

# Surveillance for Influenza A virus in Animal Populations: What can work?

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# Monitoring ≠ Surveillance ≠ Survey



- Monitoring:
  - Ongoing observations without taking an action based on the outcome.
- Surveillance:
  - Ongoing observations with a plan of action based on the outcome.
- Survey:
  - “One shot” observation with a specific aim/goal – similar to cross sectional epidemiological study.

# Surveillance systems

- Surveillance systems vary in methodology, scope and objectives;
- Design of surveys and surveillance systems is influenced mainly by their objectives/aims.



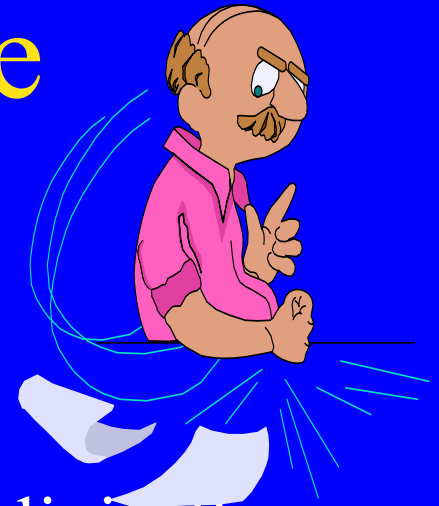
# An effective and well-designed surveillance system can answer the following questions:

- Is the disease/virus present in specific animal populations?
- If the disease occurs, what is its prevalence?
- If virus/disease has been present for several years, is the prevalence decreasing, remaining static or increasing?
- How are disease cases spatially distributed? Is there evidence of disease freedom in some regions of a country?

# Surveillance systems vary in scope and methodology among countries.

- Most important component is a clearly defined set of objectives, and a description of actions that will result when cases are detected.
- Baseline data are essential for the effectiveness of the system.
- Estimation of AI prevalence requires an estimation of the number of confirmed cases of AI  $\div$  population at risk

# Passive surveillance



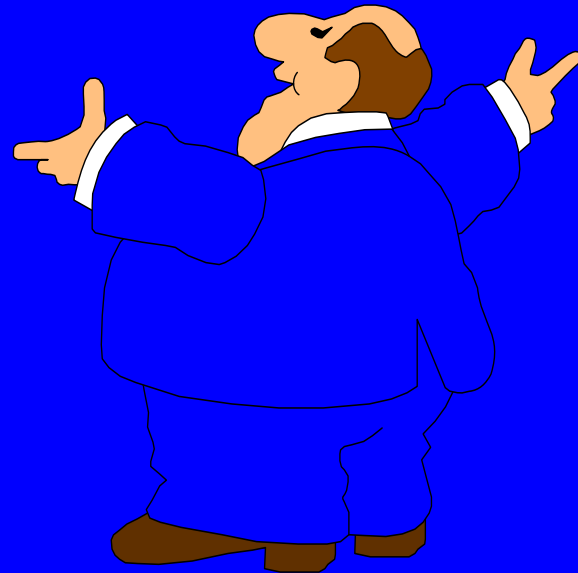
- Depends on the compulsory reporting of clinically suspect flocks or herds by farmers and veterinarians;
- Subsequent investigation of these animals by government veterinary services, and
- Collection and testing of samples for the confirmation of the virus.

# Passive surveillance for Influenza virus in animal populations

- What is the knowledge level of farmers and veterinarians about disease, including clinical signs in affected animals?
- What is the definition(s) of a suspect flock/herd?
- Are suspect birds/animals recognized by farmers?
- Is there an incentive to report (or to not report) a suspected case?

# Active surveillance for Influenza virus in animal populations

- Risk-based sampling where population is categorized as high-risk or low-risk;
- Risk factors then should be recognized or established.



# Prevention strategies for H5N1 and H1N1 in animal populations

- Strategies should focus on prevention of the spread of the virus within and among animal populations;
- Early detection of these viruses should be considered a component of the prevention strategies;



# Prevention strategies for H5N1 and H1N1 in animal populations

- Selection of the appropriate strategy should consider the host susceptibility, infectivity, pathogenicity, and virulence of each of these two viruses;
- Control strategies should NOT be the same regardless of the characteristics of the virus;
- Vaccination is NOT the sole strategy for these viruses.



Subtype	Host	Infectivity	Pathogenicity	Virulence	Potential Control Approaches
H5N1	Avian	High	High	Medium/High	Early detection with radical actions – Stumping out.
H5N1	Humans	Low	Medium	High	Avoid exposure and eliminate the source as much as possible
H1N1	Humans	High	Medium	Medium/low	Vaccination and increase the herd immunity
H1N1	Swine	High/medium (?)	Medium/Low	Low	Avoid human exposure as much as possible (biosecurity level)

# Surveillance for H5N1 and H1N1 in animal populations

- A vigilance system should focus on finding both of these viruses so they can be **monitored** for changes in trends and circulations;
- The surveillance system should consider the host susceptibility, infectivity, pathogenicity, and virulence of each of these two viruses;
- The surveillance system for H5N1 should focus on domestic and wild avian species to measure its distribution with a plan of action to reduce the virus prevalence including a reliable, efficient and safe vaccine;

# Surveillance for H5N1 and H1N1 in animal populations

- The surveillance system for H5N1 should include the detection of other H5, H7 subtypes so that their circulations in avian populations can be determined;
- The surveillance system for H5N1 should be active as much as possible so that an effective plan can be implemented;
- The surveillance system for H1N1 in a swine population should be aimed for early detection of the introduction of this strain of the virus to the swine population.

# Surveillance for H5N1 and H1N1 in animal populations

- The surveillance system for H1N1 in a swine population should be passive and use human cases as a sentinel index for detection of this virus.
- There is a need for establishing **a monitoring system** in swine population with the aim to determine the pattern of the circulating viruses in swine.
- The monitoring system should not be considered a surveillance with radical action so that reasonable collaborations from the industry can be maintained.

# Any Questions?

