

Animals as detectors of bio-events

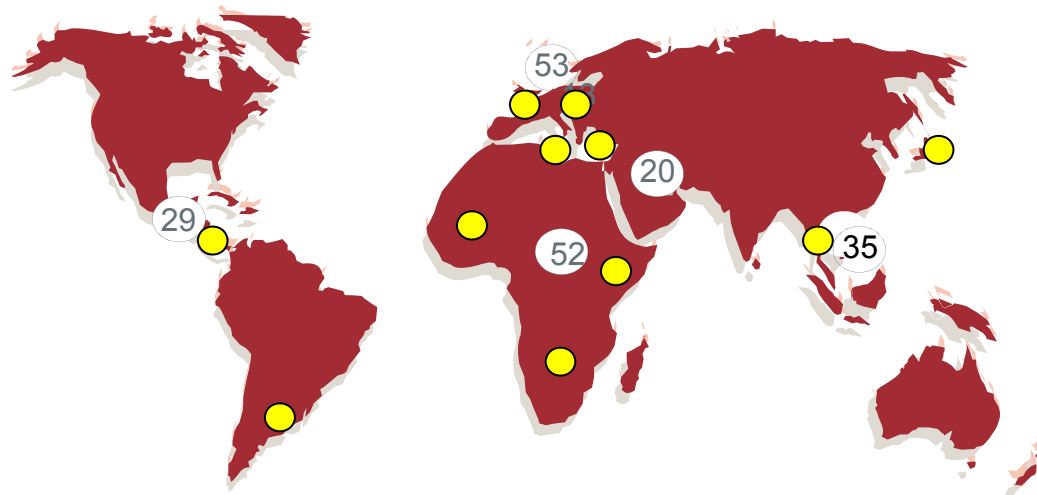
International meeting on Emerging Diseases and Surveillance
Vienna, Austria ✧ 4-7 February 2011

Bernard Vallat
Director General
World Organisation for Animal Health (OIE)



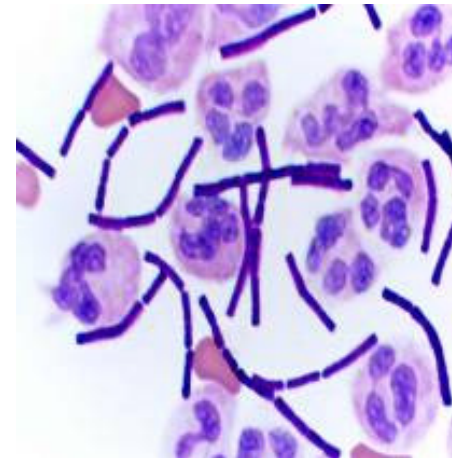
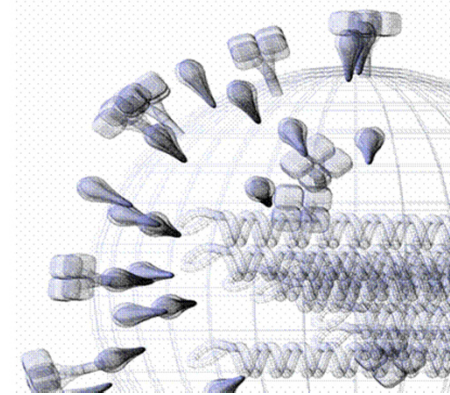
World Organisation for Animal Health (OIE)

- An intergovernmental organisation, founded in 1924
- 178 Members Countries
- Headquarters in Paris, France
 - 5 Regional offices
 - 6 Regional sub offices



The growing importance of the zoonotic potential of animal pathogens

- 60% of human pathogens are zoonotic
- 75% of emerging diseases are zoonotic
- 80% of agents with potential bioterrorist use are zoonotic pathogens



Globalisation

- Unprecedented movements of commodities and people, used by pathogens to colonize all the planet
- There is no where in the world from which we are remote and no one from whom we are disconnected

- 👉 Nowadays pathogens are transported around the world faster than the average incubation time of most epizootics.
- 👉 Climate changes and human behaviour allow colonisation of new territories by vectors and pathogens (e.g bluetongue in Europe)



Definitions (for the purpose of this presentation)

- **Bio event:** any event with potential impact on animal or human health
- **Animal sentinels:** any non-human organism that can react to a bio-event before the bio-event has impact on the humans

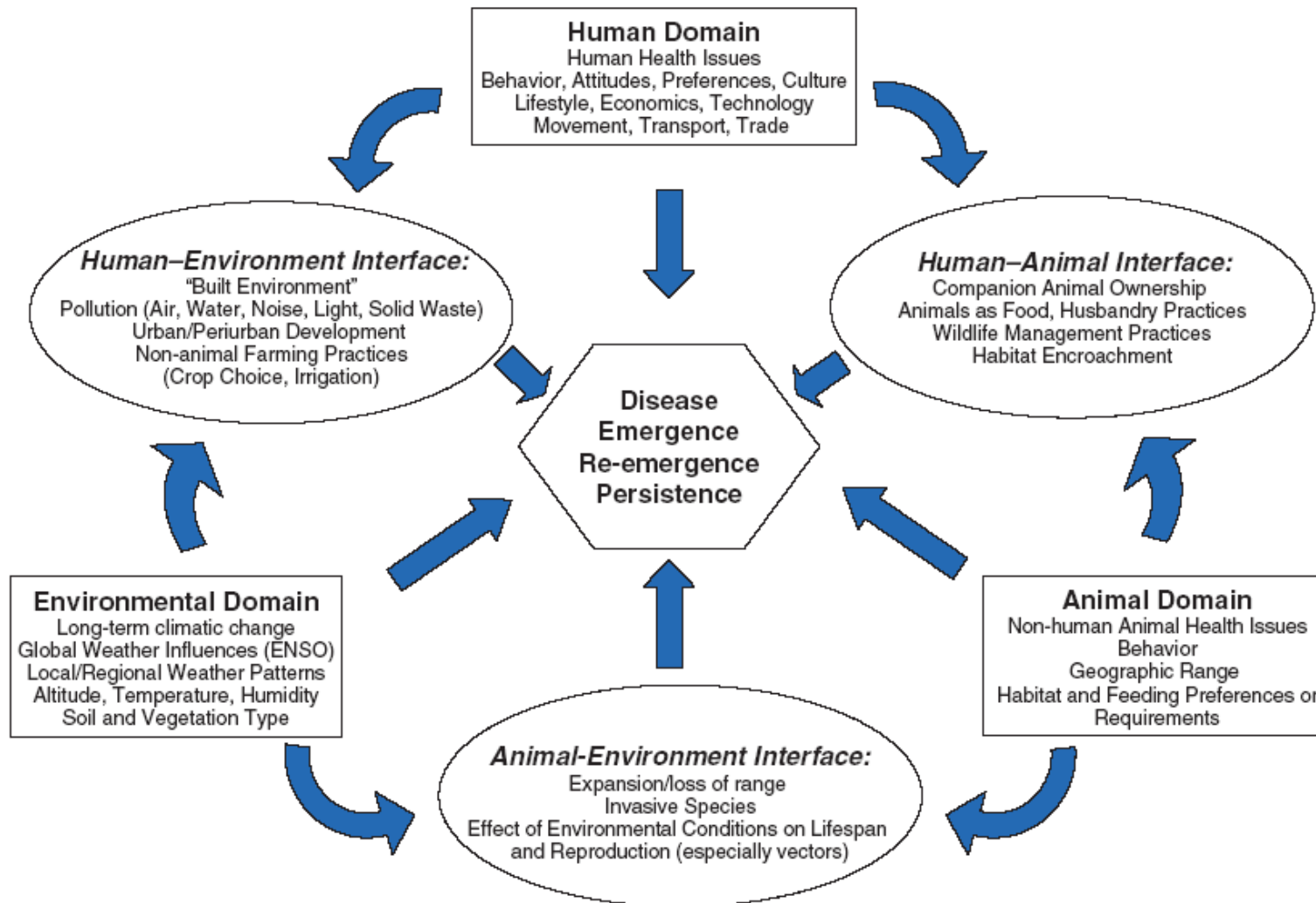
Animals are biosensors

Pathogens – Toxins Environmental contaminants - Radiation

- Environmental impact
- For human disease including zoonoses
- For wild life diseases
- For emerging diseases
- Accidental or intentional releases
- In research

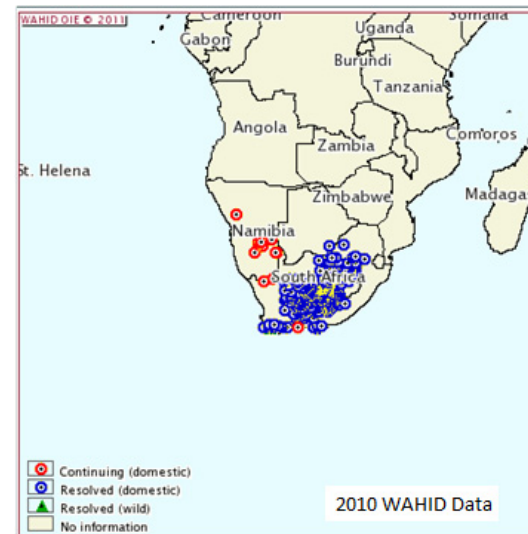
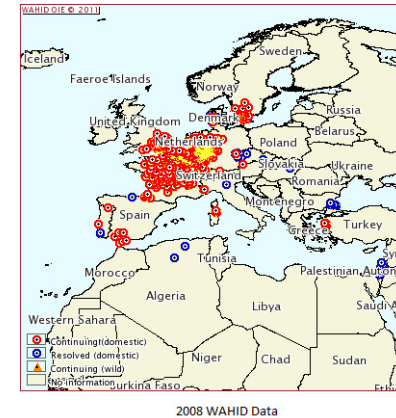


Human-Animal-Ecosystem Domain Interface



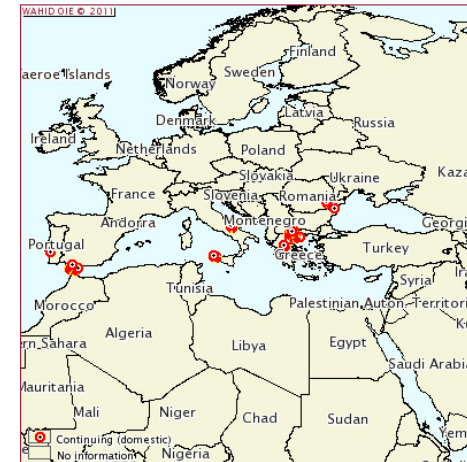
Environmental impact and human behaviour

- **Animal disease events linked to climate changes:** ex: new territories for competent vectors
- **Animal disease events linked to flooding:** RVF outbreaks in south Africa (from 19/01/2010 to 25/07/2010) rainfalls were reported one month before the start of the outbreak
- **Heavy metals in fish**



For human disease and zoonoses

- **Zoonoses** : WNF events (8 notifications in Austria, Belize, Greece, Italy, Portugal, Spain in 2011 affecting equidae, camelidae, wild species before human cases)
- **Toxic substances** : research-based studies : wild birds have revealed a broad spectrum of health effects in the Great Lakes-St. Lawrence, very likely due to environmental pollution



2011 WAHID Data

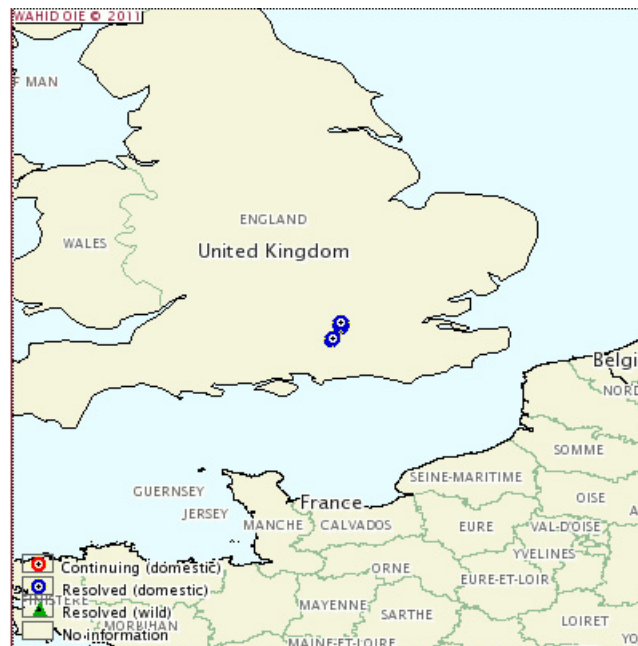


Source : ideal-sydney-getaways.com

Source : Canadian Wildlife Service, National Wildlife Research Centre, Hull, Quebec, Canada - Wildlife as sentinels of human health effects in the Great Lakes--St. Lawrence basin.- 2001 Dec - Environ Health Perspect. 2001 December; 109(Suppl 6): 853-861

Accidental releases

- **Laboratory escape:** August 3 to September 29, 2007 : 8 outbreaks of FMD in Britain, contamination of primary foci related to laboratory escape.



2007 WAHID Data

Asymptomatic reservoirs

- For many emerging pathogens, wildlife and sometimes even domestic animals show no signs of infection and play the role of asymptomatic reservoirs
- Crimean-Congo Hemorrhagic Fever (CCHF)
 - Wildlife and domestic animals species infected asymptotomatically
 - Human exposure can lead to severe hemorrhagic diseases
- Influenza viruses
 - Some have little impact on animal health (e.g., some swine influenza viruses)
 - Some have substantial impact on animal health (e.g., HPAI)
 - Some zoonotic viruses have different (e.g., more severe) impact on human health (e.g., pandemic H1N1 2009)
- How can the biosensor concept address these kinds of diseases?
 - importance of surveillance in healthy, as well as diseased, animals?
 - Also important for addressing potential pandemic risks from some animals

Asymptomatic reservoirs

- Increasingly sophisticated laboratory methods can detect the presence of previously unsuspected pathogens
- Reston Ebolavirus (REBOV)
 - Outbreak of PRRS, highly virulent strain in pigs
 - Testing of samples from pigs identified REBOV through screening with panviral microarray
 - REBOV can infect humans, but not associated with clinical illness
- How can the biosensor concept address these kinds of laboratory findings with unclear implications for human or animal health?

Challenges

- Humans still often serve as sentinels for zoonotic diseases
 - Veterinary surveillance systems should be able to identify zoonotic diseases in animals before spill over occurs to human populations
 - A failure of early detection among animals indicates inadequate veterinary surveillance
 - Early detection of HPAI H5N1 among animals allowed control at the source and minimized human health risks, but was resource intensive
 - There is an urgent need to improve Veterinary Surveillance to benefit both public health and animal health

OIE Information System

↳ Promote transparency in
and knowledge of global animal disease situation

Source of Early Warning Disease reports

- Reports from Members
- Reports from worldwide network of OIE Reference Labs.
- Active search and tracking of unofficial sources, such as scientific publications and ProMed, and lay publications, with verification of Members
- Improved Members surveillance
 - Policies
 - internal and international resources – capacity building

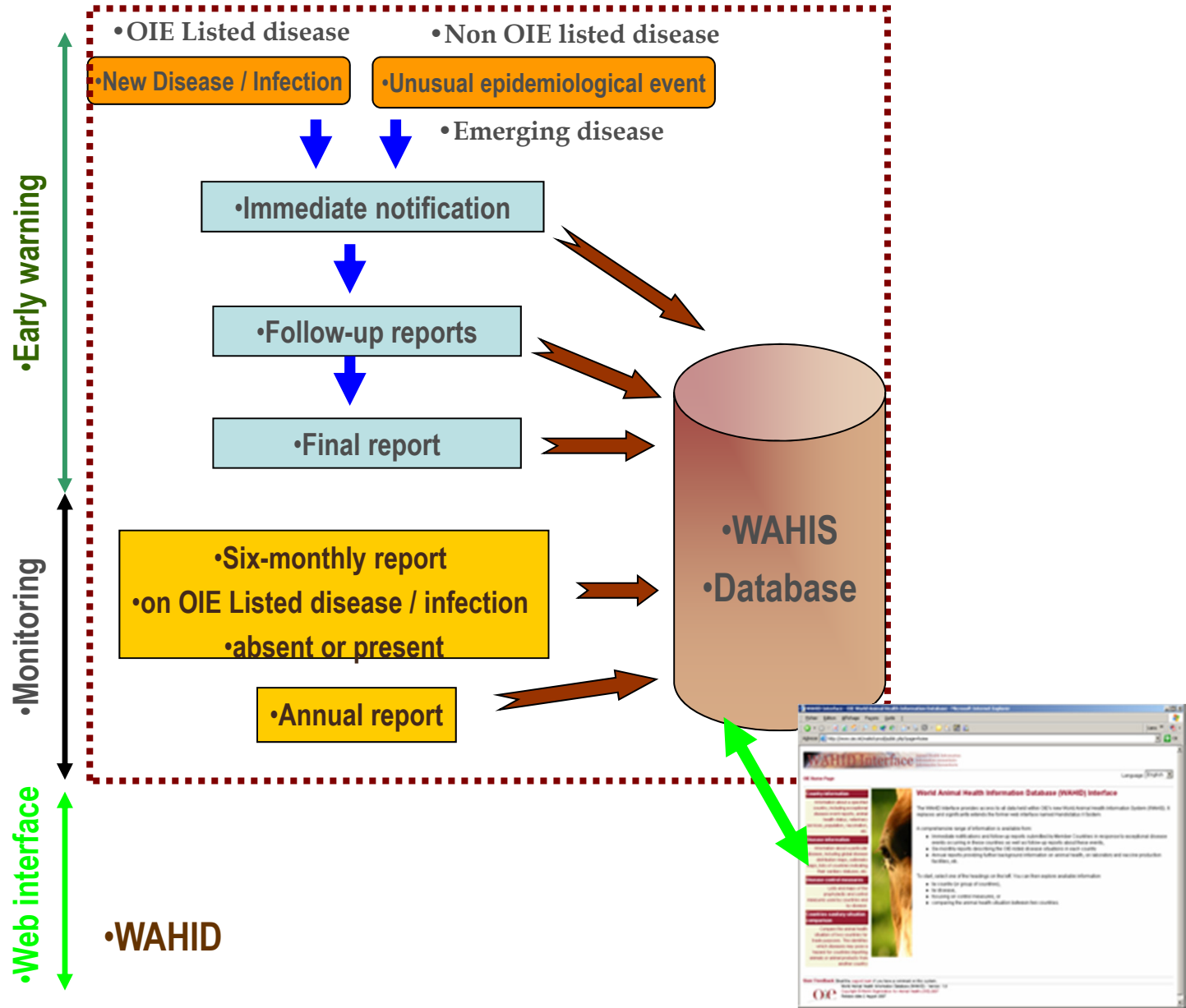
Global disease surveillance and transparency

- OIE Members are responsible for global disease surveillance and report significant disease events to OIE
 - Outbreaks of OIE listed diseases
 - Significant epidemiological events including emerging diseases
- OIE disseminates these official reports from Members to all Members via an alert system and to the public via WAHID
- OIE tracks rumours on a daily basis and validates this information through its official channels
- GLEWS – combines rumour tracking of OIE, FAO, and WHO
- Link WHO-IHR and OIE standards

WAHID Interface

Animal Health Information
Information zoosanitaire
Información Zoonitaria

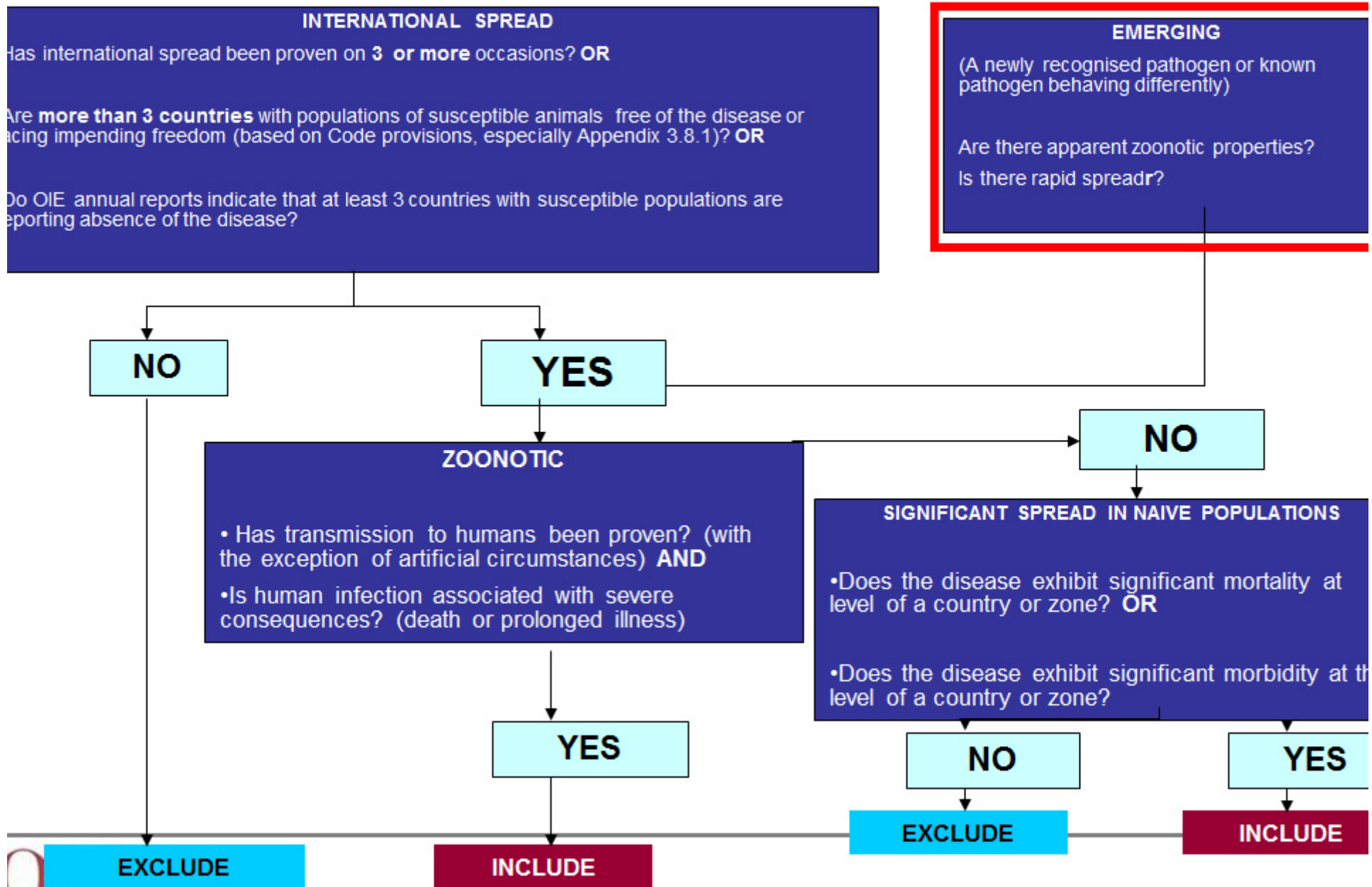
•WAHIS – Secure Access system



•must work in parallel with WHO-IHR Agreement



Decision Tree used to determine the list

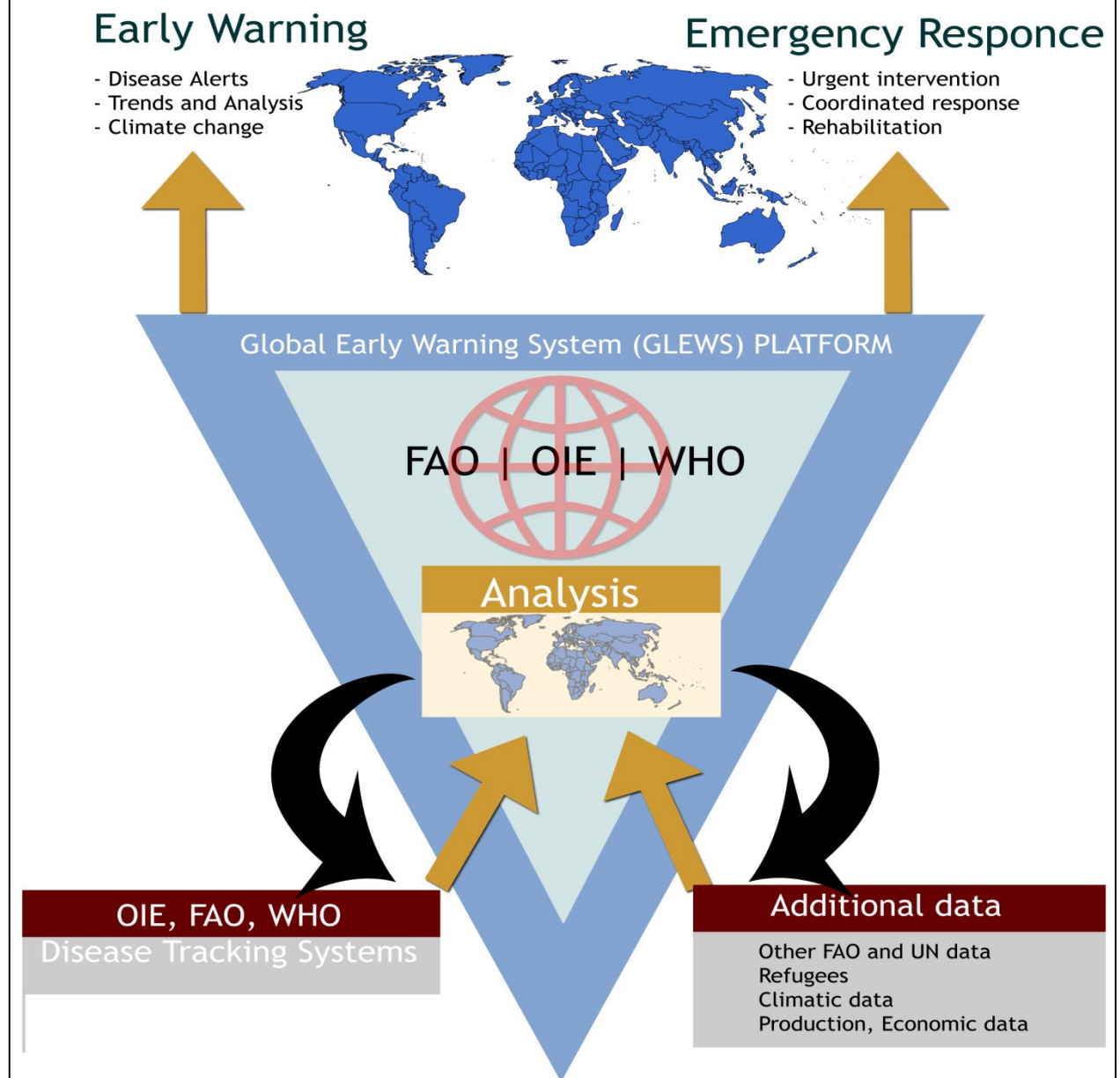




- Combines and coordinates the alert and response mechanisms of OIE, FAO and WHO

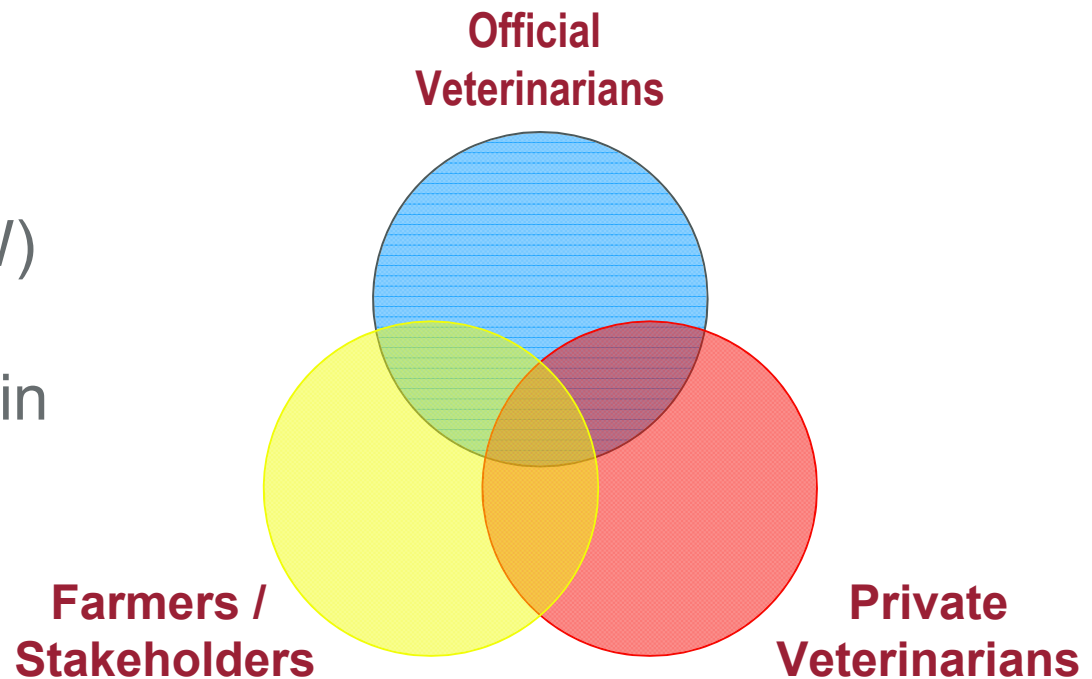
- Assists in prediction, prevention and control of animal disease threats, including zoonoses

Global Early Warning and Response System (GLEWS)



Key tripod for good surveillance, early warning and rapid response

- Livestock owners are the first to know
- Community Animal Health Workers (CAHW) with veterinary responsibilities working in close cooperation with Veterinary Services



WHO - International Health Regulations

IHR - Guide for WHO countries in the implementation of obligations.

Their aim is to help the international community prevent and respond to **acute public health risks that have the potential to cross borders and threaten people worldwide.**



Relevant OIE Standards

- Biosafety and biosecurity
- Shipment of pathogens
- Surveillance
- Accurate and rapid diagnosis
- Transparency
- Trade measures
- Quality of Veterinary Services

The vision

A world capable of preventing, detecting, containing, eliminating, and responding to animal and public health risks attributable to zoonoses and animal diseases with an impact on food security through multi-sectoral cooperation and strong partnerships.

Solutions

- Which concepts to promote for protecting countries and regions from current and emerging threats for animal and humans?

The Global Public Good Concept

Global public goods are goods whose benefits extend to all countries, people and generations.

The Global Public Good Concept

- In the case of control and eradication of infectious diseases, the benefits are international and intergenerational in scope.
- **Countries depend on each other**
- Animal health systems are not a commercial nor a strictly agricultural good. They are fully eligible to national and global public resources
- **Failure of one country may endanger the entire planet**

The Good Governance

•Requirements for all countries

- Need for appropriate legislation and its efficient implementation through appropriate human and financial resources allowing national animal health systems providing for:

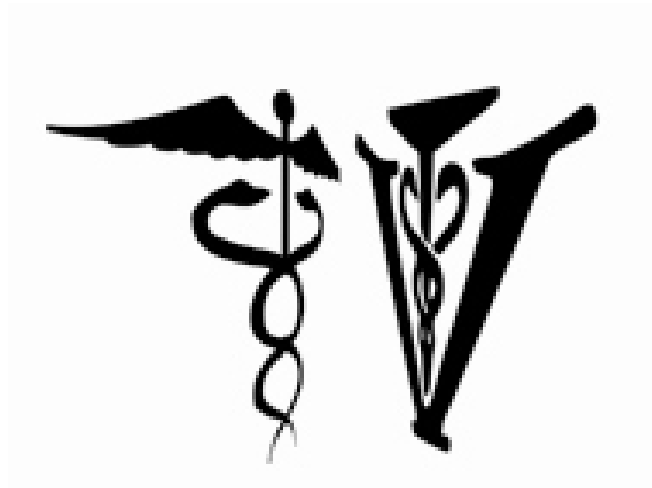
- Appropriate surveillance, early detection diagnostic capacity, transparency, notification
- Rapid response to animal disease outbreaks
- Biosecurity measures
- Compensation
- Vaccination when appropriate
- Education and research

Key elements for efficient Veterinary Services

- Supervision of all Governments
- Building and maintaining efficient epidemiosurveillance networks and territorial meshing in the entire national territory, coordinated by an efficient national chain of command
- Alliances between public and private sectors (veterinarians, farmers)
- Use of concept and standards of 'Quality of Services' democratically adopted by all OIE Members
- Veterinary education and research
- If needed, use of the global OIE evaluation tool (PVS)

The concept of “One Health”

A global strategy for preventing and managing risks at the human-animal interface



Cooperation is important particularly for predictions, prevention and response

NEXT STEPS

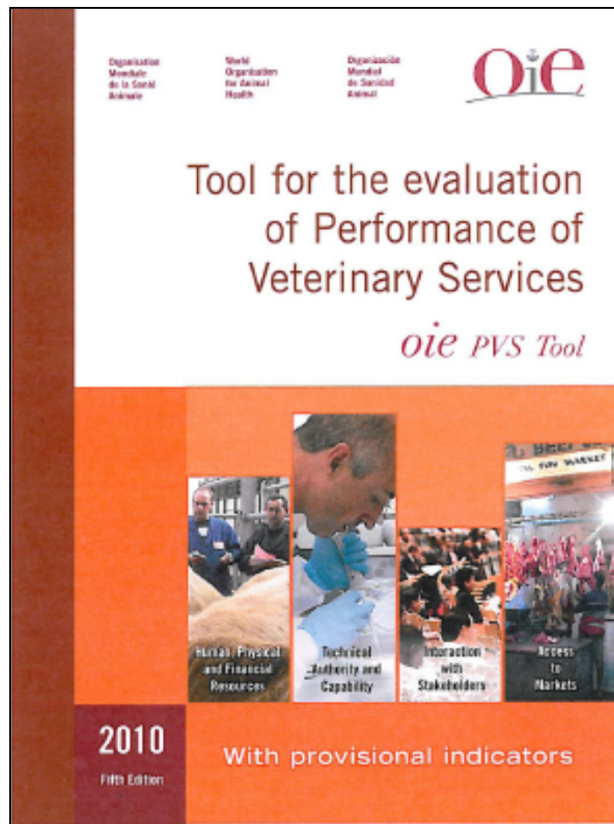
- Improve animal health governance (legislation, budget...)
- Demonstrate economic and social justification
- More investments in Veterinary Services (in both public and private components)
- Horizontal approach (investment in peace time and in systems versus crisis treatment) like defence or firemen systems
- Crucial importance of initial and continuous training
- Research
- Cooperation with public health policy makers
- Laboratory biosafety policies

Laboratory Twinning Program

Each OIE Laboratory Twinning Project...

- Is a link between OIE Reference Laboratory or Collaborating Centre (Parent) and national laboratory (Candidate)
- *Aims to improve expertise and diagnostic capacity with eventual aim of reaching OIE standards - Optimal goal is to achieve OIE Reference Laboratory designation*
- Should be sustainable once the project is over

The OIE-PVS Tool

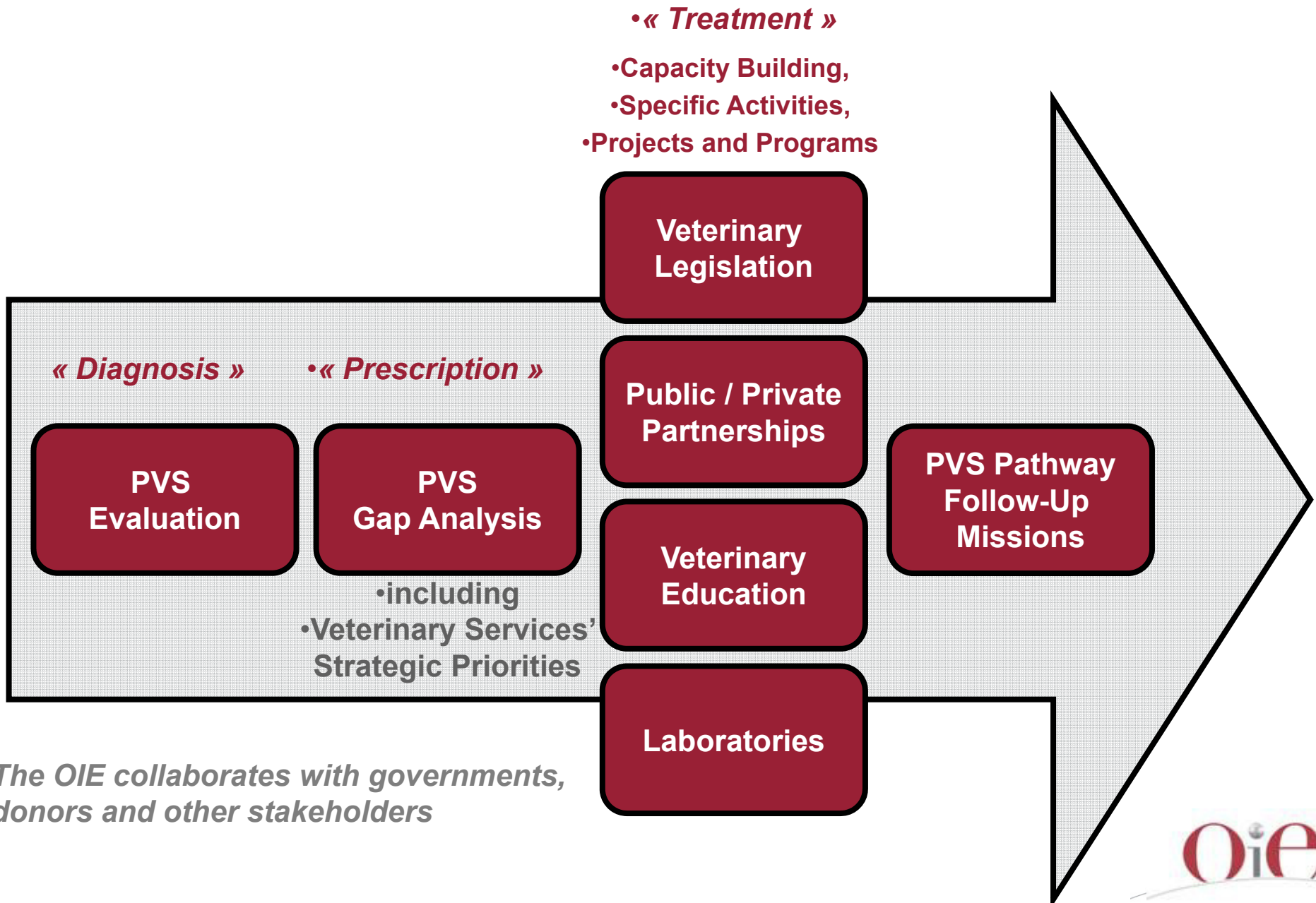


•Evaluation of the Performance of Veterinary Services

- a tool for Good Governance of Veterinary Services

107 countries already applied to be evaluated by the OIE on a voluntary basis

The OIE PVS Pathway



OIE Guidelines on Veterinary Legislation

- ▶ The guidelines will be used to update their legislation where gaps are identified in the course of an OIE PVS Evaluation

http://www.oie.int/eng/oie/organisation/A_Guidelines_Vet%20Leg.pdf

- ▶ All experts will use the same OIE Veterinary Legislation Manual (*under finalisation*)

Veterinary Education

- Trends and risks
- Deans conference and experts groups
- Core curriculum
- Expected events

Thank you for your attention



•Organisation mondiale
de la santé animale

World Organisation
for Animal Health

Organización Mundial
de Sanidad Animal