unlikely to survive, this might be an acceptable course of action. However, if you think the cow and calf would survive if you did surgery, this would be in conflict with your ethical obligation to your patient and to the farmer (who has an interest in maintaining his herd and income).

-*Persuade the farmer to pay $40.* This may or may not be possible depending on his financial means and his attitude towards you and the underlying situation. If the farmer views this as coercion, he may be distrustful towards you in the future.

Should I test the cow for trypanosomiasis?

The cow has vaginal prolapse, which is associated with trypanosomiasis. If the cow is infected, she could transmit disease to other animals in the herd, or humans nearby.

-*Don't test the cow at all because the farmer can't afford the cost of specimen collection.* This may generate the farmer's gratitude, and will help him in the short term since he will not need to pay. However, you would be relying on hope that the cow is not infected. If she does have trypanosomiasis, she could infect other cows (or people), and you would bear part of the responsibility for that, since you did not test her when you suspected the disease.

-*Test the cow using the government lab.* This will save the farmer money, which may be his primary concern. It will also ensure that results are reported to the government. If the cow does have trypanosomiasis, this is important, since it reporting the case will help to control the disease and protect the public. However, the government lab is also slower, which may mean that other cows (or people) could become infected while you are waiting for the results to come back.

-*Test the cow using the private lab.* This will cost the farmer more money, which he may not be able to afford (especially since he has already paid for the surgery and collection fee). It also may not be as reliable in reporting test results to the government, which means that this important public health information may not be shared with the necessary people. However, the private lab is faster, so it is less likely that the cow would infect others while you wait for the results.

How does the story end?

The “ending of the story” depends on the decisions you make. Unfortunately, the challenge of making ethical decisions like these is that the consequences of your decisions are not certain. However, taking time to think about the possible outcomes can help you foresee consequences and understand the reasoning behind your decisions.

Lesson 28 – Professionalism in the Practice of Veterinary Field Epidemiology

Estimated Lesson and Exercise Time	2 hours
Instructor Materials	Frontline ISAVET Lesson 28 Professionalism in the Practice of Veterinary Field Epidemiology.pptx
	Frontline ISAVET Lesson 28 Professionalism in the Practice of Veterinary Field Epidemiology Instructor Guide.doc
	Frontline ISAVET Lesson 28 Professionalism Handout.PDF
	Microsoft Word
Participant Materials	Frontline ISAVET Lesson 28 Professionalism in the Practice of Veterinary Field Epidemiology Participant Guide.PDF

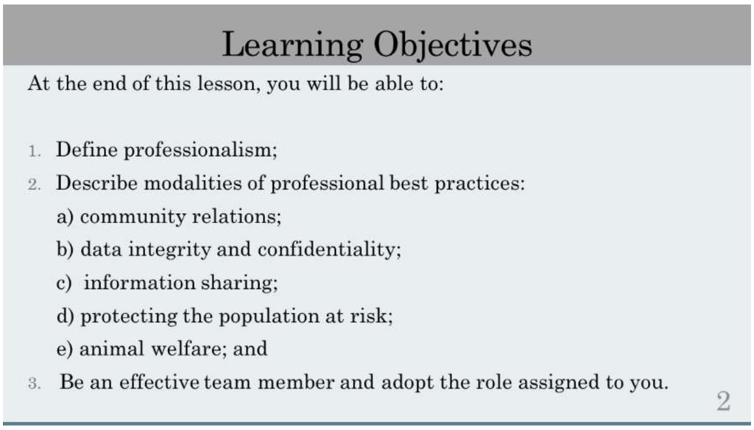
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

GIS	Geographic Information Systems
ISAVET	In Service Applied Veterinary Epidemiology Training
PPE	Personal Protective Equipment
VFE	Veterinary Field Epidemiology

Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 28 titled, “Professionalism in the Practice of Veterinary Field Epidemiology”.



Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology,
Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

- Define professionalism;
- Describe modalities of professional best practices:

a) community relations;

b) data integrity and confidentiality;

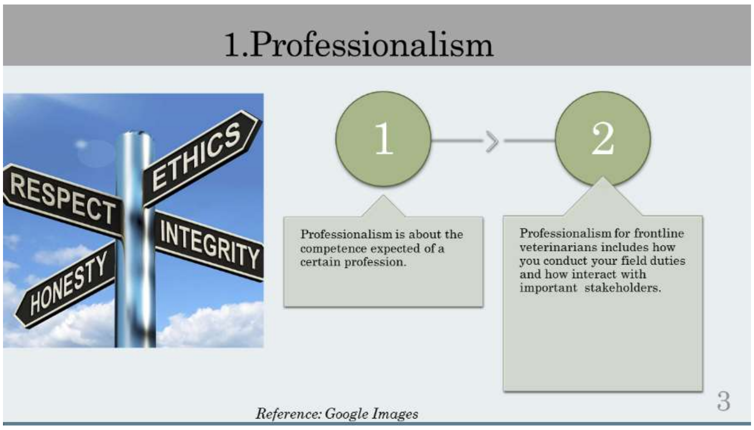
c) information sharing;

d) protecting the population at risk;

e) animal welfare; and

- Be an effective team member and adopt the role assigned to you.

Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology,
Slide 3

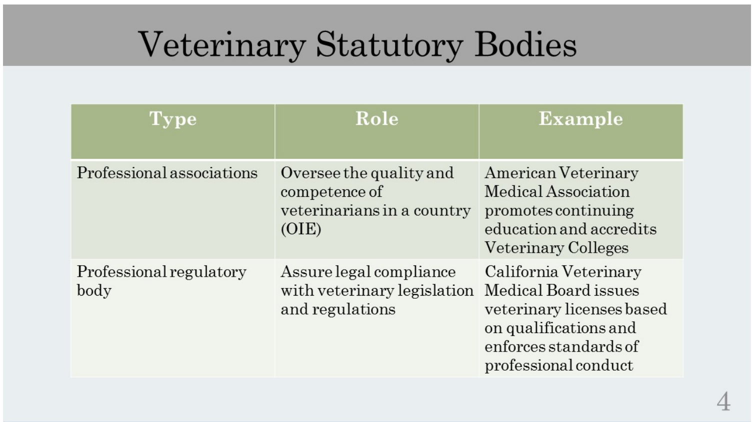


SCRIPT / KEY POINTS:

Professionalism is about the competence expected of a certain profession. Professionalism for Frontline Veterinary Field Epidemiologists encompasses the behavior, dressing & skills exhibited by veterinary field epidemiologists while at work.

Photo:

Image 1: Google



Veterinary Statutory Bodies

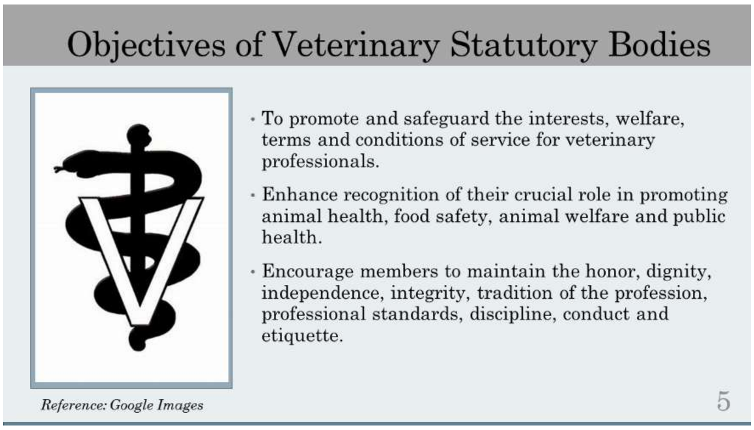
Type	Role	Example
Professional associations	Oversee the quality and competence of veterinarians in a country (OIE)	American Veterinary Medical Association promotes continuing education and accredits Veterinary Colleges
Professional regulatory body	Assure legal compliance with veterinary legislation and regulations	California Veterinary Medical Board issues veterinary licenses based on qualifications and enforces standards of professional conduct

Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 4

SCRIPT / KEY POINTS:

There are two types of veterinary statutory bodies:

1. One oversees the quality and competence of veterinarians through accreditation and continuing education
2. The other has legal power to enforce compliance with official legislation and regulations for professional standards of conduct



Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 5

SCRIPT / KEY POINTS:

A countries veterinary statutory body should promote and safeguard the interests, welfare, terms and conditions of service for veterinary professionals. It should encourage professionalism by encouraging its members to maintain the honor, dignity, independence, integrity, tradition of the profession, professional standards, discipline, conduct and etiquette.

Photo:

Image 1: Google

Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 6

SCRIPT / KEY POINTS:

Professionalism in veterinary field epidemiology embraces the One Health Approach. The health of people is connected to the health of animals & the environment.

Photo: Google images

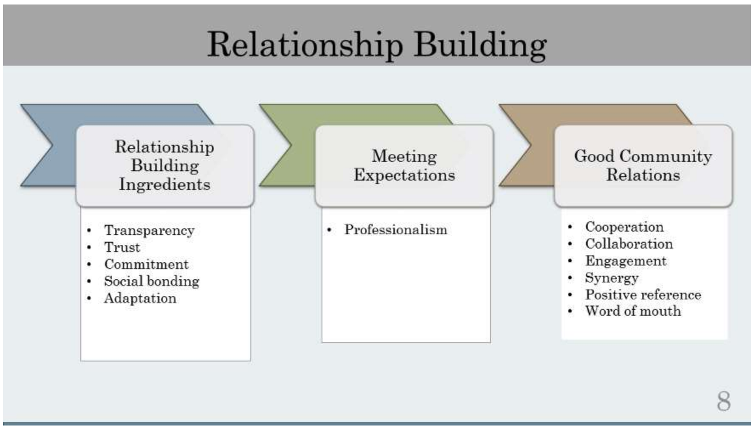
Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 7

SCRIPT / KEY POINTS:

Community relations refer to various methods used by veterinary field epidemiologists to establish and maintain a mutually beneficial relationship with communities. Community relations are hinged onto two-way communication between the veterinary field epidemiologists and the community. Veterinary field epidemiologists depend on community support and cooperation in order to succeed in the field investigations. The community depends on the veterinary field epidemiologists to investigate, identify the cause of the problem, provide intervention to stop transmission and protect the population at risk.

Photo:

Image 1: Google



Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 8

SCRIPT / KEY POINTS:

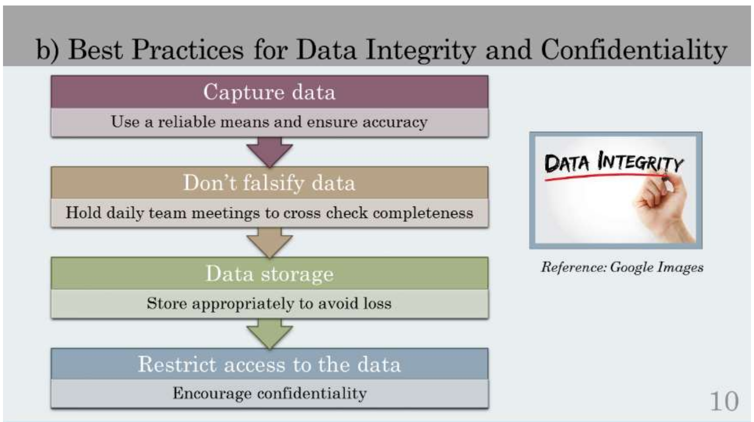
The ingredients to building relationships include trust, commitment, social bonding and adaptation. Professionalism is required to meet expectations. Good community relations rely on cooperation, collaboration, engagement, synergy, positive reference and word of mouth.

Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 9

SCRIPT / KEY POINTS:

Best practices for community relations includes:

- Recognition of the cultural institutions and elders or opinion leaders in the affected community;
- Collaboration with the local leaders and institutions;
- The team should dress appropriately in a way that is acceptable to the community of interest;
- Use the appropriate language of communication;
- Avoid mannerisms that are disruptive or destructive; and
- Show respect to the community members regardless of their appearance, whether they are barefooted or barely dressed.



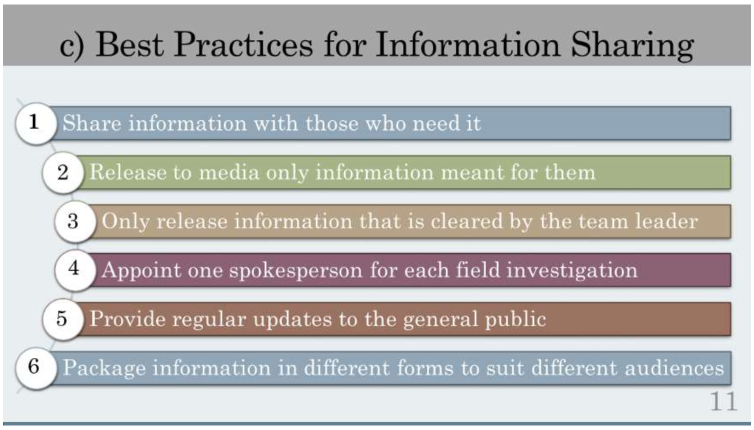
Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 10

SCRIPT / KEY POINTS:

For data integrity, here are some best practices:

- Capture data using reliable means and ensure accuracy;
- Capture data using more than one technique;
- Don't falsify data;
- Hold daily team meetings to cross check completeness of data;
- Store data appropriately to avoid loss of vital aspects or adulteration; and
- Restrict access to data.

Photo Image: Google Images

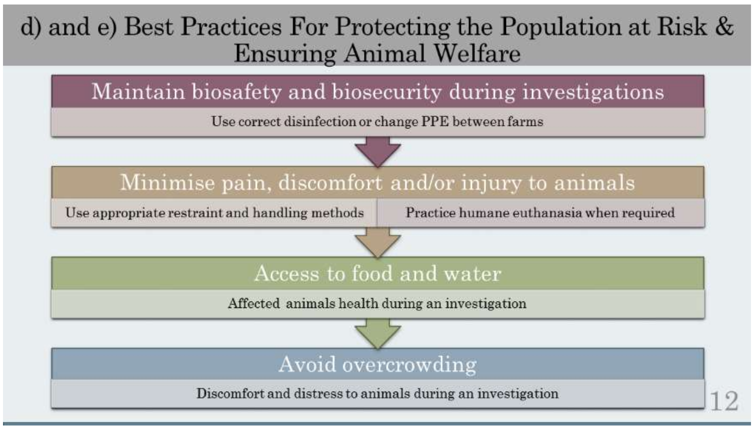


Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 11

SCRIPT / KEY POINTS:

Here are some best practices for information-sharing:

- Share information with those who need it;
- Release to media only information meant for them and with clearance from the team leader;
- Appoint one spokesperson per field investigation to avoid confusion and loss of control;
- Provide regular updates to the general public to avoid anxiety and facilitate media take over; and
- Package information in different forms to suit different audiences. For instance, it can be a technical report, media report or media brief, and or task force team report.

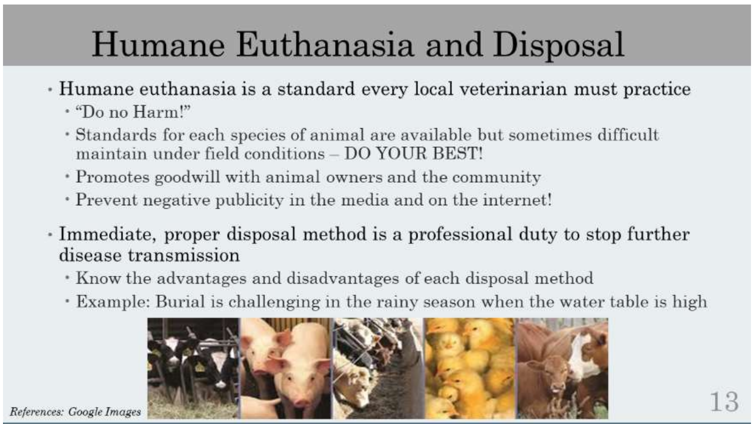


Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 12

SCRIPT / KEY POINTS:

Best practices for protecting the population at risk and ensuring animal welfare.

- Team members should disinfect or change their protective gear between farms to avoid becoming vectors (i.e., maintain the biosafety and biosecurity during investigations);
- Use appropriate restraint and handing methods or facilities to minimise discomfort and or injury to the animals during investigation;
- Allow affected animals access to food and water during investigations unless it is discouraged on medical grounds for the sake of the animal's health; and
- Avoid overcrowding thus causing discomfort and distress to animals during investigation.

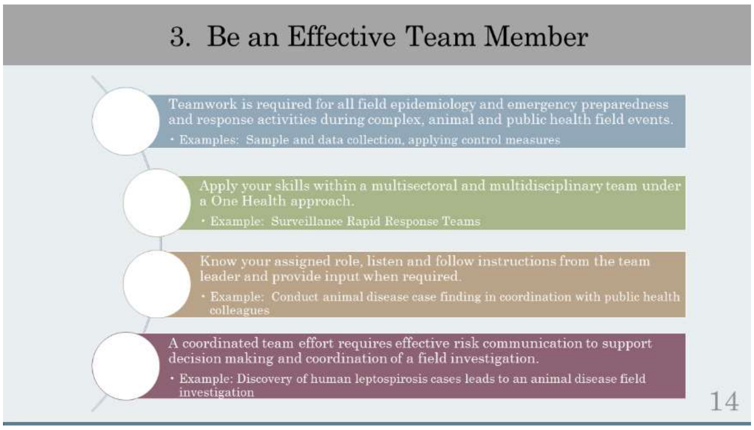


Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 13

SCRIPT / KEY POINTS:

Read slide.

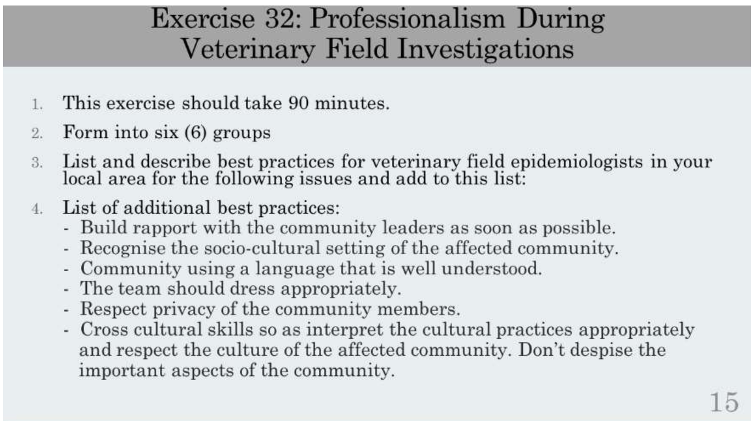
Photos: Google Images



Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology,
Slide 14

SCRIPT / KEY POINTS:

Teamwork is needed for any field epidemiology investigation to succeed in responding to a complex, unique or unexpected public health or community event by people from different agencies or institutions with different expertise. Veterinary field epidemiology is about teamwork often bringing together several competences including veterinarians, epidemiologists, public health specialists, laboratory technologists, statisticians, GIS specialists and any other professional that may be required depending on the unique circumstances. Being an effective team member requires each one to know their assigned role, listen and follow instructions from the team leader and provide their input at the right time. Without teamwork it would be difficult to achieve effective communication, decision making & overall coordination of a VFE investigation.



Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology,
Slide 15

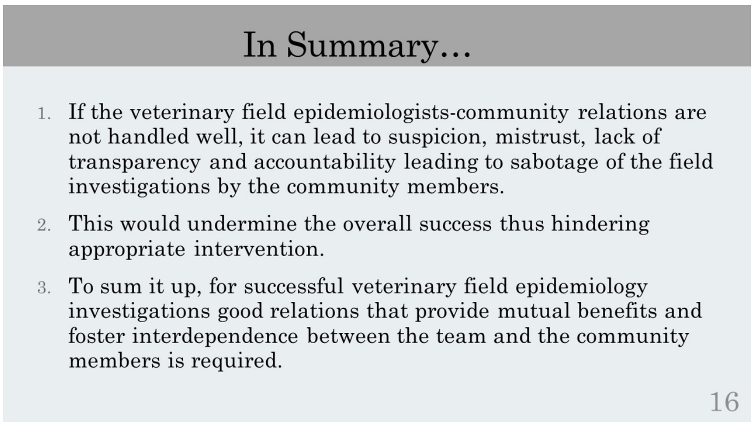
SCRIPT / KEY POINTS:

Exercise 32 instructions: Professionalism During Veterinary Field Investigations

- This exercise should take 90 minutes.
- Form into six (6) groups
- List and describe best practices for veterinary field epidemiologists in your country for the following issues and add to this list:
- List of additional best practices:
- Build rapport with the community leaders as soon as possible.
- Recognise the socio-cultural setting of the affected community.
- Community using a language that is well understood.
- The team should dress appropriately.
- Respect privacy of the community members.
- Cross cultural skills so as interpret the cultural practices appropriately and respect the culture of the affected community. Don't despise the important aspects of the community.

Instructors:

- Review instructor guide for answers.



Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 16

SCRIPT / KEY POINTS:

In summary,

- If the veterinary field epidemiologists-community relations are not handled well, it can lead to suspicion, mistrust, lack of transparency and accountability leading to sabotage of the field investigations by the community members.

- This would undermine the overall success thus hindering appropriate intervention.
- To sum it up, for successful veterinary field epidemiology investigations good relations that provide mutual benefits and foster interdependence between the team and the community members is required.

Lesson 28 –Professionalism in the Practice of Veterinary Field Epidemiology, Slide 17

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 32 – Professionalism During Veterinary Field Investigations

Description of Exercise:

List and describe best practices for veterinary field epidemiologists in your country. Should you have any questions over the exercise, please ask a trainer for clarification before during, and after the exercise.

Time: 90 minutes

Organisation of Group Work:

Form into six (6) groups.

Exercise Objective(s):

1. Define professionalism.

2. Describe modalities of professional best practices: Community relations; data integrity and confidentiality; information sharing; protecting the population at risk and animal welfare.

3. Be an effective team member and adopt the role assigned to you.

Exercise Components and Structure:

1. List and describe best practices for veterinary field epidemiologists in your country for the following issues and add to this list:
   - List of additional best practices:
   - Build rapport with the community leaders as soon as possible.
   - Recognise the socio-cultural setting of the affected community.
   - Community using a language that is well understood.
   - The team should dress appropriately.
   - Respect privacy of the community members.
   - Cross cultural skills so as interpret the cultural practices appropriately and respect the culture of the affected community. Don't despise the important aspects of the community.

Materials, Data or Information:

1. Microsoft Word

2. Microsoft PowerPoint

Expected Outputs and Deliverables of Each Participant:

1. List and description of best practices for field epidemiologists.

List and describe best practices for the following:

- **Community relations**

- Recognition of the cultural institutions in the affected community
- Collaborating with the local leaders and institutions
- Dressing by the team
- Language of communication
- Mannerisms

- **Data integrity and confidentiality**

- Capture data using reliable means and ensure accuracy.
- Capture data using more than one technique
- Do not falsify data
- Daily team meeting to cross check completeness of data
- Data storage
- Restrict access to data

- **Information sharing**

- Share information with those who need it
- Release to media only information meant for meant for them and with clearance from the team leader
- Package information in different forms to suit different audience e.g. technical report, media report and team report.

- **Protection of the population at risk and animal welfare**

- Team members should disinfect or change their protective gear between farms to avoid becoming vectors (i.e. maintain the biosafety and biosecurity during investigations).
- Use appropriate restraint and handing methods or facilities to minimize discomfort and or injury to the animals during investigation.
- Allow affected animals access to food and water.
- Avoid overcrowding thus causing discomfort and distress to animals during investigation.

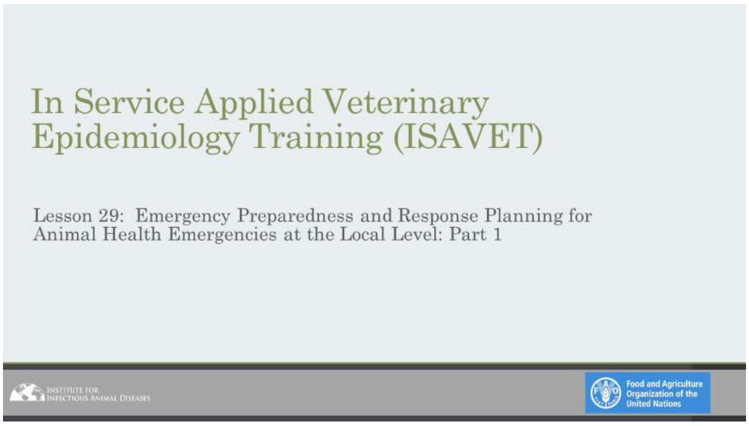
***Note:** Participants are encouraged to ask any questions to the instructor and other resource persons before, during and following the exercise.*

Lesson 29 – Emergency Preparedness and Response Planning for Animal Health Emergencies: Part 1

Estimated Lesson and Exercise Time	3 hours
Instructor Materials	Frontline ISAVET Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies: Part 1.pptx
	Frontline ISAVET Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies: Part 1 Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	Frontline ISAVET Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies: Part 1 Participant Guide.PDF

INSTRUCTOR COMMENT: LESSON ACRONYMS AND ABBREVIATIONS

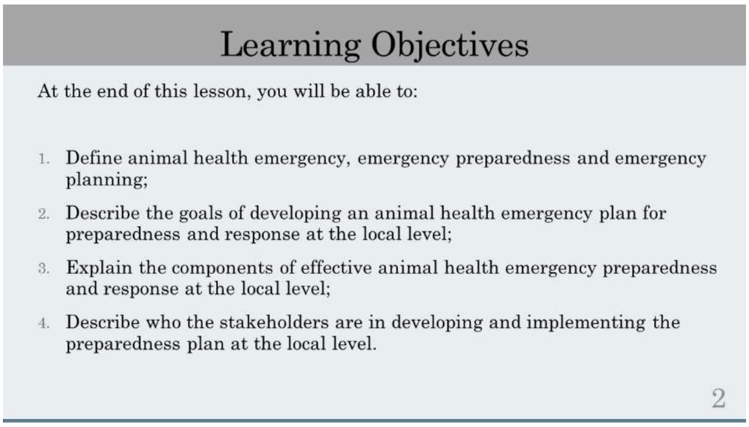
FAO	Food and Agriculture Organisation of the United Nations
GEMP	Good Emergency Management Practices
ISAVET	In Service Applied Veterinary Epidemiology Training



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level – Part 1, Slide 1

SCRIPT / KEY POINTS

Welcome to Lesson 29 titled, "Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level: Part 1"

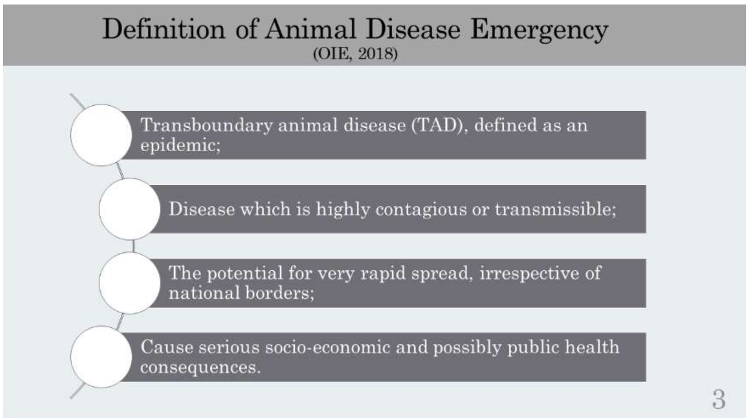


Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 2

SCRIPT / KEY POINTS

In this lesson, we will:

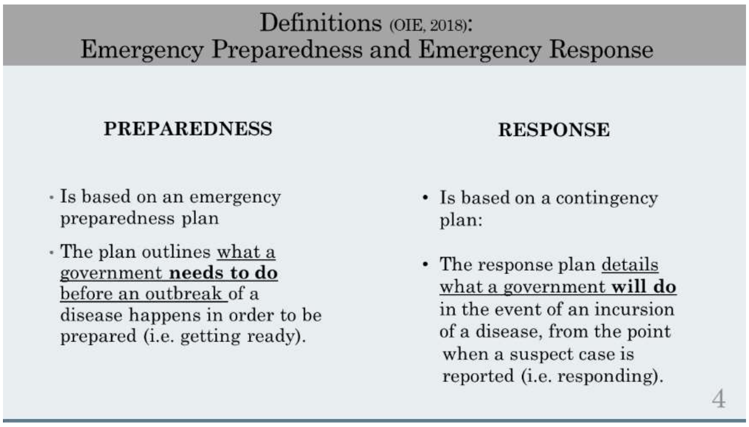
- Understand the goals of developing an animal health emergency plan at the district level;
- Understand what are the components of an effective animal health emergency plan at the district level;
- Understand who the stakeholders are in developing a plan at the district level; and
- Understand who the participants are in formalizing the plan at the district level.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 3

SCRIPT / KEY POINTS

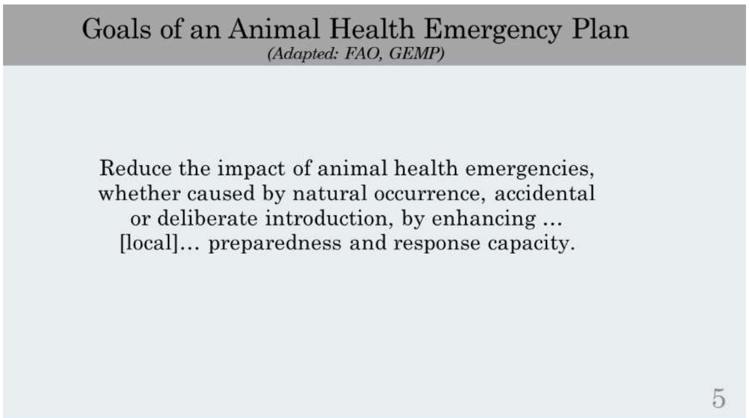
Read slide.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 4

SCRIPT / KEY POINTS

Read slide.

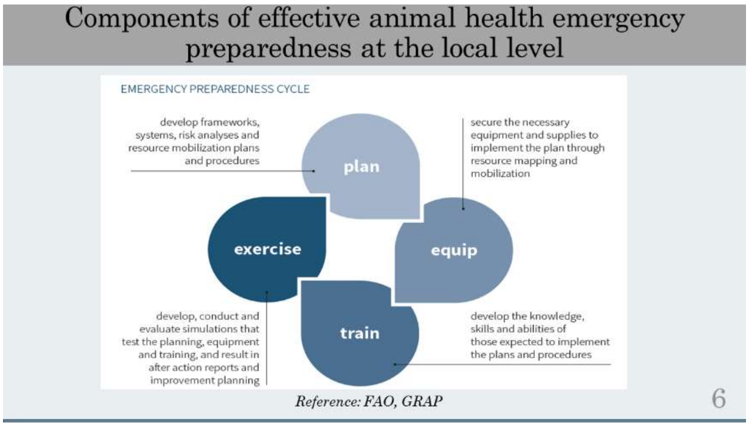


Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 5

SCRIPT / KEY POINTS

Reduce the impact of animal health emergencies, whether caused by natural occurrence, accidental or deliberate introduction, by enhancing country, regional and international preparedness and response capacity.

Reference: FAO, GEMP



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 6

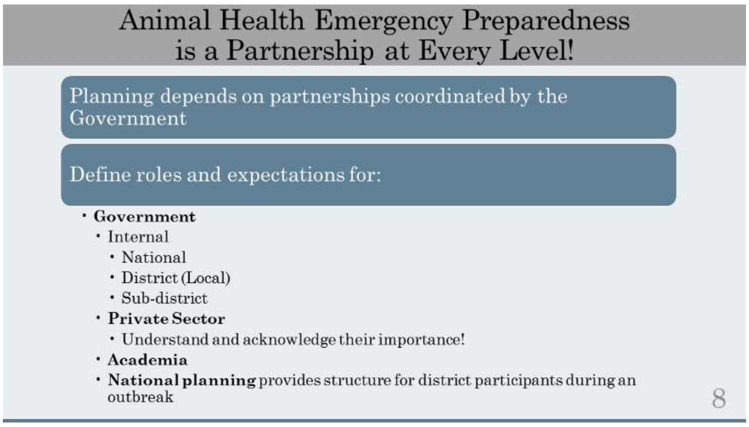
SCRIPT / KEY POINTS

The Emergency preparedness cycle includes planning and equipping (resource mobilization) in addition to training and exercising the skills among participants so that the plan can be effectively implemented at the local level.

Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 7

SCRIPT / KEY POINTS

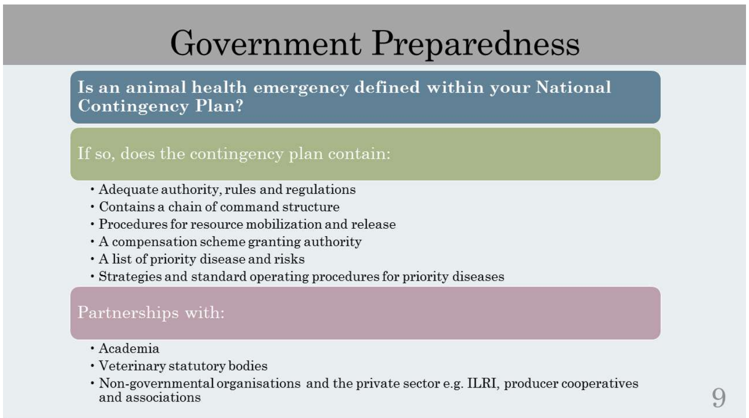
Develop a plan with internal and external stakeholders based on nation legal authority and contingency plan. Develop communication and coordination plans for animal-specific and human diseases. A funding plan for emergencies must be identified in ADVANCE.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 8

SCRIPT / KEY POINTS

National preparedness planning is needed to provide consistency of response. Often times there may be a disease outbreak in more than one part of a country so surveillance systems and response contingencies must be consistent when multiple districts are involved. It is important for those involved at all levels of government understand their role and who they reach out to for help. The first step in effective district plans is to have a national or regional plan to follow. That planning must include all levels of government, private sectors and academia in the planning process.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 9

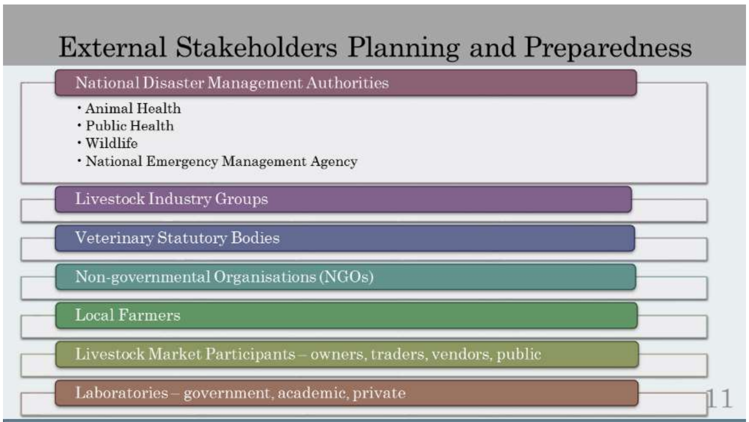
SCRIPT / KEY POINTS

The trainees from all countries will be asked if their country have national plans. They will also be asked what else a national plan should contain besides that listed. They will be asked if they have generic plans, disease specific plans or both in their country. This is the baseline for successful local preparedness planning and the goal is to get the students to think about their national plan and their role within the same.

Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 10

SCRIPT / KEY POINTS

The scope of planning from national level to the district and local level will be reviewed. This slide provide details of what national plans should include and how affective local response activities are with specific examples. Participants will be asked what is missing from these lists. Participants will be asked if they have response teams in their country and if so, when and how are they utilised.

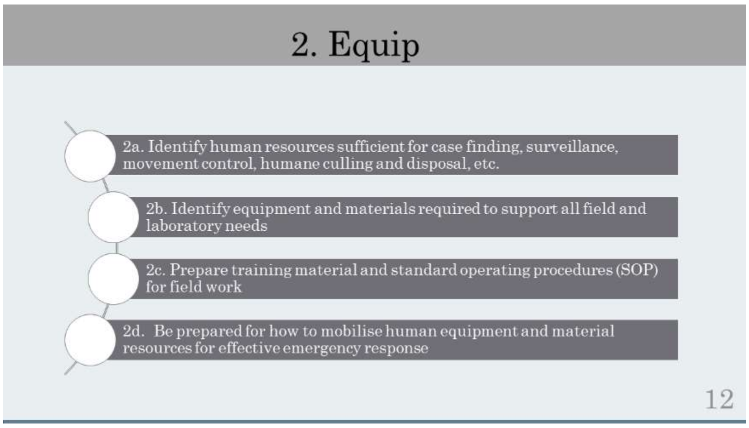


Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 11

SCRIPT / KEY POINTS

The following provides a list of external stakeholders for planning and preparedness. These include:

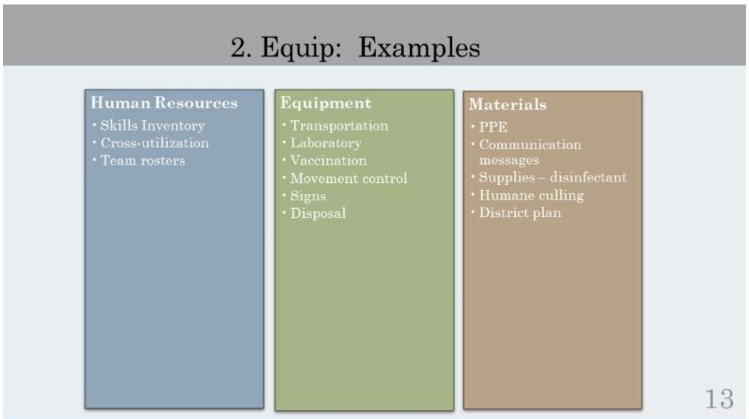
- National Disaster Management Authorities;
- Livestock industry groups;
- Veterinary associations;
- Non-governmental organisations;
- Local farmers;
- Livestock market participants; and
- Laboratories.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 12

SCRIPT / KEY POINTS

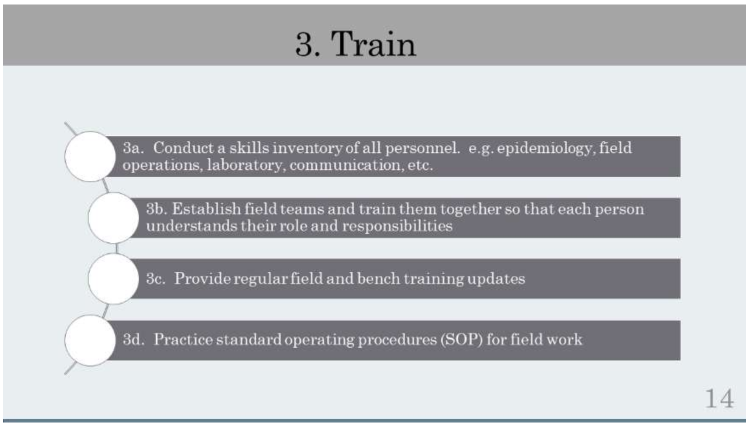
Human, equipment, material and training resources should be identified, organised and be mobilized when the need arises.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 13

SCRIPT / KEY POINTS

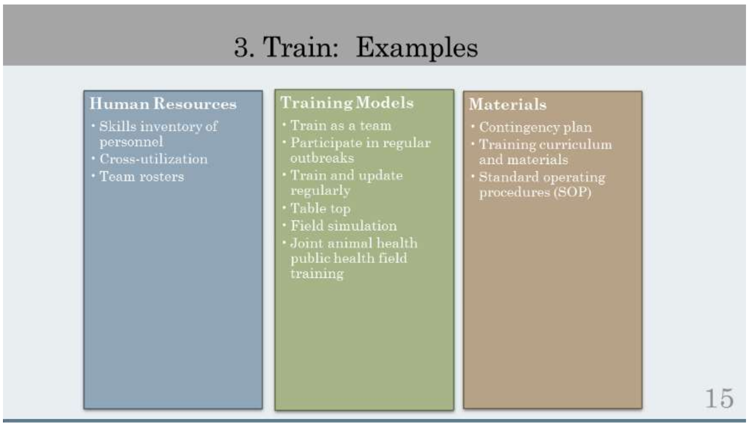
Human, equipment and material resources can only be provided if a financial plan has been developed to access emergency funds immediately after an emergency is declared.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 14

SCRIPT / KEY POINTS

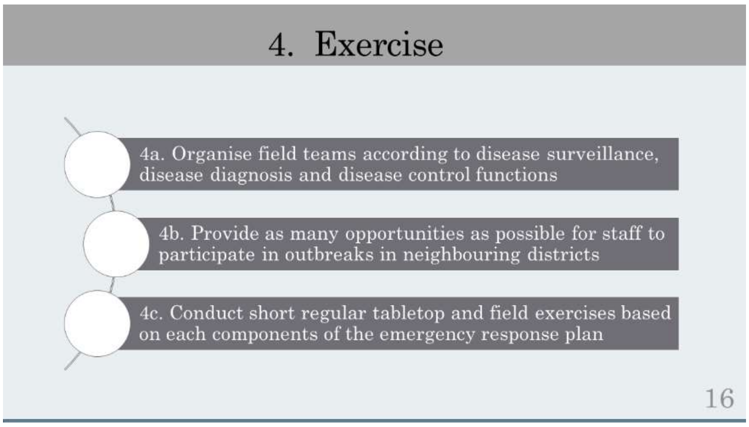
Training includes identifying resource persons, building field teams, and practicing SOP in the field e.g. donning, doffing, farm entry.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 15

SCRIPT / KEY POINTS

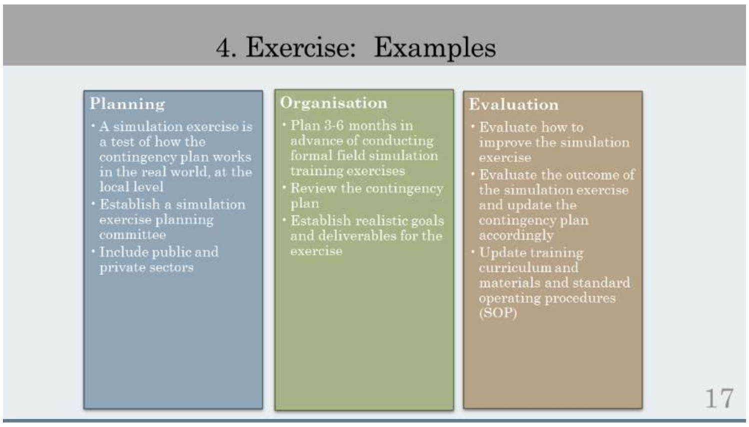
Training the right people for the right job is essential. All formal and informal training opportunities should be pursued, and SOP need to be practiced daily and continuously. Replacement should be trained in the event of illness or leaving the government service.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 16

SCRIPT / KEY POINTS

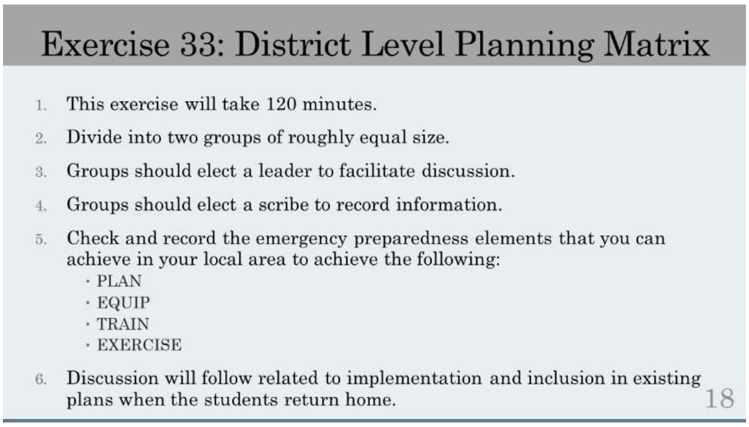
Field teams should exercise their skills taking advantage of exposure to outbreaks as they occur and participate in short tabletop and field training exercises.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 17

SCRIPT / KEY POINTS

A simulation exercise is a test of how the contingency plan works in the real world, at the local level. Always leave enough time to organize a well thought out exercise and always take the time to evaluate the process as well as the product and identify areas for improvement.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 18

SCRIPT / KEY POINTS

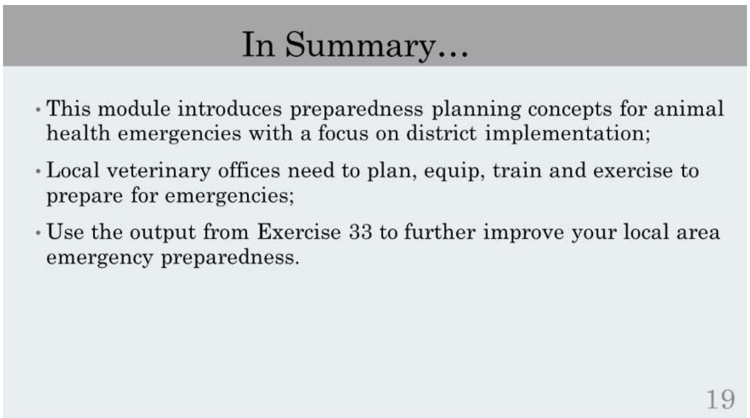
Exercise 33 instructions: District Level Planning Matrix

- This exercise will take 120 minutes.
- Divide into two groups of roughly equal size.
- Groups should elect a leader to facilitate discussion.
- Groups should elect a scribe to record information.
- Create a district level planning matrix for avian influenza.
- The concepts captured during the classroom component and the break out sessions will be used to help create the matrix.
- Discussion will follow related to implementation and inclusion in existing plans when the students return home.

At the conclusion of the white boarding session, the participants will be asked to develop a matrix for an effective district level preparedness plan.
They will be asked to consider avian influenza as the example. Each of the 9 components will be recreated from the examples worked through for avian influenza.
Other key components of the matrix will also be developed by the whole class together.

Instructors:

- Review the instructor manual for answers.



Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 19

SCRIPT / KEY POINTS

In summary,

- Preparedness and planning for animal disease events must address contingencies for prevention, mitigation and rapid response;
- A national plan is not effective unless it can be implemented and supported at the district level;
- This module introduces preparedness planning concepts for animal health emergencies with a focus on district implementation;
- An effective preparedness plan must consider all contingencies, provide structure and guidance to local responders and ensure the authority and support is; and adequate to get the work accomplished.

Lesson 29 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 1, Slide 20

SCRIPT / KEY POINTS

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 33 – Local Area Level Planning Matrix

Description of Exercise:

Develop a local-level planning matrix in preparation for an animal disease outbreak. Use avian influenza as the disease. Should you have any questions over the exercise, please ask a trainer for clarification.

Allotted Time: 120 minutes

Organisation of Group Work:

Form yourselves into groups of roughly equal size.

Exercise Objective(s):

1. Check and record the emergency preparedness elements that you can achieve in your local Area.

Exercise Components and Structure:

1. Check and record the emergency preparedness elements that you can achieve in your local Area to achieve the following:

   - PLAN
   - EQUIP
   - TRAIN
   - EXERCISE

2. Develop a local level planning matrix.

Materials, Data or Information:

1. Flip chart
2. Markers
3. Computer

Expected Outputs and Deliverables of Each Participant:

1. Complete matrix of local preparedness.

Local Preparedness Matrix

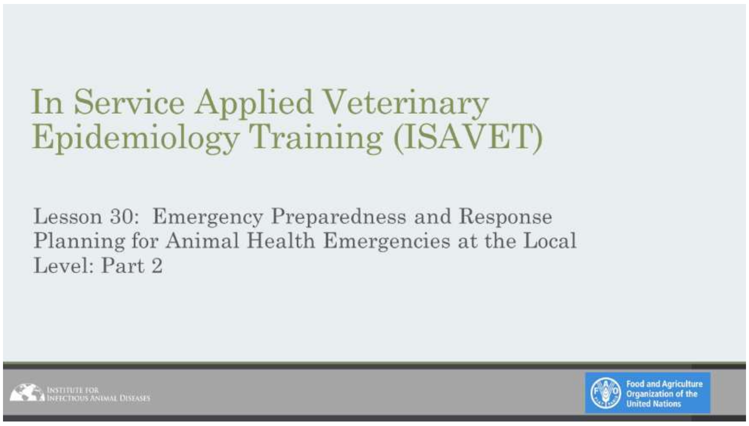
Preparedness Step	Details of Local Preparedness
1. **Plan**	▪ *Answers will vary*
2. **Equip**	▪ *Answers will vary*
3. **Train**	▪ *Answers will vary*
4. **Exercise**	▪ *Answers will vary*

Lesson 30 – Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level: Part 2

Estimated Lesson and Exercise Time	3 hours
Instructor Materials	ISAVET Lesson 30 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2.pptx
	ISAVET Lesson 30 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2.Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 30 Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2 Participant Guide.doc

INSTRUCTOR COMMENT: LESSON ACRONYMS AND ABBREVIATIONS

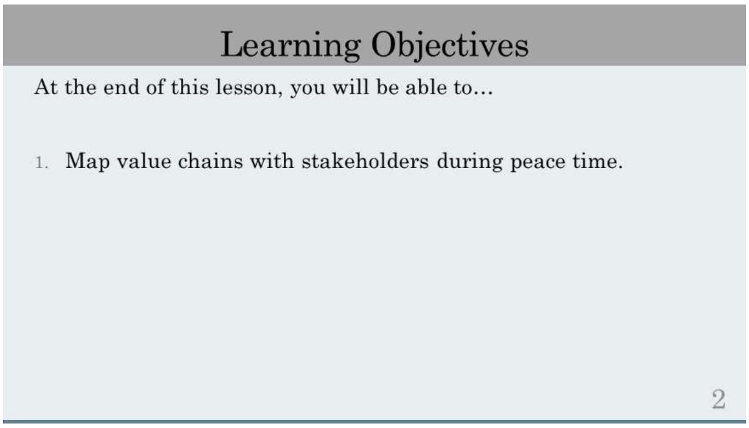
FAO	Food and Agriculture Organisation of the United Nations
GEMP	Good Emergency Management Practices
ISAVET	In Service Applied Veterinary Epidemiology Training
OIE	Woeld Organisation for Animal Health



Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 1

SCRIPT / KEY POINTS

Welcome to Lesson 30 titled, "Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level: Part 2"

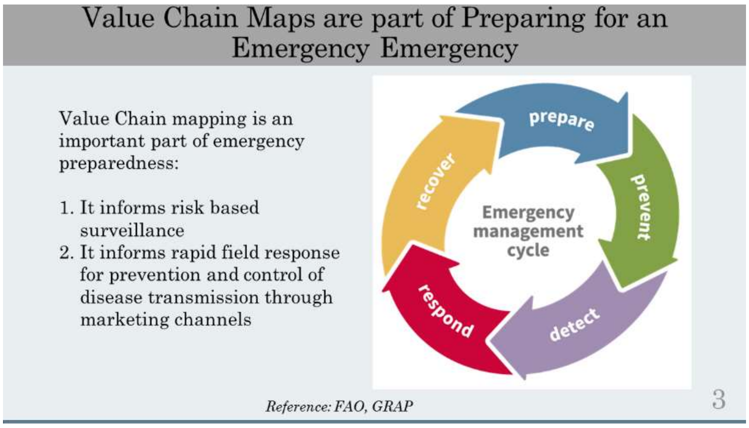


Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2,
Slide 2

SCRIPT / KEY POINTS

In this lesson, we will:

- Map value chains with stakeholders during peace time; and
- Contribute to post-incident assessments.



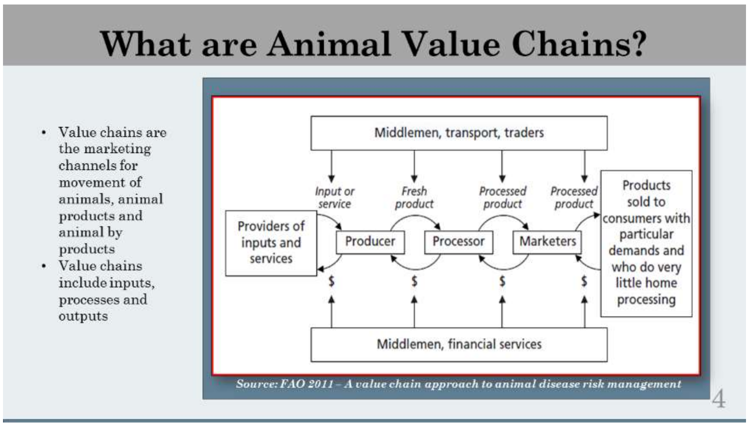
Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2,
Slide 3

SCRIPT / KEY POINTS

Most countries have national animal health emergency plans. The challenge often is ensuring they are effective and achievable at the local level. All disease responses start at the local or district level where the on-farm diagnosis is made. Ultimately then it is up to the responders at the district level to achieve success with support and guidance from the national level plan. National plans therefore must not only give structure and focus to response activities, but simultaneously be practical and implementable at the farm level.

This module will cover the preparedness activities at the local (district) level often based on national templates for guidance. Preparedness plans must acknowledge either mitigation or prevention concepts if possible, to be a comprehensive plan. Preparedness planning must also provide contingencies for rapid response. For animal health diseases, effective surveillance systems and risk analyses completed in advance are critical to rapid and effective responses, which ultimately lead to quicker recovery times.

Photo:
Image 1: FAO

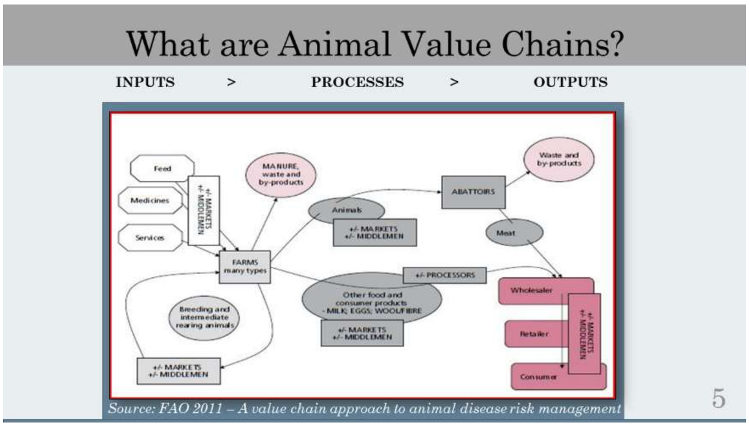


Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 4

SCRIPT / KEY POINTS

This figure illustrates the value chain approach. The process includes inputs, middlemen, transport, traders and the output includes animal products and by-products for consumers. It moves from the producer, to processer, to marketer.

Photo:
Image 1: FAO

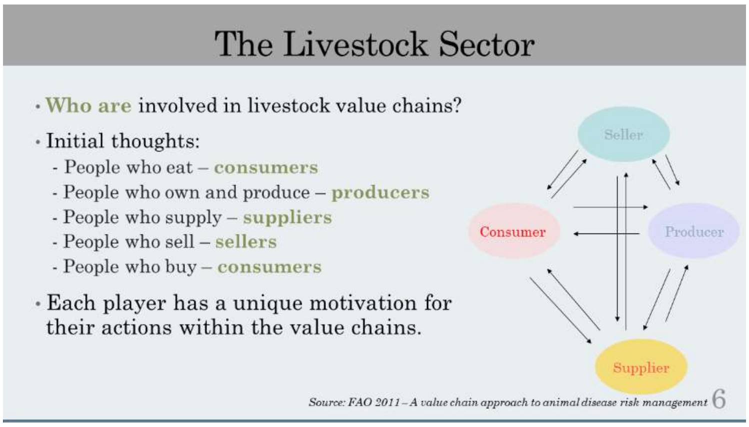


Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 5

SCRIPT / KEY POINTS

Here is another example of a value chain. Notice the inputs on the left hand side, the movements and processes in the middle and the outputs on the right hand side.

Photo:
Image 1: FAO

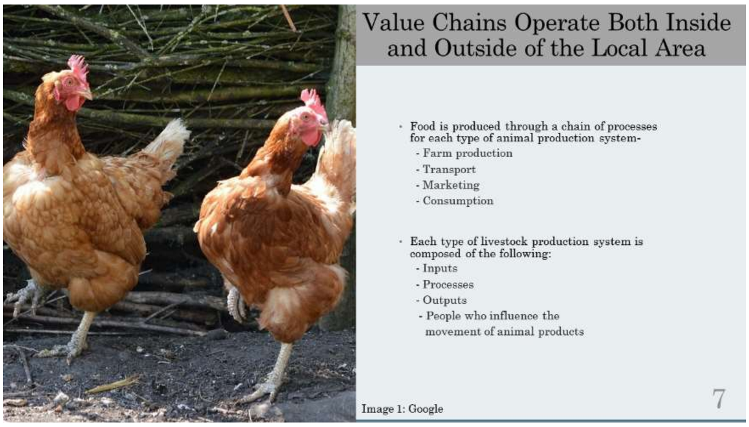


Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 6

SCRIPT / KEY POINTS

Who are involved in livestock value chains? Specific people who are players in livestock value chains could include, but are not limited to, consumers, producers, suppliers, sellers, and consumers.

Photo:
Image 1: FAO

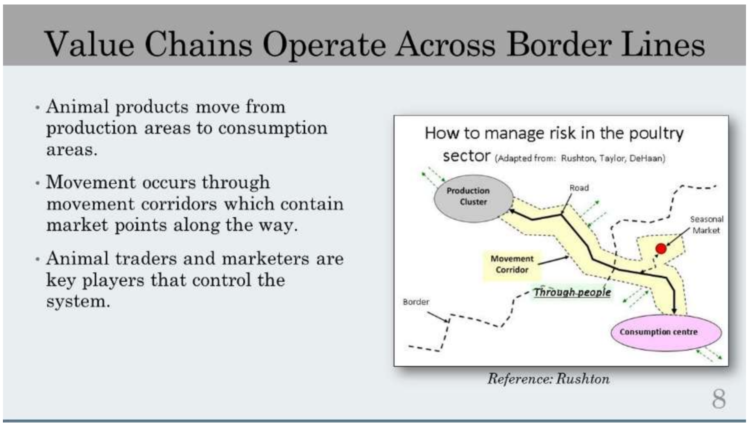


Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 7

SCRIPT / KEY POINTS

Value chains operate both inside and outside of the district. Food is produced through a chain of processes for each animal production system. Value chains can include farm production, transportation, marketing and consumption. Value chains include inputs, processes, outputs, and individuals who influence the movement of animal products.

Photo:
Image 1: Google

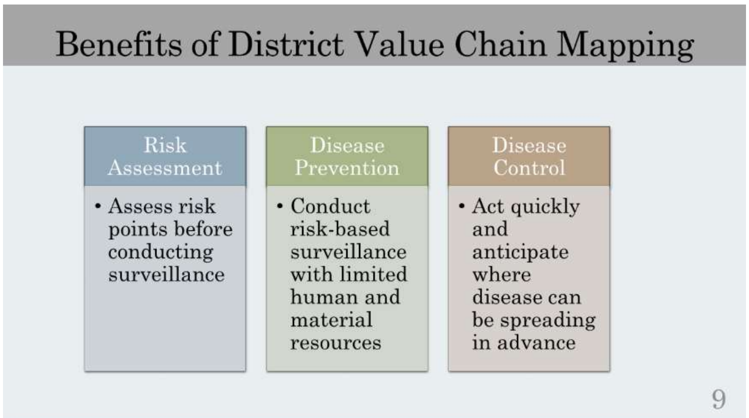


Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2,
Slide 8

SCRIPT / KEY POINTS

Notice that the marketing system shown crosses boundaries, making this an important aspect of transboundary disease control.

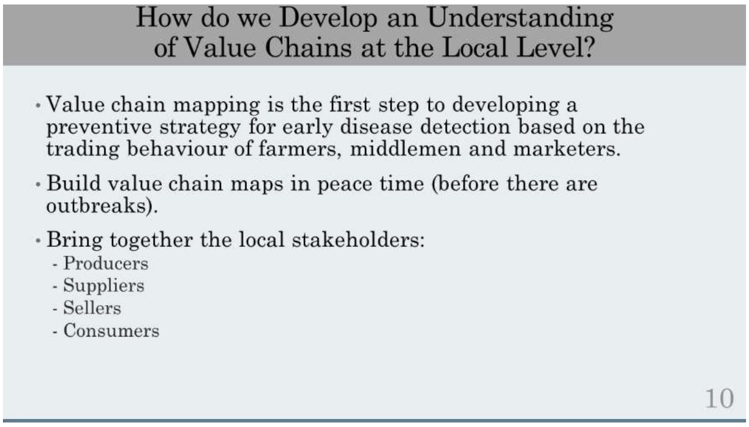
Photo:
Image 1: Rushton



Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2,
Slide 9

SCRIPT / KEY POINTS

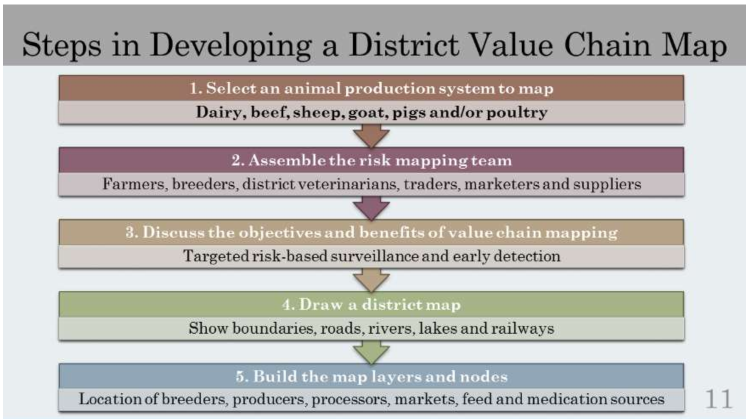
Value chain mapping at the district level offers the following benefits. These include risk assessment, disease prevention, and disease control.



Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 10

SCRIPT / KEY POINTS

Value chain mapping is the first step to developing a preventive strategy for early disease detection based on the trading behaviour of farmers, middlemen and marketers. It is important to build value chain maps in peace time (before there are outbreaks) to best understand your response measures. Value chain mapping is a critical tool that field personnel can utilise to bring together local stakeholders within a district. Specific groups for which a value chain map should be developed include producers, suppliers, sellers, and consumers.

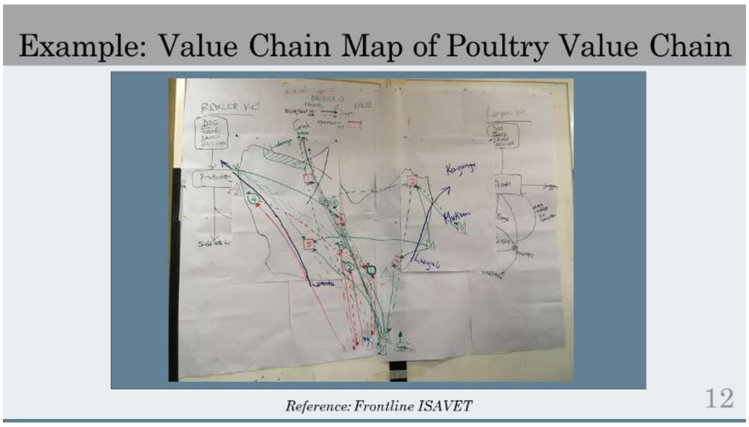


Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 11

SCRIPT / KEY POINTS

There area five steps to develop a district value chain map. The process for developing district value chain maps for each animal production system is as follows:
First, determine the productions system you are interested in mapping.
Next, assemble your risk mapping team. This will include a team of farmers, breeders, district veterinarians, traders, marketers and/or suppliers.

Next, you will need to discuss the objectives and benefits of developing a value chain map with your risk mapping team. The main goals are target based surveillance and early detection.
Next, you will From this, you will work with your mapping team to draw a district map which will include boundaries, roads, rivers, etc.
Finally, the mapping team will identify layers and nodes for breeders, producers, processors, markets, etc.



Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2,
Slide 12

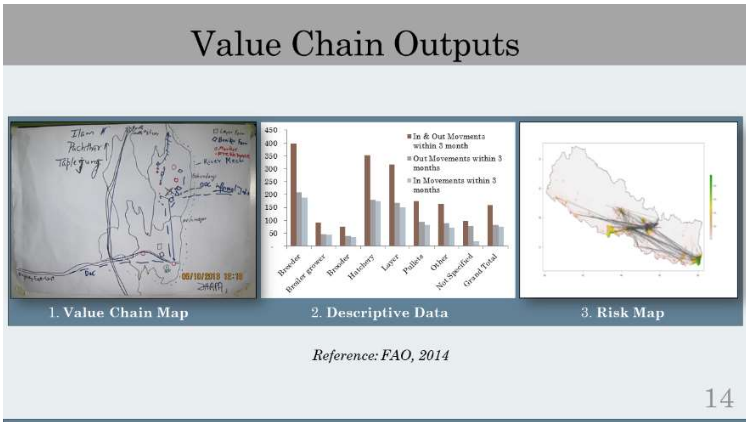
SCRIPT / KEY POINTS

The picture illustrates an example of a value chain map.
Photo:
Image 1: FAO

Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2,
Slide 13

SCRIPT / KEY POINTS

There are two main outcomes from value chain mapping. The first is the that the value chain map showcases a link between risk-based surveillance and available human, laboratory, and financial resources. The second is that the conducting value chain mapping allows your team to develop risk-based criterial for prevention and control.



Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 14

SCRIPT / KEY POINTS

Potential outputs include local value chain maps, data which provides descriptive information to quantify risk and risk maps based on advanced studies in social network analysis.

Photo(s)

Image 1: FAO

Image 2: FAO

Image 3: FAO

Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 15

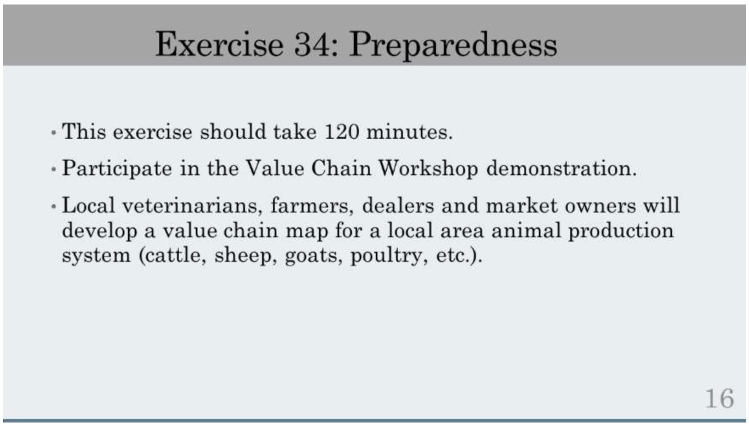
SCRIPT / KEY POINTS

Acknowledgement is extended to Dr. Jan Hinrichs, socio-economist, FAO. For additional information on designing livestock value chains for disease risk assessment and control purposes, please look at documentation developed by FAO.

Photo(s)

Image 1: FAO

Image 2: FAO



Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 16

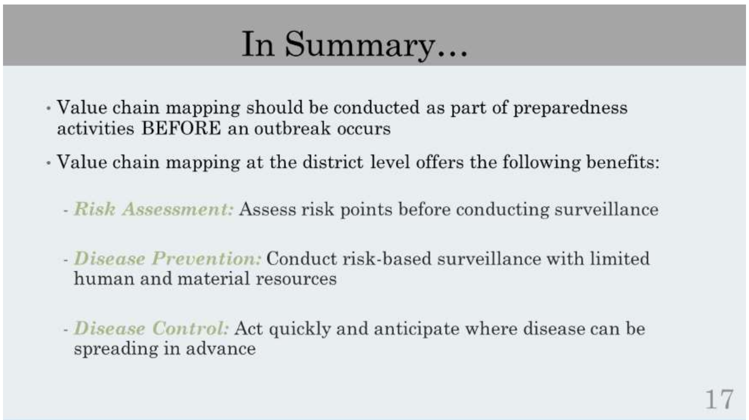
SCRIPT / KEY POINTS

Exercise 34 instructions: Preparedness:

- This exercise should take 120 minutes
- Divide into groups of equal size,
- Local veterinarians, poultry farmers, dealers, and market owners will develop a value chain map for the Luwero District poultry production system.

Instructor:

See instructor manual for answers



Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2, Slide 17

SCRIPT / KEY POINTS

In summary, value chain mapping at the local area level offers the following benefits:

- In summary, value chain mapping at the local level offers the following benefits:
- Risk Assessment: Assess risk points before conducting surveillance;
- Disease Prevention: Conduct risk-based surveillance with limited human and material resources; and
- Disease Control: Act quickly and anticipate where disease can be spreading in advance.

Lesson 30 - Emergency Preparedness and Response Planning for Animal Health Emergencies at the Local Level - Part 2,
Slide 18

SCRIPT / KEY POINTS

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 34 - Preparedness

Description of Exercise:
Develop a local-level value chain may in preparation for an animal disease outbreak. Should you have any questions over the exercise, please ask a trainer for clarification.

Allotted Time: 120 minutes

Organisation of Group Work:
Participate in the value chain workshop.

Exercise Objective(s):

1. Local veterinarians, farmers, dealers and market owners will develop a value chain map for a local production system with assistance of the local veterinarians using the following method.

Exercise Components and Structure:

1. Develop a value chain map.

Materials, Data or Information:

1. Flip chart
2. Markers
3. Computer

Expected Outputs and Deliverables of Each Participant:

1. Experience of doing value chain mapping in preparation for animal disease outbreak events.

The process for developing local value chain maps for each animal production system is as follows:

1. **Select an animal production system to map**
   Select poultry and one other species for this exercise.

2. **Assemble the risk mapping team**
   This includes farmers, breeders, local veterinarians, traders, marketers and suppliers.

3. **Discuss the objectives and benefits of value chain mapping**
   Benefits include targeted risk-based surveillance and early detection of animal disease.

4. **Draw a local map using a large piece of white paper that is taped to the wall**
   Show boundaries, roads, rivers, lakes and railways.

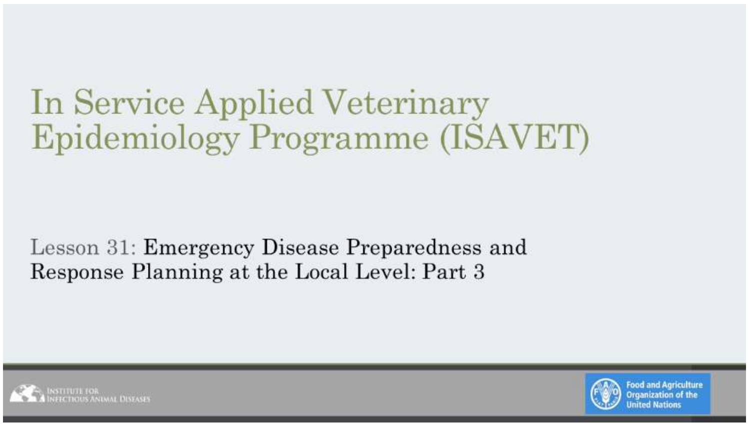
5. **Build the map layers and nodes**
   Show the location of breeders, producers, markets, feed and medication sources.

   Answers will vary by team.

Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level: Part 3

Estimated Lesson and Exercise Time	3.0 Hours
Instructor Materials	ISAVET Lesson 31 Emergency Disease Preparedness and Response Planning at the Local Level - Part 3.doc
	ISAVET Lesson 31 Emergency Disease Preparedness and Response Planning at the Local Level - Part 3.doc ISAVET Diseases Instructor Guide.doc
	Computer
	Microsoft Word
Participant Materials	ISAVET Lesson 31 Emergency Disease Preparedness and Response Planning at the Local Level - Part 3.doc

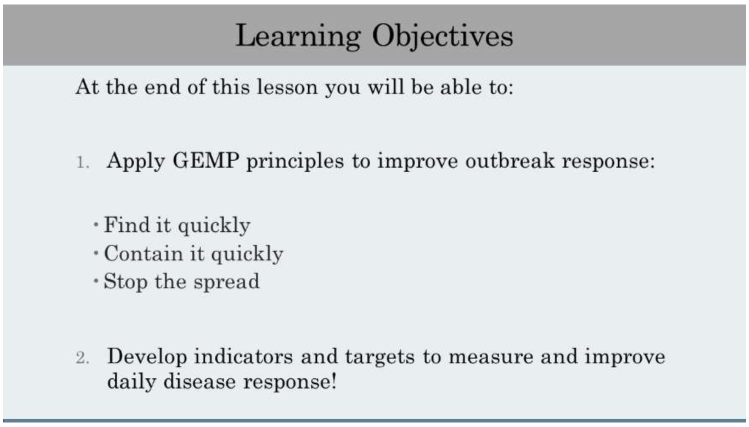
INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 1

SCRIPT / KEY POINTS

This lesson is entitled: Emergency Disease Preparedness and Response Planning at the Local Level: Part 3



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 2

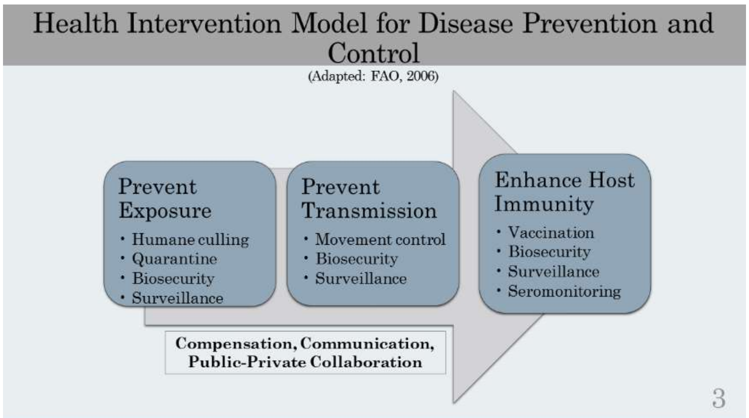
SCRIPT / KEY POINTS

At the end of this lesson you will be able to:

1. Apply GEMP principles to improve outbreak response:

Find it quickly
Contain it quickly
Stop the spread

2. Develop indicators and targets to measure and improve daily disease response!



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 3

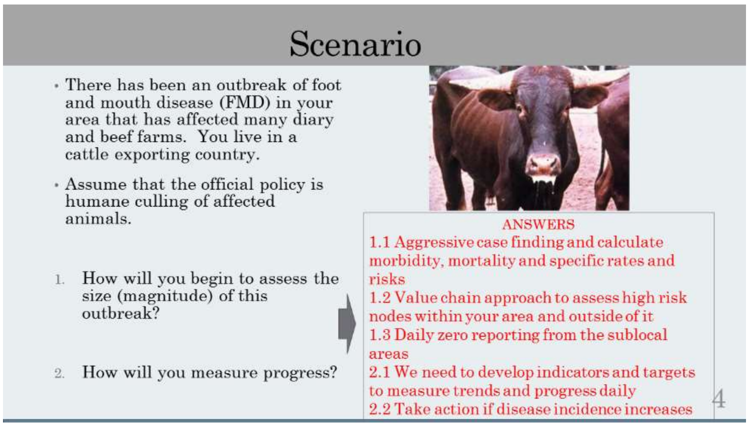
SCRIPT / KEY POINTS

The Health Intervention Model explains that there are three main ways to prevent and control diseases, namely:

- Prevent exposure;
- Prevent transmission; and
- Enhance host immunity.

Note that biosecurity and surveillance are common to all three interventions. Compensation communication and public-private partnerships are also important to implement the practices noted above.

Reference: FAO



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 4

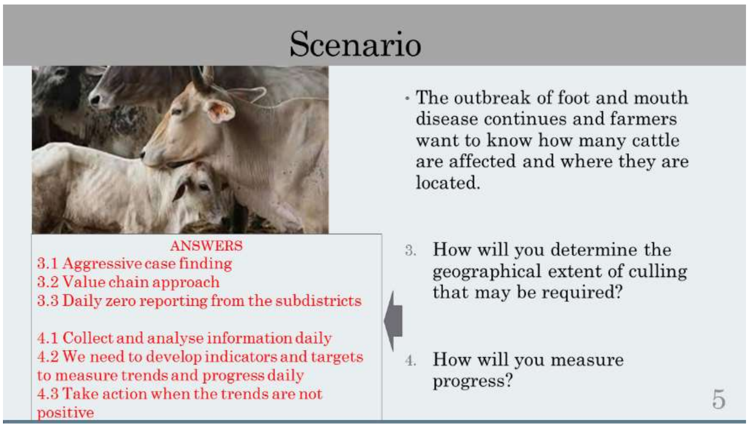
SCRIPT / KEY POINTS

How to measure impact?

1. Aggressive case finding and calculate morbidity, mortality and specific rates
2. Value chain approach to assess high risk nodes
3. Daily zero reporting from the subdistricts

How will you measure progress?

1. We need to develop indicators and targets to measure trends and progress daily
2. Take action especially when the trends are not positive



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 5

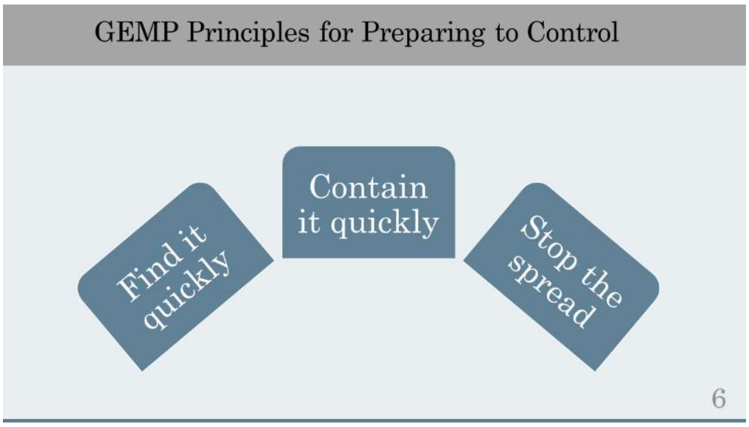
SCRIPT / KEY POINTS

How to measure impact?

1. Aggressive case finding
2. Value chain approach
3. Daily zero reporting from the subdistricts

How will you measure progress?

1. Collect and analyse information daily
2. We need to develop indicators and targets to measure trends and progress daily
3. Take action when the trends are not positive

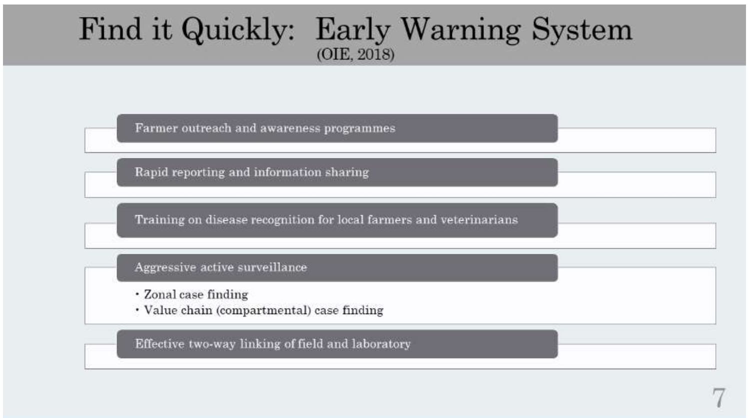


Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 6

SCRIPT / KEY POINTS

The FAO Good Emergency Management Practices (GEMP) advises measuring performance indicators for the following aspects of emergency preparedness and response:

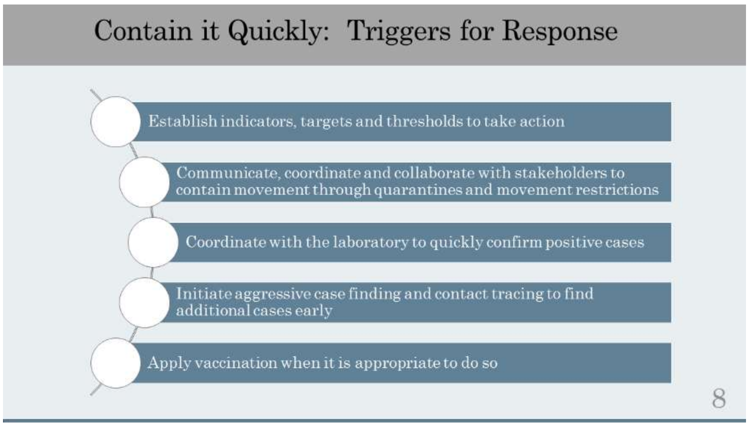
1. Find it quickly
2. Contain it quickly
3. Stop the spread



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 7

SCRIPT / KEY POINTS

Awareness and training on disease recognition, rapid reporting, aggressive case-finding and effective two-way linking comprise the elements of an early warning system



Lesson 31 – Disease Preparedness and Response at the Local area Level, Slide 8

SCRIPT / KEY POINTS

Define thresholds to distinguish an unusual increase from the normal occurrence of a disease. Then share and act upon that information with stakeholders including the laboratory, farmers and other stakeholders. Maintain aggressive case finding and contact tracing to find and contain infected animals and affected sites. If appropriate, use vaccination to enhance host immunity to decrease morbidity, mortality and virus load in the environment.

Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 9

SCRIPT / KEY POINTS

Control measures must be verified through aggressive active surveillance. This must continue according to recommendations from OIE for the period of time specified to declare freedom.

Find it Quickly: Daily Outbreak Report Metrics

Subdistrict Name	Ratio of positive to negative suspect or confirmed cases	% of suspect or confirmed positive cases detected by active surveillance	No. days from onset of clinical signs to farmer reporting (days)	No. of surveillance events reported today
Subdistrict A				
Subdistrict B				
Subdistrict C				
Subdistrict D				
Subdistrict E				
Subdistrict F				
Subdistrict G				
Subdistrict H				
Total	:	%		

10

Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 10

SCRIPT / KEY POINTS

Districts can improve their daily outbreak record for early detection by using the following metrics (measures):

- **Ratio of positive to negative suspect or confirmed cases**
- **% of suspect or confirmed positive cases detected by active surveillance**
- **No. days from onset of clinical signs to farmer reporting (days)**
- **No. of surveillance events reported today**

Contain it Quickly: Daily Outbreak Report Metrics

Subdistrict Name	No. days from reporting to quarantine	No. days from reporting to culling confirmed cases	No. days from culling to burial or burning	No. days from burial to cleaning and disinfection
Subdistrict A				
Subdistrict B				
Subdistrict C				
Subdistrict D				
Subdistrict E				
Subdistrict F				
Subdistrict G				
Subdistrict H				
Total				

11

Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3,

Slide 11

SCRIPT / KEY POINTS

Districts can improve their daily outbreak record keeping using the following metrics (measures):

- **No. days from reporting to quarantine**
- **No. days from reporting to culling confirmed cases**
- **No. days from culling to burial or burning**
- **No. days from burial to cleaning and disinfection**

Stop the Spread: Daily Outbreak Report Metrics

Subdistrict Name	No. of affected premises today (daily incidence)	Ratio of affected premises today versus previous day	Point prevalence today	Weekly prevalence estimate
Subdistrict A				
Subdistrict B				
Subdistrict C				
Subdistrict D				
Subdistrict E				
Subdistrict F				
Subdistrict G				
Subdistrict H				
Total				

12

Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 12

SCRIPT / KEY POINTS

Districts can improve their daily outbreak record keeping using the following metrics (measures):

- **No. of affected premises today (daily incidence)**
- **Ratio of affected premises today versus previous day**
- **Point prevalence today**
- **Weekly prevalence estimate**

Can you keep these metrics?

Daily Surveillance Reports by Animal-Place-Time

Animal							
Species or Type	Class	Total No. at Risk	No. Sick	No. Dead	Disease(S) Suspected (S), Probable (P) or Confirmed (C)	Notes: (Age groups, breed and sex most affected, etc)	Active (A) Passive (P)

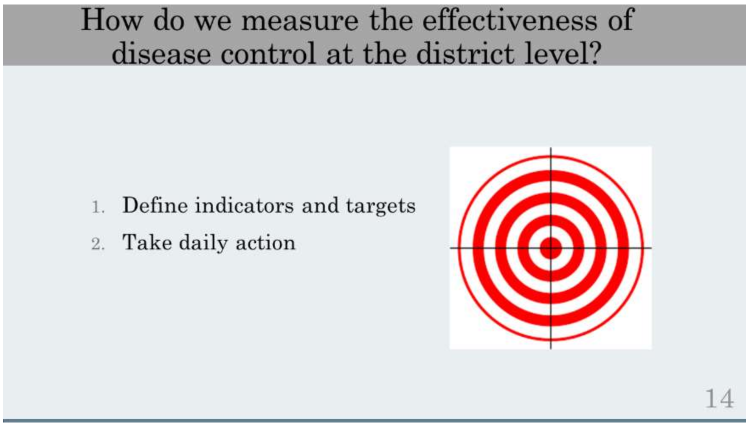
Place				Time			
Region	Subdistrict Name	GPS Coordinates (Latitude)	GPS Coordinates (Longitude)	Date of Visit	Date Symptoms First Observed	Date of First Death	Date of Laboratory Submission

13

Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 13

SCRIPT / KEY POINTS

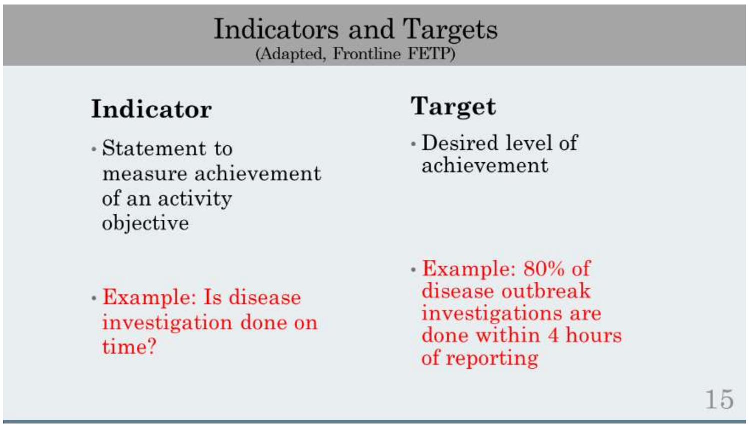
The data collected in these tables can contain disaggregated data directly gathered from the subdistrict level. This will permit detailed epidemiological analysis to be performed upon which action can be taken.
Review the slide to prepare for Exercise 15a.



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 14

SCRIPT / KEY POINTS

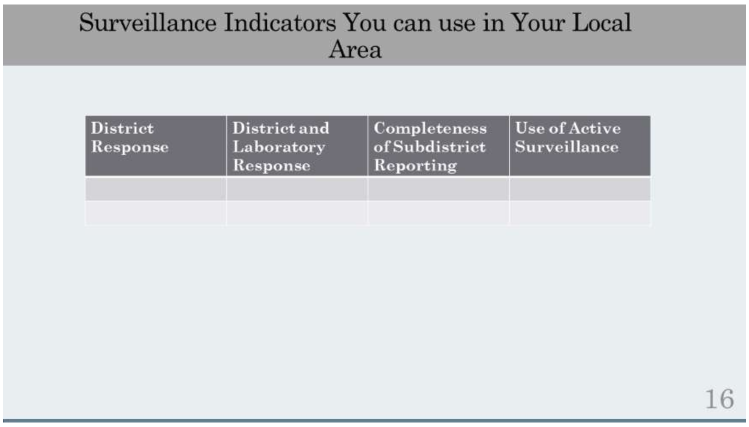
You can't improve response if you don't measure response indicators over time. Take action daily and continuously!



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 15

SCRIPT / KEY POINTS

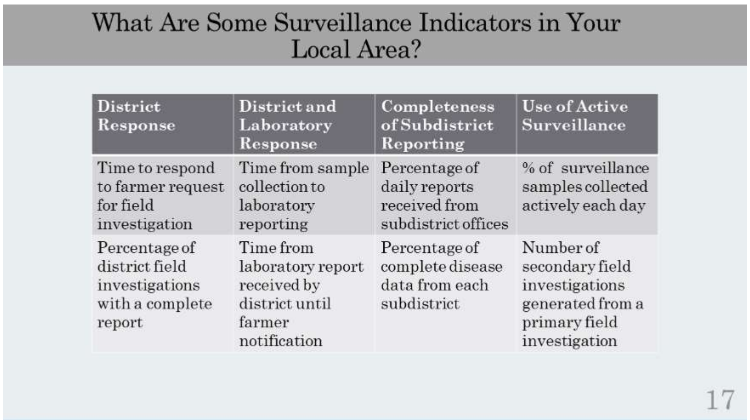
The principle for monitoring and evaluation is that you can only improve the function and performance of a emergency response if you measure baseline performance and then follow through each month.



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 16

SCRIPT / KEY POINTS

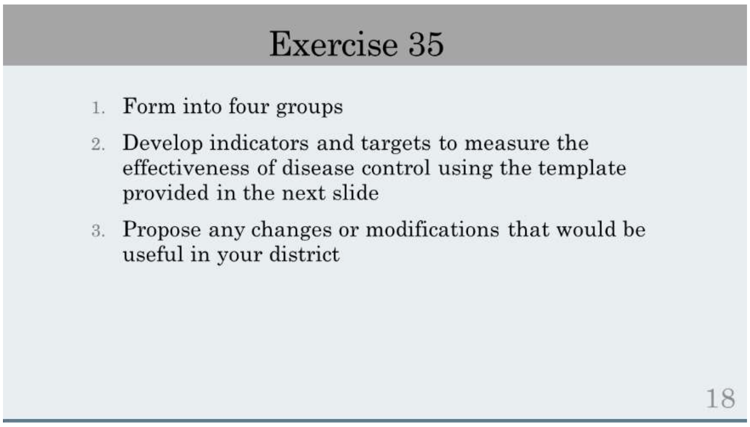
Here are four examples of surveillance indicators that provide data to measure baseline and trends over time so that we can measure progress over time.
The principle for monitoring and evaluation is that you can only improve the function and performance of a surveillance system if you measure baseline performance and then follow through each month.



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 17

SCRIPT / KEY POINTS

Here are eight specific examples of response indicators that provide data to measure baseline and trends over time so that we can measure progress over time based on timeliness and completeness.

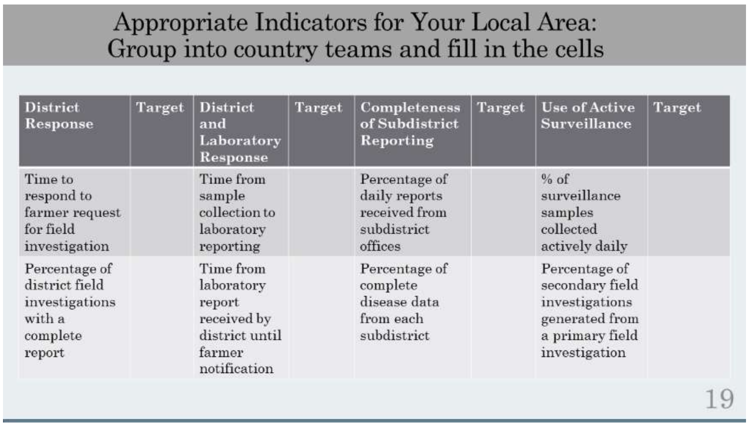


Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 18

SCRIPT / KEY POINTS

Exercise 35:

1. Form into four groups
2. Develop indicators and targets to measure the effectiveness of disease control using the template provided in the next slide
3. Propose any changes or modifications that would be useful in you local area

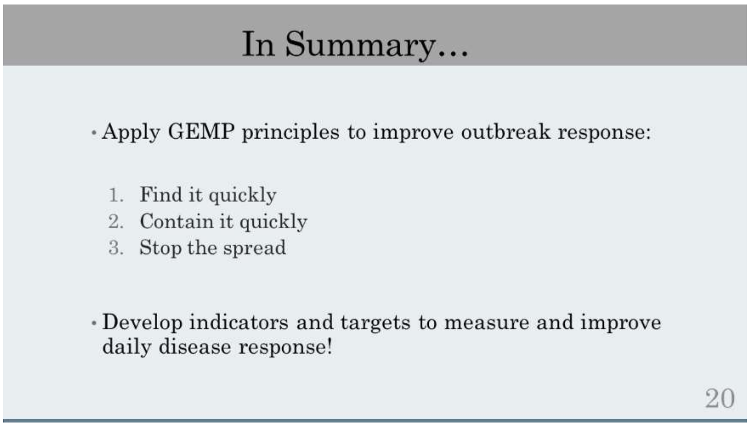


District Response	Target	District and Laboratory Response	Target	Completeness of Subdistrict Reporting	Target	Use of Active Surveillance	Target
Time to respond to farmer request for field investigation		Time from sample collection to laboratory reporting		Percentage of daily reports received from subdistrict offices		% of surveillance samples collected actively daily	
Percentage of district field investigations with a complete report		Time from laboratory report received by district until farmer notification		Percentage of complete disease data from each subdistrict		Percentage of secondary field investigations generated from a primary field investigation	

Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 19

SCRIPT / KEY POINTS

Here are eight examples of indicators with targets that provide data to measure baseline and trends over time so that we can measure progress of the outbreak response.
These measures can be graphed to show trends over time



Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 20

SCRIPT / KEY POINTS

Apply GEMP principles to improve outbreak response:

1. Find it quickly
2. Contain it quickly
3. Stop the spread

Develop indicators and targets to measure and improve disease response

Lesson 31 – Emergency Disease Preparedness and Response Planning at the Local Level - Part 3, Slide 21

SCRIPT / KEY POINTS

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.
Are there any questions?

Exercise 35 – Develop Indicators and Targets to Measure the Effectiveness of Disease Response and Control

Description of Exercise:
Prepare to measure and improve disease outbreak response in your local area

Time: 120 minutes

- Group work: 60 minutes
- Group reports and discussion: 60 minutes

Organization:
The lesson includes theory from FAO GEMP principles, a scenario exercise and a metrics exercise.

Exercise Objective(s):

1. Explain the health interventions model.
2. Explain specific principles that are used to prepare for and improve disease response following an outbreak.

Exercise Components and Structure:

- Form into four groups
- Develop indicators and targets to measure the effectiveness of disease control using the template provided in the next slide
- Propose any changes or modifications that would be useful in your local area
- Deliver group reports and participate in plenary discussion

District Response	Target	District and Laboratory Response	Target	Completeness of Subdistrict Reporting	Target	Use of Active Surveillance	Target
Time to respond to farmer request for field investigation		Time from sample collection to laboratory reporting		Percentage of daily reports received from subdistrict offices		% of surveillance samples collected actively daily	
Percentage of district field investigations with a complete report		Time from laboratory report received by district until farmer notification		Percentage of complete disease data from each subdistrict		Percentage of secondary field investigations generated from a primary field investigation	

Expected Outputs and Deliverables of Each Participant:

1. Active listening and participation in asking questions, providing targets related to response indicators to improve outbreak response.
2. Justify your indicators and target values you have chosen.

Lesson 32 – Characteristics of a Functional Disease Prevention and Control Programme at the Local Level

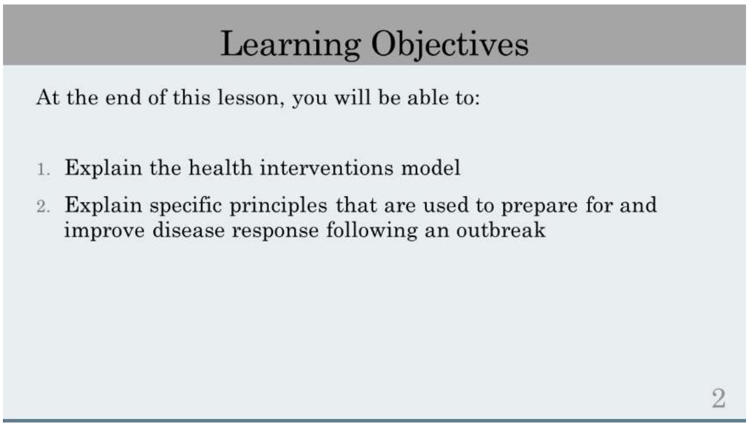
Estimated Lesson and Exercise Time	3 Hours
Instructor Materials	ISAVET Lesson 32 Characteristics of a Functional Disease Prevention and Control Programme at the Local Level
	ISAVET Lesson 32 Characteristics of a Functional Disease Prevention and Control Programme at the Local Level Instructor Guide.doc
Participant Materials	ISAVET Lesson 32 Characteristics of a Functional Disease Prevention and Control Programme at the Local Level
	Computer and Microsoft Word
	Pen or Pencil
Handout Materials for Exercises	MS Word Participant Version.doc

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 1

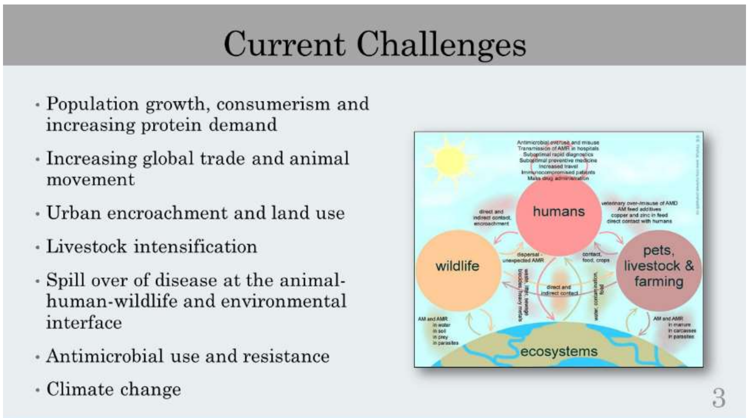
SCRIPT / KEY POINTS

Welcome to Lesson 32 titled, “Characteristics of a Functional Disease Prevention and Control Programme at the Local Level”



Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 2

SCRIPT / KEY POINTS
At the end of this lesson, you will be able to:
1. Explain the health interventions model
2. Explain specific principles that are used to prepare for and improve disease response following an outbreak



Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 3

SCRIPT / KEY POINTS

A One Health approach is needed to address the following challenges involving current agricultural production within the One Health approach:
1. Population growth, consumerism and increasing protein demand;
2. Increasing global trade and animal movement;
3. Urban encroachment and land use;
4. Livestock intensification;
5. Spillover of diseases at the animal-human-wildlife and environmental interface;
6. Antimicrobial resistance; and
7. Climate change.

Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 4

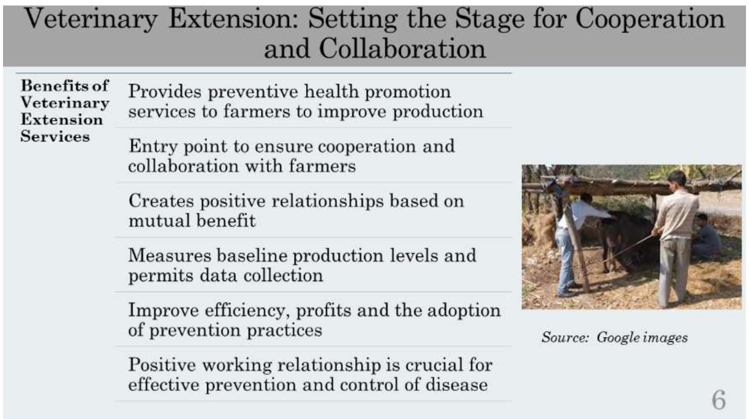
SCRIPT / KEY POINTS

Read slide.

Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 5

SCRIPT / KEY POINTS

Read slide.



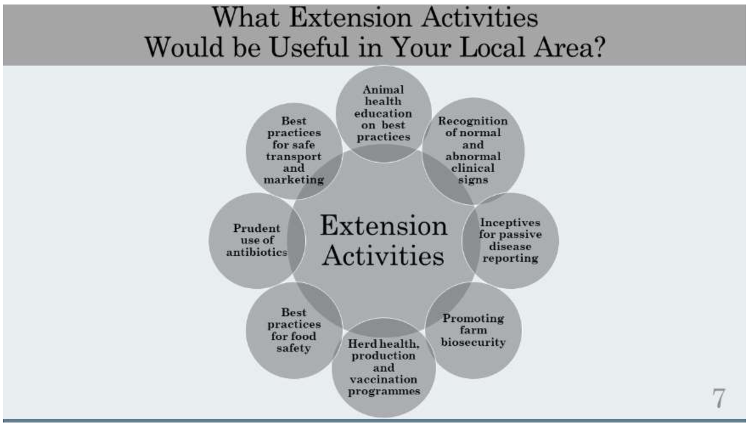
Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 6

SCRIPT / KEY POINTS

Veterinary extension work is a frontline activity that provides health promotion services to farmers to improve production. Benefits of conducting veterinary extension include the following:

- Creates positive relationships based on mutual benefit to the farmer and the animal population as a whole.
- Measures baseline production levels and permits data collection to improve production over time.
- Educates farmers on ways to improve efficiency, profits and the adoption of prevention practices.

Positive working relationships with farmers is required for the effective prevention and control of animal diseases at the district level.



Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
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SCRIPT / KEY POINTS

Extension activities with potential benefits to animal production may include:

1. Education and awareness raising about animal health diseases;
2. Training related to herd and flock health, production and vaccination programs;
3. Field trials to test biologics;
4. Best practices for food safety;
5. Prudent use and best practices for the use of antibiotics;
6. Best practices for safe transport and marketing of animals and animal products; and
7. Enhance farmers passive disease reporting.

Topics can include the following depending on local needs:

- Nutrition;
- Reproductive health;
- Biosecurity;
- Best practices for antibiotic use.

Are animal traders and marketers involved in education and training?
What are the priorities for extension in your district?

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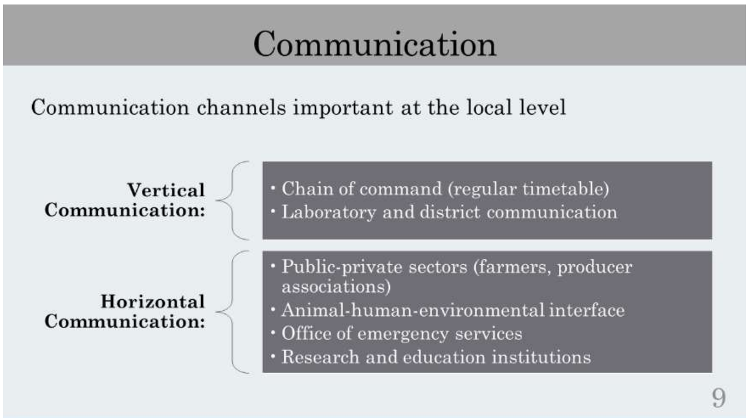
SCRIPT / KEY POINTS

Public-private partnerships can be developed through extension training and education programmes at the district level.
These partnerships are critical since the private sector owns the population at risk and they control the production and movement of animals and disease agents.
Does your district have a plan to develop contingency plans for action with producers, traders and marketers in you district?



Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 9

SCRIPT / KEY POINTS

The following communication methods are important for district prevention and control activities:

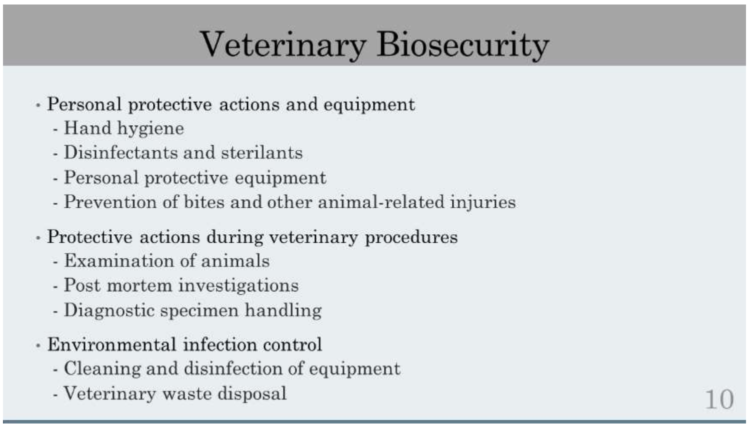
- Vertical communication:

Chain of command; and
Laboratory and district communication.

- Horizontal communication:

Public-private sectors;
Animal health-public health-environmental health agencies;
Office of emergency services; and
Research and education institutions.

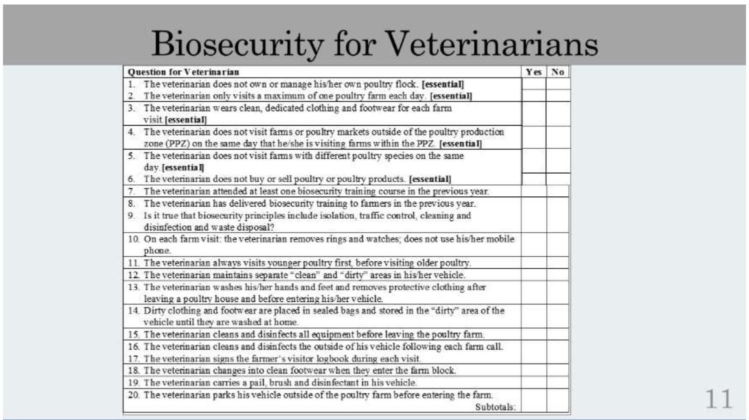
What communication messages and channels have been developed before, during and after an animal disease outbreak in your district?



Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 10

SCRIPT / KEY POINTS

Veterinarians should be models for good biosecurity practices.
Do you have and do you follow standard operating procedures for biosecurity? Is further training needed?



Question for Veterinarian	Yes	No
1. The veterinarian does not own or manage his/her own poultry flock. **[essential]**		
2. The veterinarian only visits a maximum of one poultry farm each day. **[essential]**		
3. The veterinarian wears clean, dedicated clothing and footwear for each farm visit **[essential]**		
4. The veterinarian does not visit farms or poultry markets outside of the poultry production zone (PPZ) on the same day that he/she is visiting farms within the PPZ. **[essential]**		
5. The veterinarian does not visit farms with different poultry species on the same day. **[essential]**		
6. The veterinarian does not buy or sell poultry or poultry products. **[essential]**		
7. The veterinarian attended at least one biosecurity training course in the previous year.		
8. The veterinarian has delivered biosecurity training to farmers in the previous year.		
9. Is it true that biosecurity principles include isolation, traffic control, cleaning and disinfection and waste disposal?		
10. On each farm visit: the veterinarian removes rings and watches; does not use his/her mobile phone.		
11. The veterinarian always visits younger poultry first, before visiting older poultry.		
12. The veterinarian maintains separate "clean" and "dirty" areas in his/her vehicle.		
13. The veterinarian washes his/her hands and feet and removes protective clothing after leaving a poultry house and before entering his/her vehicle.		
14. Dirty clothing and footwear are placed in sealed bags and stored in the "dirty" area of the vehicle until they are washed at home.		
15. The veterinarian cleans and disinfects all equipment before leaving the poultry farm.		
16. The veterinarian cleans and disinfects the outside of his vehicle following each farm call.		
17. The veterinarian signs the farmer's visitor logbook during each visit.		
18. The veterinarian changes into clean footwear when they enter the farm block.		
19. The veterinarian carries a pail, brush and disinfectant in his vehicle.		
20. The veterinarian parks his vehicle outside of the poultry farm before entering the farm.		
Subtotals:		

Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
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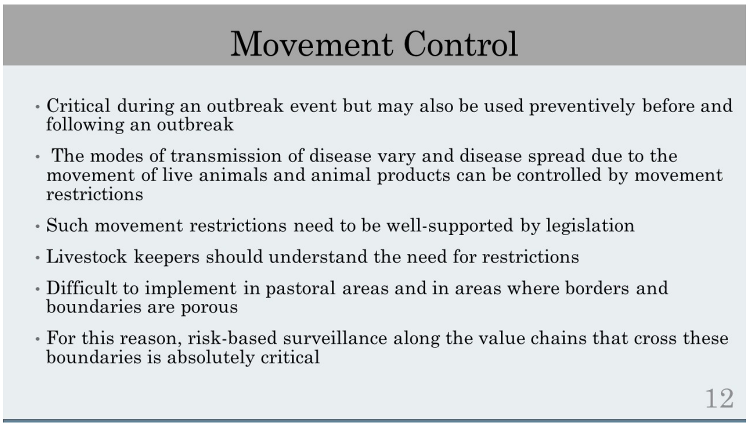
SCRIPT / KEY POINTS

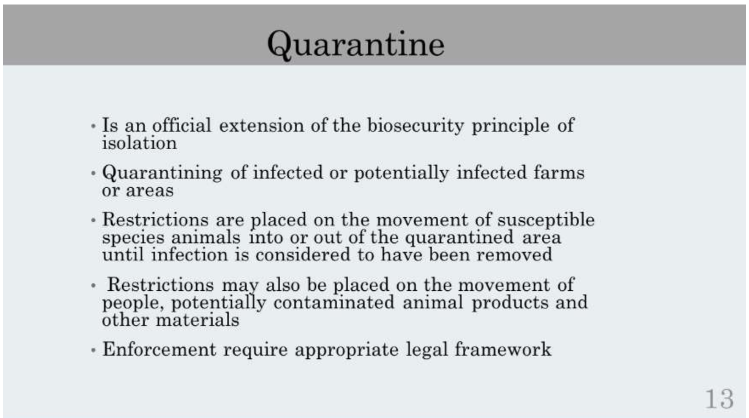
Do you have biosecurity tools to support livestock and poultry producers who are intensifying their production?
Intensification requires additional prevention measures be taken.
The table reflects biosecurity checklist for veterinarians who visit poultry farms. Other checklists exist for poultry producers and for cleaning and disinfection.
Ongoing training programmes are needed to promote the best practices for biosecurity.
Biosecurity is relevant before, during and after disease outbreak events.



Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 12

SCRIPT / KEY POINTS

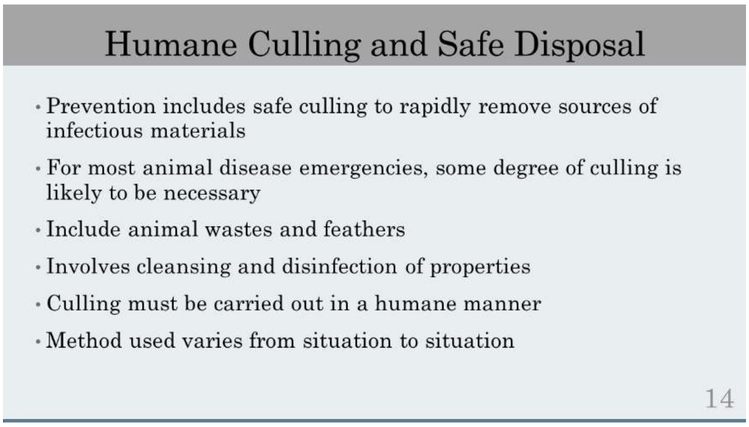
Movement control is especially critical during an outbreak event but may also be used preventively before and following an outbreak when disease confirmation is not yet complete in certain areas.
Since borders and boundaries are often very porous, it is not possible to prevent or control disease transmission in many instances. For this reason, risk based surveillance along the value chains that cross these boundaries is absolutely critical.
Does your district have a strategy for movement control that includes rapid detection through risk based surveillance?



Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 13

SCRIPT / KEY POINTS

Quarantine is an official extension of the biosecurity principle of isolation.
Is quarantine authority and implementation clearly defined in your district?



Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
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SCRIPT / KEY POINTS

Prevention includes safe culling to rapidly remove sources of infectious materials. This should include animal wastes and feathers. Humane practices are essential to uphold the veterinary oath and to model this value to farmers and the general public.

Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
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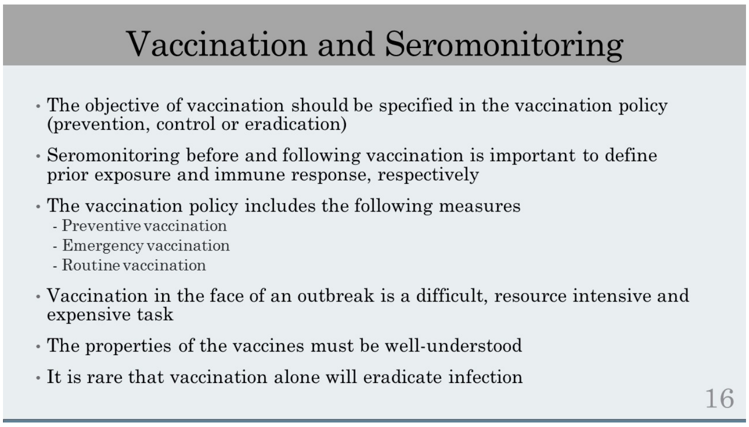
SCRIPT / KEY POINTS
Are there any compensation programs for emergency animal diseases in your country and district?
How do you create an inceptive for disease reporting in your district?



Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
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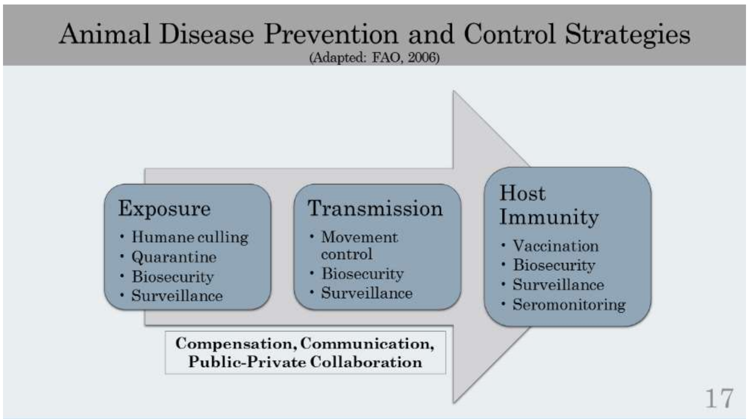
SCRIPT / KEY POINTS

Vaccination policy should specify whether the objective of vaccination is disease prevention, control or eradication. Vaccination policy includes the following measure to improve herd and flock immunity:

- Preventive vaccination to protect animals from the threat of disease entry;
- Emergency Vaccination in the face of an outbreak (e.g., FMD ring vaccination); and
- Routine vaccination in endemic areas.

A vaccination program without: 1) virus surveillance to identify current field strains; and 2) seromonitoring to measure herd and flock immunity.
Does your district have standard operating procedures to guide implementation of the national vaccination policies and private sector vaccination programs? Which programs are mass vaccination programs? Which vaccination programs are targeted?



Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 17

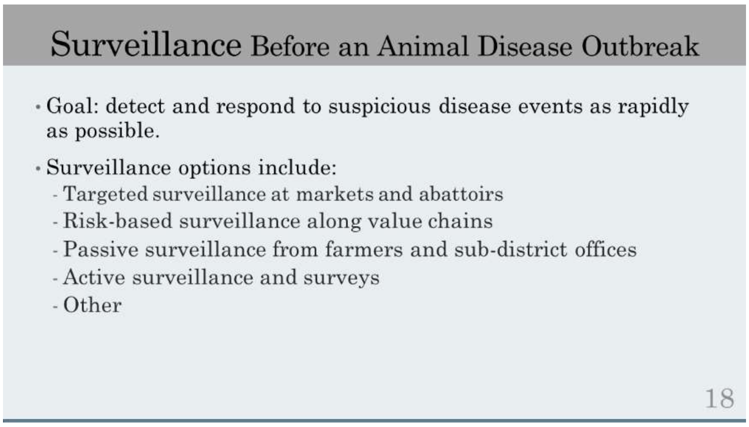
SCRIPT / KEY POINTS

Animal disease prevention and control is based on the Health Intervention Model, which explains that there are three main ways to prevent and control diseases, namely:

- Prevent exposure;
- Prevent transmission; and

• Enhance host immunity.

Note that biosecurity and surveillance are common to all three interventions. Compensation communication and public-private partnerships are also important to implement the practices noted above.



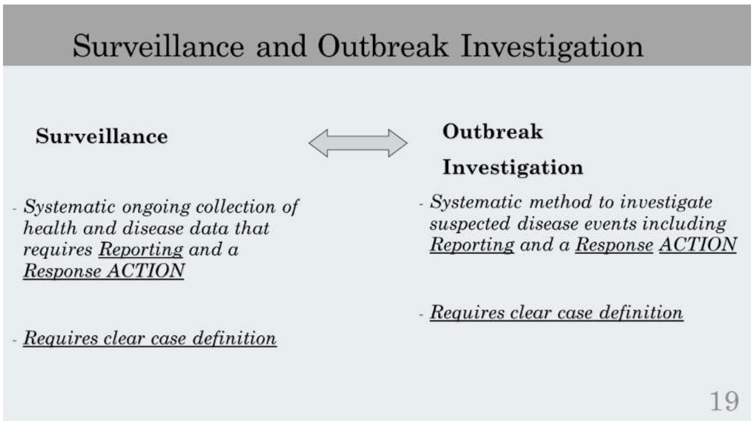
Lesson 32 –Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,
Slide 18

SCRIPT / KEY POINTS

The goal is to detect and respond to suspicious disease events as rapidly as possible. Do you have a protocol for rapid detection and response in your district?

Surveillance options include:

- Targeted surveillance at markets and abattoirs;
- Risk based surveillance along value chains;
- Passive surveillance from farmers and subdistrict offices;
- Active surveillance and surveys; and
- Other.



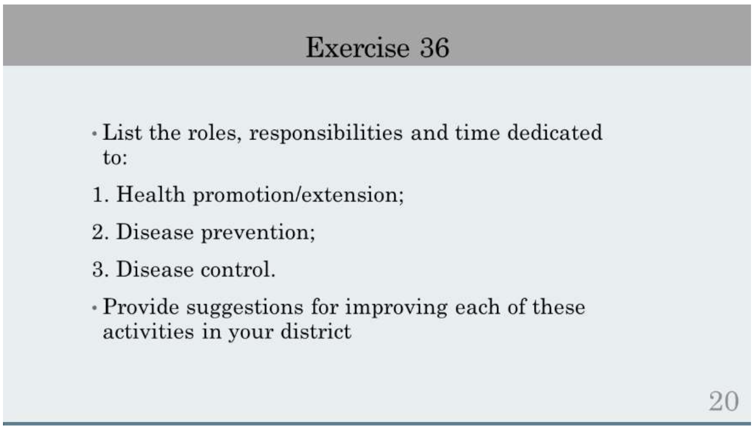
Lesson 32 – Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,

Slide 19

SCRIPT / KEY POINTS:

Surveillance should occur before during and after an outbreak investigation.

Outbreak investigation is an action taken as the outcome of disease surveillance.

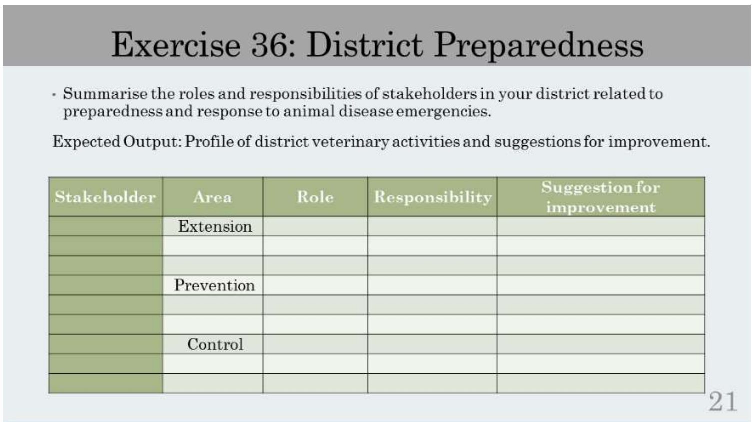


Lesson 32 – Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,

Slide 20

SCRIPT / KEY POINTS:

Using the topics in this lesson you will create a table in exercise 36 summarising the roles and responsibilities of stakeholders in your district related to preparedness and response to animal disease emergencies.



Stakeholder	Area	Role	Responsibility	Suggestion for improvement
	Extension			
	Prevention			
	Control			

Lesson 32 – Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,

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SCRIPT / KEY POINTS:

Exercise 36: District Preparedness

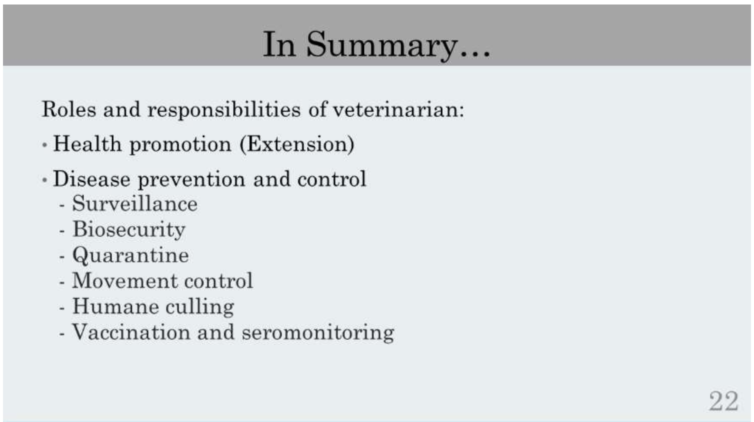
List the roles, responsibilities and time dedicated to:

1. Health promotion/extension;
2. Disease prevention; and
3. Disease control.

Provide suggestions for improving each of these activities.

Expected Output:

Profile of District veterinary activities and suggestions for improvement.



Lesson 32 – Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,

Slide 22

SCRIPT / KEY POINTS:

In summary,

- Roles and responsibilities of veterinarian:
- Health promotion (Extension)
- Disease prevention and control

- Surveillance

- Biosecurity

- Quarantine
- Movement control
- Humane culling
- Vaccination and seromonitoring

Lesson 32 – Characteristics of a Functional Disease Prevention and Control Programme at the Local Level,

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SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Exercise 36 – Roles, Responsibilities and Time Dedicated to: Health Promotion/Extension, Disease Prevention and Disease Control at the Local Level.

Description of Exercise:
The roles and responsibilities of frontline veterinarians and various stakeholders in health promotion as well as disease prevention and control described, implementation gaps and opportunities for enhancing this collaboration will be discussed with ISAVET trainees.

Time: 2 hours

Organization:

There will be a lecture on Characteristic of a Functional Disease Prevention and Control Programme at Local area Level followed by questions posed by the facilitator and ISAVET trainees.

Exercise Objective(s):

1. Explain the roles and responsibilities of frontline veterinarians and various stakeholders in health promotion as well as disease prevention and control.

Exercise Components and Structure:

C. Facilitator guiding questions related to the participating countries to identify the role and responsibilities of the various stakeholders in extension, disease prevention and control efforts in their respective countries. These includes:

- List the roles, responsibilities and time dedicated to:

  1. Health promotion extension:
  2. Disease prevention;
  3. Disease control.
  4. Provide suggestions for improvement of each activities in your local area

D. Open the floor to questions, answers and further discussion

Expected Outputs and Deliverables of Each Participant:

1. Active listening and participation in asking questions, providing examples related to the role and responsibilities of the various stakeholders at local area with regard to extension, disease prevention and control at the local area level.

Section IV: Week 4 – Field Work Training

Lesson 33 – Local Area Profile to Prepare for Field Training

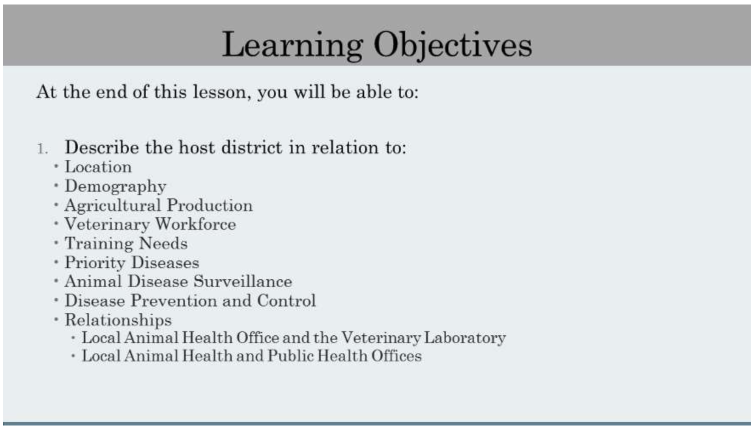
Estimated Lesson and Exercise Time	1 hour
Instructor Materials	ISAVET Lesson 33 Local Area Profile to Prepare for Field Training.ppt
	ISAVET Lesson 33 Local Area Profile to Prepare for Field Training Instructor Guide.doc

INSTRUCTOR COMMENTS: LESSON ACRONYMS AND ABBREVIATIONS

Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 33 titled, "Local Area Profile to Prepare for Field Training".

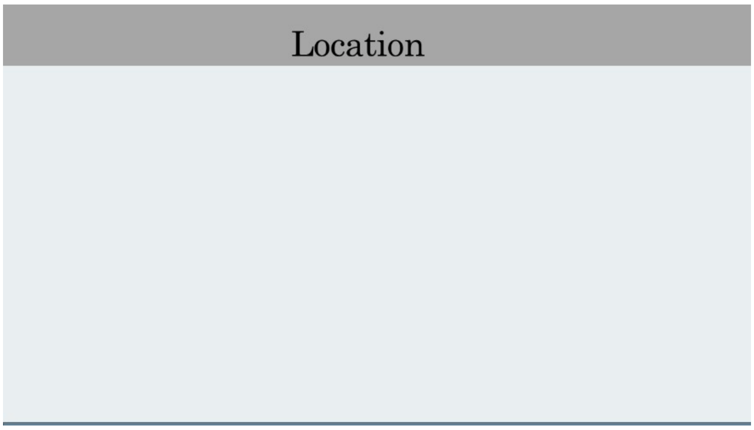


Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

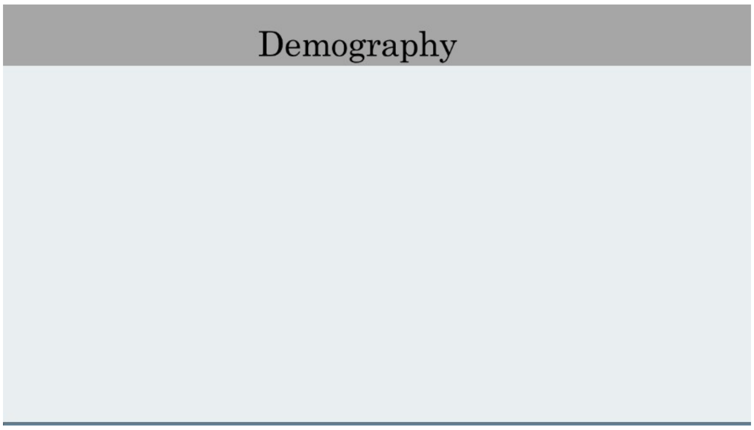
- Describe the host district in relation to:
- Location
- Demography
- Agricultural Production
- Veterinary Workforce
- Training Needs
- Priority Diseases
- Animal Disease Surveillance
- Disease Prevention and Control
- Relationships
- Local-Laboratory
- Local Animal Health-Public Health



Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 3

SCRIPT / KEY POINTS:

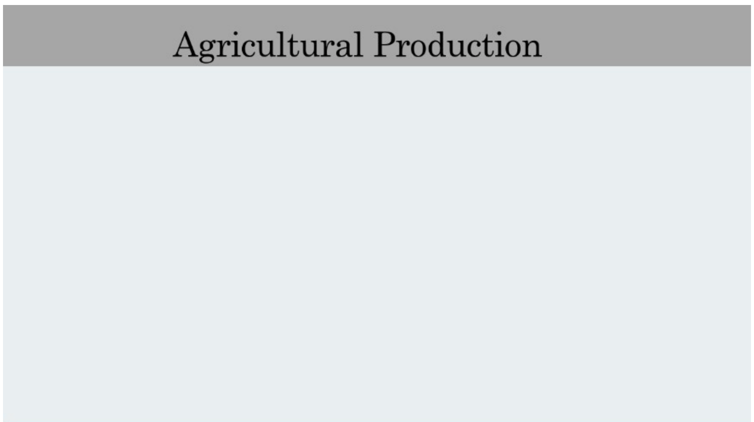
Describe the local area location using maps



Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 4

SCRIPT / KEY POINTS:

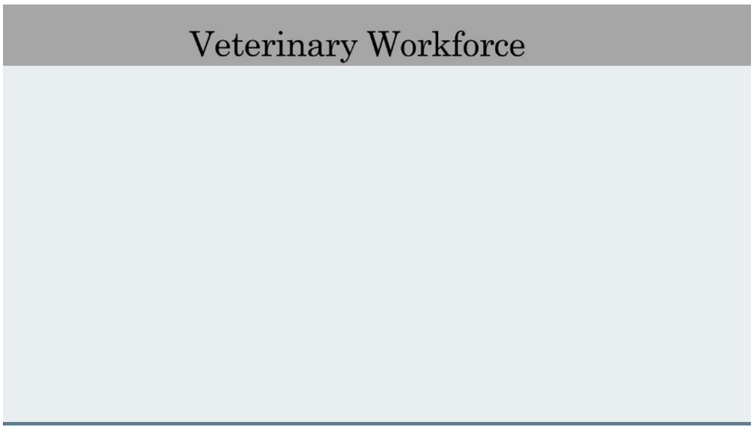
Provide vital statistics of the human and animal populations in this area using tables, graphs and maps



Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 5

SCRIPT / KEY POINTS:

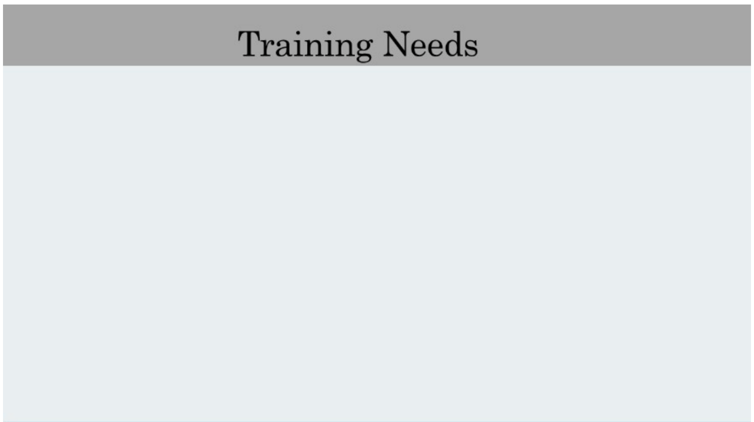
Describe the major agricultural products in the area and include important animal production systems in the area using tables, graphs and maps



Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 6

SCRIPT / KEY POINTS:

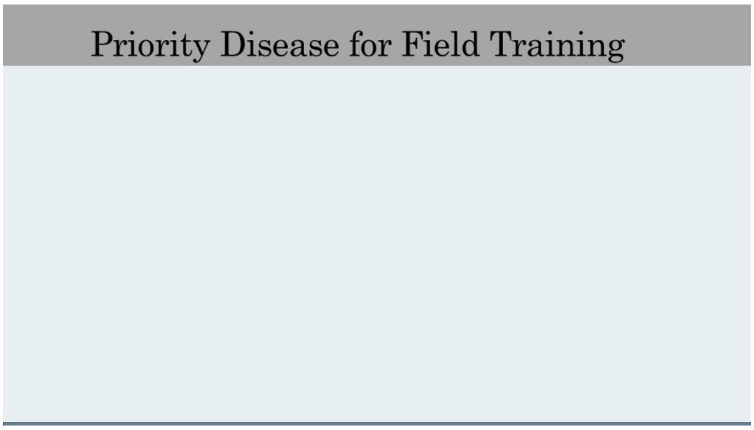
Describe the number and type of veterinarians and para-veterinarians serving this area



Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 7

SCRIPT / KEY POINTS:

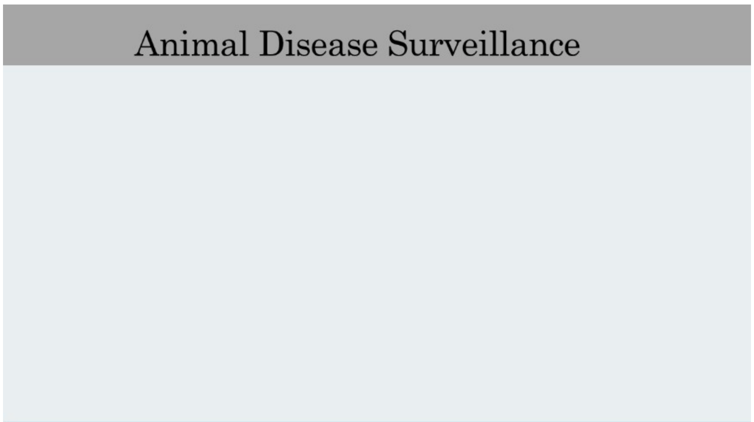
List the most important training needs for veterinarians and paraveterinarians in this area



Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 8

SCRIPT / KEY POINTS:

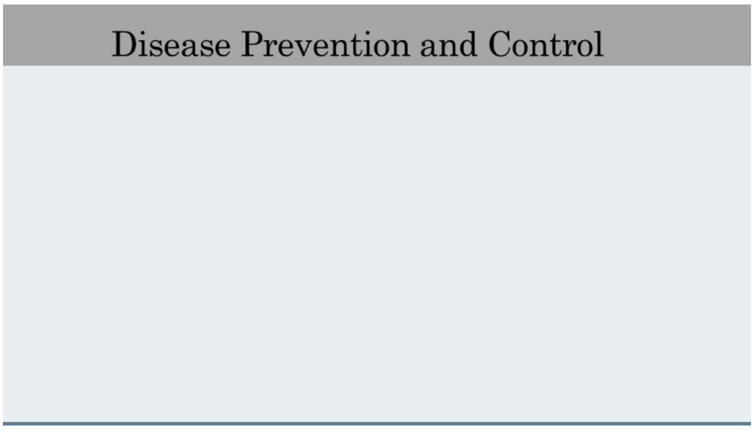
Describe the epidemiology of the priority identified for the field training week including past statistics showing disease trends and outbreaks



Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 9

SCRIPT / KEY POINTS:

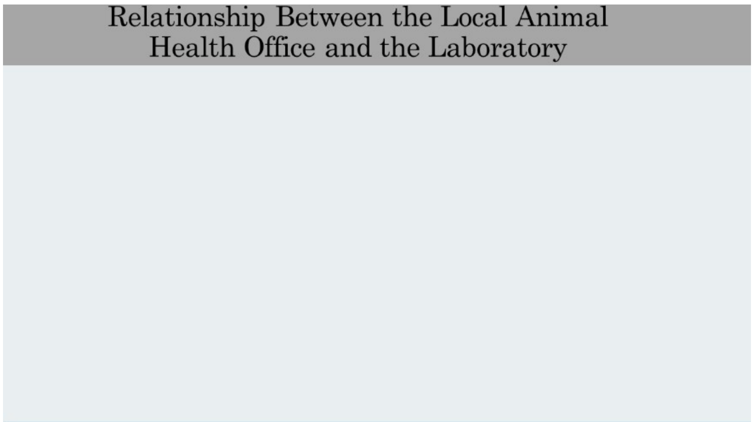
Describe the surveillance system for the priority disease and other important diseases in this area. Include the use of active and passive surveillance for routine and emergency surveillance.



Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 10

SCRIPT / KEY POINTS:

Describe disease prevention and control efforts used in the area before, during or following an animal disease event in this area.

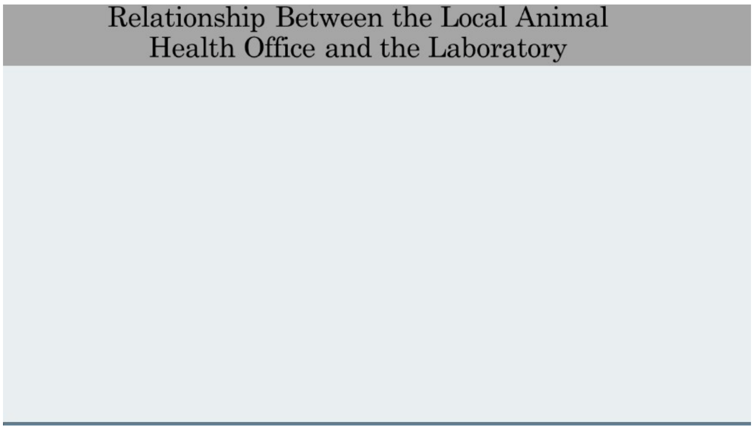


Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 11

SCRIPT / KEY POINTS:

Describe the relationship between the local animal health office and the laboratory related to:

- Surveillance
- Outbreak Investigation
- Data collection
- Data sharing

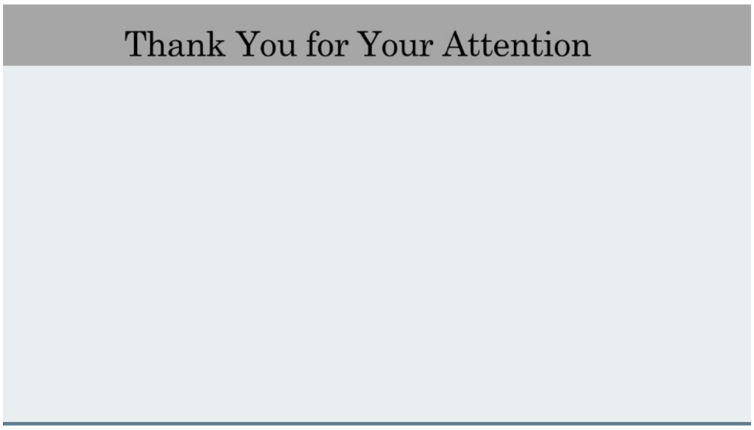


Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 12

SCRIPT / KEY POINTS:

Describe the relationship between the local animal health office and the public health office related to:

- Surveillance
- Outbreak Investigation
- Data collection
- Data sharing



Lesson 33 – Local Area Profile to Prepare for Field Training, Slide 13

SCRIPT / KEY POINTS:

Thank you slide

Lesson 33: Local Area Profile to Prepare for Field Training

Instructions for Local Trainers

Purpose: To plan and prepare a local area profile for Frontline ISAVET Field Trainees.

Objective: Follow a systematic method to plan and prepare a local area profile in advance of conducting field work.

Instructions:

The following points should be included in your presentation:

Describe the host district in relation to:

1. Location
2. Demography
3. Agricultural Production
4. Veterinary Workforce
5. Training Needs
6. Priority Diseases
7. Animal Disease Surveillance
8. Disease Prevention and Control
9. Relationships
    a. Local Animal Health Office and the Veterinary Laboratory
    b. Local Animal Health and Public Health Offices

Expected Outputs:

At the end of this lesson, you will be able to:

1. Provide a summary of the local area related to the general agricultural context, animal disease history, the veterinary workforce, priority diseases, surveillance, disease prevention and control and both internal and external working relationships.
2. Answer questions from trainees related to the local context and how to conduct themselves in the field.

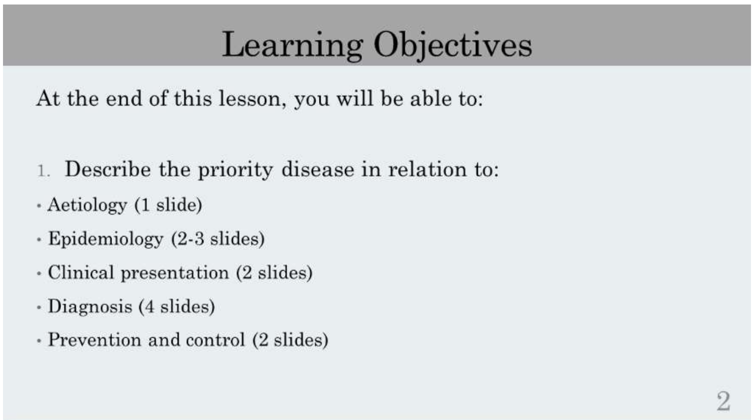
Lesson 34 – Disease Profile to Prepare for Field Training

Estimated Lesson and Exercise Time	1 hour
Instructor Materials	ISAVET Lesson 34 Disease Profile to Prepare for Field Training.ppt
	ISAVET Lesson 34 Disease Profile to Prepare for Field Training Instructor Guide.doc

Lesson 34 – Disease Profile to Prepare for Field Training, Slide 1

SCRIPT / KEY POINTS:

Welcome to Lesson 34 titled, Disease Profile to Prepare for Field Training.



Lesson 34 – Disease Profile to Prepare for Field Training, Slide 2

SCRIPT / KEY POINTS:

In this lesson, we will:

1. Describe the priority disease in relation to:

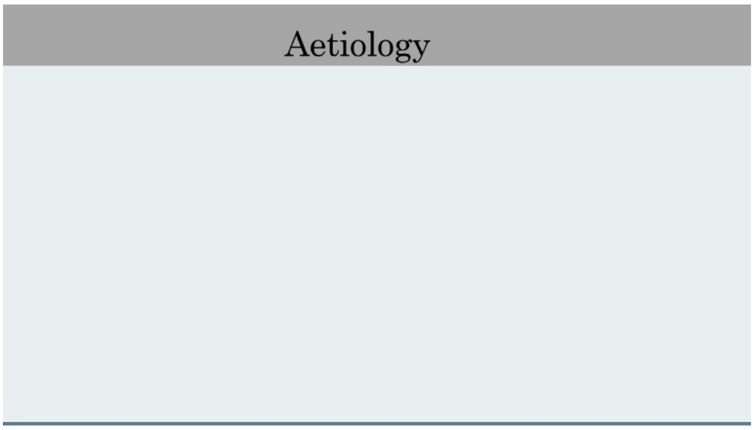
Aetiology (1 slide)

Epidemiology (2-3 slides)

Clinical presentation (2 slides)

Diagnosis (4 slides)

Prevention and control (2 slides)

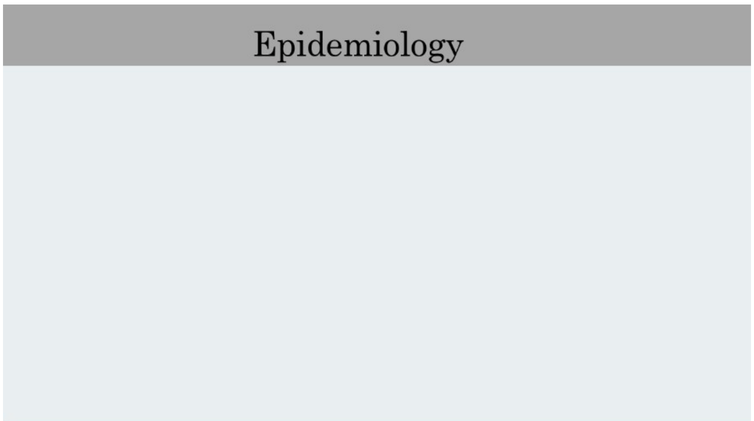


Lesson 34 – Disease Profile to Prepare for Field Training, Slide 3

SCRIPT / KEY POINTS:

The following sections should be included in your presentation:

1. Aetiology (1 slide)
   a. Classification of causative agent



Lesson 34 – Disease Profile to Prepare for Field Training, Slide 4

SCRIPT / KEY POINTS:

Describe:

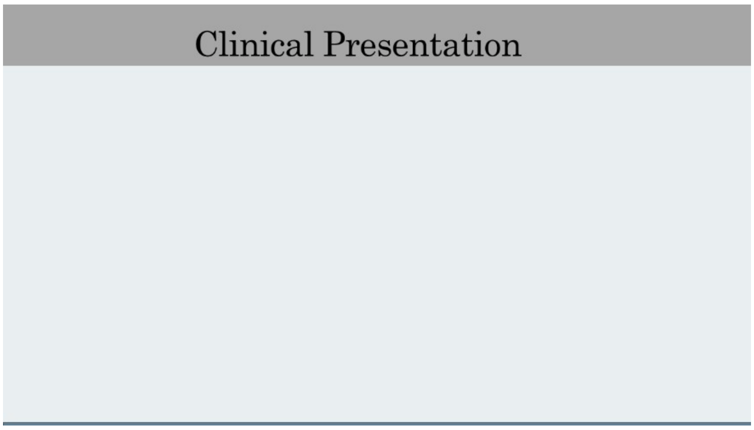
Epidemiology (2-3 slides)

Hosts

Transmission

Sources of causative agent

Occurrence in the district



Lesson 34 – Disease Profile to Prepare for Field Training, Slide 5

SCRIPT / KEY POINTS:

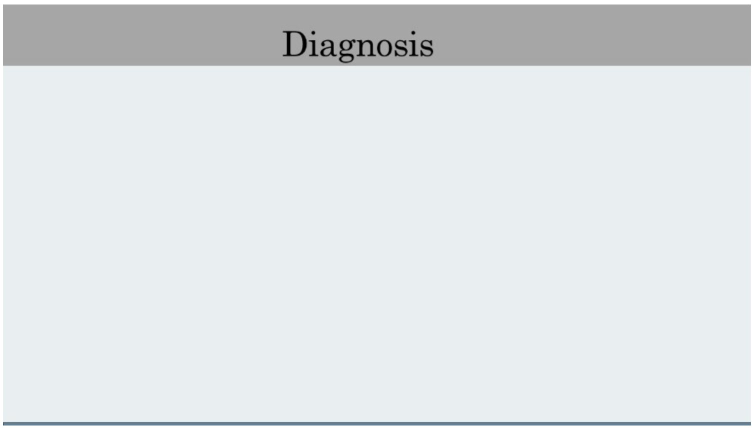
Describe:

Clinical presentation (2 slides)

Clinical signs observed

Morbidity

Mortality



Lesson 34 – Disease Profile to Prepare for Field Training, Slide 6

SCRIPT / KEY POINTS:

Describe:

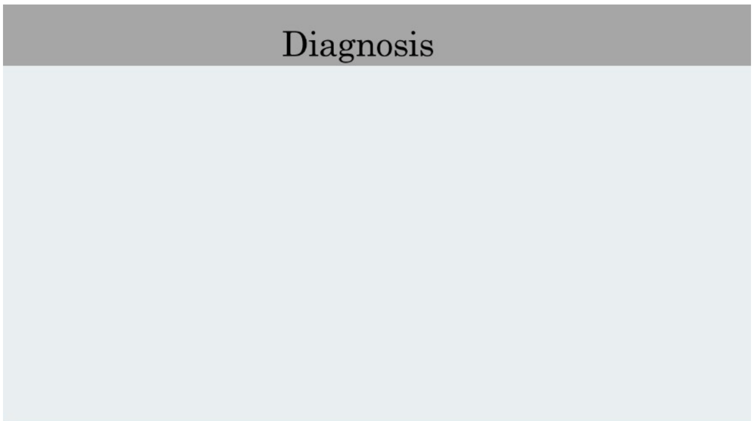
Diagnosis (4 slides)

Clinical diagnosis

Lesions seen

Differential diagnosis

Laboratory diagnosis (field samples and testing methods)



Lesson 34 – Disease Profile to Prepare for Field Training, Slide 7

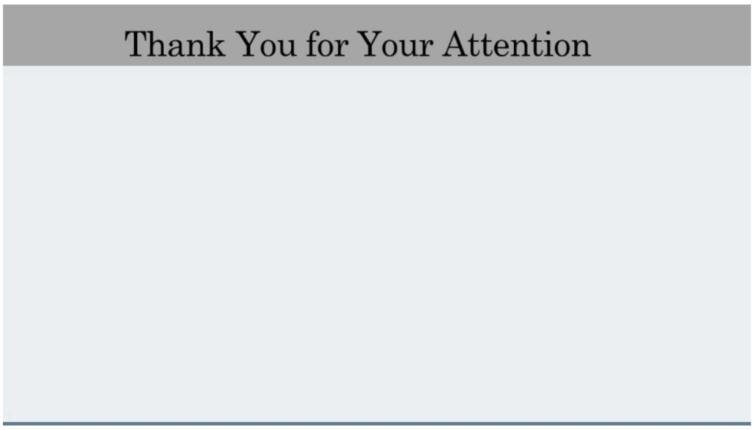
SCRIPT / KEY POINTS:

Describe:

Prevention and control (2 slides)

Sanitary prophylaxis

Medical prophylaxis



Lesson 34 – Disease Profile to Prepare for Field Training, Slide 8

SCRIPT / KEY POINTS:

Thank you for your attention. Answer any questions the trainees may have

Lesson 34: Disease Profile to Prepare for Field Training

Instructions for Trainers

Purpose: To plan and prepare a local disease presentation in week four of the Frontline ISAVET training curriculum.

Objective: Use the disease criterion to develop a local disease presentation to plan and prepare for field training.

Exercise Format and Instructions:

1. Use the highest priority animal health disease in your local area that was identified during the scoping mission.
2. Develop a disease presentation PowerPoint over the selected disease in your local.

The following sections should be included in your presentation:

1. Aetiology (1 slide)
    a. Classification of causative agent
2. Epidemiology (2-3 slides)
    a. Hosts
    b. Transmission
    c. Sources of causative agent
    d. Occurrence in the local
3. Clinical presentation (2 slides)
    a. Clinical signs observed
    b. Morbidity
    c. Mortality
4. Diagnosis (4 slides)
    a. Clinical diagnosis
    b. Lesions seen
    c. Differential diagnosis
    d. Laboratory diagnosis (field samples and testing methods)
5. Prevention and control (2 slides)
    a. Sanitary prophylaxis
    b. Medical prophylaxis

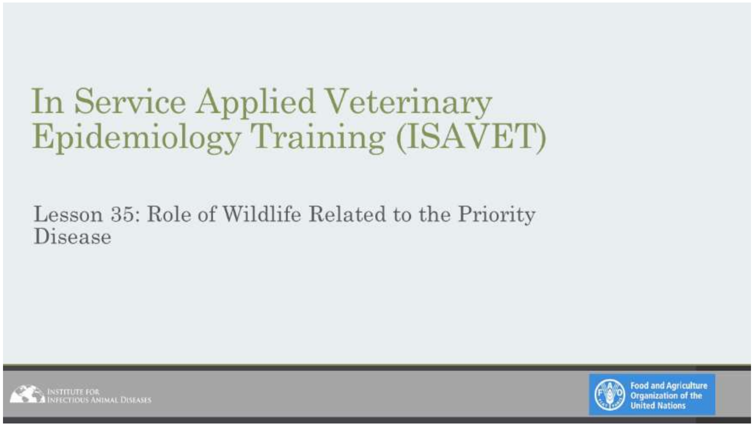
Expected Outputs:

Participants will be able to:

1. Develop a local disease presentation to plan and prepare for week four field training.

Lesson 35 – The Role of Wildlife Related to the Priority Disease

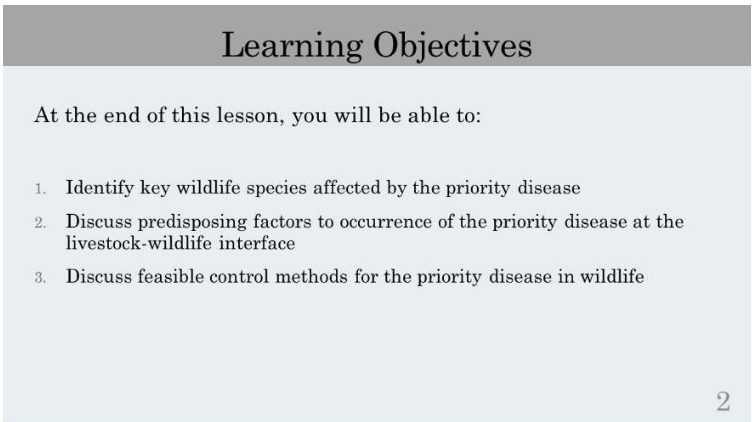
Estimated Lesson and Exercise Time	1 hour
Instructor Materials	ISAVET Lesson 35 The Role of Wildlife Related to the Priority Disease.ppt
	ISAVET Lesson 35 The Role of Wildlife Related to the Priority Disease Instructor Guide.doc



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 1

SCRIPT / KEY POINTS:

Welcome to this lesson titled "Role of Wildlife Related to the Priority Disease"



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 2

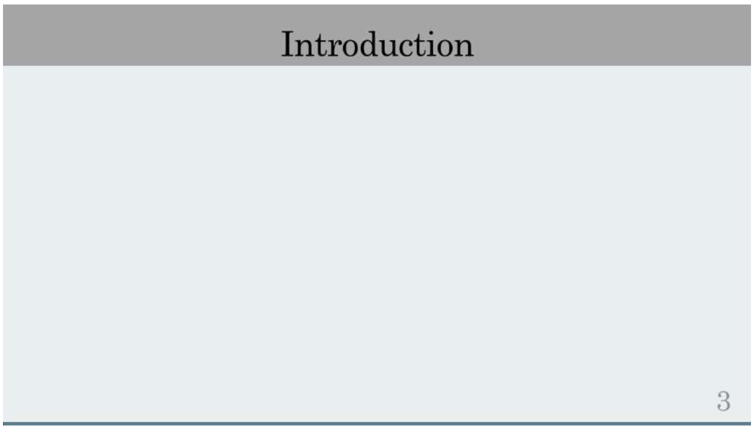
SCRIPT / KEY POINTS:

At the end of this lesson, you will be able to:

Identify key wildlife species affected by the priority disease

Discuss predisposing factors to occurrence of the priority disease at the livestock-wildlife interface

Discuss feasible control methods for the priority disease in wildlife

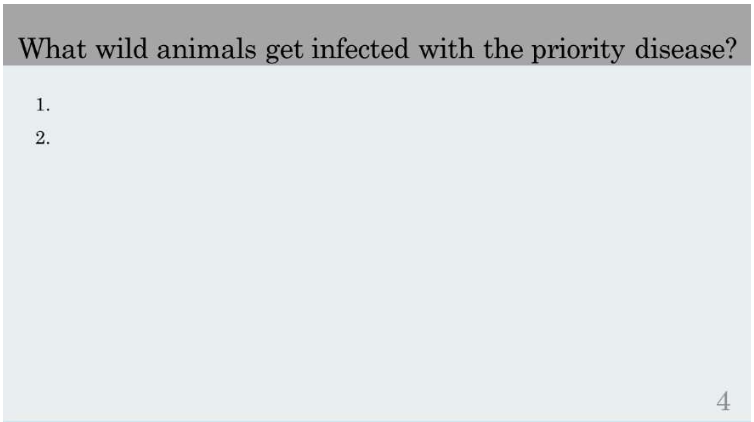


Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 3

SCRIPT / KEY POINTS:

Describe the significance of the disease agent to humans, animals and wildlife

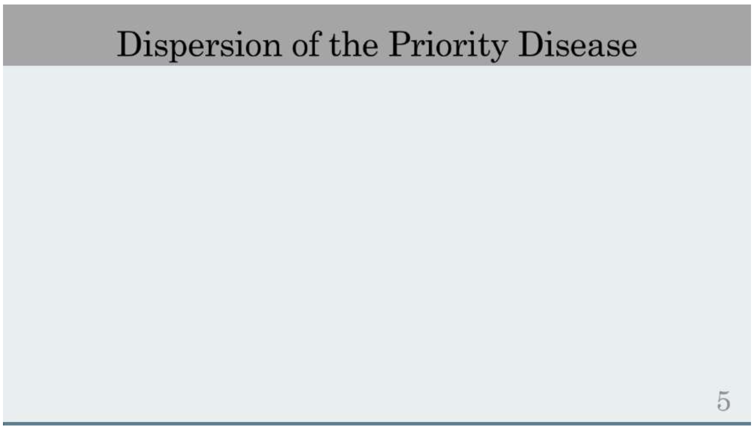
Indicate the number and names of significant species of the priority disease pathogen



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 4

SCRIPT / KEY POINTS:

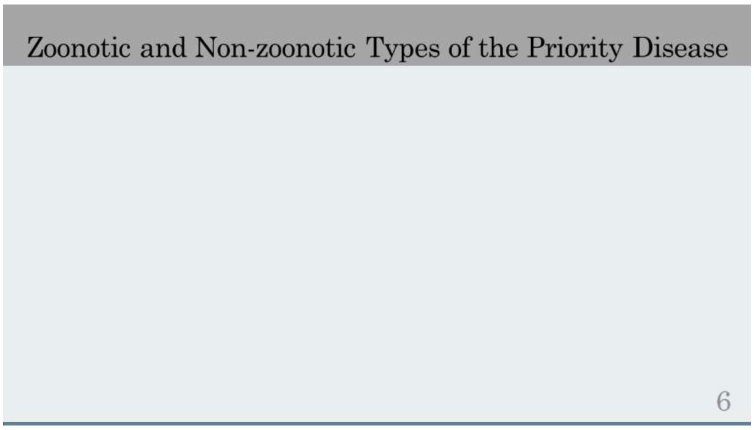
List the types of wild animals get infected with the priority disease



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 5

SCRIPT / KEY POINTS:

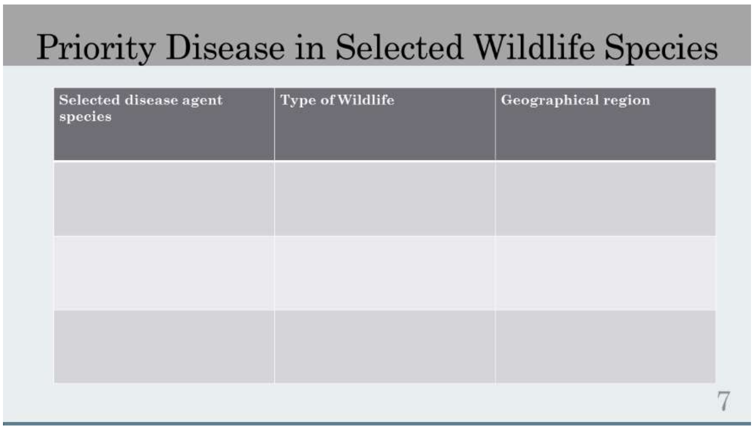
Describe the species distribution of the priority disease agent using a tables, graphic or chart



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 6

SCRIPT / KEY POINTS:

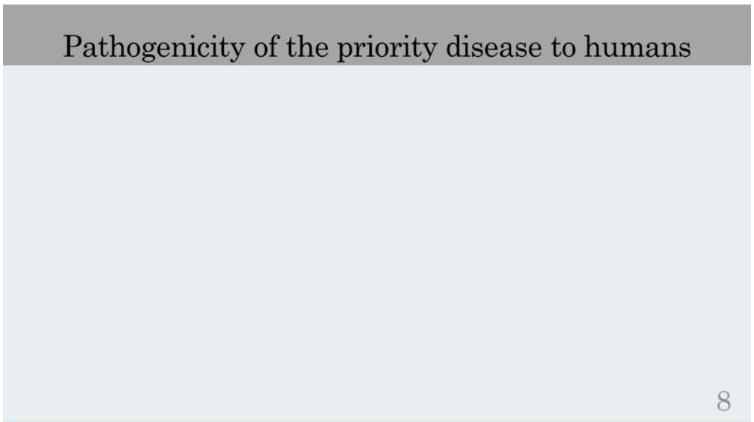
Describe the distribution of the priority disease of zoonotic and non zoonotic types of the priority disease pathogen using a tables, graphic or chart



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 7

SCRIPT / KEY POINTS:

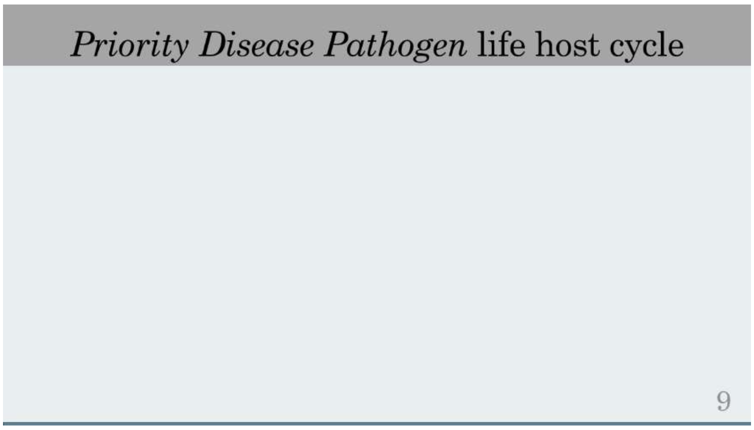
List the disease agent species or subtypes, the type of wildlife in which it is found and the geographic distribution.



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 8

SCRIPT / KEY POINTS:

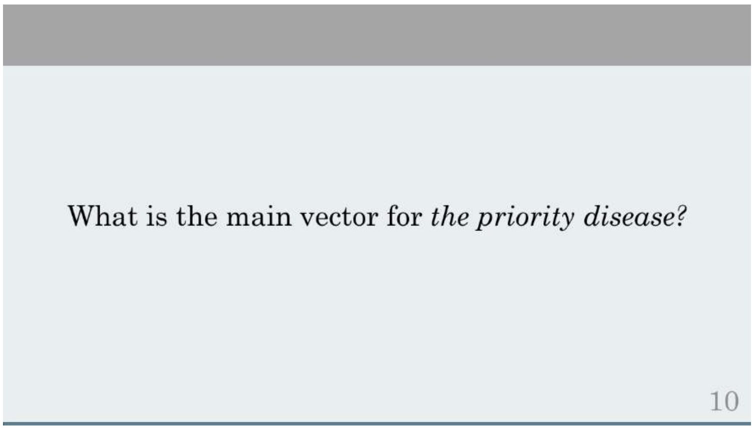
Describe the pathogenicity of the priority disease pathogen to humans using a table showing various subtypes.



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 9

SCRIPT / KEY POINTS:

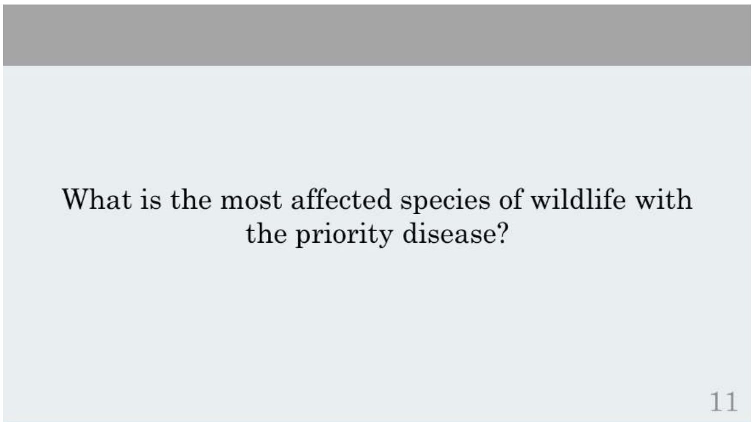
- Describe the disease agent-host life cycle



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 10

SCRIPT / KEY POINTS:

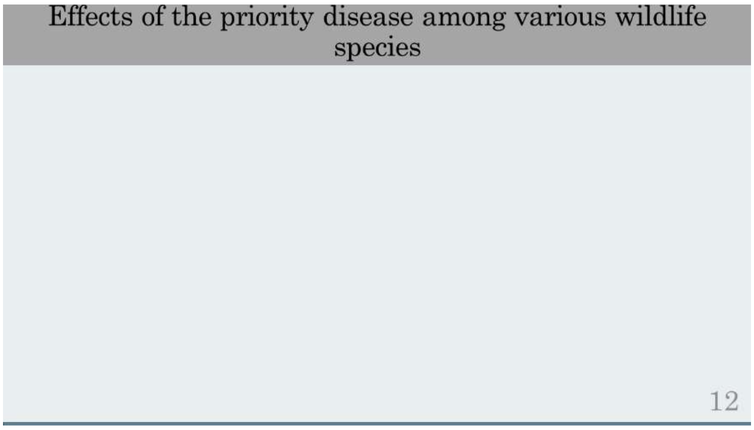
Add if appropriate for vector borne diseases



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 11

SCRIPT / KEY POINTS:

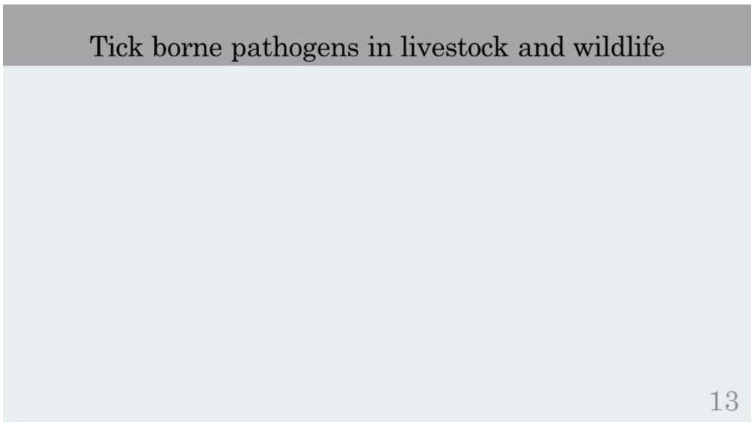
List the wildlife species most affected by the priority disease



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 12

SCRIPT / KEY POINTS:

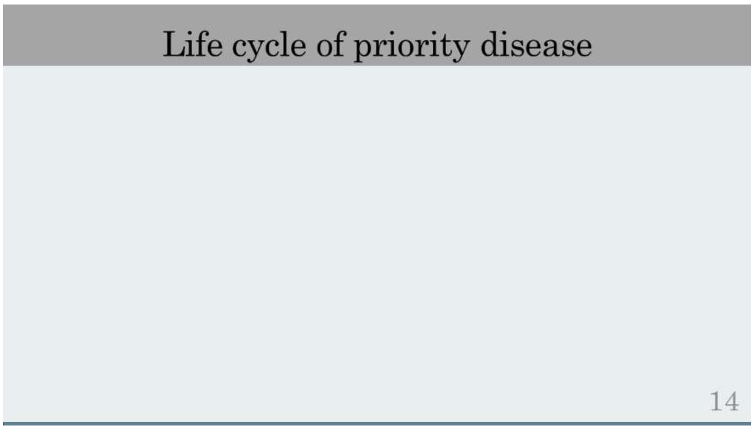
Describe the effects of the priority disease among various wildlife species using a table or graphic



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 13

SCRIPT / KEY POINTS:

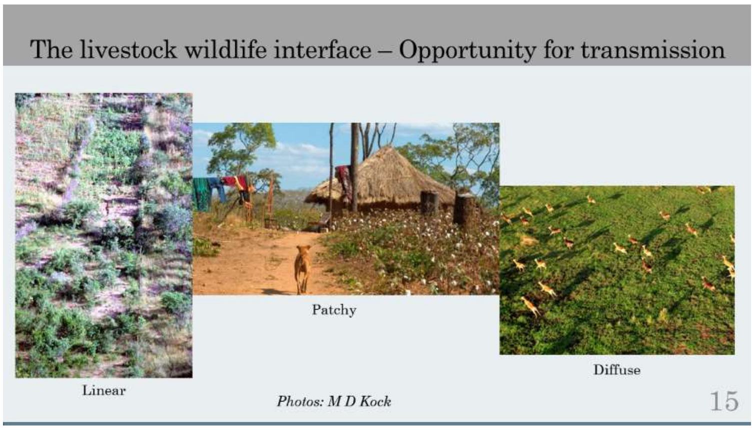
Describe the distribution of the vector borne pathogens in livestock and wildlife



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 14

SCRIPT / KEY POINTS:

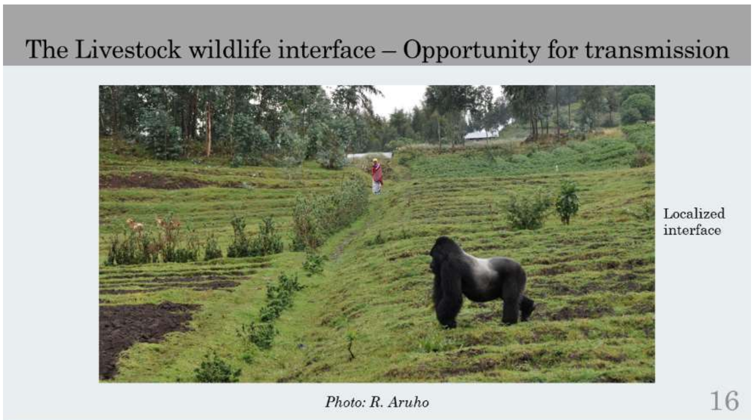
Describe the life cycle of the pathogen if appropriate



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 15

SCRIPT / KEY POINTS:

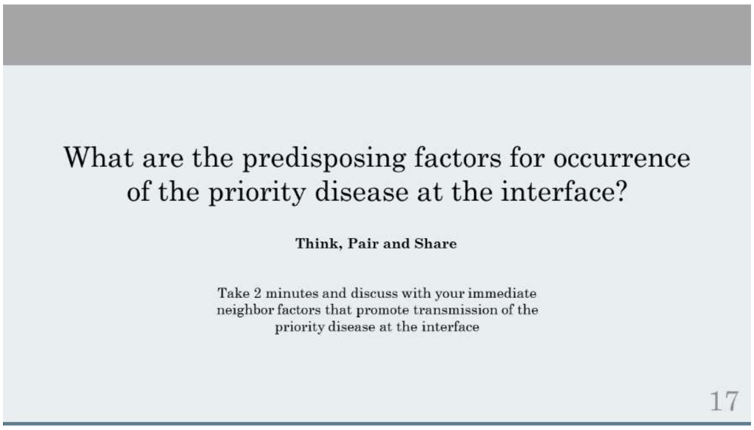
Discuss the livestock-wildlife interface and opportunities for transmission



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 16

SCRIPT / KEY POINTS:

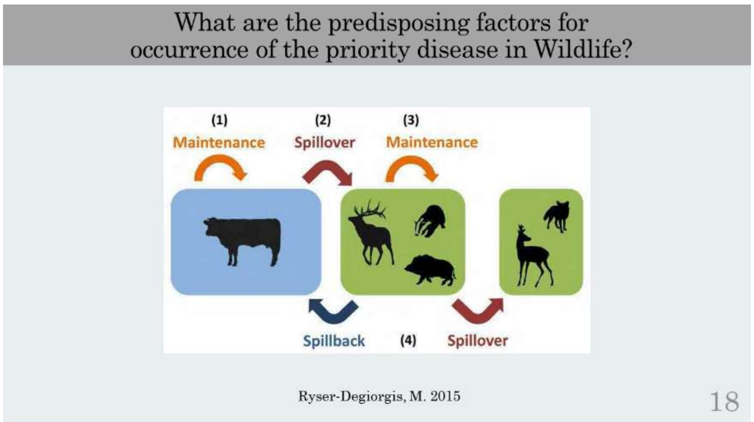
Opportunity for transmission



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 17

SCRIPT / KEY POINTS:

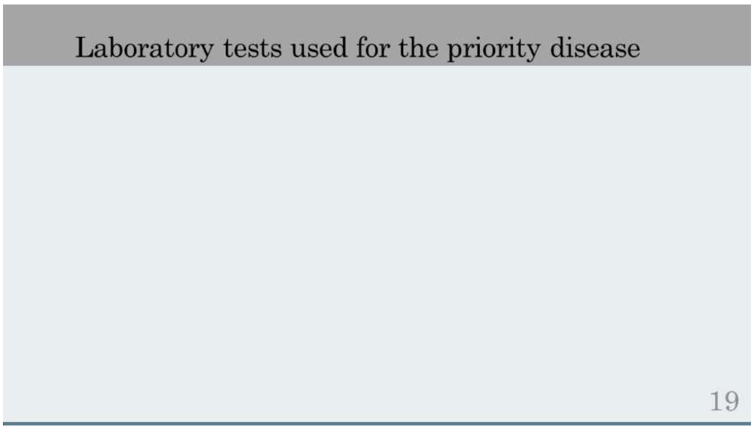
What are the predisposing factors for occurrence of the priority disease at the interface?



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 18

SCRIPT / KEY POINTS:

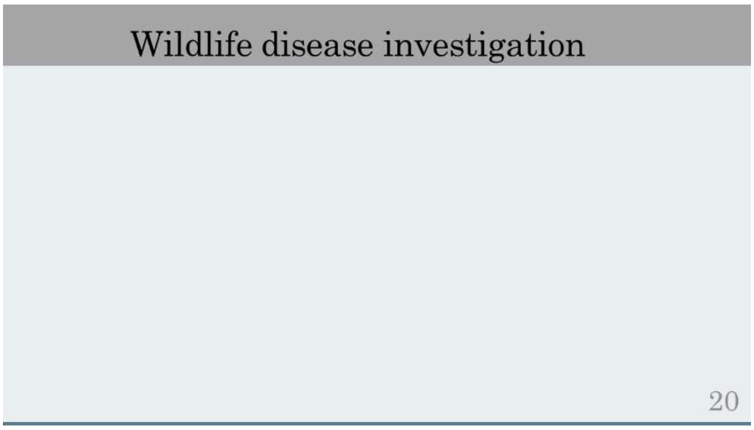
What are predisposing factors for maintenance, spillover, and spillback of the disease agent?



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 19

SCRIPT / KEY POINTS:

List important laboratory tests used to diagnose the priority disease



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 20

SCRIPT / KEY POINTS:

Sometimes it is unlikely to have an outbreak of the priority disease. Why? – Inapparent carriers

Select sampling points

Consider livestock-wildlife interface

Bridging opportunities e.g. dead animals, bridge species etc.

Prioritize high density species e.g. buffalo herds

Use opportunities such as translocations,

Estimate extent of potential infected range and sample outside and inside zone

Select animals

Carcasses, sick and healthy animals

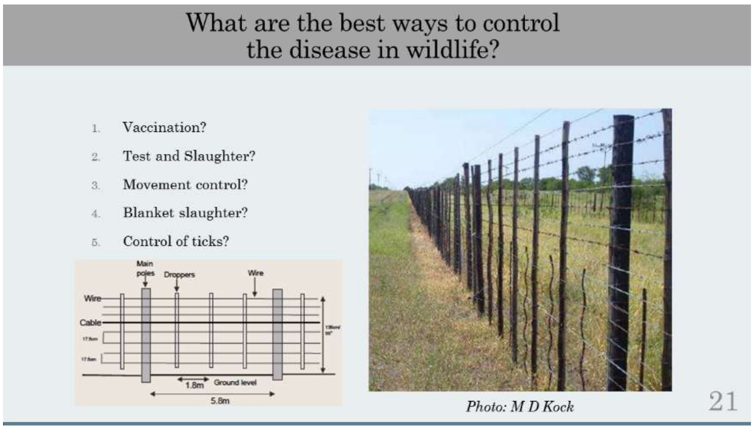
Domestic animals at the interface

Collect vectors e.g. ticks

Develop monitoring strategy

Prioritize investigation on drivers

Consider the constraints and limitations e.g. location, sampling, availability of resources and politics



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 21

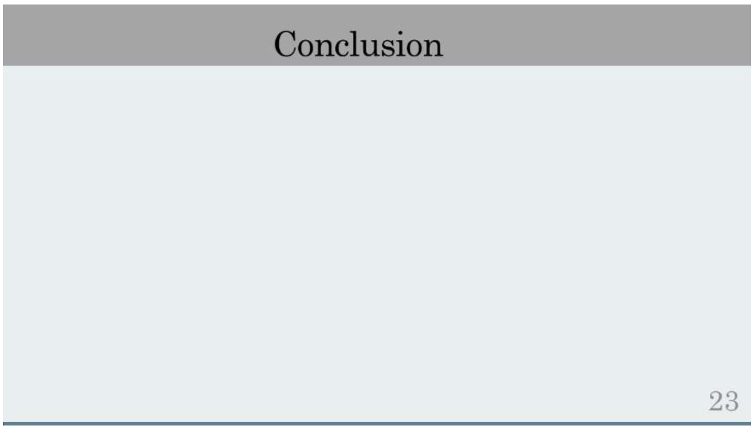
SCRIPT / KEY POINTS:

What are the best ways to control the disease in wildlife?

Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 22

SCRIPT / KEY POINTS:

Opportunity and risk



Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 23

SCRIPT / KEY POINTS:

There are several species of the priority disease agent and the main species of worry in wildlife are x, y, z

The main species of vector (if appropriate) for transmission of the priority disease includes a,b,c

The wildlife-livestock interface plays a key role in transmission of the priority disease

Lesson 35 – The Role of Wildlife Related to the Priority Disease,
Slide 24

SCRIPT / KEY POINTS:

Here are the collaborating Universities that are supporting Frontline ISAVET training in Africa.

Are there any questions?

Lesson 35: Role of Wildlife Related to the Priority Disease

Instructions for Trainers

Purpose: Demonstrate the role of wildlife related to the biology and epidemiology of the priority disease identified through the scoping mission.

Objective: To plan and prepare a wildlife presentation in week four of the Frontline ISAVET training curriculum.

Exercise Format and Instructions:

3. Using the most common animal health related disease in your district, research and prepare a disease presentation PowerPoint related to wildlife.

The following points should be included in your presentation:

6. Introduction
7. Wild animals affected with the priority disease
8. Species distribution of the priority disease agent
9. Distribution of the priority disease of zoonotic and non zoonotic types of the priority disease pathogen
10. List the disease agent species or subtypes, the type of wildlife in which it is found and the geographic distribution
11. Describe the pathogenicity of the priority disease pathogen to humans
12. Describe the disease agent-host life cycle
13. Vector characteristics
14. List the wildlife species most affected by the priority disease
15. Describe the effects of the priority disease among various wildlife species
16. Describe the distribution of the vector borne pathogens in livestock and wildlife (if appropriate)
17. Describe the life cycle of the pathogen (if appropriate)
18. Discuss the livestock-wildlife interface and opportunities for transmission
19. What are the predisposing factors for occurrence of the priority disease at the interface?
20. What are predisposing factors for maintenance, spillover, and spillback of the disease agent?
21. List important laboratory tests used to diagnose the priority disease
22. Sometimes it is unlikely to have an outbreak of the priority disease. Why? Discuss strategies for monitoring
23. What are the best ways to control the disease in wildlife?
24. Conclusions

Expected Outputs:

At the end of this lesson, you will be able to:

3. Identify key wildlife species affected by the priority disease.

4. Discuss predisposing factors to occurrence of the priority disease at the livestock-wildlife interface.
5. Discuss feasible control methods for the priority disease in wildlife

Lesson 36 – Preparing for Field Work

Estimated Lesson and Exercise Time	1 hour
Instructor Materials	ISAVET Preparing for Field Work Forms: 1. Form Field Teams.doc 2. Donning and Doffing.doc 3. Field Team Assignments Biosafety and Biosecurity Entry.doc 4. Animal Handling and Sample Collection.doc 5. Collection and Recording of Field and Laboratory Data.doc 6. Preparation and Submission of Laboratory Samples.doc 7. Proper Exit Procedures.doc

Topic: Preparing for Field Work

1. Form Field Teams

Purpose: Define the composition of field teams

When: On the last day of the third week of training

Objectives:

A. The lead trainer should form blended field teams based on:

1. Technical aptitude based on classroom training performance;
2. Multiple country composition;
3. A maximum 5:1 ratio of field mentor to trainees;
4. Inclusion of trainees, mentors, district veterinary staff , drivers and support persons.
5. Number of vehicles and drivers available for the field activity

B. Identify for each field team:

1. The names of team leaders, members, mentors, district staff ,drivers and support persons;
2. Field work locations (i.e. districts, farms, etc), number of locations to sample and the number of samples to collect at each location.
3. The field materials needed for each team

Allotted Time: 20 minutes

Exercise Format and Instructions:

This is a plenary group exercise lead by facilitators (i.e, the lead trainer, field trainer, etc) based on the following instructions.

1. Review Table 1 indicating the composition of field teams including trainees, mentors, district staff and drivers/support persons;
2. Review Table 2: Example of geographic distribution, number of farms and number of samples to collect for each team (based on prior sample size calculation).

Materials:

- Table 1. Example of Field Team Formation
- Table 2: Example of geographic distribution, number of farms and number of samples to collect for each team (based on prior sample size calculation)

Expected Outputs:

Participants will be able to:

1. Explain how to form field teams based on technical aptitude based on classroom training performance; blended country composition; a maximum 5:1 ratio of field mentor to trainees; and inclusion of trainees, mentors, district veterinary staff and drivers/support persons.
2. Explain how to allocate field team activities including field location, number of locations to sample and the number of samples to collect at each location.

Trainer Instructions:

1. To review Table 1.
   a. Review the headings of each column in Table 1;
   b. Ask participants for the name of the lead for Team 3 and the mentor for Team 5 [Correct responses: Kanakulya Ronald and John Lukwago, respectively];
   c. Ask how this format would need to be modified from past experience.
2. To review Table 2.
   a. Review the headings and rows in Table 2;
   b. Ask participants how many farms and samples were collected in Luweero Subcounty [Correct responses: 6 farms and 45 samples].

Table 1. Example of Field Team Formation

ISAVET Uganda Pilot				
Trainee Field Teams				
Name	**Surname**	**Country**	**Email 1**	**Team for field work**
Emmanuel (Lead)	Hasahya	Uganda	ehasahya@gmail.com	1
Abraham	Kamara	Liberia	abrahimkamara600@gmail.com	1
Foday	Sheriff	Sierra Leone	fomsheriff@gmail.com	1
Gebru Legesse	Gebregiorgis	Ethiopia	gebrul123@gmail.com	1
Caryl (Mentor)	Lockhart	FAO HQ		1
Ahmed Ziad (Lead)	Abdilahi	Ethiopia	ahmeduziad11@gmail.com	2
Joseph Gikonyo	Gathuku	Kenya	josephgikonyo123@gmail.com	2
Joseph Kofi	Abuh	Ghana	josephabuh@yahoo.com	2
Margaret	Driciru	Uganda	margaret.driciru@gmail.com	2
David (Mentor)	Castellan	TAMU		2
Lwasi Bbosa	Michael	District Vet		1 and 2
Malovu	James	District Vet		1 and 2
Driver				1 and 2
Kanakulya Ronald (Lead)	Mutebi	Uganda	ronaldkanakulya@gmail.com	3
Christopher	Auma	Kenya	christopherongonga@yahoo.com;	3
Mekonnen Golessa	Bajets	Ethiopia	mgbajets@gmail.com	3
Samwel	Mngumi	Tanzania	sbmngumi@yahoo.com	3
Francis (Prof)	Ejobi	Makerere University		3
Chrisostom (Mentor)	Ayebazibwe	FAO Uganda		3
Carla (Mentor)	Stoffel	FAO HQ		3
Katumba (Lead)	Hannington	Uganda	hanningtonk@gmail.com	4
Hagere Hatiya	Wale	Ethiopia	vet2003h@gmail.com	4
Eddie Miaway	Farngalo	Liberia	wonkehmie@gmail.com	4
Idriss	Yahya	Ghana	yahyaidriss1983@gmail.com	4
Hector	Kusiru	Kenya	kusiruh@yahoo.com	4
Dee (Mentor)	Ellis	TAMU		4
Sam (Mentor)	Okuthe	FAO Uganda		4
Nabulya	Harriet	District Vet		3 and 4
Afua	Bulezi	District Vet		3 and 4
Driver				3 and 4
Julian	Lawach	Uganda	jlawach@gmail.com	5
Eyob Eticha	Wordofa	Ethiopia	eyoba20000@gmail.com	5
Solomon	George	Liberia	georgesolomontamba@gmail.com	5
Linus Prosper	Mrina	Tanzania	linus_prosper@yahoo.com	5
Justin	Buenger	TAMU		5
Lukwago (Mentor)	John	District Vet		5 and 6
Kasule	Timothy	District Vet		5 and 6
Driver				5
Faith Koima	Chepkemoi	Kenya	fkoima@yahoo.com	6
Robert	Aruho	Uganda	robertaruho@gmail.com	6
Jerome Majaliwa	Said	Tanzania	majaliwa.jerome@gmail.com	6
Yembeh	Koroma	Sierra Leone	yembehkoroma80@gmail.com	6
Zewdu Belay	Emagnaw	Ethiopia	kzfr89@gmail.com	6
Chrisostom (Mentor)	Ayebazibwe	FAO Uganda		6
Lukwago	John	District Vet		5 and 6
Kasule	Timothy	District Vet		5 and 6
Driver				6

Table 2: Example of geographic distribution, number of farms and number of samples to collect for each team (based on prior sample size calculation).

Team	Day	District	Subcounty	Parish	Village	Farmer	GPS Coordinates	Number of Farms	Number of Samples
			KAMILA SUB-COUNTY						
5	1	Luwero	Kamila						
5	1	Luwero	Kamila						
5	1	Luwero	Kamila						
Team	Sub Total							3	20
6	1	Luwero	Kamila						
6	1	Luwero	Kamila						
6	1	Luwero	Kamila						
Team	Sub Total							3	24
Sub county	**Total**							**6**	**44**
		Luwero	KIKYUSA						
3	1	Luwero	Kikyusa						5
4	1	Luwero	Kikyusa						
4	1	Luwero	Kikyusa						
Team	Sub Total							3	17
Sub County	**Total**							3	**22**
		Luwero	KATIKAMU						
3	2	Luwero	Katikamu	Busula	Kikoma	Kara Farm			
3	2	Luwero	Katikamu						
3	2	Luwero	Katikamu						
Team	Sub Total							3	29
4	2	Luwero	Katikamu						
4	2	Luwero	Katikamu						
4	2	Luwero	Katikamu						
Team	Sub Total							3	28
Sub county	**Total**							**6**	**57**
		Luwero	**MAKULUBITA**						
5	2	Luwero	Makulubita						
5	2	Luwero	Makulubita						
5	2	Luwero	Makulubita						
Team	Sub Total							3	34
6	2	Luwero	Makulubita						
6	2	Luwero	Makulubita						
6	2	Luwero	Makulubita						
6	2	Luwero	Makulubita						
Team	Sub Total							4	26
Sub county	**Total**							**7**	**60**
		Luwero	**LUWEERO SUB-COUNTY**						
1	2	Luwero	Luweero						
1	2	Luwero	Luweero						
Team	Sub Total							2	30
2	2	Luwero	Luweero						
2	2	Luwero	Luweero						
2	2	Luwero	Luweero						
2	2	Luwero	Luweero						
Team	Sub Total							4	15
Sub County	**Total**							**6**	**45**
		Luwero	**BUTUNTUMULA SUB-COUNTY**						
1	1	Luwero	Butuntumula						26
2	1	Luwero	Butuntumula						27
Sub County	**Total**							**2**	**53**
District	**Total**							**30**	**281**

Topic: Preparing for Field Work

2. Donning and Doffing Demonstration

Purpose: Demonstrate standard safe donning and doffing procedures of personal protective equipment (PPE) used in field work for the proper practice of biosafety and biosecurity.

Objective: Demonstrate the correct sequence of dressing and removal of PPE equipment.

Allotted Time: 40 minutes

Exercise Format and Instructions:

A. Donning (dressing) – to be done prior to entering the farm

1. Participants will receive one set of PPE each and work in pairs under the "buddy system".
2. The facilitator will model each step in the donning procedure before farm entry and the first participant will don the PPE kit with assistance with the second member of the pair.
3. The second participant will then don the PPE with the assistance of the teammate.
4. Trainers will assist teams with the donning procedure.

B. Doffing (removal) – to be done upon exiting the farm

1. The facilitator will model each step in the doffing procedure upon exiting the farm and the first participant will remove the PPE kit with assistance with the second member of the pair.
2. The second participant will then remove the PPE kit with the assistance of the teammate.
3. Trainers will assist teams with the doffing procedure.

Materials:

- Personal protective equipment (PPE)
- Steps for donning and doffing of PPE – Provided below

Expected Outputs:

Participants will be able to:

1. Describe the components of a PPE kit.
2. Describe and demonstrate the ability to apply and remove PPE in the correct sequence under the "buddy system".

Trainer Instructions:

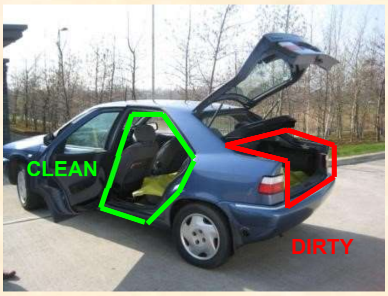
1. The facilitator will act as the primary instructor.
2. Donning will occur upon entry to the farm.
3. Doffing will occur upon exiting the farm.
4. Trainers will model and/or assist participants with donning and doffing.

Steps for donning and doffing of PPE

Department of Agriculture, Fisheries and Food
An Roinn Talmhaíochta, Iascaigh agus Bia

PROTOCOL FOR PUTTING ON PROTECTIVE CLOTHING (FMD)


1. Prepare equipment & PPE (protective clothing) before travelling



2. Prepare "clean" & "dirty" areas in car


3. Remove watch & jewellery before leaving car


4. Place mobile phone in zip-lock bag

5. Carry equipment to site in plastic bag

6. Identify suitable location for clean/dirty separation

7. Prepare clean & dirty disinfection points at hygiene barrier


8. Put on disposable suit


9. Put on waterproof suit


10. Put on boots – putting legs of disposable suit inside boots


11. Pull down legs of waterproof suit outside boots


12. Put on boot covers


13. Put on two pairs of disposable gloves


14. Pull sleeve of disposable suit down between the two pairs of gloves


15. Tape outer glove to sleeve of disposable suit


16. Pull down sleeves of waterproof suit outside gloves

17. Carry equipment onto site


18. When on site, do not remove mobile phone from zip-lock bag

Seirbhís Tréidliachta Stáit
SVS
State Veterinary Service

Department of Agriculture, Fisheries and Food
An Roinn Talmhaíochta, Iascaigh agus Bia

PROTOCOL FOR TAKING OFF PROTECTIVE CLOTHING (FMD)

1. Disinfect equipment & outside of sample boxes/bags

2. Place equipment & samples in equipment bag on clean side

3. Remove boot covers & place in waste bag for disposal


4. Disinfect legs of waterproof suit


5. Clean soles of boots thoroughly & disinfect


6. Disinfect remainder of waterproof suit

7. Remove waterproof suit

8. Place suit in PPE bag on "clean" side


9. Remove first outer glove – touching only the outer surface


10. Remove second outer glove by hooking thumb under cuff - place in waste bag

11. Step onto clean side & disinfect boots

12. Remove disposable suit & place in waste bag on "dirty" side

13. Remove first inner glove – touching only the outer surface

14. Remove second inner glove by hooking thumb under cuff - place in waste bag

15. Double bag & seal the equipment & PPE bags


16. Disinfect outside of bucket


17. Disinfect hands using 6-step procedure


18. Wipe face with wet-wipes

19. Pour disinfect over plastic mat & place mat in waste bag

20. Place equipment & PPE bags in "dirty" area of car

Seirbhís Tréidliachta Stáit SVS State Veterinary Service

NDCC April 2009

Topic: Preparing for Field Work

3. Field Team Assignments Including Biosafety and Biosecurity Entry Procedures

Purpose: Each member of the field team plays a different role and must conduct their duties with biosafety and biosecurity in mind.

Objective: Define the roles and responsibilities of field team members for the following field team functions:

- Biosecurity;
- Neutral zone liaison;
- Clinical examination and sample collection and packaging;
- Data collection and record keeping.

Allotted Time: 45 minutes

Exercise Format and Instructions:

A. Organise teams and assign functions to each field team member: <u>10 minutes</u>

1. The facilitator and trainers will form 6 teams with 5 members each and select a team leader;
2. Each team will have a trainer who will assign a specific field team function to each member and lead the activities provided under sub-headings B and C.

B. Review respective roles and responsibilities: <u>5 minutes</u>

3. Each field team member will take 5 minutes to read and review their roles and responsibilities;

C. Test the knowledge of field team members roles and responsibilities: <u>10 minutes</u>

4. The trainer will have a card for the roles of each function and will provide them to the team leader;
5. The field team leader will ask field team members to select all of the correct roles for their function;
6. The trainer will ask: Which team function is responsible for external communication with the outside world?

D. Define the clean zone, neutral zone and dirty zone on a suspect or confirmed positive location: <u>20 minutes</u>

7. The trainer asks team members to define and justify the locations of the clean, neutral and dirty zones for the training site using the plastic ribbon/security tape provided;
8. The trainer will demonstrate how to transfer clean and contaminated equipment including clean laboratory supplies, contaminated samples

Materials:

- Frontline ISAVET Field Exercise Team Functional Roles and Responsibilities
- Biosafety and Biosafety SOP
- Separate flash cards with all field member roles
- Plastic ribbon/security tape

Expected Outputs:

Participants will be able to:

1. Explain and apply the roles and responsibilities of field team members for the following field team functions including: biosecurity; neutral zone liaison; clinical examination and sample collection and packaging; and data collection and record keeping.
2. Explain how to define clean, neutral and dirty zones at a location and enter safely.

Trainer Instructions:

1. The facilitator will monitor each team that is under the supervision of a trainer during the exercise.
2. Each trainer must emphasize that it is not only WHAT each member does for their function, but also HOW to conduct their duties safely!
3. Emphasise what happens when a "clean" team member is contaminated and becomes "dirty".

Frontline ISAVET Field Exercise Team Functional Roles and Responsibilities

Field Team Composition

- The 30 Frontline ISAVET trainees are assigned to 6 field teams, each comprised of 5 persons each;
- Each team will have a team leader and be accompanied by at least one field mentor and one local veterinarian;
- Each field team member takes charge of one of the following functions:
  - Biosecurity;
  - Neutral zone liaison;
  - Clinical examination and sample collection and packaging;
  - Data collection and record keeping;
- A fifth person in a team will assist in the collection, packaging and submission of samples.

Field Team Member Roles and Responsibilities

Function	Roles	Responsibilities
Biosecurity	1. Brief the field team members on biosecurity SOP	1.1 Review the biosecurity practices for each team member including: - Safe farm entry - Donning PPE - Traffic control in clean (green), intermediate (yellow) and dirty (red) zones - Proper sample collection handling and removal - Dealing with torn PPE - Disposal of dirty PPE - Doffing PPE - Safe farm exit
	2. Enforce all biosecurity practices specified in the SOP	2.1 Observe and guide team members on safe biosecurity practices - Oversee and assist teammates donning and doffing - Oversee Proper sample collection handling and removal; dealing with torn PPE; disposal of dirty PPE - Safe entry and exit from the farm
	3. Coordinate with the intermediate zone team member	3.1 Coordinate donning and doffing

Function	Roles	Responsibilities
		3.2 Coordinate safe farm entry and exit including safe packaging and shipping of samples
Neutral (yellow) Zone Liaison	1. Coordinate all movement onto and off the farm	1.1 Bring this work sheet to the field for easy reference 1.2 Establish the neutral zone with the field team leader 1.3 Assist team members with donning and doffing in the neutral (yellow) zone 1.4 Assist team members with sample and data transfer across the neutral (yellow) zone 1.5 Coordinate with the local veterinarian for entry and exit procedures
	2. Coordinate activities and movement with the biosecurity team member	2.1 Ensure safe entry and removal of personnel and samples from the farm 2.2 Ensure that dirty PPE is left behind with the farmer 2.3 Remind the farmer to burn or bury the dirty PPE on site
	3. Emergency liaison contact	3.1 Should signs of disease be reported by the team, the liaison will immediately contact a field mentor 3.2 Declares the team as “dirty” and initiates removal from further field duties until preventive interventions are taken including shower and change of clothes
Clinical Examination, Sample Collection and Packaging	1. Prepare all sampling materials for collection, packaging and shipping	1.1. Label and gather all blood sample tubes and container bags for each farm 1.2. Label all swab sample bags 1.3. Gather all needles, tubes, hubs and sample bags
	2. Conduct a physical exam on the animals selected by the farmer	2.1 Confirm the presence of past or current oral, mammary or interdigital lesions
	3. Collect blood and swab samples from the affected animals with compatible lesions	3.1 Collect the required number of samples per farm 3.2 Carefully pack the blood in sealed bags
	4. Coordinate with data collection team member	4.1 Coordinate activities with data collection and recording team member to ensure safe transfer in a sealed bag 4.2 Ensure that all samples are labelled and safely packaged for shipping

Function	Roles	Responsibilities
Data Collection and Record Keeping	1. Prepare and complete data collection forms	1.1 Label and organize the field data collection form 1.2 Record clinical signs 1.3 Record animal and blood tube identification numbers 1.4 Verify and confirm all data on samples and data collection form
	2. Coordinate with the sample collector to validate the identify of each sample for each farm	2.1 Confirm the identity of each animal and each sample
	3. Administer the questionnaire to the farmer	3.1 Administer the epidemiology questionnaire to the farmer and confirm all responses
	4. Gather and return all questionnaires and field sampling to the field training center	4.1 Place each set of completed questionnaires and forms for each farm in a sealed bag in the neutral zone for safe exit from the farm

Standard Operating Procedures (SOP)

Document #	Title: Standard Operating Procedures for Biosafety and Biosecurity	Print Date: November 2 2018
Revision # 1	Prepared By: David Castellan	Date Prepared: November 2 2018
Effective Date: November 2 2018	Reviewed By:	Date Reviewed:
Standard:	Approved By:	Date Approved:

Policy: All Frontline ISAVET field teams shall plan, prepare and implement field activities in accordance with the concept of situational awareness and the following standard operating procedures (SOP). This SOP should be adapted for the use of each specific country.

Purpose: To reduce the transmission of the virus from infected/contaminated premises or equipment.

Failure to take biosecurity measures will contribute to virus transmission and reduce public confidence in government actions intended to prevent and control animal diseases. All field personnel must take biosecurity seriously in carrying out their field duties.

During an emergency, field operations can be defined as either "clean" with no suspected exposure to the field virus or "dirty" when virus exposure is likely or certain.

Scope: To be applied for all Frontline ISAVET Field Training and thereafter in daily use while at work in the home country.

Responsibilities: All personnel that will access farms based on the following designations, especially the "dirty" field duties.

Table 1: Dirty and Clean Field Duties

"Clean" Field Duties	"Dirty" Field Duties
Surveillance Teams	Culling Teams
Diagnostic Teams	Disposal Teams
Field Epidemiologist	Cleaning/Cleansing and Disinfection Teams
Biosecurity and Safety Teams	Appraisal (Compensation) Teams
	Front Line Staff (once on farm)

Definitions:
Biosafety – Activities to safeguard human health in relation to contact with harmful disease agents and toxins.
Biosecurity - procedures or measures designed to protect the population against harmful biological or biochemical substances.

Resources (to be confirmed):

- Disposal, breathable coveralls
- Rubber boots,
- Safety goggles
- Gloves (inner latex glove, outer glove)
- Disposable particulate respirator (N95)
- Disposable head cover
- Plastic buckets
- Disinfectant
- Sealable plastic bags
- Plastic booties
- Boot brush
- Garbage bags
- 5 gal Water
- Disinfectant wipes

Procedures:

General Provision

These designations must be maintained and mandatory interventions measures must be taken when “clean” team members become exposed to field virus. Specific intervention measures are noted below. In addition, all field personnel must receive biosecurity training on proper dressing and undressing procedures for each PPE change.

Minimum Biosafety Measures:

All Task Force personnel will take the following minimum biosecurity measures:

1. Before beginning field work each day, make sure you have enough PPE, disinfectant and materials, at least four (4) sets of protective clothing as part of the biosecurity kit. Use a fresh pair of protective gear at each site.
2. All field personnel must wear required personal protective equipment, including:
    a. Disposal, breathable coveralls
    b. Rubber boots, dedicated sandals or boot covers;
    c. Safety goggles
    d. Gloves (inner latex glove, outer glove)
    e. A disposable particulate respirator (N95)
    f. Disposable head cover (if available)
3. Keep clean and dirty clothing, equipment, and supplies separate. Designate “clean” (interior) and “dirty” (trunk) storage areas in your vehicle or use sealable plastic bins.
4. Well maintained footbaths must be placed at the entry/exit point of each affected premises while teams are on site. For surveys, alternative measures can be used.
5. Treat every farm as a suspect. Always park away from the site you are visiting with consideration made of the animal and people movement. Park on a paved surface or plastic/tarpaulin to avoid contaminating your vehicle or facilitating proper cleaning and disinfecting.
6. Remove all jewelry before performing field duties.
7. Record date and time of farm/community access.

8. Access steps.
    a. Set up disinfection area (clean, neutral and dirty zones – draw a line in the dirt to distinguish between zones).
    b. Put on protective over clothing including head cover and previously cleaned and disinfected rubber boots covered by disposable booties. Bootie should cover boots completely.
    c. Place cellphone (if you are the designated contact person) in sealable bag
    d. Some commercial farms may provide footwear and it is preferable to use this footwear rather than one's own footwear, however make sure the footwear is clean and wear plastic bootie inside of boots
    e. Put on a (double – OTIONAL FOR OUTBREAK INVESTIGATIONS) pair of disposable latex gloves one before and the other after putting on the coverall.
9. On Site steps
    a. While on the farm maintain biosecurity principles to reduce spread and safeguard containment.
    b. Remember some disease agents can be zoonotic so ensure PPE must be intact.
    c. Make an effort to adhere to the recommended shift of 3 to 4 hours on site to ensure hydration requirement for outbreak investigations and field surveys.
10. Exit steps.
    a. While still on the dirty side of the site, remove the outer bootie and the disposable coverall. Remove all dirt and organic matter from your boots and then thoroughly disinfect them using a bucket, brush, and an effective disinfectant.
    b. Remove outer glove, coverall, googles and headcover and place in plastic bag and step into neutral zone
    c. Wash glasses and bagged cellphone if applicable second bucket of disinfectant and wash all exposed areas (i.e. Face), nostrils and ears
    d. Leave all used disposable boots, gloves, and coveralls at the facility, where possible. If this is not possible, place them in a double plastic garbage bag and seal them for later disposal in a burial or landfill site placing them in the 'dirty' area of the vehicle
    e. Thoroughly wash your hands with soap and water and sanitizer.
11. Vehicle Care: Clean and disinfect your vehicle inside and out at least once daily. This is especially important to do when visiting commercial farms. Clean wheel wells, tires and floor-mats (carpets should be covered with plastic floor mats).
12. Equipment Use/Care: Keep all equipment used in the field clean. Disinfect any equipment that comes into contact with animals or their secretions before taking it to another property, or use disposable equipment. Use non-porous materials such as plastic, rather than wood, or other material than can harbor the virus.
13. Cell phones Use: Cellphones should not be used on infected premises unless absolutely necessary a designated communication individual is recommended. Cell phones should be placed in sealable (zip-lock) bags in the field operations and MUST be cleaned and disinfected using disinfectant wipes prior to departing the site in the vehicle
14. Apply situational awareness; consider previous, present and future contacts:
    If you come into contact with a sick or dying animal, consider yourself "dirty". You must change your clothing; bathe and either remain away from poultry for the next 24 hours or be transferred to "dirty" duties.

In addition:

a. Avoid contact with other premises or “clean” teams in the area
b. Change from contaminated PPE equipment
c. Thoroughly clean and disinfect all vehicles
d. Change into clean clothing and clean footwear and double bag contaminated clothing; go to designated decontaminating site for laundering of clothing and shower
e. Thoroughly wash with soap and water
f. Have no contact with poultry for at least 24 hours afterwards
g. Re-join “clean” or “dirty” teams pending the supervisor’s decision

15. Bathe at the end of each work shift to prevent transmission. Use soap and water and thoroughly clean ears, eyes, nostrils in addition to normal bathing practices.

Effectiveness Criteria:

References:
A. USDA Biosecurity Guidelines
B.

Records/Forms:

Form #	Record/Form/Activity Name	Satisfies
Required by Standard		
Poultry Biosecurity	**Interim Biosecurity Checklist For Public and Private Sector Poultry Veterinarians**	SOP for Poultry
Other Forms/Records		
XXXXX	Record	
XXXXX	Record	
XXXXX	Record	

Revision History:

Revision	Date	Description of changes	Requested By
1.0	November 2 2018	Adapted for Frontline ISAVET Uganda Field Training	Frontline ISAVET

Topic: Preparing for Field Work

4. Animal Handling and Blood Collection: Cattle and Poultry

Purpose: Demonstrate animal handling and blood collection methods for cattle and poultry.

Objective: Review clinical principles of animal handling and blood collection for cattle and poultry.

Allotted Time: 120 minutes

Exercise Format and Instructions:

A. Animal Handling: 60 minutes

1. Facilitators and trainers will demonstrate principles and practices for safe capture, restraint and release of cattle and poultry.
2. Participants are to practice safe capture, restraint and release of cattle and poultry.

B. Blood Collection: 60 minutes

1. Facilitators and trainers will demonstrate methods for collecting blood from cattle and poultry;
2. Participants are to practice blood collection methods for cattle and poultry.

Materials:

- Standard Operating Procedures for Cattle Handling Methods and Techniques
- Standard Operating Procedures for Poultry Handling Methods and Techniques

Expected Outputs:

Participants will be able to:

1. Explain and apply principles of animal handling for cattle and poultry;
2. Demonstrate competence in blood collection from cattle and poultry.

Trainer Instructions:

1. Facilitators and trainers will demonstrate cattle and poultry handling principles and practices using several activities with cattle and poultry and then participants will practice the same activities that include:
    a. Capture;
    b. Restraint for clinical examination;
    c. Release.
2. Facilitators and trainers will demonstrate cattle and poultry blood collection methods including tail vein and brachial vein, respectively.

Standard Operating Procedures (SOP)

Document # 1a	Title: Standard Operating Procedures for Cattle Handling Methods and Techniques	Date Prepared: July 22, 2019
Revision #:	Prepared by: Dr. Dee Ellis and Dr. Innocent Rwego	Date Prepared: October 8, 2019
Effective Date:	Reviewed by:	Date Reviewed:
Standard:	Approved by:	Date Approved:

Policy: All Frontline ISAVET field teams shall conduct animal handling procedures accordance with field applications and the following standard operating procedures (SOP). This SOP should be adapted for the use of each specific country.

Background

The purpose of this SOP is to instruct how to put cattle into a handling facility or restrain them when no facility is available. This SOP also explains why some cattle may not want to go into a handling facility and describes some techniques for animal handlers to implement to pen / restrain cattle. Always remember that the cattle owner or the caretaker are the most knowledgeable about their specific cattle handling methods and facility considerations. The owner and/or caretaker should be consulted BEFORE any plans are made to handle, inspect or take diagnostic samples from their cattle. Evaluate working facilities in advance when possible.

Advanced Planning

Always move slowly and quietly around cattle. Remember that cattle react to direct eye contact. Always have an animal handling plan for a situation discussed *in advance* with the owner or caretaker. Always know how much help will be available before you arrive at a premise.

Cattle Biology and Behaviour

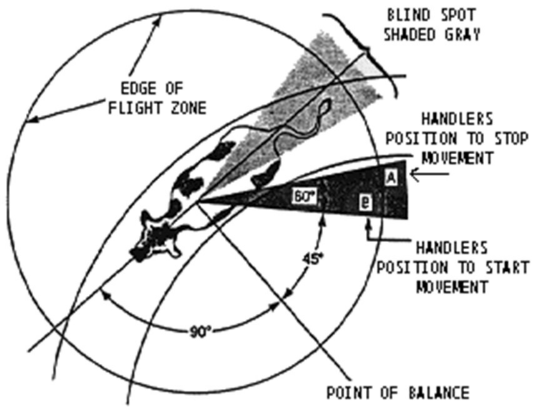
Keep the following biological and behavioural characteristics in mind as you handle cattle:

- Low Stress Handling is always the goal because it facilitates:
    - Less stress to animals
    - Less injuries to animal and humans
    - Less dependence on ideal facilities
- A voluntary cattle flow is ideal. Ensure the cattle go where desired but *let them think it is their idea!*
- Use Cattle Instincts to accomplish a voluntary flow including:
    - Predator-Prey response
    - Herd mentality – isolated cattle want to return to herd
    - Safety in numbers – cattle want to stay together
    - Cattle may follow another animal into a pen voluntarily
    - If cattle are not afraid of handlers, they can be herded easier
- Body position/posture
    - Cattle look at humans for fear or curiosity with both eyes
    - Cattle look at humans with one eye when they trust you
    - Cattle are looking for direction from animal handlers
- Maternal Instincts – mother cows can act more aggressively with newborn calves
- Cattle Flow and correct distance
    - Initiate pressure to stimulate response
    - Relieve pressure to reward response
- Cattle prefer straight inline movements
- Pressuring back of herd too hard causes them to turn and face you
- Follow the leader

Vision

Understand what cattle can see. They have different eyesight than humans; they possess:

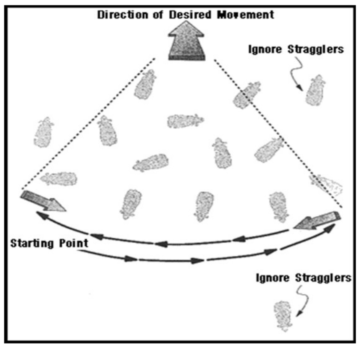
- Good peripheral vision – can detect motion
- Bad depth perception – makes cattle resistant to moving across ditches, over holes, making sharp turns, etc.
- Sensitivity to contrasts in levels of light
    - Will balk at shadows
    - Will move toward light
- Need to lower head to see things at their feet
- A blind spot – directly behind them
- Desire to make eye contact with humans
- The figure to the right shows how to approach cattle



Handling Methods

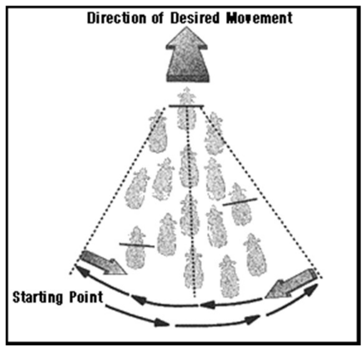
Moving and Handling Cattle (Considerations):

- Lead animal – in pastoralist communities, sometimes you have a lead animal. Once it starts moving, the rest of the animals move with it.
- Point of Focus –Point of shoulder
    - Forward movement – behind point of balance
    - Backward movement – front of point of balance
- Cattle tend to move in opposite direction from handler movement
- Point of balance dictates instinctive cattle movements
- Flight zone – 45-60-degree angle from point of shoulder



High Stress Situations to Avoid:

- Separating mother cow from young calf
- Isolating an animal from herd
- Pressuring an animal when there is nowhere to go
- Operating in animal's blind spot
- Immediately chasing escaped animals – *they often will instinctively rejoin herd*
- Distractions:
    - Loud noises
    - Dogs
    - Small children
    - Light/dark contrasts
    - Moving objects
    - Unsteady footing
    - Being beaten using sticks



Restraint Options

- Discuss with the owner in advance possible methods of restraint available:
    - Running (lane) chute – a narrow, elongated trap used to line cattle up in single file
    - Squeeze (crush) chute – a small stall used to restrain one cow at a time which has front and back gates and movable sides that can be used to squeeze (immobilise) a cow
    - Cattle crush (wooden or metallic) – similar to a squeeze chute but without the gates

    - Stanchion – upright frame composed of metal bars or wooden posts that hold the head of a cow in place
    - Head Restrained – Halter/rope/nose tongs
        - Nose tongs should only be used if culturally acceptable
    - Casting – a technique of tying rope around an adult cow to make it lie down which can be used when no handling facility is available
    - Flanking (calves) – a technique of reaching over a calf while standing at its side, grasping its hindleg and foreleg closest to you, then lifting and sliding the calf to the ground. This technique can be used when no handling facility is available.
    - Chemical Sedation (last resort) – costly but could be used when working with overly aggressive animals (e.g. use dart gun) or when cattle cannot be caught
- Discuss with the owner in advance the types of cattle to be restrained:
    - Special requirements for the breed of cattle (e.g. Ankore – some are docile if used to people but some are very aggressive since they are only used to the herdsman)
    - Special requirements for bulls
    - Special requirements for dairy cattle

References:

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11. Proper Handling of Egg-Type Hens, Poultry Science Manual 6th edition, Kirk Edney, Texas A&M University, Poultry Science Department

Records/Forms:

Form #	Record/Form/Activity Name	Satisfies
Required by Standard		
Frontline ISAVET Curriculum	Lesson 36: Preparing for Field Work	Sample Collection
Other Forms/Records		

Standard Operating Procedures (SOP)

Document # 1.3	Title: Frontline ISAVET Standard Operating Procedures for Poultry Handling Methods and Techniques	Date Prepared: June 21, 2019
Revision #:	Prepared by: David Castellan	Date Prepared: June 21, 2019
Effective Date:	Reviewed by:	Date Reviewed:
Standard:	Approved by:	Date Approved:

Policy: All Frontline ISAVET field teams shall conduct animal handling procedures accordance with field applications and the following standard operating procedures (SOP). This SOP should be adapted for the use of each specific country.

Background

Poultry are defined as avian species domesticated by humans for meat and egg production. Poultry include three Orders: the Galliformes (including fowl); the Anseriformes (ducks and geese); and the Columbiformes (pigeons). Knowledge of their biology and behaviour is essential for proper care and management.

Advanced Planning

When handling poultry, be aware that *poultry owners will scrutinise how you handle their poultry.* If you are taking blood samples, take extra care to avoid causing the formation of a haematoma near the brachial vein since it may reduce the farmer's trust in you as well as the value of the poultry being sold.

Owners know and understand their poultry best and are in the best position to capture poultry for testing or other purposes. Always develop a plan for capturing the poultry with the owner BEFORE you begin.

Poultry Biology and Behaviour

Keep the following biological and behavioural characteristics in mind as you handle poultry:

- Although avian species typically fly, poultry have limited ground flight potential
- Poultry have a very large cerebellum supporting adaptation to flight and terrestrial locomotion
- The beak and featherless areas are very sensitive to pain
- Poultry display group feeding and watering behaviour for protection against predators

Vision

Vision is very important and well developed for the survival of poultry species:

- Chickens have 40% more retinal axons than humans
- Fowl have more rods than humans giving them excellent diurnal vision day and night
- Poultry have colour vision and have additional colour perception including the ultraviolet range
- The eyes are laterally placed, and the field of vision is wide exceeding 300 degrees, however with a narrow binocular zone of vision as depicted in the figure below

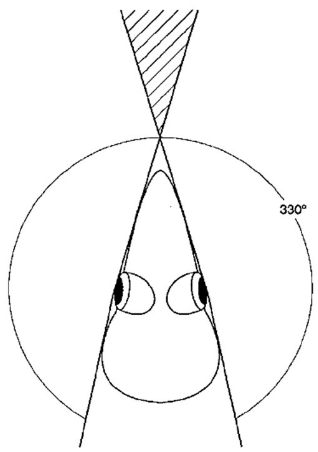


Figure Above. Fowl's head from above showing how each eye has a very extensive field of view forwards, sideways and backward, but that the area of binocular overlap (shown hatched) is relatively small.

Handling Methods

<u>Moving and handling Poultry (Considerations):</u>

- Display calmness and gentleness in your movements, eye contact and voice

- Avoid “chasing” poultry which creates stress for the poultry and for the owner
- Gentle handling is ALWAYS REQUIRED for the following reasons:
    - The bones of poultry are extremely light and hollow and easily broken since they are adapted for flight
    - Egg producing poultry sometimes develop brittle bones when calcium and vitamin D is limiting (layer fatigue) and their bones can be easily broken! This is particularly important when handling quail and other small poultry species

<u>Hand Capture</u>

- Capture of poultry into an existing enclosure or small building is well suited to capture of poultry by hand
- Juvenile poultry such as chicks should be VERY gently cradled within your hands
- The preferred way to capture free ranging poultry is to gently grab each side of the bird and avoid separation of the wing from the body. NEVER grab the wing to catch poultry
    - An alternate, humane method for capturing poultry is to grab both legs (shanks) just above the foot
    - It is NEVER recommended as a best practice to carry poultry upside down

<u>Caged Poultry: Capture</u>

- Caged chickens should be inserted through cage doors headfirst and should be removed from the cage feet first, by both legs
    - They should NEVER be handled by the head, neck, or one wing alone.
    - Be careful when removing poultry from cages since the feathers will get caught and may break and may result in bleeding and infection if the feather shaft is severed from the wing or body

<u>Net capture</u>

- Capture of free ranging village poultry during the daytime can be difficult
- Capture poultry as dawn and dusk approach since it is easier because poultry prefer to sleep while roosting in trees and bushes at these times;
- Both small pole nets and larger fish type casting nets can be used

<u>Machine Capture</u>

- Large commercial poultry companies have conveyor systems onto which the poultry are loaded into cages to be sent to market

<u>Hold</u>

- Once captured, gently tuck the bird under one arm while holding the legs with the other hand. Remain calm and quiet and do not squeeze the bird or restrict breathing in any way!

<u>Release</u>

- The recommended method of release is to gently set the chickens on the floor, on their feet.
    - Avoid releasing poultry into the air since flight will excite, stress and panic the other poultry
    - This is particularly dangerous to do under crowded conditions where “piling up” can occur!

References:

1. POULTRY BEHAVIOUR AND WELFARE © M.C. Appleby, J.A. Mench and B.O. Hughes 2004 CABI Publishing.
2. Recommended Code of Practice for the Care and Handling of Poultry from Hatchery to Processing. 1990. Agriculture Canada Publication 1757/E available from Communications Branch, Agriculture Canada.

Records/Forms:

Form #	Record/Form/Activity Name	Satisfies
Required by Standard		
Frontline ISAVET Curriculum	Lesson 36: Preparing for Field Work	Sample and Data Collection
Other Forms/Records		

Revision History:

Revision	Date	Description of changes	Requested By
1.0	October 10, 2019	Formatted by Sarah Manning	N/A

Topic: Preparing for Field Work

5. Collection and Recording of Field and Laboratory Data

Purpose: Demonstrate the collection and recording of field and laboratory survey data for a Frontline ISAVET field team.

Objective: Review proper procedures related to the collection and recording of field and laboratory data including:

1. Pre-test of the field questionnaire;
2. Coordination with the laboratory in the design of the laboratory reporting form;
3. Appropriateness and length of the field questionnaire;
4. Adequacy of the laboratory data collection form;
5. Delivery of the field questionnaire.

Allotted Time: 30 minutes

Exercise Format and Instructions:

Participants will be given the example questionnaire for this exercise, "Field and Laboratory Sample Collection Form – Uganda Frontline ISAVET Pilot".

A. The facilitator will assign each field team to briefly review the questionnaire and provide brief responses to the following four questions: 20 minutes

1. How will you conduct the pre-test of the field questionnaire?
2. How will you coordinate with the laboratory in the design of the laboratory reporting form?
3. Do you think the questionnaire questions are appropriate and the length of the field questionnaire is reasonable?
4. Do you think the laboratory data collection form is adequate?
5. How would you advise trainees on how to effectively deliver the field questionnaire?

One member of each field team will record their responses in point form and provide them to the trainers in each group.

B. The facilitator will give the leader of each field team 2-3 minutes each to briefly highlight important responses to one or two of the five questions, ask for additional suggestions from other teams and then synthesise important lessons to be drawn from the exercise: 10 minutes

Materials:

- Table 1. Field Team Responses: Collection and Recording of Field and Laboratory Data
- Example of Field and Laboratory Sample Collection Form – Uganda Frontline ISAVET Pilot
- Pens and notepad to record responses

Expected Outputs:

Participants will be able to:

1. Demonstrate proper procedures on how to collect and record field and laboratory data during a field exercise to Frontline ISAVET trainees.

Trainer Instructions:

1. Each field team will work separately to provide their responses which will be shared with all teams through a facilitated plenary session.
2. The questionnaire is familiar to many of the mentors in attendance. Allow up to 5 minutes for participants to review the questionnaire.
3. Trainers will collect notes from each field team
4. Key technical lessons to emphasise include the following:
    a. Pre-test:
        i. Should be done at least one week before final delivery;
        ii. Should be brief enough to be delivered in 20 minutes to avoid "survey fatigue" with interviewees;
        iii. The collection of laboratory data must be conducted as the samples are identified and logged into the form simultaneously;
        iv. The delivery of the field questionnaire should be conducted following sample collection when the animal caretaker is not otherwise occupied by animal handling sampling.
    b. Laboratory Coordination:
        i. Ideally arranged 2-4 weeks in advance of field training;
        ii. Includes arrangements for diagnostic support and advice on what the data collection form should include;
        iii. Includes calculations of daily laboratory surge capacity for the maximum number of samples to be submitted.
    c. The Field questionnaire:
        i. The questionnaire contains appropriate questions and takes a realistic amount of time to deliver to avoid "survey fatigue". This questionnaire is too long;
        ii. All questions are related to predictor and outcome variables required for descriptive analysis and are appropriate for the disease;
        iii. The questionnaire should take a maximum of 20 minutes to deliver.
    d. The laboratory data collection form:
        i. Is prepared and verified with the laboratory in advance (2-4 weeks);
        ii. Should include individual animal and farm location identification, date of collection and clinical information;
        iii. Brief and well organised in a tabular format to facilitate accurate and rapid data collection tied to sample identity;
        iv. Requires close coordination and ongoing verification between sample collector and data recorder under challenging field conditions.
    e. Delivery of the field questionnaire:
        i. ALWAYS thank the interviewee for their time and effort at the beginning and end of the interview;
        ii. Use appropriate body language and sit or stand at the same level as the interviewee;
        iii. Ask each question with the same wording each time;
        iv. Take side notes of improvements needed due to lack of clarity of the questions;
        v. Encourage open dialogue and listen;
        vi. Observe as you are recording responses. Are your observations and the questionnaire responses compatible?

Table 1.

Field Team Responses: Collection and Recording of Field and Laboratory Data

<u>Instruction: Please submit the completed form to a field trainer following the exercise</u>

Field Team Number:	
Questions	**Responses**
1. How will you conduct the pre-test of the field questionnaire?	
2. How will you coordinate with the laboratory in the design of the laboratory reporting form?	
3. Do you think the questionnaire questions are appropriate and the length of the field questionnaire is reasonable?	
4. Do you think the laboratory data collection form is adequate?	
5. How would you advise trainees on how to effectively deliver the field questionnaire?	

Example of Field and Laboratory Sample Collection Form – Uganda Frontline ISAVET Pilot

ECF AND BRUCELLOSIS SURVEY FORM

LUWERO DISTRICT, UGANDA

Farm Reference No.__________

---

1. Date of Visit (mm/dd/yyyy): ____/_____/_______
2. Name of Investigator(s): ____
3. Team No.: ___________
4. Name and Address of Farm: ____
   3.1. Village:____
   3.2. Parish:____
   3.3. Sub county:_____________________________________
   3.4. District: ____
5. GPS Information (if available): Latitude ______ Longitude ________
6. Name of Person who provided Information: ________________________________
7. Contact Information of Person: __________________________ _________________

---

8. Farm Profile
   8.1 Farming system type: [ ] Confined in paddock [ ] Common pasture with other animals
   [ ] Mix of confined and communal [ ] Other____________

8.1.1. Species and Number of each animal per species

Species	Males	Number	Female	Number
Cattle	Bull (>18 months)		Cows (>18 months)	
	Young Bull (3-18 months)		Heifer (3-18 months)	
	Male calf (<3 months)		Female calf (<3 months)	
	Castrated male (any age)			
Sheep	Male (adult)		Female (adult)	
Goat	Male (adult)		Female (adult)	
Pigs	Male		Female	
Poultry	Layers		Broilers	
Other				

8.1.2. Cattle breeds present on farm:

Breed	Number of animals

8.1.3. How do you feed your animals? [ ] Stall feed [ ] Graze in field /forest
[ ] Both

8.1.4. If you graze animals, when are they put outside? [ ] Throughout the year
[ ] Certain months of the year
[ ] During daytime only

Please Explain:

____
____
____
____
____
____
____
____
____

8.2 Have your cattle had abortions, retained afterbirths or weak calves born alive (premature).
[ ] Yes [ ] No

9 Mixing of animals on and off farm:

9.1. Do your animals come in contact with livestock owned by other farms during vaccination, grazing, veterinary treatment etc.?

[ ] Regularly [ ] Occasionally [ ] Never

9.2. If, yes does your cattle share pastures/ feeding areas/pens/paddocks with the following?

[ ] Sheep [ ] Goats [ ] Cattle [ ] Pigs [ ] All types

9.3. Do you borrow breeding bulls from other herds/ farms/ households?

[ ] Always [ ] Sometimes [ ] Never

9.4. How often do you purchase new animals?

[ ] Rarely (most years I don't buy any)

[ ] Sometimes (most years I buy new animals at least once)
[ ] Regularly (I buy new animals several times a year)

10 Milking practices

10.1. Do you routinely milk your cows? [ ] Yes [ ] No

10.3. How do you milk your cows?
[ ] by milking machine only
[ ] by hand milking only
[ ] both milking machine and hand milking

10.4 Do you routinely wash your hands before milking? [ ] Yes [ ] No

10.5 Do you routinely wash the udder before milking?
[ ] Yes, with antiseptics [ ] Yes, with warm water [ ] Yes, with cold water [ ] No

10.6 Does your family consume raw milk from your cattle. [ ] Yes [ ] No

11 Vaccination

11.1. Are your animals vaccinated? [ ] Yes [ ] No

11.2. If they are vaccinated, please name the disease(s) for which they are vaccinated.
[ ] Foot and Mouth Disease (FMD) [ ] Anthrax [ ] Rift Valley Fever [ ] Brucellosis
[ ] Others, specify ____

12 Knowledge about Brucellosis:

12.1. Have you heard of the animal disease called Brucellosis? [ ] Yes [ ] No [ ] Unsure

12.2. Which species of animals can get Brucellosis?
[ ] Cow [ ] Sheep [ ] Goats
[ ] Poultry [ ] Others (please specify) ______________

12.3 What are the typical clinical signs of Brucellosis in Animals?
[ ] Respiratory problems [ ] Sudden death [ ] Diarrhoea
[ ] Produce less milk [ ] Lameness [ ] Abortions
[ ] Weight loss [ ] Skin disease [ ] Inflammation of the testicles
[ ] Difficulties to become pregnant [ ] live weak calf

Questions on animal disease transmission to humans:

12.4 Are you aware that farmers can get diseases from animals? [ ] Yes [ ] No [ ] Unsure

12.5. Have you heard of the human disease called Brucellosis? [ ] Yes [ ] No [ ] Unsure

12.6. Do you know how brucellosis is transmitted from animals to humans? [ ] Yes [ ] No

12.7. Please state how brucellosis is transmitted from animals to humans.

[ ] drinking raw milk [ ] Contact with aborted foetus or placental membrane

[ ] Other, specify ____

[ ] I don't know

13 Abortions and parturition

13.1. Do you ever have abortions in your herd and if so how often?

[ ] Throughout the year [ ] Concentrated during some period

13.2. How often do you assist with parturition (calving assistance) of cows?

[ ] Never assist with calving of cows, cows are always left on their own, unassisted when calving

[ ] Most of the time I do not assist with the calving of cows

[ ] Most of the time I do assist with the calving of cows

[ ] Always assist with the calving of cows

13.3 If you assist your cows during parturition, do you wear protective equipment such as gloves and masks?

[ ] Never [ ] Sometimes [ ] Always

13.4. If one of your cows aborts, what do you do?

[ ] Separate the cow(s) that has aborted from the others for some time

[ ] Call the local veterinarian

[ ] Slaughter the cow(s) that has aborted at the farm/herd/household for consumption.

[ ] Sell the cow(s) that has aborted in the market

[ ] Sell the cow(s) that has aborted to the butcher

[ ] Give medications

[ ] Vaccinate animals

[ ] Do nothing

[ ] Other, specify __________________________

14 Knowledge of ticks and tick-borne diseases (enter responses in the table below):

14.1 Can you name the important tick borne diseases that occur in your district? [ ] Yes [ ] No

14.2 Please indicate period of year when you most frequently observe these diseases?

14.3 . Describe the clinical signs associated with each of the diseases mentioned in Q 41.1

14.1.Disease	14.2. Period of the year	14.3. Clinical signs

Tick and Tick control practices

14.4 . Can you tell us the types of ticks (name or type) found on your animals?

[ ] Yes [ ] No

14.5 Specify during which season each of these ticks are most frequently observed?

11.4 Tick	11.5. Period of the year

14.6 How do you control ticks on your animals?

[ ] No tick control [ ] Acaricide application

[ ] Other: please specify ____

14.7 If you treat with Acaricide, what method do you use to apply it?

[ ] Dipping [ ] Hand Spraying

[ ] Other: please specify ________________________

14.8 If you treat with Acaricide, how often do you treat?

[ ] Weekly [ ] Biweekly

[ ] Monthly [ ] Occasionally

14.9 Name the brand of Acaricide(s) you use. ____

14.10 Do you treat your animals for ECF? [ ] Yes [ ] No

14.11 If yes, to treating for ECF, please provide the name of the drug used.

____

14.12 Name of drugs used to treat the other tick borne diseases?________________________

14.13 Who applies the treatments?

[ ] Farmer [ ] Veterinary services in your district

[ ] Other, Specify ____

INTERVIEWER NOTES / DIAGRAM:

Annex 1: Laboratory and Clinical Data Collection Form

Sample ID	Animal ID/Name	Sample type (serum, tick)	Tick Count (No.)	dairy, beef or mixed	Breed	Age (Yr)	Sex (M/F)	Body condition score	Risk categoryHistory of illness, abortion or healthy	Additional details

Topic: Preparing for Field Work

6. Preparation and Submission of Laboratory Samples

Purpose: Demonstrate specimen collection, to ensure quality test results which lead to accurate interpretation and two-way linking between field and laboratory functions.

Objective: Apply and practice skills related to specimen collection, packaging and shipping of diagnostic samples.

Allotted Time: 60 minutes

Exercise Format and Instructions:

- Participants will collect and prepare their samples for packaging and shipping. The facilitators and trainers will lead field teams so that specimens will be processed in the following sequence using the accompanying *Standard Operating Procedures for Laboratory Specimen Submission, Packaging and Shipping*:

A. Specimen Collection: <u>20 minutes</u>

The following process will be practiced by each participant:

1. Identify type of specimen;
2. Take personal protective measures;
3. Prepare equipment;
4. Label each sample and confirm with laboratory submission form;

5. Explain instructions for ante-mortem and post-mortem tissue samples;
6. Maintain confidentiality.

B. Specimen Packaging: 20 minutes

The following process will be practiced by each participant:

1. Classify your sample;
2. Package in three layers;
3. Maintain cold chain.

C. Specimen Shipping: 10 minutes

The following process will be practiced by each participant:

1. Label the package;
2. Document your shipment.

D. Discussion: 10 Minutes

The facilitators will ask participants to share challenges in their country in applying these standard operating procedures.

Materials:

- Standard Operating Procedures for Laboratory Specimen Submission, Packaging and Shipping
- **Required resources**: (Mark)
  - Without-anticoagulant (Red top), with clot activator and serum separator gel (tiger top), sodium heparin (green top), EDTA (purple top) or with polymer gel and powdered glass clot activator (gold top) tubes
  - Faecal and urine samples need triple packing. The primary container must be leak-proof.
  - Sealed plastic cups
  - Slides
  - Syringes and needles
  - Swabs and media
  - Laboratory submission form
  - Label
  - Indelible pen or use a graphite pencil
  - Disinfectant
  - Protective gloves
  - Eyeglasses

Expected Outputs:

Participants will be able to:

1. Explain how to ensure quality test results which lead to accurate interpretation and two-way linking between field and laboratory functions.

Collect and prepare samples for packaging and shipping following *Standard Operating Procedures for Laboratory Specimen Submission, Packaging and Shipping* to ensure quality test results and two-way link

Trainer Instructions:

1. Participants will be provided with the *Standard Operating Procedures for Laboratory Specimen Submission, Packaging and Shipping*.
2. Participants who were unable to collect at least one blood sample during the previous sessions will do so at this time.
3. Facilitators and trainers will first demonstrate and then guide each team on specimen submission, packing and shipping.
4. As a final step, facilitators will ask participants to share challenges in their country in applying these standard operating procedures.

Standard Operating Procedures (SOP)

Document # 5	Title: Frontline ISAVET Standard Operating Procedures for Laboratory Specimen Submission, Packaging and Shipping	Date Prepared: January 29, 2019
Revision #:	Prepared by: Drs. Heather Simmons, Linda Logan, and Akiko Kamata	Date Prepared:
Effective Date:	Reviewed by:	Date Reviewed:
Standard:	Approved by:	Date Approved:

Policy: All Frontline ISAVET field teams shall plan, prepare and implement field laboratory specimen collection, packaging and transporting in accordance with the surveillance activities covered in the Frontline ISAVET. This SOP is intended to guide submission of specimens to reference (by air) and/or provincial laboratories (by road) and should be adapted as appropriate for use in each specific country.

Purpose: To collect quality field specimens, package diagnostic specimen appropriately and transport or dispatch them to the designated diagnostic laboratory while maintaining samples in cool conditions with coolant (frozen or chilled gel packs, or dry ice). This will enable diagnosticians to obtain accurate results, accurate interpretations and make recommendations for district veterinarians and farmers based upon samples collected from surveillance or outbreak investigation measures covered in Frontline ISAVET.

All field personnel must take specimen collection, packaging and shipping of diagnostic samples seriously if they desire quality test results which lead to accurate interpretation. Samples must be clearly labeled.

All field personnel must receive an awareness training on infectious substance transport according to the UN regulations.

Scope: Field Specimen Collection, Packaging and Shipping

Responsibilities: All Frontline ISAVET personnel that will access farms to collect field samples for surveillance and/or outbreak investigation measures must follow these guidelines; and conduct investigation in biosecured manner.

Before preparation:

Need to identify in which category of infectious substance the samples to be collected most likely will be e.g. Category A infectious substance, Biological substance Category B, or exempt animal specimen.

Required resources:

- Without-anticoagulant (Red top), with clot activator and serum separator gel (tiger top), sodium heparin (green top), EDTA (purple top) or with polymer gel and powdered glass clot activator (gold top) tubes
- Faecal and urine samples need triple packing. The primary container must be leak-proof.
- Sealed plastic cups
- Slides
- Syringes and needles
- Swabs and media
- Laboratory submission form
    - Label
- Indelible pen or use a graphite pencil
- Disinfectant
- protective gloves
- eyeglasses

Specimen Collection Duties
- Determine which tube(s) will be used for sample submission (e.g. red top, red tiger top, purple top, light blue top or green top). It is critical to know what diagnostic tests are to be run so you know which sample tubes are appropriate.
- Establish the type of specimen to be collected (e.g. whole blood, serum plasma, urine, swabs, fluids/aspirates or faecal samples) - Serum and plasma need to be separated from red blood cells and placed in a secondary vial as soon as possible (within 60 minutes) - Protect whole blood samples from temperature extremes. Extreme heat or freezing can destroy cellular elements
- Obtain the proper equipment to collect field samples. - Collect and properly label the required laboratory samples to match them with the questionnaire data and sample collection forms
- If a post-mortem is to be performed, collect the correct specimens and place them in ten parts buffered formalin to one-part tissue or other recommended ratio. - For post-mortems, collect and properly label the required laboratory samples to match them with the questionnaire data and sample collection forms
- Collect and document as much clinical history as possible including clinical signs, numbers of animals affected, species, ages, sex, husbandry/feeding type, water source, and summarise what samples you have collected and what you suspect might be the disease or cause of death. - Express your sincere thanks to the farmer for his time and contributions
- If possible, print hard copies of laboratory submission forms and carry them to the field with you to remind you of all the information required for submission. It is always better to have too much information than too little. By filling out these forms you will be sure to have a good way to contact the farmer later and report results. Closing the communication loop by letting farmers know what the problem is and advising them of how to resolve these disease problems will assure you of the opportunity to visit their farm on another occasion. You want to provide service and value to these farmers.

● To transport samples collected from animals that are unlikely to be infected e.g. animal samples to test non-infectious disease, also need to be transported in triple packaging.

- Triple packaging
    - Primary receptacle (leak-proof)
    - Secondary packaging (leak-proof)
    - Outer packaging
- Absorbent

NOTE: Do not forget marking as 'exempt animal specimen' on the surface of the outer packaging. See p130-131 of the UN Model Regulations available at https://www.unece.org/fileadmin/DAM/trans/danger/publi/ST_SG_AC10_1_Rev20_Vol_I_E_WEB.pdf

● To transport samples colleced from animals that are suspected to have an infectious disease need to be transported in a triple packaging meeting packaging requirement for Category B (except for CCHF, Nipah, Henra … these must be handled as Category A). See TABLE 3.6.D at https://www.iata.org/whatwedo/cargo/dgr/Documents/DGR-60-EN-3.6.2.pdf for details.

Required resources:

- Triple packaging for transport category B on road
  - Primary receptacle (leak proof. Screw top)
  - Secondary packaging (volume of each receptacle must be less than 1 Litre)

  NOTE: The primary receptacle OR the secondary packaging must have passed a test for an internal pressure of 95 kPa i.e. not anything available.

  - Outer packaging

  NOTE: either the secondary or the outer packaging must be rigid
- Absorbent
- Appropriate label/mark (e.g. UN3373 sticker)

Packaging and Shipping Duties for transport Category B on road
- Determine the classification type of the sample collected (e.g. Category A infectious substance, Biological substance Category B, or exempt animal specimen)
- Mark and label your package with the name, address, telephone number, shipper's name and address, consignee's name and address, and the type of biological specimen category using its Proper Shipping Name.
- Prepare a laboratory submission form and itemised list.
- Package the sample using 'triple packaging' (three layers). - Place specimens in a primary receptacle. - Place the primary receptacle inside secondary packaging. This should be packed in such a way, that under normal conditions of transport, the specimens cannot break, be punctured or leak contents. i.e place absorbent material in sufficient quantity between the primary receptacle(s) and the secondary packaging. - Place the itemised list of all contents with the laboratory submission form between the secondary packaging and your outer packaging. Protect this list from liquids/humidity, if possible, in a plastic bag. - Ice packs or dry ice may be placed around secondary packaging. If dry ice is used, calculate quantity sufficient for the duration of the transport. Ensure that this does not compromise the information on the laboratory submission form or itemised list.

Required resources:

- Triple packaging for transport Category B by air
  - Primary receptacle (leak proof. Screw top)
  - Secondary packaging

    NOTE: The primary receptacle OR the secondary packaging must have passed a test for an internal pressure of 95 kPa i.e. not anything available.

- Rigid outer packaging. Cannot containing more than NET weight 4 KG of Category B specimen.
- Absorbent.
- Appropriate label/mark (e.g. UN3373 sticker).

Packaging and Shipping Duties for transport Category B by air
- Determine the classification type of the sample collected (e.g. Category A infectious substance, Biological substance Category B , or exempt animal specimen)
- Mark and label your package with the name, address, telephone number, shipper's name and address, consignee's name and address and the type of biological specimen category using its Proper Shipping Name.
- Prepare the laboratory submission form and itemised list.
- Package the sample using 'triple packaging' (three layers). The outer packaging must be rigid. - Place specimens in a primary receptacle. Use a screw top tube. Do not use a flip top tube. - Place the primary receptacle inside secondary packaging. This should be packed in such a way, that under normal conditions of transport, the specimens cannot break, be punctured or leak contents i.e place absorbent material in sufficient quantity between the primary receptacle(s) and the secondary packaging. - Place an itemised list of all contents with the laboratory submission form between the secondary packaging and your outer packaging. Protect this list from liquids/humidity, if possible, in a plastic bag. - Ice packs or dry ice may be placed around secondary packaging. If dry ice is used, calculate quantity sufficient for the duration of the transport. Ensure that this does not compromise the information on the laboratory submission form or itemised list.

Definitions:

1. Laboratory Specimen – Collection of data from a defined population in a limited time period.

2. Serum Separator Tube (SST) – Serum that has been collected from clotted samples in a red top or tiger top tube. A SST is a gold top tube.

3. Category A infectious substance – An infectious substance that is transported in a form that, when exposure to it occurs, can cause permanent disability, life-threatening disease or fatal disease in otherwise healthy humans or animals.

4. Category B infectious substance – An infectious substance that is transported in a form that, when exposure to it occurs, cannot cause permanent disability, life-threatening disease or fatal disease in otherwise healthy humans or animals.

5. Exempt animal specimen - A specimen collected directly from animals for research, diagnosis, disease treatment and prevention which there is minimal likelihood that pathogens are present.

- *NOTE: A specimen Collected directly from animals includes including, but not limited to, excreta, secreta, blood and its components, tissue and tissue fluid swabs, and body parts*

Procedures:

General Provision

Proper specimen collection, labeling, packaging and submission are intended to improve our quality of results for animal disease diagnosis. This applies even for road transport.

Process:

Frontline ISAVET trainees will follow the following process for Specimen Collection, Shipping and Packaging:

1. Specimen Collection
    a. Identify the type of specimen to be collected while working with the farmer in the field. Determine the type of specimen collection container or tube you will use for obtaining field samples. Determine the type of sample transport box you need to use for transporting field samples. Discuss with the farmer why you are using specific colored tubes to collect blood samples in the field.
    b. Take personal protective measures when working with blood and samples that might contain zoonotic agents. Wear protective gloves and eyeglasses and wash hands well with soap and water upon completion of your field work.
    c. Obtain the correct equipment for field specimen collection.
        c.i. Syringes and needles
        c.ii. Red top, blue top, green top, Tiger top, or gold top tubes
        c.iii. Nasal swabs and media
        c.iv. sample transport box
    d. Collect and properly label any required laboratory specimens to match them with the questionnaire data and the sample data collection form. Laboratory results must be collated for use in surveillance.
    e. If a post-mortem is required, conduct a post-mortem and collect the required tissue samples and place in buffered neutral formalin not using more than one volume of tissue to 10 volumes of liquid. Sample thickness should not be more than half a centimeter.
    f. Take notes while you have the attention of the farmer and collect the clinical history including signs, length of time the issue has been ongoing, information on the affected animals and whether there have been any deaths (and if other farmers in the area have experienced similar issues).

   g. Express your sincere thanks to the farmer for his time and contributions and give re-assurance that all information will be confidential and that combined results of all farms will only be shared with all participating farmers.

2. Packaging and Shipping
   a. Classify your sample by providing all information with clear, legible writing and identify the substance as a 1) Class A infectious substance, 2) Class B infectious substance, or 3) exempt animal specimen.
      NOTE: Category A cannot be dispatched without Dangerous Goods Declaration signed by a person certified by a training for infectious substance shipment training within 2 years; and it cannot be transported without using specific packaging set prepared for Category A.
   b. Package your samples using triple packaging (three layers): 1) a primary receptacle, 2) secondary packaging and 3) rigid outer packaging. Make sure you include the itemised list of all contents between the primary and secondary packaging, and cool packs to maintain the samples while in transit.
   c. Mark and label the outside of your package to include the name, address and telephone number of the farmer. Include the consignee's name and address. Provide correct labels based on sample classification.
   d. Document your shipment and hand carry or send to laboratory via a courier that you know to be reliable.

Effectiveness Criteria: Thoroughness and completeness

References:

1. Source??

Records/Forms:

Form #	Record/Form/Activity Name	Satisfies
Required by Standard		
FAO Technical working group curriculum development	Frontline ISAVET Training Curriculum	Laboratory Specimen Submission, Packaging and Shipping
Other Forms/Records		

Form #	Record/Form/Activity Name	Satisfies
Frontline ISAVET Curriculum	Lesson 36: Preparing for Field Work	Sample Handling and Shipping

Revision History:

Revision	Date	Description of changes	Requested By
1.0	January 29, 2019	Adapted for Frontline ISAVET Uganda Field Training	Frontline ISAVET
2.0	October 10, 2019	Formatted by Sarah Manning	N/A

Topic: Preparing for Field Work

7. Proper Exit Procedures

Purpose: Demonstrate the concept of staging the movement of people, equipment and sample specimens from the dirty area to the neutral area and clean area at a suspect or affected location.

Objective:

1. Field teams will practice moving people, equipment and samples across dirty, neutral and clean zones;
2. Field teams will practice safe disposal of waste from a suspect or infected location.

Allotted Time: 30 minutes

Exercise Format and Instructions:

A. Movement of people, equipment and samples across dirty, neutral and clean zones. <u>20 minutes</u>

1. The facilitators will:
   a. Review Figure 1 representing the steps in moving people, equipment and samples across dirty, neutral and clean zones;

   b. Model each step for the movement of people, equipment and samples across dirty, neutral and clean zones;
2. Each field team will then practice activity 1b.;
3. Trainers will observe and assist teams with safely moving people, equipment and samples across dirty, neutral and clean zones.

B. Safe disposal of waste from a suspect or infected location. 10 minutes

1. The facilitators will ask the following questions related to safe disposal of waste, including:
   a. What is the preferred site for disposal of soiled PPE?
   b. What is the preferred site for disposal of needles, tubes, swabs and sharp objects?
   c. What is the preferred site for disposal of contaminated pens and paper?
   d. What do I do with my mobile phone, watch and jewelry?

Materials:

- Worn, soiled PPE
- Needles,
- Wasted blood tubes
- Blood samples
- Contaminated writing equipment
- Garbage bags
- Sharps biohazard containers
- Disinfectant
- Buckets and brushes

Expected Outputs:

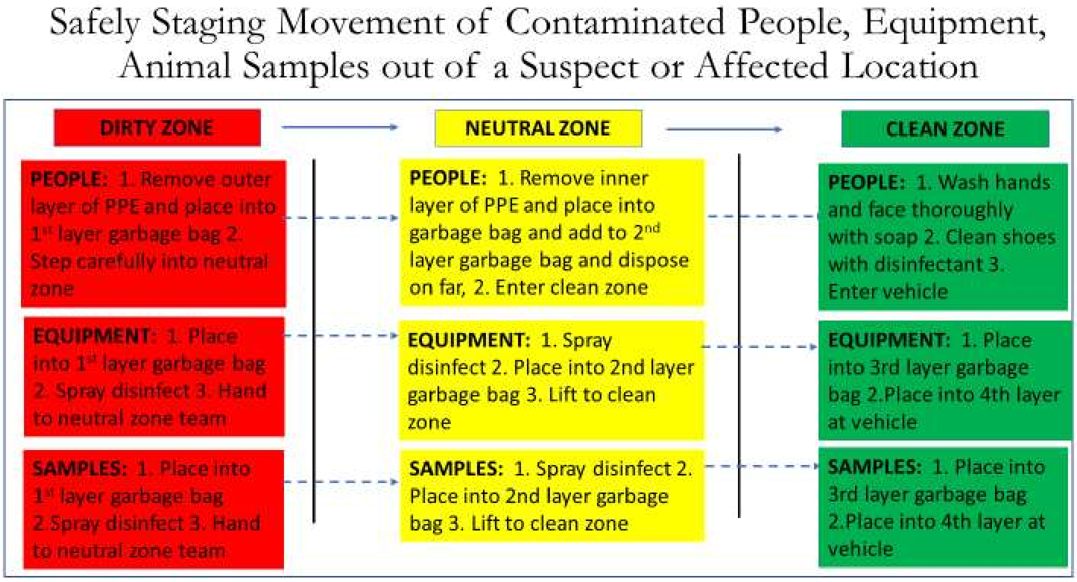
Participants will be able to:

1. Safely move people, equipment and samples across dirty, neutral and clean zones at a suspect or affected location;
2. Safely dispose of soiled PPE and hazardous waste from a suspect or affected location.

Trainer Instructions:

1. The facilitators will review Figure 1 representing the steps in moving people, equipment and samples across dirty, neutral and clean zones; then
    a. Model each step for the movement of people, equipment and samples across dirty, neutral and clean zones;
    b. Each field team will then practice activity 1b.;
    c. Trainers will observe and assist teams with safely moving people, equipment and samples across dirty, neutral and clean zones.
2. The facilitators will ask the following questions related to safe disposal of waste, including:
    a. What is the preferred site for disposal of soiled PPE? [It is preferable to ask the farmer if it is acceptable to leave the soiled PPE at that same location so that you do not spread disease]
    b. What is the preferred site for disposal of needles, tubes, swabs and sharp objects? [Since these are hazardous waste that can injure people and animals, it is best to place them in a biohazard container and triple bag them to prevent leakage and contamination.]
    c. What is the preferred site for disposal of contaminated pens and paper? [It is preferable to leave them at the same location but you can also dip pens and plastic clipboards in a bucket with disinfectant]
    d. What do I do with my mobile phone, watch and jewelry? [always place these items in a sealed plastic zip-loc bag and store in a safe place. Never take a mobile phone to use it in the dirty zone as it is a good fomite that can re-contaminate your hands after you have washed.]

Figure 1.


Safely Staging Movement of Contaminated People, Equipment, Animal Samples out of a Suspect or Affected Location
DIRTY ZONE
NEUTRAL ZONE
CLEAN ZONE
PEOPLE: 1. Remove outer layer of PPE and place into 1st layer garbage bag 2. Step carefully into neutral zone
PEOPLE: 1. Remove inner layer of PPE and place into garbage bag and add to 2nd layer garbage bag and dispose on far, 2. Enter clean zone
PEOPLE: 1. Wash hands and face thoroughly with soap 2. Clean shoes with disinfectant 3. Enter vehicle
EQUIPMENT: 1. Place into 1st layer garbage bag 2. Spray disinfect 3. Hand to neutral zone team
EQUIPMENT: 1. Spray disinfect 2. Place into 2nd layer garbage bag 3. Lift to clean zone
EQUIPMENT: 1. Place into 3rd layer garbage bag 2.Place into 4th layer at vehicle
SAMPLES: 1. Place into 1st layer garbage bag 2.Spray disinfect 3. Hand to neutral zone team
SAMPLES: 1. Spray disinfect 2. Place into 2nd layer garbage bag 3. Lift to clean zone
SAMPLES: 1. Place into 3rd layer garbage bag 2.Place into 4th layer at vehicle

This Manual provides the curricular contents of the Frontline In-Service Applied Veterinary Epidemiology Training (ISAVET) programme. The intended audience of the Manual are Trainers and Mentors of the Frontline (ISAVET) at national-level. The manual will serve as an FAO Global resource for National capacity development of Veterinary Services to detect and respond to emerging infectious animal diseases including transboundary animal diseases and zoonotic diseases.