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ISTITUTO ZOOPROFILATTICO SPERIMENTALE DELL'ABRUZZO E DEL MOLISE "G. CAPORALE"

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WOAH Regional Seminar
Vector-Borne Diseases in the European Region

25 - 27 June 2025
Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale",
International Centre for Veterinary Training and Information (CIFIV), Teramo, Italy

REPORT

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Executive summary

A WOAH regional seminar was held from June 25-27, 2025, to address the increasing threat of Vector-Borne Diseases (VBDs) in Europe. The seminar, which built on a previous roundtable, brought together approximately 100 experts from over 40 countries to share best practices and formulate a unified, proactive One Health

approach.

The seminar's discussions and interactive polls identified significant challenges and opportunities, leading to the following key conclusions:

1. Fragmentation in Surveillance and Collaboration: A major gap exists in cross-border and intersectoral collaboration, hindering effective data sharing and coordinated responses. The need to move from siloed, national efforts to a shared, regional approach was a central theme.
2. The Need for Actionable, Data-Driven Policy: Participants found a critical lack of harmonized data, making it difficult to conduct cost-benefit analyses, evaluate vaccine effectiveness, or justify funding. The seminar concluded that standardizing data collection and improving its accessibility is paramount to informing sound policy and action.
3. Shortage of Expertise and Need for Training: There is a clear deficiency in specialized skills, particularly in veterinary entomology. Translating high-level policies into tangible on-the-ground action is a persistent challenge due to this lack of expert capacity and a need for more practical guidance and training.
4. Strategic Investment in Research and Tools: The seminar highlighted the importance of coordinating research to address knowledge gaps, such as the overwintering mechanisms of pathogens. It also underscored the need for agile vaccine platforms and the establishment of antigen banks to ensure a more proactive stance against emerging threats.

In response to these findings, the Seminar concluded with a set of recommendations focused on strengthening intersectoral collaboration, enhancing data-driven surveillance, and strategically investing in the workforce and research to build a more resilient and unified defence against VBDs in the region.

Background

The World Organisation for Animal Health (WOAH) develops international standards to improve animal health, animal welfare, and veterinary public health worldwide. Additionally, it is responsible for the World Animal Health Information System (WAHIS), which is based on reports from Member countries about outbreaks of animal diseases, including vector-borne diseases (VBDs) and zoonoses. WOAH supports Veterinary Services of Member Countries in their crucial role to safeguard animal health at national and regional levels.

VBDs pose a growing threat, causing serious health problems and economic burdens due to factors such as globalization, climate change, and the expansion of invasive insects. Their complexity, involving multiple components like wild animal reservoirs, arthropod vectors, and environmental conditions, necessitates a unified One Health approach involving different governmental services.

WOAH has conducted a series of seminars on VBDs across its regions and supported different initiatives such as PROVNA project which Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale" (IZS Teramo) is currently successfully implementing.

In Europe, most recently, a WOAH Roundtable (RT) on Emerging and Re-emerging Vector-Borne Diseases was organized by WOAH Regional Representation for Europe in November 2023 (Tbilisi, Georgia). Building on this, the WOAH, in collaboration with the European Commission, IZS Teramo and partners, organized a regional seminar to follow up productive discussions and share best practices.

This Regional seminar was co-funded by the European Union (DG SANTE, European Commission Directorate General Health and Food Safety), and supported by the Ministry of health of Italy.

The purpose of the seminar: To build upon the outcomes of the previous Roundtable and leverage the shared best practices of WOAH European Member Countries to develop and implement enhanced, harmonized, and data-driven strategies for the prevention and control of Vector-Borne Diseases, thereby fostering a unified and proactive One Health approach to safeguard animal and public health in the region.

Specific objectives of the seminar

1. To further develop the key recommendations and actionable insights identified during the pilot Roundtable on Emerging and Re-emerging Vector-Borne Diseases (November 2023), with a specific focus on

translating these into concrete strategies for improved prevention and control.

2. To facilitate the in-depth exchange of current epidemiological data, risk assessments, and predictive modelling techniques for VBDs within the European region, enabling a more proactive and targeted approach to prevention and control.

3. To critically analyse and disseminate successful and innovative strategies for VBD surveillance and prevention, including but not limited to:
    - Integrated vector management (IVM) approaches and their effective implementation.
    - Early warning systems and forecasting capabilities for vector emergence and disease outbreaks.
    - Biosecurity measures to prevent the introduction and spread of vectors and pathogens.
    - Public awareness campaigns and community engagement strategies for VBD prevention.

4. To share and evaluate effective control measures for established VBDs, focusing on Rapid detection and response protocols for outbreaks, sustainable and environmentally sound vector control methods, strategies for managing insecticide resistance in vector populations and development and implementation of contingency plans for emerging VBD threats.

5. To strengthen inter-sectoral collaboration and communication among veterinary, public health, and environmental authorities in the development and implementation of integrated VBD prevention and control programs, promoting a unified One Health approach (for zoonotic VBD).

6. To identify key regional priorities and opportunities for collaborative research, surveillance networks, and joint prevention and control initiatives among WOAH Member Countries in Europe.

7. To formulate concrete and measurable recommendations for enhancing regional and national VBD prevention and control strategies, including potential policy adjustments, research priorities, and capacity-building needs.

Seminar Outline and Structure

The 2.5-day seminar was structured to facilitate a comprehensive and interactive dialogue on Vector-Borne Diseases (VBDs). It featured five technical sessions, a roundtable discussion, and the official launch of a key regional project.

- WOAH team described the Organisation's vision and strategy for VBD surveillance and control (Dr Gregorio Torres), and the capacity building programmes able to strengthen Member capacity to prevent and control them (Dr Barbara Alessandrini and Dr Jennifer Lasley).

- Partners from DG SANTE (Dr Etienne Bonbon), EFSA (Dr Sofie Dhollander), WHO-EURO (Dr Marc-Alain Widdowson), ESA (Dr Stefano Ferretti), FESASS (Mr Alain Cantaloube), STAR-IDAZ consortium (Prof Isabel Santos), Global Burden of Animal Diseases Programme (Prof Jonathan Rushton) presented their organisations' vision and policies on VBDs as well as their priority activities and innovative methods applied in VBD surveillance and control and shared their analysis of gaps and needs to improve VBD control in the region. The presentation on the Mediterranean Animal Health Network (REMESA) activities was delivered by Dr Francesco Valentini (WOAH SRR-NA). One Health aspects of VBDs were discussed by Dr Chadia Wannous (WOAH HQ) and partners.

- Global and European Epidemiological situation for VBDs was reported by Dr Paolo Tizzani (WOAH, DID). Analysis of VBD country situation reported at the RT in Tbilisi and shared by some participants for the seminar in Teramo was presented by Dr Marina Sokolova (WOAH-Europe). The overview of country policies, running projects, VBD outbreaks and best practices in VBD control were presented by experts from Austria (Dr Annette Nigsch), Azerbaijan (Dr Galib Abdulaliyev), Argentina (Dr Andrea Marcos), Georgia (Dr Tengiz Chaligava), Jordan (Dr Mohammad Khashan), Italy (Drs Benedetta Cappelletti, Paolo Calistri and Laura Amato), France (Dr Sophia Denorre), Montenegro (Dr Rados Mikovic), N. Macedonia (Dr Angela Grujovska), Spaine (Dr Miriam Martin Rebordinos), Serbia (Dr Tamas Petrovic), Sweden (Drs Hedvig Stenberg and Kristina Mieziewska), Türkiye (Dr Sabri Hacioglu), UK (Drs Caroline Povey and Daniel Jeronimo).

- Online SLIDO tool was used to collect expert opinions on gaps and needs and way forward in VBD and vector control in the region and Member Countries.
- RoundTable discussion organized and moderated by Dr Annamaria Conte (IZS Teramo) gathered experts from EFSA, WHO, WOAH, IZS Teramo to share knowledge and concerns on VBD data integration in the region.
- At the seminar, the PROVBAC project was launched during which IZS Teramo will work together with six countries of Balkan and Caucasus regions applying the same methodology of the successful PROVNA project in the Northen Africa (Drs Alessandro Ripani, Chadia Wannous, Laura Amato, Annamaria Conte).

The Agenda is attached to the report.

Audience and Participation

All 53 Member countries were invited to nominate high-level decision-maker officers or technical experts involved in notification or monitoring/control of VBDs. WOAH representatives from RR Americas, SRR NA participated in the seminar. About 70 participants including WOAH staff, and IZS Teramo experts attended the seminar in person and about 30 experts connected online. Speakers from DG SANTE, WHO, EFSA, ESA, STAR-IDAZ, FESASS, Global Burden of Animal Diseases Programme, Jordan Center for Disease Control delivered presentations. In total, about 40 countries were represented at the seminar.

Highlights of the seminar

The seminar was inaugurated with welcoming remarks from Dr. Nicola D'Alterio of IZS Teramo, Dr. Bernard Van Goethem of DG SANTE, and Dr. Giovanni Filippini from the Ministry of Health, Italy. Dr. Budimir Plavsic of WOAH served as the seminar lead. The opening addresses emphasized the increasing threat of VBDs and the paramount importance of cooperation for effective control.

1. VBDs are (re)emerging and enlarging their geographic range because of various risk drivers, such as climate changes, modifications in land use, reduction of biodiversity, travels and globalization of goods trade.
2. Surveillance, control and prevention of VBDs must be based on OH approach, assuring data sharing and intersectoral collaboration among relevant sectors and disciplines.
3. International Organizations are deeply involved to facilitate this process. Quadripartite OH initiative is the main example.

4. WOAH international standards (Terrestrial Animal Health Codes (TAHC/Terrestrial Code and Manuals) are the main frameworks that support policy development and its implementation in Member Countries. WAHIS is a main tool that allows for collecting and analysing animal health information. In the TAHC Glossary, there is a definition of vectors and some relevant VBD terminology.
5. Cross-border cooperation and networking among countries is of paramount importance for the control of VBDs (REMESA and other regional and international initiatives can support the collaboration among national authorities).
6. The sharing of data among countries on VBDs occurrence, vectors distribution and abundance, characteristics of agents, as well the cooperation on vaccine development and control approaches are fundamental for the success of the control and prevention strategies against VBDs put in place by the national veterinary authorities.
7. Disease notification and provision of epidemiological information are cornerstone TAHC recommendations/standards for understanding the regional (and global) VBD situation and developing national programmes of VBDs control.
8. Concerning some zoonotic VBDs (e.g. West Nile Fever (WNF), Cong-Crimean Haemorrhagic Fever (CCHF)) surveillance activities performed by veterinary authorities are functional to the application of Public Health control and prevention measures. This emphasises the role of veterinary in the prevention of human cases.
9. From 2022 to 2025, three diseases (Blue tongue (BTV), WNF and EHD) accounted for 98% of reported to WAHIS exceptional epidemiological events in Europe. The level of surveillance varies across the region depending on the disease.
10. The history of VBD epidemics in the last decades in Europe provides important contributions for the discussion about vaccination policies, both in case of successful (LSD) and less effective (BT) stories.
11. Education/training of veterinary entomologists is a demand in Member Countries. There were just a few participants who confirmed their countries can provide international courses. The UK, Italy, and The Netherlands, were among them.

Highlights from Session 1

Vector-borne diseases pose a growing global threat to both animal and human health. In health sector, VBDs account for 17% of all infectious diseases and cause over 700,000 deaths annually worldwide (https://www.who.int/news-room/fact-sheets/detail/vector-borne-diseases). Factors like climate change, globalisation, and environmental changes are contributing to the widespread of VBDs. VBDs outbreaks impose massive economic costs; for example, the Bluetongue Virus outbreak in Europe from 2006-2009 caused an estimated €1 billion in direct and indirect losses. The World Organisation for Animal Health is supporting its 183 Members in their effort to combat VBD by promoting the One Health approach, integrating surveillance, implementing effective vaccination, enhancing vector control, and supporting Veterinary Services in strengthening their capacities. Through its 8th Strategic Plan, WOAH emphasises science-based standards, resilient Veterinary Services, and multilateral intersectoral collaboration. To progress in the control of VBD, it is necessary to address some strategic challenges including limited surveillance, resistance to insecticides and repellents and underinvestment in veterinary infrastructure. "*We may not be prepared, but with the right tools and partnerships, we can be better prepared to face these evolving global health threats" (G.Torres' presentation).*

The WOAH, develops international standards for animal health and welfare, including those related to VBDs. These standards are outlined in the Terrestrial Code, which is updated annually and publicly available. The Terrestrial Code includes a glossary of terms, defining a "vector", "infestation", "official control programme".
WOAH standards cover various TAHC chapters relevant to VBDs, including in Section 1: Notification of diseases and provision of epidemiological information (Chapter 1.1); Criteria for the inclusion in the WOAH list (Chapter 1.2); Diseases, infections and infestations listed by the WOAH (Chapter 1.3); Animal health surveillance (Chapter 1.4); Surveillance for arthropod vectors of animal diseases (Chapter 1.5). Section 4 is dedicated to Disease prevention and control, including zoning and compartmentalisation, and official control programmes for listed and emerging diseases.

WOAH lists 27 vector-borne diseases, which constitute about 30% of all WOAH listed diseases for terrestrial animals. Examples of listed VBDs affecting multiple species include Crimean-Congo Haemorrhagic Fever, Heartwater, Bluetongue virus infection, Epizootic haemorrhagic disease virus infection, Leishmaniosis, Rift Valley

fever virus infection, Japanese encephalitis, Surra, and West Nile Fever. Specific VBDs are also listed for bovine (e.g., Bovine anaplasmosis, Bovine babesiosis), sheep & goats (e.g., Nairobi sheep disease), equine (e.g., Eastern, Western, and Venezuelan Equine Encephalitis virus infections, African Horse Sickness virus infection), and swine (e.g., Nipah virus encephalitis). WOAH also provides "Complementary Chapters" that are regularly updated, covering standards for diagnosis and vaccines, epidemiological information, and detailed information on vectors and vector species.

Specific considerations for VBDs in the Terrestrial Code include topics such as Determining the animal health status of a country, zone, or compartment; Recommendations on safe trade for live animals, genetic material, and other animal products; Recommendations on surveillance, including vector surveillance for presence/absence and monitoring for seasonal freedom; Protection of animals from vectors (e.g., vector-protected establishments, during transportation); Vector-related sanitary measures for trade (e.g., animals free of ticks, protection from vector attacks during transportation/transit).

Chapter 1.5 of the Terrestrial Code specifically addresses surveillance for arthropod vectors. The objectives of this surveillance include: gathering up-to-date information on the spatial and temporal distribution and abundance of vectors of arthropod-borne listed and emerging diseases, monitoring changes in their distribution and abundance, collecting data to inform risk assessment (including vector competency) and risk management of VBDs, detecting the presence of specific vectors or confirming their absence, and understanding pathways of entry for vectors and vector-borne pathogenic agents.

It is noted that there is no conclusive relationship between the presence of vectors and the disease status of a country/zone for trade purposes. A sampling plan for vector surveillance depends on factors such as biology, ecology, host animal populations, environmental conditions, and high-risk areas, often requiring historical data. A three-stage strategy for sampling is recommended: stratification, subdivision of strata into spatial sampling units, and actual sampling sites. This information is used for decision-making on risk management and further surveillance.

The European Union (EU) has a structured policy framework for VBDs, adapting to events, risks, and Member States' (MSs) priorities. Since 2018, twelve VBDs have been listed under the Animal Health Law (Art 5 + Annex II) and categorised by Commission Implementing Regulation (EU) 2018/1882. These diseases vary in pathogenic agents, host species, vector species, impact, and zoonotic potential, but are grouped due to their common transmission specificity.

Disease Categories:

- **Category A:** Diseases like Rift Valley Fever (RVF), Lumpy Skin Disease (LSD), African Horse Sickness (AHS), and African Swine Fever (ASF) require immediate eradication measures, zoning, and emergency vaccination.
- **Category B:** Currently none listed, these would involve compulsory eradication programmes.
- **Category C:** Diseases such as Bluetongue (BTV) involve optional control/eradication programmes to achieve disease-free status, vaccination, and movement rules.
- **Category D:** Examples include Epizootic Haemorrhagic Disease (EHD), Surra, Equine Infectious Anaemia (EIA), and Venezuelan Equine Encephalomyelitis (VEE), with rules primarily for movements.
- **Category E:** Diseases like Japanese Encephalitis Virus (JEV), West Nile Virus (WNV), Eastern Equine Encephalomyelitis (EEE), and Western Equine Encephalomyelitis (WEE) primarily require surveillance and notification.

Rules for surveillance and notification apply to all categories, as do rules for entry into the EU. Vaccines are a crucial tool, integrated into EU rules, including for Category A diseases, with vaccination being the responsibility of MSs.

The **European Food Safety Authority (EFSA) provides scientific advice** to assess animal health risks related to VBDs. Under a new mandate from the European Commission, EFSA is coordinating a multi-annual, cross-sectoral assessment of the risks posed by 25 vector-borne diseases affecting animals in the EU, some of which are zoonotic. This initiative promotes a harmonised approach to risk assessment and management across Member States. The work is underpinned by strong collaboration between three expert consortia: VectorNet,

providing entomological data and expertise; L'ORA, leading Living One Health Risk Assessment activities; and the Disease Profiles Consortium, developing disease-specific knowledge maps, based on evidence generated through living systematic literature reviews. In addition, the One Health Network for Veterinary Entomology (OHVEN)—jointly fostered by the European Centre for Disease Control (ECDC) and EFSA—alongside national One Health surveillance activities in Member States, plays a key role by contributing entomological and epidemiological data. Surveillance data from these activities are uploaded to the Global Biodiversity Information Facility (GBIF) and serve as a foundational input for vector distribution mapping. EFSA opinions, such as the 2020 report on RVF, directly influence EU policy, leading to designations like an EU Reference Laboratory for RVF in Teramo. In April 2017, at the request of DG SANTE, EFSA published a scientific opinion on 36 VBDs, assessing their risk of introduction into the EU through movement of livestock or pets. This was considered a first screening, and it was already at that time recommended in the assessment that it should be updated. There is a continuous need for more data, knowledge, and science to better understand VBD evolution and develop prevention and control tools.

Italy's Ministry of Health has a long history with the first structured health legislation dating back to the Royal Decree of 20 March 1865. The Ministry of Health was formally established in 1958. As of October 2023, the Ministry of Health includes departments such as the Department of Human, Animal and Ecosystem Health (One Health) and International Relations, and Directorates General for Animal Health, and Hygiene and Food Safety. Italy promotes the One Health approach through key national tools and plans: The National Prevention Plan (PNP) 2020-2025; The National Recovery and Resilience Plan (PNRR); The Multi-Year National Control Plan (PCNP) 2023-2027: This plan aims to make official controls transparent across the agri-food chain, verify compliance with European regulations, and ensure coordination among authorities to avoid overlaps and optimise resources. It covers areas like food and feed safety, GMOs, animal health requirements, animal by-products, animal welfare, plant harmful organisms, pesticides, and organic products.

The Mediterranean Animal Health Network (REMESA) is a regional animal health network vital for information sharing, preventing and controlling emerging and re-emerging VBDs in the Mediterranean basin. It was created in Algiers in **2009** as a common framework for regional animal health projects aiming at improving Veterinary Public Health, harmonise surveillance and control activities, and facilitating trade of animals and products in the Mediterranean region by strengthening national and regional capacities for transboundary animal diseases and zoonoses. Priority Diseases for REMESA include Rabies, FMD, PPR, Brucellosis, Tuberculosis, and VBDs such as RVF, BT, WNF, and AHS. Notably, within the REMESA framework, in addition to the exchange of information/cooperation/coordination, several activities on VBDs have been developed in recent years: workshops and webinars of the Scientific and Technical Office of REMESA (STOR), and the PROVNA project.

In conclusion, an effective implementation of One Health requires overcoming national borders and developing a shared health ecosystem through international cooperation, investments in research and innovation, and a "cognitive revolution" among citizens to understand the importance of an interdisciplinary and global approach to health.

Arbovirus surveillance in the WHO European Region with focus on human cases of Dengue, Zika, Chikungunya, West Nile Virus, and Malaria demonstrated the future steps to include continuing surveillance for dengue, Chikungunya, and Zika, engaging partners for modelling expected dengue frequency, and analysing WNV seasonality, with potential expansion of reporting to include WNV. Dengue: there was an outbreak in Madeira, Portugal, from mid-June to October 2024. Autochthonous (locally acquired) dengue cases were reported by Spain (8), France (83), and Italy (213) during this period. A scoping review identified evidence of autochthonous dengue in France, Croatia, Portugal (Madeira), Spain, and Italy since 2008. Serological evidence of past exposure was found in France, Croatia, and Madeira from population surveys, and in Turkey and Madeira from blood donor studies. The European Region classifies countries into three risk levels (High, Medium, Low) for dengue, based on five key indicators, including suitability for mosquito vectors, presence of autochthonous cases, and temperature. Five countries are classified as High risk, 13 as Medium, and 11 as Low.

Monthly aggregate reporting for dengue, Zika, and Chikungunya from 30 countries/areas commenced in June 2024. Most EU/EEA countries (100% of 27 surveyed) have the capacity for dengue virus testing, primarily using PCR (89%) and Enzyme Immunoassays (56%). Similarly, 84.62% of Balkan, Caucasus, and Central Asia countries (13 surveyed) have testing capacity, mainly RT-PCR (76.92%) and IgM/IgG antibody testing (61.54%).

However, some countries face challenges with reagent availability and frequently request support for procurement and training. Zika and Chikungunya: no autochthonous Zika cases were reported in the period mentioned. One autochthonous Chikungunya case was reported by France in July. West Nile Virus: WNV is the arbovirus with the widest geographic distribution in the region, with cases and outbreaks expanding over the last two decades. It is endemic in some countries and sporadically detected in others. Climatic factors, such as ambient temperature and precipitation, influence transmission, and incidence is expected to increase in future years due to rising temperatures. A retrospective collection of data and a scoping review are being conducted to understand seasonality and inform surveillance. Malaria: **f**rom 2012 to 2023, 299 malaria cases were recorded, mostly imported. No locally acquired cases have been reported since 2010. Türkiye is the only country in the region not certified as having eradicated malaria.

Highlights from Session 2

Epidemiological Situation and Trends in Europe: Since 2005, Europe has reported to WAHIS a significant number of VBD-related "exceptional events," accounting for approximately 60% of such events globally, with a notable increase in recent years. Since 2005 and as of May 2024, there has been an increasing trend in the maximum latitude of VBD outbreaks reported over the years, showing a positive correlation with global temperature anomalies, suggesting an effect of climate change on VBD epidemiology. In 2023-2024, 99% of the 2,501 VBD outbreaks were reported in temperate regions.

From 2022 to 2025, three diseases accounted for 98% of reported exceptional epidemiological events: Bluetongue with 3,936 outbreaks, West Nile Fever with 581 outbreaks, and Epizootic Haemorrhagic Disease with 271 outbreaks. Surveillance systems are in place for these diseases in Europe. The level of surveillance varies across the region depending on the specific disease. WOAH uses an early warning system, including immediate notifications and follow-up reports, and conducts daily web screening for listed diseases through an Epidemic Intelligence (EI) activity system (Epidemic Intelligence from Open Sources, EIOS) to improve the sensitivity of WOAH WAHIS system.

Several initiatives are being implemented to strengthen VBD surveillance using a One Health approach, which integrates human, animal, and environmental health sectors.

The OH SURVector project (One Health Surveillance and Vector Monitoring for cross-border pathogens) is a consortium of 8 partner institutions in 5 Member States, funded by the EU4Health programme 2021-2027. Its project period is from January 2024 to December 2026. The goals of OH SURVector are to: set up and scale up One Health Surveillance for vectors and vector-borne pathogens to protect the health of humans, animals, and the environment; achieve early detection of newly introduced vector species and pathogens; enable early detection of an increased risk of exposure in new areas and periods of the year; facilitate early epidemic detection and monitoring of ongoing outbreaks, strengthen cross-sectoral collaboration on national and cross-border levels towards an integrated One Health approach.

It centers on establishing a nationwide monitoring system for ticks and mosquitoes—the key vectors of zoonotic diseases—across Austria, Czech Republic, Greece, Hungary, and Slovak Republic. Pathogen screening under OH SURVector includes West Nile, Usutu, Borrelia spp., Crimean-Congo Haemorrhagic Fever, and Tick-borne Encephalitis, with priorities differing by country. One further goal is to identify the potential for harmonization of activities in diverse ecosystems reaching from the Alps to the Mediterranean.

EcoSurv is another project, co-funded by the EU4Health Programme 2021-2027, aiming to establish a surveillance system on selected (re)emergent and at-risk of introduction zoonoses using an ecological approach. EcoSurv seeks to provide the Italian health system with a coordinated surveillance system that innovates traditional health approaches by setting up a risk assessment-based One Health surveillance for emerging and re-emerging pathogens that pose serious cross-border threats.

EcoSurv's approach is focusing on surveillance activities across various animal populations: domestic ruminants and related VBDs like Rift Valley Fever (RVF), Crimean-Congo Haemorrhagic Fever, and Q fever, aiming for early detection of RVF and CCHF in Italy; migratory birds and their environment for CCHF, WNF, and highly pathogenic avian influenza (HPAI), aiming for early detection of CCHF and novel WNF strains; pig farms and wild boars for hepatitis E virus (HEV) and Swine Influenza Virus (SIV); wild and synanthropic mammals for HPAI H5N1 spillover,

Echinococcus, and early detection of changes in geographic distribution of Lyme Disease (LD) and Tick-Borne Encephalitis (TBE).

Both OH SURVector and EcoSurv highlight the importance of early detection, cross-border collaboration, and the One Health approach in combating the increasing threat of VBDs, especially given the observed epidemiological changes potentially influenced by climate change.

Highlights from Session 3

Country-Specific Experiences and Control Measures: Vaccination plays a significant role in control and eradication efforts. Countries face challenges in integrating disparate surveillance data into single national databases and harmonising data formats. Furthermore, resource constraints, including insufficient financial support, lack of specialised laboratory equipment, and a shortage of entomology experts, hinder comprehensive VBD control efforts in some regions. Given the mobility of vectors and hosts (e.g., migratory birds), international and inter-regional collaboration is repeatedly cited as essential for regional disease security and effective responses to cross-border risks.

Argentina experienced a WEE epidemic, with the last official record prior to 2023 being in 1988. The first suspected cases were reported on 22 November 2023. Mandatory vaccination using inactivated, bivalent (EEE and WEE) or polyvalent vaccines was implemented on 24 November 2023. The outbreak saw its last case on 15 April 2024, with the closure of the event on 13 May 2024. Epidemiologically, there were 1,542 total cases affecting 2,139 equines, resulting in a morbidity of 8%, mortality of 2%, and lethality of 27% (rising to 50% in stallions). Human cases of WEE were also reported, with 87% being male. Vector surveillance for *Aedes (Ochlerotatus) albifasciatus* and Culex genus were conducted, with all tested vectors negative for WEE by PCR. Measures also included adapting definitions for suspected and confirmed human cases, and human diagnosis.

United Kingdom's top three VBD concerns are Bluetongue, Tick-Borne Encephalitis, and West Nile Virus.

West Nile Virus: Surveillance includes passive dead wild bird surveillance (testing ~800 birds annually), monitoring breeding sites for vector species (Culex, Aedes), testing to exclude and passive surveillance of horses, and investigating human encephalitis cases. WNV was detected in *Aedes vexans* mosquitos collected in 2023. The Human Animal Infections and Risk Surveillance (HAIRS) group regularly updates risk assessments and supports local authority mosquito control plans.

Bluetongue-3 (BTV-3) is currently present, with 262 cases reported since September 2024, alongside one case of BTV-12 as of 17 June 2025. On 1 July 2025, the restricted zone for Bluetongue was extended to cover all of England, allowing animal movement within England without a specific licence or test, as the disease is now widespread. Vaccination is strongly encouraged as the most effective long-term control option and must be reported to Defra within 48 hours. Modelling efforts are underway to better understand BTV-3 spread based on the recent outbreak.

Tick-Borne Diseases are an immediate public health threat, with sporadic human cases from *Ixodes ricinus* tick bites. Four probable or confirmed TBE cases acquired in England have been reported since 2019. The UK has suitable environmental conditions and large numbers of wild reservoir species (small mammals, sheep, deer, cattle). Other significant tick-borne pathogens include *Anaplasma spp*., *Rickettsia spp*., *Babesia spp.,* and *Borrelia spp.* (Lyme disease), with 3,000-5,000 human Lyme disease cases annually. We do provide advice to people at risk and Human Animal Infections and Risk Surveillance risk assessments undertaken and reviewed regularly. There are no tick control programmes; actions focus on public warnings to avoid bites, raw milk warnings, and regular testing of animals for diseases like louping ill and redwater fever.

The UK identifies needs for VBD surveillance and control, including funding large research consortia focused on mosquito and tick diseases, improving VBD modelling using environmental data, better understanding of seasonality and vector-free periods, developing environmentally friendly vector control measures, and strengthening the "One Health" approach with public health, food safety, and environmental health colleagues. A particular challenge is the poor awareness of VBDs within the National Health Service (NHS), making it difficult to obtain data from General Practitioner (GP) practices.

Italy has a WNF surveillance system that has evolved along with the epidemiological situation, since the first cases of the disease were identified in horses in 1998. The current framework is provided by the National Plan for the Prevention, Surveillance and Response to Arboviruses 2020-2025, which contains both veterinary and public health measures in an integrated plan. The territory is divided into distinct risk areas, where various veterinary surveillance activities are carried out. These include surveillance of resident birds (target species: magpie, carrion crow, and Eurasian jay), entomological surveillance (to assess the presence and abundance of competent vectors and monitor WNV circulation), clinical surveillance (through the reporting of neurological syndromes in equines), and passive surveillance of wild bird mortality.

When the first case is confirmed in a province where the virus has not yet been detected—whether in birds, horses, or mosquitoes—a coordinated response system is immediately activated. The findings are promptly shared with all relevant authorities, including the National Transplant Centre and the National Blood Centre. These institutions then initiate mandatory screening of blood donors in the affected province to prevent virus transmission through transfusions or transplants. Simultaneously, regional authorities launch public awareness campaigns to inform citizens about personal protective measures and reduce the risk of mosquito bites. In parallel, targeted pest and vector control interventions are implemented locally, with their effectiveness monitored to evaluate the impact of the measures taken.

Due to the complexity of the West Nile virus epidemiological cycle, effective surveillance requires a multidisciplinary approach. Entomological and veterinary surveillance activities play a crucial role in assessing the potential risk to human health and enabling timely and effective disease control measures in humans. For these reasons, the integration of veterinary, entomological, and human surveillance systems is essential for a coordinated and efficient public health response - of which the current plan represents a key example.

Azerbaijan: Azerbaijan has a significant animal population, including approximately 2.5 million cattle, 7.1 million sheep and goats, and 30 million poultry. There are also 5 thousand pigs, 200 camels, 65 thousand horses, 28 thousand donkeys, and 218 thousand pets (dogs/cats). The Cabinet of Ministers of the Republic of Azerbaijan has enacted several key legislative acts concerning animal health, including VBDs: #167, July 7, 2006: A list of particularly dangerous diseases that pose a threat to animal and public health.#228, October 19, 2006: A list of infectious animal diseases subject to quarantine and restriction measures.#65, March 7, 2007: A list of especially dangerous diseases of animals subject to mandatory notification, with prevention, diagnosis, and elimination financed by the state budget. Several VBDs are identified as priority hazards based on legislative acts. Lumpy Skin Disease (LSD): Approximately 2.3 million bovine animals have been vaccinated, achieving a 92% vaccination coverage. Neethling strain vaccines are used. Vaccination coverage has increased from 80% in 2014 to 92% by 2024. African Swine Fever (ASF): In May-June 2024, 589 blood samples (3.0%) were serologically examined from 43 farms involving 19,842 pigs across 15 cities/districts and 25 villages/settlements. Schmallenberg: the first occurrence was in 2013 among imported breeding cattle from Hungary. It was included on the "List of especially dangerous diseases of animals subject to mandatory notification..." from January 22, 2015. Bluetongue Virus: Azerbaijan has adapted veterinary requirements for importing breeding and production cattle, and bovine semen from infected EU countries. These requirements are in accordance with WOAH Terrestrial Animal Health Code recommendations, specifically Article 8.3.8. for ruminants and camelids, and Article 8.3.10 for semen of ruminants and camelids. Zoonotic Diseases (Never Reported): Q fever, Rift Valley fever, and Tularemia are listed as zoonotic diseases that have never been reported in Azerbaijan. Laboratory Capacity: The animal health system includes a Central Veterinary Laboratory (CVL) and seven Regional Laboratories, all operating at biosafety level 2. There is also a Field Laboratory with biosafety level 2+. These laboratories are responsible for the diagnosis of animal diseases, examination of veterinary products, feed, feed additives, biological active supplements, and products of animal origin.

Proposals for future improvements include: preparing animal welfare guidelines related to VBD circumstances during transportation and at animal rest points; conducting research, surveillance, and epidemiology monitoring on VBDs within the framework of "One Health" and climate change requirements; implementing related legislative acts at national and global levels; creating a system for early detection and information exchange.

France: key VBDs include 1) Lyme disease, Q fever; Crimean-Congo Haemorrhagic Fever, Tick-borne encephalitis virus, neither of which has had human outbreaks so far; 2) mosquito-borne diseases like West Nile Disease (autochthonous cases), Dengue (83 cases in 2024), Zika (1 case in 2019), and Chikungunya (1 case in

2024). *Aedes albopictus* mosquito distribution is mentioned in relation to these diseases; 3) diseases transmitted by biting flies such as Leishmaniasis (Phlebotomus), Equine Infectious Anaemia (EIA) (Tabanus), and Bovine Besnoitiosis (Stomoxis, Tabanus); 4) diseases transmitted by *Culicoides*, specifically Epizootic Haemorrhagic Disease (EHD) and Bluetongue.

Epizootic Haemorrhagic Disease (EHD): first outbreaks occurred in September 2023 at the Spanish border. It is transmitted by Culicoides and affects cattle, with small ruminants often asymptomatic. Surveillance measures include event-based surveillance, with state-covered costs for veterinary visits, blood sampling, and lab analysis. Control measures involve movement restrictions within a 150 km regulated zone, requiring disinsectisation + negative PCR for movement to free zones, or vaccination. Vaccination with a vaccine preventing viremia became possible from September 2024. Two million HEPIZOVAC doses were distributed between September 2024 and January 2025, primarily for cattle in vaccination zones, with farmers able to self-vaccinate unless animals are moved from a regulated zone, in which case veterinary vaccination is required. Outbreaks: 4,316 from Sept 2023 to May 2024; 3,896 from June 2024 to May 2025; and 10,745 from August 2024 to May 2025. In the 2024-2025 season, 98% of EHD outbreaks affected cattle.

Bluetongue (BTV) - specifically BTV-3 and BTV-8: BTV-3 - first outbreak in Northern France on August 5, 2024. Surveillance is event-based and planned, with state-covered costs for event-based surveillance. Control included movement restrictions similar to EHD, but the regulated zone was lifted in February 2025 due to rapid diffusion. Vaccination is possible, with 11.7 million BTV-3 doses distributed for sheep and cattle in autumn 2024. Outbreaks: 10,745 from June 2024 to May 2025; 2 outbreaks since June 1, 2025. In the 2024-2025 season, 81% of BTV-3 outbreaks affected cattle and 18% affected sheep. BTV-8 - a new strain emerged in August 2023 and is considered enzootic in France, thus having surveillance but no specific national measures. Outbreaks: 17,004 from June 2024 to May 2025; 3 outbreaks since June 1, 2025. In the 2024-2025 season, 61% of BTV-8 outbreaks affected cattle and 37% affected sheep. 7 million BTV-8 vaccines are available in public stock. BTV-1 - risk of rapid spread northwards from Spain due to the stop of Spain's bluetongue eradication program. 1 million cattle and 600,000 sheep vaccine doses are available in public stock for 8 departments near the Spanish border. A new vaccination campaign is set to begin in July 2025.

Country needs regarding VBD surveillance and control include: vaccination is the primary tool for BTV/EHD control, but Europe faces vaccine market pressure, leading to shortages; the creation of an antigen bank to rapidly develop vaccines for new exotic serotypes; development of multivalent vaccines; improved cross-border coordination and communication toward farmers.

Spain: Vector-borne diseases are emerging in Spain by factors such as climate change, globalization, and evolving agricultural practices. Spain has experienced a rise in WNF cases, becoming one of the most affected countries in Europe. National surveillance programs targeting equines, birds, and vectors (Culex) play a crucial role in detecting and managing outbreaks. Meanwhile, the complex scenario with BTV, with four circulating serotypes in Spain, has led to the discontinuation of the long-standing eradication program in Spain. EHD emerged in Spain in 2022, prompting immediate control measures, Including the authorization of a vaccine for this disease. Special emphasis is placed on CCHF, a zoonotic disease of growing concern since its first autochthonous human case in 2016. Spain has implemented robust surveillance and control strategies under a comprehensive national plan, emphasizing tick monitoring and serological surveys in wild and domestic animals.

The integration of these efforts under a One Health approach, including the GRANT UE project, aims to enhance coordination among public health, agricultural, and environmental sectors. Strengthening data integration and harmonization, alongside ongoing surveillance and simulation exercises, will be essential in preparing for future challenges posed by these diseases.

Sweden has experience with several VBDs, including Bluetongue (2008-2010, 2024-ongoing): and Schmallenberg virus (2012-reoccurring). Sweden successfully eradicated BTV-8, which was introduced via wind-borne vectors from other Member States. Effective early detection through bulk milk surveillance and compulsory vaccination of all bovine and ovine herds with 10 or more individuals for two years were key to its success. An economic analysis from 2012 concluded that disease freedom has high economic value, estimating potential losses of 60 million SEK/year (approx. 5 million EUR) if the disease would spread freely, and compulsory vaccination would then often be cost-effective. The Bluetongue Serotype 3 (BTV-3) outbreak (2024) is ongoing.

Due to changes in EU legislation with BTV no longer compulsory to eradicate, success of eradication through compulsory vaccination became less certain. Voluntary vaccination could then be a better long-term option although eradication would be less likely. Voluntary vaccination was enabled with mandatory registration of vaccinated animals for surveillance. Animal owners are permitted to vaccinate their own animals after proper training, thus reducing costs. Challenges include vaccine delivery delays and slow rate of vaccination. Schmallenberg Virus: (SBV) First outbreak occurred in 2012. SBV was spread by the same known vectors as BTV but the spread was much faster, and the virus recurred in 2024, though with few clinical cases and it is not a classified disease. Sweden highlights the need for more data on economic impact of VBDs and harmonisation for promoting vaccination.

Türkiye identifies Bluetongue, LSD, WNV, CCHF, and Rift Valley Fever as significant VBDs. Bluetongue: It is a notifiable disease, with the west and south of the country at risk. Sheep vaccination is conducted based on risk assessment, and surveillance of Culicoides (biting midges) is performed for early detection. Suspected ruminant cases are tested, and positive cases trigger quarantine, control programs, and vector control. LSD: There have been no cases since 2021, and vaccination stopped by 2025. WNV: The last horse case was in 2018, leading to a WNV vaccination programme for horses in high-risk areas, with no horse cases detected since. The Health Ministry analyses human cases, with the first outbreak in humans recorded in 2010. CCHF: Insecticides are distributed to livestock owners and farms in areas where human CCHF cases are observed, as part of a One Health approach. RVF: Spread is closely monitored due to a high risk of spread from Africa, though a 2021 serosurvey on small ruminants found no seropositivity in Türkiye. Awareness-raising activities are organised and the relevant regulations are implemented to combat these diseases. Countries need to improve testing capacities for the potential spread of new diseases, such as the vesicular stomatitis virus. Türkiye emphasises the importance of developing effective and multivalent VBD vaccines suitable for field use as not all VBDs currently have such vaccines.

Jordan's strategic location at the crossroads of Asia, Africa, and Europe, combined with its diverse physiographic regions (including desert and rift valleys), makes it vulnerable to VBDs. Institutional roles are divided among the Ministry of Health for human and some vector surveillance, the Ministry of Agriculture for animal disease reporting, and the Jordan Center for Diseases Control (JCDC) for data integration, research, and interagency coordination. Notifiable VBDs include Leishmaniasis, CCHF, Malaria, Schistosomiasis, and West Nile Fever for human health, and Bluetongue, Rift Valley Fever, and African Horse Sickness for animal health. Between 2008 and 2024, cases of Cutaneous Leishmaniasis, Malaria, Schistosomiasis, and Rickettsiosis were reported, notably all detected cases being imported.

Jordan faces challenges including a lack of sufficient financial support, need for specialized laboratory equipment and training, insufficient entomology experts, and the prioritisation of other epidemic diseases. JCDC initiatives include national risk assessments, forming multi-sectoral rapid response teams, and inter-sectoral training. Ongoing efforts include a national vector control needs assessment in cooperation with WHO and an epidemiological study on mosquito-borne diseases. This study aims to conduct national risk analysis, implement seroprevalence surveys in humans and animals in high-risk zones, and identify/screen mosquito vector species. The expected outcomes include a risk map, baseline seroprevalence data, identification of mosquito vectors beyond malaria programme coverage, and recommendations for targeted control.

North Macedonia has established a comprehensive framework for addressing animal health and VBDs. The Food and Veterinary Agency serves as an independent body responsible for food and animal feed safety, as well as the implementation, control, supervision, and monitoring of veterinary activities related to animal health, welfare, and public health. The national animal health legislation includes the Law on Veterinary Health and corresponding bylaws, with ongoing efforts to align with EU regulations (Reg. 429/2016). The Law on Food Safety also grants certain authorisations to the Director concerning Animal Health issues. An Annual Order for Animal Health is published annually, regulating disease prevention and control measures based on the country's epidemiological situation. The Department for Animal Health and Welfare of Animals is key for policymaking, monitoring epidemiological situations, data analysis, and drafting legislation. Official veterinarians and private veterinary practices are involved in implementing legislative measures. The Veterinary Laboratory at the Faculty of Veterinary Medicine in Skopje supports these efforts.

Based on epidemiological situation, risk of introduction, and potential for spread, North Macedonia prioritises:

Bluetongue: A programme for control and eradication of BT has been in place since 2007. Surveillance includes passive surveillance (clinical surveillance) and screening for antibodies. The last occurrences were in 2020 (serotype 4) and 2024 (serotype 8), both affecting ovine and caprine animals. Entomological Surveillance focuses on Culicoides vectors. This monitoring aims to determine the presence, dynamics, geographical distribution, and virological testing for bluetongue virus in Culicoides populations. Species identified include *C. obsoletus/scoticus, C. imicola, C. pulicaris, C. punctatus,* and *C. newsteadi*. West Nile Disease: The Annual Order for Animal Health includes provisions for examining poultry and equine animals. Surveillance also involves diagnostic testing for antibodies in poultry within the Avian Influenza surveillance programme. Human cases have been reported annually, with figures such as 6 cases in 2018, 7 in 2019, and 5 in 2024. Laboratory data shows serological positives in poultry and equids in various years. For instance, 40 positive poultry samples out of 873 tested by ELISA in 2021. Leishmaniosis: The Annual Order for Animal Health mandates testing of all stray dogs in shelters using accredited methods. Positive stray dogs are euthanised, while owned dogs have the possibility of medical treatment. Human cases have fluctuated, with 12 cases in 2018 and 4 in 2024. Canine leishmaniosis prevalence (by IFAT) was 7.73% in 2020 and 2.58% in 2024. Crimean-Congo Haemorrhagic Fever: Between 2015 and 2024, 6 individual human cases were registered, with 3 laboratory-confirmed cases in 2024 from Kriva Palanka, Skopje, and Delčevo. One human death was registered in 2023. Active surveillance for ticks was conducted in 2023 due to positive human cases. Laboratory data for 2023 showed 10 positive ELISA results out of 17 sheep and goat samples for CCHF.

North Macedonia identifies several needs for improving VBD surveillance and control, including an integrated programme between human and veterinary sectors, sharing surveillance data, joint outbreak investigations, increasing passive surveillance, awareness campaigns, improvements in biosecurity measures, and enhanced cooperation with stakeholders.

Montenegro faces challenges from VBDs, with specific efforts for surveillance and control. Registered and Priority VBDs: Human Medicine: Malaria, Leishmaniosis, West Nile Fever, Lyme borreliosis; Veterinary Medicine: Bluetongue disease, Lumpy Skin Disease, Leishmaniosis. Bluetongue Outbreaks: The last occurrence before 2014 was in 2001. 2014 Outbreak: from mid-October to December 2014, BT was confirmed in 8 Municipalities, affecting 135 holdings with 236 animals (6% illness rate) and 77 animal deaths. BTV4 was confirmed by the EU Reference Laboratory. 2015 Cases: only 7 cases were reported, primarily in bovine holdings. 2016 Outbreak: from August to December 2016, BT was confirmed in 682 holdings across 18 Municipalities, with the greatest number of outbreaks in sheep (546 holdings). Serotype 4 was again confirmed. Measures included herd surveillance, movement bans, separation of healthy and infected animals, and disinfection. Lumpy Skin Disease: the first case in cattle was registered on 21 July 2016 in Gusinje. The disease rapidly spread, affecting 557 laboratory-confirmed cases on 418 farms across 16 municipalities by October 2016. Most cases were in hilly mountainous areas, particularly Bijelo Polje, Berane, Mojkovac, and Kolašin. Emergency mass vaccination with a homologous live vaccine was implemented in 2016, followed by additional vaccinations in 2017, 2018, and 2019. This led to the absence of new cases after October 2016, and no cattle vaccination against LSD has been carried out since 2020. Leishmaniosis in Dogs: while IFA tests were done on 71 dogs by the Diagnostic Veterinary Laboratory, the source notes this number does not reflect the real situation, as many tests are done using SNAP fast tests in private veterinary practices.

Country needs: Montenegro's needs regarding VBD surveillance and control include formation of a unified national database for vectors and VBDs; developing forms and instructions for data submission to this database; establishing a Commission for vector surveillance and control; development and implementation of a plan for conducting verification experiments on modern vector control systems; Procurement of equipment for these experiments; preparation of annual programmes for timely detection of tick-borne diseases and implementation of tick population monitoring; development of a Protocol for rapid response to invasive vector species; proposals for changes to the Law on protecting the population from infectious diseases.

Serbia has an integrated West Nile Virus monitoring programme established by the Veterinary Directorate of the Ministry of Agriculture. The main aim is early detection of WNV presence in the environment to apply timely control measures, such as mosquito control and prevention of outbreaks in humans and animals. The programme has been active in various years since 2014, including 2024 and 2025. The programme is based on monitoring antibodies in sentinel animals and detecting the virus in natural reservoirs. Active Surveillance includes 1) serological testing of sentinel animals: this evolved from WNV IgG in horses and poultry (2014) to WNV IgM

antibodies in horses (2015-2021), and from 2022, IgM antibodies in horses and IgG antibodies in calves (6-8 months old); 2) virus presence in mosquito vectors (RT-PCR). Passive Surveillance includes serological testing of paired sera samples and virus detection in samples from horses with clinical signs of neurological disorders. All municipalities in Serbia are covered by the programme, with sampling points determined by risk assessment.

Serbia is involved in the EYWA project (Horizon2020) which aims at early warning for epidemics related to VBDs. This project provides accurate and interpretable disease prediction maps for mitigating mosquito-borne diseases. EYWA has expanded its operations since 2020 across Europe (Greece, Italy, France, Germany), Africa (Ivory Coast, Cameroon), and Asia (Thailand), and will continue as an advanced application service in the DestinE platform.

Serbia recognises the need to establish an effective surveillance system for WNV and other flavivirus VBDs (TBEV, USUV). WNV is considered an endemic infection and a significant problem. A fully integrated "One Health" surveillance system is deemed the best solution, though it requires continuous adaptation to changing situations. An effective surveillance system is only purposeful with adequate subsequent prevention and control measures.

Georgia implements surveillance and control measures for several VBDs. These include Crimean-Congo Haemorrhagic Fever, Leishmaniosis, West Nile Fever, Lyme borreliosis, Tularaemia, Q-fever, Babesia spp, and Theileria spp. Crimean-Congo Haemorrhagic Fever: A CDC-funded project (2018-2019) implemented CCHF surveillance, focusing on increasing staff training, a pilot surveillance programme in animals and ticks across 10 municipalities, GPS mapping of infected zones, and establishing laboratory diagnostics. Out of 646 cattle serum samples, 407 (63%) were positive by ELISA (IgG). None of the 170 tick samples were positive by PCR. Prevalence by villages ranged from 0% to 100%, with an average of 63.7%. Human cases show fluctuations over the years, with 47 cases in 2018 and 1 in 2023. West Nile Fever and Bluetongue Surveillance: training campaigns for field veterinarians and laboratory specialists (serology, molecular biology) have been conducted. Entomology training sessions focused on setting up light traps, sample collection, and identifying tick, mosquito, and Culicoides species, with trainers from Turkish universities and institutes. Vector Collection: vectors were collected around the country in bordering and high-risk regions. Identified Culicoides species include *C. helveticus, C. reconditus, C. comosioculatus, C. imicola, C. cameroni, C. punctatus, C. pulicaris s.l, C. obsoletus,* and *C. scoticus.* Mosquito species include *Culex pipiens, Aedes albopictus, Anopheles maculipennis, Aedes vexans,* and *Culex modestus*. Tick species include *Dermacentor marginatus, Dermacentor reticulatus, Rhipicephalus sanguineus*, and *Rhipicephalus bursa.*

Georgia plans to conduct activities such as establishing legislation for disease control, a regional VBD surveillance and early warning network, capacity building through joint regional training programmes and SOP development, and promoting public-private partnerships

Highlights from Session 4

WOAH supports its Members in strengthening their capacities through a series of programmes in continuous transformation and evolution. Recognising that VBDs are more probable to spread where Health Systems are more fragile and lack of institutional and workforce capacities, WOAH is encouraging its Members to exploit data from PVS (Performance of Veterinary Services). Pathway evaluations now available in an information system able to extract and visualize data on weaknesses, strengths and recommendations provided by the independent experts, to plan investments and development programmes based on evidence. WOAH capacity building programmes – mainly delivered through the PVS and the Training System - can support multisectoral collaboration following the One Health approach, legislation development, workforce assessment and development, education and continuing education, sustainable laboratories.

FESASS (La Fédération Européenne pour la Santé Animale et la Sécurité Sanitaire), which gathers and represents farmers, and their animal health services, is a network of 2,500 veterinarians, engineers, and technicians, with 10 laboratories, serving 1 million farmers and representing more than 85% of EU Livestock (60 million cattle, 104 million pigs, 39 million small ruminants). FESASS highlights that VBDs in the EU present a "real patchwork" due to different epidemiological situations, attitudes in infected Member States regarding surveillance, vaccination (compulsory or free), and movement management, and varying solidarity/compensation mechanisms. This situation stems from disease profiles, EU geographic and climate differences, and EU categorisation, indicating limits of subsidiarity and a key role for the sector. Long-term eradication seems impossible, suggesting

a need to learn to live with and improve/adapt VBD management.

FESASS proposes several key areas for improvement and coordination: Long-Term Views: reassessing objectives (eradication vs. control) based on EFSA opinions, recategorisation of diseases (E, ED, EDC) according to enzootic and exotic serotypes, reassessing sensitive species lists, and revising requirements for animal movements; Surveillance and Knowledge: adapting surveillance for early detection with priorities on vectors, epidemiology, and vaccination efficiency. This includes targeting surveillance based on risks, creating a specific data bank, updating EU situation maps, using new technologies, securing financing as a shared responsibility, and improving knowledge of vectors and pathogenicity; Vaccines Availability and Use: recognising vaccines as key tools, FESASS advocates for better and faster availability of vaccines, including using new vaccines at EU level before marketing authorisation (TUA). They also call for R&D for multivalent vaccines, a database for orbivirus genetic sequences, more antigen/vaccine/diagnostic reagent banks, and partnerships between CAs, stakeholders, and producers to better secure vaccine demand. Individual choice and buffer zones are also considered.

Dealing with VBDs requires a new paradigm for surveillance, vaccines, vaccination, and animal movements. FESASS calls for EU and international cooperation and coordination, including adapting international standards on VBDs and developing One Health cooperation on zoonotic VBDs to increase synergies in research and surveillance. Other proposals include developing genetic resistance ("Tropicalisation" of the herd), extending health funding to other stakeholders, and strengthening international cooperation, especially in the Mediterranean Basin.

Global Burden of Animal Diseases (GBADs) focuses on the costs, benefits, and effectiveness of VBDs and VBD-control programmes. It highlights that disease profoundly affects economies by altering labour supply and price and impacting regional or social group productivity. While VBD threats are real and change over time (often linked to climate change), "at the heart of the issue are people". Human behaviour, driven by heuristics (rules of thumb) or more methodical approaches, influences these threats. Humans create linkages, modify environments, and influence weather patterns.

The GBADs programme aims to clarify data and analysis by quantifying "how much are we losing" and "how much are we spending". This involves assessing the absolute and relative burden of each disease, identifying affected societal groups, attributing causes, and understanding economic impacts.

New technologies like vaccines and diagnostics alter the relationship between disease losses and animal health expenditure, necessitating long-term assessment of animal health investments. The total burden can be divided into: Avoidable losses: indicate technical and allocation issues (e.g., spending the wrong amount, unequal access). Policy focuses on information and coordination; Unavoidable losses: indicate a lack of technical options (interventions don't exist or are inaccessible). Policy focuses on research and development (R&D).

Animal health burdens disproportionately affect consumers and value chain actors more than producers. A shift in animal health burdens generates benefits across society, especially for urban consumers. Good burden estimations support advocacy for disease management, indicate resource allocation between diseases, pinpoint where resources are being used, and highlight areas for improved resource use.

Case Study: Bluetongue Impacts: National/Regional level impacts include significant economic costs, largely due to inability to trade animals (e.g., US$1.4 billion in France in 2007, US$130 million annually in USA due to trade losses and testing). Control measures and production losses are also major contributors.

Studies show the economic justification for prevention costs (e.g., Scotland BTV-8 outbreak prevention costs of £141m over 5 years were justified given estimated £100m annual outbreak cost). Vaccination policies have clear impacts, but benefits may not be equal across different types of farmers (e.g., sheep vs. cattle farmers in Belgium). Preventive measures and early detection indicators contribute to informed decision-making and effective strategies (e.g., Tunisia BTV-4 outbreak).

STAR-IDAZ IRC (Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses) aims to coordinate research at an international level to accelerate the delivery of new

tools and improved animal health strategies. It has 36 partner organisations in 23 countries, representing over $2.5 billion in research investment. Key deliverables include candidate vaccines, diagnostics, therapeutics, other animal health products and procedures, and key scientific information/tools to support risk analysis and disease control. This involves providing a structure and focus for research, identifying bottlenecks and critical gaps, and visualising complex problems.

STAR-IDAZ IRC develops research roadmaps, which are interactive, online tools, to outline the significant steps and problems to be solved based on identified gaps. A generic roadmap for Control of Vectors and of Transmission of Vector-borne Diseases considers control through three routes: Control on the host; Control on the vector; Control on the ecology or biotope of the vector and host.

Launch of PROVBAC Project (Session 5)

The PROVBAC project is a 9-month initiative sustained by WOAH with the general objective establishing a risk-based surveillance system for priority vector-borne zoonotic diseases in the Western Balkans and Caucasus. This project builds upon the eco-regionalisation method developed in PROVNA and will utilise already available surveillance data.

The PROVNA project (Defining Ecoregions and Prototyping an EO-based Vector-borne Disease Surveillance System for North Africa) initially focused on defining the ecoregions of North Africa. It is now in its second phase (PROVNA2), which aims to establish a risk-based surveillance system across North African countries. This system leverages the eco-regionalisation approach to monitor the emergence and spread of key animal and zoonotic diseases transmitted by mosquitoes. In addition, the project supports Veterinary Services in implementing or enhancing risk-based targeted surveillance of vector-borne diseases (VBDs). This includes field data collection to apply the ecoregion-based method, with the goal of improving surveillance strategies and optimizing the use of financial and human resources through strategic planning.

Key Objectives of the PROVBAC projects are: to define the ecoregions of the Western Balkan and Caucasus territories, characterising distinct environmental and climatic factors and identifying similar areas potentially favourable for vectors and vulnerable to specific VBDs; to investigate the association between specific ecoregions and priority vector-borne zoonotic diseases by analysing historical and available data on vector and disease distributions (with accurate geolocation); to promote the use of a risk-based approach in VBD surveillance in the region.

An ecoregion is a territory classified into similar areas based on specific environmental and climatic factors. The fundamental assumption behind this approach for VBDs is that similar areas, whether in space or time, are likely to be subject to similar diseases, particularly those transmitted by vectors. This concept is crucial because the climate and environment significantly influence the presence and distribution of vectors responsible for human and animal diseases globally.

Photos Credit: European Space Agency

Examples of satellite data used include Sentinel 1 (radar) and Sentinel 2 (optical). In the context of VBDs, Earth Observation (EO) data applications include projects like PROVNA and monitoring WNV circulation in Italy (AIDEO).

The integration of EO data with in-field surveillance data allows for the development of innovative and risk-based strategies for VBD control, optimising financial and human resources through strategic planning. This collaborative, data-driven approach supports a regional strategy for vector-borne and transboundary animal disease control and contributes to the growing interest in innovative surveillance tools within the One Health framework.

Roundtable discussion

Turning Data into Epidemic Intelligence: from Fragmented Systems to Coordinated Action in VBD Surveillance. Vector-borne diseases unfold within complex ecological, climatic, and socio-political systems. Tackling them effectively requires timely access to integrated, multisectoral data, from entomological surveillance to climate indicators, from wildlife health to human case reporting.

This foundational need is formally acknowledged in the Quadripartite One Health Joint Plan of Action (2022–2026), the strategic blueprint jointly developed by FAO, WHO, WOAH, and UNEP to guide global One Health implementation. The OH JPA outlines six interconnected Action Tracks, with Action Track 3 dedicated specifically to controlling and eliminating endemic zoonotic, neglected tropical and vector-borne diseases.

Guiding the strategic logic of the OH JPA is the One Health Theory of Change (ToC), developed by the One Health High-Level Expert Panel (OHHLEP). This conceptual framework defines how One Health transformation is expected to occur and “Data, evidence and knowledge” is one of the three pathways to system transformation, recognizing the value of scalable, integrated tools and platforms to inform coordinated action.

However, translating these frameworks into practice remains challenging. We often face institutional barriers and legal constraints that hinder cross-sectoral data sharing. Surveillance efforts continue to operate in silos, and many initiatives to harmonize and link data remain underfunded or disconnected from formal governance structures.

To better understand these systemic bottlenecks and identify pathways forward, the Quadripartite launched the One Health Intelligence Scoping Study (OHISS). This extensive analysis mapped the global "riskscape" of One Health threats and assessed the current state of intelligence systems across sectors. It confirms the critical need for common standards, interoperable platforms, and trusted governance frameworks — alongside stronger links between intelligence generation and decision-making processes.

Together, these three instruments — the OH JPA, the Theory of Change, and the OHISS — form a coherent roadmap for strengthening One Health intelligence globally.

This roundtable focussed not only on identifying barriers, but also on highlighting what’s working, where innovation is present, and how we can scale solutions to make One Health data intelligence more effective and sustainable — particularly in the context of emerging and endemic VBDs.

Highlights of the Roundtable discussions

The roundtable began with a shared recognition that while data integration, sharing, and epidemic intelligence are recurring themes, progress remains uneven, especially in the context of vector-borne diseases, which emerge and spread through complex ecological, climatic, and institutional environments. The discussion aimed to move from problem identification toward practical strategies for turning data into actionable intelligence that supports timely and effective decision-making. During the discussion, participants highlighted the complexity of the current landscape for vector-borne disease (VBD) surveillance, which relies on multiple data sources (environmental, entomological, surveillance of the disease in domestic and wild animals, human health, and contextual data on drivers such as animal trade and population movement).

Participants described the current VBD surveillance landscape as highly fragmented. Numerous data systems exist across animal, human, and environmental health sectors. Some of these systems are well-developed and institutionalized, while others operate in isolation or lack meaningful interconnection. Despite the volume of data generated, its potential remains underexploited due to limited interoperability and the absence of shared standards.

While some national, sub-regional, or regional initiatives have made progress in integrating data, these remain relatively isolated examples and often face challenges in terms of sustainability, interoperability, and geographic

coverage. Participants also pointed out persistent structural issues, such as inefficient data management, the lack or redundancy of databases, limited data sharing, and delays in disease notification and laboratory confirmation. In many regions, surveillance capacity remains weak, particularly for wildlife and entomological components. Despite these challenges, it was recognized that relevant data does exist and, it would be good to improve coordination and interoperability among existing systems, to enable more integrated and actionable insights across sectors and disciplines.

It was highlighted that certain data streams, such as entomological and environmental data, are essential to understanding VBD dynamics but are systematically underused, and in some case a lack of expertise (e.g. entomological expertise) is also a barrier. These data often lack integration into public health strategies, partly because of insufficient harmonization and incentives for sharing. But initiatives like VectorNet and databases like GBIF will surely help in data harmonization and sharing.

National-level evaluations of veterinary systems were noted as a potentially rich source of insight, particularly through performance reviews. However, preparedness for VBD threats is not always systematically captured in these assessments, pointing to a missed opportunity for strengthening surveillance and control.

A key theme in the discussion was the framing of data sharing not as an objective in itself, but as a potential outcome of well-established intersectoral communication. The value of trusted, recurring dialogue across sectors was emphasized as the foundation for problem identification and responsive data exchange. The focus, it was argued, should be on stimulating collaborative environments where data sharing emerges naturally as needed—rather than on building linked databases as a standalone goal.

Participants reflected on the persistent fragmentation of data across sectors in the surveillance of vector-borne diseases (VBDs), despite the One Health (OH) approach emphasizing integration, intersectoral collaboration, and shared data governance. Several barriers to effective data sharing were outlined. These include institutional inertia, incompatible mandates, and legal constraints that restrict the flow of information, even in contexts where political support exists. Operational fragmentation remains a persistent challenge. Social and political barriers are particularly significant. Participants emphasized that building trust between sectors and institutions is essential, and this requires transparency, clearly defined rules for data governance, and the creation of communities of practice. The example of the One Health Knowledge Nexus Community of Practice promoted by the Quadripartite was cited as a positive step in this direction.

Technical and analytical challenges were also highlighted, including inconsistent or unstructured data, poor metadata, and lack of standardised ontologies, all of which make difficult integration and usability.
In terms of infrastructure and technological gaps, panellists called for greater investment in platforms and systems that support secure and accessible data storage and exchange. The example of GBIF was referenced as a model for facilitating biodiversity data sharing that could inspire similar efforts in the VBD space.

Finally, participants pointed to successful initiatives that demonstrate what is possible when barriers are addressed. The GLEWS+ experience was mentioned as a concrete case of improved data integration and collaboration in practice.

The technical burden of harmonizing datasets, especially across countries and formats, was noted as substantial, often requiring significant time and resources. In this sense it was also highlighted the importance of having international standards and guidelines from international organisations like WOAH to improve a standardized data collection and surveillance.

From a technical standpoint, many of the core interoperability issues are solvable. However, the real challenge lies in establishing governance models and trust mechanisms that enable data to be shared and used safely and meaningfully. There was also growing recognition of the role that non-official data sources, (citizen science, open-source platforms, and web scraping). They can play in enriching VBD intelligence, provided proper validation mechanisms are in place.

Turning data into timely and meaningful action remains a central challenge. Intelligence platforms are only useful when embedded within decision-making structures. Without that connection, data risks remain static and unutilized.

Experience shows that integrating VBD data into response systems, particularly when visualized and contextualized, can lead to better-informed actions. However, without analytical frameworks and adequate scientific literacy, shared data can also be misused or misinterpreted.

The session closed with a consensus around two major shifts needed to advance One Health intelligence for VBDs in the coming years:

1. **Institutional** – Develop long-term, cross-sector governance mechanisms that provide legitimacy, intersectoral collaboration, trusting, transparency.
2. **Technical** – Support interoperable and modular platforms that integrate diverse data streams without requiring full system overhauls.

The roundtable concluded with a strong call to shift away from the continuous development of new, disconnected systems. Instead, participants emphasized the importance of optimizing and interconnecting existing tools and data infrastructures. As a concrete first step toward this goal, they suggested creating regional working groups or networks to help coordinate efforts and foster system integration.

Interactive session 1: Gaps and needs

The interactive session, which included polls conducted via Slido, focused on identifying existing gaps and listing requirements for the effective prevention and control of vector-borne diseases.

A. Key Gaps Identified in Vector-Borne Disease Management

Participants identified several critical gaps hindering the effective management of VBDs. These can be broadly categorized as follows:

1. Data and Surveillance:

- A recurring theme was the lack of harmonized and accessible data. Specific gaps include the need for a centralized database for VBDs, vaccinations, and vector control measures.
- Participants highlighted the necessity of data sharing across borders and between different sectors, including veterinary, entomology, ornithology, wildlife, and public health specialists.
- The development of a robust VBD surveillance system under the One Health concept was also noted as a significant gap.

2. Vaccines and Control Measures:

- The availability, efficacy, and variety of vaccines were major concerns. There is a need for vaccines against various serotypes, including multivalent options. The industry's willingness to develop these vaccines was also questioned.
- A lack of clear, effective preventive measures for farmers beyond basic movement control was pointed out.
- The effectiveness of non-vaccination control measures, such as vector repellents and insecticides, was frequently questioned.

3. Collaboration and Coordination:

- A significant gap exists in cross-border and inter-state collaboration and the development of joint approaches to surveillance and eradication.
- The need for improved cooperation under the "One Health" approach, integrating veterinarians, entomologists, and other specialists, was emphasized.
- A lack of coordination among various ongoing projects and activities was also identified as a hindrance.

4. Knowledge and Expertise:

- There are significant knowledge gaps concerning vector ecology, such as overwintering mechanisms of both vectors and pathogens like Bluetongue virus (BTV).
- A shortage of specialized personnel, particularly veterinary entomologists, was a commonly cited issue.

5. Policy and Economics:

- Participants noted a lack of clear regulations for VBDs, contrasting with the very clear regulations for Category A diseases.
- The need for cost-benefit and economic analyses of different control strategies was also highlighted.

B. Critical Needs for Prevention and Control of VBDs

The identified needs for improving the prevention and control of VBDs directly reflect the perceived gaps:

1. Enhanced Knowledge and Education:

- There is a strong need for better knowledge of vectors, their spreading conditions, and the effectiveness of control measures like insecticides.
- Educating farmers on vector ecology, biosecurity, and the safe use of insecticides is crucial.

2. Improved Tools and Strategies:

- The development and availability of effective and agile vaccine platforms, including multivalent and DIVA vaccines, are paramount.
- There is a call for environmentally friendly and vector-specific insecticides.
- Flexible, tailored approaches to control are needed, as a "one size fits all" strategy is considered ineffective for VBDs.

3. Strengthened Collaboration and Systems:

- Harmonized early warning surveillance systems and cross-border cooperation are essential.
- A true "One Health" approach with intersectoral collaboration and control plans is required.
- Establishing good quality data for decision-making and evaluating the effectiveness of implemented measures is a priority.

4. Resources and Support:

- Adequate funding, human capacity (including more veterinarians and entomologists), and budget allocation are fundamental needs.
- Stakeholder buy-in and awareness among farmers and the public are necessary for successful implementation of control measures.

Interactive session 2: The Way Forward

The "Way Forward" session, featured a series of open-text polls to gather insights on the control of vector-borne diseases. These were focused on four key areas: the overall way forward for VBD control, the role of Members and their Veterinary Authorities, the role of WOAH, and the contributions of WOAH Reference Centres. Based on the poll results, here are some conclusions and recommendations for each of the four key areas recognized by participants.

1. The Way Forward with VBDs Control

Conclusion: The overwhelming consensus is that a shift towards a more collaborative, data-driven, and strategic regional approach is necessary. The current methods are seen as insufficient, with a clear call for more formal networks and frameworks to unify efforts. Vaccination is considered a critical tool, but there is a need for better data and access to safe and effective vaccines.

Recommendations:

- **Establish a Formal Regional Network:** Create a "Community of Practitioners" with a formal framework for regular, structured discussions on surveillance outcomes, control experiences, and emerging threats.

- **Prioritize a Unified Data Strategy:** Develop a plan to harmonize data collection and sharing across countries so they can "speak the same language epidemiologically."
- **Focus on Multivalent and DIVA Vaccines:** Support the research, development, and availability of advanced vaccines and ensure their effectiveness is measured and shared.
- **Increase Public and Stakeholder Awareness:** Launch educational campaigns to highlight the impact of VBDs on public health and trade, which can also help secure more funding and political will.

2. Role of WOAH Member Countries and Veterinary Authorities

Conclusion: Member countries and their Veterinary Authorities need to take a proactive and well-funded approach. The feedback suggests a disconnect between high-level policy and practical, on-the-ground implementation. Effective surveillance, communication, and resource allocation are seen as the most significant areas for improvement.

Recommendations:

- **Develop Clear VBD Action Plans:** Implement comprehensive VBD programs with clear objectives, defined authorities, and dedicated budgets.
- **Boost Surveillance and Monitoring:** Invest in advanced surveillance techniques, including passive surveillance at abattoirs and insect viral load monitoring, and use this data to inform and justify policy decisions.
- **Formalize Intersectoral Communication:** Create formal mechanisms for dialogue between animal health, public health, and agricultural sectors, as well as with neighboring countries.
- **Ensure Sustainable Vaccine Supply:** Work with the pharmaceutical industry to address issues of vaccine availability and accessibility.

3. WOAH's role and support for VBDs prevention and control

Conclusion: WOAH is viewed by participants as a crucial coordinating and guiding body. Poll respondents want WOAH to leverage its position to provide clearer guidelines, facilitate collaboration, and champion the issue of VBDs on the global stage. There is a strong desire for WOAH to act as a central hub for training, information, and standardization.

Recommendations:

- **Create Binding Guidelines and Standards:** Develop clear, detailed guidelines for vector control and movement of animals, and work towards making them binding for member countries.
- **Coordinate Regional and Global Efforts:** Actively coordinate vaccine research, facilitate regional expert dialogues, and promote experience sharing to prevent duplication of efforts.
- **Strengthen Training and Capacity Building:** Expand the availability of online trainings, e-learning modules, and workshops to help member states build a skilled workforce.
- **Advocate for VBDs:** Use its platform to keep VBDs on the regional and global health agenda, emphasizing their link to climate change and the economic benefits of control measures.

4. Contribution of WOAH Reference Laboratories and Collaboration Centers

Conclusion: The poll highlights the critical role of these centers as the scientific and technical backbone of VBD control. Their ability to conduct cutting-edge research, provide specialized training, and support Members directly is considered invaluable. There is a desire for them to be more connected and collaborative to maximize their impact.

Recommendations:

- **Coordinate Research to Avoid Duplication:** Establish a network for research centers to plan joint projects, define research areas, and share knowledge to optimize resources.

- **Provide Advanced, Practical Training:** Offer hands-on training in specialized areas like parasitology, entomology, and diagnostics.
- **Share Expertise and Equipment:** Actively support member countries by sharing expertise, contributing equipment to local testing centers, and helping to set up rapid testing systems.
- **Help with Data Harmonization:** Take a leadership role in helping national laboratories standardize diagnostic methods and data collection to enable regional data analysis.

Overall Conclusions of the Seminar

Charting the Path Forward for VBD Control: This seminar's discussions and poll results reveal a clear and unified understanding of the challenges and opportunities in the fight against Vector-Borne Diseases. A key conclusion is that the path forward requires a fundamental shift from fragmented, national-level responses to a coordinated, collaborative, and evidence-based regional strategy. The following points synthesize the major gaps and needs identified by participants, providing a clear roadmap for future action.

Bridging Gaps in Collaboration and The One Health Approach: A recurring theme is the urgent need to move beyond isolated efforts. Participants highlighted a significant gap in cross-border communication and a lack of formalized collaboration frameworks. This has led to an uncoordinated response and an inability to share best practices effectively. The consensus is that a true "One Health" approach is not a theoretical concept but a practical necessity, requiring a formal, two-way data exchange between animal, public, and environmental health sectors. Establishing a "community of practitioners" and promoting regular dialogue will be crucial for building the trust and transparency needed to sustain this collaboration.

The Critical Need for Actionable Data: The seminar identified a major deficiency in the collection, harmonization, and application of data. Without a centralized, consistent database, it is nearly impossible to conduct accurate cost-benefit analyses to support funding decisions or evaluate the effectiveness of control measures. This gap is particularly acute for vaccine effectiveness, the impact of vector control measures, and the overwintering mechanisms of vectors and pathogens. To address this, a high-level priority must be to standardize data collection and sharing protocols, ensuring that evidence, not assumption, drives decision-making.

Translating Priorities into Tangible Action: While there are many high-level strategies in place, the seminar revealed a struggle to translate these priorities into tangible action on the ground. This is directly linked to a lack of clear, standardized guidance and a critical shortage of expert capacity. Specifically, the scarcity of trained entomologists and the need for more education for farmers were repeatedly cited. To overcome this, there must be a concerted effort to provide targeted trainings, create standardized regulatory frameworks, and expand educational resources on vector biology and prevention.

Coordinating Vaccinal Strategies and Research: The poll results underscore the reliance on the private sector for vaccine development and a lack of coordinated vaccinal strategies. This leaves countries vulnerable to supply chain issues and makes a unified regional response difficult. Seminar participants called for more investment in agile vaccine platforms, the establishment of vaccine banks, and the coordination of research to address emerging threats like new VBDs spreading to different areas. This will ensure a more proactive stance, rather than a reactive one, in the face of future outbreaks.

Overall Recommendations from the VBD Seminar

Based on the insightful discussions, poll results, and expert contributions, the following recommendations are drafted to guide a more effective and sustainable approach to VBD control. These recommendations emphasize collaboration, data-driven decisions, and strategic investment.

1. Strengthen Intersectoral and Cross-Border Collaboration: A cohesive response to VBDs requires moving beyond national and sectoral silos. It is recommended to:

- **Promote Resource Sharing:** Facilitate and encourage the sharing of national plans, protocols, web tools, and informative materials among countries to prevent the duplication of efforts and accelerate implementation.
- **Reinforce the One Health Approach:** Formally integrate the One Health approach into national strategies, with intersectoral agreements on investments in the workforce and control measures for zoonotic VBDs. Efforts to promote the sharing of standardized data among sectors at national and international levels must be enforced.
- **Balance Harmonization and Flexibility:** A crucial balance must be found between the need for cross-border harmonized control strategies and the necessity to apply fit-for-purpose control measures that are adapted to the unique epidemiological conditions and national priorities of each region.

2. Advance Data-Driven Surveillance and Policy: The lack of harmonized data and evidence-based tools is a significant barrier to effective decision-making. It is recommended to:

- **Enhance Data Sharing and Harmonization:** Enforce efforts from International Organizations and Agencies to promote the sharing of standardized data among sectors at national and international levels. This includes developing shared databases on vaccine effectiveness, vector distribution, and control measures.
- **Develop Interactive Surveillance Tools:** Promote the development of interactive tools that support at-risk surveillance and rapid response. These tools should empower veterinary authorities to better utilize data for timely and informed action.

3. Invest Strategically in the Workforce and Research: A sustainable VBD framework depends on a skilled and knowledgeable workforce. It is recommended to:

- **Prioritize Capacity Building:** Promote ongoing and additional capacity-building initiatives, with a particular focus on addressing the shortage of experts in entomology, risk assessment, epidemiological surveillance, and VBD diagnostic methods. These initiatives will justify and encourage governments to build a sustainable framework.
- **Coordinate Research Priorities:** Promote the establishment of antigen banks and repositories with information on agents' sequences to allow for a prompter vaccine production and supply. Invest in research to address key knowledge gaps, such as the overwintering mechanisms of vectors and pathogens.

Additional reading:

1. S. Babo Martins* & J. Rushton. Cost-effectiveness analysis: adding value to assessment of animal health, welfare and production. Rev. sci. tech. Off. int. Epiz., 2014, 33 (3), 681-689
2. A guide - Introduction to the use of Cost-Effectiveness Analysis in Animal Health by Jonathan Rushton, Will Gilbert and Derrick Jones with Sara Babo Martins and Jan Hinrichs. 15th August 2018 (www.gf-tads.org/fileadmin/user_upload/gf-tads/docs/document_about/Global/CEA_Guide_Aug_2018.pdf)
3. Article by Dr Budimir Plavsic: Vector-Borne Diseases in Europe and Neighboring Regions: An Analysis of Animal Health, Zoonotic Threats, and Integrated Responses, April 2025.