Risk based surveillance: wildlife

Dr. Marius Masiulis
FAO international consultant,
State Food and Veterinary Service of Lithuania

Regional Workshop on FMD and other TADs

Yur'evets, Vladimir, Russian Federation
29/11/2017 - 30/11/2017

Risk based surveillance

• is not a particular technique;

• describes a general approach to undertaking disease surveillance;

• an understanding of risk factors and their impact on disease distribution is crutial.

• The principle is simple and self-evident: the most efficient way to find disease is to survey the animal populations that are most likely to be affected.

• The analysis of data collected through risk-based surveillance has required the development of new analytical techniques.

Risk Analysis

- – analytical process to provide information regarding undesirable events;
- – process of estimating probabilities and expected consequences for identified risks.
- – detailed examination including risk assessment, risk evaluation and risk management alternatives, performed to understand the nature of unwanted outcome;

http://www.sra.org/resources_glossary

What is Risk Assessment?

A strategic approach to planning, **at all levels and across all functions of an organization**, that identifies exposures of activities and assists in making risk adjusted decisions...

Risk Assessment

❖A careful examination of what could cause disease, so that you can weigh up whether you have taken enough precautions or should do more.

❖The aim is to make sure that disease will not spread.

❖Legal requirements.

Risk Assessment steps

The main steps of a risk assessment are:

➢– Framing the risk question
➢– Identifying the hazard(s)
➢– Outlining the risk pathways
➢– Identifying data needs
➢– Collecting data
➢– Assessing the risk

Aim of surveillance

EARLY DETECTION OF A SPECIFIC ANIMAL DISEASES
HAS THE INFECTION BEEN INTRODUCED?

DEFINE THE EVOLUTION OF THE INFECTION
IS THE INFECTION INCREASING IN THE POPULATION OR
FADING OUT?

ASSESS IF THE APPLIED STRATEGY WORKS AS EXPECTED. IS
THE APPLIED CONTROL/ERADICATION STRATEGY
WORKING?

Animal Health surveillance

- surveillance for diseases **that are present:**

- describing the level or distribution of disease (or a pathogen or risk factors for disease)

- detecting cases of disease (at the animal or group/herd level), in order to take action at that same level.

- surveillance for diseases **that are absent:**

- detecting the incursion of new, emerging or exotic diseases (or pathogens or their risk factors)

- demonstrating freedom from disease or pathogens.

RISK OF SPREAD AFTER INTRODUCTION OF THE VIRUS

- Delayed diagnosis;
- Wild animal population size and density;
- Inappropriate hunting methodologies;
- Lack of biosecurity measures applied during hunting;
- Infected wild animal carcasses available for healthy wild animals;
- Poaching;
- Forest connectivity.

9

Risk based surveillance strategy in wildlife

Passive surveillance:

Best surveillance for the early detection of almost all infectious diseases (in particular for ASF in wild boars);

Active surveillance is useless for early detection in free and at risk areas but good tool in already infected areas for estimation of disease prevalence.

10

ACTIVE SURVEILLANCE

Describes an activity that is designed and initiated by the prime users of the data (!)

One of the significant advantages of active surveillance is that the activity is designed by the users of the information.

Therefore, it is possible to ensure that both the nature and the quality of the data collected are adequate to meet the users' surveillance requirements.

ACTIVE SURVEILLANCE IN INFECTED AREAS

The virus is present;

Quantification of the spread of the virus (prevalence/incidence)

Virological and or serological tests

Sample collection: hunters/veterinarians

Risk of further spread of infection: appropriate management of hunting grounds, handling of shot wild boars when transported in private cars; hygienic standard of the dressing areas, storage of carcasses while waiting for the results of the tests; positive carcasses disposal, etc.

PASSIVE SURVEILLANCE

Passive surveillance describes surveillance systems where information on disease events is brought to the attention of the veterinary authorities without them actively seeking it.

Another way of thinking about passive surveillance is that it uses data that have already been collected for some other purpose; in such circumstances, veterinary services do not initiate the data collection.

PASSIVE SURVEILLANCE

Evaluation of the passive surveillance efficiency!

The number of suspected cases to be investigated has to be estimated in advance, same figures should be used to evaluate the efficacy of the surveillance in place;

In peace time, how many dead animal (for example - wild boars) should be found in at risk areas?

Duration: it is always difficult to maintain a high level of passive surveillance for any disease absent for a long period...

Food and Agriculture Organization
of the United Nations

PASSIVE OR ACTIVE SURVEILLANCE: WHICH IS BETTER?

Passive is better when	Active is better when
▪ An official "suspect case" definition is available and well known among stakeholders ▪ Evident Clinical Symptoms ▪ High lethality rate ▪ High animal owners awareness ▪ High Veterinary Service awareness	▪ Clinical symptoms are not evident, episodic or short lasting ▪ Low/null lethality rate ▪ Low animal owners awareness

---

Food and Agriculture Organization
of the United Nations

HIGH RISK PERIODS

FIRST	SECOND
The period between the introduction of an infection into a Country and the first detection of the infection **How much time we need to detect the infection?**	The period between the first animal has been detected as infected and the establishment of measures to prevent virus spreading **How much time we need to put in place control measures ?**
The length of the 1st HRP depends on: the efficacy and efficiency of the surveillance scheme in place **Surveillance strategy**	**Outbreak management**

EFFICIENCY OF A SURVEILLANCE SYSTEM

The efficiency of a surveillance system is modulated according to the characteristics of:

Disease: lethality, spread, clinical signs

Susceptible host population: species, geographical distribution, size, breeding system; biosecurity etc.

and

Risk of introduction: risk assessment.

17

SURVEILLANCE IN WILDLIFE

Role played by wildlife in the epidemiology of infection.

Epidemiological unit: the wildlife metapopulation that lives in a continuous geographic distribution delimited by natural or artificial barriers.

Suspect case definition: rarely clinical signs are seen, death is the obvious symptom (low lethal diseases).

Efficacy of the passive surveillance: difficult to assess: how many dead individuals are retrieved in peace time?

Sampling unit: which is correct sampling unit in order to avoid sampling dilution (low detection probability) or oversampling?

Sample collection: how to collect sample?

Timing: seasonal hunting, catching, virology vs. serology

SURVEILLANCE IN PRACTICE

Highest probability **to detect** the introduction of infection in a free area (early detection);

Highest precision in measuring epidemiological parameters (i.e. prevalence, n. of seropositive animals etc.);

Sustainable from both implementation and economical terms;

Have a practical approach (actions are foreseen).

Thank you for your attention