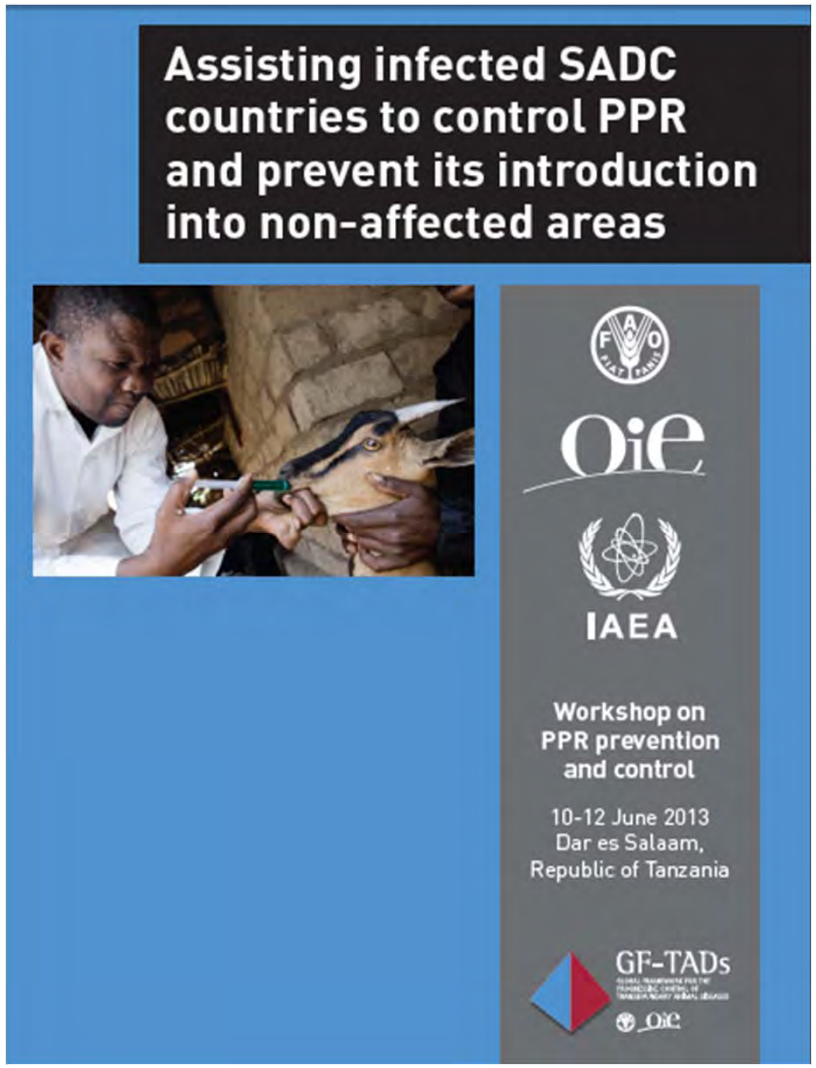


Peste des Petits Ruminants (PPR)

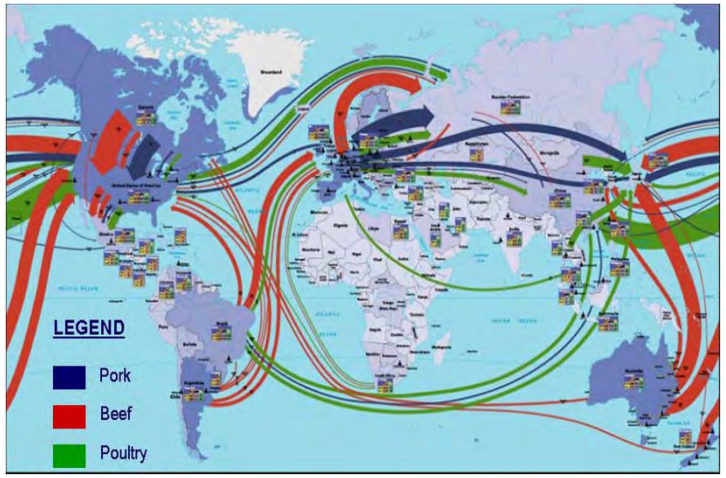
Situation worldwide

Joseph Domenech

Workshop on PPR prevention and control in the SADC Region
10-12 June 2013, Dar es Salam, Tanzania

Animal diseases: a major problem for animal productions and human health

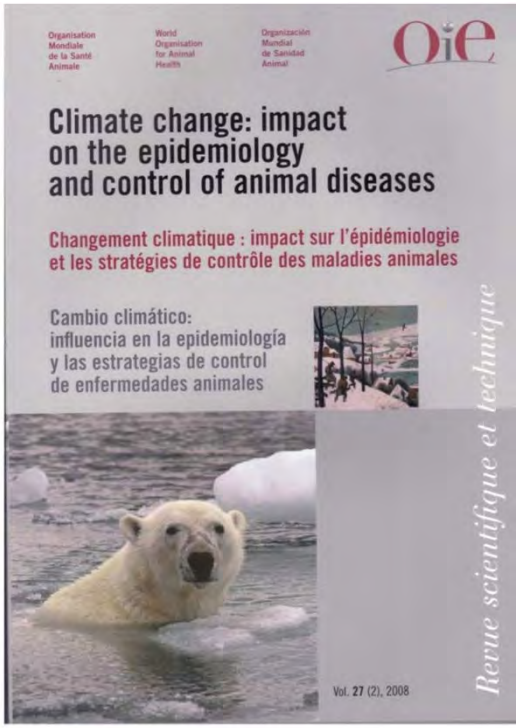
- Food security
- Rural development
- Small holders livelihoods
- Trade: domestic, regional, international
- Human health and well being



Globalisation

Repeated Crises

Disease Emergence



Importance of PPR

- Increasingly important viral disease of livestock
- One billion small ruminants are at risk annually
- In developing countries:

  Lowers production efficiency

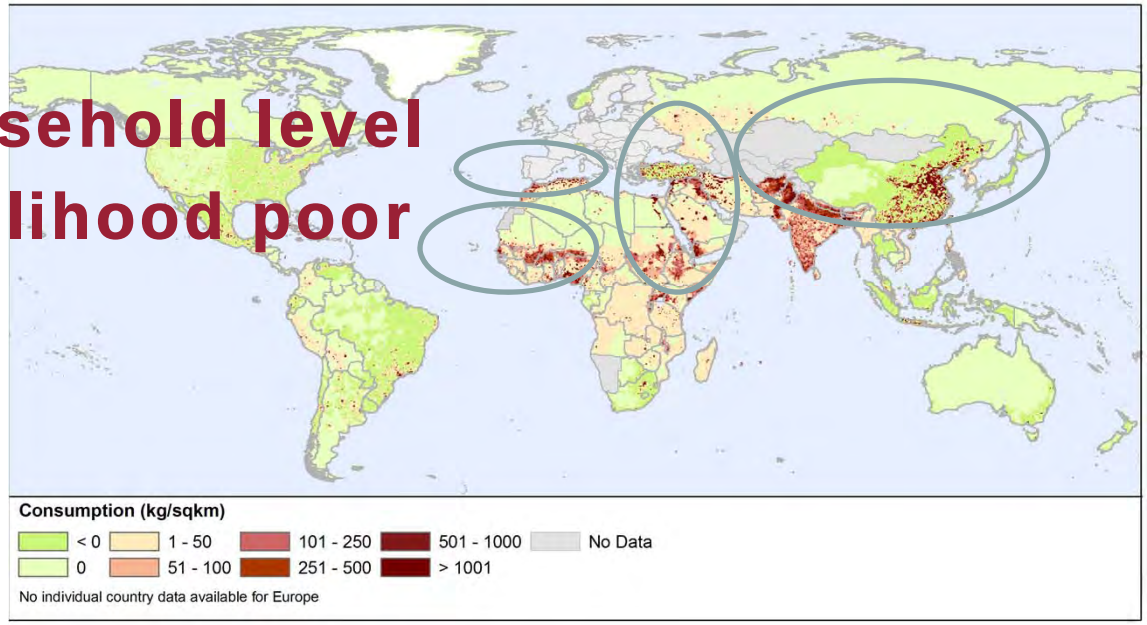
  Food insecurity

  Poverty at the household level

  Particularly on livelihood poor farmers

  Trade impact

  Export restrictions



Growth in demand for mutton from 2000 to 2030 (Source: Robinson and Pozzi (2011) [i].

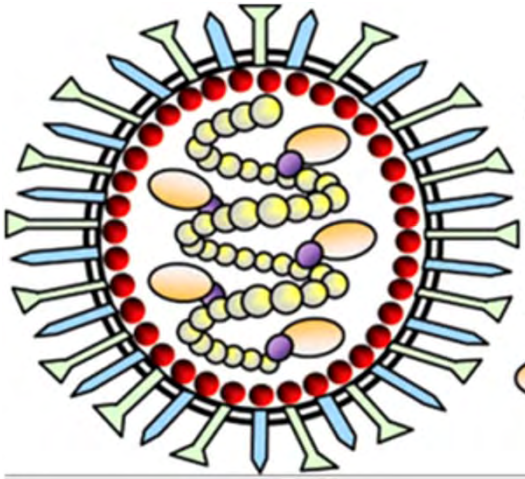
Importance of PPR

High levels of mortality and morbidity rates.

Mortality rate – 90%
Morbidity rate – 50-80%

The impact of FMD can be direct and indirect. Among them are:

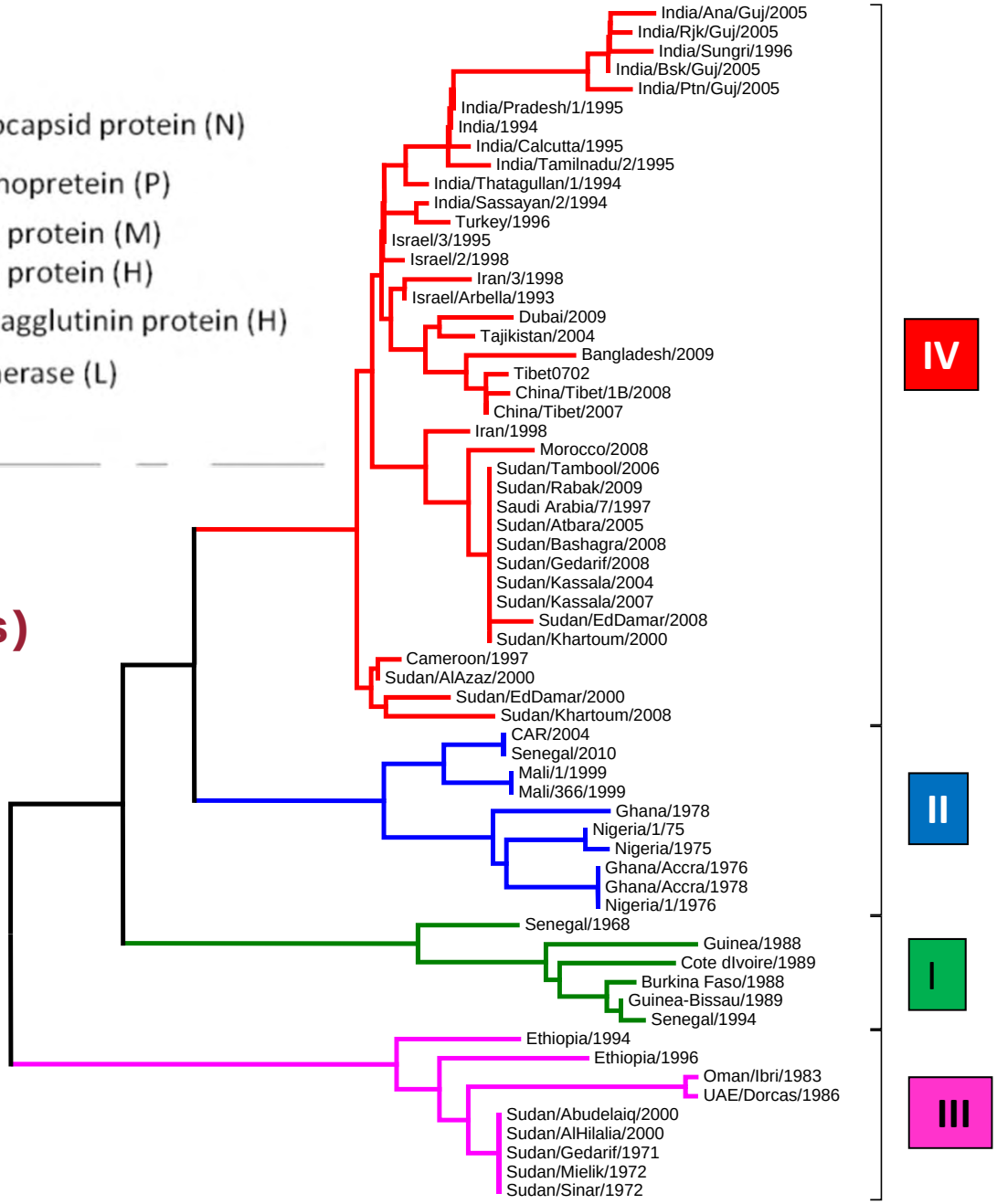
- **Mortality**
- **Reduced productivity : milk, meet, fertility…**
- **Restricted market access**
- **Possible resultant loss of biodiversity and valuable genetic resources**
- **Cost of the control activities**
- **…**



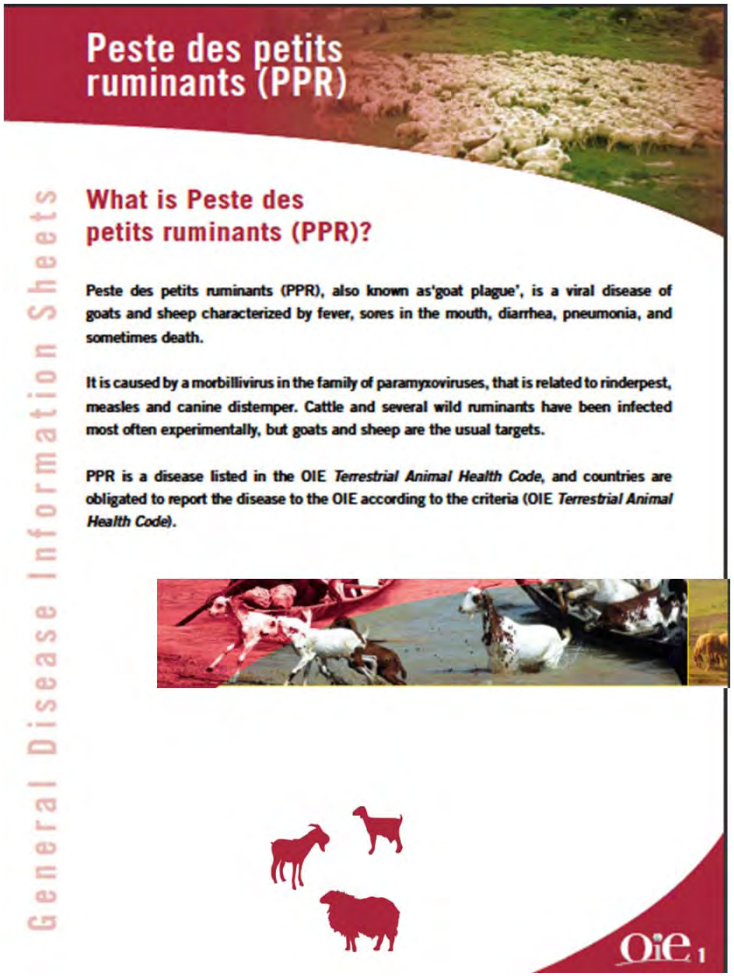
Family Paramyxoviridae
Genus Morbillivirus (like RP, ND, Distemper, Meales)

4 known genotypes (phylogenic classification of N gene sequences)

Emergence of genotype IV (Asia) in Africa



Clinical signs



Peste des petits ruminants (PPR)

General Disease Information Sheets

What is Peste des petits ruminants (PPR)?

Peste des petits ruminants (PPR), also known as'goat plague', is a viral disease of goats and sheep characterized by fever, sores in the mouth, diarrhea, pneumonia, and sometimes death.

It is caused by a morbillivirus in the family of paramyxoviruses, that is related to rinderpest, measles and canine distemper. Cattle and several wild ruminants have been infected most often experimentally, but goats and sheep are the usual targets.

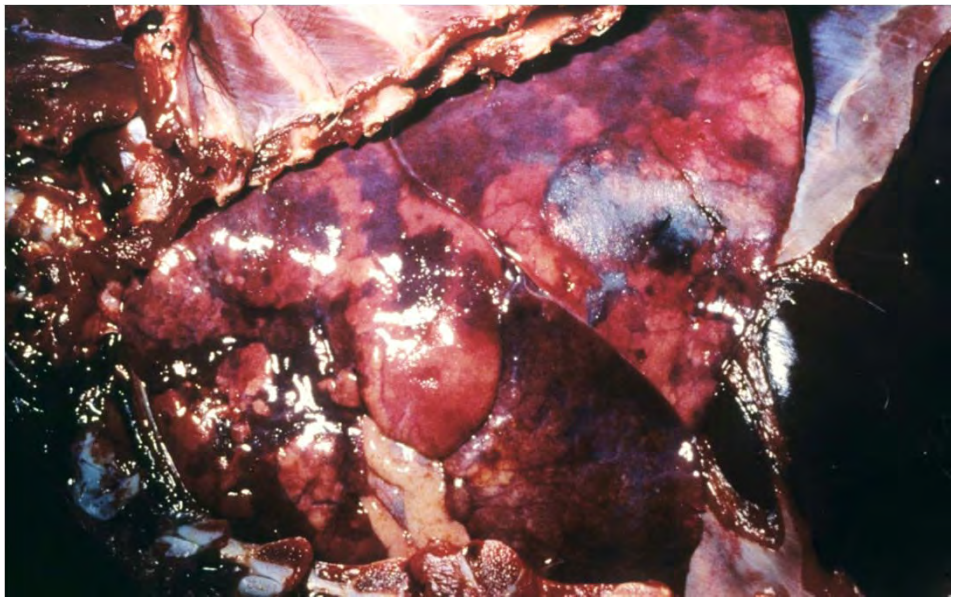
PPR is a disease listed in the OIE *Terrestrial Animal Health Code*, and countries are obligated to report the disease to the OIE according to the criteria (OIE *Terrestrial Animal Health Code*).

oie 1

Febrile illness,
Mucopurulent ocular and nasal discharges,
Erosion of the mucosa, death caused by bronchopneumonia or severe dehydration caused by acute diarrhoea.

Symptoms are often confused with, and exacerbated by, secondary infections making PPR a difficult disease to characterise, and diagnose

At necropsy, characteristic zebra markings may occur in the large intestine
Lesions also occur in the lungs showing congestion or bronchopneumonia when associated with bacterial infection.



Photos: credit P Fernandez, CIRAD, IAH Pirbright

Differential diagnosis

Respiratory signs can be due to contagious caprine pleuropneumonia (CCPP) or pasteurellosis. Pasteurellosis can also be a secondary complication of peste des petits ruminants

Bluetongue, contagious ecthyma,
foot and mouth disease, heartwater, coccidiosis
mineral poisoning.

.

Epidemiology

The disease is highly contagious and easily transmitted by direct contact between the secretions and/or excretions of infected animals and nearby healthy animals

Natural disease affects mainly goats and sheep. Usually more severe in goats.
There are the only species having a significative role in the epidemiology of PPR

Cattle: generally infected subclinically only .

Buffaloes: PPRV was isolated from an outbreak of rinderpest-like disease in India in 1995.

Camels: suspected to be involved in Ethiopia in 1995–1996

Wildlife: role?

In Africa, several ruminant wildlife species are susceptible: buffalo, topi, eland, hartebeest, waterbuck, hartebeest, kob… (serological and sometimes antigen detection)
But no clinical cases in Sub Saharan Africa

In Middle and Near East: morbidity and mortality in semi captive desert ongulates hippotragines, caprines, gazelles,

In Central Asia, wild goats in Kurdistan.

In South Asia, in free ranging wildlife in Pakistan

Situation worldwide

See the presentations at the 81th OIE General Assembly of the OIE and at the Regional Commission for Africa 26-31 May 2013, Paris, France

- **K Ben Jebara: Animal health status worldwide in 2012 and early 2013**

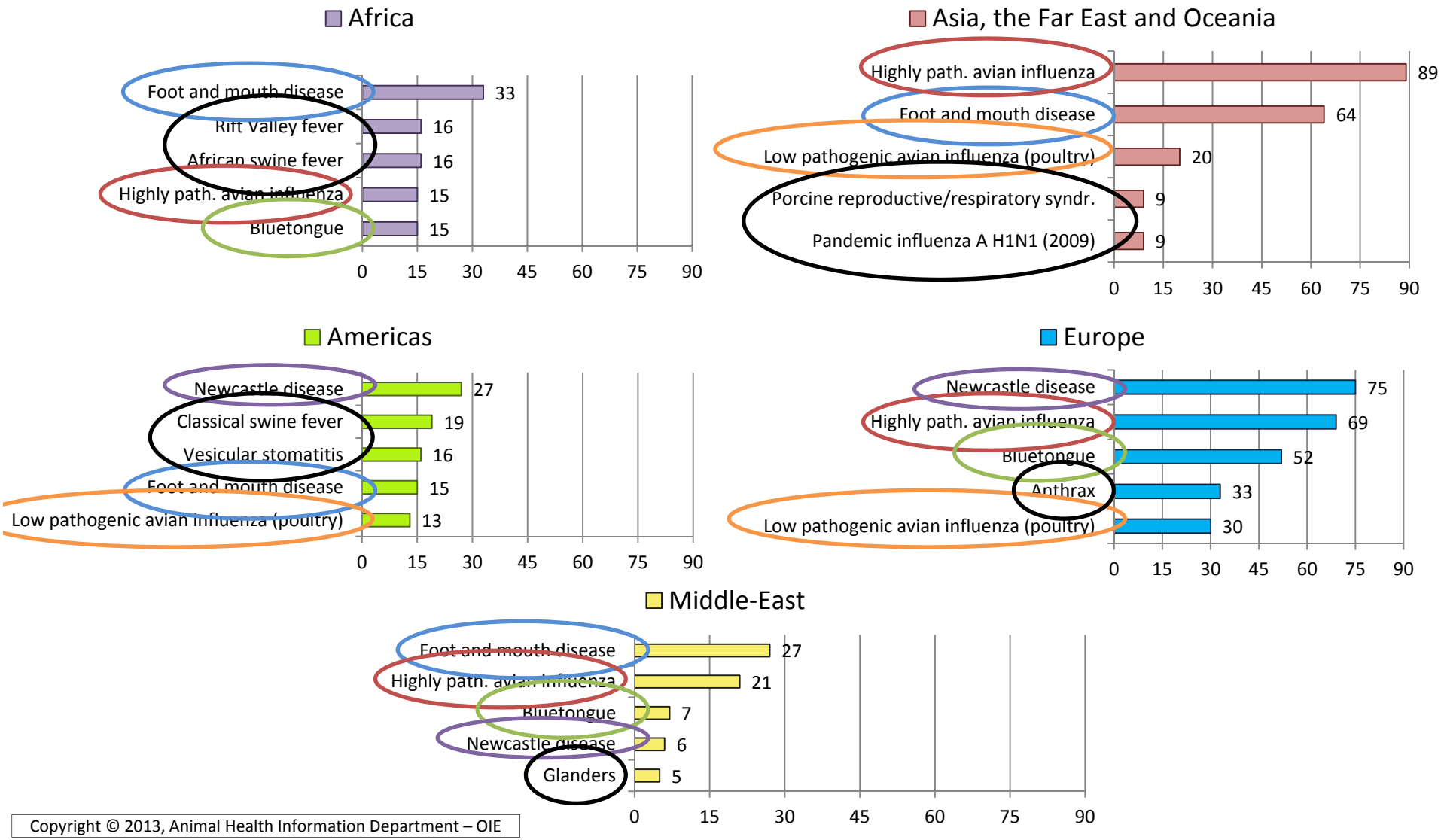
- **J Domenech: Update regarding the PPR control strategy in Africa**

TRANSPARENCY AND TIMELINESS OF REPORTING

Trends in animal disease reporting by region, between 2005 and 2012

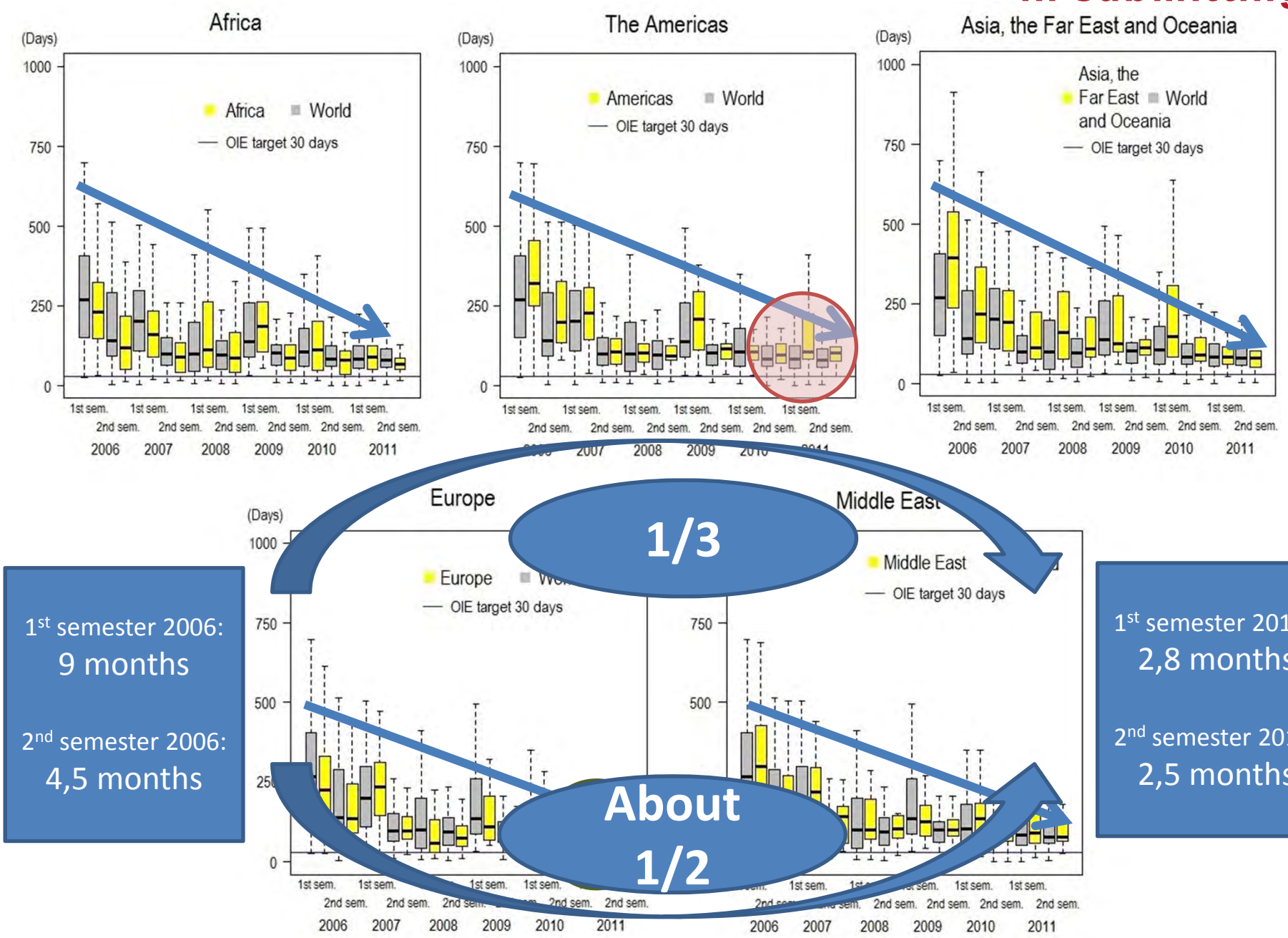
Immediate notifications and follow-up reports

Main diseases reported to the OIE through immediate notifications 2005 to 2012 and corresponding number of notifications by Region



Six-monthly reports, 2006-2011

Fastness in submitting

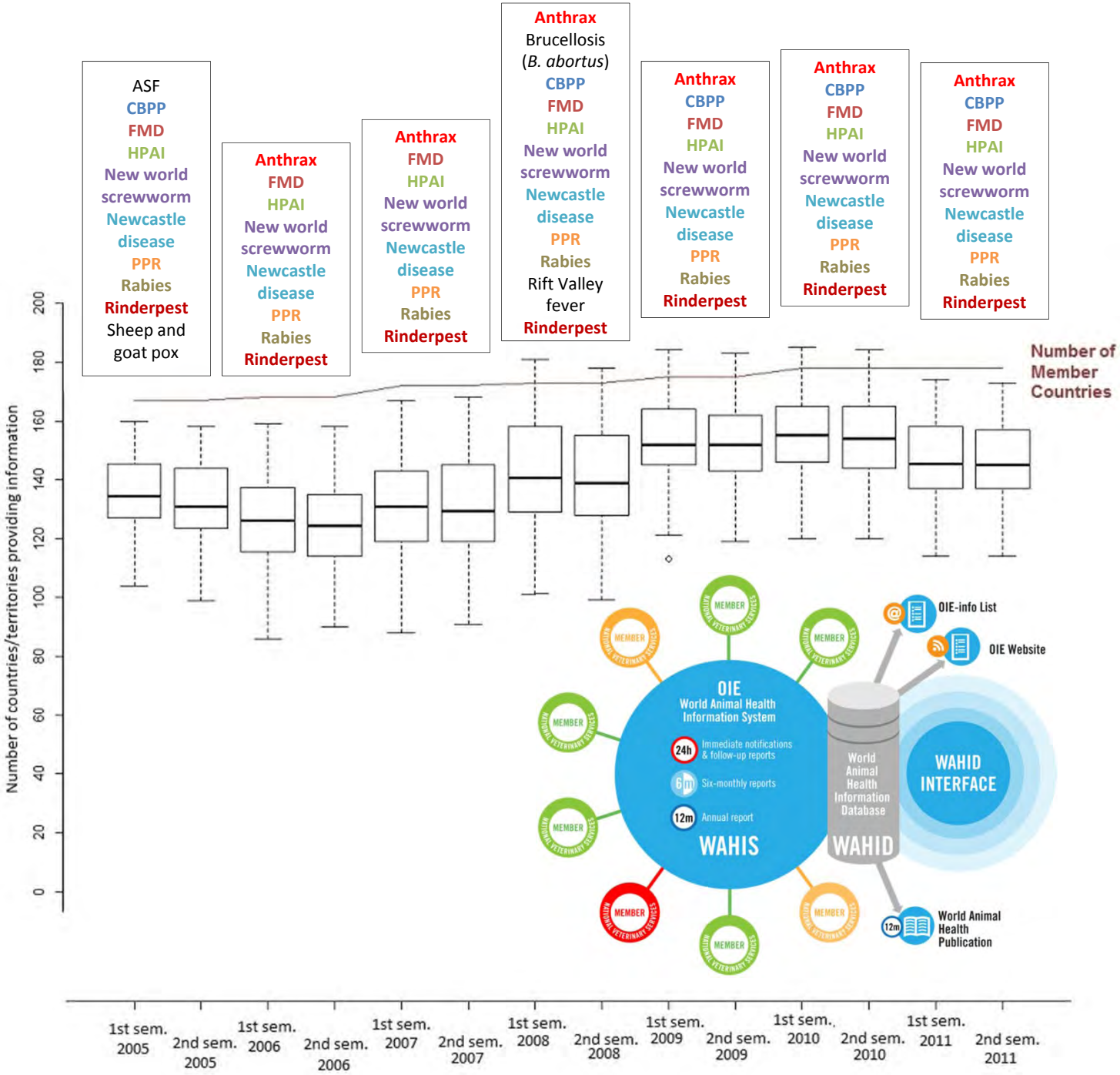


1st semester 2006: 9 months

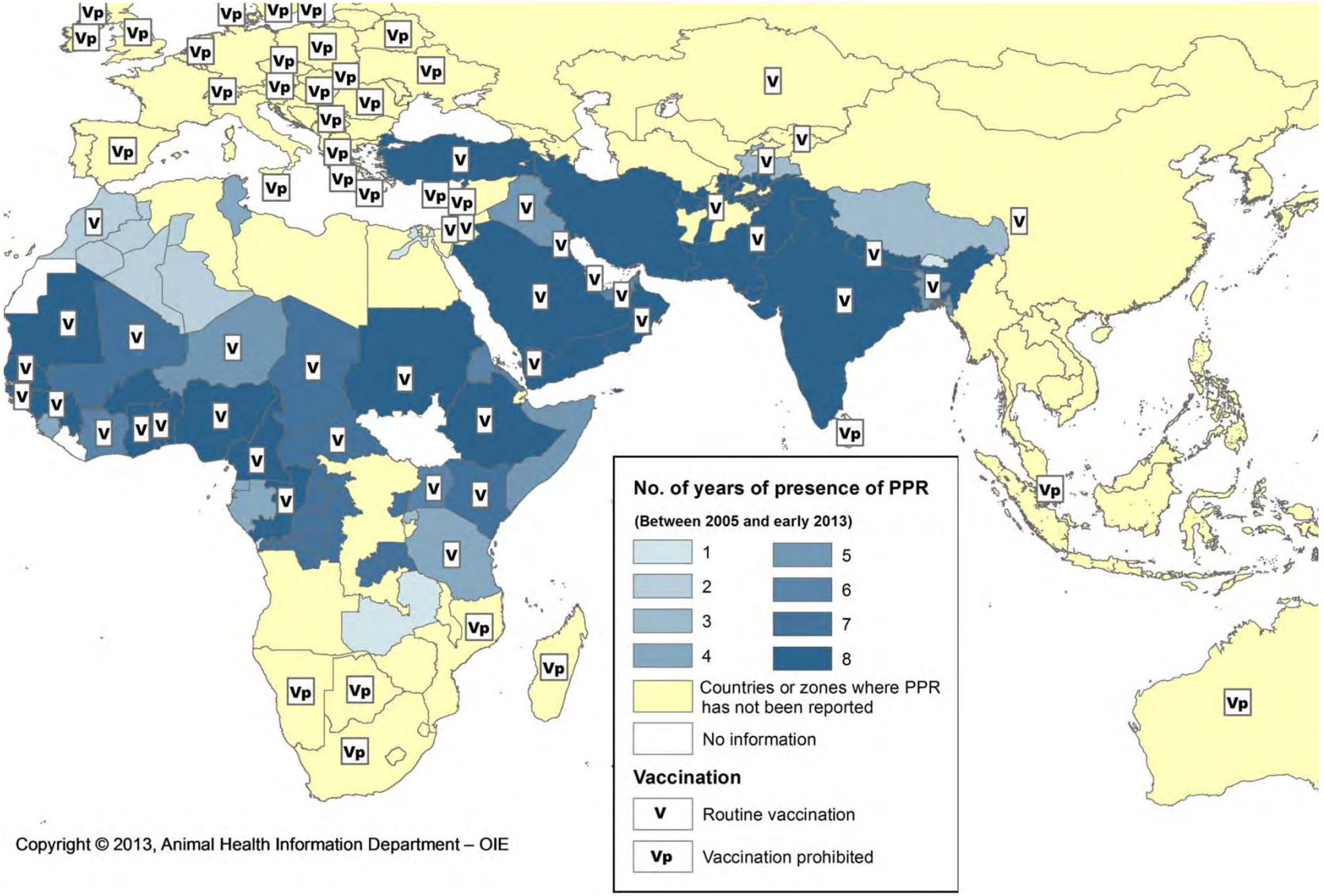
2nd semester 2006: 4,5 months

1st semester 2011 : 2,8 months

2nd semester 2011: 2,5 months


ASF
CBPP
FMD
HPAI
New world screwworm
Newcastle disease
PPR
Rabies
Rinderpest
Sheep and goat pox
Anthrax
FMD
HPAI
New world screwworm
Newcastle disease
PPR
Rabies
Rinderpest
Anthrax
FMD
HPAI
New world screwworm
Newcastle disease
PPR
Rabies
Rinderpest
Anthrax
Brucellosis (B. abortus)
CBPP
FMD
HPAI
New world screwworm
Newcastle disease
PPR
Rabies
Rift Valley fever
Rinderpest
Anthrax
CBPP
FMD
HPAI
New world screwworm
Newcastle disease
PPR
Rabies
Rinderpest
Anthrax
CBPP
FMD
HPAI
New world screwworm
Newcastle disease
PPR
Rabies
Rinderpest
Anthrax
CBPP
FMD
HPAI
New world screwworm
Newcastle disease
PPR
Rabies
Rinderpest
Number of Member Countries
Number of countries/territories providing information
0
20
40
60
80
100
120
140
160
180
200
1st sem. 2005
2nd sem. 2005
1st sem. 2006
2nd sem. 2006
1st sem. 2007
2nd sem. 2007
1st sem. 2008
2nd sem. 2008
1st sem. 2009
2nd sem. 2009
1st sem. 2010
2nd sem. 2010
1st sem. 2011
2nd sem. 2011
MEMBER
NATIONAL VETERINARY SERVICES
OIE
World Animal Health Information System
24h
Immediate notifications & follow-up reports
6m
Six-monthly reports
12m
Annual report
WAHIS
World Animal Health Information Database
WAHID
WAHID INTERFACE
OIE-info List
OIE Website
World Animal Health Publication

Evolution of PPR in Africa, the Middle East and Asia between 2005 and early 2013, and vaccination strategies reported for 2011/2012



PPR situation in Regions

Between 2005 and early 2013, 58 countries/territories in Africa, the Middle East and Asia reported PPR present or suspected at least once

For 2011 and 2012: (175 countries/territories reported information on PPR)

- **47 (27%) declared the disease present or suspected**
- **111 (63%) notified that the disease had never been reported**
- **17 (10%) notified that the disease had been absent between 2011 and 2012**

In the Middle East and Asia, 21 reporting countries have been affected by PPR at least during the past eight years

In Africa, 37 reporting countries have been affected by PPR during the past eight years and the disease is endemic in many countries. In 2012 and early 2013, 8 immediate notifications on PPR were submitted to the OIE by African countries

Conclusion

- The distribution of PPR has expanded throughout the past eight years

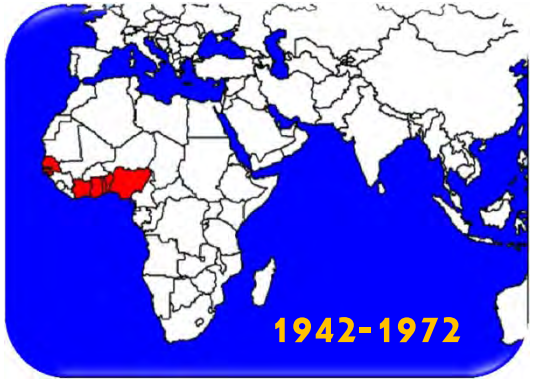
- It is now present over a large part of Africa and in the Middle East and part of Asia, and threatens the food security and livelihood of smallholders by affecting the development of the small ruminants' sector as a result of the high mortality and morbidity it has been causing over a long period

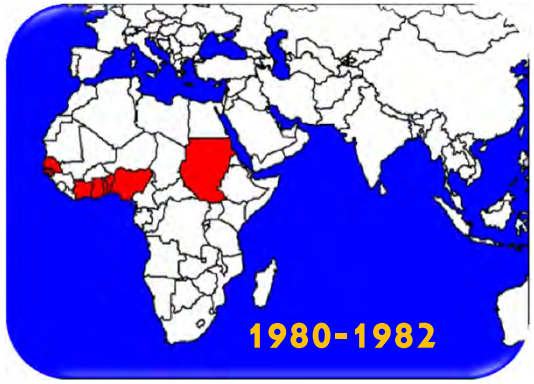
Conclusion

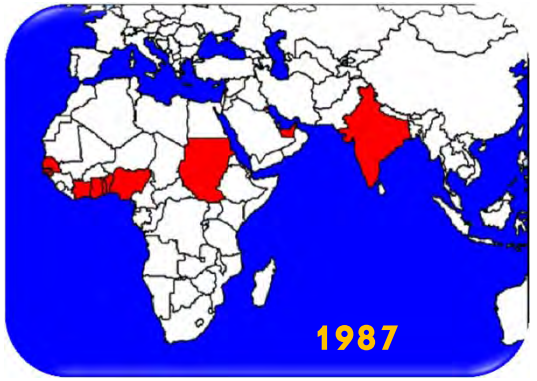
- The cost of vaccines and their administration as well as logistical issues make vaccination campaigns problematic in some regions

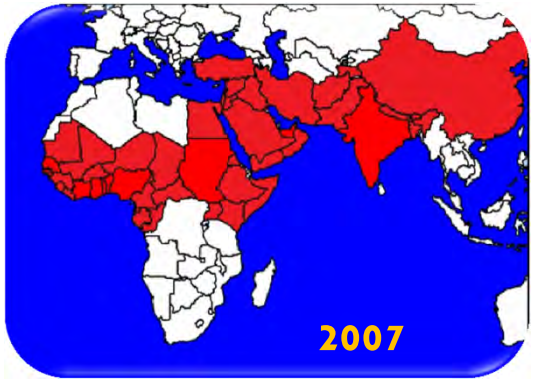
- Despite these difficulties, all affected countries should undertake surveillance to allow prompt disease reporting, especially given the availability of sensitive and specific diagnostic tools for PPR

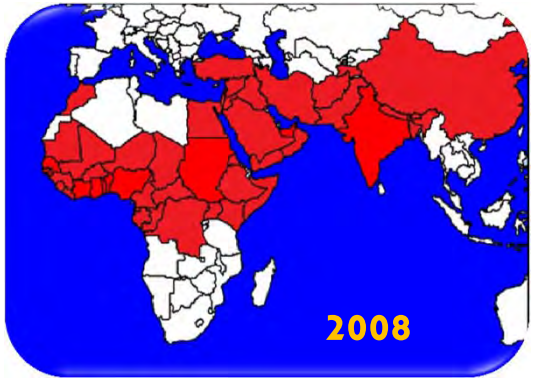
Evolution of PPR distribution in the world

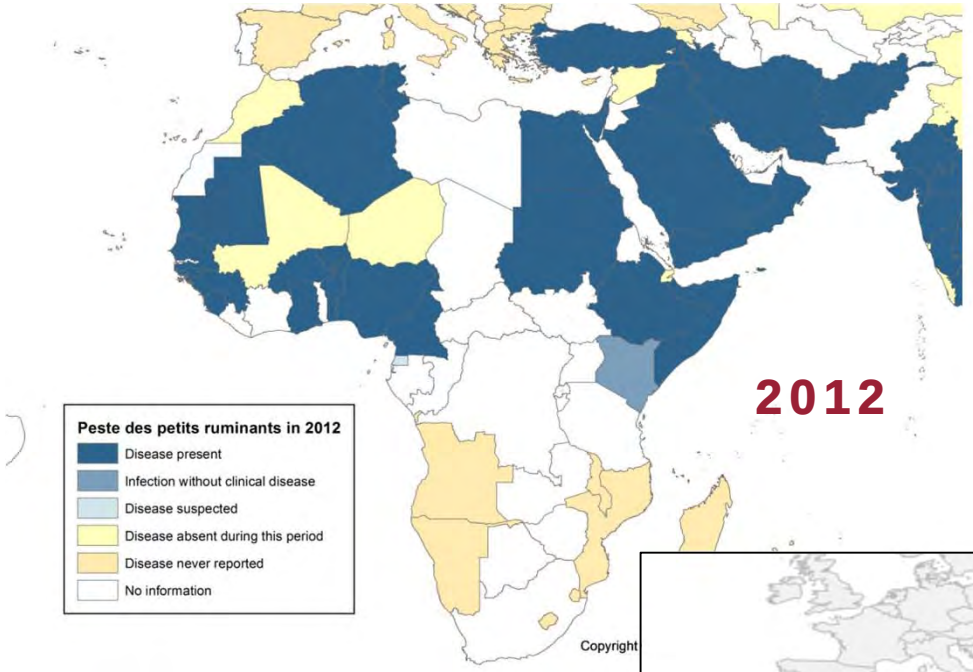




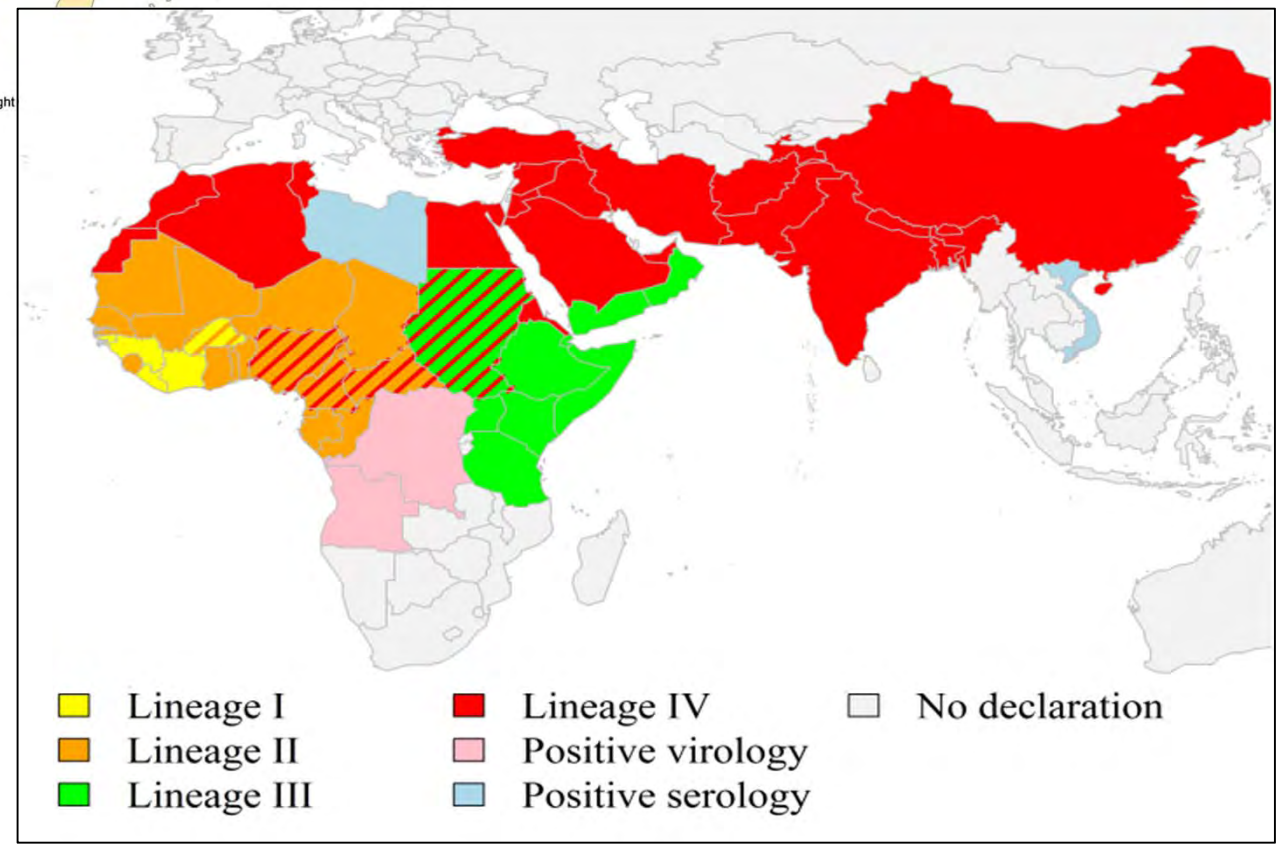


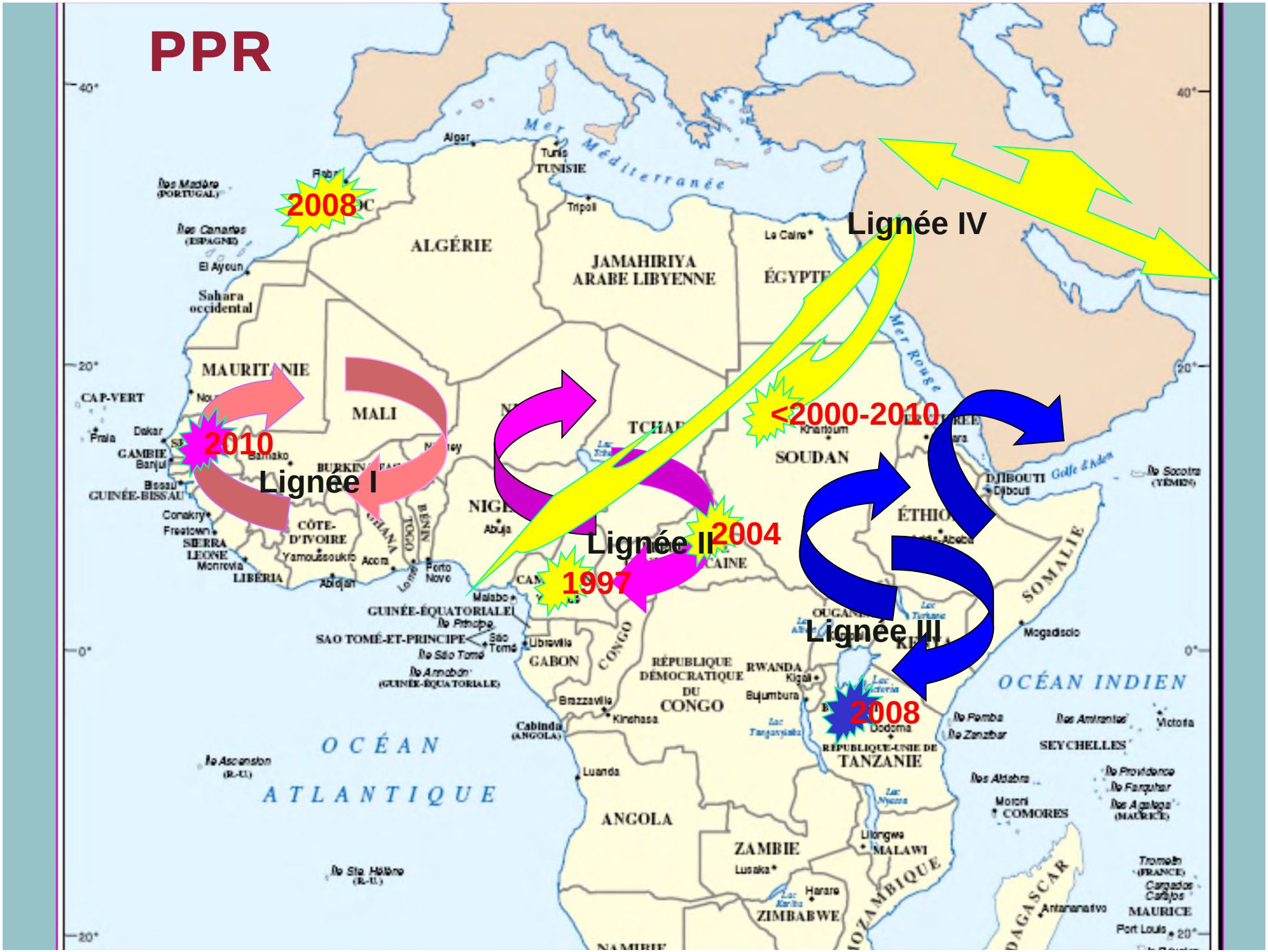





Peste des petits ruminants in 2012
Disease present
Infection without clinical disease
Disease suspected
Disease absent during this period
Disease never reported
No information
Copyright

2012


Lineage I
Lineage II
Lineage III
Lineage IV
Positive virology
Positive serology
No declaration


PPR
2008
Lignée IV
ALGÉRIE
JAMAHIRIYA ARABE LIBYENNE
ÉGYPTE
Mer Méditerranée
Mer Rouge
<2000-2010
2010
Lignée I
MAURITANIE
MALI
SOUDAN
Lignée II
2004
1997
Lignée III
2008
GUINÉE-ÉQUATORIALE
SAO TOMÉ-ET-PRINCIPE
GABON
CONGO
RÉPUBLIQUE DÉMOCRATIQUE DU CONGO
RWANDA
TANZANIE
ANGOLA
ZAMBIE
ZIMBABWE
MALAWI
MOZAMBIQUE
SOMALIE
ÉTHIOPIE
DJIBOUTI
SEYCHELLES
COMORES
MAURICE
OCÉAN ATLANTIQUE
OCÉAN INDIEN

Situation in Africa

See the presentations at the 20th Conference of the OIE Regional Commission for Africa
18-22 February 2013, Lome, Togo

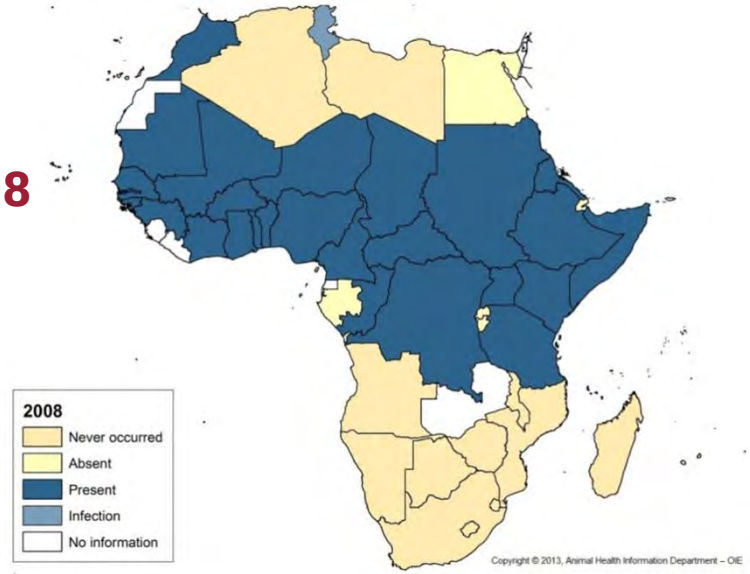
- K Ben Jebara: Situation zoosanitaire des Pays Membres de la Commission Régionale de l'OIE pour l'Afrique en 2012,
- J Domenech: PPR Situation in Africa

Reoccurrences in 2012 & 2013

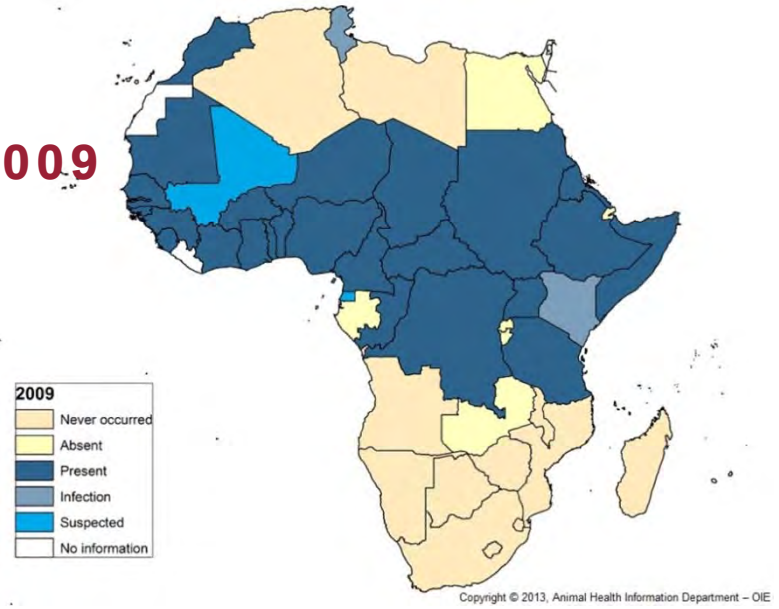
- Algeria (in Ghardaia in March 2012 and later in January 2013)
- Comoros (in Grande Comore in September 2012)
- Egypt (in Al Qahirah and Al Isma'iliyah in August 2012)
- Tunisia (in Sidi Bouzid in April 2012, and later in several regions of the country, including Sidi Bouzid and the neighbouring regions of Ariana and Gafsa in August 2012)
- A first occurrence was reported by Angola (in Cabinda in October 2012)
- An unexpected increase in morbidity and mortality of PPR was reported by Congo (Dem. Rep. of the) in January 2012

Situation in Africa

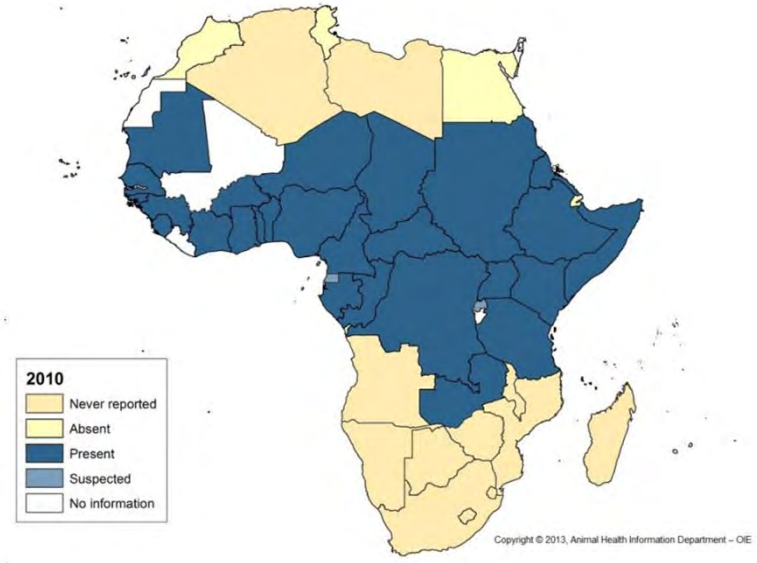
2008



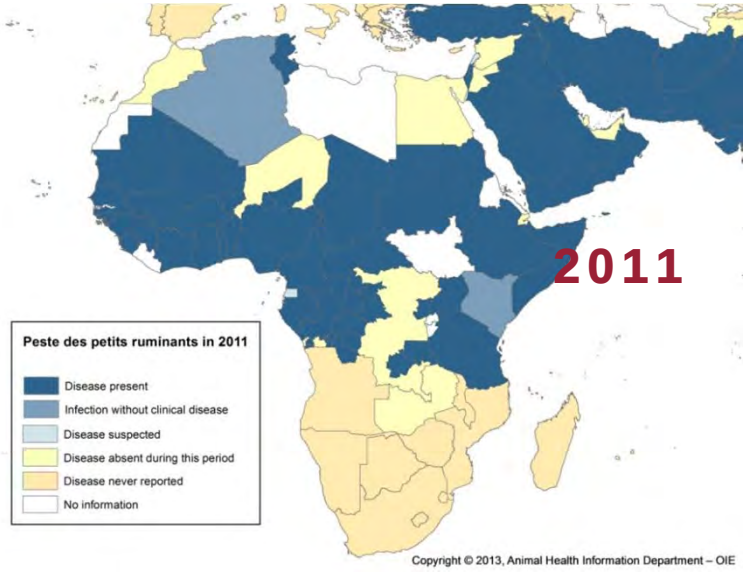
2009



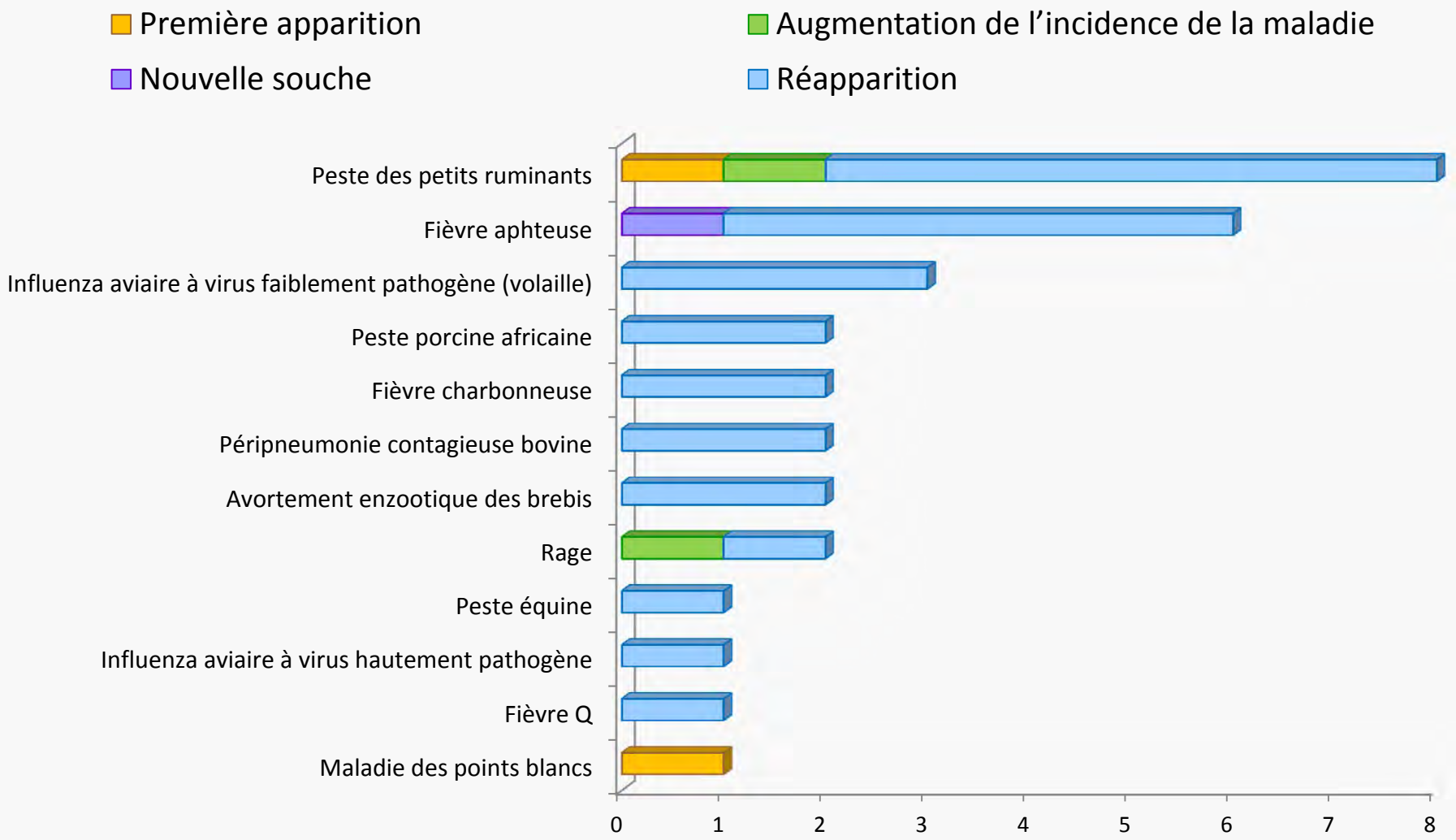
2010



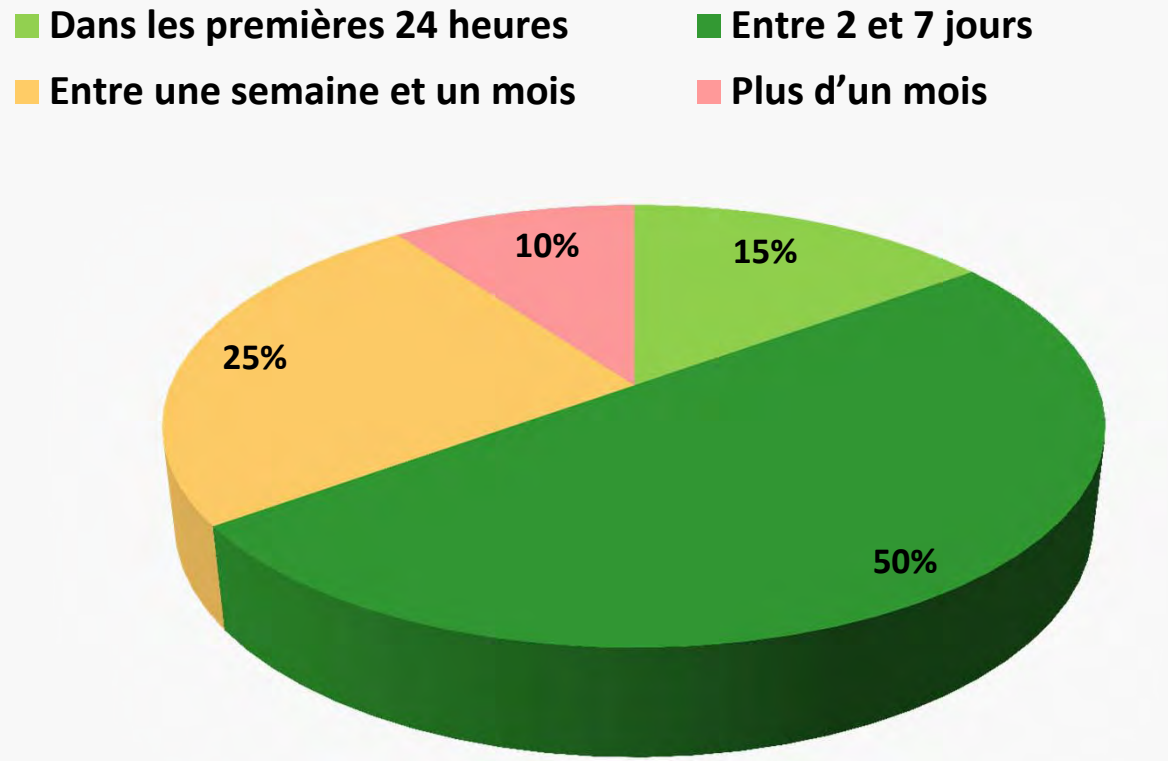
2011



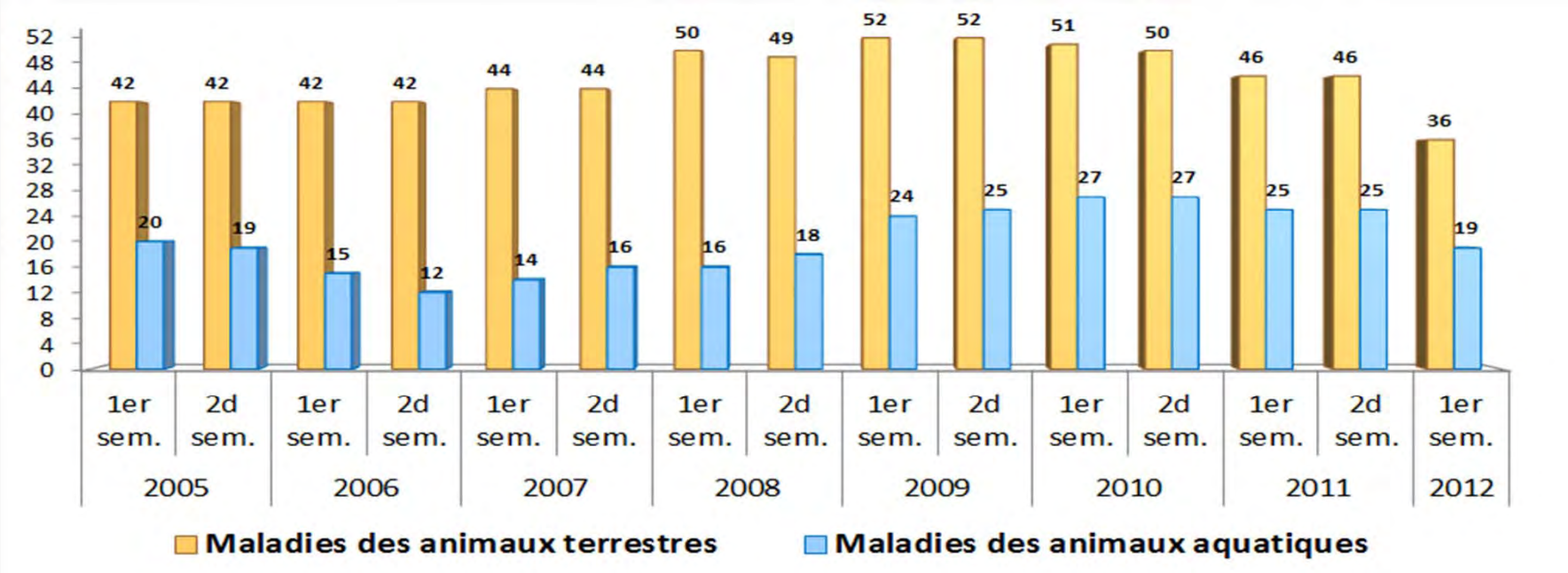
Number of new epidemiological events notified in Africa 2012 and beginning of 2013



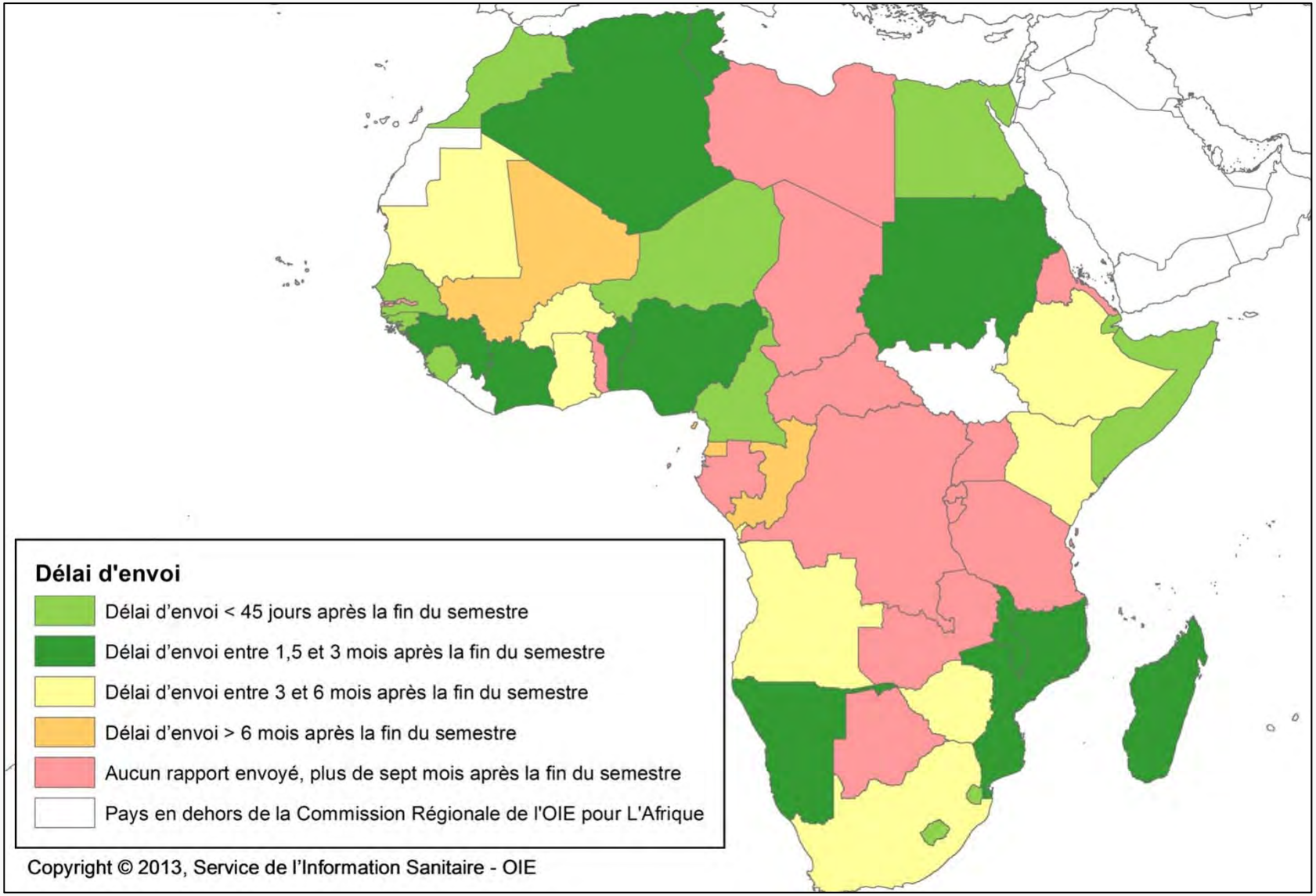
Time between alert message and corresponding immediate notification



Six-monthly reports for the period 2005 - 2012

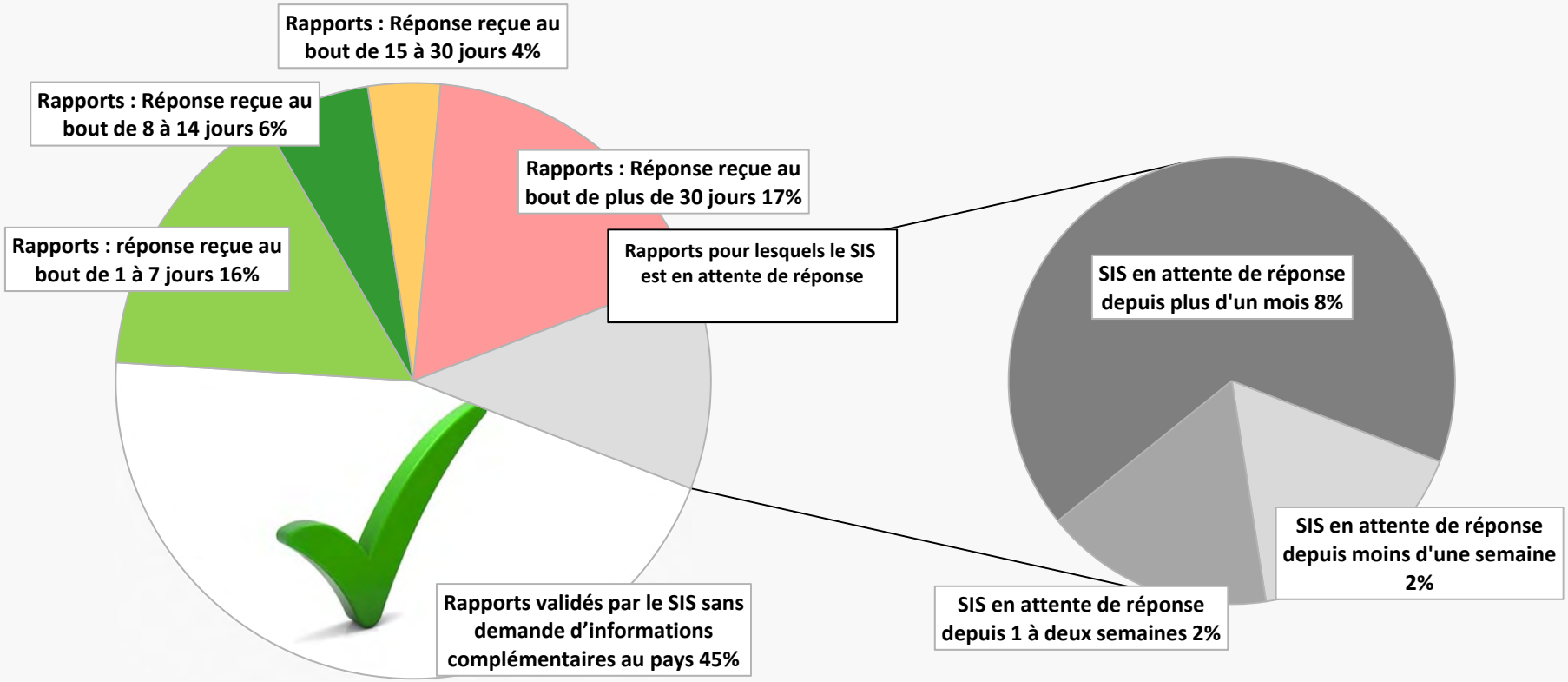


Fastness in submitting the first six-monthly reports, 2012 (terrestrial and aquatic diseases)

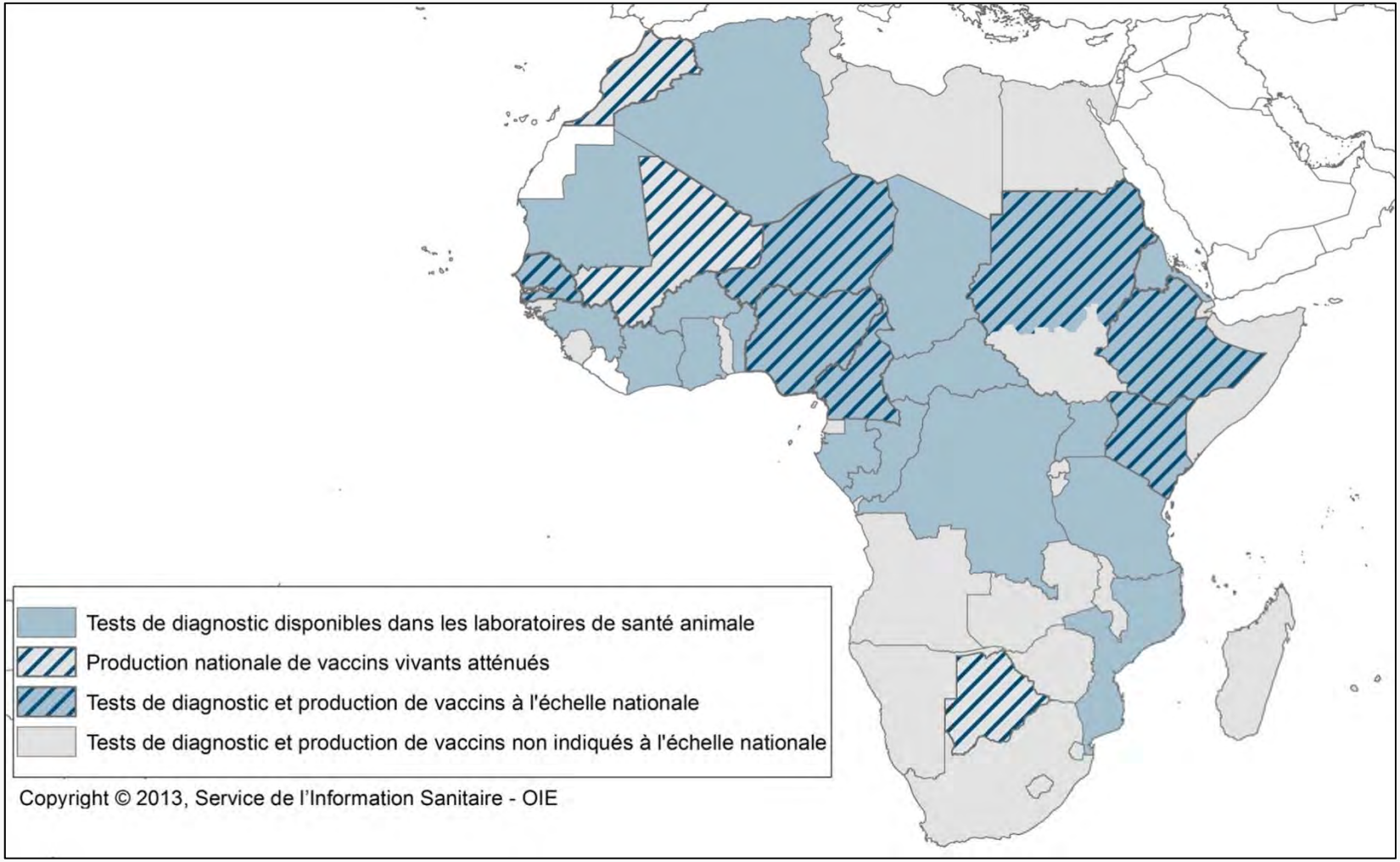


**Les frontières entre le Nord-Soudan et le Sud-Soudan n'ont pas encore été officiellement validées par ces deux pays*

Time between the date of the first OIE request for complementary information after submission of the 2012 first six-monthly report by the country and date of receiving the country response



PPR: diagnostic and prevention



**Les frontières entre le Nord-Soudan et le Sud-Soudan n'ont pas encore été officiellement validées par ces deux pays*

National activities to control PPR

- Coordination meetings in 2012: North Africa (REMESA, EC); Angola-Dem. Rep Congo-Zambia

- Control programmes: Angola (vaccination (Northern region), surveillance); South Africa (passive surveillance and diagnostic capabilities strengthened); Togo (vaccination, goal: 70% vacc coverage in 3 years)

- Simulation exercices: Mozambique

- Preparation of new national control programmes: Mozambique (vaccination and diagnostic tests); Nigeria (vacination, transborder cooperation); Zimbabwe (vaccination, communication)

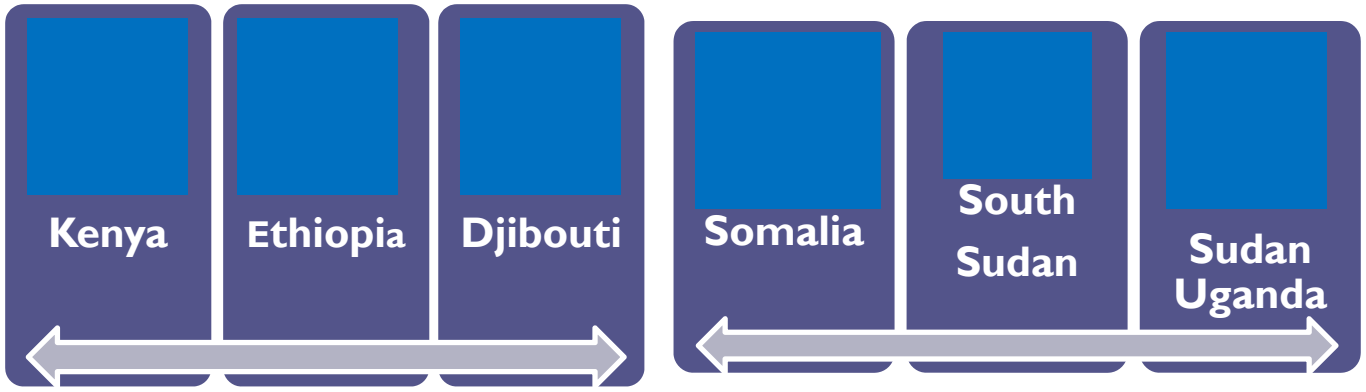
PPR control programs in Africa

- VACNADA. 2011: 17,4 millions vaccination in 14 pays concernés, diagnostic and vaccine production
- LEISOM: 2,4 millions vaccination in Somalie
- AU-IBAR with ILRI, 2012: pilot studies in two Eastern African countries (thermostable vaccine, institutional delivery systems)
- IAEA: support to 10 African laboratories (sequencing)
- FAO: support to countries (emergency vaccination, epidemiology surveillance, diagnostic, socio-économics, delivery systems)

AU-IBAR, IGAD and FAO initiative in Eastern Africa

The SHARE programme in IGAD Region

PPR and small ruminant diseases control for building resilience amongst the pastoralist communities of the Horn of Africa



Epidemiological and socio-economic situation, roadmaps methodology/strategy development, delivery systems, regional coordination, knowledge gaps…

African Union
Interafrican Bureau
for Animal Resources

PAN AFRICAN PROGRAM FOR PROGRESSIVE CONTROL OF PESTE DES PETITS RUMINANTS (PPR) IN AFRICA

Conference of the Ministers in charge of animal ressources of the African Union

Abidjan, Cote d'Ivoire, April 2013

« Vaccine Standards and Pilot Approach to PPR Control in Africa (VSPA)

An OIE project funded by the Bill and Melinda Gates Foundation

BILL & MELINDA GATES foundation

Three components of the project

- The establishment of a PPR Vaccine Bank,

- The strengthening of the capacities of the Pan African Veterinary Vaccine Centre of the African Union (AU/PANVAC)

- The development of a pilot strategy to progressively control/eradicate PPR in 2-3 countries.

Other regional activities

- **GCC+ Yemen: FAO PPR sub-regional meeting, 1-3 April 2013, Riyadh, Kingdom of Saudi Arabia**
- **South Asia:**
  - **SAARC countries: Roadmap meeting Bangladesh**
- **India: National control programmes**

Available tools

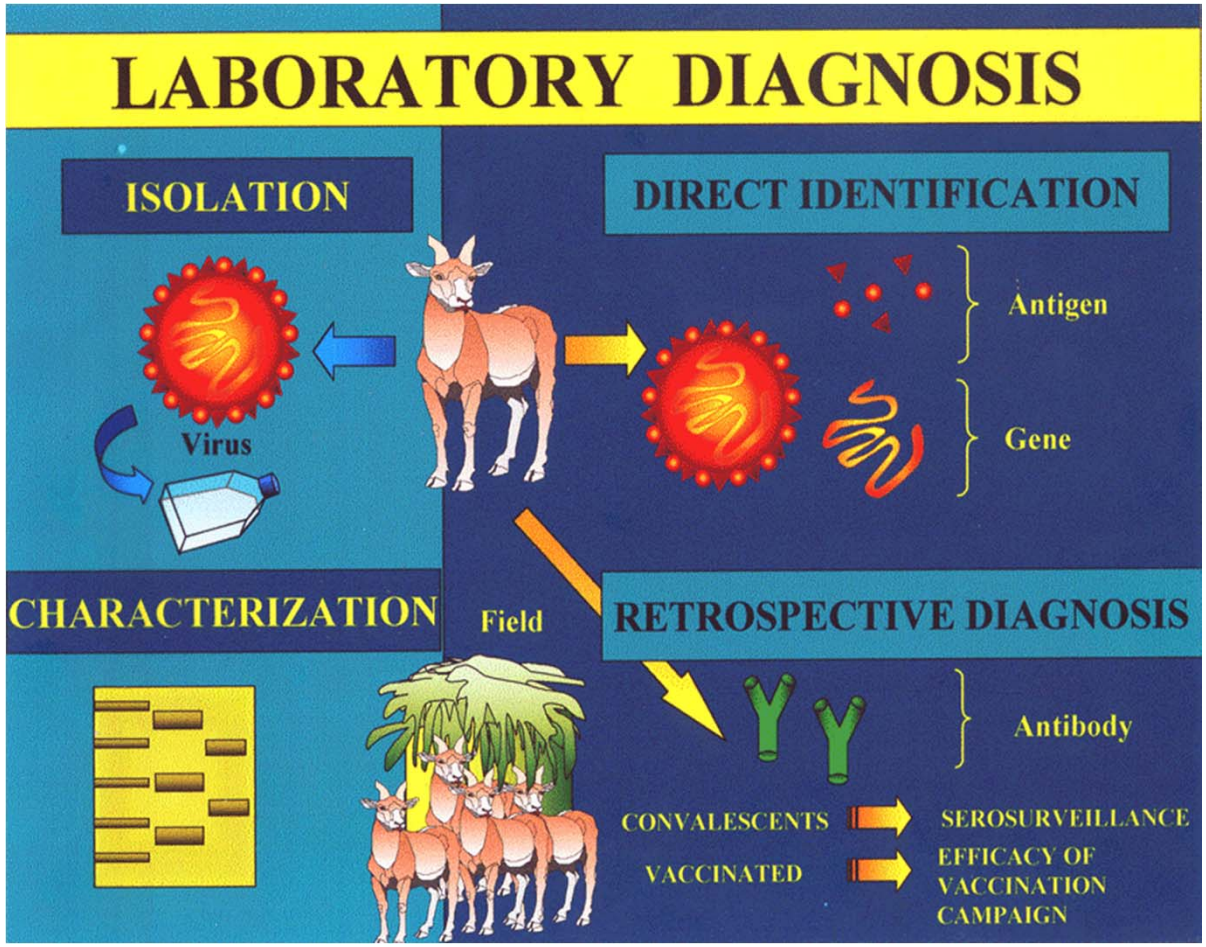
Laboratory diagnostic tests

- Virus isolation,
IFI, Immunocapture

- Serological Analysis:
c-Elisa, VNT

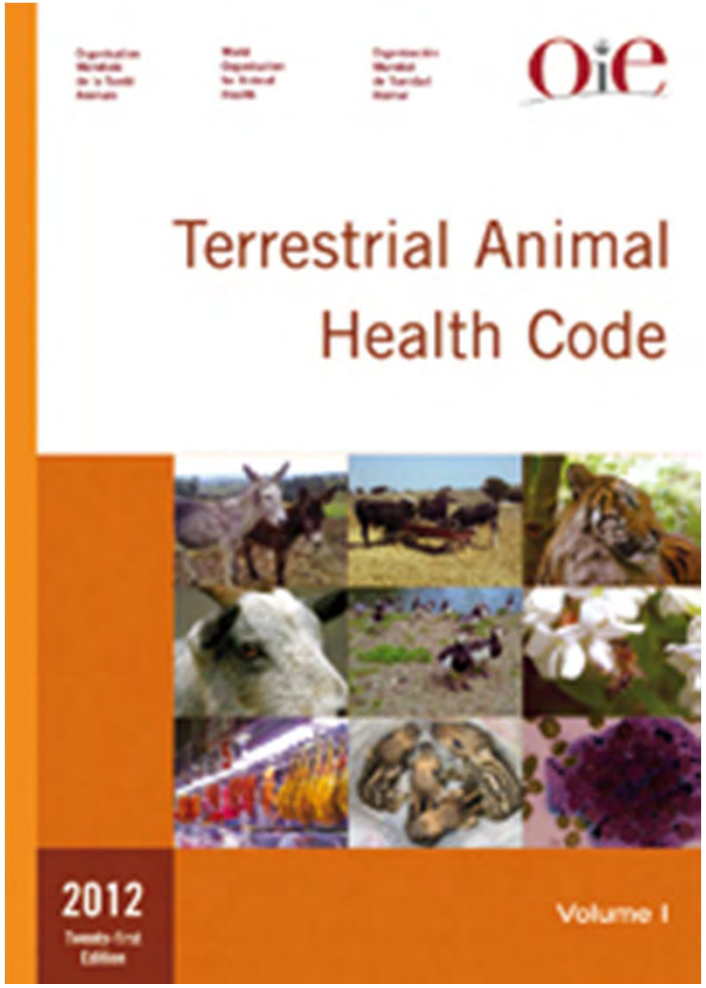
- Molecular biological
techniques:
Conventional RT-PCR,
Quantitative RT-PCR,
Sequencing

.



Code relevant articles regarding PPR

In OIE Terrestrial Animal Health Code

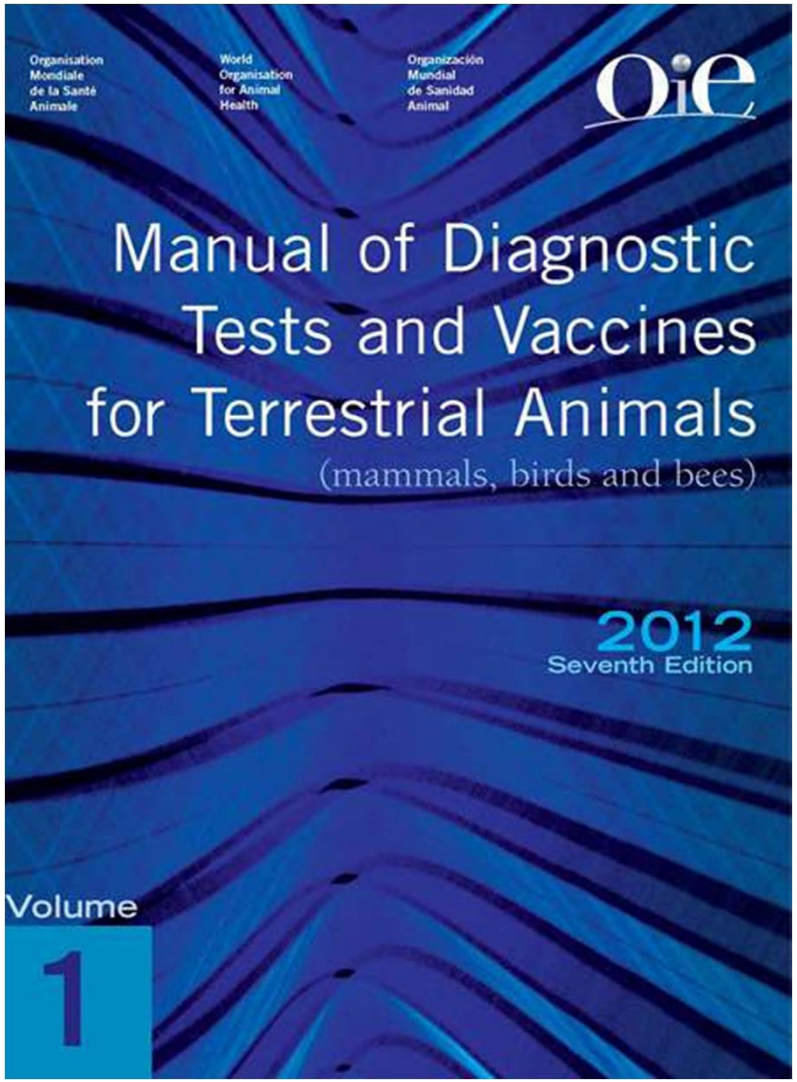


Chapter 14.8. Peste des Petits Ruminants

Related to import of animals and animal products (science based and risk analysis approaches)

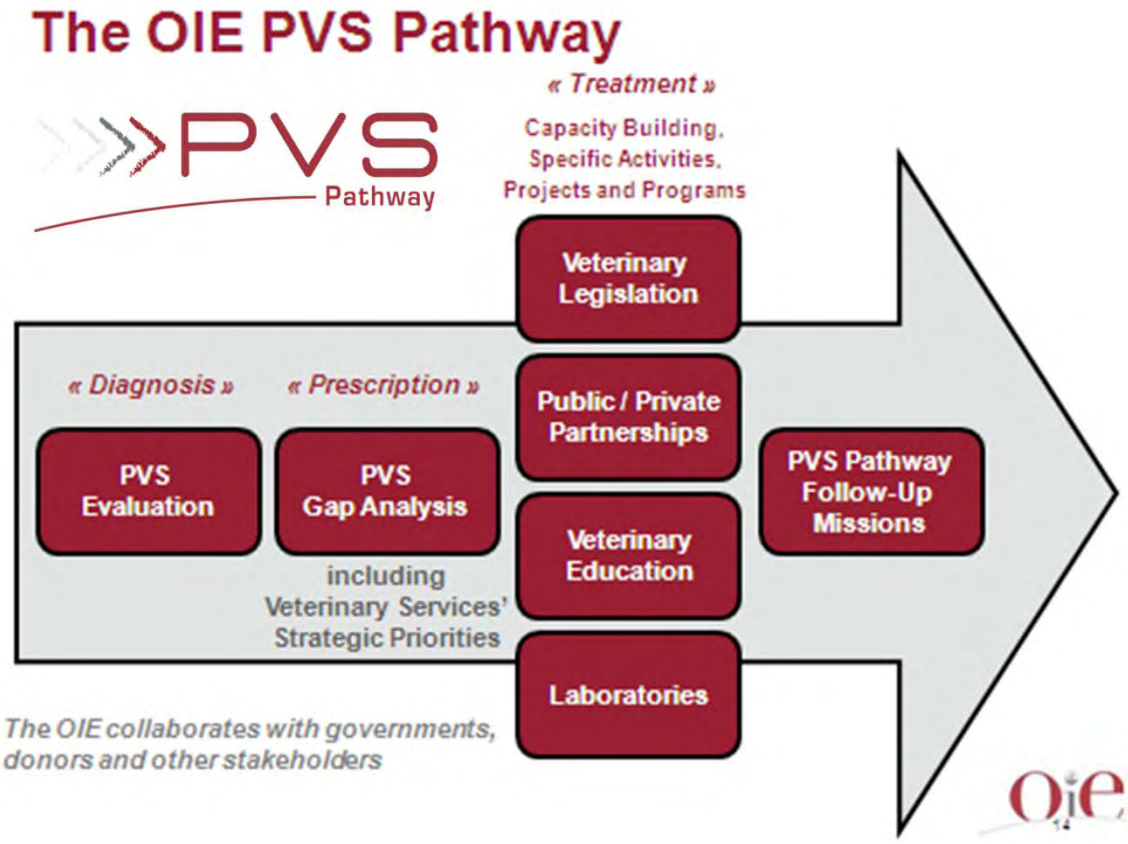
Manual relevant articles regarding PPR

In OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, 2012



CHAPTER 2.7.11.
PESTE DES PETITS RUMINANTS
(12 pages)

SUMMARY



PVS Evaluation

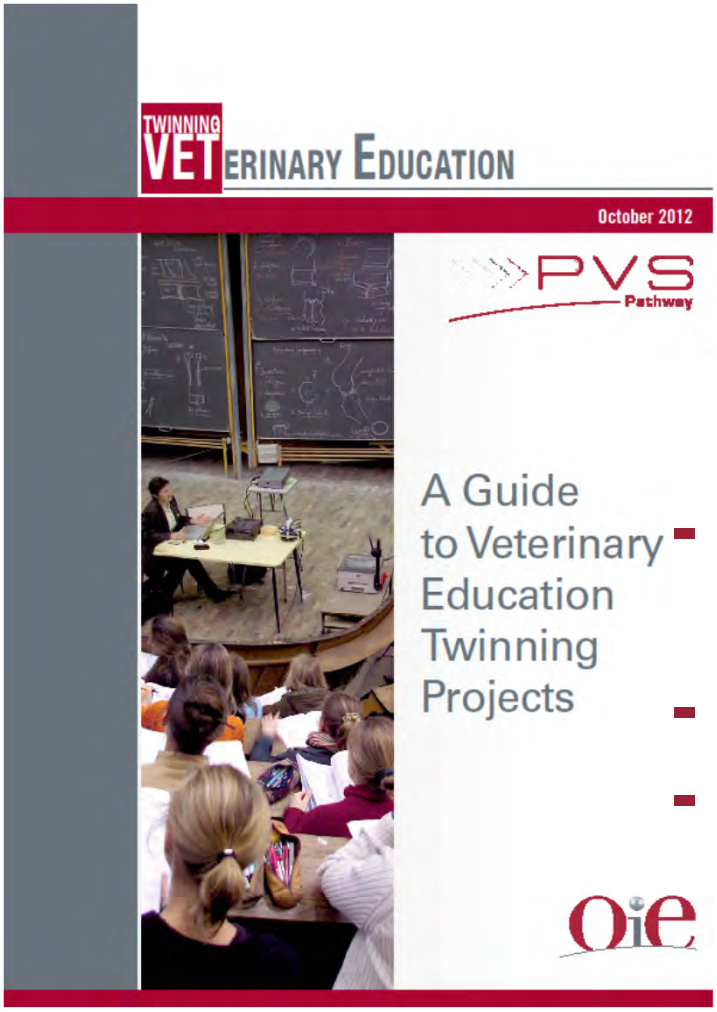
PVS Gap Analysis

OIE PVS Legislation missions,
Veterinary Education (twinnings)
Veterinary Stat Body (twinnings)
Laboratory PVS Gap Analysis, One Health PVS mission.
PVS Pathway Follow-up Eval.
Round tables with donors.

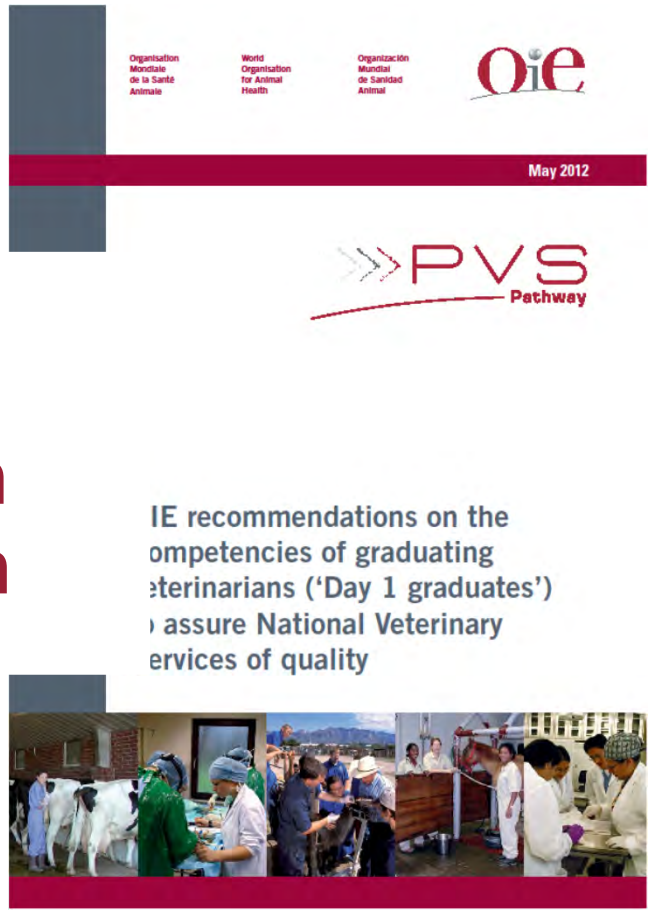
A continuous Process to improve the compliance of VS with international standards

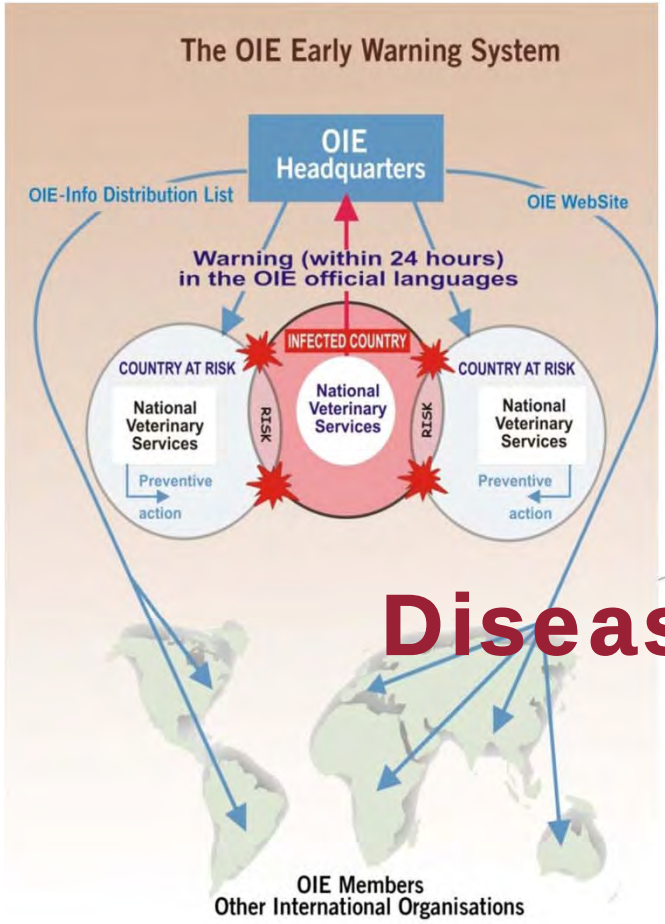
Veterinary education

Recognition of veterinary qualifications. Promotion of professional excellence throughout the world



- Minimum curriculum
- Evaluation
- Twinnings





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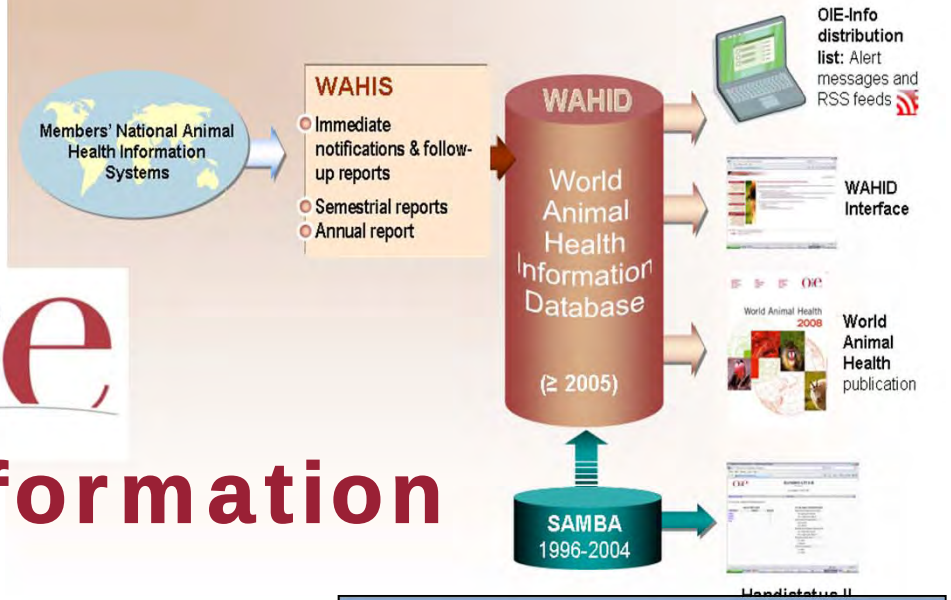
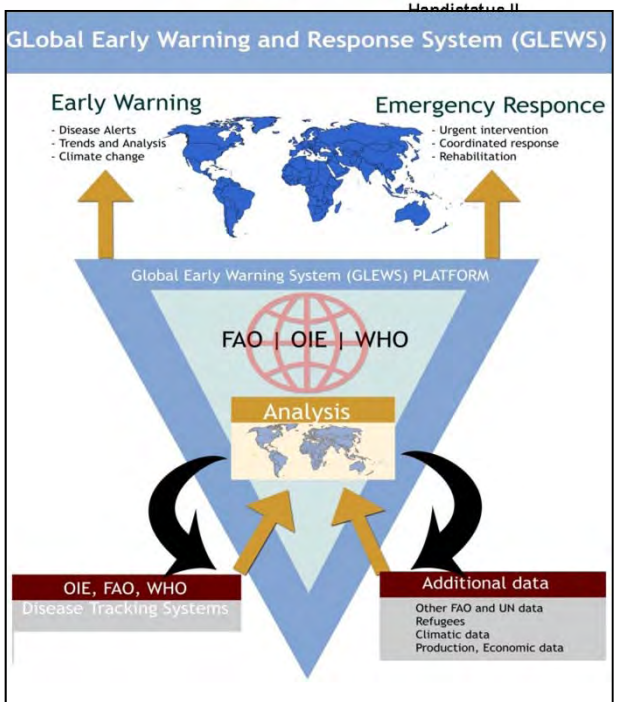


Disease information



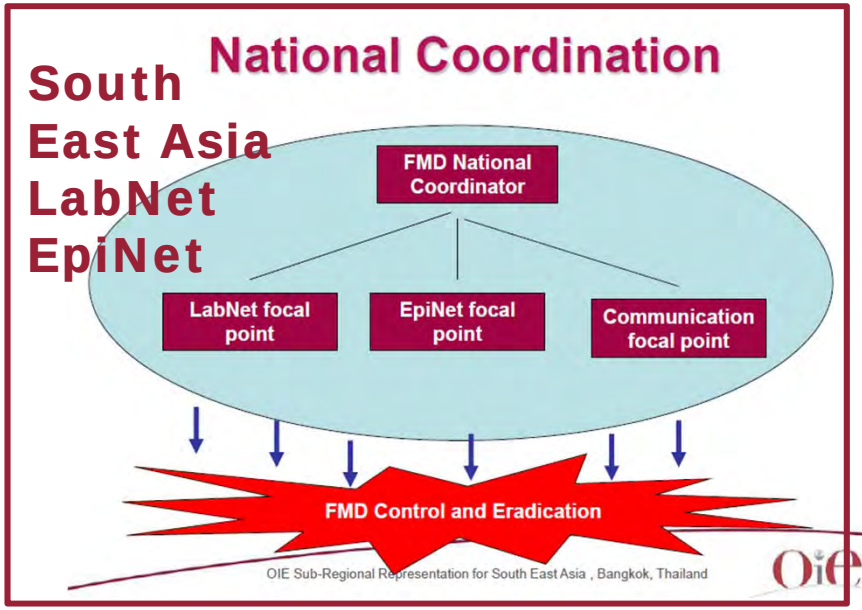
GLEWS
Global Early Warning System

WHO

The FAO OIE Crises Management Center

Surveillance, Regional Networks

- Methods: active, passive, randomized, targeted
- Risk identification:



Epi Networks: back to back with Labor. Networks

Permanent institutional cooperation

FAO - Food and Agriculture Organization

WHO - World Health Organization

CODEX ALIMENTARIUS
International Food Standards

WTO - Wo

IPPC - Int

World Ban

CABI - CAB International

ILRI - International Livestock Research Institute

FAO - OIE GF TADS

Global Framework for the Progressive Control of Transboundary Animal Diseases

And cooperation with Regional public organisations and private sector bodies

(more than 50 agreements)

Vaccines

Parameter	Nigeria 75/1	PPR Sungri96	PPR Arasur 87
Passage & Origin	LK-6, BK-2, Vero-70 Nigeria. sheep	Vero, 60 North India, goat	Vero 75 South India, Sheep
Complete CPE	3-6 days	3-6 days	2-3 days, rapid growing
Safety in Pregnancy	Safe in pregnancy		
Lineage	I based on F gene	IV based on F gene	IV based on F gene
Usage	Extensively used in several countries	Extensively used in India > 20million doses	used in some states of India
Virus Sequence	Full genome sequenced	Nearly Full genome sequenced	Not available

Quality controlled

Compliance with OIE standards (Terrestr. Manual)

FAO OIE GF TADs PPR Working Group meetings

PPR has been included in the Regional 5 years Action Plans of Africa, the Middle East and South Asia

Preparation of a Global PPR Control Strategy

Consultation process for the elaboration of the PPR Global Strategy

Similar to the preparation of the FMD Global Strategy

- With experts, national and regional authorities, policy-makers, development partners and private industry: Workshop to be organized

- Lessons learned from regions

- The Global Framework for the Progressive Control of Transboundary Animal Diseases GF-TADs) provides the governance structure to prepare the Strategy

- Peer review of the strategy

Inputs from the OIE Scientific Commission and its Ad Hoc Group

Knowledge improvements needed

- Epidemiology and socio economics
- Vaccine delivery systems: private services/public, Vets/CAHWs, cost recovery/public-private good....
- Vaccines: thermostable, DIVA, combined vaccination (immunosuppression?)
- Diagnostic tests: penside tests

Several organisations such as the OIE FAO Reference Centers develop research programmes.

OIE and FAO support these researches and they will establish a Global Research and Expertise Network with the objectives to:

- **Offer technical advice and veterinary expertise to Member Countries**
- **Exchange scientific data and biological materials between veterinary labs**
- **Highlight, promote development and ensure coordination of PPR research needs**
- **Close link and interactions with strategy development**

Thank you for your attention