CONCEPTS AND LIMITATIONS OF EPIDEMIOSURVEILLANCE

Systèmes d'information et outils de pilotage du secteur élevage dans les pays du Sud:
Postures et méthodes

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UR AGIrs

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WTO – Standards and security

- GATT agreements - Article 20
- Governments can act on trade to protect human, animal or plant health, but must demonstrate that:
  - There is no discrimination
  - They don't use these barriers as disguised protectionism

SPS Agreements

- Each country can set its own standards according to the regulation:
  - Need to be based on scientific evidences (transparency)
  - Valid only when additional measures must be applied to protect human, animal health or plant
  - Any distinction between countries of identical or similar conditions (equivalence)

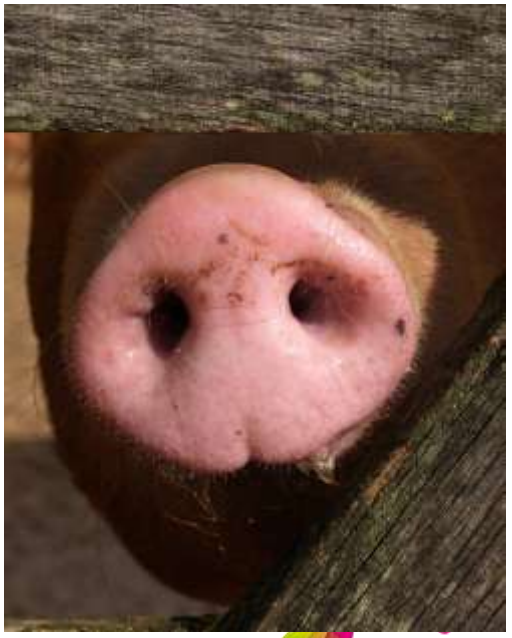
- Food safety - FAO/WHO Food Commission of Codex Alimentarius
- Animal health - World Organization for Animal health (OIE)
- Plant health - FAO secretariat of the International Plant Protection Convention

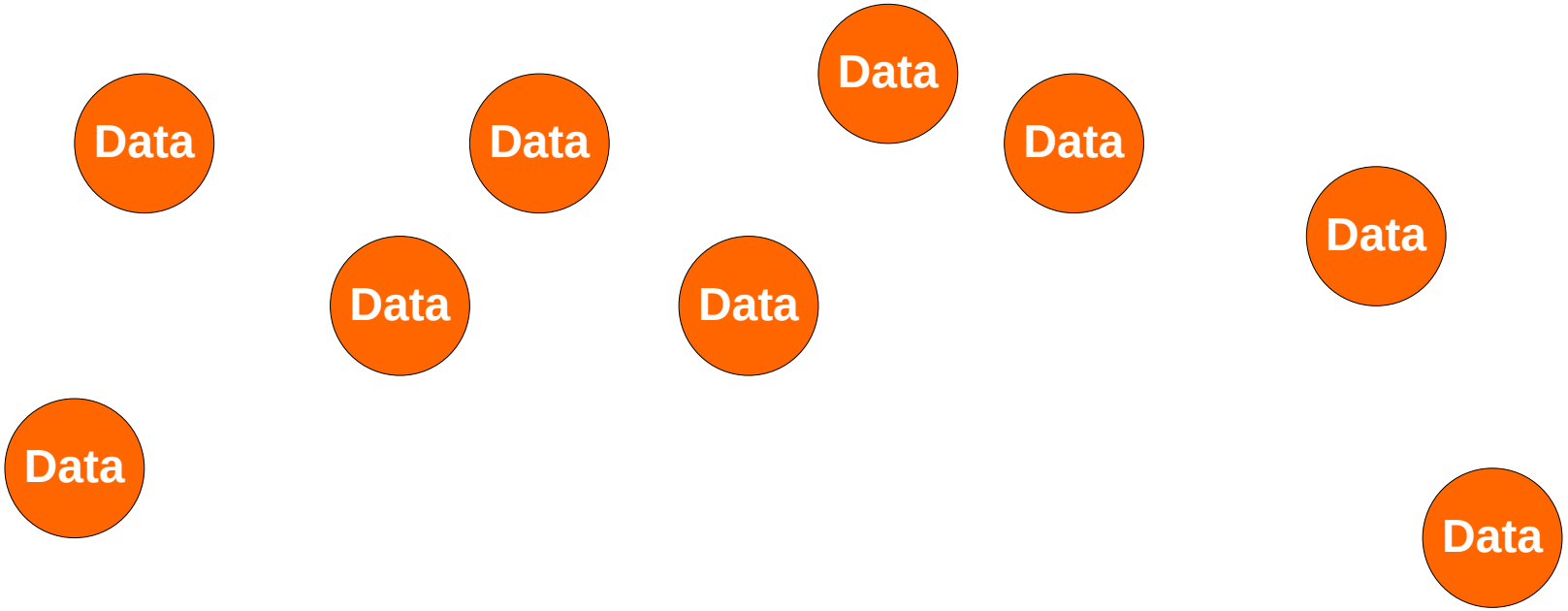
OIE standards– Terrestrial animals

- Terrestrial animal health code
  - Health measures designed to prevent the transfer of pathogens to humans or animals
  - Including sections on
    - *Risk Analysis*
    - *General guidelines and surveillance of specific diseases*
      - Article 1.4.1 *Surveillance in animal health*

Definition of surveillance

- Disease surveillance in animal health is the ongoing systematic collection, analysis and interpretation of data and the dissemination of information to those who need to know in order to take action.
- *"Surveillance is not conducted for the sole purpose of collecting data but the express purpose of disseminating health information on a timely basis to decision makers"*





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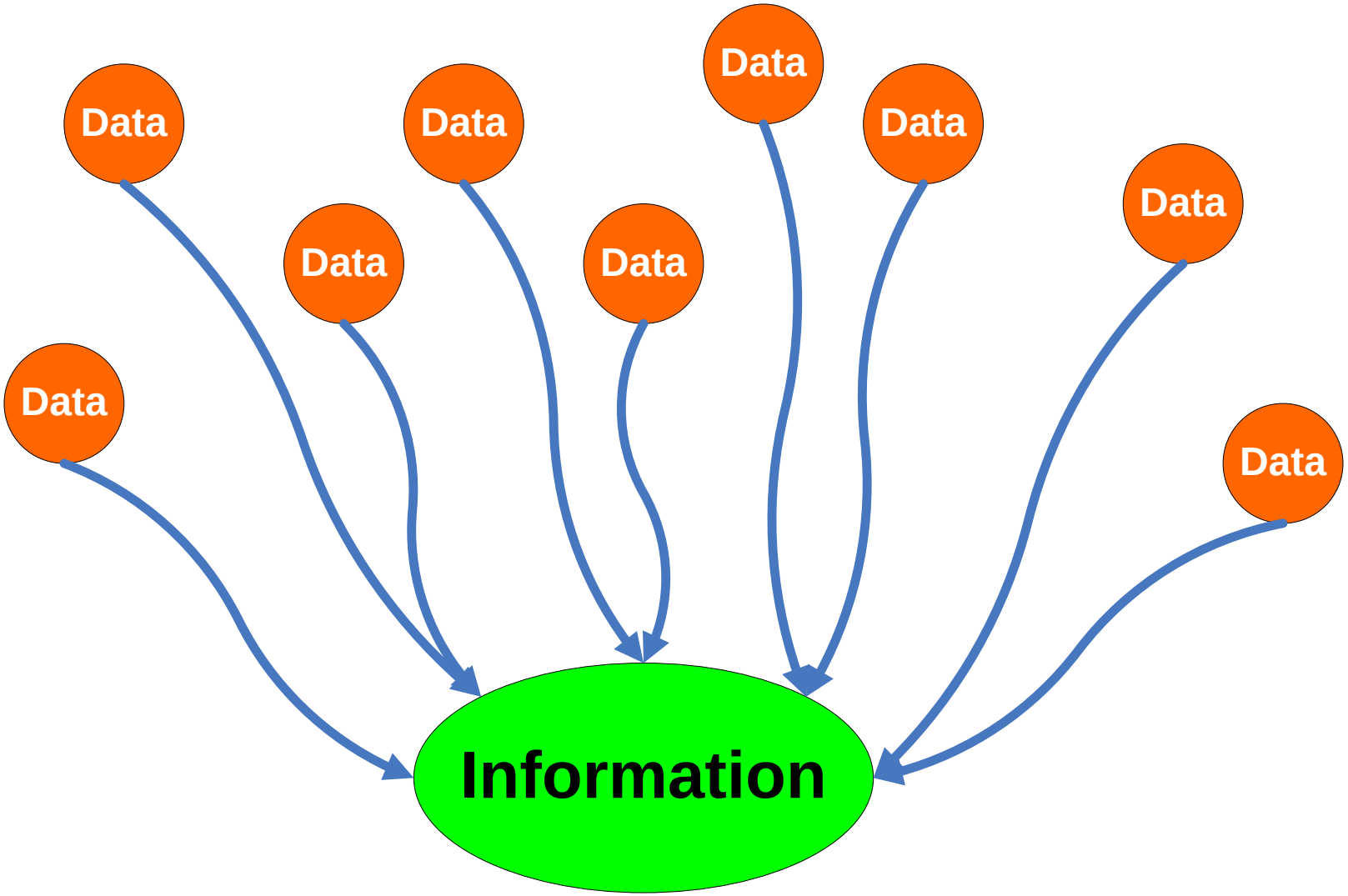

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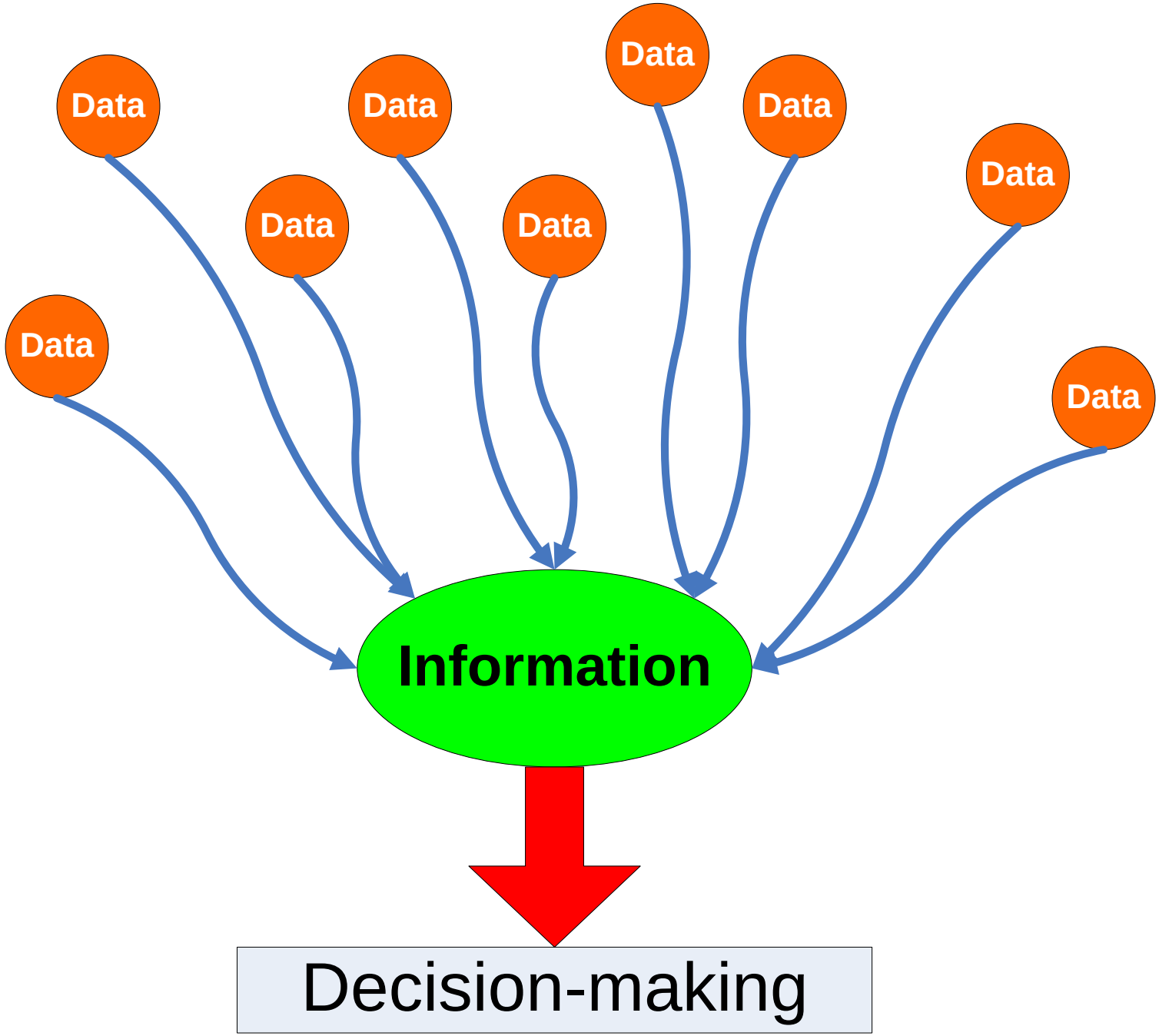


Zepeda C. 2009

Surveillance vs. Survey

- A survey may be defined as an investigation in which defined information is collected during restricted time.
  - May be used to test hypothesis.
- Surveillance is usually based on information collected as part of routine health system
  - although it may sometimes be based on repeated structured surveys.

Surveillance and monitoring

Surveillance

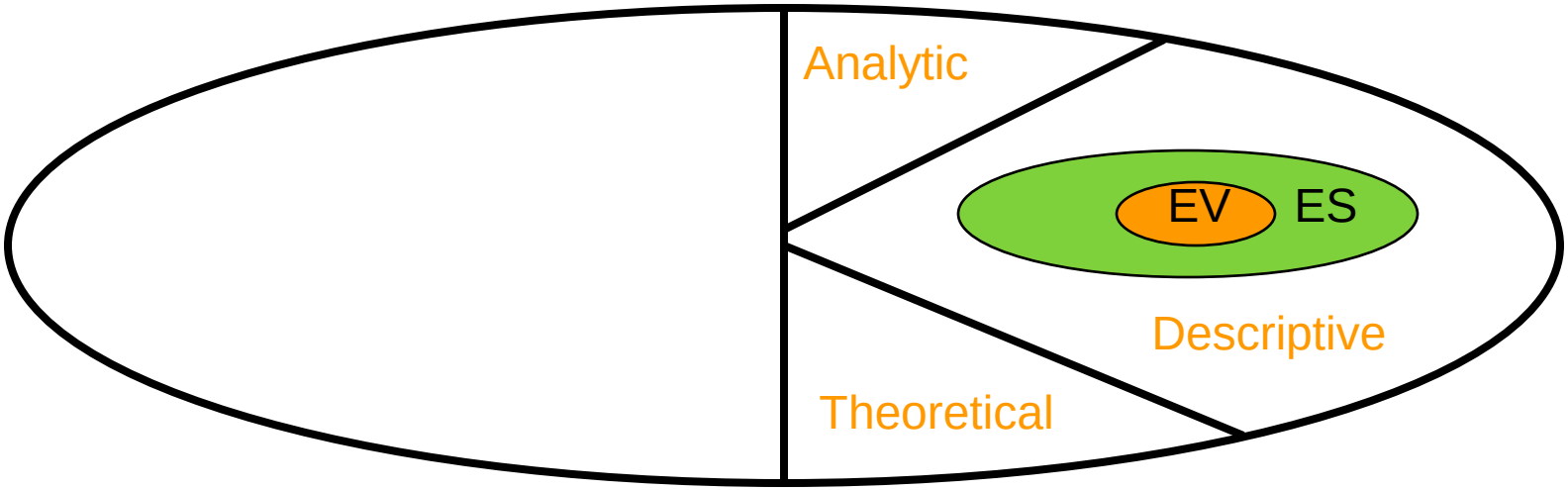
- Transforms data into information
- Implies an action
- Essential for diseases under a program

Monitoring

- Overview of disease occurrence
- Does not imply an action
- Basis for the development of a program

Both activities require the support of competent diagnostic laboratories

Place of surveillance



Control

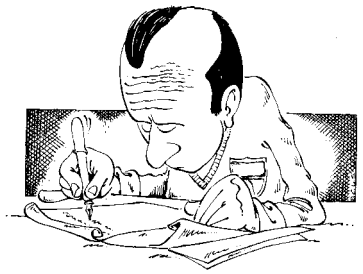
Epidemiology

Purpose of surveillance

To know the situation in order to take action

Tools for decision makers in the control of animal diseases

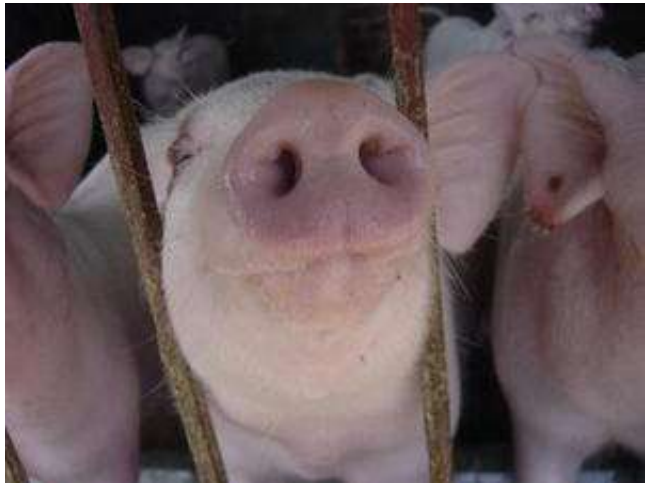
Surveillance system



- « Group of people or organism which is structured to implement surveillance of one or several pathological entities in a given area. »

Components of surveillance system

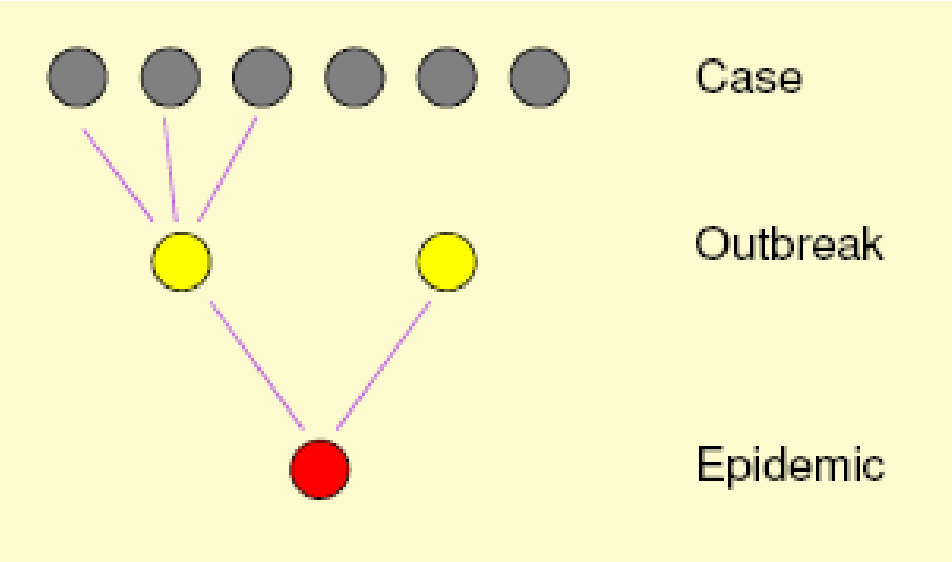
- Mechanism to obtain information
- Mechanism for analysis and interpretation of information



- Mechanisms to disseminate information once interpreted, so that it can be taken into account when making decisions on how to prevent and control disease

The “Case”

- A case is an animal or unit fulfilling the specific definition based on clinical, laboratory or epidemiological characteristics.

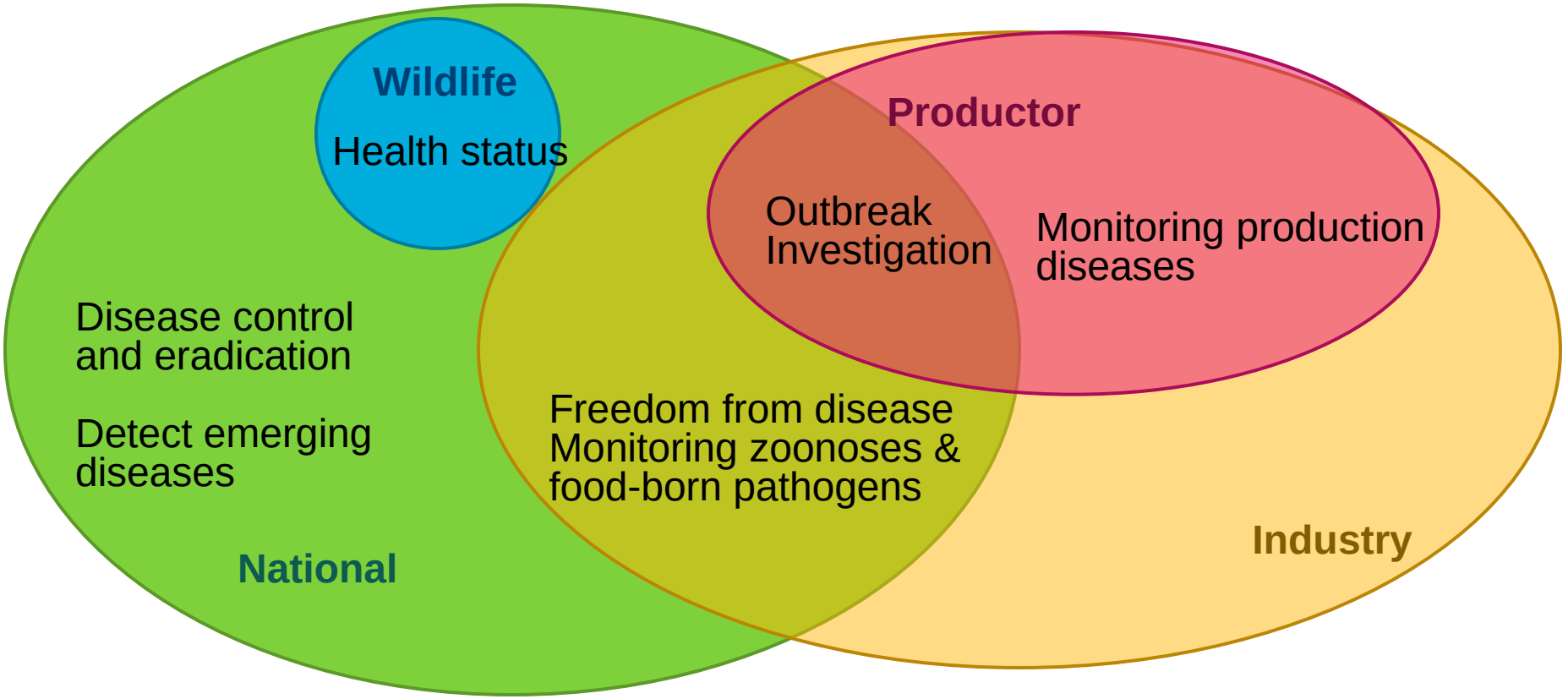


Objectives and uses of surveillance

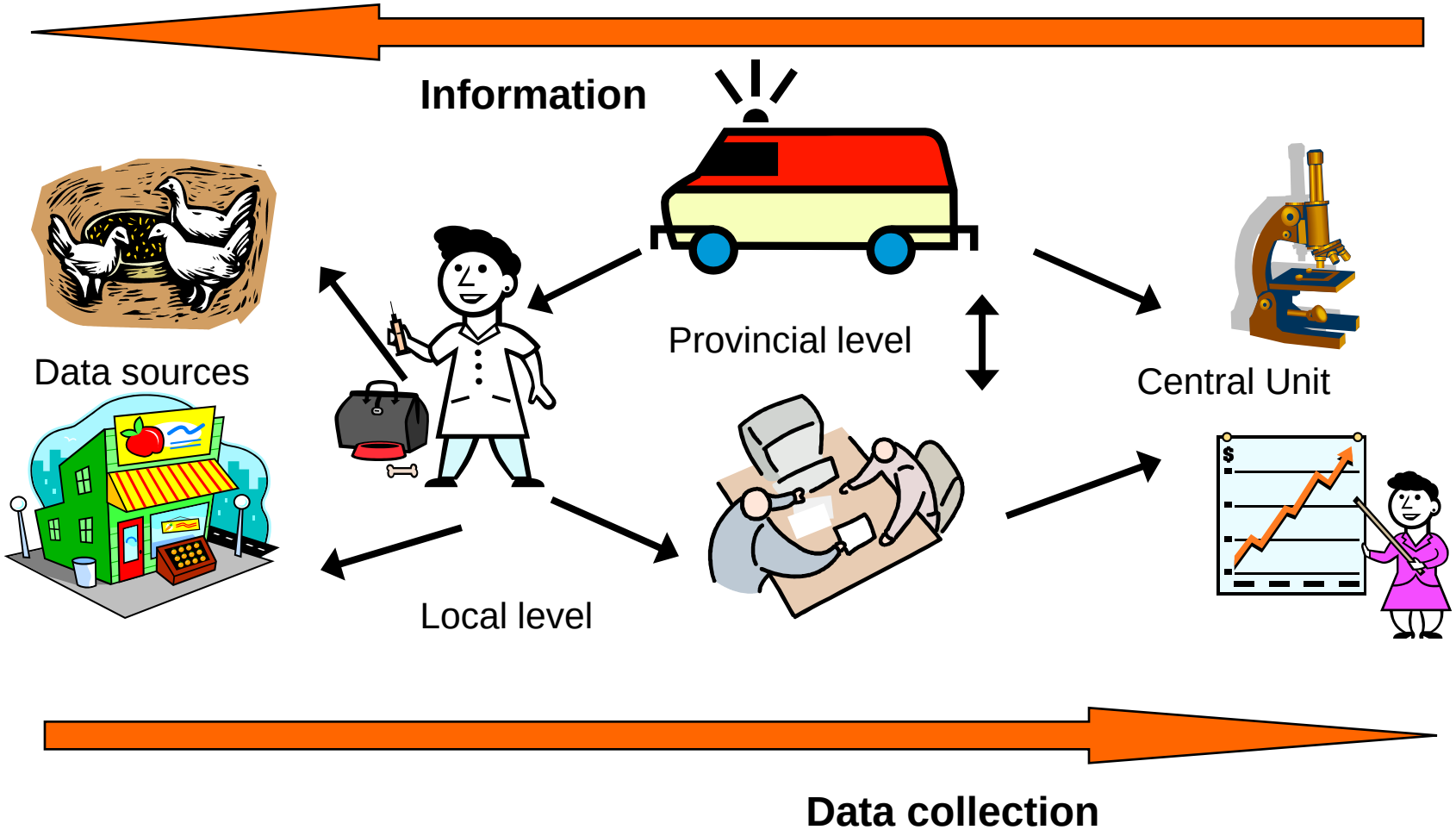
- Target animal diseases of importance to national economy, food security and trade
  - Early warning ➔ Early reaction
  - Outbreak investigation - EID
  - Implementation & monitoring of control and eradication programs

- Fulfilling international reporting needs

Surveillance levels and objectives



Surveillance system: general structure



General institutional organisation

- Steering committee
  - Take decisions
  - Responsible for organisation
- Technical committee
  - Development of surveillance protocols
  - Multi-disciplinary
- Central unit
  - Coordination of the surveillance
  - To centralise, analyse and diffuse the information
- Laboratory
  - Service provider for the samples analysis
  - Scientific expertise for the conception of protocol surveillance
- Field team
  - Supporting epidemiological survey
  - Coordination of the field actors
- Regional unit
  - Management of field activities
  - Validation of data collection
- Surveillance station
- Farmers

Design of the information network

1. To determine the source of data
   - What are the data collected in the field ?
   - To answer the objectives of the surveillance
   - Cf. surveillance protocol

Design of the information network (2)

1. To determine the source of data
   - What are the data collected in the field ?
   - To answer the objectives of the surveillance
   - Cf. surveillance protocol

2. To identify the actors
   - Who is collecting the data ?
   - Who contributes in transmission and management of data ?

Design of the information network (3)

1. To determine the source of data
   - What are the data collected in the field ?
   - To answer the objectives of the surveillance
   - Cf. surveillance protocol
2. To identify the actors
   - Who is collecting the data ?
   - Who contributes in transmission and management of data ?

3. To design forms to collect data

- Questionnaire
- Register

Design of the information network (4)

1. To determine the source of data
   - What are the data collected in the field ?
   - To answer the objectives of the surveillance
   - Cf. surveillance protocol
2. To identify the actors
   - Who is collecting the data ?
   - Who contributes in transmission and management of data ?
3. To design forms to collect data
   - Questionnaire
   - Register
4. To define the expected results from analyses
   - To control the relevance of number and quality
     - Data not useful or missing data
     - Data not precise
   - Rate of analysis
   - Way of presenting the results

Design of the information network (5)

1. To determine the source of data
   - What are the data collected in the field ?
     - To answer the objectives of the surveillance
     - Cf. surveillance protocol
2. To identify the actors
   - Who is collecting the data ?
   - Who contributes in transmission and management of data ?
3. To design forms to collect data
   - Questionnaire
   - Register
4. To define the expected results from analyses
   - To control the relevance of number and quality
     - Data not useful or missing data
     - Data not precise
   - Rate of analysis
   - Way of presenting the results
5. To design the contents of feed-back
   - Which data or information will be restored ?
   - Rate of feed-back ?

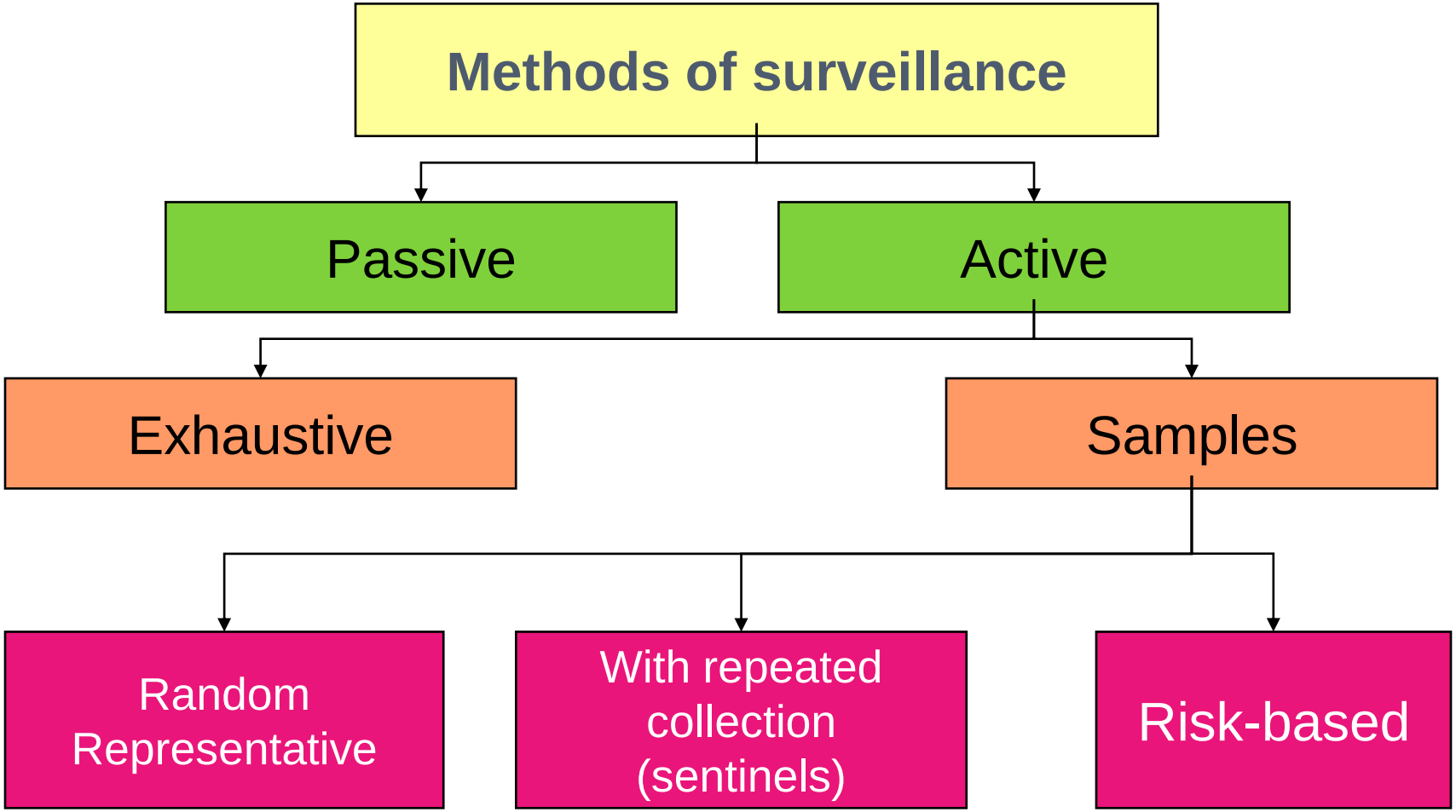
National Surveillance System

An effective veterinary infrastructure is necessary to support this surveillance system

Methods in Surveillance

Innovative approaches and limitations

Methods of surveillance



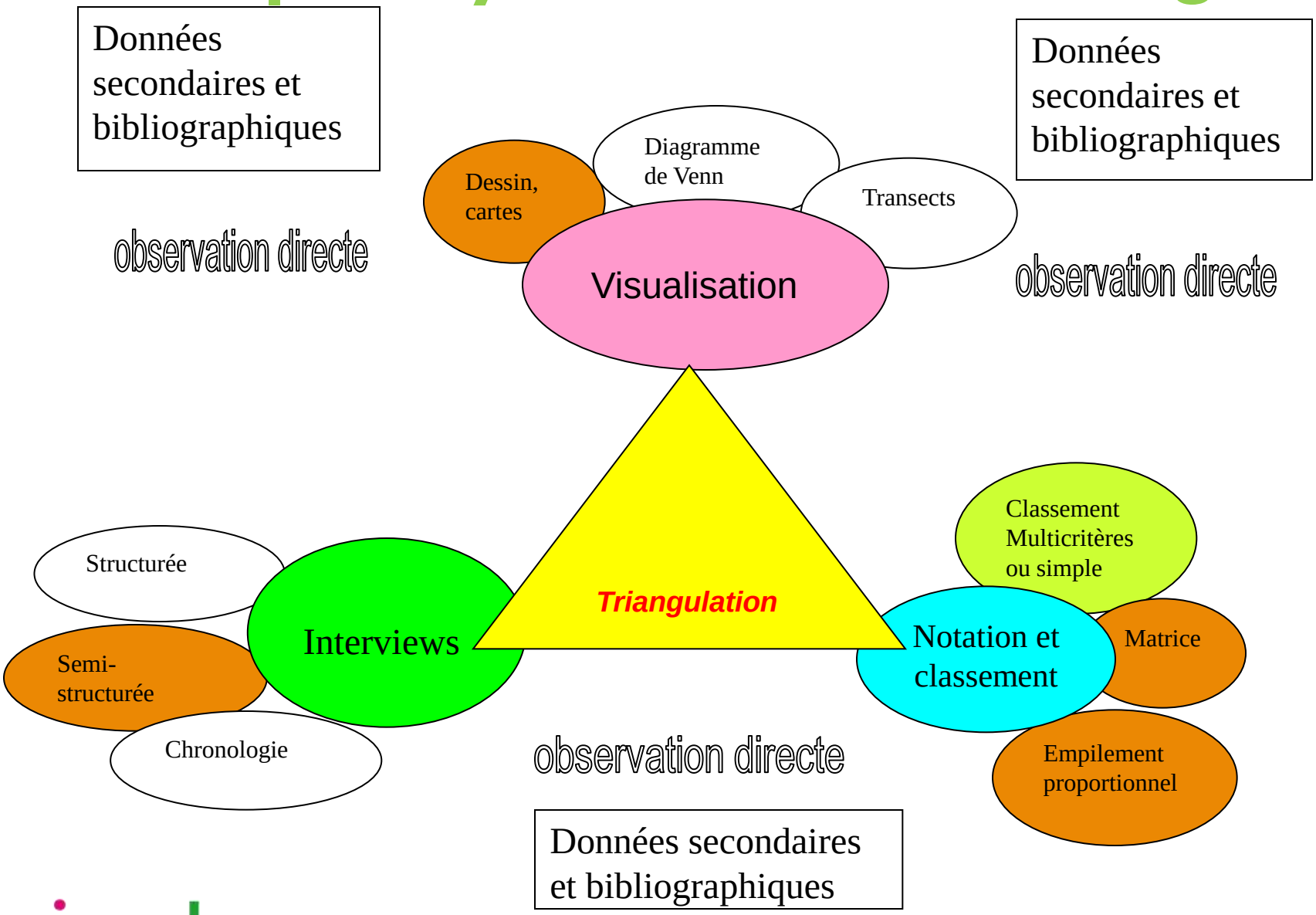
Endemic disease surveillance

- Endemic disease = endemic condition
- Objectives
  - Baseline knowledge of disease in a population
  - Monitor trends
    - Prevalence, incidence
    - Age/species, Seasonality
- Justifications
  - Early intervention
  - Risk communication
  - Review of surveillance
  - Cost/benefit of intervention
- Methods
  - Prevalence estimation is more relevant than detection
  - Se more important Sp
  - Multiple data sources often needed
  - **Capture/recapture**

Surveillance of exotic disease

- A known condition that crosses political boundaries to occur in a country or region in which it had not previously occurred.
- **2 main objectives:**
  - EARLY DETECTION
  - DOCUMENTATION OF FREEDOM:
    - Calculate sensitivity of each Surveillance System Component
    - Through the construction of a **Scenario Tree**

Participatory Disease Searching



Syndromic surveillance

- Objective
  - Methods aimed at early detection of emerging diseases
  - Surveillance that uses health-related data (clinical signs or indirect indicators) that precede formal diagnosis, and indicate sufficient probability of a change in the health of the population
- Case definition is deliberately non-specific to increase sensitivity

Definition: *Risk-based surveillance*

„A surveillance programme in the design of which risk assessment methods have been applied together with traditional design approaches in order to assure appropriate and cost-effective data collection„

Stärk et al. 2006

Risk-based designs

- Preferential testing for hazards that have more serious consequences – Risk Identification
  - Human health
  - Animal health
- Preferential testing in sub-populations (strata) that have **higher risk** of being infected – Risk Assessment

  → Risk-based surveillance (RBS)

Factors affecting the effectiveness of surveillance systems

- Geographic coverage
- Awareness of field veterinarians and farmers
  - What to report? To whom? What happens if I do?
  - Poor feedback to health workers and communities
- Economic incentives
  - Possible consequences of disease reporting
  - Conflicts of interest
- Compensation
  - Inadequate or inexistent programs
- Time-lag
  - Failure to report on time
  - Incomplete and late reporting
  - Duplication of efforts
- Data analysis
  - Inadequate data analysis
  - Failure to use available information to check trends
  - Under utilization of surveillance information in decision making

Limitations and issues of surveillance

- How much resources in the detection of new events?
- How much resources for surveillance for known, treatable, non statutory diseases ?
- Needs some research on the cost benefit of different approach
- Lack of resources (financial and skills)

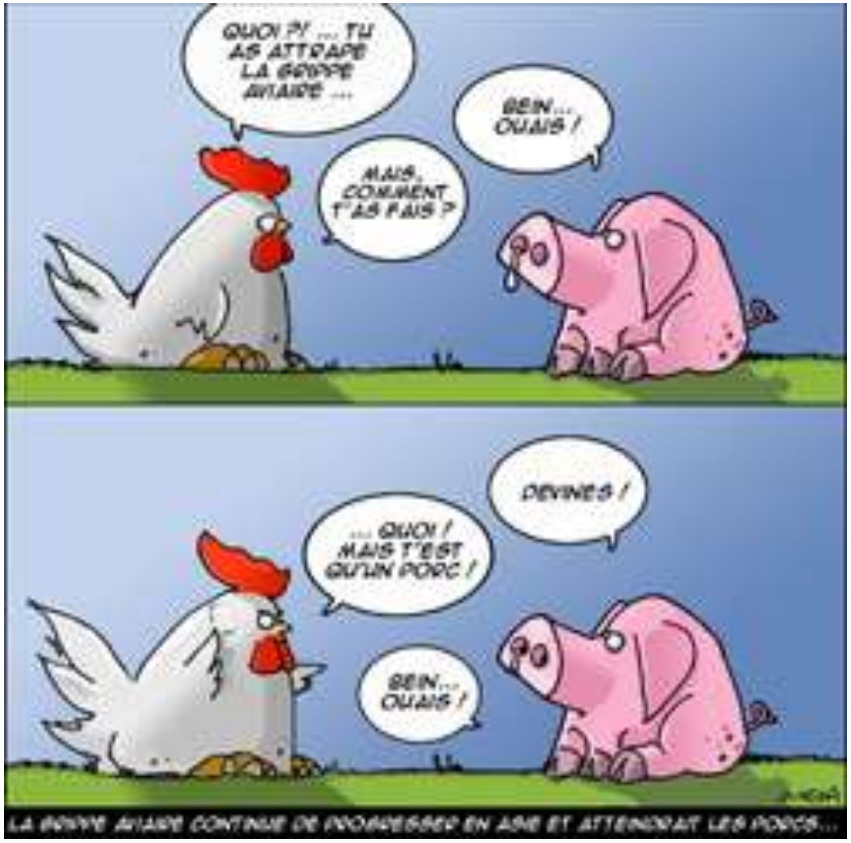
Limitations and issues of surveillance

- Case finding very different from monitoring trend
- Accuracy/precision required differs from objectives (value of perfection?)
- Use of existing data before design of surveillance system
- Innovative approaches often not considered in developed country setting
- Shared effort between field (human / animal surveillance) - One Health initiative

Limitations and issues of surveillance

- Ensure direct link between surveillance & risk management
- Problem of trust (Motivate contributors, service to investigate unusual events, training, awareness campaign)
- Communication of benefits to public opinion
- Communication between scientists and decision makers

THANK YOU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BEIN... OUAIS !
MAIS, COMMENT T'AS FAIS ?
DEVINES !
... QUOI ! MAIS T'EST QU'UN PORC !
BEIN... OUAIS !
LA GRIPPE AVIAIRE CONTINUE DE PROGRESSER EN ASIE ET ATTEIGNAIT LES PORCS...