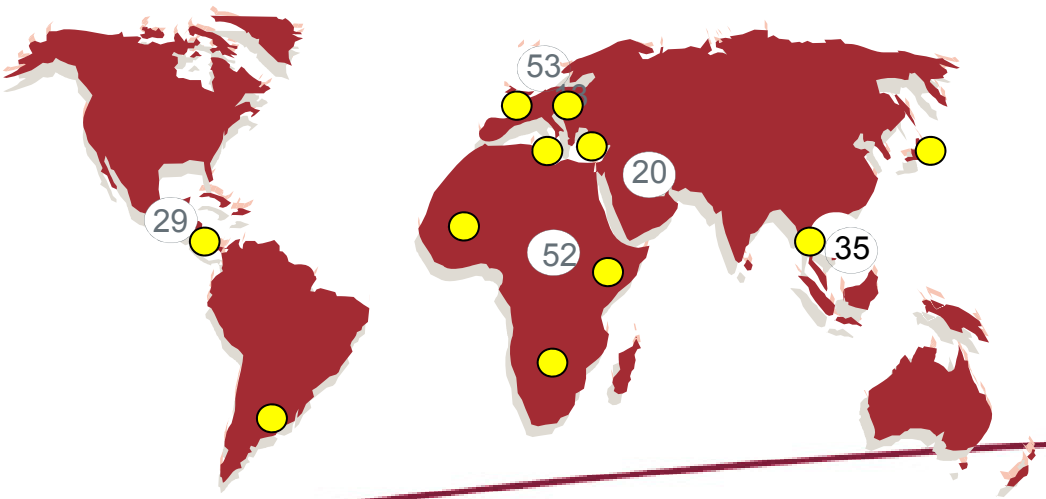
Global cooperation in countering emerging animal and zoonotic diseases

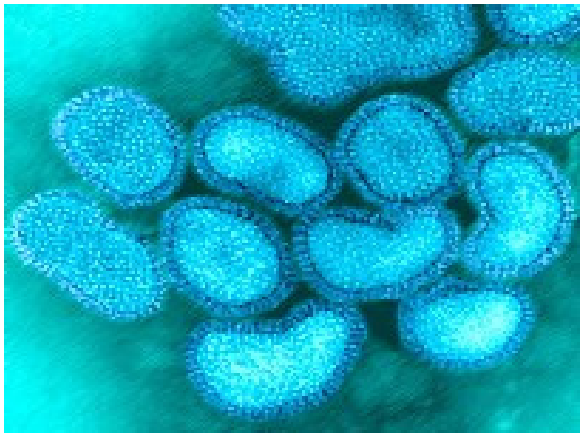
Keith Hamilton
World Organisation for Animal Health

World Organisation for Animal Health (OIE)

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



Threats – OIE listed diseases



Public health

Animal health

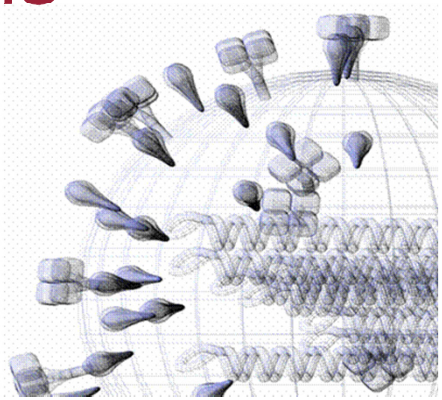
Food security

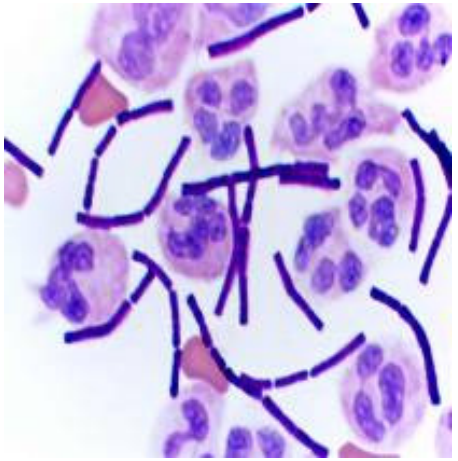
Economics

Food safety

The growing importance of zoonotic animal pathogens

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





Increasing opportunities for emerging diseasesand vulnerability to them

- Globalisation
- Urbanisation
- Climate change
- Resistance to drugs
- Rising demand for food
- Synthetic biology
- Political instability
- Weak animal health care systems

Detection and international reporting

Possible origins of animal disease outbreaks

- Natural disease events
- Deliberate release (bioterrorism) – ideal bio weapons
- Breaches in laboratory bio-containment
- New and emerging diseases

“Disease detection and control for a natural, deliberate or accidental release of animal pathogen or emerging pathogen is virtually the same”

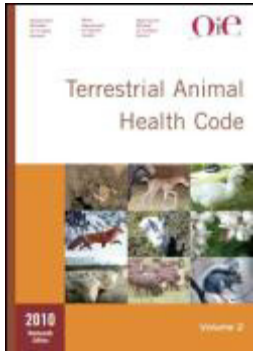
Animals are biosensors

Pathogens -- Toxins -- Radiation

- Environmental changes
- For human disease and zoonoses
- Domestic animal diseases for wildlife diseases
- For emerging infectious diseases
- Accidental or deliberate releases
- In research

Source : www.flickr.com/photos/ studiomiguel/3946174063/

OIE – responsibility for transparency of the global animal disease situation



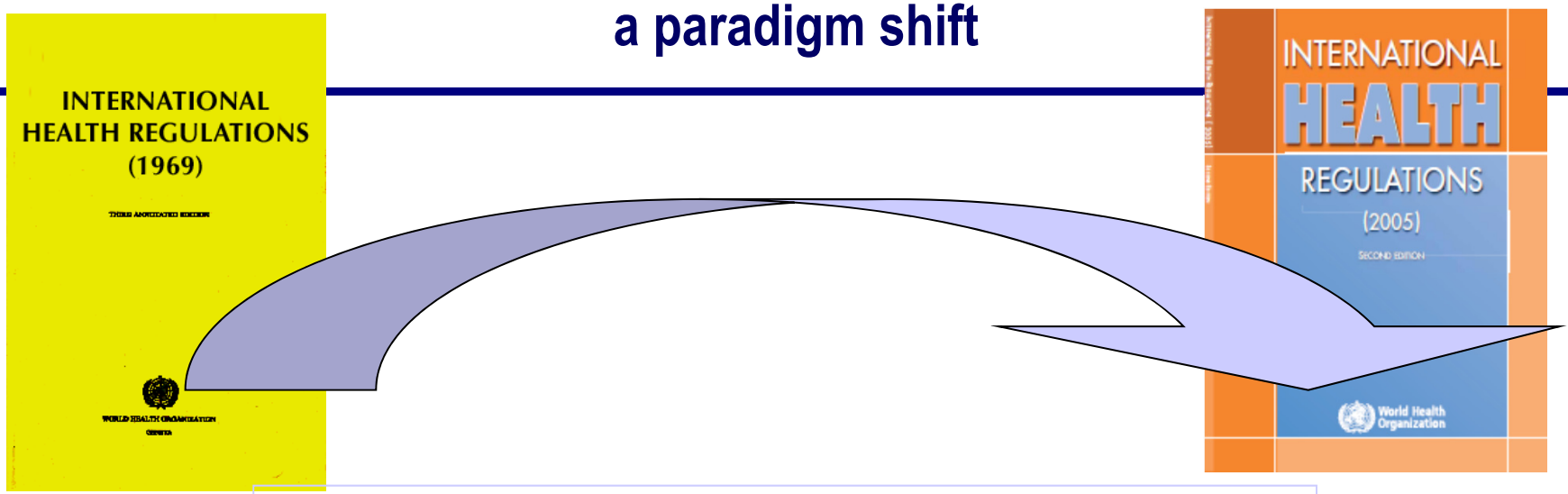
OIE Members must notify important disease events to OIE, including:

- OIE listed diseases (100+ of the most severe disease threats to human and animal health, and to economies worldwide)
- Emerging diseases
- Significant epidemiological events

OIE disseminates **official reports** from Members to all Members via an alert system and to the public via WAHID

International Health Regulations (IHR 2005)

a paradigm shift



From **control of borders** to **containment at source**
From **diseases list (i.e. smallpox, cholera, plague and yellow fever)** to **all threats**
From **preset measures** to **adapted response**

15 June 2007 : Entry into force of IHR (2005)
2007 – 2009 : Assessment, development of national plan
2009 – 2012 : Implementation of national plan
(**Core capacity requirements** for surveillance and response)

FAO/OIE/WHO
GLEWS
GLOBAL EARLY WARNING SYSTEM

The Global Early Warning System (GLEWS)

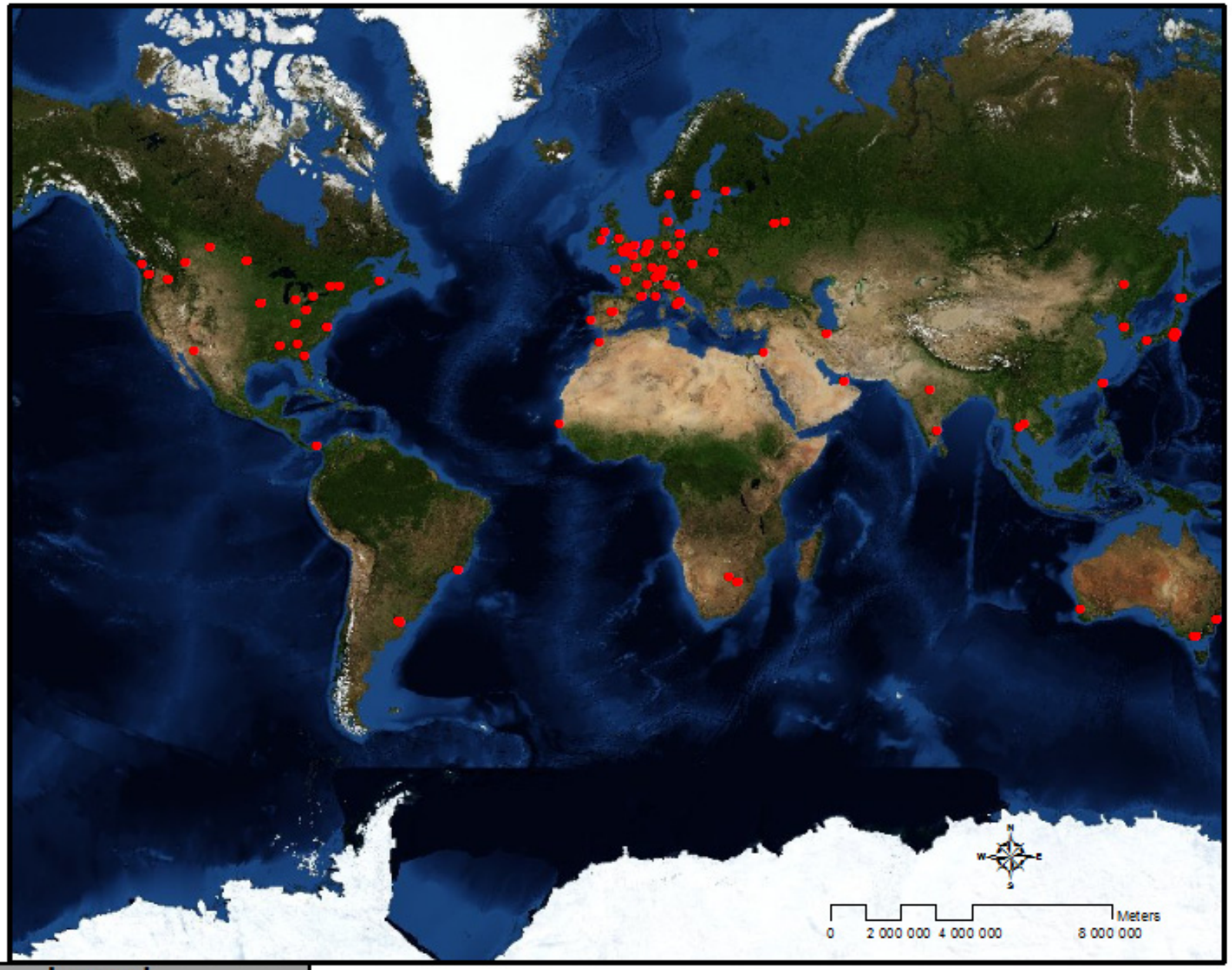
- **Joint disease tracking by OIE, WHO, and FAO**
- **Combines** and **coordinates** the alert and response mechanisms of OIE, FAO and WHO
- Assists in **prediction**, **prevention** and **control** of animal disease threats, including zoonoses
- Validation of rumours

International response

Network of expertise

To support surveillance and control
world wide

OIE REFERENCE LABORATORIES

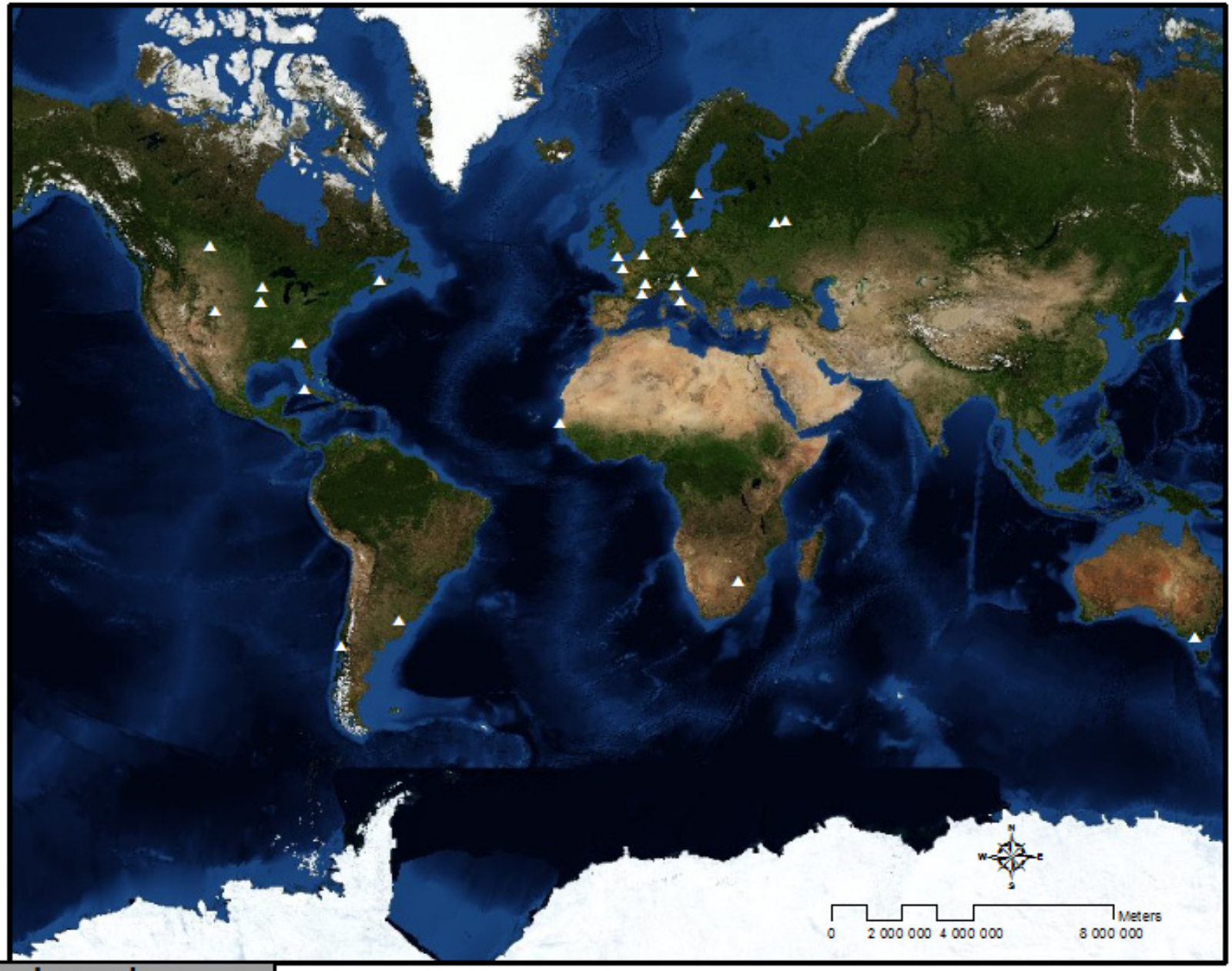


Legend

- OIE Reference Laboratories

mandate

OIE COLLABORATING CENTERS



mandate

Outbreak response

OIE network of expertise

- OIE Experts in
  - » Ref. Laboratories
  - » Collaborating Centres
- Technical support
- OIE expert missions
- OIE Reference Laboratory mandate ‘to place expert consultants at the disposal of the OIE’

Joint missions with FAO and WHO

- FAO-OIE Crisis Management Centre – Animal Health
  - » Rapid response capability

Crisis Management Centre – Animal Health

Function

Deploys **missions** and develops **tools**
to support veterinary services
responding to **disease emergencies**

Real example: pandemic H1N1

April '09: novel H1N1 virus with genes of avian, swine, and human origin causing infections in humans in North America with sustained human to human transmission

May '09: WHO warned of imminent publication of paper suggesting the virus has a laboratory origin

Within 24 hours key experts from WHO and OFFLU networks are mobilised to provide expert opinion in joint WHO-OFFLU telecon

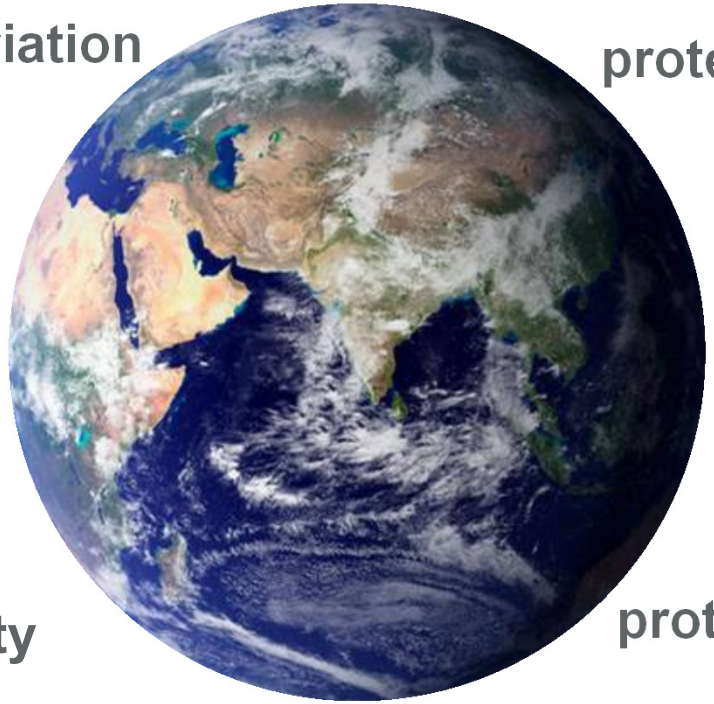
Conclusion: the hypothesis is flawed and the paper does not present scientific evidence to suggest the virus has a laboratory origin

Protection

Veterinary services are global public goods

poverty alleviation

protecting animal health



food security

protecting public health

market access

food safety

protecting animal welfare

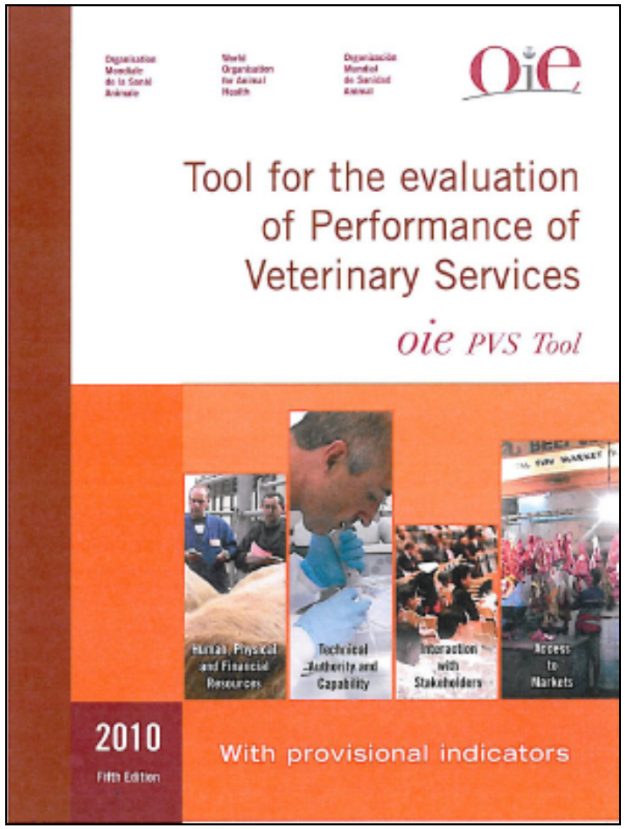
biological threat reduction

OIE Mechanisms

- Legally based disease reporting system
- International Standards (WTO backing)
  - Surveillance
  - Diagnosis and vaccine production
  - Trade measures to prevent spread of disease through trade
- Biosafety biosecurity
- Expertise
- Advocacy

Actions to strengthen Veterinary Services globally

The OIE-PVS Tool and Gap Analyses



Evaluate and improve the Performance of Veterinary Services

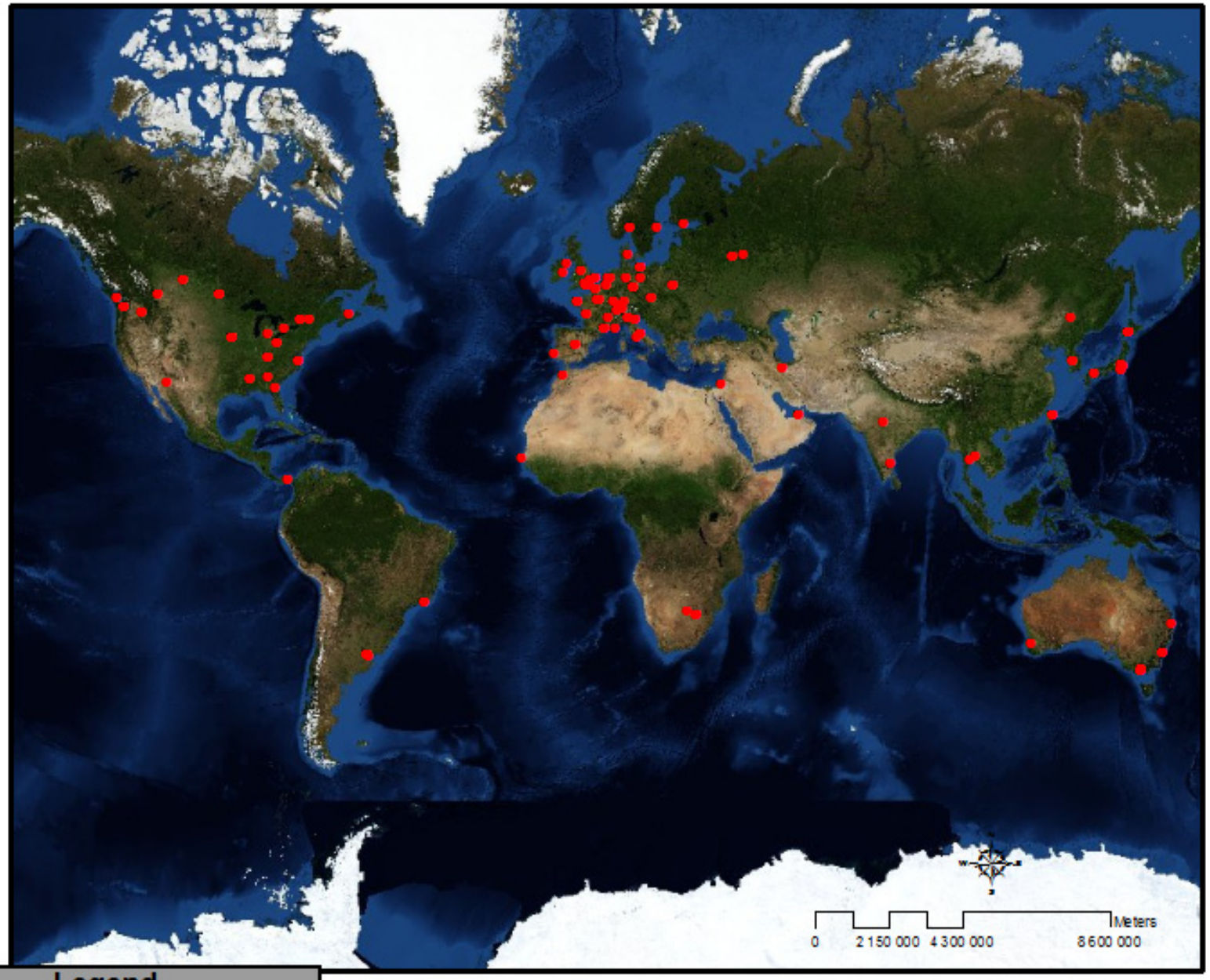
based on 46 core competencies

Improve compliance with OIE Standards

Follow-up:

- PVS monitoring
- Gap analyses
- Assistance with legislation

OIE REFERENCE LABORATORIES

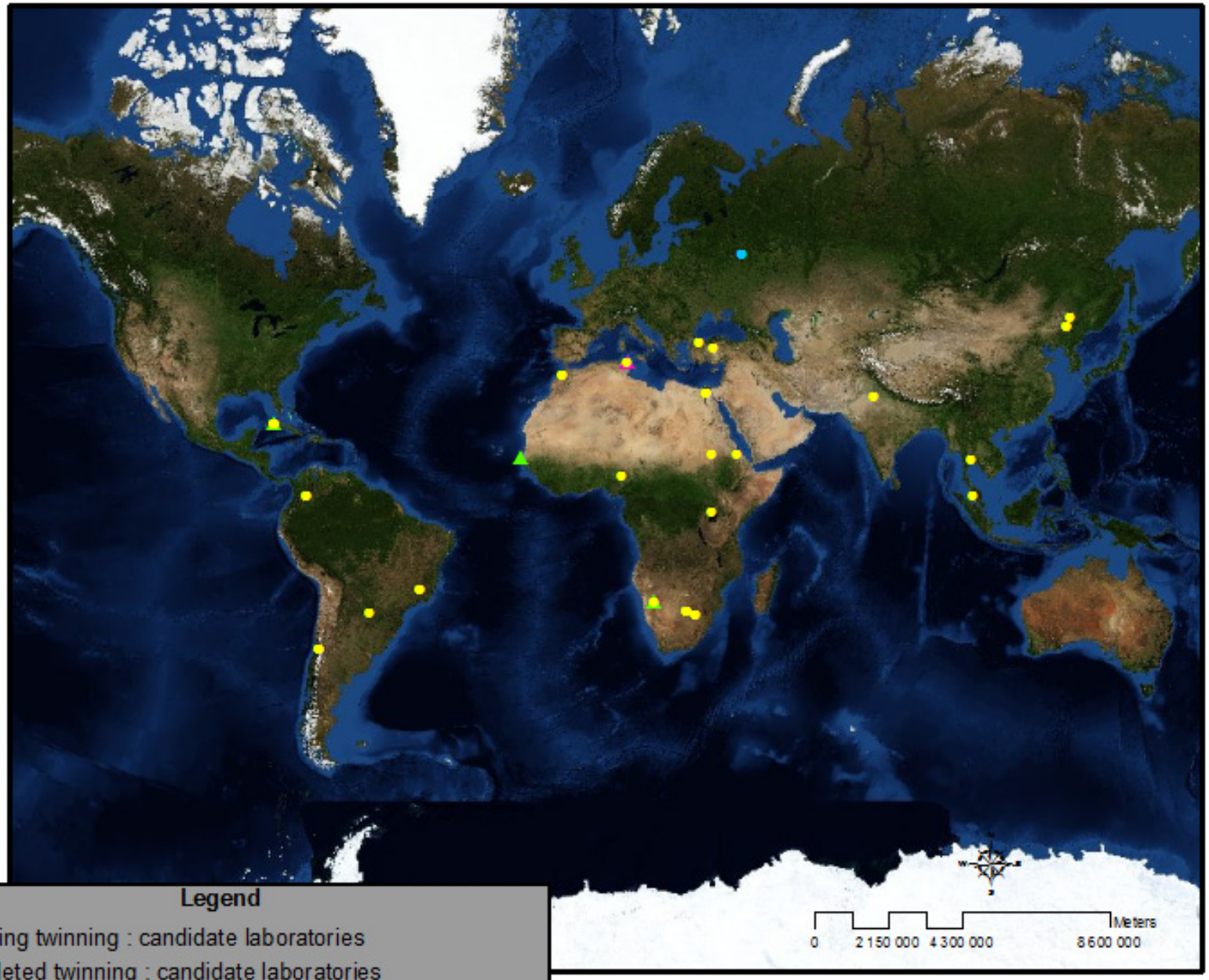


OIE Laboratory twinning

Aims

- Improve compliance with OIE standards
- Eventually for Candidates to apply for ‘reference’ status
- Extend the OIE network of expertise geographically

TWINNING : CANDIDATE LABORATORIES AND COLLABORATING CENTERS



OIE Twinning: *a valuable tool for regional development*

Trevor Drew, Tony Fooks & Judy Stack
Veterinary Laboratories Agency, United Kingdom

The Veterinary Laboratories Agency (VLA) is a UK Government institute, committed to improving animal and human health through control of important diseases. The UK government supports much of VLA's international activities through full sponsorship of its 15 OIE Reference Laboratories, as well as additional RL roles for other international bodies, where top-up funding is provided. In addition to providing ad hoc consultancy, expertise and diagnostic services, reagent supply and training, VLA is also actively engaged in the OIE "Twinning" scheme.

What is "OIE Twinning"?

The World Organisation for Animal Health (OIE) Reference Laboratories (RL) and Collaborating Centres (CC) provide a global service, providing member states with expertise and diagnostic capacity concerning diseases important to trade of livestock and related commodities.

OIE aims to enhance regional representation and development by establishing new RLs elsewhere in the world.

A key objective is sustainable capacity building.

- Links are made between an existing OIE RL or CC with a Candidate Laboratory (CL).
- Knowledge and skills are exchanged allowing the CL to develop capacity and expertise for a disease or topic that is a priority in its region.
- Eventually the CL will be able to provide support to other countries and may apply to become an OIE RL or CC.

Examples of planned activities under the scheme

We are privileged to have a Twinning project currently running with the Changchun Veterinary Research institute (CVRI), Jilin, P.R. China, on classical swine fever (CSF) and rabies.

The Chinese government is investing heavily in redevelopment of CVRI and other institutes. In addition to activities for specific diseases, the Twinning project includes input to the following areas:

- Facilities design
- Biosecurity and biosafety

Classical Swine Fever

Pig production in China provides a primary source of protein, as well as fulfilling an important societal role, providing a source of additional income for poorer families. Despite high vaccine coverage, outbreaks still regularly occur both in the village and commercial sector.

Prof Changchun Tu of CVRI supported by Profs Tony Fooks and Trevor Drew of VLA

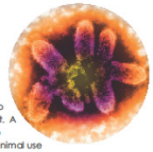
In January 2009, VLA staff visited CVRI to exchange information on scientific activities and to perform a "gap analysis" to prioritise future collaboration. Two Chinese scientists are due to visit VLA in the autumn to undertake two months training, in diagnosis and to carry out short research projects.

Additionally, it is anticipated that the close working relationship will provide opportunities for collaborative research, also with joint applications to international calls.

Priority areas for CSF include:

- Improved diagnosis
- Vaccine manufacture, quality and efficacy
- Molecular epidemiology
- Pathogenesis of diverse strains of virus

Rabies



Human rabies in China continues to rise exponentially, largely due to poor vaccine coverage in naïve dogs - 2.8% in rural areas. Tragically, victims are mainly children, which has profound societal impact. There is a lack of detailed surveillance information, but the high percentage of disease prevalence in dogs – up to 6.4% - confirms that they a continual health threat. A recent collaboration between CVRI and VLA also indicated that the quality of rabies vaccines for animal use did not satisfy the efficacy requirements for fully eliminating rabies from the dog population. These are likely the major factors that result in the high incidence of human rabies in China. Priorities therefore include:

- Implementation of diagnostic testing for rabies
- Validation of in-house diagnostic tests for rabies
- Participation in proficiency schemes and ring trials for internationally approved diagnostic tests for rabies
- Epidemiological surveys of rabies in humans and animals
- Development of oral recombinant vaccines for dogs
- Evaluation of the vaccination coverage in community-owned dogs
- Studies of vaccine-elicited immunity in community-owned dogs
- Assessment of rabies vaccine quality for animal use

Brucellosis

We are currently working closely with the Pendik Veterinary Control and Research Institute (PVCRI) in Turkey on brucellosis. Brucellosis is one of the most important bacterial zoonoses worldwide, causing abortion and infertility in livestock. It is endemic Turkey where it causes important economic, veterinarian and some public health consequences. The Twinning project includes the following topics to enhance the diagnostic capability of PVCRI.

A poster on brucellosis on display in PVCRI Turkey

- Preparation of National & Working Standard Sera to improve & monitor the quality of diagnostic tests.
- Application of molecular techniques to obtain more details on epidemiological situation.
- Antigen production.
- Exchange material and samples to ensure harmonisation.

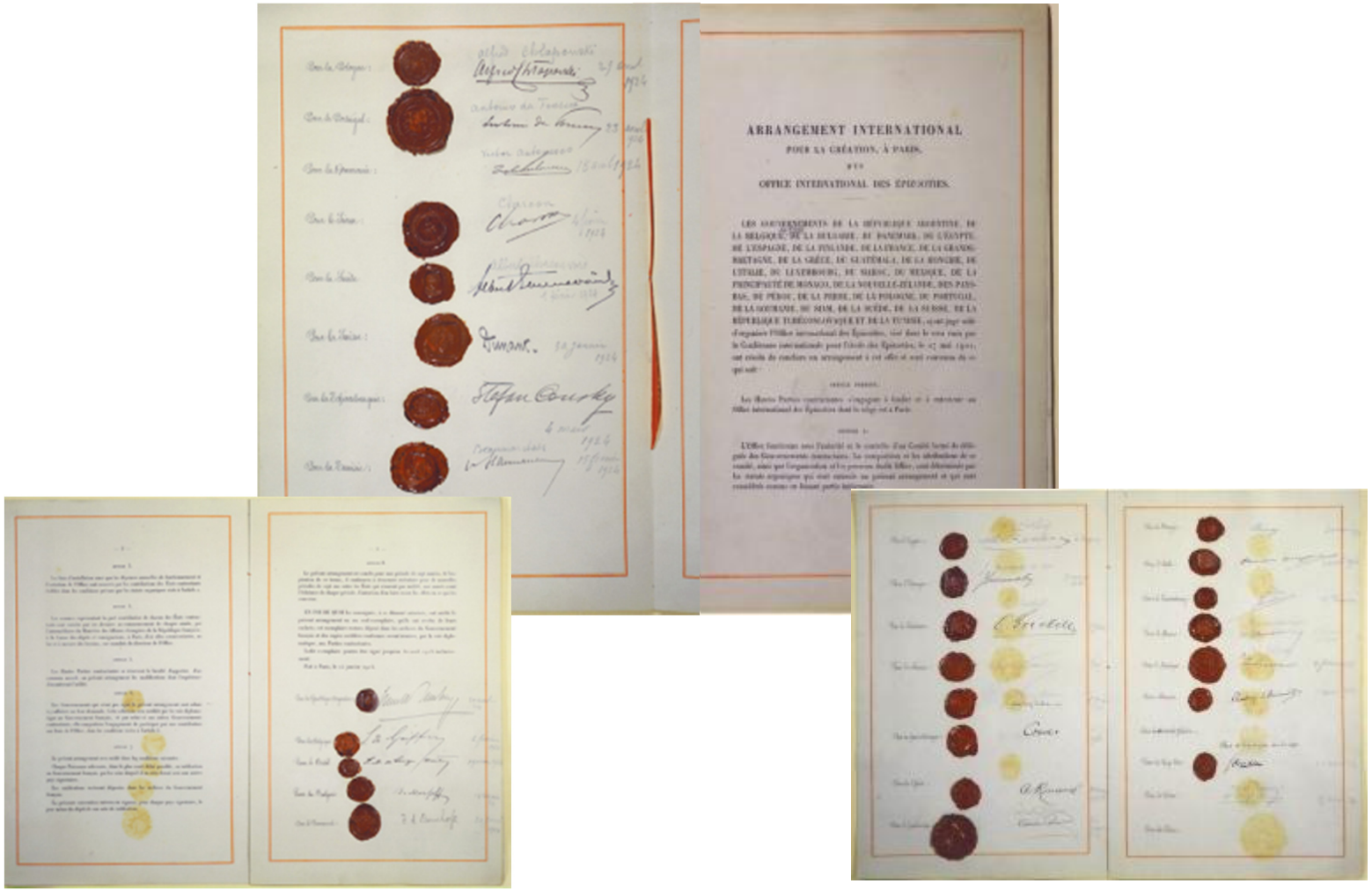
We have already held two meetings where we spent valuable time in eachothers laboratories, exchanged presentations on the skills within both institutes and examined antigens and reference sera according to OIE Manual of Diagnostic Tests & Vaccines.

Future Activities

Twinning with the brucellosis group at The Central Veterinary Research Laboratories Centre, Khartoum, Sudan is in the early stages of development. Future VLA objectives for Twinning are to establish the Botswana National Veterinary Laboratory as a regional centre for Avian Influenza and Newcastle Disease diagnosis and to establish an OIE Avian Influenza and Newcastle Disease Reference Laboratory at the Onderstepoort Veterinary Institute in South Africa.

http://www.oie.int/en/support-to-oie-members/laboratory-twinning/

1924



ARRANGEMENT INTERNATIONAL

POUR LA CRÉATION, À PARIS,

D'UN

OFFICE INTERNATIONAL DES ÉPIZOOTIES.

KH1

Destruction and sequestration of rinderpest - OIE and FAO Resolutions

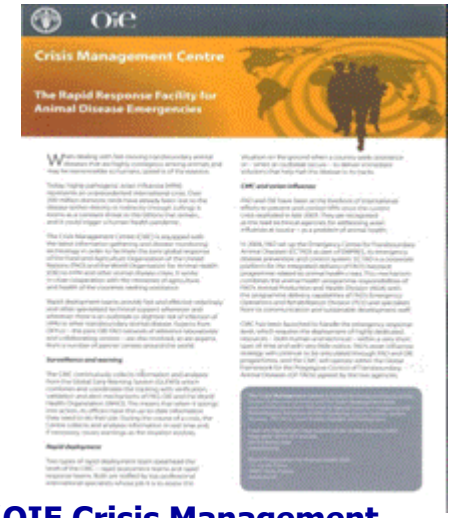
- Members to maintain vigilance and awareness – surveillance and reporting
- Members to reduce number of institutions holding virus world wide
- Members to destroy rinderpest containing material or transfer to approved biosecure storage facility
- OIE-FAO approval of facilities storing virus, monitor these facilities, and to approve research using rinderpest

Diapositive 30

KH1

Vaccine and virus - worry re contaimnation?
Questionnaire results
Work of RVC
Keith Hamilton; 27/06/2011

The OIE - a global partner in the promotion of animal health and food security



- **FAO/OIE Crisis Management**
- **Center**