

The Online R-FETPV 1st Module: Basic Epidemiology and Surveillance Data Analysis

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Food and Agriculture
Organization of the
United Nations



Basic Epidemiology and Surveillance Data Analysis: Do we need epidemiology to manage animal diseases?

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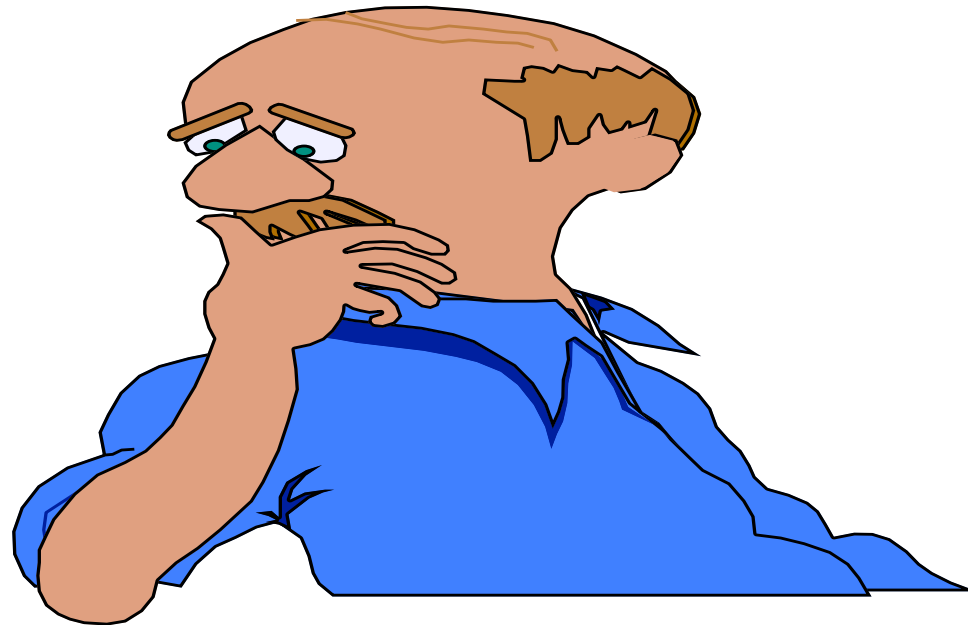
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Outline

- Why and What veterinary epidemiology?
- What are the components of national animal health program?
- What are the components of a reliable and comprehensive surveillance program?
- Answering the question of the title - Conclusion and essential needs for scientifically based animal health program.
- Q & A

Why and What Veterinary Epidemiology?



Review Assessment

Cohort Studies

A 3D graphic featuring the text 'Review Assessment' in large, bold, yellow-to-orange gradient letters at the top. Below it, the text 'Cohort Studies' is written in a blue, cursive font. The background consists of a stylized globe with blue and yellow segments, set against a white background with green wavy lines at the top.

Definition of Epidemiology

- The study of a disease pattern in a population in order to determine *prevention and control strategies*

What Veterinary epidemiology is.....

- Integrative, assorted discipline
- Sequence of reasoning
- It's all about PREVENTION

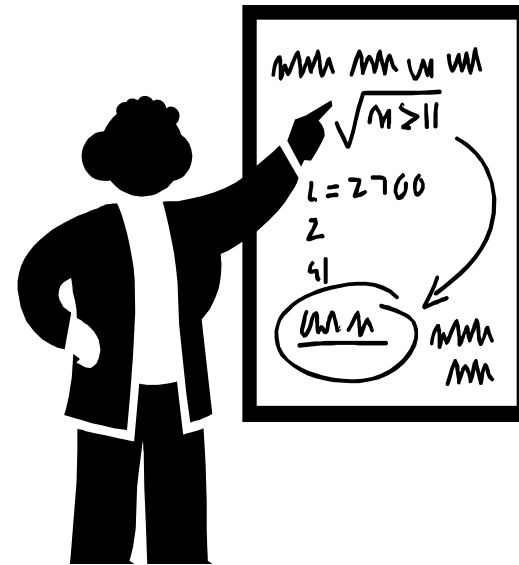


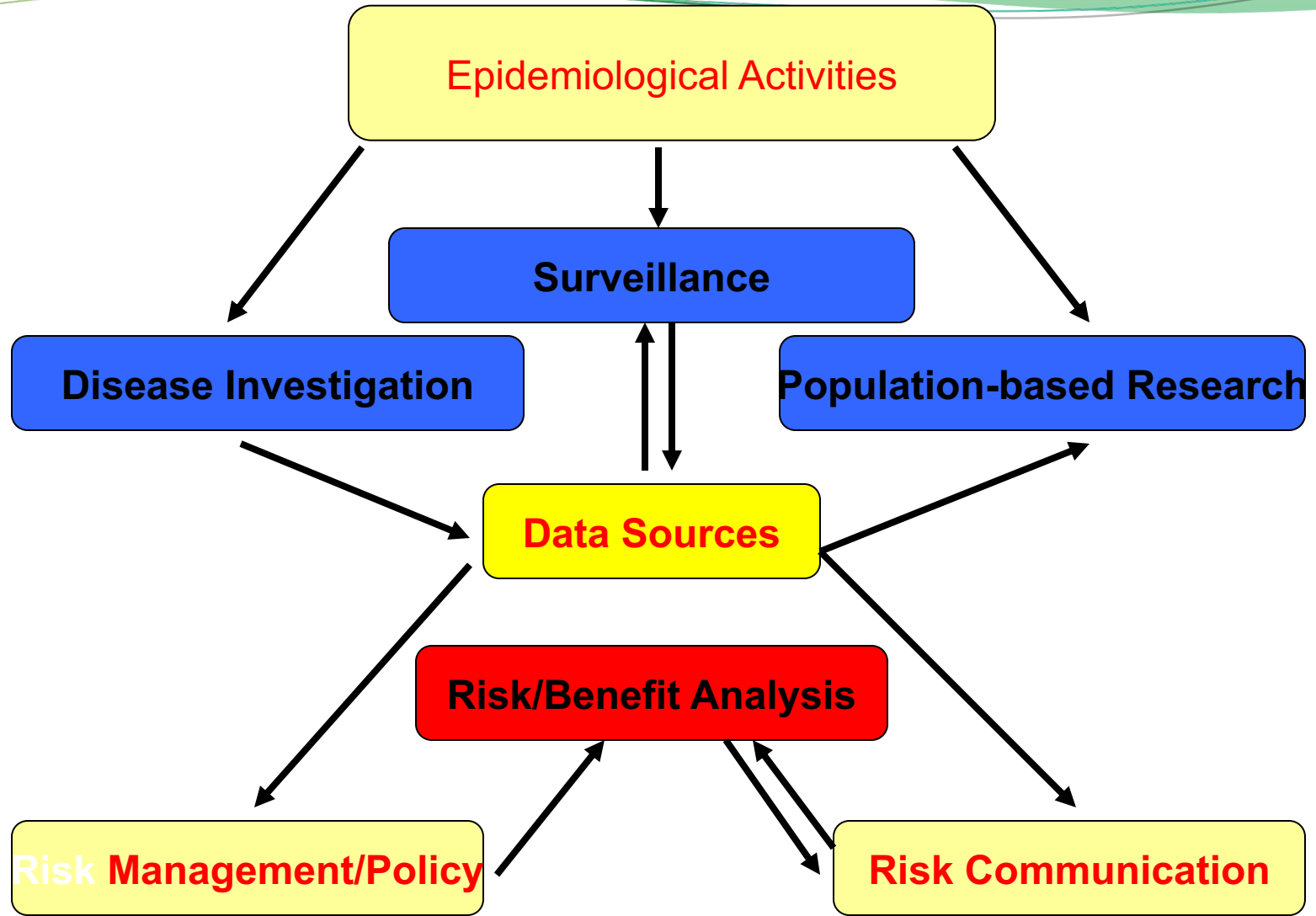
Classification of Epidemiology in Veterinary Medicine

- Descriptive Epidemiology - Clinical Epidemiology
- Analytical Epidemiology - Quantitative Epidemiology
- Experimental Epidemiology - Clinical Trials and Modeling

What epidemiology is not.....

- Only surveys
- Painfully complicated models
- Keeping track of people in the office





Benefits from a field epidemiological approach:

- Determination of the direction of *future work*
- *Support* in the decision-making process
- Direct effects on the *quality and success* of disease management and finally disease eradication efforts

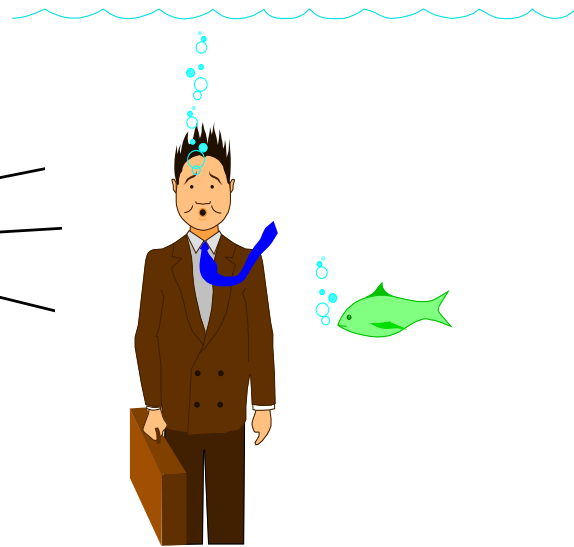
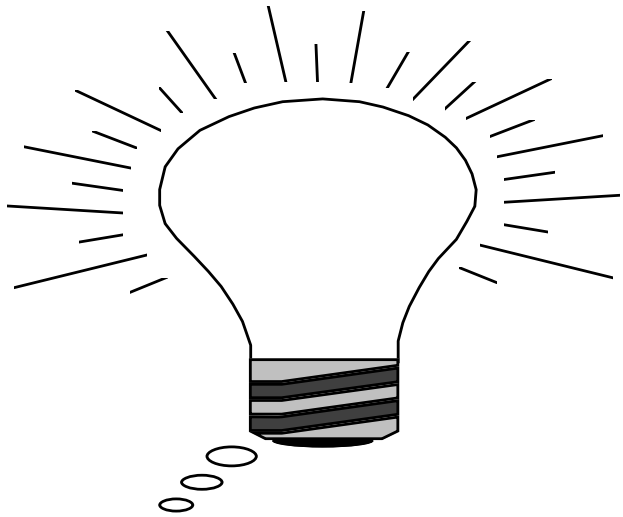
What are the characters of a successful epidemiologist?



- Should have an inquisitive mind
- Be curious, identify potential problems



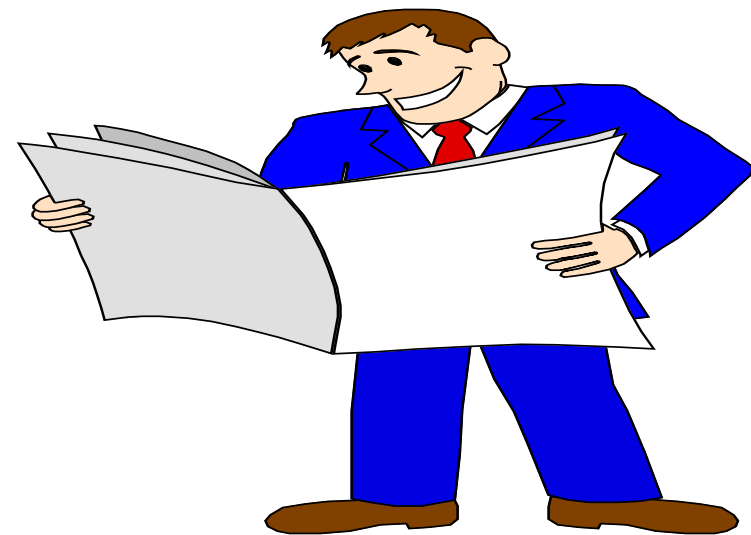
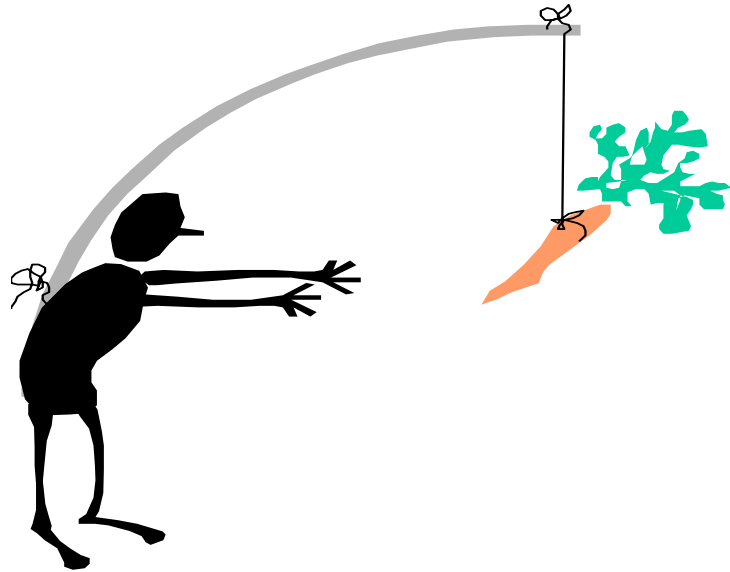
- Be willing to investigate and search files, records, documents, and visited farms
- Should be patient and open minded in his/her approach



- Should be willing to listen
- Should be a creative thinker



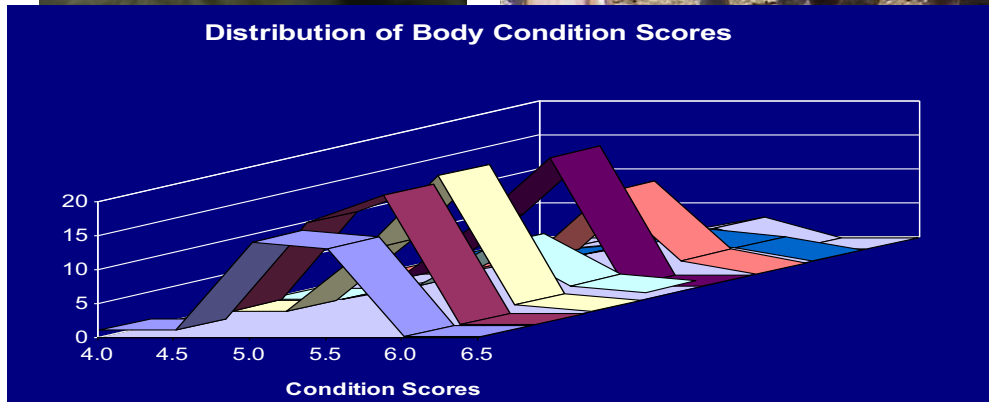
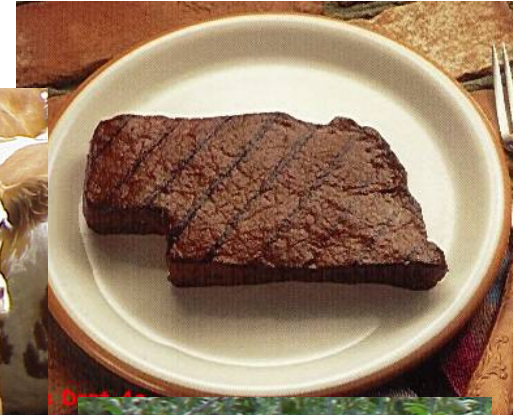
- Have clinical experience in the field
- Have the ability to seek and accept new knowledge – Training and training



- Enjoy working with the public
- Have the ability to use the quantitative and scientific approach to solve a disease problem



Opportunities

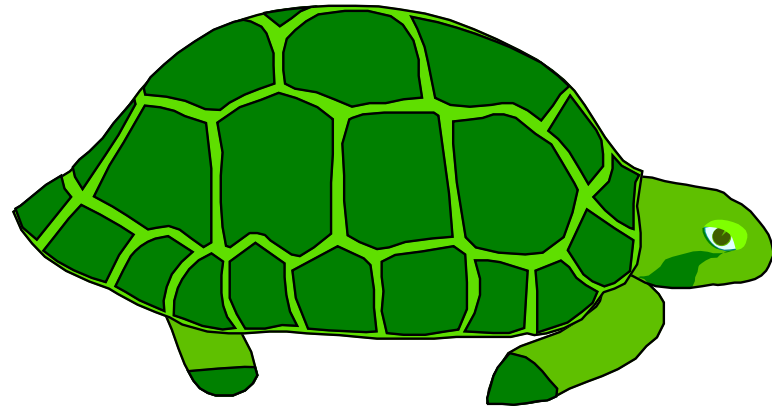
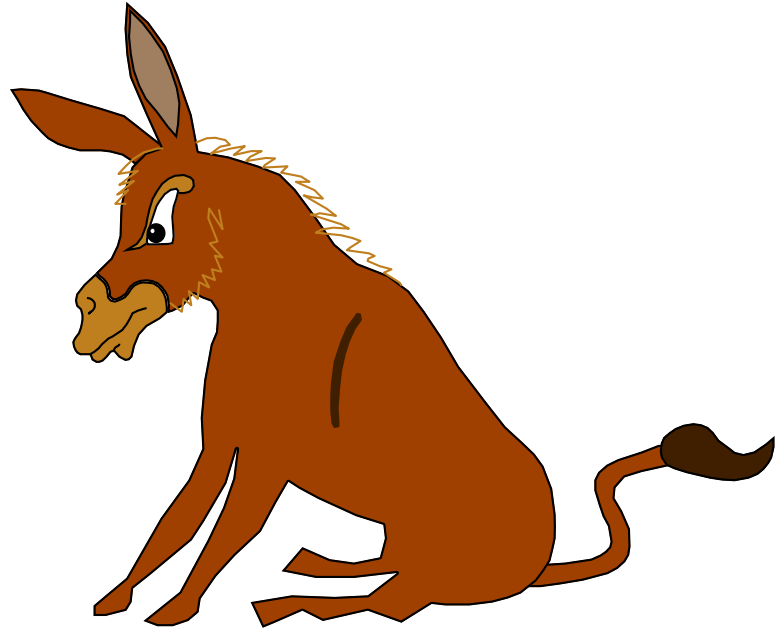
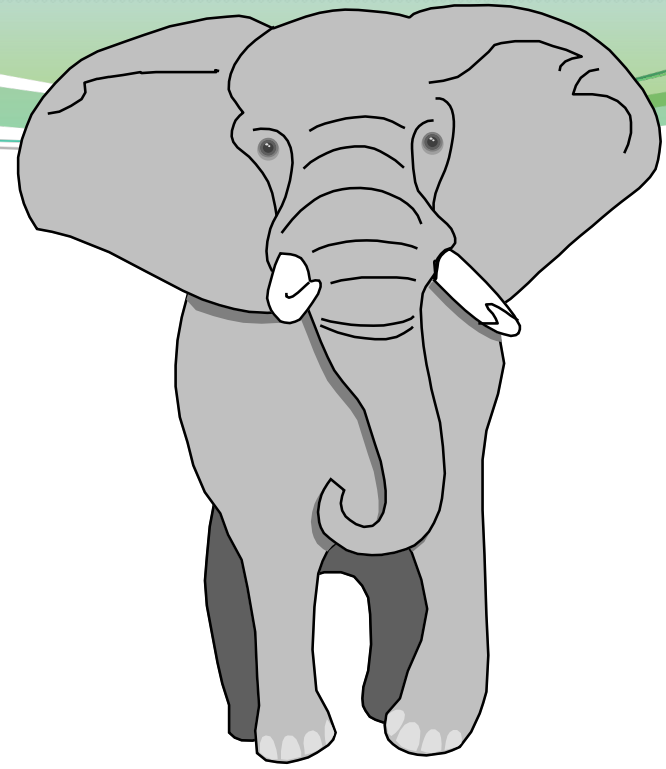
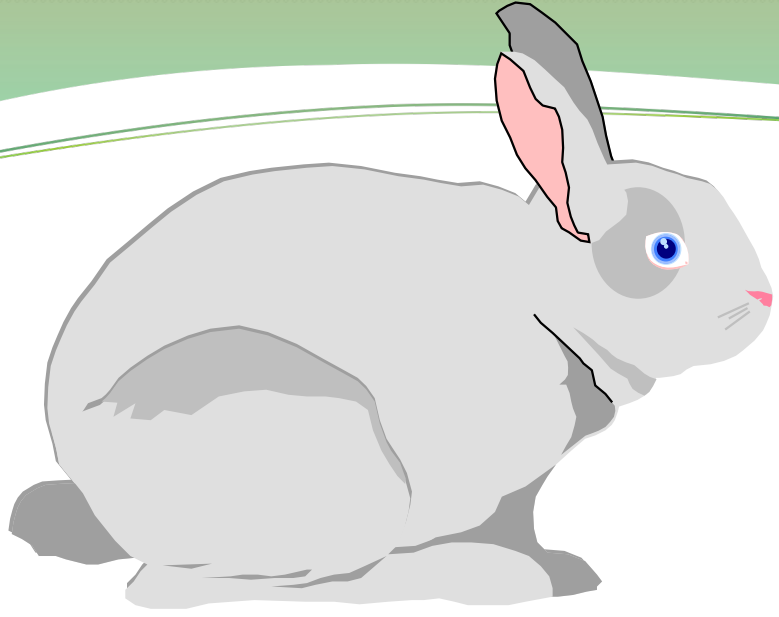



Epidemiology



"Common sense,
with a system"







What are the components of national animal health program?



Animal Health vs. Animal Disease Vs. Veterinary Services

Which term is better?

What are primary purposes/goals?

- Reduce the spread of diseases – prevention measures
- Enhance animal production – directly and indirectly
- Ensure the safety of animal origin food production – public health obligation
- Satisfy the national and international requirements in terms of animal health status.

What are the secondary purposes/goals?

- Establish a line of communication between the sellers/exporters and buyers/importers of animals in terms of animal health status
- Understand the diseases under consideration in terms of their natural occurrence and epidemiology
- Maintain a method to monitor the disease status of animal populations – assign a priority list
- Support the veterinary professional activities through education and awareness

Classification of Animal Health Programs

- Administrative/legal criteria – program vs. non program diseases
- Intervention criteria – vaccination, test and slaughter, depopulation, ..etc
- Disease types – brucellosis, bovine tuberculosis, ..etc

Essential requirements for a sound animal health program (Check List)

- Purpose - cleared and defined
- Justification – both scientific and public reasons
- Target population(s)- who and how
- Administrative structure
- Financial support
- Time frame
- Measurable outcome/output
- Methods/approach

Measurable Outcome/output

- Administrative caseload is NOT an outcome for a program
- Measuring the amount of dispensable materials is not an outcome for a program
- The outcome should be related to the disease(s) under consideration

Measurable Outcome/output

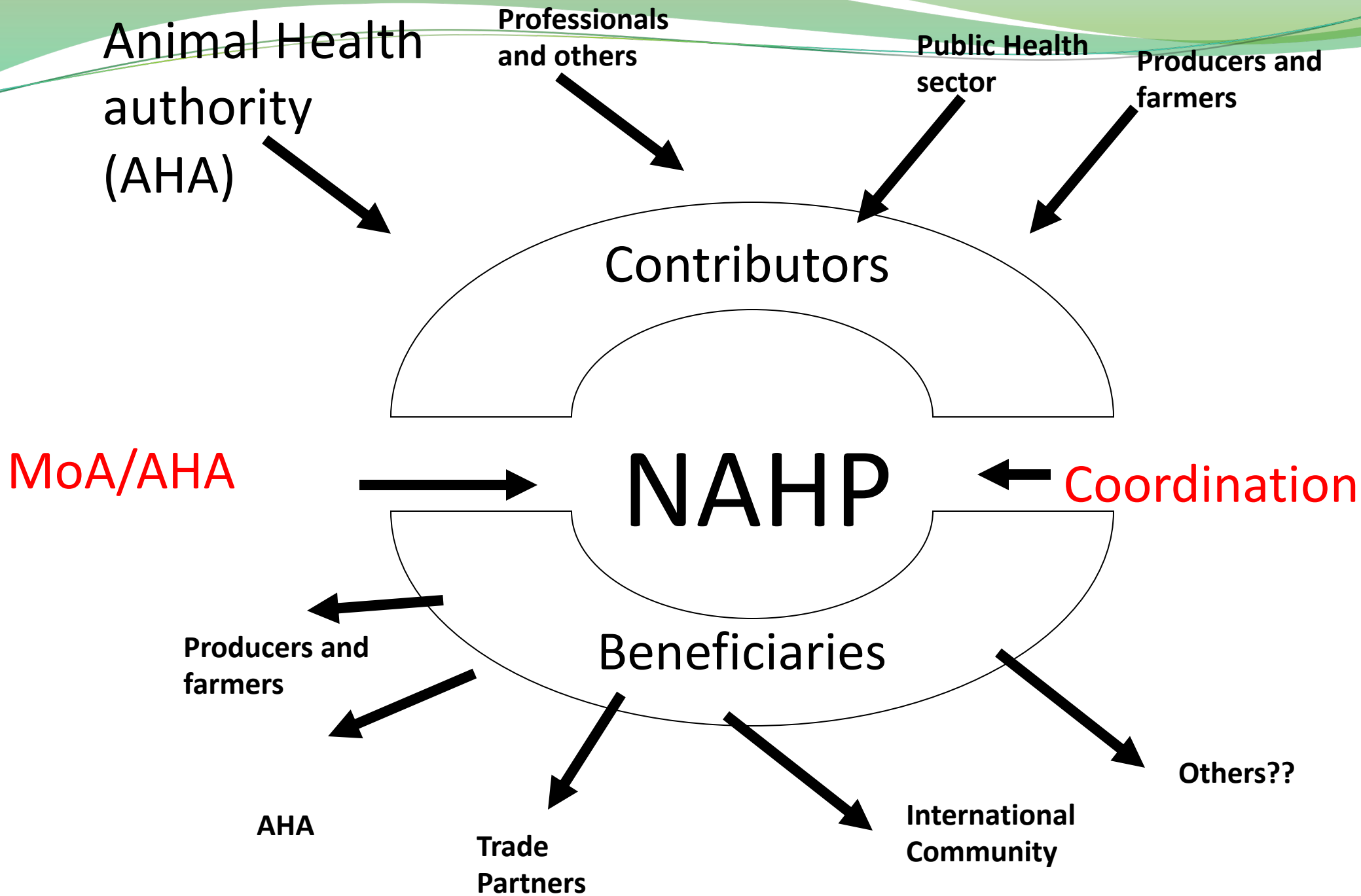
- Measurable outcome requires collection of reliable data during the implementation of the program
- Long vs. short outcome
- Morbidity vs. mortality rates as measurable outcome
- Prevalence vs. incidence rate as measurable outcome
- Economic incentives/parameters may be part of the outcome

Methods and approaches

- Scientifically based approach
- Practical and culturally acceptable
- The approach should be directly related to the goal/purpose of the program
- Options should be assessed/evaluated prior to a final decision to adapt specific approach
- The approach should be available as a protocol prior to the implementation of the program

Components of NAHP

- **Legislation and administrative structure**
- **Field operation infrastructure**
- **Surveillance and data collection system**
- **Disease diagnosis laboratory system**
- **Preventive and control campaigns**
- **Outreach and extension campaigns**





What are the components of a reliable and comprehensive surveillance program?

Surveillance ≠ Monitoring Survey ≠ Surveillance

- Surveillance:
 - Ongoing observations with a plan of action based on the outcome.
- Monitoring:
 - Ongoing observations without taking an action on those observed subjects based on the outcome.
- Survey:
 - A focused assessment with a specific aim/goal – similar to cross-sectional epidemiological study.

Surveillance

- Purpose
 - Provide information for action
 - Institute (or modify) control, eradication and preventive measures
 - Evaluate previous efforts
- Time Frame
 - On-going observations

Surveillance Basics

- A system and NOT a single or multiple studies.
- Usually directed at a health-related event within a defined population
- Requirements
 - A defined disease monitoring system
 - A predefined threshold for action
 - Predefined directed actions (responses)
- Types of data collection
 - Active or passive

Surveillance System: Design & Implementation Considerations

- System aim or goal
 - Is the most important consideration
 - Require clearly defined program objectives
- Reference population
 - Imposed by the aim of the program
- Sampling techniques
 - Imposed by the aim of the program
 - Sample selection/sample size
 - case definition/study population

Considerations for design and implementation

- International and national requirements, including social and political considerations
- Sampling considerations including risk-based (targeted) surveillance
- Sample sizes for estimation of prevalence and incidence changes, detection of disease, certification of disease freedom
- Diagnostic tests
- Use of sentinel people, animals and herds
- Data collection methods including quality (biases, completeness of data etc.)

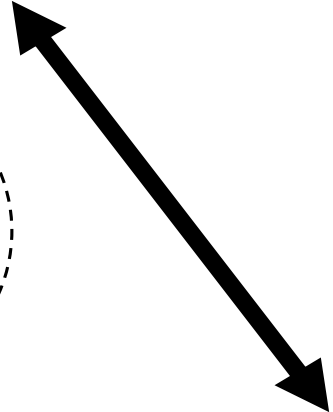
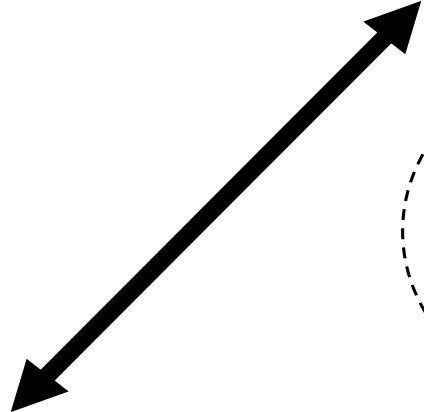
Key Point

- The PURPOSE of the surveillance system will impact the design
- Examples:
 - Early warning system – detect disease incursions
 - Detection of infected villages/herds and implementation of control measures
 - Evaluate changes in prevalence/incidence over time
 - Disease freedom certification for international recognition purposes
 - More than 1 of the above

**Policy, strategies,
regulations, and
authority**



**National Animal Health
Services**



Field and Clinical Operations



**Diagnostic and
Investigation Operations**



**Prevention, treatment,
vaccination, awareness**



Laboratory, field response



Conclusion and essential needs for scientifically based animal health program

Answering the question of the title ***“Do we need epidemiology to manage animal diseases?”***

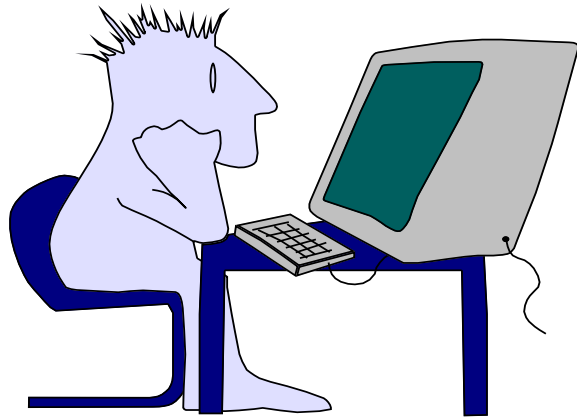
- Short answer is YES
- Consideration of the justifications of what I presented above
- If So then what is needed?

The NEEDS!

- Build awareness of the needs for veterinary epidemiology for NAHP through knowledge, attitude, and demonstrations.
- Training from bottom up but also from top to the bottom with reliable but practical tools to deliver the right message to the audience.
- Expand the training program of R-FETPV to general uses as part of building awareness.

The NEEDS!

- Expand on the professional network to include other relevant public service agencies and entities to broaden the NAHP activities.
- Work with the relevant international agencies to promote/enhance reliable and scientifically based approaches to animal disease management.
- Use adverse national and global animal health events as an opportunity to prompt national animal health programs.



Questions and Answers

