



Technical Item

INVESTING IN ANIMAL HEALTH to Secure Everyone's Future: A financing framework for Veterinary Services

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Acronyms and abbreviations

AgTech	Agricultural Technology
AI	Artificial Intelligence
AMR	Antimicrobial resistance
AMU	Antimicrobial use
AOI	Agriculture Orientation Index
ASF	African swine fever
BSE	Bovine spongiform encephalopathy
CAHWs	Community animal health workers
CERCs	Contingent Emergency Response Components
CERPs	Contingent Emergency Response Projects
COVID-19	Coronavirus disease caused by the SARS-CoV-2 virus
DFIs	Development finance institutions
DLI	Disbursement linked indicator
DLR	Disbursement linked result
GAFSP	Global Agriculture and Food Security Program
GBADs	Global Burden of Animal Diseases programme
GDP	Gross Domestic Product
FAO	Food and Agriculture Organization of the United Nations
FMD	Foot and mouth disease
HICs	High income countries
HPAI	Highly pathogenic avian influenza
IFC	International Finance Corporation
FAO	Food and Agriculture Organization of the United Nations
FMD	Foot and mouth disease
LICs	Lower-income countries
LMICs	Low- and middle-income countries
MDBs	Multilateral Development Banks
OECD	Organisation for Economic Co-operation and Development
PPPs	Public–private partnerships
PPR	Peste des petits ruminants
PRAPS	Regional Sahel Pastoralism Support Project
PVS	Performance of Veterinary Services
R&D	Research and development
RBF	Results-based financing
RVF	Rift Valley fever
SARS	Severe acute respiratory syndrome
TADs	Transboundary animal diseases
UMICs	Upper-middle-income countries
VMPs	Veterinary medicinal products
VPPs	Veterinary paraprofessionals
WOAH	World Organisation for Animal Health

Executive summary

Why animal health matters. Healthy animals are the backbone of our food systems, our economies and our health. Worldwide, the livestock sector is worth over US\$ 1 trillion and supports the livelihoods of more than one billion people, many of them among the world's poorest. Yet, despite this enormous value, animal health services are severely underfunded, receiving on average just 0.05% of national GDP, while animal diseases reduce global agricultural production by around 20% each year.

The consequences are far-reaching. Diseases devastate farmers, disrupt food supplies and can spread to humans. Simply put, the cost of inaction far exceeds the cost of prevention. Beyond economics, animal health is inseparable from human health. Most emerging infectious diseases originate in animals, and antimicrobial resistance (AMR), one of the greatest threats to modern medicine, is closely linked to antibiotic use in livestock. In other words, investing in animal health means investing in global health security.

The case for investment is clear. Investing in animal health is one of the most effective economic decisions countries can make. Studies show returns of up to 86% per year, placing animal health among the most productive investments for society.

The global shortfall is also manageable. Bringing Veterinary Services worldwide up to internationally recognised standards would cost an estimated US\$ 2.3 billion per year – a small fraction of the livestock sector's total value, and far less than the losses caused by preventable outbreaks.

What needs to change? Experience shows that no single financing tool is sufficient. The most resilient systems combine complementary, flexible instruments and mechanisms. Veterinary Authorities should adopt a diversified financing approach that aligns funding with the type of service:

- i. Public funding should focus on services that benefit all, such as disease surveillance, outbreak preparedness and control of transboundary diseases.
- ii. Private investment should cover services that directly benefit individual farmers and businesses, such as veterinary treatments and vaccines.
- iii. Blended finance (which combines public, private and/or philanthropic funds) should be used to unlock investment in countries where markets alone cannot deliver.
- iv. Results-based financing (which links payments to verified outcomes like vaccination coverage) can improve accountability and efficiency.

A stable regulatory environment led by governments and Veterinary Authorities is essential to give private actors the confidence to invest. This Technical Item proposes a structured approach to maximise available sources of finance for animal health.

The bottom line. The world is underinvesting in animal health, at enormous cost to farmers, economies and societies. Closing this gap does not require unlimited resources; it requires smarter decisions about who pays for what, stronger Veterinary Services and a genuine commitment from all actors in the livestock sector to treat animal health as a priority, under the leadership of Veterinary Authorities.

1. Introduction and context

Animal health, under human stewardship, is fundamental to the quality of life of individual animals. It is also central to the services animals provide to humans, and generates shared benefits across society, underpinning food and nutrition security, sustainable development and economic prosperity. This highlights the central importance of veterinary science and veterinary practice to human and sustainable development. The *State of the World's Animal Health* report (WOAH, 2025a) identified major challenges, including zoonoses, transboundary animal diseases (TADs), antimicrobial resistance (AMR), food security and biodiversity loss, all intertwined with human wellbeing. Addressing these challenges requires robust, equitably distributed and adequately resourced Veterinary Services (Latiffah *et al.*, 2025).

Veterinary Services comprise governmental and non-governmental organisations that implement animal health and welfare measures and apply WOAHA international standards under the oversight of Veterinary Authorities. Private sector organisations, veterinarians, veterinary paraprofessionals (VPPs) and aquatic animal health professionals are typically accredited or approved by the Veterinary Authority to deliver delegated functions. This enables investment in animal health by a wide range of actors.

Despite their strategic importance and their role in protecting public goods, as well as supporting social and economic development, Veterinary Services remain insufficiently resourced in many parts of the world. Constrained public budgets, competing fiscal priorities and – in some contexts – limited recognition of the strategic value of animal health, have all contributed to pervasive investment gaps. As a result, Veterinary Services face increasingly complex animal health challenges without the resources required to address them effectively (WOAH, 2025a; Latiffah *et al.*, 2025).

At the same time, the livestock sector, including aquaculture, is evolving rapidly, presenting both challenges and opportunities, and prompting a radical rethinking of the animal health business model. Demand for animal-sourced foods is increasing, animal health risks are becoming more frequent and complex, with potential large-scale impacts, and consumer concerns about social licence are growing. The ecosystem of actors involved in animal health and welfare is also expanding.

WOAH Members have raised concerns about the adequacy and sustainability of financing for Veterinary Services. They highlighted the need to better understand how to mobilise and sustain investment in animal health coupled with stronger advocacy to demonstrate its strategic value and drive change.

This Technical Item first examines why investment matters (Section 2), outlining the societal, economic and health benefits of strong Veterinary Services, as well as the costs of underinvestment. It then explores the scope for investment (Section 3), identifying priority areas, including those relevant to the private sector, based on the economic characteristics of animal health. Section 4 presents a range of options and avenues for investments. Building on this, Section 5 proposes a coherent investment framework, emphasising the importance of an enabling environment for business, aligning financing instruments with service types and introducing a practical decision tree to maximise financing for animal health.

The Technical Item concludes (Section 6) with key considerations for WOAHA, partners and Members on how to address the adequacy and sustainability of investments in animal health, recognising that

Box 1.

The World Organisation for Animal Health (WOAH) publishes the Terrestrial Animal Health Code and Manual, together with the Aquatic Animal Health Code and Manual (known as the Terrestrial and Aquatic Codes and Manuals), which provide international standards to improve animal health and welfare and veterinary public health. Although not formally defined in the Codes, for the purposes of this Technical Item, animal health may be understood as the absence of disease or infection.

Animal welfare, defined in the Terrestrial Code as the physical and mental state of an animal in relation to the conditions in which it lives and dies, also affects livestock productivity and the societal acceptability of animal production.

In this Technical Item, animal health and welfare are considered as a whole and are inseparable.

This Technical Item also applies to both terrestrial and aquatic animals, and excludes specific issues related to companion animals and the pet medicine market.

approaches must be adapted to national contexts and specific needs. Beyond providing practical guidance to Members, this Technical Item aims to support discussion on investment in animal health at the upcoming Animal Health Forum during the 93rd World Assembly.

Given the limited scientific literature on financing animal health, this Technical Item is based on a structured and iterative methodology combining a conceptual framework, stakeholder consultations and a targeted literature review. Inputs were gathered through interviews and questionnaires with key informants, complemented by a literature review. As detailed in Section 7, inputs were collected from WOAHA Members, Collaborating Centres, institutional and technical partners, industry representatives and actors in the livestock and aquatic value chains, including investors, insurers and financial institutions. While inherently limited by the relatively low number of interviews conducted within the available timeframe, this approach was designed to capture diverse perspectives. Finally, a glossary is provided in Section 8.

2. Why investing in animal health matters

Animal health is a critical foundation of economic prosperity and food security. The global livestock and meat market was valued at US\$ 1.37 trillion in 2024 and is projected to reach approximately US\$ 1.60 trillion by 2034 (Precedence Research, 2025). Global trade in live animals and major animal products (meat, dairy, eggs and honey) exceeds US\$ 300 billion annually (Workman, 2025). In Indonesia, for example, livestock was valued at nearly US\$ 54 billion in 2021, including approximately US\$ 33 billion in population value and US\$ 21 billion in production value (Smith *et al.*, 2024a). Beef cattle accounted for 44% of this total, and poultry for a further 36%. Accurate estimation of livestock volume and value at the country level supports informed investment decisions.

Livestock contributes an estimated 40% of the global value of agricultural output (agricultural gross domestic product [GDP]¹), with higher shares in countries where animals fulfil multiple functions (e.g. social capital, food production, income generation, manure provision, draught power and savings or insurance resources) (Salmon, 2018a). Livestock supports the livelihoods and food and nutrition security of almost 1.3 billion people globally, although there is uncertainty around this estimate (Salmon *et al.*, 2020). On average, 68% of the poorest rural households keep farm animals (Pica-Ciamarra *et al.*, 2015).

Aquatic animals are also economically significant. Global fisheries and aquaculture production reached a historic milestone with nearly 189 million tonnes in 2023 (a 2.1% increase from 2022) (Lujan, 2025). The estimated first-sale value of aquatic animals reached US\$ 501 billion, of which nearly 70% was generated by aquaculture. Global exports of aquatic animal products reached US\$ 182 billion, with Europe accounting for 38%, Asia 34% and the Americas 21%. These figures highlight the importance of aquatic animals to national economies.

Interviewed WOAHA Members consistently emphasised that animal health is critical to national economies and health security, and that governments face strong political and social pressure when

Box 2.

Key figures: Why animal health matters

- **US\$ 1.37 trillion → 1.60 trillion:** projected growth of the global livestock and meat economy
- **~40%** of global agricultural GDP: contribution of livestock to food systems and economies
- **1.3 billion people:** dependent on livestock for livelihoods and food security
- **US\$ 500+ billion/year:** value of global trade in animals and animal products
- **US\$ 350+ billion/year:** value of aquaculture

¹ Global public expenditures on agriculture reached a record high of US\$ 701 billion in 2023, reflecting a 2% average annual growth since 2015.

food security and market access are disrupted. Stakeholders across value chains similarly highlighted the direct link between animal health, productivity and economic performance. Healthy animals, and those with good welfare, show higher fertility, improved growth rates, increased production and reduced losses, making preventive health and welfare measures key drivers of efficiency and profitability.

Animal diseases remain a major constraint to livestock and aquaculture development, both in terms of prevalence and economic impact. Six major animal disease outbreaks occurred between 2000 and 2012, including Nipah virus in Malaysia, West Nile fever in the United States of America, severe acute respiratory syndrome (SARS) in Asia and Canada, highly pathogenic avian influenza (HPAI) in Asia and Europe, bovine spongiform encephalopathy (BSE) in the United Kingdom and the US, and Rift Valley fever (RVF) in East Africa, altogether causing economic losses of approximately US\$ 80 billion (World Bank, 2012a). Foot and mouth disease (FMD) alone costs farmers up to US\$ 21 billion per year globally (Knight Jones and Rushton, 2013). Overall, animal diseases are estimated to reduce livestock production by around 20%, resulting in annual losses for farmers of US\$ 300 billion (Sheahan and Barrett, 2017).

Box 3.

Key figures: Economic impact of animal diseases

- **20% reduction** in livestock productivity globally due to animal diseases
- **~US\$ 300 billion/year** in economic losses to farmers
- **US\$ 80 billion** in total losses from six major disease outbreaks (2000–2012)
- Up to **US\$ 21 billion/year** cost of foot and mouth disease alone

African swine fever (ASF) has caused severe global economic damage. Losses exceeded US\$ 141 billion in the People's Republic of China alone by 2019 (Li *et al.*, 2019; Frezal *et al.*, 2021). The outbreaks led to a substantial reduction in the global pig herd, significant spikes in pork prices, reduced GDP in affected countries and serious threats to food security and the livelihoods of smallholder farmers. In addition, the outbreaks led to trade restrictions and prompted supply chains to shift towards regions free from reported cases of the disease. Economic consequences extended across global supply chains, disrupting transport and processing sectors, while increasing expenditure on biosecurity measures. ASF also reduced soybean imports: lower demand in China, combined with increased global supply (e.g. from Argentina), created a 'feed glut' that placed downward pressure on global soybean prices and reduced exporter margins. In affected countries, the disease devastated low-biosecurity farms, family-run and smallholder farms, significantly reducing rural household incomes and creating long-term economic instability. Governments have collectively spent billions on disease control, including sanitation, monitoring and compensation.

In Spain, the re-emergence of ASF in 2025 caused pig prices to fall from € 1.30/kg to € 1.05–€ 1.10/kg within a few weeks, pushing many farms below profitability. Major export markets temporarily suspended trade, further amplifying losses. Preliminary estimates indicate tens of millions of euros in weekly losses. In Italy, since its incursion in 2022, ASF has resulted in losses of approximately € 20 million per month in exports, threatening the country's € 20 billion ham industry. More than 120,000 pigs have been culled since 2022 as part of control measures, adding further economic strain (DRGMedia, 2025).

In Senegal, the disease burden in small ruminants is estimated to exceed US\$ 400 million annually, largely due to losses in animals and production, while direct animal health expenditure remains comparatively low (Meyer *et al.*, 2025). Although peste des petits ruminants (PPR) is endemic and a priority disease, it accounts for only 5% of total economic losses. Other endemic diseases, such as brucellosis in livestock, also generate substantial costs through reproductive losses, reduced milk yield and infertility, with estimates suggesting losses of up to several billion US dollars in economic impact in affected regions. Some country-level estimates cite median losses of about US\$ 3.4 billion where the disease is poorly controlled, and significant annual losses reported in parts of Latin America and Africa due to reduced productivity and control costs (e.g. reduced milk yield, abortions) (Dadar *et al.*, 2021).

Where available, such data can support Veterinary Authorities in allocating resources more effectively. Over time, country case studies are increasingly providing evidence to support improved resource allocation, prioritising interventions with the greatest impact and benefits (Smith *et al.*, 2024b; Stone *et al.*, 2024).

As the global human population grows and human activity encroaches into natural habitats, intensification of food production systems accelerates changes to these habitats and increases the likelihood of pathogen spillover (Richardson *et al.*, 2016). According to WOAHO Observatory analysis, at least 2.2 million professionals or paraprofessionals were part of the veterinary workforce across WOAHO Members in 2019 (WOAHO, 2022). However, the diversity of target animal populations and rapidly changing contexts make it challenging to define precise needs and gaps.

Increased trade in animals and animal products also raises the risk of disease spread and the emergence or re-emergence of infections. Climate change is likely to place additional pressure on food availability while creating more favourable conditions for pathogens, vectors and diseases. Human population displacement due to economic, political and humanitarian crises represents another driver of emerging risks. Animal health risks are both highly likely and potentially severe in their impact. Thus, investing in animal health is critical to reducing risk in the livestock sector and mitigating wider consequences for global health.

Investments in animal health are strategic investments and offer high returns. Access to quality veterinary medicinal products (VMPs) and services is cost-effective for disease prevention and productivity gains. Improved regulation of veterinary inputs is associated with higher milk yields, based on a 190-country survey (World Bank, 2017). At country level, for example in Ethiopia, improved animal health could increase national GDP by up to 3.6%, equivalent to US\$ 2.5 billion (Countryman *et al.*, 2024). Initiatives such as the Global Burden of Animal Diseases (GBADs) programme provide methods to quantify these impacts and guide resource allocation (Rushton *et al.*, 2018).

Based on data from the Gap Analysis collected by the WOAHO Pathway for the Performance of Veterinary Services (PVS) Information System (WOAHO, 2025b), it is estimated that annual budgets for Veterinary Services would need to increase by 52%² to achieve the performance and capacity targets necessary for compliance with WOAHO standards and alignment with national priorities. At the same time, investments in animal health can generate annual returns of up to 86% (World Bank, 2012a), making them 'the most productive investments on behalf of (hu)mankind' (Jonas, 2019).

Globally, bringing Veterinary Services up to WOAHO international standards is estimated to cost approximately US\$ 2.3 billion annually (World Bank, 2022). Costing exercises³ conducted using the PVS Gap Analysis across 91 WOAHO Members (Africa 45, Americas 13, Asia Pacific 19, Europe 9, Middle East 5) suggest that the total annual cost of Veterinary Services would amount to US\$ 4.9 billion. This represents a modest fraction of the livestock sector's market value (less than 3%) and is far lower than the cost of major disease outbreaks (less than 0.05% of the direct economic cost of COVID-19 in 2020).

Despite this, public investment remains limited. On average, Veterinary Services receive only 0.05% of national GDP⁴ and roughly 1% of agricultural GDP (see Figure 1)⁵. This reflects broader underinvestment in agriculture, particularly in low-income countries (LICs), where government expenditure on agriculture relative to the sector's GDP contribution (measured by the Agriculture Orientation Index [AOI]), has remained chronically low, declining from 0.50 in 2015 to 0.43 in 2023 (UN,

² n=54 Members; data collected through Gap Analysis since 2010 (Africa: 1 high-income country [HIC], 1 upper-middle-income country [UMIC], 13 lower-middle-income countries [LMIC], 9 lower-income countries [LIC]; Asia Pacific 4 UMIC, 6 LMIC; Americas 3 HIC, 5 UMIC, 4 LMIC; Europe 1 HIC, 2 UMIC, 2 LMIC; Middle East 1 LMIC).

³ For which sufficient information was available. WOAHO Members across different income groups HIC 10%, UMIC 24%, LMIC 45% and LIC 21%, applying purchasing power parity from time of data collection.

⁴ n=54 Members; data collected through Gap Analysis since 2010 (Africa 1 HIC, 2 UMIC, 14 LMIC, 9 LIC; Asia Pacific 4 UMIC, 6 LMIC; Americas 3 HIC, 5 UMIC, 4 LMIC; Europe 1 HIC, 2 UMIC, 2 LMIC; Middle East 1 LMIC)

⁵ n=49 Members; data collected through Gap Analysis since 2010 (Africa 1 HIC, 1 UMIC, 13 LMIC, 9 LIC; Asia Pacific 3 UMIC, 4 LMIC; Americas 3 HIC, 5 UMIC, 4 LMIC; Europe 1 HIC, 2 UMIC, 2 LMIC; Middle East 1 LMIC)

2025). In these countries, agriculture accounts for around 18% of national GDP but receives only 1.85% of total government expenditure.

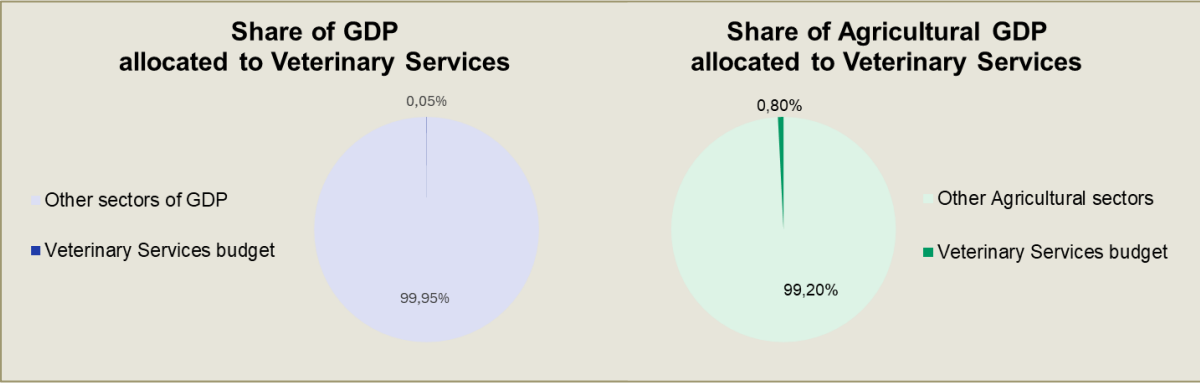


Figure 1. Share of gross domestic product (GDP) allocated to Veterinary Services

Across all regions, interviews with WOAHA Members agreed on the need to increase and secure investments at scale to strengthen Veterinary Services, close coverage gaps, adapt to climate change and leverage the private sector as a source of co-investment, innovation and service delivery. While regional and national challenges differ, all Members need innovative and sustainable financing, policy reform, and a more enabling environment for sustainable animal health systems and related business.

Context matters, however. In parts of sub-Saharan Africa, cattle and small ruminants are sometimes kept as savings rather than productive assets. Arguments about good stockpersonship and the economic value of animal health do not easily apply under such conditions because those animals are not seen as an investment that needs to provide an economic return. Instead, animals are perceived as a safe store of wealth and when they die, wealth is destroyed, often affecting the poorest households, making the purely commercial arguments irrelevant. The large number of livestock owners in this region, alongside their collective political importance, holds the attention of policymakers and governments. In the 2024 Nouakchott Declaration, however, countries of West Africa and the Sahel recognised the need to mobilise private investors to engage further in the development of animal value chains (World Bank, 2024). Considerations in this Technical Item and its proposed framework allow for a flexible approach and solutions tailored to national contexts.

3. The scope for investing in animal health

Since its origins, the veterinary profession has operated at the intersection of public and private interests, as reflected in the WOAHA definition of Veterinary Services (WOAHA, 2024). As technologies and innovation evolve, they continue to reshape the animal health sector, with new actors emerging, including agricultural technology (AgTech) companies and digital service providers. In parallel, increasingly vertically integrated agri-food companies and a growing number of corporations with social responsibility commitments are reshaping the animal health landscape beyond traditional actors.

3.1. Animal health as a shared responsibility

As the range of actors involved in animal health expands, so does the recognition that maintaining effective Veterinary Services requires shared responsibility and sustained investment. Those who benefit from healthy animals, secure food systems and stable markets also have a role in contributing, directly or indirectly, to the costs of safeguarding these public and private goods.

Interviews identified consumers as an important stakeholder group. Consumer preferences increasingly shape production practices, particularly in relation to animal welfare, environmental, social and governance (ESG) considerations, production systems (e.g. free-range), and expectations regarding nutrition and food safety. However, both public and private stakeholders noted a persistent gap between consumer expectations and their willingness to bear the associated costs. For example, preferences for

higher-welfare systems may coexist with limited awareness of biosecurity implications or reluctance to pay higher prices. Also, in many countries affordability remains a major concern for a proportion of the population, with the cost of a healthy diet⁶ estimated to be two to three times higher than the poverty line (see Figure 2) (Stehl *et al.*, 2025).

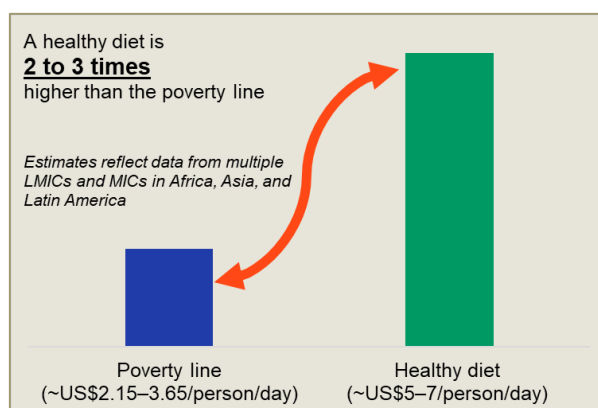


Figure 2. Cost of a healthy diet relative to the poverty line

Smallholder livestock owners, particularly in low- and middle-income countries (LMICs), face structural weaknesses in animal health services, which are often fragmented, under-resourced and largely reliant on paper-based systems. These marginalised stakeholders are disproportionately affected by the limited reach of Veterinary Services. According to Observatory analysis of PVS Evaluation reports, LMICs tend to have lower capacity to deploy an adequate number of animal health professionals, ensuring their competencies, and maintaining effective surveillance systems (unpublished analysis by the Observatory in 2026). The absence of reliable data further constrains investment in the sector. In this context, disease outbreaks may go undetected or delay their notification, hindering the timely deployment of appropriate responses. As a result, farmers operate with little trust in service quality and bear the costs of systems that fail to protect their assets. This represents a significant opportunity cost at the farm level.

Over recent decades, growing attention has been given to VPPs, community animal health workers (CAHWs) and technicians as providers of last-mile service delivery to farmers, as well as a source of employment in rural areas. As of 2019, at least one million VPPs were present globally and affiliated with Veterinary Services, representing approximately half of the veterinary workforce (WOAH Observatory, 2022).

VPPs and CAHWs play a key role in frontline defence, as they are often the primary point of contact for farmers in remote, underserved and rural areas. They contribute to the early detection of animal diseases, thereby helping to prevent the spread of larger outbreaks. In addition, VPPs provide essential animal health services, including vaccination and basic clinical procedures under the supervision of veterinarians. WOAHA has supported the growing recognition of VPPs in animal health management by promoting their role and competencies through standards, curricula and regulatory frameworks.

Box 4.

Country spotlight

In Chad, stakeholder interviews confirmed that CAHWs have become a key component of animal health service delivery in some communities, and that their activities appear economically sustainable, even in resource-constrained environments.

During key informant interviews with WOAHA Members, delegates from Australia, Kazakhstan, Kenya, Kyrgyzstan, New Zealand, the United Kingdom, Uruguay and Uzbekistan consistently emphasised the importance of delegating service delivery functions to private veterinarians and VPPs.

⁶ A healthy diet is defined as meeting energy needs while ensuring adequate intake and diversity across food groups, consistent with FAO-based metrics used in Stehl *et al.* (2025). Poverty lines refer to international benchmarks (e.g. US\$2.15–3.65 per person per day)

Emerging and non-traditional actors in Veterinary Services include AgTechs and other technology-based companies. Many of these, along with non-governmental organisations (NGOs), have developed solutions and deployed them through pilot projects and larger-scale operations. Some provide useful models for how digitalisation can contribute to reshaping animal health systems, particularly in resource-constrained settings. However, digitalisation requires more than technology change. It demands robust and adapted processes, shifts in organisational practices and mindsets and changes in how data are generated, shared, analysed and used across the service delivery chain.

Veterinary Authorities face the challenge of recognising and integrating the emergence of AgTechs in the field of animal health. Beyond providing technological solutions, AgTechs can aggregate smallholders, help structure value chains, attract off-takers and facilitate access to innovation and finance for producers who are often excluded from fragmented value chains.

However, digitalisation in animal health is primarily constrained by organisational processes and system-level challenges. Despite the dynamism of the sector, adoption of advanced AgTech solutions remains uneven. In particular, digital livestock solutions have, in some cases, advanced more rapidly in LMICs, raising questions about the enabling business environment for these technologies. In addition, issues related to data privacy, cybersecurity and capacity for data analysis, as well as the risk of excluding women and other vulnerable groups who may face structural, social or technological barriers to accessing digital tools, are important considerations in the digitalisation of animal health (FAO, 2021).

3.2. Economic value of animal health

Strategic investment opportunities exist across the functions of Veterinary Services. These include, for both public and private sectors, strengthening the research and development (R&D) of veterinary products; ensuring equitable access to quality vaccines and diagnostics; developing and sustaining a skilled veterinary workforce; improving veterinary service delivery systems; and investing in essential infrastructure, equipment and research. Additional priorities include improving animal welfare on-farm, during transport and at slaughter; strengthening disease prevention, surveillance and emergency response capacities; and enhancing animal health information systems, whether digital or conventional. Investments are also needed to raise awareness and engagement along value chains, from farmers to consumers, to improve understanding of the value of animal health, roles and responsibilities, and the respective contributions of all actors. This Technical Item also emphasises the central importance of data and information in supporting effective governance and enabling policy and financing environments that encourage innovation and private sector participation.

Box 5.

Country spotlight

In Kenya, AgTechs are transforming animal health through digital, sustainable and locally adapted innovations, with a focus on improving livestock productivity for smallholder farmers. Key initiatives include artificial intelligence (AI)-based disease monitoring and tele-health services for remote areas (Njuguna et al., 2024).

In Indonesia, an AgTech platform connects nearly 3 million farmers and 11,000 field veterinarians via mobile phones to capture animal health data, linking these to laboratory reports and slaughterhouse surveillance systems, and enabling real-time monitoring of animal health at scale (AIHSP, 2024).

In India, AgTechs have developed innovative data ecosystems around unified animal-level records covering breeding and health events, vaccination history, with all who interact with an animal (e.g., owners, veterinarians, VPPs, technicians, inspectors) contributing data. The model proves useful to bridge the veterinary access gap, build a high-trust environment, enable evidence-based disease control, gradually moving from reactive to preventive care (Joshi, 2025).

In the Republic of Korea, the use of AI for real-time data analysis and early disease detection in pig farms has generated returns on investment (ROIs) exceeding 400% within three years, driven by reduced disease incidence, lower medical costs, improved animal performance and a significant reduction in antimicrobial use (Adamie et al., 2024).

A large share of animal health services can be characterised as private goods, where benefits accrue directly and exclusively to the livestock owner. Clinical diagnosis and treatment illustrate a pure private good. These services are both rivalrous and excludable: a veterinarian's time spent treating one animal cannot be used for another, and the farmer paying for the service generally captures the full benefit.⁷ When a veterinarian treats a cow for mastitis, the recovery of the animal and its productive capacity benefit only the owner, with little or no spillover to other farmers or to society at large. The same logic applies to services such as artificial insemination, feed and nutritional advice, and production-oriented extension tailored to individual farmers. Because these benefits are private and measurable, market incentives are generally sufficient to support service provision. Where export market eligibility creates a direct commercial incentive for maintaining disease-free status, vertically integrated private operators have demonstrated through interviews how they can institutionalise animal health service delivery for thousands of contracted smallholders. These models provide subsidised genetics, feed, extension and veterinary inputs not as philanthropy, but because supply consistency is essential to their own business model, demonstrating that commercial incentives can align with public health objectives at scale.

Where such incentives are absent, markets alone may not deliver. In Colombia, for example, producer associations have institutionalised this approach at sector level by co-financing official FMD and classical swine fever control programmes through parafiscal contributions (World Bank, 2012b). This model has supported the achievement and recovery of disease-free status in strategic export regions.

In many contexts, private veterinarians, VPPs and emerging AgTech companies have strong market incentives to deliver such services, and cost recovery from users is generally feasible and appropriate. Insights from key informants, including examples such as Heifer International in Nepal and Amul in India, indicate that organising farmers into cooperatives can generate economies of scale, improve access to Veterinary Services, and support government functions such as disease surveillance, traceability and livestock movement control.

Similarly, the production and distribution of VMPs largely operate through private markets. Vaccine manufacturers, for example, generate commercial returns by selling products at market prices. This explains why private industry dominates vaccine manufacturing globally, although state-owned enterprises (SOEs) continue to operate in numerous countries. In many settings, the distribution of VMPs, including antimicrobials and antiparasitics, has been successfully privatised, improving both access and quality. In these areas, the role of government is primarily to establish a sound regulatory environment and enable effective private sector participation. This includes defining and enforcing acceptable quality and competency standards for service providers, as highlighted by Oman during the stakeholder consultation, and ensuring that delegated responsibilities are assigned only to qualified and authorised entities.

At the other end of the spectrum are pure public goods, which are non-excludable and non-rival and generate broad societal benefits. The private sector will tend to underprovide such services due to free-rider problems, as individual actors cannot capture the full benefits of the investment. Veterinary epidemiological surveillance is a clear example of a pure public good. Monitoring disease presence, spread and evolution benefits the entire value chain and the wider public, but individual farmers cannot be charged for the information generated. This is particularly evident in export markets, where the credibility and transparency of surveillance systems underpin national market access, while costs are borne locally. Without public funding, surveillance would likely be severely underprovided.

The same rationale applies to quarantine services, which serve as a collective safeguard against the introduction and spread of diseases within and across national borders. Governments should retain primary responsibility for funding, regulation and oversight to ensure consistency and biosecurity. However, operational delivery may be supported or implemented by the private sector where appropriate. Such arrangements can leverage private sector efficiency and innovation while preserving the public mandate for national disease prevention and control.

⁷ Pure public goods share two qualities: non-excludability and non-rivalry. Non-excludability (or the indivisibility of benefits) means that, once provided to one party, the good is available to all. Non-rivalry means that consumption by one party does not reduce the amount available to others. In practice, these distinctions are not always clear-cut, and many services exhibit characteristics of both public and private goods.

Food hygiene systems, meat inspection and drug quality control present a distinct situation due to information asymmetries. Consumers cannot readily assess whether products are safe, and farmers cannot verify the quality of vaccines or medicines prior to purchase. These conditions justify mandatory public oversight, even where operational delivery is subcontracted to private providers acting on behalf of the Veterinary Authority, as noted by several Members in the interviews. As the outcomes of these services benefit end users (farmers and consumers), costs may be partially recovered through the price of goods or services. Compliance with standards (e.g. food safety and animal welfare) may also create direct benefits for private food business operators, including access to export markets and associated costs should therefore be incorporated into business models.

Certain areas of animal health also exhibit strong public good characteristics. Diseases affecting farmers or communities in LMICs often lack sufficient market demand to attract private investment, for example, in R&D for drugs or vaccines. In such cases, research is more appropriately funded by the public sector or supported through international mechanisms. Here, one WOAAH Delegate emphasised that, while applied research is often financed by governments through dedicated agencies, academic institutions may prioritise independent, publication-driven research. This highlights the need for closer alignment between research agendas and policy priorities.

Box 6.

Country spotlight

In Egypt, investment in avian influenza-free poultry establishments has demonstrated how targeted biosecurity measures can simultaneously improve productivity and expand export opportunities, with private operators bearing the associated costs.

A number of neglected tropical diseases fall into this category. A related, though distinct, example is vector control, which presents similar challenges. Because vectors move across farms, landscapes and wildlife habitats, effective control requires coordinated action beyond individual farms. As the benefits cannot be confined to a single landowner, collective financing, typically led by government, may be necessary. A clear example of this is the control of Rift Valley fever (RVF). In such cases, public sector intervention is required to address market failures (GALVmed, 2013). Climate change adds further complexity, as shifting weather patterns can alter vector habitats and disease dynamics, increasing the need for coordinated, forward-looking interventions.

In some cases, public authorities recognise that individuals may under-consume certain goods if left to market forces alone. These are referred to as merit goods and may be subsidised or provided free at the point of use. Livestock extension services and vaccination against certain contagious (notifiable) diseases may fall into this category.

Between the two poles of public and private goods lies a broad category of services with mixed characteristics, where private decisions generate significant externalities. Vaccination or culling in response to highly contagious diseases illustrates this dynamic. Although vaccines are purchased by individual farmers, they reduce disease transmission risks for neighbouring farms and across the wider value chain. This positive externality means that private demand for vaccination may fall short of socially optimal levels (free-rider effects). In such cases, governments may justify subsidies or mandatory vaccination programmes, often implemented in partnership with private veterinarians, as highlighted by WOAAH Members during interviews. The control of outbreaks such as HPAI, for example, requires coordinated action combining farm-level biosecurity, movement controls, culling and vaccination, extending beyond individual farm decisions.

In response to the 2006 HPAI outbreak, the government of Vietnam, supported by a World Bank-funded Avian Flu Emergency Recovery Project, invested in surveillance systems, poultry sector rehabilitation and public awareness. This illustrates how a disease initially affecting the private agricultural sector can rapidly acquire the characteristics of a national, and even global, public good (World Bank, 2014).

The rationale for public intervention is even more pronounced for zoonotic diseases, where the primary impact is on human health, but the most cost-effective interventions are implemented at the animal source. Diseases such as rabies, bovine tuberculosis, RVF and HPAI illustrate how investments in animal health generate substantial public health benefits, further strengthening the case for collective action and public financing.

At the same time, protecting animal health is inherently a shared responsibility. Public interventions, such as vaccination campaigns or disease control programmes, depend critically on complementary private investments, including farm-level biosecurity and good husbandry practices. It is therefore not a question of public versus private action, but of designing effective joint approaches where responsibilities, incentives and financing are aligned to achieve optimal outcomes.

The geographic reach of disease externalities introduces an additional layer of complexity. While some animal health measures primarily generate local or national benefits (e.g. RVF), the control of highly infectious TADs with pandemic potential constitutes a global public good. An uncontrolled outbreak in one country can threaten populations worldwide, as demonstrated by the COVID-19 pandemic. This framing has significant financing implications. If pandemic risk reduction is considered a global public good, its costs should not fall exclusively on governments and farmers in countries where spillover risks may be highest. Instead, it justifies international grants or highly concessional financing of national animal health systems, not only as development assistance for LMICs, but as a collective investment by the global community in its own health security and protection (World Bank, 2014; 2022).

3.3. Implications for the financing of animal health

The *beneficiary pays* principle (also referred to as the *cost recovery* or *user pays* principle) is a foundational concept in public finance, economics and development policy. The core idea is that those who derive benefit from a good or service should bear a proportionate share of its costs, rather than having those costs fall entirely on the general public or third parties.

This principle underpins the privatisation reforms of Veterinary Services that spread across Africa, Asia and Latin America in the 1990s (Umali *et al.*, 1994; World Bank, 2002). In Sub-Saharan Africa, for instance, the number of private veterinarians grew from near zero in the mid-1980s to nearly 2,000 by the mid-1990s following these reforms, with most countries reporting improved access to veterinary care and products. However, interviews conducted for this Technical Item reveal that, in many cases, the transition has been incomplete or unsuccessful.

In practice, the boundaries between private and public goods, and between national and global benefits, are rarely clear-cut. According to Observatory analysis of PVS Evaluation reports (2006–2023), only one third of evaluated Members have made progress in developing joint programmes, such as public–private partnerships with producers and non-government stakeholders (unpublished results of a WOAHA Observatory analysis). Moreover, many beneficiaries including smallholder farmers and emerging industries in LMICs lack the financial capacity to bear the full costs of necessary investments (IFC, 2014). This creates a dual challenge: assessing the financing capacity of countries and industries, including individual farmers, while mobilising appropriate financing mechanisms to ensure a fair allocation of costs. This should be approached dynamically, recognising that financing mechanisms may be needed to temporarily bridge capacity gaps and progressively enable private actors to assume a greater share of costs. Such transitions must be carefully designed. Experience with agriculture subsidies shows that they are often difficult to reform or phase out; hence, it is essential to establish graduation pathways and clear exit strategies to avoid prolonged or indefinite reliance on public financing.

The global public good dimension of animal health has frequently been invoked to advocate for increased international support to Veterinary Services. However, this should not overshadow the continued importance of national and private responsibilities. Current financing practices do not always reflect the true distribution of responsibilities and benefits. Many WOAHA Members, LMICs and HICs alike, use limited public resources to subsidise services that could or should be privately financed or cost-shared, while genuine global public goods remain underfunded.

Beyond farmers and veterinarians, the animal health ecosystem now includes processors and agri-food companies, traders and exporters, VPPs and CAHWs, consumers, civil society, veterinary pharmaceutical manufacturers, AgTech and digital firms providing surveillance or traceability solutions, and financial actors such as investment and venture capital funds. The confidence of these actors depends on predictable, well-governed Veterinary Services and on de-risking the livestock sector, that is, by implementing actions that reduce real or perceived risks to a level compatible with investment.

When determining the appropriate allocation of responsibilities and benefits, Veterinary Authorities must therefore consider multiple criteria, including the economic nature of services, the distribution of benefits and the capacity of different actors to contribute, as presented in Figure 4.

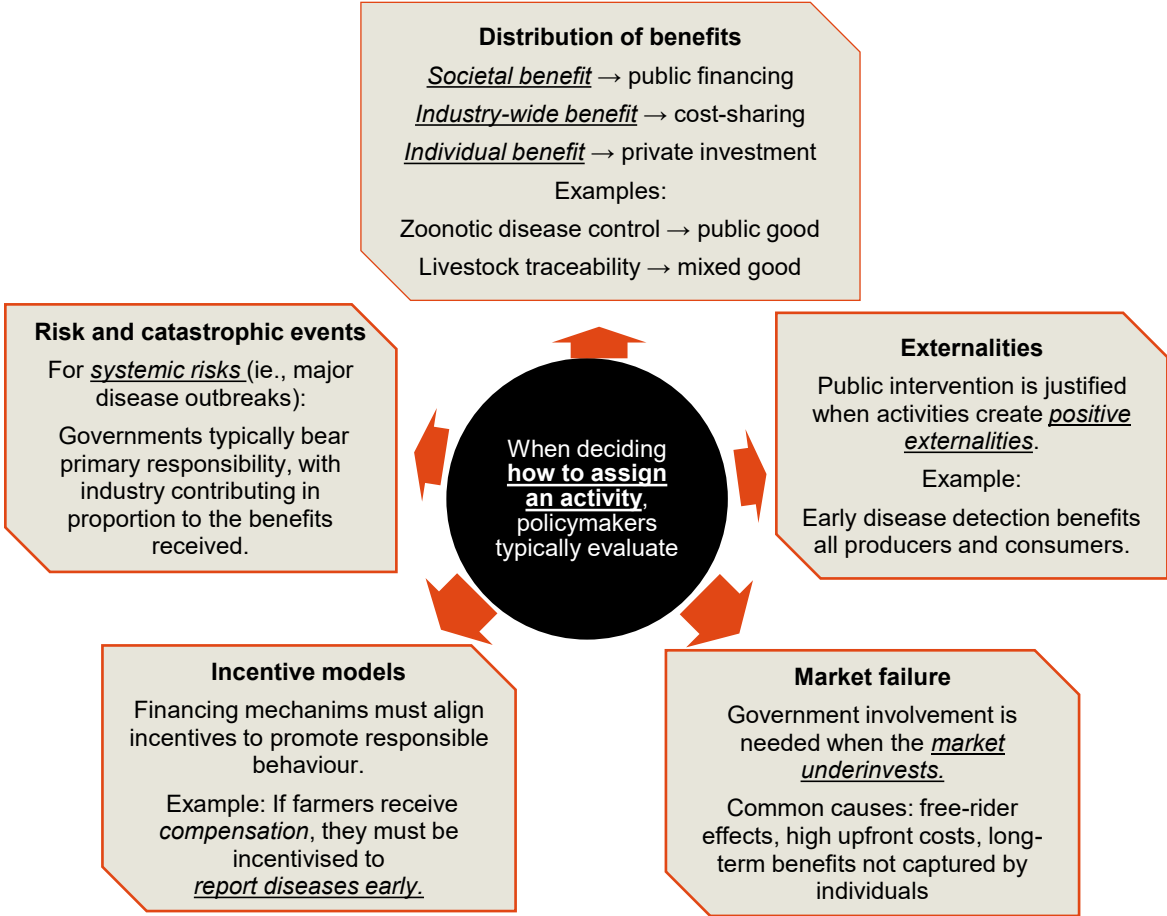


Figure 4. Decision criteria for allocating animal health activities by financing responsibility and delivery model

Financing for outbreak response has historically been slow, fragmented and often relying on *ad hoc* donor contributions that arrive too late to contain fast-moving events. In response, a range of surge financing instruments has emerged, including Contingent Emergency Response Components (CERCs) in World Bank-financed projects, and more recently the Contingent Emergency Response Projects (CERP) designed as proactive, Investment Project Financing (IPF) instruments for swift financial mobilisation during natural disasters, pandemics or crises. CERCs and CERPs typically enable governments to quickly repurpose existing project funds to meet urgent needs, bypassing long approval processes based on pre-agreed implementation manuals. Built-in animal disease control and compensation funds have proven effective in both preparedness and response.

Compensation is a prerequisite for effective disease surveillance and control, not an optional add-on. Good practice shows that compensation rates must be fair, reflect market conditions, and be regularly adjusted for inflation. Payments must also be made quickly, handled transparently, and delivered through systems that are reliable and trusted by farmers in order to effectively influence their behaviour. This requires advance preparation to avoid crisis-time improvisation. Long-term sustainability depends on institutional financing arrangements, such as animal disease control and compensation funds. CERCs, or equivalent mechanisms, embedded in investment projects, are effective for rapid compensation deployment during outbreaks. At regional level, harmonising compensation across borders can help prevent animal (and disease) movement driven by differential incentives.

Experience shows that no single instrument is sufficient. The most effective systems rely on a combination of complementary, agile tools that are pre-arranged and ready to be deployed before a crisis strikes. The key lesson is that sustained investment in prevention and preparedness, rather than reactive emergency financing alone, determines both the likelihood of outbreaks and the speed, effectiveness and cost-efficiency of the response when they occur.

3.4. Strategic areas for private sector investment

The evolving landscape of investment in Veterinary Services worldwide increasingly calls for strategic collaboration between public institutions and private-sector actors. Despite changing contexts, progress remains limited. Across both HICs and LMICs, only 10% of evaluated Members ($n=120$) reported improvements in access to functional and well-maintained physical resources, including buildings, transport, information technology (e.g. internet access), cold chain systems and other essential infrastructure. Progress was slightly higher in other areas, with 30% of evaluated Members reporting improvements in operational (recurrent) funding and 40% in emergency funding. Nevertheless, these advancements remain modest according to the Observatory’s preliminary analysis. Consultations with key industry informants identified several areas in which private-sector capabilities can effectively complement public mandates.

Table 1. Strategic areas for private sector investments in strengthening Veterinary Services

Investment area	Strategic focus	Opportunities for private sector engagement
Animal health product development and innovation	Advancing science-based solutions for diverse production systems	Investment in vaccines, diagnostics, parasite control and digital health tools; development of regionally adapted products and resilient manufacturing and supply systems
Livestock nutrition and feed systems	Supporting animal health, productivity and sustainability through nutrition	Development of advanced feed solutions, functional ingredients and precision nutrition; strengthening quality, safety and advisory systems
Farm-level animal health, welfare and biosecurity	Enhancing prevention and compliance at the production level	Investment in housing, welfare standards and biosecurity infrastructure; deployment of smart technologies for monitoring, early detection and decision support
Veterinary diagnostics and laboratory networks	Strengthening timely detection and evidence-based decision-making	Expansion of diagnostic capacity, laboratory networks and quality systems; development of rapid tests and digital reporting platforms
Processing, handling and value chain assurance	Ensuring safe, transparent and welfare-compliant value chains	Investment in humane handling, traceability systems and processing infrastructure; adoption of digital tracking and assurance mechanisms
Prevention, surveillance and preparedness systems	Building integrated and proactive animal health systems	Co-investment in surveillance, early warning and vaccination initiatives; integration of public and private data systems
Access to quality veterinary products	Improving equitable availability and responsible use	Strengthening supply chains and distribution models; addressing risks of substandard products, particularly in underserved markets
Innovation, demonstration and technology validation	Accelerating uptake of proven solutions	Support for pilot projects, demonstration farms and field validation; facilitation of regulatory pathways and responsible market introduction
Workforce development and veterinary service delivery	Enhancing skills, capacity and service reach	Investment in education and training, digital advisory platforms and service delivery models involving veterinarians and other animal health professionals
Emergency response, risk sharing and resilience	Strengthening preparedness and mitigating economic shocks	Development of insurance mechanisms, contingency planning and coordinated response systems involving public and private stakeholders

The areas outlined in Table 1 provide a high-level framework for Veterinary Authorities to engage with national, regional and global private-sector actor in a structured and forward-looking manner. By fostering an environment that encourages innovation, responsible investment and partnership-based delivery, WOA Members can improve the efficiency and sustainability of Veterinary Services. This framework is adaptable to different economic contexts and leverages the comparative advantages and core competencies of diverse partners.

4. Financing options for animal health

Financing animal health requires mobilising multiple complementary financing sources. Countries typically rely on a combination of public funding, private domestic investment and international development support, including innovative financial instruments, which together form a diversified financing architecture.

4.1. Public budget financing

Public funding remains a critical source for Veterinary Services, with government budgets supporting core institutional functions, regulatory oversight, disease surveillance, border control and emergency response. These core functions require stable and predictable funding, as well as a strong policy and regulatory framework, and cannot be delegated to market actors without public financial backing.

In practice, however, domestic funding for Veterinary Services is often constrained, particularly, though not exclusively, in LMICs. During the 1980s and 1990s, structural adjustment programmes supported by international financial institutions aimed to stabilise public finances, reduce fiscal deficits and reform public sectors. These reforms often led to reductions in operational budgets for Veterinary Authorities, while large civil service payrolls remained largely unchanged. Consequently, Veterinary Authorities frequently retained formal institutional structures but lacked the operational resources for field activities such as surveillance, vaccine procurement, laboratory maintenance and emergency response (World Bank, 2005b).

This was corroborated through interviews, which highlighted the long-term implications of these reforms. In Chad, approximately thirty private veterinarians were formally mandated and supported through public subsidies during rinderpest eradication campaigns. When these subsidies ended, the system quickly became financially unsustainable; today, only two of these veterinarians remain active. As a result, access to veterinary medicines and services has become fragmented. In response to this situation, the government has initiated strategic reflections aimed at better structuring and regulating the involvement of private veterinarians, in order to promote their gradual, effective and sustainable integration into national veterinary systems.

Strengthening domestic budget allocations for core functions therefore remains a central priority. Reversing the decline described above requires political commitment and recognition of animal health as a strategic investment, rather than a residual budget line. It also requires political commitment to make a clear distinction between genuinely public functions that warrant full public funding and private goods that should transition to cost-recovery mechanisms (World Bank, 2009).

Key respondents emphasised the importance of public investment in strategic areas aligned with national priorities. They highlighted the role of public organisations in facilitating such investment, including the National Meat Institute in Uruguay, which supports meat sector policies, and Agrinnovate India Limited in India, which promotes research, development and technology management. India's Union Budget for 2026–27 shows a substantial increase in livestock and allied sector funding, reflecting a renewed commitment to animal health, infrastructure and private-sector-led value chain development.

International development partners can also play a complementary role, particularly in LMICs, by supporting capital-intensive investments in laboratory infrastructure, surveillance systems, diagnostic capacity and training. Multilateral development banks (MDBs) remain important sources of financing for investments that cannot be easily absorbed by national budgets. For example, the World Bank has supported veterinary systems through livestock projects and emergency response programmes, including the Global Program for Avian Influenza Control and Human Pandemic Preparedness and Response, which strengthened biosecurity, surveillance and laboratory capacity in 62 countries between 2006 and 2013 (World Bank, 2020).

Similarly, the World Bank and the Government of Kenya co-financed the US\$ 8.3 billion Regional Pastoral Livelihoods Resilience Project (RPLRP) to improve livestock markets and animal health services in 14 arid and semi-arid counties. Other initiatives, such as the Regional Pastoralism Support Project (PRAPS), provide further examples of targeted investment in pastoral livestock systems (World Bank/Government of Kenya, 2015).

Notably, PRAPS was designed based on the WOAHP VPS Evaluations and Gap Analyses conducted by PVS Experts, which assess national veterinary capacities, compliance with WOAHP standards and country-defined priorities. This approach ensured that investments were aligned with national strategies and focused on strengthening domestic capacities, ensuring that external support reinforces national systems rather than substituting for them.

Such investments are most effective when designed to ensure sustainability, local ownership and alignment with national veterinary priorities. Business models should therefore support long-term sustainability and national ownership, rather than short-term project gains.

Box 7.

Country spotlight

Additional examples include Pandemic Fund-supported projects in Cambodia (US\$ 400 million), Kazakhstan (US\$ 58 million), Yemen (US\$ 33 million), Papua New Guinea (US\$ 284 million) and Nepal (US\$ 25 million). These investments are grounded in proposals informed by gaps identified through PVS Evaluations, and aim to strengthen epidemiological surveillance, laboratory systems and workforce capacity for pandemic prevention, preparedness and response. Lebanon used its PVS Evaluation to secure a European Union twinning project to strengthen Veterinary Services and food safety capacities of the Ministry of Agriculture.

The Republic of Türkiye leveraged PVS Evaluation recommendations to improve animal disease control through partnerships with the World Bank and the European Union, developing veterinary strategies and policies.

Uzbekistan attracted more than US\$ 700 million from international financial institutions, including the World Bank, the Asian Development Bank (ADB), the International Fund for Agricultural Development (IFAD), Agence Française de Développement (AFD), the Japan International Cooperation Agency (JICA) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). This funding allowed Uzbekistan to update legislation, improve livestock sector programmes, promote innovation and increase national budget allocations.

Overall, 47% of Members reported that additional resources following PVS Evaluation came from national authorities, 29% from external partners and 8% from public–private partnerships¹.

1. N=29 Members in 2025: data from the WOAHP VPS Information System

4.2. Cost recovery and user contributions

User contributions represent an important source of financing for Veterinary Services that generate direct benefits to farmers and agribusinesses. In many countries, users already pay for clinical diagnosis and treatment, farm-level advisory services, artificial insemination and other production-related extension services.

Well-designed cost recovery systems can strengthen the financial sustainability of service delivery while reducing pressure and reliance on public budgets. By requiring users to contribute to the cost of services from which they benefit directly, such systems reveal genuine demand, distinguishing services that farmers value from those they do not.

However, cost recovery systems must be designed and applied carefully. They are generally inappropriate for pure public goods, where free-rider problems mean that user fees would lead to underuse. They may also prove ineffective in remote or low-income areas where purchasing power is insufficient to sustain a viable private veterinary market. In such contexts, a publicly funded network of CAHWs or VPPs, trained and supervised by veterinarians, may represent the most cost-effective way to maintain basic service coverage, with partial cost recovery supplemented by public subsidy.

The subcontracting model offers a pragmatic middle path, whereby government retains responsibility for funding and quality assurance of public good services (e.g. vaccination campaigns, meat inspection, blood testing), but contracts delivery to private veterinarians on a fee-for-service basis. Often highlighted during Member and stakeholder interviews, this model has been successfully applied in many countries, generating revenue for private practitioners while maintaining public accountability (World Bank, 2002; World Bank, 2005b).

4.3. Public–private partnerships

Public–private partnerships (PPPs) offer a mechanism that combines public oversight with private resources, expertise and delivery capacity. In the veterinary sector, these partnerships can help expand service coverage, mobilise investment and improve operational efficiency. WOAHP has documented numerous examples of successful PPPs across its Members (OIE, 2018), and many interviewees highlighted additional cases.

The partnerships take different forms, including contracted vaccination campaigns, privately operated diagnostic laboratories under public accreditation, and collaboration with agribusiness companies to deliver services within livestock value chains. Digital technologies are also expanding opportunities for partnership. For example, in Lampung Province, Indonesia, commercial feedlots partnered with smallholder farmer groups, providing veterinary services and technical support in exchange for

Box 8.

Country spotlight

In Denmark, stakeholders emphasised that, beyond subcontracting arrangements, strong industry cooperatives have developed collective financing mechanisms through levy-based funds that support surveillance, biosecurity infrastructure and disease control programmes. A notable example is the porcine reproductive and respiratory syndrome (PRRS) reduction Strategy programme, which was initially financed and implemented by industry on a voluntary basis before being formalised through government regulation. Financing through fees was introduced once the regulatory framework was in place, illustrating a phased approach in which private initiative precedes public intervention.

In Uruguay, a structured public–private co-responsibility framework combines strong State leadership over sovereign functions, such as surveillance, certification and emergency response, with significant private-sector financial contributions through levies, service fees and dedicated funds. Notably, mechanisms such as the Insurance for the Control of Prevalent Diseases in Cattle, financed by producer contributions, support compensation, surveillance and disease control measures under official programmes. This illustrates how collective financing by the private sector can operate under public oversight to sustain animal health systems.

Similarly, in Germany, a compulsory public-law system, to which all livestock holders must contribute, provides structured funding for emergency response in the event of disease outbreaks. This illustrates how mandatory collective contributions can ensure predictable financing beyond voluntary arrangements.

preferential livestock sourcing (World Bank, 2006). Building on such cooperative models, Indonesia's integrated animal health information system (iSIKHNAS) now connects nearly 3 million farmers and 11,000 field veterinarians via mobile phones, feeding data into laboratory and disease surveillance networks. This provides a model of public–private collaboration in data infrastructure and connectivity (Bosquet, Machiraju and Mira-Salama, 2022). More broadly, AgTech firms are increasingly supporting animal health systems through digital surveillance tools, traceability platforms and data analytics that complement public monitoring systems.

Successful partnerships depend on clear regulatory frameworks, transparent governance arrangements and well-designed contracts that define responsibilities and performance expectations. Evidence from the literature, supported by stakeholder interviews and responses from key informants in Australia, Uruguay, Botswana, Kazakhstan, Kenya, Kyrgyzstan, Oman and Uzbekistan, as well as industry associations, indicates that HICs and upper-middle-income countries (UMICs) tend to have more structured and higher-volume engagement through formal PPPs, concession contracts and regulated procurement. This trend reflects stronger legal frameworks, more attractive markets and greater institutional capacity to design and manage PPPs.

In contrast, many LMICs rely heavily on service providers operating outside formal agreements, often through informal and out-of-pocket arrangements. This creates a paradox: the countries that most need well-governed public–private engagement (i.e. those facing substantial service gaps), frequently lack the enabling conditions to implement it effectively.

As reiterated during interviews, the key conditions for successful PPPs include clear legal and regulatory frameworks that formally recognise private veterinary practice, performance-based contracts with independent verification, and transparent governance arrangements that prevent regulatory capture or informal monopolies. In addition, a strong enabling business environment, including predictable policies, accessible financing and incentives for private investment, is critical for sustainable, high-quality and respectful partnerships.

4.4. Blended finance and investment de-risking

Blended finance is increasingly recognised as a promising mechanism for mobilising private investment to address the persistent funding gap in Veterinary Services, particularly in supporting compliance with WOAHA international standards and strengthening veterinary infrastructure, governance and capacity in the animal health system. It involves the strategic use of public or philanthropic funds to reduce investment risks and attract private capital.

In emerging markets, the aquaculture and livestock sectors often face perceived investment risks, including market volatility, regulatory uncertainty and limited access to credit for smallholder farmers. Blended finance instruments can help address these constraints through guarantees, concessional co-financing or first-loss capital, thereby improving the risk–return profile of investments. For example, guarantee instruments can reduce lender risk by providing financial protection against default, encouraging commercial banks and development finance institutions (DFIs) to lend to veterinary service providers, agro-veterinary input distributors or smallholder livestock enterprises that would otherwise be excluded from credit markets.

Blended finance can also attract impact investors seeking both financial returns and measurable social, health or environmental outcomes. In the context of animal health, these outcomes may include improved food safety, reduced zoonotic disease burden or antimicrobial resistance (AMR) and enhanced animal welfare. Such co-benefits can mobilise mission-aligned capital from foundations, impact funds and DFIs.

Examples from related agri-food sectors illustrate the potential of these approaches. The Global Agriculture and Food Security Program (GAFSP) and the International Finance Corporation (IFC) have pioneered blended finance in adjacent value chains. IFC's US\$ 3.8 million investment in Nepal's Probiotech Industries, co-financed through GAFSP's Private Sector Window, demonstrates how blended instruments can strengthen agribusiness value chains while indirectly supporting animal health through improved feed quality and food safety standards (IFC/GAFSP, 2015).

Despite its potential, scaling blended finance remains constrained by a limited pipeline of bankable projects with credible cash-flow projections. In addition, a gap persists in financial institutions' understanding of animal health and welfare, while actors in the veterinary sector may lack the financial literacy needed to structure investable projects. Strengthening project preparation capacity and relevant literacies across both sides is therefore vital to unlocking future investment.

Recent geopolitical events have also affected the availability of agriculture development financing and increased investment risks, potentially constraining the expansion of blended finance. New approaches suggest embedding conditionalities across all levels of blended finance to maximise the value of public support to private firms and ensure alignment with clearly defined targets (Mazzucato and Rodrik, 2024).

4.5. Results-based financing

Results-based financing (RBF) describes mechanisms that link payments to independently verified outputs or outcomes (sometimes referred to as disbursement linked indicators [DLI]), rather than simply funding operational inputs. Such approaches can improve efficiency and accountability in veterinary service delivery. For example, RBF rewards outputs (e.g. number of animals vaccinated, disease cases detected, farmers reached) or outcomes (e.g. disease incidence reduction, export certification rates).

RBF can realign incentives throughout the animal health service delivery chain. A vaccination campaign contractor, for example, could be paid per animal that is verifiably and effectively vaccinated, rather than per day of activity or number of doses delivered. This shifts performance risk to the service provider and rewards efficiency. Similarly, a laboratory could receive performance-linked payments tied to turnaround time and diagnostic accuracy.

For example, the Kazakhstan Sustainable Livestock Development Program is financed by the World Bank and focuses on livestock development with strong veterinary service components. The first DLI was agreed upon between the government and the financing institution; it targets cattle registration in a Unified Information System (UIS). Payment is based on the progress of the establishment and rollout of a national animal traceability and identification system. The three key disbursement linked results (DLRs) include: regulations issued for the UIS, transfer of existing cattle data into the system, and progressive registration of new cattle (at a US\$ amount per number of heads). A second DLI targets small and medium farmers who have access to improved veterinary services. Payment is linked to amendment of secondary legislation to promote private veterinary service provision (aligned with WOAHPVS recommendations for the country), followed by scalable disbursements (at a US\$ amount per number of veterinarians trained and contracted under the new framework).

Using a similar mechanism, in Pakistan the Strengthening Markets for Agriculture and Rural Transformation (SMART Punjab), includes a DLI on improving livestock health, based on the shift of the Department of Livestock and Dairy Development budgetary allocations from curative to preventive animal healthcare. The targets progress from a 3:1 preventive-to-curative ratio (year 1) to a 4:1 ratio (year 3) and ultimately a 9:1 ratio (originally set for year 5), with disbursements set per target year achieved.

Output-based aid is a specific RBF instrument that uses explicit, transparent subsidies linked to verified service delivery. This approach is particularly relevant for reaching poor or remote livestock keepers who cannot afford market-rate veterinary services but who generate significant externalities (e.g. disease control, food security and safety) that justify public subsidy. The subsidy is calibrated to close the affordability gap rather than substitute entirely for user contributions.

RBF can also operate at the institutional level. International financing programmes may link disbursements from multilateral development banks (MDBs) or bilateral loans to the achievement of veterinary system benchmarks, including those identified through WOAHPVS Pathway.

5. A financing framework for Veterinary Services

Sustainable animal health systems rely on a balanced mix of financing streams, with instruments tailored to the economic characteristics of each service and the local context. Public budgets remain the foundation, financing genuine public goods unlikely to be provided by markets alone. Cost recovery and private investment can support clinical and production-oriented services. PPPs and subcontracting models can help bridge gaps between pure public or private goods, extending reach and improving efficiency. Innovative financing instruments, including blended finance and RBF, can help mobilise and better align a broader range of resources (public, private and international) by attracting private investment while leveraging concessional funding from development partners. These approaches can improve efficiency and ensure accountability for outcomes.

Beyond financing, institutional capacity is equally critical. National Veterinary Authorities must be able to plan, contract, monitor and regulate a complex system involving multiple actors. Investment in this capacity is often among the highest-return financing decision, enabling more effective use of all other resources. Yet, this critical dimension is frequently overlooked.

5.1. Creating an enabling environment for business

For VMPs, many countries, particularly LMICs, lack adequate regulatory frameworks for manufacture, registration, distribution, commercialisation and pharmacovigilance (World Bank, 2017), creating legal barriers that affect their production, distribution and access. Burdensome or unclear regulations discourage private sector participation. In many countries, the involvement of multiple institutions in registration processes without clearly defined roles has been identified as a common bottleneck, slowing market entry and driving up compliance costs.

In cases where registration requirements are unclear or inconsistent, where no publicly accessible list of authorised VMPs exists, where timeframes for dossier review are not defined, and where pharmacovigilance mechanisms are inadequate, countries struggle to ensure a reliable and safe supply of VMPs. Weak regulatory environments, combined with limited enforcement capacity, also contribute to reliance on informal supply chains. All interviews consistently highlighted that private actors, from pharmaceutical companies investing in vaccine R&D to investors financing smallholder cooperatives and CAHWs, will only commit resources where regulatory frameworks are predictable and enforcement is credible.

More broadly, a business enabling environment refers to the regulatory, institutional and operational conditions that allow the private sector to function effectively and drive economic growth (World Bank, 2025a). It can be understood across three dimensions:

- (i) the regulatory framework, including the quality of laws and rules governing how firms open, operate and close;
- (ii) public services, referring to the institutional and infrastructure support provided by governments to help businesses comply with those regulations (e.g. digital tax systems or trade infrastructure); and
- (iii) operational efficiency, reflecting the practical experience of firms in navigating these rules and public services in day-to-day operations.

These dimensions apply across the life cycle of private and public enterprises, including business registration, location, utility services, labour, financial services, international trade, taxation, dispute resolution, market competition and insolvency.

In essence, a strong business enabling environment is one in which well-designed regulations and effective public institutions reduce uncertainty and costs, empowering the private sector to invest, grow and innovate. The key components of an enabling environment for business are summarised in Table 2.

Key respondents, including representatives from the Veterinary Authorities of Australia, Chile, Ethiopia, Denmark, New Zealand and the United Kingdom, as well as nearly all private sector participants, emphasised the importance of communication and consultation between public and private stakeholders. Respondents highlighted this as essential for aligning national priorities with local needs, strengthening trust and improving the delivery of animal health services.

An enabling environment supports these outcomes by reducing uncertainty and allowing public institutions, private providers and producer groups to complement one another. Veterinary Authorities set policies, standards and coordination frameworks, while private actors deliver surveillance, outreach, vaccination and rapid response.

Box 9.

Country spotlight

Animal Health Australia offers an example of effective national-level coordination, with its model adapted and implemented in Canada and Ireland.

In France, a well-established dialogue process brings together government, professional organisations, veterinarians and industry to co-design national health policies. This framework has been progressively structured and regularly revised to incorporate shared responsibilities and financing commitments. Recent work has built on these established foundations to adapt the governance framework to the evolving epidemiological challenges, in particular by updating financial compensation schemes and vaccination arrangements through sectoral health contracts. This structured and continuous dialogue has strengthened alignment across actors and contributed to more predictable and coordinated implementation.

Many interventions are also informed and facilitated at the grassroots level by local stakeholders, including municipality-level actors in Haiti, Cambodia and Nepal.

Table 2. Key components of an enabling environment for business

Component of the enabling environment	Purpose/What it enables	Implementation examples (depending on national context)
Stable and transparent policy framework	Provides predictable, science-based policies that encourage long-term private sector investment in animal health systems	Clear regulations, transparent governance, long-term policy commitments
Effective regulatory systems	Ensures quality, safety and timely availability of veterinary medicines, vaccines, diagnostics and animal health services	Efficient product registration systems, regulatory oversight and harmonised standards
Investment incentives	Encourages private sector investment in priority animal health infrastructure, innovation and services	Tax incentives, subsidies, grants or public co-investment schemes
Access to finance and risk-sharing tools	Reduces financial risks associated with disease outbreaks and encourages business participation in animal health services	Credit facilities, livestock insurance, blended finance mechanisms and compensation schemes
Market access and fair competition	Improves the availability and distribution of quality animal health products and services	Streamlined product approval, transparent import/export procedures and fair market regulations

Component of the enabling environment	Purpose/What it enables	Implementation examples (depending on national context)
Capacity and workforce development	Strengthens human resources and technical systems needed to support animal health programmes	Training programmes, laboratory strengthening, surveillance systems and professional development
Public–private partnership mechanisms	Facilitates cooperation between governments and industry in disease prevention, surveillance and service delivery	Public–private partnerships, joint vaccination campaigns and coordinated response systems
Data sharing and information systems	Improves transparency, surveillance and evidence-based decision-making for disease control and prevention	Disease reporting platforms, traceability systems and shared surveillance data
Innovation and research support	Encourages the development and adoption of new technologies and solutions in animal health	Support for R&D, technology adoption programmes and innovation partnerships

5.2. Matching finance to the type of service

This section presents a context-specific financing framework for classifying animal health services along a continuum from pure public goods to pure private goods, illustrating how this classification informs financing strategies, delivery models and PPP potential (see Table 3). The framework is based on insights gathered through stakeholder interviews and consultations and is intended as a guide; actual arrangements may vary depending on country context, local capacity and specific sectoral needs.

This continuum highlights the need for a layered financing architecture. It clarifies where public investment is essential due to the societal nature of the activity, where private financing is appropriate and where blended approaches, PPPs or cost-sharing arrangements can unlock additional resources. It also underscores the importance of a strong business enabling environment to ensure that private actors are willing to invest while safeguarding public interests and societal benefits.

Table 3. Financing framework for animal health

	Pure public good	Mostly public good	Mixed public/private good	Mostly private good	Pure private good
Example activities	<ul style="list-style-type: none"> - National disease surveillance systems - Emergency preparedness planning - Border biosecurity and quarantine systems - Public disease reporting systems - Research on emerging disease threats - Public awareness and risk communication 	<ul style="list-style-type: none"> - Disease eradication programmes - National vaccination campaigns - National laboratory diagnostic networks - Biosecurity standard development - Training programmes for veterinarians and inspectors 	<ul style="list-style-type: none"> - Disease prevention programmes at farm level - Traceability and animal identification systems - Early detection and reporting systems - Biosecurity infrastructure - Industry-led disease monitoring - Emergency response capacity 	<ul style="list-style-type: none"> - Farm-level productivity improvements - Individual herd health management - Commercial diagnostic services - Private veterinary services - Farm infrastructure investments 	<ul style="list-style-type: none"> - Commercial veterinary products - Farm equipment and technology - Breeding services - Feed and production inputs - Private consulting services

	Pure public good	Mostly public good	Mixed public/private good	Mostly private good	Pure private good
Financing model	<ul style="list-style-type: none"> - Primarily government funded - International organisations may contribute for global goods 	<ul style="list-style-type: none"> - Majority public funding - Partial industry cost sharing - Grants, levies or sectoral contributions may be used 	<ul style="list-style-type: none"> - Cost-sharing between government and industry - Industry levies - Matching funds - Insurance-type funds - PPP investment models 	<ul style="list-style-type: none"> - Primarily privately funded - Government support may include: <ul style="list-style-type: none"> - Tax incentives - Innovation grants - Technical guidance 	<ul style="list-style-type: none"> - Fully market-based - Paid directly by users
Key considerations	<ul style="list-style-type: none"> - Primarily government funded - Industry contribution typically limited to consultation or advisory roles 	<ul style="list-style-type: none"> - Aligning incentives so industry supports collective goals - Maintaining equity across sectors - Ensuring participation even from smaller actors 	<ul style="list-style-type: none"> - Designing fair cost-sharing formulas - Establishing clear governance structures - Maintaining accountability and transparency - Ensuring participation across the value chain 	<ul style="list-style-type: none"> - Ensuring access for small producers - Avoiding market failures - Supporting innovation and competition 	<ul style="list-style-type: none"> - Maintaining competitive markets - Ensuring quality standards - Protecting consumers
PPP potential	<ul style="list-style-type: none"> - Limited - National advisory/consulting platforms/bodies 	<ul style="list-style-type: none"> - Moderate - Public sector sets framework - Private sector supports implementation 	<ul style="list-style-type: none"> - High - Possible PPP models include: <ul style="list-style-type: none"> - Joint funding mechanisms - Industry-managed programmes with government oversight - Co-investment in infrastructure - Shared risk management funds 	<ul style="list-style-type: none"> - Limited but possible in: <ul style="list-style-type: none"> - Innovation programmes - Extension services - Technology adoption initiatives 	<ul style="list-style-type: none"> - Very low - Government role is mainly regulatory

5.3. Maximising finance for animal health

Recognising that diversified financing is essential to close the sector's financing gap, this section proposes a structured approach to maximise available sources of finance from both public and private actors in a sequenced and complementary way. This approach builds on the layered financing logic outlined in previous sections and helps Veterinary Authorities align funding sources with the type of service and its expected benefits.

Table 3 illustrates how different types of animal health activities can be matched with appropriate financing approaches, highlighting the need to combine public and private sources of funding. The way these approaches are applied will vary depending on country context, sectoral priorities and capacity constraints, and should be considered as guidance rather than a prescriptive model.

For activities that deliver broad societal benefits and are inherently public, stable and adequate public funding remains a core responsibility of the Veterinary Authority. For other activities, Veterinary Authorities should assess whether private sector solutions are viable and sustainable, while preserving public resources for areas they are most needed. This requires a systematic and hierarchical decision-making process that can be applied at the outset of any activity or service request.

Importantly, this is not a one-off exercise but a continuous process aligned with annual planning and budget cycles. By using public funds strategically and fostering an enabling environment that attracts private investment, WOAHA Members can strengthen financial management capacity and channel sustainable investments to reinforce their Veterinary Services.

This approach follows four steps:

- Step 1. Prioritise private sector investments.** Assess whether the activity can be financed commercially, without public funding or guarantees, while remaining accessible, affordable and delivering value for money. Activities that can be fully and sustainably financed by the private sector should rely on private investment and should not be prioritised for public funding. Commercial solutions can also improve efficiency.
- Step 2. Address market barriers through reform.** If private financing is not feasible, identify the underlying constraints. Where these relate to policy or regulatory gaps, structural inefficiencies, market failures or social and environmental externalities, the Veterinary Authority, in collaboration with relevant government bodies, should strengthen governance, reform regulations or pricing, improve performance of utilities or state-owned enterprises, and reduce transaction costs to better align private and public interests.
- Step 3. Use public funding to catalyse private investment.** Where reforms alone are insufficient and private sector financing remains difficult, the Veterinary Authority should consider cost-sharing mechanisms, such as PPPs, to reduce costs to viable levels for both sectors. Public funds are used strategically to attract private investment and expand partnerships, while essential public goods remain fully government funded. Such support should maximise the value of public resources provided to private firms and may include conditions to ensure alignment with policy objectives.
- Step 4. Provide direct public funding.** Only when private financing remains unviable despite reforms and risk-sharing measures, or where the activity is inherently a public good, public funding should be used to directly support the animal health activity. This ensures that public resources are reserved for essential interventions that cannot be delivered through private sector participation.

The cascade approach should be anchored in two strategic imperatives:

- 1. Strengthen the enabling environment for private investment.** Veterinary Authorities must prioritise sector and utility reforms, stronger governance and improved budget management to make animal health functions more attractive for private sector investment. These policy, regulatory and institutional reforms are often politically and administratively demanding and require sustained, long-term commitment.
- 2. Use public resources strategically to mobilise private finance.** Public resources should be used to catalyse private financing, expand financial instruments to reach new investors and free up public budgets for foundational investments.

Targeted diagnostic tools, such as the PVS Pathway, can support this process by systematically assessing the enabling environment for private investment and identifying opportunities to maximise financing for animal health. In fragile and conflict-affected settings, commercial solutions may be limited, requiring more direct public engagement while still applying the cascade logic as a decision-making framework.

6. Conclusions and key considerations

Animal health remains systematically underfunded relative to its economic, social, environmental and public health importance. Animal disease losses are estimated to be 20% of global livestock production, meaning that the cost of inaction far exceeds the cost of sustained investment. Yet, despite their broader contribution to economies and societies, Veterinary Services receive only about 0.05% of national GDP, resulting in a persistent financing gap to bring these services up to WOAAH standards.

While this gap is most visible in LMICs, where basic capacities remain underfunded, it is increasingly evident in HICs, where public budgets for animal health are stagnating or declining in real terms. In these contexts, competing fiscal pressures and shifting political priorities risk eroding hard-won capacities, particularly in surveillance, preparedness and prevention.

This underinvestment reflects not only resource constraints but also a structural misalignment between the value of animal health and current financing incentives across all income settings. Veterinary Services span a continuum from private goods to national, regional and global public goods. However, financing systems rarely reflect this diversity, with many countries relying on constrained public budgets, fragmented external funding and insufficient mobilisation of private capital.

The consequences extend well beyond agriculture. Weak, underfunded or politically under-supported animal health systems increase the risk of zoonotic disease emergence, accelerate AMR, and undermine food and nutrition security, trade and rural livelihoods. Recent trends also show that TADs are re-emerging in regions previously considered low-risk, highlighting that vulnerabilities are no longer confined to LMICs but represent a shared global risk. Investing in animal health is therefore not only a sectoral issue, but a strategic priority for global health security, economic resilience and sustainable development.

A further barrier to investment is the scarcity of robust economic data and evidence. Limited information makes it difficult to build compelling investment cases, attract private capital or ensure accountability for public expenditure. Closing this evidence gap is itself a prerequisite for scaling up financing. Digitalisation can accelerate this bridging progress by improving data collection, analysis and sharing across WOAAH Members, industry and investors.

The following **seven key** considerations emerge from this Technical Item:

1. Differentiate financing by the public-good nature of each service.

Governments and international partners should base financing decisions on a clear typology of services. Core public functions (e.g. epidemiological surveillance, emergency preparedness, border biosecurity and TADs control) require stable public funding and international grants or concessional financing, as market mechanisms alone will not provide them. Services generating direct private benefits (e.g. clinical diagnostics or routine veterinary care) are appropriate for cost-recovery mechanisms, user fees and private provision under public oversight. This differentiation applies across all country income levels: LMICs require expanded public and concessional financing, while HICs must maintain investment in essential public goods that risk being deprioritised due to budget pressures.

2. Strengthen national Veterinary Authorities as system stewards.

Financing alone will not deliver results without capable institutions to plan, regulate, reform and oversee a complex multi-actor ecosystem. Governments should invest in workforce development, governance capacity, financial literacy and regulatory capacity of their Veterinary Authorities to coordinate across public and private actors, enforce standards and ensure accountability for service delivery outcomes.

3. Scale up blended finance to attract private investment.

Given the scale of the financing gap, public and philanthropic capital should be used strategically to reduce risk and attract private investment in animal health. Blended finance instruments, such as guarantees, first-loss mechanisms and concessional lending, should be

scaled up and tailored to the specific needs of the sector. These instruments can unlock and scale the innovation and commercialisation of new veterinary products, services and technologies, generating high ROIs while contributing to global priorities such as disease prevention, food security and sustainable livestock and aquaculture systems. This approach is particularly critical in LMICs, where investment gaps are greatest and the potential impact and ROI are also the highest.

4. Expand results-based financing to strengthen accountability.

Financing mechanisms that link disbursements to independently verified outputs and outcomes, such as vaccination coverage, disease incidence reduction or compliance with biosecurity standards, should be adopted more widely. RBF improves incentive alignment, focuses resources on impact and generates the performance data needed to strengthen the evidence base for sustained investment.

5. Create an enabling environment for private sector participation.

Governments should establish clear, predictable and proportionate regulatory frameworks that allow private actors (e.g. veterinary service providers, pharmaceutical companies, producer associations, processors and AgTech firms) to operate with confidence. Legal clarity on accreditation, data ownership, liability and market access is essential to attract sustained private investment and to harness the potential of digital and technology-based tools for animal health management and service delivery.

6. Treat transboundary animal disease control as a global public investment.

The international community, including MDBs, bilateral donors and international financial institutions, should significantly increase grant and highly concessional financing for TADs control in LMICs, including those with zoonotic or pandemic potential. The re-emergence of TADs in previously eradicated areas, or in regions where diseases such as FMD were historically absent, highlights a growing risk that transcends income levels. These outbreaks generate substantial control costs and trigger substantial compensation and response expenditures even in HICs. Investments in controlling TADs should therefore be explicitly framed as investments in global public goods that advance health security and pandemic prevention, rather than as development assistance alone.

7. Close the data and evidence gap.

WOAH, partners and national governments should invest in improving the quality and availability of data, including its collection, storage, integration, analysis and sharing. Efforts should also focus on assessing the outcomes of policies and interventions, strengthening the economic analysis of animal disease impacts and veterinary investment returns, in order to build stronger evidence base for animal health financing. Better evidence is essential to support the investment case, improve resource allocation, foster accountability across all financing streams and attract private capital.

7. Methodological notice

The preparation of this Technical Item followed a structured and iterative approach designed to ensure a robust evidence base, inclusive stakeholder engagement and alignment with WOA's mandate. The methodology was implemented in four steps: (i) conceptual framework development, (ii) data collection, (iii) literature review and (iv) drafting, review and finalisation.

This Technical Item is grounded in the recognition that animal health is a strategic investment rather than a cost. Despite its critical role, Veterinary Services remain underfunded. A key challenge lies not only in mobilising additional resources, but also in identifying and proposing options to allocate financing responsibilities more effectively across stakeholders. Linked to this, the following conceptual framework (Step 1) was put forward: animal health generates different types of economic goods, each with distinct financing responsibilities, namely national public goods, global public goods and private goods. In practice, however, these categories often overlap. Animal health interventions frequently generate both public and private benefits, with spillover effects across borders and along value chains. As a result, financing responsibilities cannot be assigned to a single actor. At the same time, the capacity to pay varies widely across countries, sectors and producers, precluding a universal funding model. While the notion that 'those who benefit should pay' provides a useful foundation, it must be applied through context-specific arrangements that: (i) align cost-sharing with the distribution of benefits (public/private; national/global); (ii) reflect differences in stakeholders' capacity to pay; and (iii) address imbalances where some beneficiaries do not contribute proportionately. Current financing practices do not fully reflect the distribution of responsibilities. This conceptual framing therefore informs the central question of the Technical Item: how Veterinary Authorities can identify and apply financing options that ensure equitable cost-sharing, appropriate allocation of resources and financial sustainability.

The second step focused on gathering inputs from a broad range of stakeholders. Data were collected through interviews and questionnaires targeting Veterinary Authorities, academia, industry associations, agricultural producers, meat and feed industries, genetic companies, pharmaceutical companies, international organisations and non-governmental organisations. A total of **51 consultations** were conducted, including interviews and written contributions:

- **Public sector (Veterinary Authorities):** 19 representatives from WOA Members, including 18 WOA Delegates.
- **Private sector (value chain):** 14 representatives from companies across the meat industry, AgTech companies, pharmaceutical firms and transporters, as well as written contributions from the seven industry associations with which WOA has an agreement (see Section 7.1).
- **Finance and research:** 18 individuals representing agricultural investors, insurers, donors, academia, international organisations and non-governmental organisations.

To ensure global representation, consultations included stakeholders from all WOA regions, from Africa, the Americas, Asia and the Pacific, Europe and the Middle East, as well as global-level organisations. Two sets of questions were developed: one for the public sector and one for all other stakeholders. These aimed to test the conceptual framework and explore the four key dimensions:

- Why investment in animal health and welfare is a strategic priority, recognising its role as a national and global public good.
- Who should contribute financially, emphasising that costs and responsibilities cannot be borne by a single actor. Fair cost-sharing models must reflect benefits received and the capacity to pay.
- How sustainable investment can be achieved, including mechanisms to reduce risk and attract private capital (e.g. through AgTech, insurance or digital finance).
- What Members can contribute in terms of knowledge sharing and expectations for future resolutions, reinforcing the importance of peer learning and collective problem solving.

The data gathering process provided a comprehensive set of perspectives, expectations and practical insights. These data (Step 3) were complemented by a review of relevant literature and documentary sources across three categories:

- **Peer-reviewed journals and technical publications**, providing scientific evidence and analytical frameworks to ensure alignment with current research.
- **Documents provided by interviewees**, including reports and internal analyses offering contextual insights that complemented perspectives gathered during interviews.
- **Case studies and ongoing research**, drawn from partner organisations and current projects, demonstrating real-world implementation and challenges.

This review ensured that the Technical Item is grounded in both empirical research and practice-based evidence.

The final step entailed drafting the Technical Item based on the evidence gathered and analyses conducted. The document underwent successive rounds of peer review by WOA and World Bank Group experts. Following validation, it was copy-edited to ensure consistency and clarity, translated to support accessibility and published on the WOA website.

7.1. List of WOA Members and organisations consulted

WOA Delegates and public authorities from the following Members were consulted, listed here in alphabetical order by country.

1. Australia: Dr Beth Cookson, Chief Veterinary Officer, Department of Agriculture, Fisheries and Forestry
2. Botswana: Mr Andrew Madeswi, Chief Executive Officer, Botswana Vaccine Institute Limited
3. Chad: Dr Ghislaine Mbeurnodji Singambaye, General Directorate of Veterinary Services
4. Chile: Dr Monica Rojas Noack, Deputy Director of Aquaculture, National Directorate, National Fisheries and Aquaculture Service
5. Colombia: Dr Viviana Sofia Zamora Pineda, Deputy Director for Animal Protection, Colombian Agricultural Institute
6. Denmark: Dr Charlotte Vilstrup, Chief Veterinary Officer, Danish Veterinary and Food Administration, Ministry of Food, Agriculture and Fisheries
7. Egypt: Dr Hamed Mousa Elaknas, Chairman of General Organization for Veterinary Services and Chief Veterinary Officer, General Organization for Veterinary Services, Ministry of Agriculture and Land Reclamation
8. Ethiopia: Mr Getachew Diriba, PhD, Senior Advisor to the Minister of Agriculture, Ministry of Agriculture, Addis Ababa
9. France: Dr Marie-Christine Le Gal, Deputy Director General and Chief Veterinary Officer, Directorate-General for Food, Ministry of Agriculture and Food Sovereignty
10. Germany: Dr Katharina Kluge, Head of Directorate, Directorate of Animal Health and Animal Welfare
11. India: Dr Praveen Malik, Chief Executive Officer, Agrinnovate India Limited (AgIn)
12. Kazakhstan: Mr Taskyn Kyzaiabayev, Deputy Chairman of the Committee of Veterinary Control and Supervision, Ministry of Agriculture of the Republic of Kazakhstan
13. Kenya: Dr Allan Azegele, Director of Veterinary Services, Ministry of Agriculture and Livestock Development
14. Kyrgyzstan: Dr Adilet Sotovaldiyev, Director, Veterinary, Livestock Development, Pasture and Fodder Service, Ministry of Water Resources, Agriculture and Processing Industry
15. New Zealand: Dr Mary Van Andel, Chief Veterinary Officer, Ministry for Primary Industries
16. Oman: Dr Samah Al Sharif, Ministry of Agriculture, Fisheries Wealth and Water Resources

17. United Kingdom: Dr Christine Middlemiss, Chief Veterinary Officer, Department for Environment, Food & Rural Affairs
18. Uruguay: Dr Marcelo Rodriguez Irazoqui, Director General of Livestock Services, Ministry of Livestock, Agriculture and Fisheries; and Ms Antonella Riani, National Meat Institute
19. Uzbekistan: Dr Abrar Akbarov, Deputy Chairman, State Veterinary Committee

In addition to WOAHA delegates and public authorities, the Forum Secretariat gathered insights from the following organisations (in alphabetical order):

1. Action for Animal Health (AAH), United Kingdom
2. Allana Group, India
3. Andrea Stürmer Advisory, Germany
4. Betagro Public Company Limited, Thailand
5. Brooke Action for Working Horses and Donkeys, United Kingdom
6. Building Nexus, Switzerland
7. Ceva Santé Animale, France
8. Charoen Pokphand Foods (CPF), Thailand
9. Dairy Companies Association of New Zealand (DCANZ), New Zealand
10. Diagnostics for Animals (D4A), France
11. FAIRR Initiative, United Kingdom
12. Farmers Choice Limited, Kenya
13. Fonterra Co-operative Group, New Zealand
14. Gates Foundation, United States of America
15. GormalOne LLP, India
16. Health for Animals (H4A), Belgium
17. Heifer International, United States of America
18. International Alliance for Biological Standardization (IABS), Switzerland
19. International Dairy Federation (IDF), Belgium
20. International Feed Industry Federation (IFIF), Luxembourg
21. International Poultry Council (IPC), United States of America
22. International Wool and Textile Organisation (IWTO), Belgium
23. Legal & General Group (L&G), United Kingdom
24. Meiji Holdings Co., Ltd., Japan
25. Seracon GmbH, Germany
26. Standards and Trade Development Facility (STDF), Switzerland
27. Topigs Norsvin, Netherlands
28. World Bank Group, United States of America

8. Glossary

Note: Definitions in this glossary are drawn from a range of authoritative sources, including WOA, the World Bank Group, OECD, FAO and the International Monetary Fund (IMF), as well as standard economic terminology.

A

Additionality: A condition in blended finance where public or concessional funds produce an impact (investment flow, risk reduction, market creation) that would not occur otherwise.

Affordability gap: A situation in which intended users cannot pay the full cost of a service at market price.

B

Beneficiary pays principle/User pays principle: The principle that those who benefit directly from a service should pay for it, ensuring efficient and equitable allocation of public resources.

Blended finance: The use of concessional public or philanthropic funding to mobilise private investment into development sectors by improving the risk–return profile of projects.

Business enabling environment: The regulatory, institutional and operational conditions that influence a firm's ability to operate efficiently and invest.

Cascade approach (Maximising Finance for Development): In support of its Maximising Finance for Development (MFD) framework, the World Bank Group adopted the cascade approach that leverages and prioritised private sector support for economic growth and sustainable development. It is hierarchical decision model that prioritises: 1) private financing, 2) policy reforms to enable private financing, 3) public co-financing/PPP, and 4) public financing only as last resort.

Catastrophic risk: Low frequency, high impact events that typically require public provision or pooling.

Concessional finance: Financing provided on terms below market rates to lower investment risk (e.g. soft loans or grants).

Cost recovery: A financial mechanism whereby users pay part or all of the cost of a service in proportion to benefits received.

Cost sharing: A structured arrangement where public and private actors co-finance an activity based on distribution of benefits.

D

Delegable functions: Tasks that may be performed by private veterinarians, paraprofessionals or laboratories, provided they are accredited and supervised.

Disease externality: The impact of a disease that extends beyond the farm where it originates.

E

Enforcement capacity: The ability of authorities to ensure compliance with laws, standards and contractual obligations.

Externality: A cost or benefit incurred by a third party who did not choose to incur it.

G

Global public good: A good whose benefits extend across borders and cannot be limited to any single country.

I

Impact investment: Investments intended to generate measurable social or environmental impact alongside financial returns.

Innovation grants: Direct public funding instruments that are usually non-repayable transfers, awarded to firms, research bodies or consortia on a competitive basis, to generate or adopt innovations (products, processes, services or organisational methods) consistent with national science, technology and innovation (STI) policy objectives.

L

Levy (parafiscal tax): Compulsory fee paid by an industry subset, earmarked for sector activities.

M

Market failure: When private markets fail to provide socially optimal levels of a good.

Matching funds: A matching grant (or matching fund scheme) is a non-repayable public contribution that requires beneficiaries to co-finance a pre-agreed share of eligible costs (cash and/or in-kind), with the public contribution 'matching' the private contribution at a specified rate; used to overcome coordination failures, information gaps or externalities in private investment.

Moral hazard: A reduced incentive to take precautions when protected from the consequences of risk.

O

Output-based aid: Subsidies linked to the verified delivery of specific outputs.

P

Performance-based contracting: Contracts in which payment is linked to verified results.

Private good: A good that is both rivalrous and excludable; consumed individually.

Privatisation: The transfer of ownership, control or management of state-owned enterprises, assets or public services from the public sector to the private sector, typically through sale, concession or contracting-out.

Public–Private Partnerships (PPPs): A joint approach in which public and private sectors agree responsibilities and share resources and risks to achieve common objectives that deliver benefits in a sustainable manner.

Public good: A good that is non-excludable and non-rival, requiring public financing.

R

Re-risking: Actions that reallocate or decrease the level of risk borne by different actors.

Results-based financing (RBF): Financing linked to the achievement of independently verified outputs or outcomes.

S

Sovereign functions: Functions inherently linked to State authority that cannot be delegated.

T

Tax incentives: Preferential tax provisions granted to specific taxpayers or activities, typically to encourage investment or other policy-relevant behaviours. They include instruments such as exemptions, tax holidays, reduced rates, tax credits, super-deductions, accelerated depreciation, deferrals and customs reliefs

Transaction costs: Costs associated with participating in or managing a system beyond the direct cost of the service itself.

V

Value chain financing: Financing that flows through relationships in the value chain (processors, integrators, traders).

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