

Controlling Endemic Zoonotic, Neglected Tropical and Vector-Borne Diseases in the Animal Sector with a One Health Approach

Executive Summary

Endemic zoonoses (EZ) are infectious diseases, disproportionately affecting low- and middle-income countries and people living in proximity with their animals. They include rabies, brucellosis and echinococcosis, amongst others. The majority of EZ are classified as neglected tropical diseases (NTDs) because they mainly affect poor and marginalised human and animal populations in low- and middle-income countries, and therefore they are almost absent from the global political and research agenda. EZ usually do not spread fast or wide, further contributing to their low priority. Some of the EZ and NTDs are vector-borne diseases (VBDs), transmitted by vectors such as mosquitoes. Climatic conditions in some African, Asian, and Middle and South American countries are the perfect breeding ground for the rise and persistence of these diseases, with climate change accelerating the prevalence, especially in low- and middle-income countries.

Recognising that these diseases are best controlled by applying a multisectoral approach, the World Organisation for Animal Health (WOAH) advocates adopting the [One Health](#) approach to ensure that they are addressed comprehensively. The approach provides opportunities to join forces with local Veterinary Services, communities, governments and other relevant stakeholders to promote multisectoral inclusive partnerships and enhance disease prevention, surveillance and control [1].

The Quadripartite consisting of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Health Organization (WHO) and WOAH developed the [One Health Joint Plan of Action \(2022–2026\)](#) (OH JPA) to integrate systems and capacity to better tackle health threats at the animal–human–environment interface collectively, with Action Track 3 of the plan focusing on controlling and eliminating EZ, NTDs and VBDs with a One Health approach. WOAH is advocating policy alignment of Action Track 3 in the animal health sector.



Insights from Scientific Evidence

Although only 16 countries bear **80%** of the burden of NTDs, they impacted at least **1.74 billion** people globally in 2019 [2,3].

The NTD rabies causes livestock deaths costing about **USD \$512 million** yearly, with major losses in livestock-dependent economies (e.g. Ethiopia, Sudan, Tanzania) and in countries with high population density (e.g. China, India, Bangladesh) [4].

VBDs account for more than **17%** of all infectious diseases, causing more than 700,000 human deaths annually [5].

Avian malaria, a VBD, causes mortality rates of **65–90%** in wild Hawaiian birds [6].

Climate change allows vectors to survive in places where they did not previously, causing an increase of VBDs such as dengue fever [7].

Zoonoses are responsible for **2.5 billion** cases of illness and **2.7 million** human deaths annually [8].

Eradicating the EZ brucellosis from sub-Saharan Africa is estimated to generate **USD \$0.5–\$1 billion** yearly in additional income potential for stakeholders in the region [9].

Definition of Concepts

Neglected tropical disease

Disease that primarily affects vulnerable and marginal populations living in rural areas of tropical and subtropical countries who have little access to medical care [1].

Zoonotic disease

Infectious disease that spreads between animals and humans. The disease can be foodborne, waterborne, vector-borne, transmitted through direct contact with animals or indirectly by environmental contamination [10].

Endemic zoonotic disease

Disease that exists continually or continuously in a geographical area [10].

Vector

Insects or other carriers that transport an infectious agent from an infected human or animal to a susceptible human or animal, its food or immediate surroundings [11].

Vector-borne disease

Human and animal illnesses caused by parasites, viruses and bacteria that are transmitted by vectors [1].






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The Importance of Reducing Risks Associated with Endemic Zoonotic, Neglected Tropical and Vector-borne Diseases

Domestic and wild animals are involved in the infection dynamics of some NTDs (e.g., Chagas disease, echinococcosis, rabies; see Table 1 for more detail). Animals can be hosts of pathogens, parasites and vectors.

For example, domestic and wild animals can be infected by the parasite *Trypanosoma cruzi*, developing Chagas disease or remaining asymptomatic but feeding and infecting vectors, which maintains the transmission cycle [12].

Table 1: Examples of EZ, VBDs and NTDs, their hosts and distribution

Disease	EZ	VDB	NTD	Hosts	Geographical distribution
Dengue fever	●	1 ● 	●	Humans, monkeys	Middle East, Africa, the Americas, Asia, the Caribbean, the Pacific
Malaria	●	2 ● 	●	Wild non-human primates	Sub-Saharan Africa, South-East Asia, Eastern Mediterranean, Western Pacific, the Americas
Chagas disease	●	3 ● 	●	Mammals	The Americas
Rabies	●	●	●	Dogs and other mammals	Africa and Asia
Echinococcosis	●	●	●	Dogs and other mammals	Worldwide
Brucellosis	●	●	●	Cattle, sheep, goats, pigs	Middle East, Mediterranean region, sub-Saharan Africa, China, India, Peru and Mexico. Increase seen in central and southwest Asia

The burden of EZ, NTDs and VBDs is almost always carried by people living in low- and middle-income countries, with women and children being disproportionately affected. Currently, the animal burden is not well understood. Resources for diagnostics, treatment, surveillance and research on the animal burden are limited. Mis- and under-diagnosis in humans and animals is common owing to the lack of locally available and accessible

diagnostic tools [13]. The diseases affect humans and animals directly (e.g. morbidity, mortality, medical and veterinary expenses) and indirectly (e.g. loss of productivity, income and tourism), impacting livelihoods and economic growth. Intervention in the animal hosts is often the most cost-effective way to control EZ, NTDs and VBDs (see the case study on rabies).

Case study: Namibia's battle against rabies



From June to July 2023, Namibia's Northern Communal Areas (Oshana, Omusati, Oshikoto, Ohangwena, Kunene) performed targeted dog vaccination campaigns. Vaccination points were set up to create many accessible central places for dog owners to bring their pets for rabies vaccination. Estimating the vaccination coverage was logistically challenging, therefore different methods were used: Documentation through a mobile app, the capture–mark–recapture method, high-resolution settlement layer (HRSL) data to estimate the dog population, and owner surveys.

This indicated that **vaccination coverage was at least 64% and at most 86% at one vaccination point**. In total, **40,286 dogs were vaccinated**. Namibia's government leadership and community involvement had already reduced human rabies cases from around 25 deaths in 2015 to 7 cases in 2022.

In addition, environmental changes are promoting the spread of NTDs, as climate change and land use change can influence the distribution of vectors. An expansion of VBDs and their vectors is predicted in future climate change scenarios

with warming temperatures and rising sea levels creating more suitable vector habitats. Changing seasonal patterns and winter warming can result in prolonged periods that are suitable for disease transmission [7].

Prospects

There is a lack of political attention for EZ, NTDs and VBDs, leading to unpredictable funding, exclusion from national policies and limited coordination to prevent and control the diseases. The lack of disease surveillance and control measures are caused by several factors, including geographical remoteness, low disease reporting and high costs associated with surveillance activities. This calls for allocation of resources, capacity building, prevention, surveillance and

control, including vaccination and eradication programmes. These must be tailored to local circumstances in collaboration with the local community, Indigenous Peoples and experts from relevant sectors [8]. Crucially, the capacities of Veterinary Services in low- and middle-income countries must be strengthened, integrating an environmental perspective to comprehend disease pathways (see Figure 1) [14].

In addition, more interdisciplinary eco-epidemiological studies should be conducted, linking infections among human, animal and vector populations to tackle the knowledge gap that challenges prevention, control and elimination measures [15]. The One Health approach provides tools to coordinate efforts,

implement cross-sector governance and promote cross-sector research [1]. The approach can connect governance at local, regional and national levels, and facilitate One Health policies that prioritise the prevention and control of EZ, NTDs and VDBs.

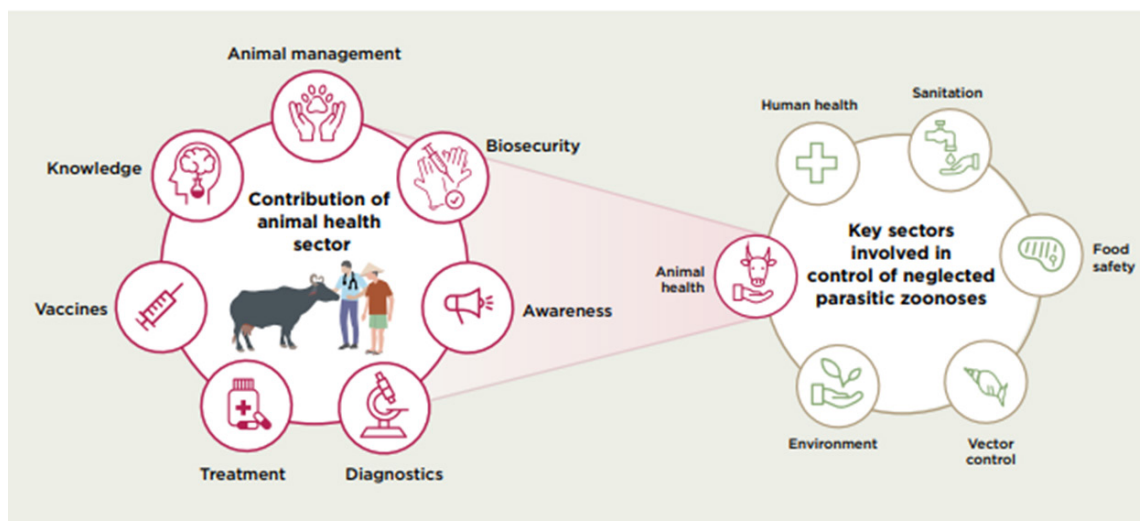


Figure 1: Controlling neglected zoonoses with a One Health approach via cross-sector collaboration. Veterinary Services can provide essential tools when resources are available [16].

WOAH’s Contribution to Addressing Endemic Zoonotic, Neglected Tropical and Vector-borne Diseases via the One Health Approach

Adopting a One Health approach in relevant WOA activities

Multisectoral collaboration and coordination is a key principle of the One Health approach. It is important to institutionalise **multisectoral coordination mechanisms** among key stakeholders (animal health, public health, environment, wildlife sectors and local communities). Intersectoral coordination mechanisms should be backed up by legal

frameworks that enable information sharing, joint surveillance, disease prevention and response activities. The **Veterinary Legislation Support Programme** provides countries with the opportunity to have their veterinary legislation systematically reviewed by experts, to identify weaknesses, strengthen their capacity in legal drafting and revise or develop new legislation.

With the development of **international standards**, WOAHA contributes to minimising risks associated with emerging and re-emerging zoonotic diseases [17]. The WOAHA **Working Group on Wildlife** informs and advises on diseases in wild animals, for example EZ and NTDs [18]. WOAHA is part of the **United Against Rabies Forum**, a global platform with various stakeholders who work together to control and eliminate rabies, an NTD endemic in many countries and regions.

This is in line with objectives set out in **Zero by 30: the global strategic plan to end human deaths from dog-mediated rabies by 2030**.

The Quadripartite address infectious diseases of zoonotic origin in the **One Health Joint Plan of Action (2022–2026)** via Action Track 3 that focuses on controlling and eliminating EZ, NTDs and VBDs. Also important for addressing these diseases are Action Tracks 1, 2 and 6 (see Figure 2).

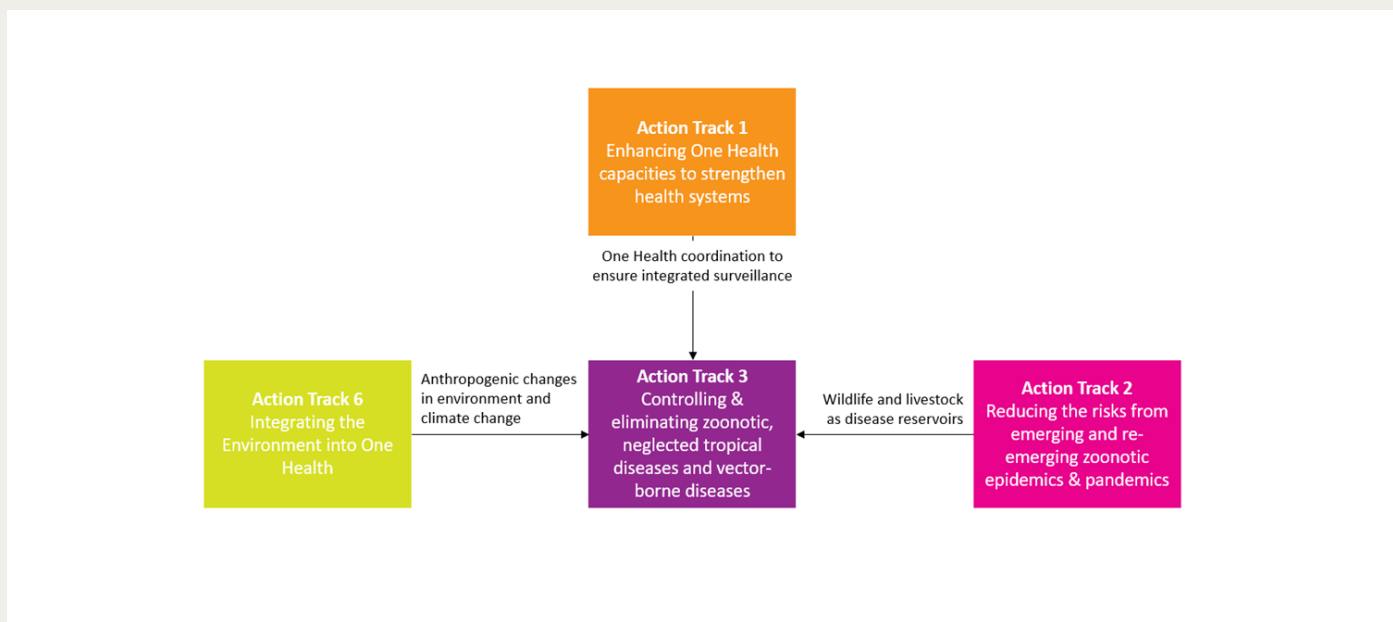


Figure 2: Interrelation of Action Track 3 with Action Tracks 1, 2 and 6 of the One Health Joint Plan of Action.

WOAHA, in collaboration with WHO and FAO, prepared **A Tripartite Guide to Addressing Zoonotic Diseases in Countries**, a tool that allows countries to improve their zoonotic disease frameworks, strategies and policies. The guide is associated with operational tools, such as the **Multisectoral Coordination Mechanism Operational Tool (MCM OT)**, the **Joint Risk**

Assessment Operational Tool (JRA OT), and the Surveillance and Information Sharing Operational Tool (SIS OT). The Operational Tools are freely-accessible to strengthen countries' capacities for One Health risk assessment, surveillance and information sharing for zoonotic diseases, including VBDs, and more are under development [19].

Implementing One Health disease surveillance and control

An essential component of the One Health approach is integrated surveillance that combines data from animal, human and environmental sectors to inform risk management and risk communication. WOAAH supports its Members in achieving this through several projects and surveillance tools:

- The **World Animal Health Information System (WAHIS)** is an early warning and monitoring system where countries can report and share data on animal disease outbreaks. WOAAH currently provides a list of 121 animal diseases to be reported, of which 27 are VBDs and 6 NTDs.
- **WAHIS-Wild beta** is the online platform for global surveillance of wildlife diseases.
- The **Global Early Warning System (GLEWS+)** is an early detection One Health surveillance system of health threats at the human–animal–environment interface.
- The **PROVNA project** aids veterinary authorities in six North African countries to improve risk-based surveillance, augmented with environment data, for VBDs.
- The **Wildlife Health Framework** strengthens the ability of Veterinary Services to manage the risk of disease emergence and the implementation of mitigation measures to protect wildlife health.
- The **EBO-SURSY project** strives to improve local, national and international early detection systems for zoonotic diseases in ten countries in West and Central Africa, with plans to expand to more countries in the region.
- **WOAH vaccine banks** for rabies ensure the procurement of high-quality vaccines manufactured in line with WOAAH international standards.
- The **Global Burden of Animal Diseases (GBADs)** programme gathers and uses existing data to improve animal health at local, national and global levels.

Building One Health capacity in the animal health workforce

WOAH offers tools at different scales aimed at enhancing One Health capacities. These include capacity building and performance monitoring frameworks for the improved **Performance of Veterinary Services (PVS) Pathway** and training for the veterinary workforce via the interactive **Training Platform** to strengthen Veterinary Service competencies and ensure adequate understanding and implementation of standards and guidelines. The PVS Information System is an innovative tool enabling an understanding of Veterinary Service strengths and weaknesses related to One Health competencies and providing recommendations to improve capacities.

The Tripartite, with plans to engage UNEP, conduct PVS/IHR National Bridging Workshops to foster One Health capacity building at national level, by creating synergies between the animal health, human health and environment sectors. The Tripartite developed the **One Health Competency Framework for Field Epidemiologists** to support the animal health, public health and environment workforce in developing collaborative capacities, as well as the **Global Laboratory Leadership Programme**, providing training in leadership and management so that laboratories can effectively play their role in the prevention, detection and control of diseases [20].

Policy Recommendations

WOAH recommends policy-based solutions to strengthen the prevention, surveillance and control of EZ, NTDs and VBDs under the One Health approach:

At policy and institutional level:

- Integrate the One Health approach at local and national levels to strengthen multisectoral collaboration and coordination between governments, competent authorities, organisations, Indigenous Peoples and local communities.
- Develop or strengthen joint risk communication and community engagement policy and strategy on EZ, NTDs and VBDs.
- Increase investment in local Veterinary Services for early detection and diagnosis of EZ, NTDs and VBDs in animals.
- Allocate sufficient resources to support data collection on EZ, NTDs and VBDs at national and local levels, including animal disease burden data, to improve the quality of reported data and promote reporting of animal health data to WAHIS and GLEWS+.



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At programmatic level:

- Ensure that a national One Health Multisectoral Coordination Mechanism is in place, facilitating the implementation of the One Health Joint Plan of Action, which encompasses EZ, NTDs and VBDs.
- Set up intersectoral technical working groups on EZ, NTDs and VBDs at country level with legal mandate and sufficient resources to support prevention, surveillance and control measures and to improve coordination, communication and implementation of relevant activities between veterinary, public health and environment sectors in areas with high prevalence of EZ, NTDs and VBDs.
- Support the scale-up of EZ, NTD and VBD eradication and control programmes, such as the rabies vaccination programmes for animals in line with the ZERO by 30 strategic plan.
- Promote scientific research on EZ, NTDs and VBDs, the animal burden of disease and links among infections in human, animal and vector populations, as well as research and development of affordable diagnostics for animals to improve early detection of diseases.

At technical level:

- Provide training and education of local veterinary workforces, local authorities, Indigenous Peoples and local communities in relation to disease prevention and health promotion.
- Involve sub-national technical staff, local authorities, Indigenous Peoples and local communities in the decision-making process to adapt the activities to the local context.
- Train media on the burden and priority areas for investment in control and elimination of EZ, NTDs and VBDs to project accurate information at national level and beyond.

WOAH sources for further information

[WOAH international standards](#)

[World Animal Health Information System \(WAHIS and WAHIS Wild\)](#)

[Performance of Veterinary Services \(PVS\) Pathway](#)

[GLEWS+: Global Early Warning and Response System](#)

[WOAH Training Portal](#)

[WOAH vaccine banks](#)

[WOAH Wildlife Health Framework](#)

[EBO-SURSY Project](#)

[PROVNA project](#)

[National Bridging Workshops](#)

[Quadripartite One Health Joint Plan of Action \(2022–2026\)](#)

[A Tripartite Guide to Addressing Zoonotic Diseases in Countries and Operational Tools](#)

[The Global Burden of Animal Diseases \(GBADs\)](#)

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