

Vector-borne diseases, international standards and WOAH current work

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FESASS General Assembly
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Brussels - Belgium

Thanks to Denise Dubois, Gregorio Torres, Francisco d'Alessio, Paolo Tizianni, Francesco Valentini, Chadia Wannous



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for Animal
Health

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mondiale
de la santé
animale

Organización
Mundial
de Sanidad
Animal

Epidemiological data



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animale
Fondée en tant qu'OIE

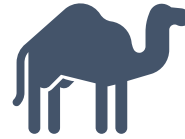
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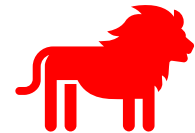
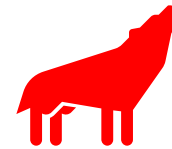
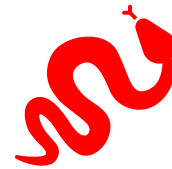
**121 listed diseases
Domestic animals
and wildlife**

**3 Emerging
diseases**

183 Members



**53 Non-listed
diseases in
wildlife**





Reporting LISTED Diseases



User-friendly, intuitive, time-efficient



High resolution dynamic mapping



Open access to WAHIS data



<https://wahis.woah.org>

Facilitates reporting, promotes the use of data



- EIOS system for epidemic intelligence
- Daily screening of the web for all listed diseases
- Communication between WOA and Members

The screenshot displays the EIOS monitoring interface. At the top, it shows navigation tabs for Monitoring, Documents, Dashboards, Training, Communities and Teams, and Help and Feedback. The main content area is titled 'Board: OIE_Diseases' and features a search bar, a 'Filter definition' button, and a 'TOTAL ARTICLES' counter showing 119k. Below this is a world map with numerous black circular markers indicating disease locations. To the left of the map is a time-series chart showing activity from 2014 to 2022, with a search bar for text within articles. Below the chart are date range filters and a 'Display stats and filter by' dropdown. At the bottom, there is a list of news articles with columns for language, title, categories, and location. The browser's taskbar at the very bottom shows open files like 'gadm40_ETH_shp.zip' and 'Ethiopia_25022022.xlsx'.



WAHIS – Data collection

**121 listed diseases
Domestic animals
and wildlife**

**3 Emerging
diseases**

183 Members

Early warning system



Immediate notifications
Follow-up reports
Final reports

Monitoring system



Six-monthly
reports

WOAH-listed diseases

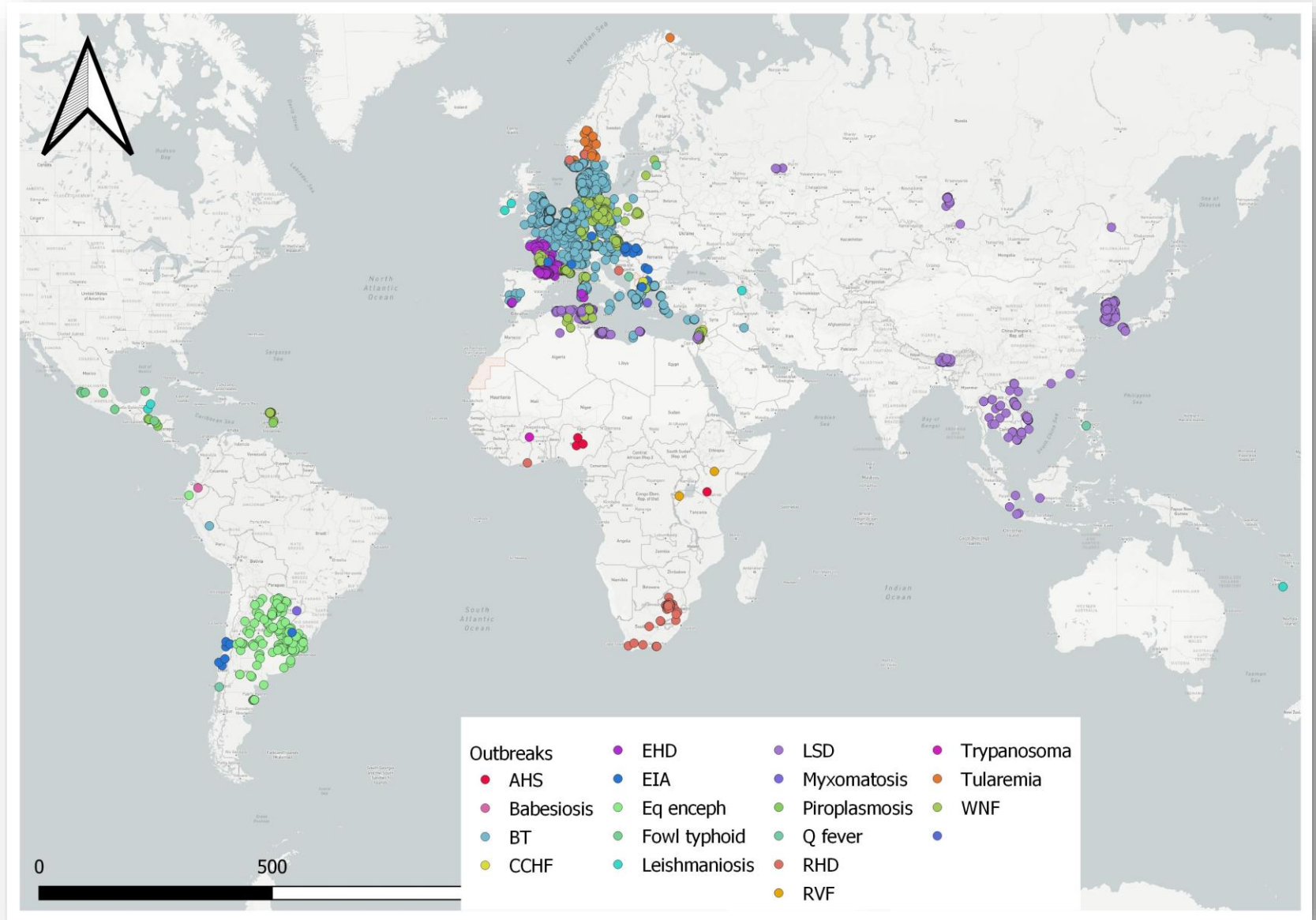




Reporting Diseases



6,969 Obs
67% in Europe

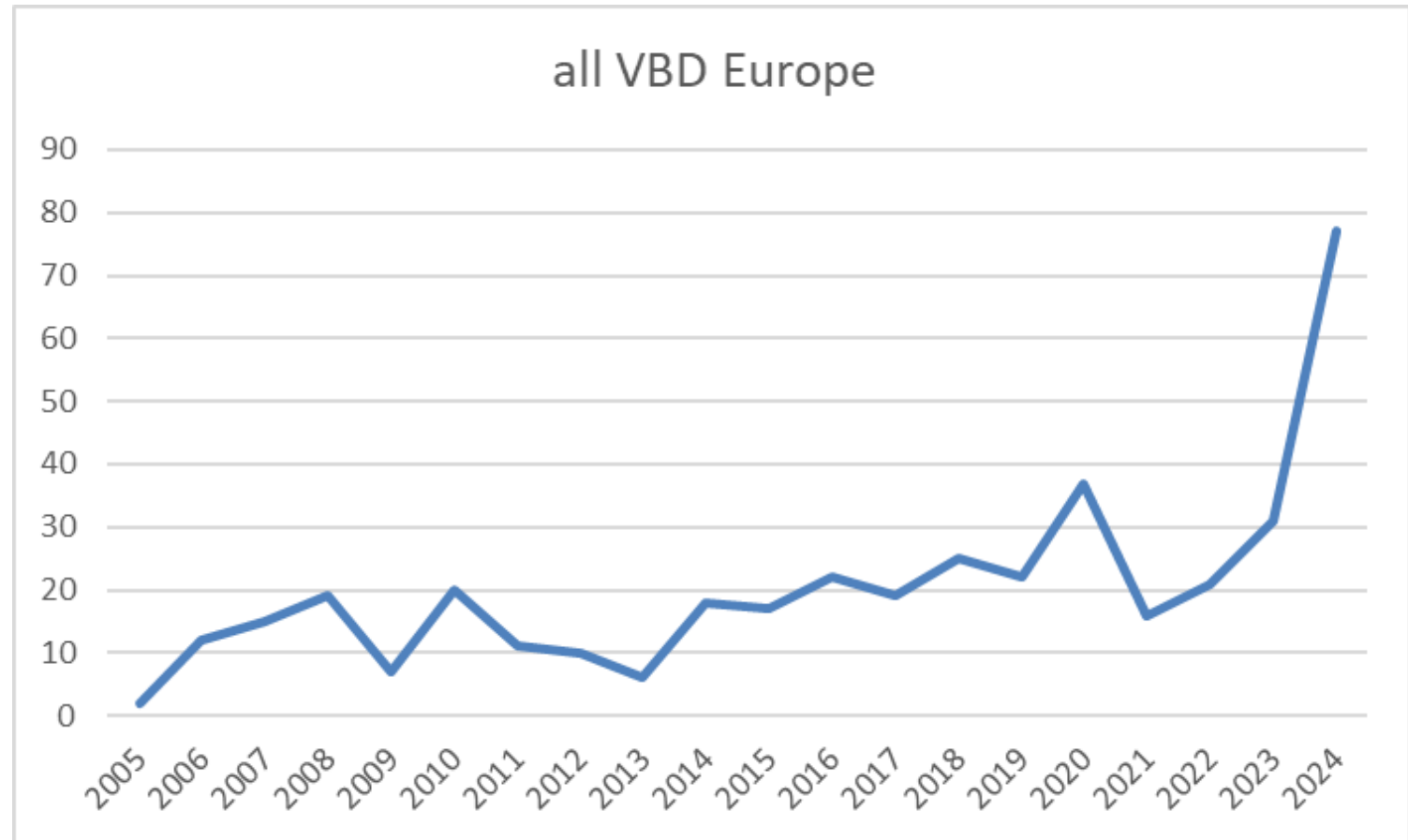
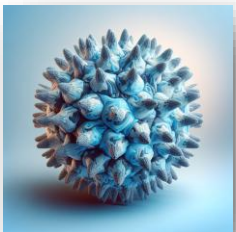




Reporting Diseases



2 in 2005
77 in 2024



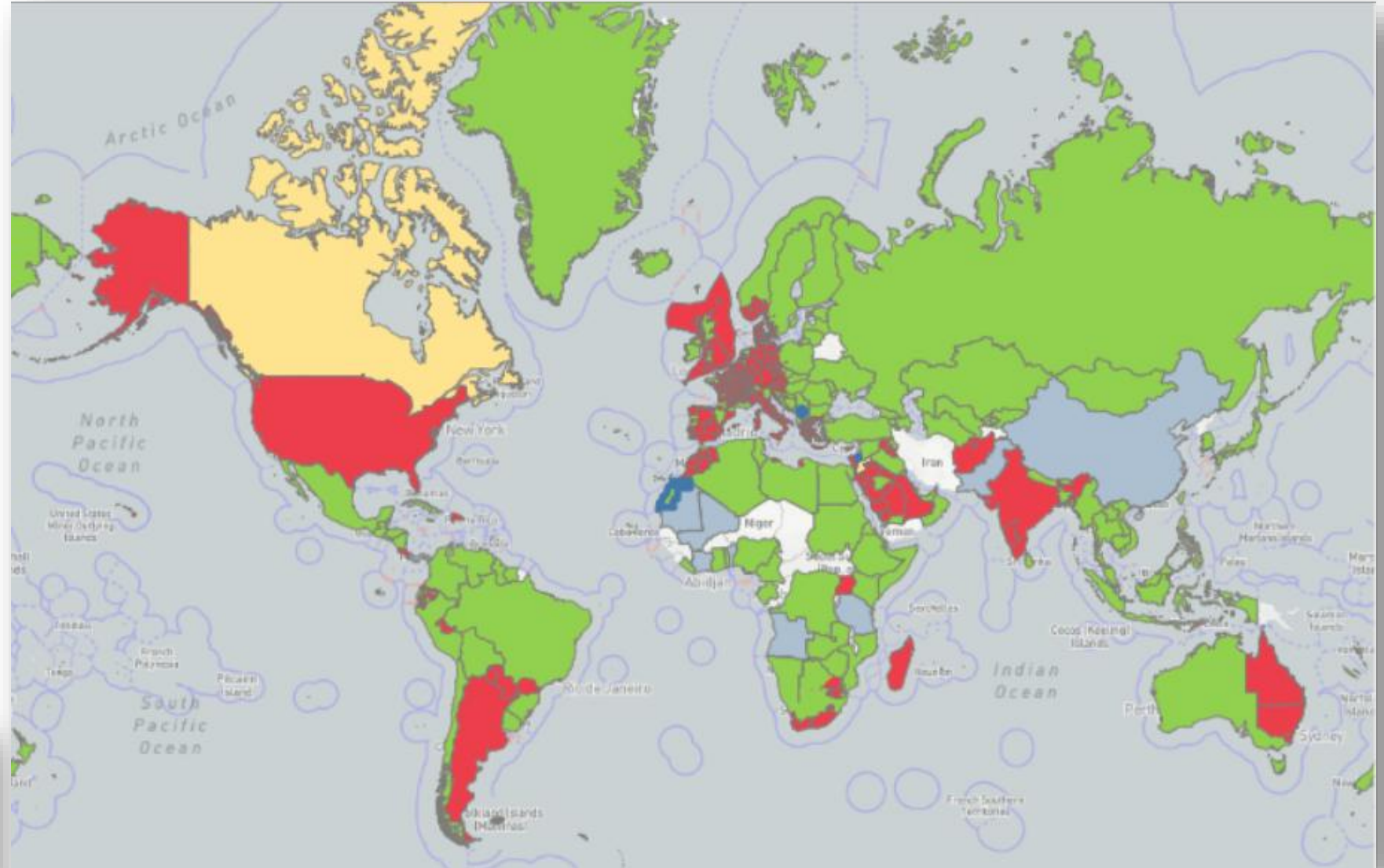


Reporting Diseases



49 countries and territories reporting the disease present
21 in Europe

- No report available or no outbreaks were reported in the area for a disease present in the country
- No information provided in report for selected disease(s)
- Absent in the country
- Suspected
- Present

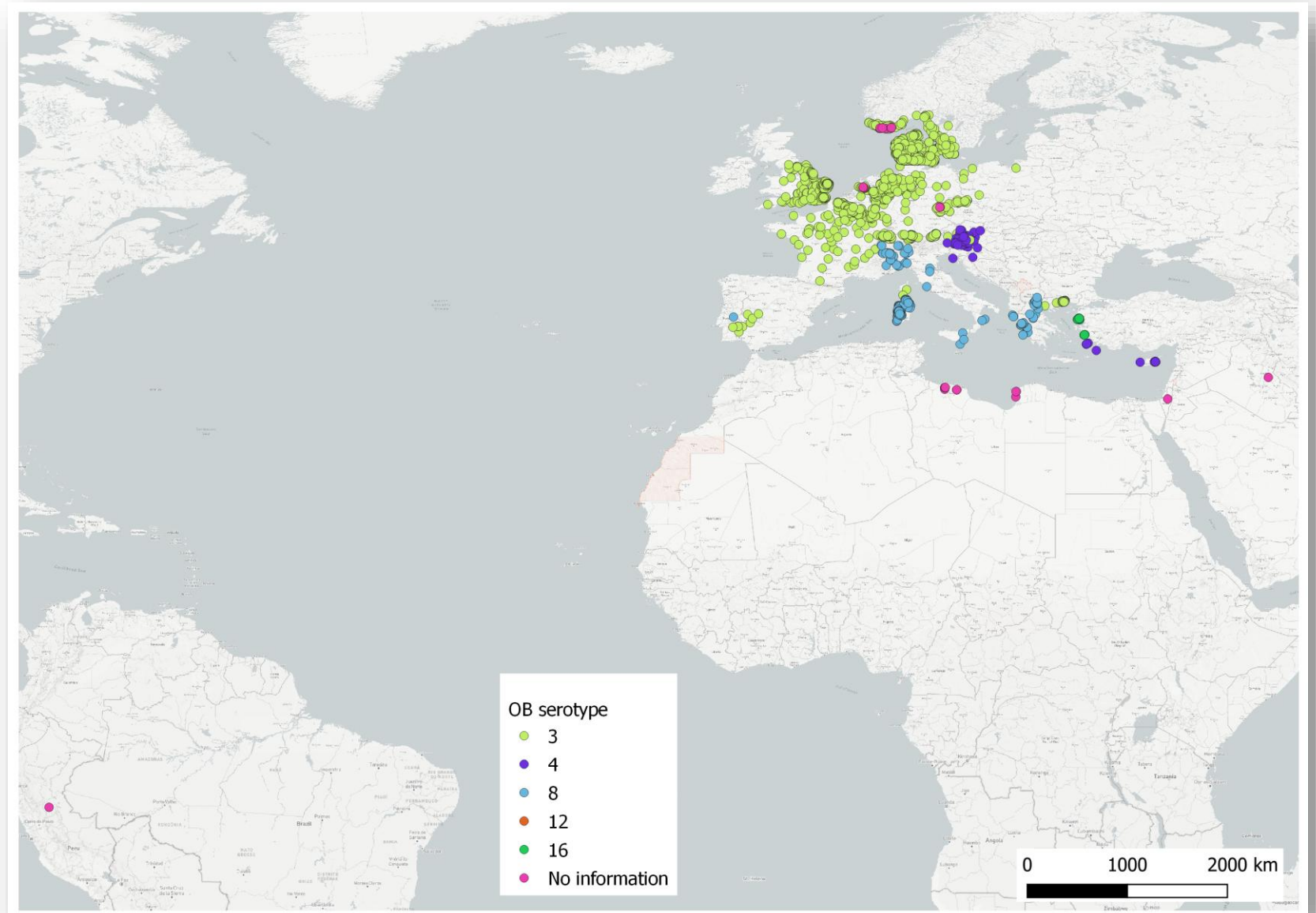




Reporting Diseases



3,900 Obs
99.5% in Europe
81% serotype 3



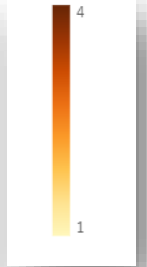
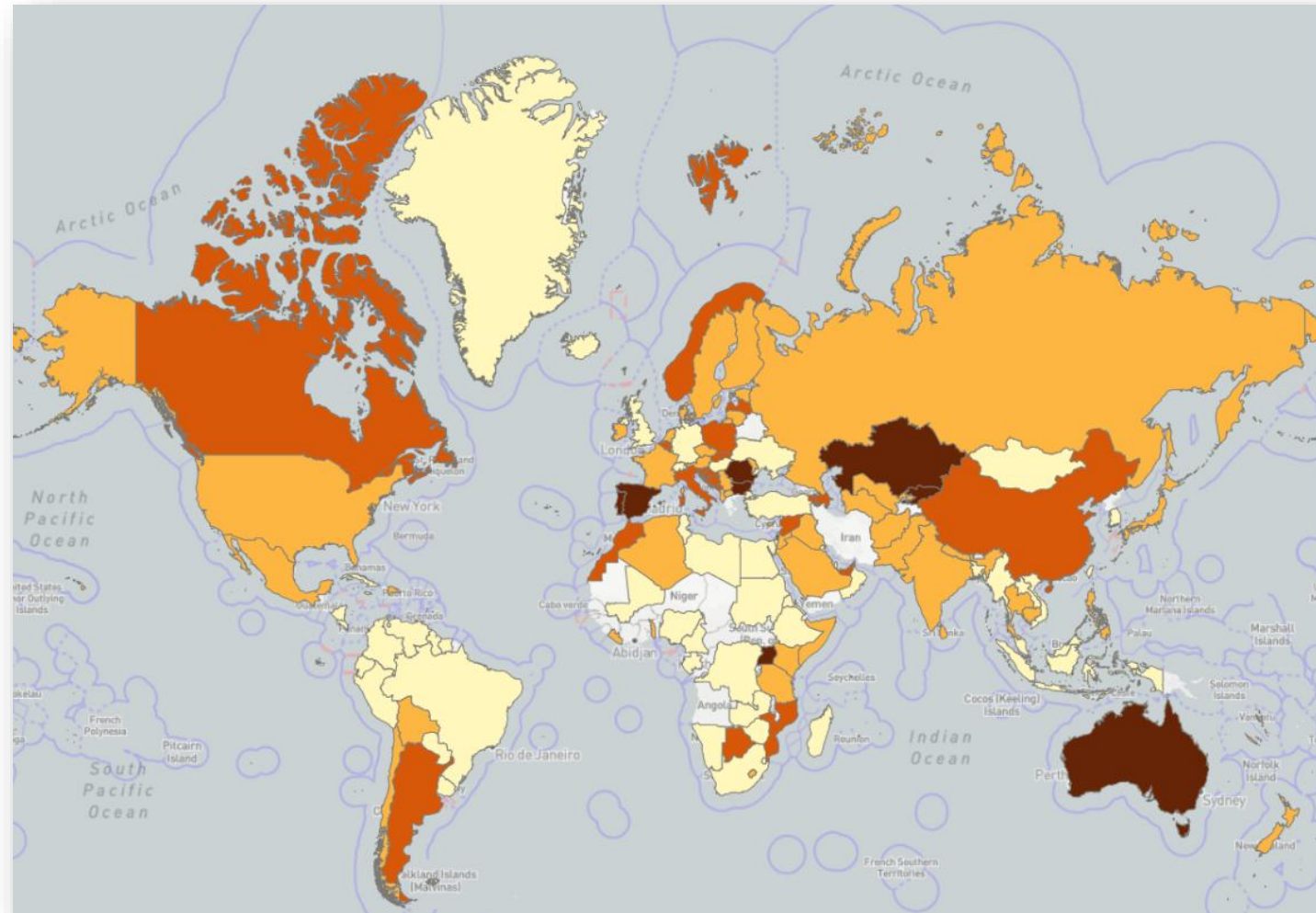


Reporting Diseases



144 countries and territories reporting any surveillance in place*

40 in Europe



* General surveillance, Targeted surveillance, Screening, Monitoring



Policy to Action: Vaccine and vaccination. Reflections for change

- Platform for dialogue (WOAH Delegates, subject matter experts, civil society and private sector)
- On the barriers that are currently impeding the development and use of vaccines in disease prevention and control strategies.
- With the objective to establish a 2–3-year roadmap with concrete actions.

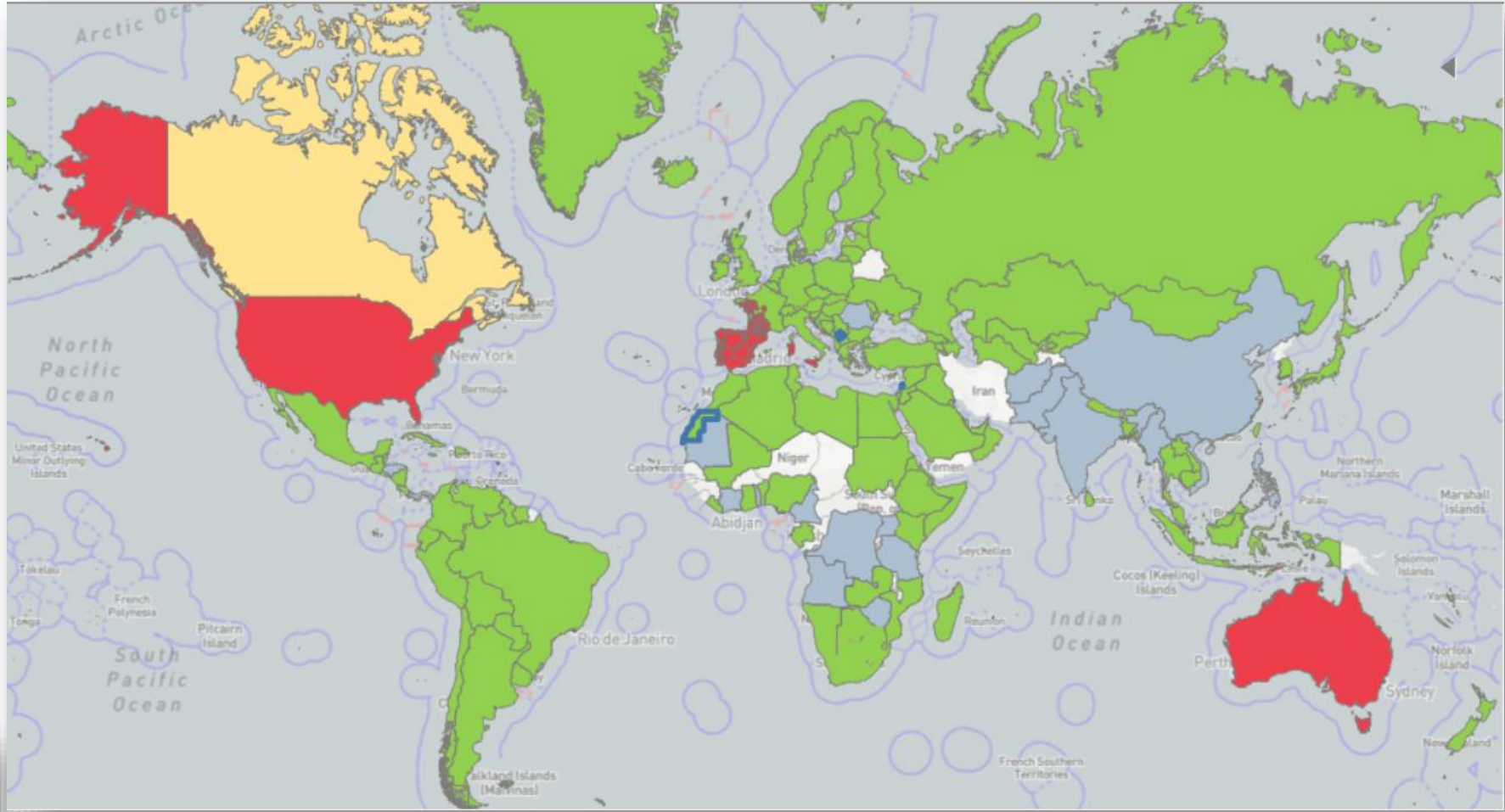
*BTV-3 outbreak in Europe was a factor that influence the choice
of this year Animal Health Forum*



Reporting Diseases



11 countries and territories reporting the disease present
4 in Europe



- No report available or no outbreaks were reported in the area for a disease present in the country
- No information provided in report for selected disease(s)
- Absent in the country
- Suspected
- Present

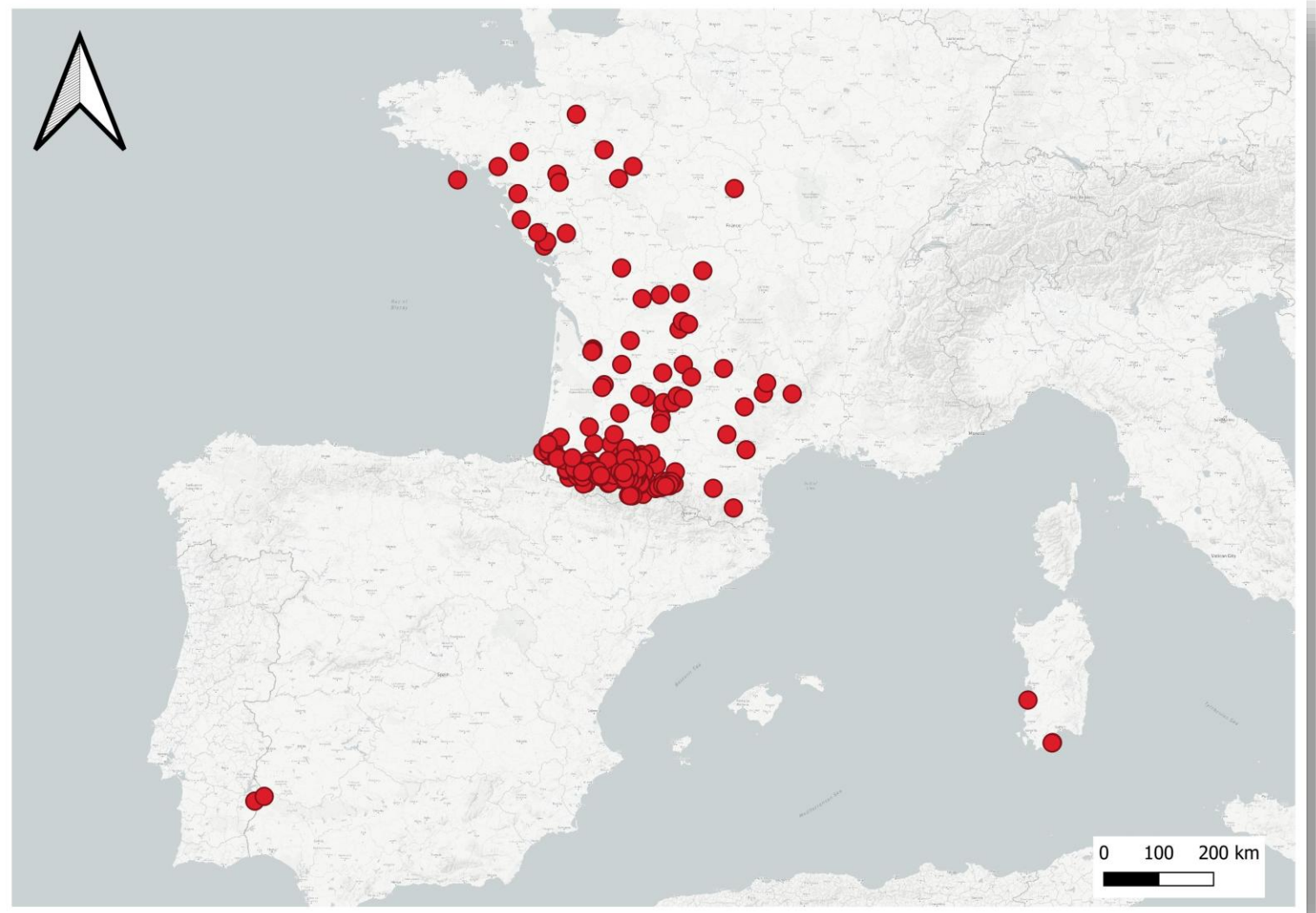




Reporting Diseases



249 Obs
100% in Europe



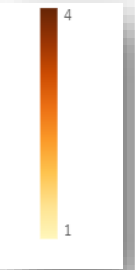
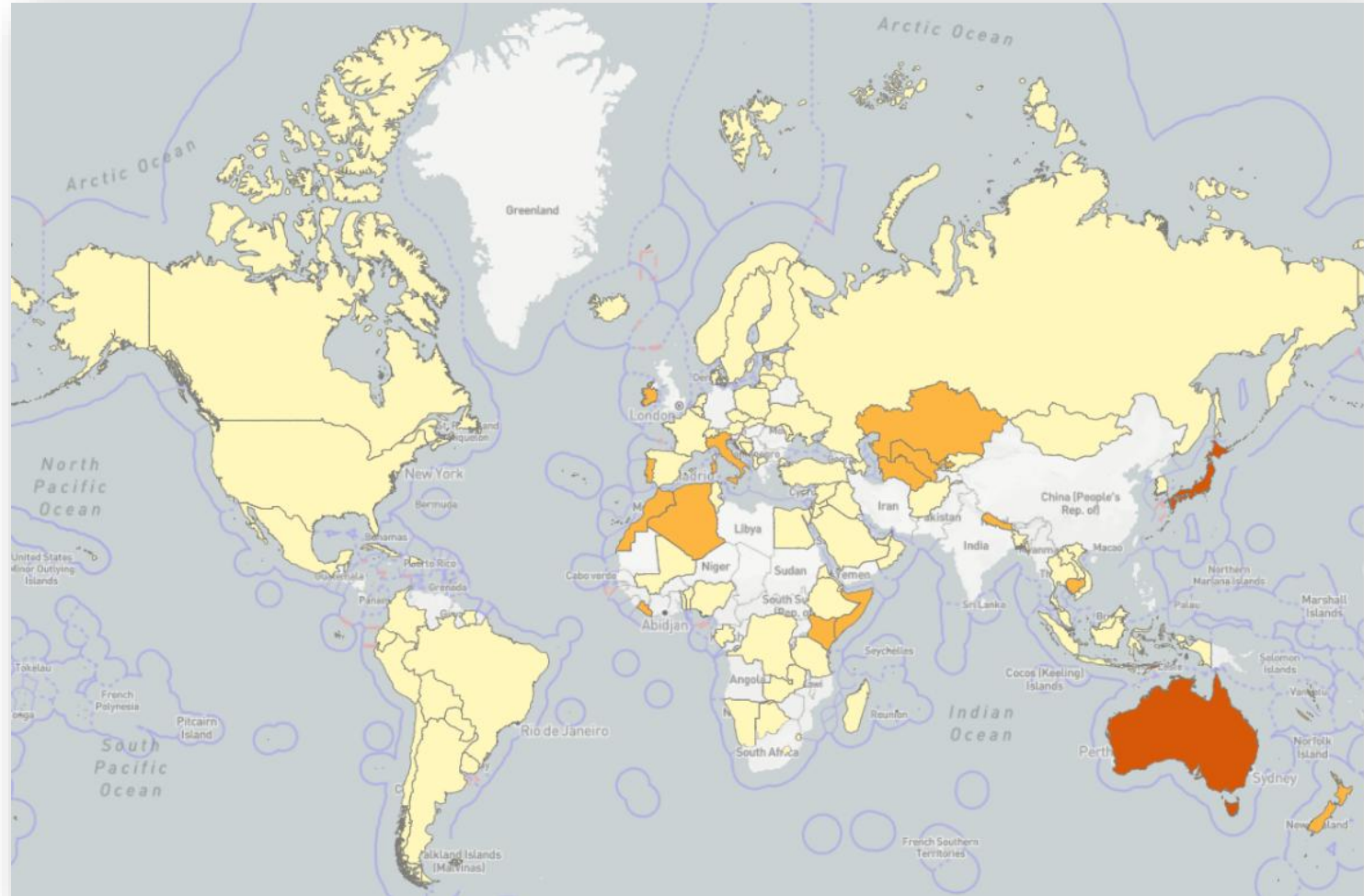


Reporting Diseases



114 countries and territories reporting any surveillance in place*

31 in Europe



* General surveillance, Targeted surveillance, Screening, Monitoring



- High quality data to make informed decision
- Effective response requires strong surveillance and report systems integrating human, animal and entomology components
- Common disease indicators and technology to collect, analyse data from human and animal health systems
- Transparency: Sharing disease intelligence in a timely manner to support Health Authorities in their risk management process
- Comprehensive surveillance Monitoring & Evaluation framework to improve health risk management strategies

Data -> Information -> Knowledge -> Decision

WOAH Standards and vector borne diseases



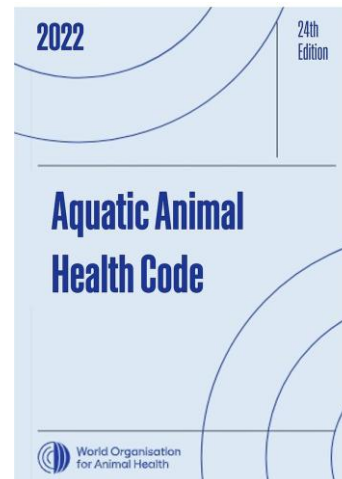
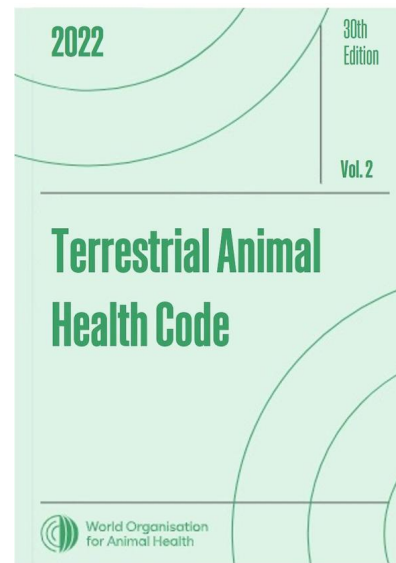
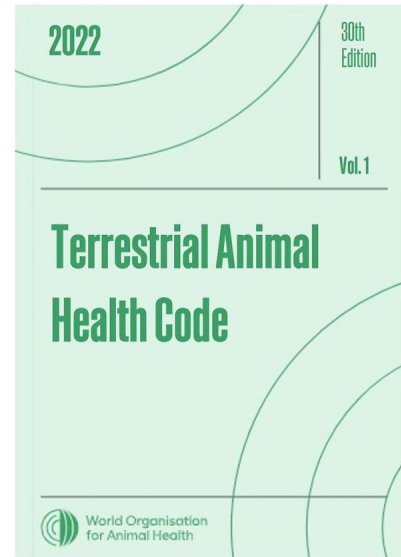
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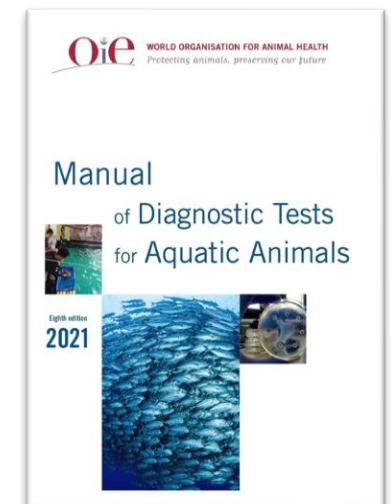
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WOAH international standards

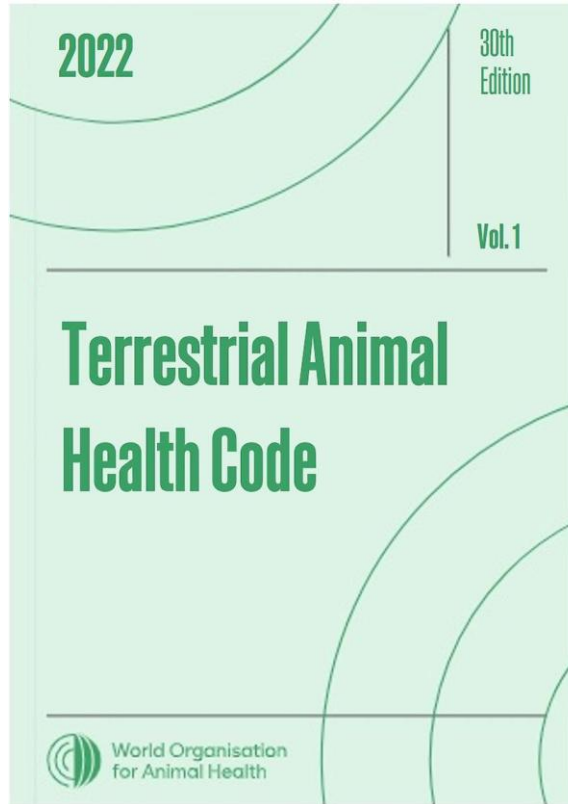
Codes



Manuals

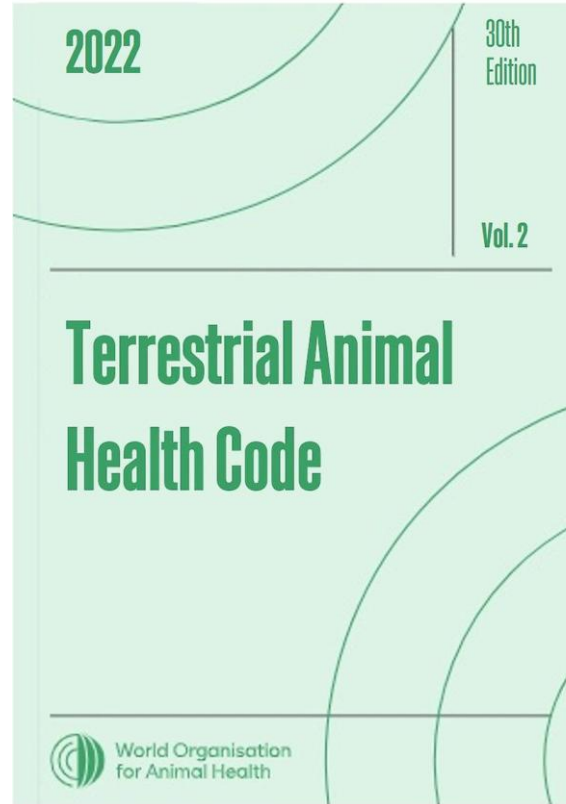


Terrestrial Code



Volume I

User's guide and
Horizontal chapters



Volume II

Disease-specific
chapters

- New version every year
- Latest version publicly available on the WOAH website
- Previous editions are also available



- **Vector**

means an insect or any living carrier that transports an infectious agent from an infected individual to a susceptible individual or its food or immediate surroundings. The organism may or may not pass through a development cycle within the vector.

- **Infestation**

means the external invasion or colonisation of animals or their immediate surroundings by arthropods, which may cause clinical signs or are potential vectors of pathogenic agents.

- **Official control programme**

means a programme which is approved, and managed or supervised by the Veterinary Authority of a Member Country for the purposes of controlling a vector, pathogenic agent or disease by specific measures applied throughout that Member Country, or within a zone or compartment of that Member Country.



SECTION 1. ANIMAL DISEASE DIAGNOSIS, SURVEILLANCE AND NOTIFICATION

- Chapter 1.1.** Notification of diseases and provision of epidemiological information
- Chapter 1.2.** Criteria for the inclusion in the WOAHA list
- Chapter 1.3.** Diseases, infections and infestations listed by WOAHA
- Chapter 1.4.** Animal health surveillance
- Chapter 1.5.** Surveillance for arthropod vectors of animal diseases

SECTION 4. DISEASE PREVENTION AND CONTROL

- Chapter 4.4.** Zoning and compartmentalisation
- Chapter 4.5.** Application of compartmentalisation
- Chapter 4.18.** Official control programmes for listed and emerging diseases



Chapter 1.5. **Article 1.5.1. Introduction**

(...)

- The Terrestrial Code contains recommendations for the **surveillance of several vector-borne diseases** and general recommendations for animal health surveillance.
- The need has arisen to complement these general recommendations on surveillance with advice on the **surveillance for vectors themselves**. This chapter only addresses surveillance for arthropod vectors.
- For the purpose of trade, it should be noted that **there is no conclusive relationship between the presence of vectors and the disease status of a country/zone**, and also that the apparent absence of vectors does not by itself confirm vector-free status.

(...)



Chapter 1.5. **Article 1.5.2. Objectives**

(...)

- 1) **gathering up-to-date information** on the spatial and temporal distribution and abundance of vectors of the arthropod-borne listed diseases and emerging diseases;
- 2) **monitoring changes** in the spatial and temporal distribution and abundance of these vectors;
- 3) collecting relevant data to **inform risk assessment** (including vector competency) and risk management of these vector-borne diseases;
- 4) **detecting the presence of specific vectors or confirming their absence**;
- 5) understanding **pathways of entry** for vectors and vector-borne pathogenic agents.

(...)



VBD

- **Definition of disease occurrence**

Detection of the pathogenic agent in an animal (not vector)

- **Animal health status**

Vector Surveillance – presence/absence of vector

Seasonal Freedom

High surveillance area bordering infected country or zone

- **Protection of animals from vectors**

vector-protected establishment or facility

during transport

- **Vector related sanitary measures for trade**

Free of ticks - treatment

Protection from vector attacks during transport/transit

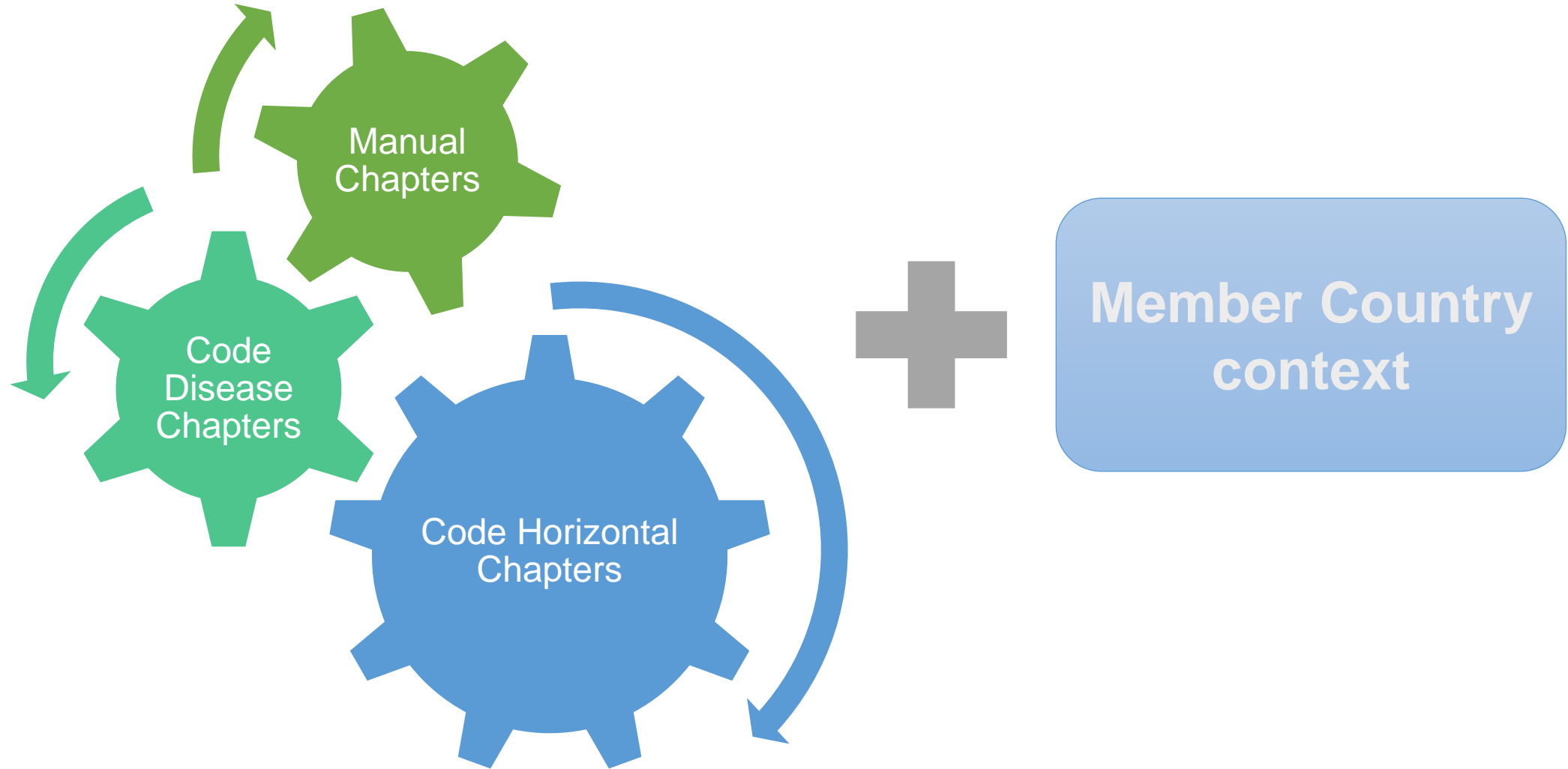


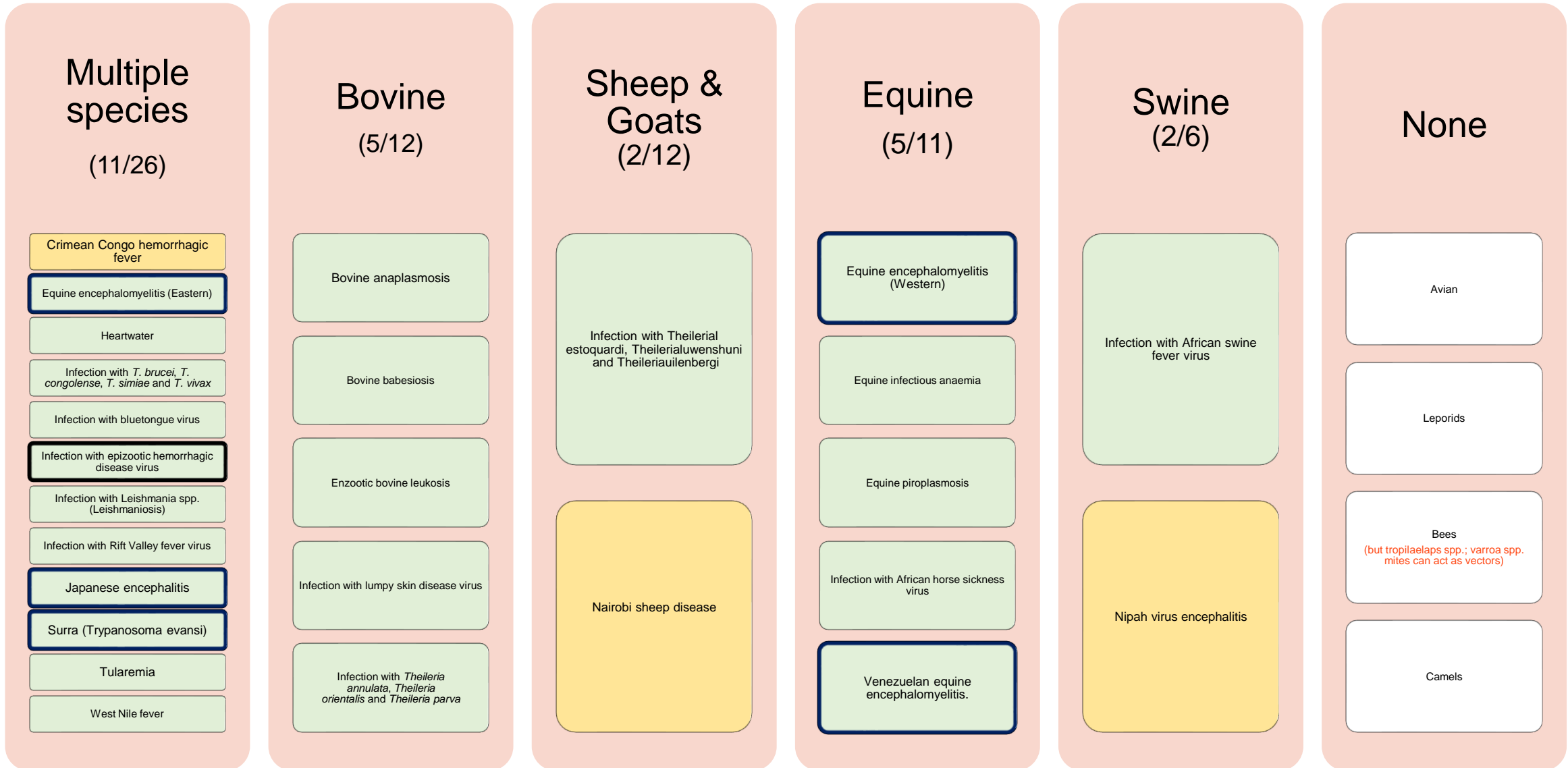
Complementary Chapters – Regularly updated

1. Standards for diagnosis and vaccines
2. Epidemiological information
3. Detailed information on vectors, vector species, etc



Using the WOAAH international standards





Terrestrial Code Chapter exists

Chapter under revision

In preparation

The PROVNA project

Defining Ecoregions and Prototyping an EO-
based VBDs Surveillance System for North
Africa



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Overview – “phase 1”



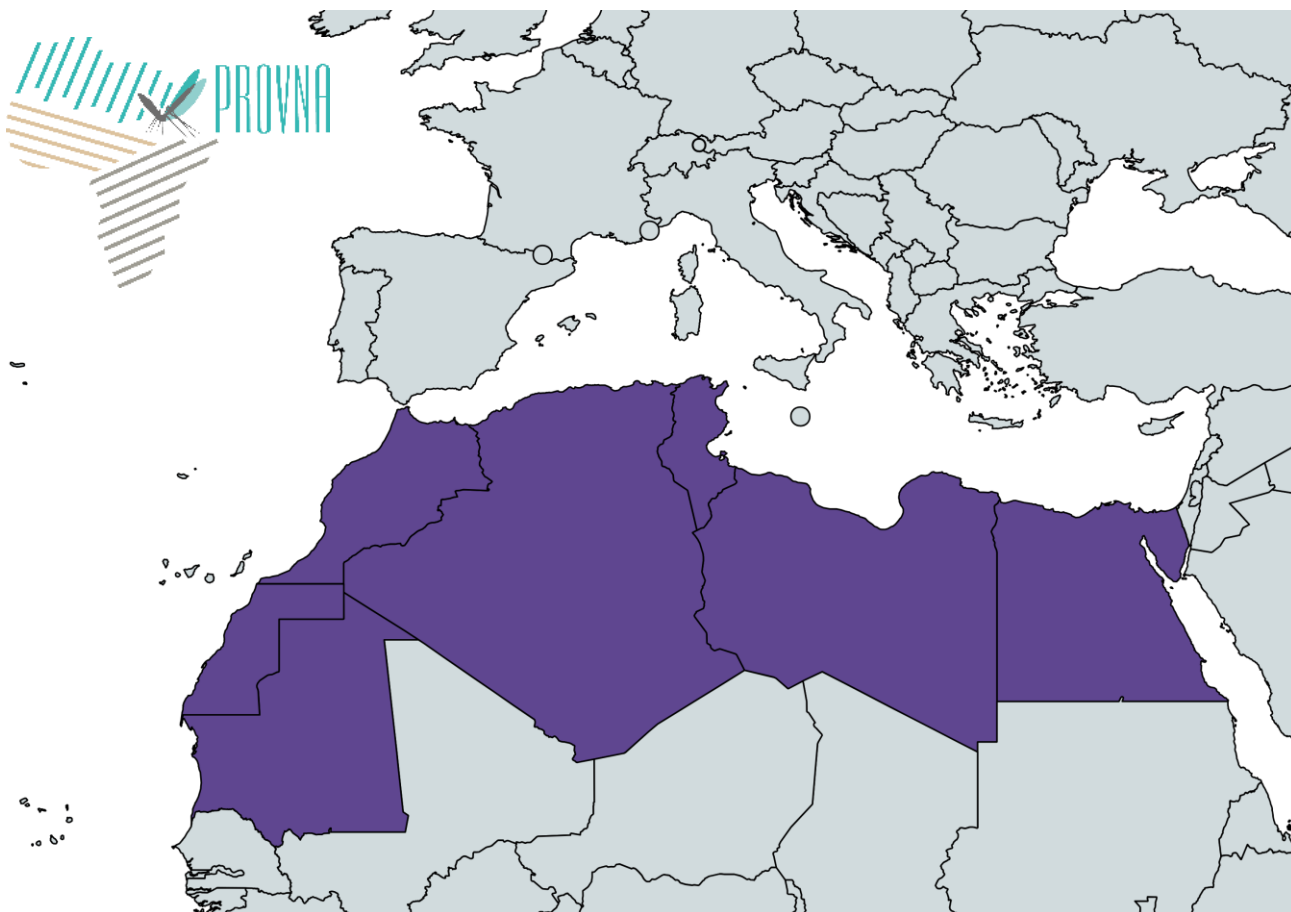
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DELL'ABRUZZO
E DEL MOLISE
"G. CAPORALE"



THE UNIVERSITY OF
TENNESSEE
KNOXVILLE



START: 26/04/2022 (proposal 17/02/2022)

END: 31/10/2023 – 18 months

No cost extension: 30/06/2024

Total budget: ≈ 160.000 €



PC-TAD



Federal Ministry
for Economic Cooperation
and Development

BMZ



General objective:

Supporting the local competent authorities in North Africa for the identification of specific areas on which to carry out entomological/serological surveillance for vector-borne diseases.

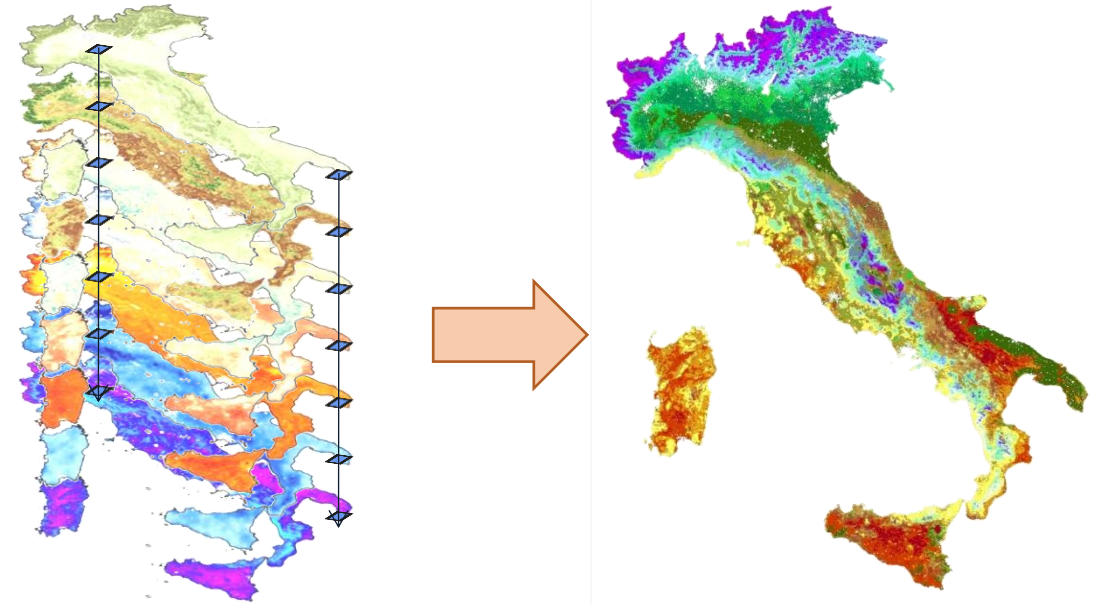
2 Specific objectives:

- To define the “**ecoregions**” of the North African territory, characterized by distinct environmental and climatic factors
- To build a **customised prototype application** to identify areas at risk for VBDs in North Africa region.

RVF

Eco-regionalization

The process through which a territory is classified into similar areas (“**ecoregions**”) according to specific environmental and climatic factors (e.g., elevation, vegetation, rainfall, temperature).



Ippoliti et al, 2019. PLoS ONE 14(7): e0219072



Overview and objectives – “phase 2”



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E DEL MOLISE
"G. CAPORALE"

| |
|------------------------------------|
| START: September 2024 |
| END: January-May 2026 |
| Total budget: ≈ 400.000 USD |



General objective:

To establish a risk-based surveillance system across North Africa, using the eco-regionalization method, to monitor the emergence and spread of key animal and zoonotic diseases transmitted by mosquitoes.



Specific objectives:

- • To **strengthen the capacity** of National Veterinary Authorities in North Africa for monitoring mosquito-borne diseases.
- • To **develop standardised protocols** for the **diagnosis** and **surveillance** at national level of mosquito-borne diseases in North African countries.
- • To **promote the use of a risk-based approach** in the surveillance of mosquito-borne diseases in North Africa.
- • To **provide** the National Veterinary Authorities of North African countries with **decision-support tools** capable of integrating satellite data characterising the various eco-regions with data collected through in- field surveillance activities.



Project activities will be carried out by 6 work packages :

- WP0 - Coordination, networking, dissemination
- WP1 - Gap analysis and needs assessment
- **WP2 - Definition of surveillance protocols**
- **WP3 - Capacity building activities**
- **WP4 - In-field monitoring**
- WP5 - Modelling

➤ Country-specific on-field surveillance activities

- Entomological/Serological
- Disease present/absent

Ad-hoc online meetings + field missions

➤ Material

- Mosquito traps
- Laboratory reagents
- Samples shipment

➤ Trainings

- Online
 1. Epidemiology: use of satellite data
 2. Entomology: sampling/use of traps
 3. Virology:
 - Sequencing
 - Sampling/shipment
- In-person
 1. Epidemiology: GIS
 2. Entomology: analysis of captures / vector identification
 3. Virology: molecular biology on collected samples

The PROVBA project in Europe



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General objective:

To establish a risk-based surveillance system for priority vector-borne zoonotic diseases in Western Balkans and Caucasus based on ecoregions characterization through earth observation data collected from satellites.



Duration: 12 months

Focus: West Nile Fever and Crimea-Congo hemorrhagic fever

5 Work Packages:

- **Coordination, networking, dissemination**
- **Collection of data available**
- **Earth Observation data needed for the identification ecoregion**
- **Eco-regionalization**
- **Maps evaluation for WNF and CCHF**

Total budget estimate: ≈ 165.000 €

Albania, Bosnia and Herzegovina, Georgia, Montenegro,
North Macedonia and Serbia



Memorandum of intent

European Space Agency – WOAAH

Use of Earth Observation to Monitor Health Risks at the Animal-Human-Ecosystem Interface

General objective:

Successful cooperation in the use of space-based data, technologies, systems and services to monitor environmental factors influencing animal health, including zoonotic and VBDs.

Initial focus:

- ✓ How to develop and apply predictive models for VBDs (using EO data, AI and machine learning)
- ✓ How to apply EO data to identify and mitigate health risks associated with environmental changes
- ✓ How to enhance stakeholders' decision-making using the OH approach through the integration of EO data, modelling tools and visualisation capabilities

STAR-IDAZ:

**Global Strategic Alliances for the
Coordination of Research on the Major
Infectious Diseases of Animals and
Zoonoses**



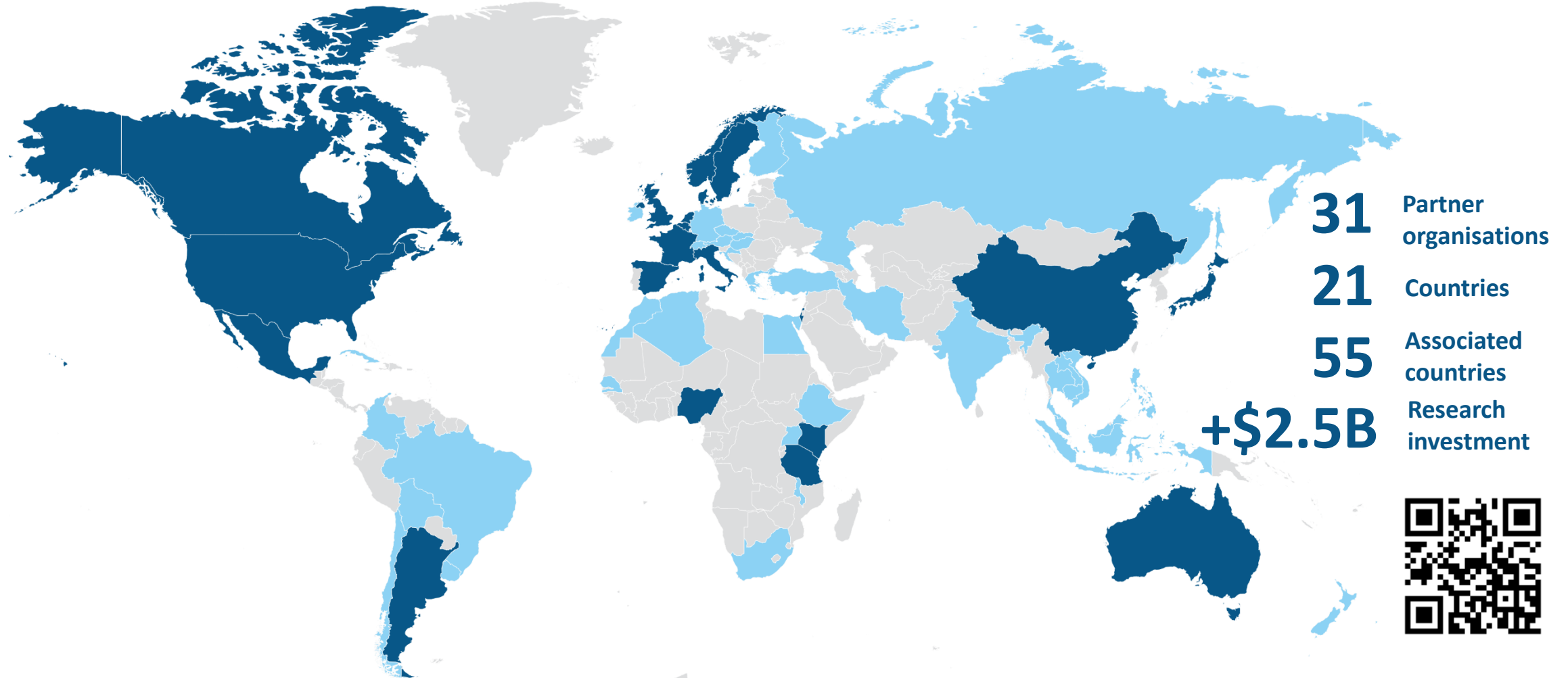
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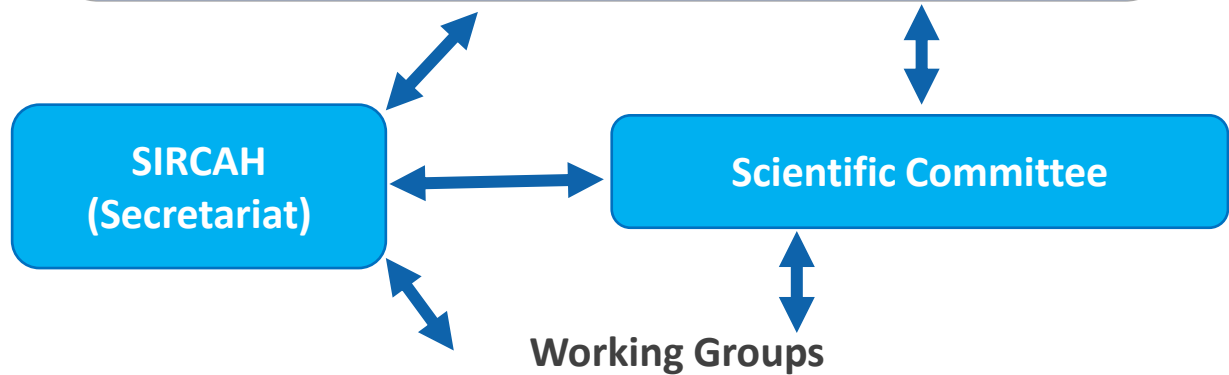
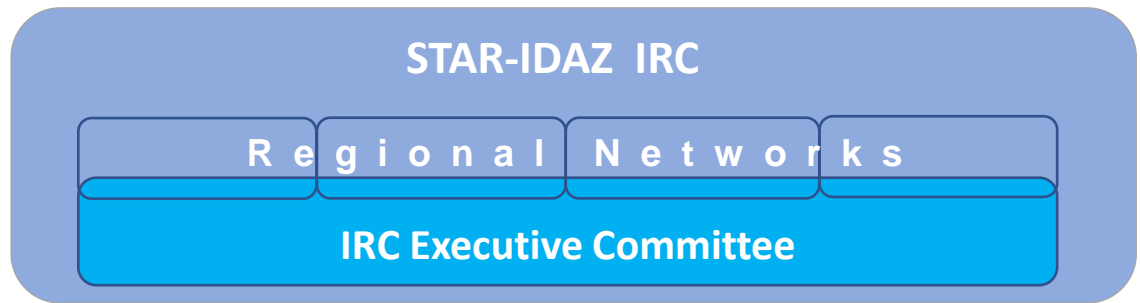
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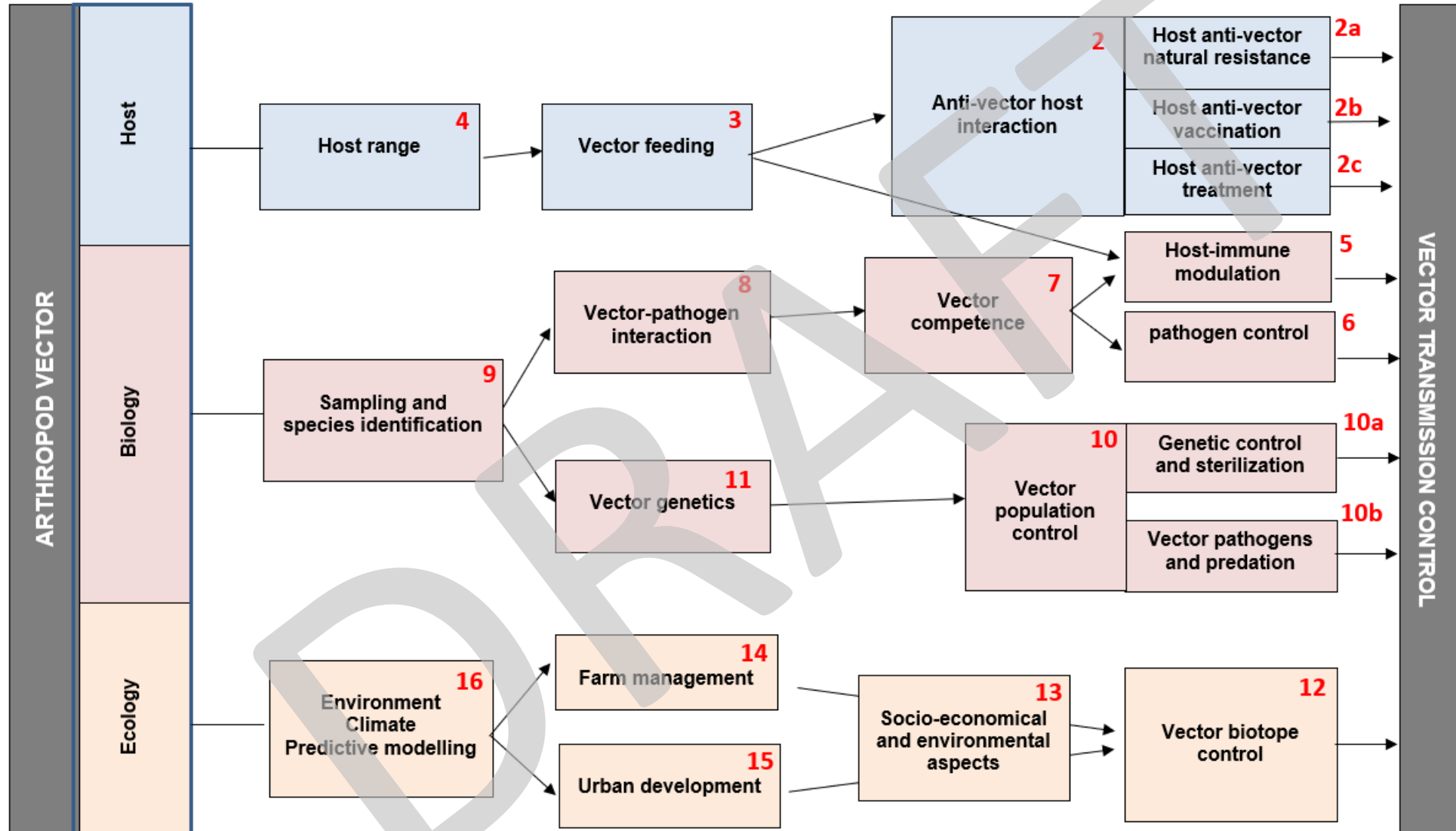
STAR-IDAZ: Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses



Aim: to improve coordination of research activities on the major infectious diseases of livestock and zoonoses to speed up the delivery of improved control methods.



Research roadmap for Vector Transmission Control (work in progress)





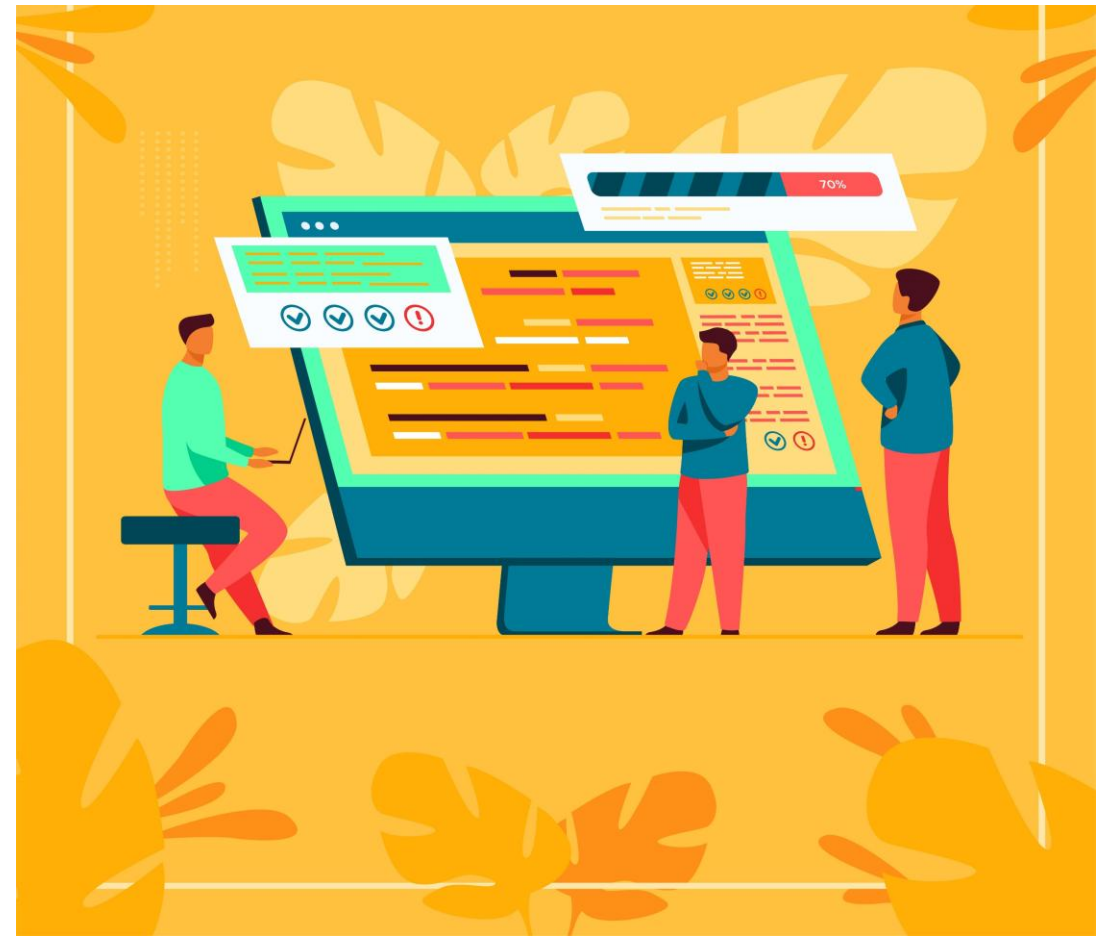
- Integrated surveillance including data from human and animal entomologist needed
- Vaccination is an essential tool to protect animals and humans
- Consider the rapid and multifaceted evolution that VBD can undergo
- Worry on replacement of entomology scientists that could lead to a mid/long term issue

Thank you
Merci beaucoup
Muchas Gracias

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**Help Shape Our 8th Strategic Plan: Take the WOA H
Data, Services & Support Survey**



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Click [here to access](#) the survey available
in French, English and Spanish