

Sustainability of Veterinary Services: experiences and challenges

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Original: Spanish

Summary: *One of the core missions of the World Organisation for Animal Health (OIE) is the promotion of Veterinary Services in order to improve the legal framework and resources of national Veterinary Services to make them first-rate.*

Veterinary Services have a decisive role to play worldwide in protecting both animals and humans and hence in supporting the work of the OIE. The activities of Veterinary Services are a global public good because they are the protectors of animal health and welfare, key stakeholders in public health and food safety and the sanitary safety of international trade. They also contribute to reducing poverty among rural populations of developing countries by preserving their valuable animal assets, which are essential to their livelihoods.

For the effective performance of these functions, competent authorities must ensure that their Veterinary Services are provided with adequate resources.

The OIE PVS Pathway missions conducted over the past decade have shown that Veterinary Services are chronically underfunded, resulting in poor organisation and inadequate staffing, which jeopardises animal health and welfare nationally, regionally and globally.

In light of these findings and deductions, it is crucial for OIE Delegates to raise the awareness of competent authorities about the key role played by Veterinary Services and the importance of providing them with sufficient financial and human resources to guarantee strong performance (in compliance with OIE standards) and sustainability.

This paper discusses the concept, origins, mission and good governance of official Veterinary Services or Veterinary Authorities. It describes how the different responsibilities are assigned and the conceptual rationale behind restructuring processes. It makes special mention of the changes that have occurred since the 1980s, with structural adjustment leading to use of the rules of welfare economics to divide the different responsibilities between the public and private sectors. It presents opportunities for action to secure the financial sustainability of Veterinary Services. Finally, it points to the challenge facing Member Countries in managing OIE official recognition or maintaining their animal disease status in the current context of budgetary constraints and in the future.

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Introduction

The 21st Century has faced Veterinary Services (VS) in the Americas with the challenge of rethinking and gearing up to manage the animal health achievements of recent decades. Official VS will need to incorporate new competencies in order to implement the tasks that will be required to manage OIE official recognition or maintenance of countries' animal disease status.

What should I do? What should I stop doing? These are frequently asked questions that need to be weighed against budgetary constraints, the pursuit of goals, the VS mission and the role that the country assigns to animal production.

The need to meet society's demands in an appropriate and lasting manner calls for financially sustainable official VS and a public policy context that provides them with stability.

This paper discusses insights and experiences regarding the establishment and restructuring of VS, current challenges and a number of mechanisms available to build financial sustainability.

Veterinary Services rooted in the public domain

According to the OIE *Terrestrial Animal Health Code (Terrestrial Code)*, the term **Veterinary Services** means *'the governmental and non-governmental organisations that implement animal health and welfare measures and other standards and recommendations in the Terrestrial Code and the OIE Aquatic Animal Health Code in the territory [...]'* [13]. The provision of veterinary services therefore involves a variety of organisations, ranging from the Veterinary Authority, which has *'the responsibility and competence for ensuring or supervising the implementation of animal health and welfare measures, international veterinary certification and other standards and recommendations in the Terrestrial Code in the whole territory...'* [13] to private veterinary care providers (veterinarians, veterinary paraprofessionals and aquatic animal health professionals) who are authorised to practice veterinary medicine in a country and are able to provide guidance in a specific situation or to advise one or more farms of different sizes.

'... The Veterinary Services are under the overall control and direction of the Veterinary Authority. Private sector organisations, veterinarians, veterinary paraprofessionals or aquatic animal health professionals are normally accredited or approved by the Veterinary Authority to deliver the delegated functions' [13]. In many countries in the region, when veterinary services are provided by private actors, they may be required to furnish some form of accreditation or approval from the Veterinary Authority, including certification from a professional association, to be allowed to practice the veterinary profession. When implementing official control programmes, accreditation, authorisation, monitoring and control tasks may be delegated to the Veterinary Authority.

VS have always come within the public service domain because, initially, nearly all veterinary services were provided by official VS (veterinary authorities). In keeping with each country's distinctive features, VS were created in response to national or international issues relating to transboundary epidemics, such as rinderpest (as from the late 19th Century) or, in the Americas, foot and mouth disease and issues such as public health. In developing countries, VS were established gradually with the support of international cooperation agencies, which came with guidelines, capacity-building and financing.

The creation of official VS created strong demand for veterinary science professionals, which led to the establishment of faculties or schools of veterinary medicine that were also public in nature. In the early stages and until around the 1970s, the vast majority of graduates from such schools were employed in public VS.

Owing to their design and development, VS have had a predominantly public connotation. However, private veterinary services developed gradually in parallel. Now the situation has evolved and changed completely. In the absence of precise figures, it is estimated that, in some countries, 80% of veterinary professionals work in the private sector. As regards vocational training, in the Americas, which is home to around 50% of the world's veterinary schools, the number of private universities is also growing.

OIE mission: the promotion of Veterinary Services

The mission of the World Organisation for Animal Health (OIE) is to promote better prevention, control and management of animal diseases, including those transmissible to humans. As a mark of the close relationship between animal health and animal welfare, the OIE has also become the leading international organisation for animal welfare. In addition, one of the OIE's core missions is the promotion of veterinary services in order to improve the legal framework and resources of national VS to make them first-rate.

The OIE has stated clearly that the proper functioning of VS requires infrastructure and the resources and capabilities to allow them to seize the opportunities provided by the international institutional framework in the context of the World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures and the functions of improving animal and public health.

In this context, the OIE considers VS as a global public good and has established the need for public investment in the form of resources, capabilities and infrastructure for animal health and welfare, environmental protection and public health promotion.

Official Veterinary Service mission and good governance

Initially, the mission of official VS was to control and, where possible, eradicate the animal diseases for which they were established. Subsequently, an overall mission of animal disease control and eradication was developed [2]. The founding mission of controlling and eradicating animal diseases for which official VS were established has now evolved into an overall mission of ensuring the health and welfare of terrestrial and aquatic domestic and wild animals [2]. The shift in focus from disease to health and welfare has strongly defined the purpose of official VS and reoriented their actions.

In line with the reorientation of the VS mission, the OIE has spearheaded the process of ensuring good governance of VS. Good governance is where official VS, in compliance with their mission, channel public resources chiefly into tasks that ensure the general well-being of society. This requires official VS to prioritise issues and to place more value on those that constitute global public goods [8], which involves the proposal of actions in coordination with other countries [2, 14].

After the creation of the World Trade Organization and the Agreement on the Application of Sanitary and Phytosanitary Measures, in order to secure the well-being of society, the leading issues became the facilitation of international trade in animals and safe food of animal origin, together with animal and public health and the environment (including wildlife). In addition, recognition was given to the role of animal health in reducing poverty, alleviating hunger and achieving the other Sustainable Development Goals [1].

Therefore, the mission of official VS has broadened while the range of actions has narrowed in pursuit of the public good. The emphasis needed to be placed on following guidelines for good governance and, hence, on the establishment of regulatory frameworks and appropriate legislation [14, 12].

The restructuring of official Veterinary Services: an ongoing task

Official VS have been restructured repeatedly since their inception. Initially, restructuring focused on the establishment of VS and later on the incorporation of different responsibilities. At that time, the adjustments were chiefly organisational to accommodate the expanding portfolio of official VS. Until the 1970s, the trend was mainly towards public funding from domestic resources, international cooperation or multilateral bank loans.

As mentioned earlier, official VS were founded to respond to finite animal health issues. To meet these challenges, official VS gradually established surveillance systems linked to diagnostic laboratories and field services to implement animal health programmes. New issues emerged, such as food inspection and other veterinary public health tasks, which were also incorporated into their responsibilities. These new challenges forced VS to reinvent and restructure themselves on a number of occasions. While these institutional adjustments were under way, it was common for veterinary professionals to go abroad to train and later return to their home countries to contribute new knowledge and even to expand the list of issues to be addressed by official VS. Some countries even added further tasks to those of official VS, such as research, extension on animal production or even support for credit policies and production financing [19].

In the 1980s and 1990s, the State model of wide-ranging public funding functions was plunged into crisis. Structural adjustment was introduced to reduce government spending, control inflation and manage external debt in developing countries. This adjustment guided State restructuring towards allocating public resources to actions that would benefit society as a whole [9], as well as towards a broad policy of privatisation [6].

In this context, official VS embarked on a new restructuring drive with the aim of providing efficient and effective services [7] and reviewing the division of responsibilities between the public and private sectors. In addition to structural adjustment, this restructuring of official VS was also motivated by the acknowledgement of low productivity and competitiveness in animal production systems as a direct result of animal health issues.

At that time, it also became apparent that the limited budget of official VS and the multiplicity of responsibilities they had accrued were resulting in poor-quality services [3, 7], a heavy constraint on their operation [5] and, in general, problems in maintaining national disease control and public health programmes at adequate levels [11].

At present, official VS are engaged in a dynamic of structural change where not only are responsibilities that originally belonged to the public sector being transferred to the private sector but official VS management and organisation are also under review. In particular, we have seen the development and application of tools such as the OIE PVS Pathway and the complementary tools of the Inter-American Institute for Cooperation on Agriculture (IICA), allowing countries to evaluate the status of their VS in order to define needs, consider possible solutions, including funding, and work to achieve compliance with OIE standards to meet the demands of this new era of change [4].

The OIE PVS Pathway has been clearly identified as structural in order to address the financial sustainability of VS and to channel public investment efficiently into them [15].

The challenges facing official Veterinary Services in Latin America and the Caribbean in the 21st Century

Countries across Latin America and the Caribbean (LAC) have made considerable progress with their official disease status. Animal disease eradication programmes have delivered significant results, and official and private VS have undoubtedly been effective in controlling OIE listed diseases. In parallel, growth in animal populations, animal production and international trade across LAC in recent decades has led to global recognition for the region as a reservoir of animal protein [15]. There is no doubt that improved official disease status has contributed significantly to the development of the livestock sector in the Americas.

Official VS with experience in controlling and subsequently eradicating animal diseases are at the forefront of the great challenge posed by the management of OIE officially recognised disease freedom. The extensive experience gained from disease control and eradication programmes poses a challenge to official VS, in that new competencies will be needed to navigate the transition from endemic to official disease-free status and, in particular, to maintain and generate benefits from this official disease freedom [15].

First of all, countries should, in their different ways, accelerate and/or consolidate the eradication of diseases with an impact on trade. Once this has been achieved, and after securing OIE endorsement, official VS should spearhead the drive to ensure that potential trade partners acknowledge this official disease status for the purposes of trade with those countries. Skills and competencies in risk analysis and negotiation are crucial for this.

To continue improving their official disease status, countries need to adapt their surveillance systems for exotic diseases that were once endemic. Given the risk of disease emergence and re-emergence, countries must also generate competencies that ensure their preparedness for rapid detection, response and recovery of their official disease status and, above all, for re-opening any markets that may have been affected.

The protection of international markets, and hence their production sectors, will require animal health programmes to be redesigned, mechanisms such as zoning and compartmentalisation to be introduced, and the full range of measures for building the trust of trade partners to be communicated and implemented effectively.

Growing global demand for products also necessitates a better understanding of the new demands and perceptions of consumers who have added to the requirements of trade-partner authorities by calling for VS to take specific measures to guarantee the safety of their food. This highlights the need to tackle the new challenges of food safety and quality, animal welfare and antimicrobial resistance.

Along with the current trade with many and diverse partners, including high-value markets in developed countries, there is growing demand from developing countries in Asia and, in the future, from Africa. The flexibility, confidence and professionalism needed to meet the requirements of a large number of countries and customers will monopolise the attention of official VS.

The new OIE official recognition for countries' disease status and their (current or potential) participation in international markets will increase the need to play an active part in the activities of the OIE, Codex Alimentarius and relevant regional organisations in order to achieve compliance with international standards and thereby meet the challenges of a globalised world.

The animal health management of countries' official disease status in LAC calls for an understanding of the cultural values and differences between value chain actors and trade partners. It also calls for the design of programmes that cater for diverse production systems, ranging from highly integrated systems linked to international trade to backyard and subsistence family systems. Geographic, ecosystem and species diversity in the Americas will test the management and sustainability of countries' official disease status. Increasingly this has led to VS responsibilities being broadened to include such matters as spatial analysis competencies, wildlife health and the interface between wildlife and domestic animals and humans.

Cross-sector (health-agriculture-environment) work and public-private interaction have been key in implementing disease eradication programmes and achieving countries' current animal health status. As

part of official disease status management, shared tasks such as vaccination, the redesign of surveillance systems and emergency preparedness call for relationships with the private sector to be reviewed and rebuilt in a new context. Critical points to be redefined include strategies for co-financing new activities, the implementation of joint tasks and the generation and distribution of benefits.

Unlike control and eradication programmes, which have high operating and variable costs, these new tasks have a large fixed-cost component. The complexity of these tasks undoubtedly necessitates the adjustment and re-empowerment of VS, including building staff capacity and enhancing infrastructure, technology, management and linkages.

The financial sustainability of Veterinary Services

Financial sustainability enables official VS to carry out their mission effectively with assured long-term funding. The current context of limited resources where official VS have multiple (new and old) tasks to perform makes the decision on how to allocate these resources critical. Financial sustainability will depend on two factors: first, the allocation of resources to VS and, second, the development of management strategies that achieve efficient resource use. Ultimately, it is a question of prioritising which tasks to carry out and which to stop doing.

Based on more than 10 years' experience in implementing the OIE PVS Pathway, the OIE [15] has emphasised the need for sustainable public and international investment to enable the Veterinary Services to fulfil its mission and generate a global public good. The importance of VS in securing economic development, national and food security, public health and animal health and welfare contrasts with their limited allocation of resources, infrastructure, fixed and working capital, and human talent. Such resource constraints, which, in many countries, are structural in nature, call for a proactive investment policy.

The main financing constraints are the low level of investment and poor financial management, impacting on efficiency, potential for return and sustainability [15].

A wide range of measures and approaches have been taken to tackle the problem and below is a description of some experiences and options that might serve as a useful guide for decision-makers.

The division of responsibilities between the public and private sectors

Over the years since official VS came into being, the responsibilities placed upon them have never ceased to grow. However, the more new responsibilities are added to their portfolio, the bigger the concern over financing.

While the financing of official VS has been a constant concern since their inception, the debate intensified in the 1980s when guidelines for restructuring official VS were issued in response to structural adjustment and to productivity and competitiveness problems.

The first step was to divide responsibilities between the public and private sectors in accordance with the rules of welfare economics and the new institutional economics. The division of responsibilities was based on the characteristics differentiating a public good from a private good, in accordance with the concepts of rivalry and excludability (Table I).

Table I. Conceptual framework for dividing responsibilities between the public and private sectors according to types of good

Type of good	Rivalrous	Excludable
Private	YES	YES
Public	NO	NO
Toll	NO	YES
Common	YES	NO

In accordance with these concepts, a good is private when it is excludable (the consumption of the good by one person limits another's access to it) and rivalrous (the good is accessible only to those who pay for its use or consumption). A private service therefore generates excludable benefits for every private individual and, for that reason, the consumer is expected to be willing to pay for it. For example, a curative service is excludable because the treatment is applied to a specific animal and private actors will only provide the service to those who pay for it. The benefits of the treated animal are enjoyed solely by the owner.

In contrast, a pure public good is neither excludable nor rivalrous. For example, the fact that a producer benefits from OIE official recognition of a country's animal disease status does not exclude other producers, nor is the benefit contingent upon a specific payment.

Based on the above conceptual framework and on published literature [19], Table II presents a summary of the division of responsibilities between the public and private sectors in developing countries. While the table does not cover the full range of services, it is nonetheless useful in clarifying the division of responsibilities.

Table II. Summary of the division of responsibilities between the public and private sectors, on the basis of several authors

Service	Public	Private	Remarks
Curative		X	
Treatment and diagnosis		X	
Diagnostic support		X	Positive externalities
Drug delivery		X	
Vaccine and drug production		X	
Artificial insemination		X	
Vaccination programmes	X*	X	Positive externalities
Inoculations		X	Positive externalities
Tick control	X*	X	Positive externalities
Extension	X*	X	According to means of communication
Research	X	X	According to intellectual property rights
Food inspection	X		
Movement control	X		
Epidemiological surveillance	X		
Pharmaceutical quality control	X		

**Under special conditions*

Source: 19

As Table II shows, many countries restructured their official VS and transferred responsibilities to the private sector with the aim of reducing tasks under public sector responsibility and concentrating public resources on the provision of public services.

Experience showed that this process of restructuring contributed to financial sustainability. However, a number of circumstances associated with market failure or other macroeconomic conditions meant that the division of responsibilities sometimes failed to achieve the desired result. For example, difficulties or lack of incentives have been identified for the establishment, in remote areas, of private veterinary practices or family, subsistence or smallholder farmers, leading to lack of service provision. Reducing public responsibilities does not guarantee that staff or financial resources will be available for implementing public tasks. Therefore, difficulties such as poor public service provision or quality may continue to occur.

Prioritisation between problems and diseases

Even after dividing responsibilities between the public and private sectors, the public sector still has many functions (as many as there are animal health problems) but available resources are limited. The next step is therefore to prioritise problems.

Broadly, prioritisation means the sequential ordering of problems. Intuitive or rational means may be used to draw up this list of priorities. There have been some experiences of using and adapting multi-criteria evaluation for prioritisation. Prioritisation criteria include such variables as disease occurrence, technical feasibility and economic impact [18].

Public-private partnership for the implementation of actions and provision of services

After dividing responsibilities between the public and private sectors and prioritising public responsibilities, the next rational step is to tackle service provision. In the Americas, the involvement of private actors in the provision of services under public sector responsibility has proved successful in optimising resource use. Examples include: accredited private laboratories for disease diagnosis; livestock producer committees to deliver vaccination services; community informants to carry out passive surveillance; trained and supervised veterinary paraprofessionals to perform programme tasks in the field; accredited private veterinarians to work in the field; and the private provision of medicines/vaccines through a tendering process, local trade associations or a network of private input suppliers.

Financing

Sources of financing may be defined in accordance with three basic ways of financing a service: *a)* sale of the service; *b)* total or partial donations; and *c)* financing through compulsory contributions [10].

Sale of the service requires the beneficiary to identify and perceive the private benefits of using that service. To establish a trading market, an equilibrium price must be set that covers costs and is consistent with the benefits. For instance, voluntary vaccination schemes exist where producers pay for the vaccine and its administration.

For total or partial donations, to be sustainable, they must be long-term, and this requires acknowledgement of the common good. They may be provided by donors, producer associations, or even, in some cases, large producers, the food processing industry or exporters wishing to donate resources to ensure that smallholder producers implement programmes. In this case, benefits take the form of a positive externality. Similarly, resources may be donated by third countries to support activities fully or in part through financial cooperation.

In the case of compulsory financing, the VS establishes a regulatory framework where, first, it makes the service compulsory (for example, animal movement permits) and, second, it sets a fee for providing it. The use of cost-recovery models has been recommended, where the price corresponds to the costs and resources are kept preferably in a trust fund or revolving fund to support the provision of the service.

Finally, depending on a country's vision and the role played by animal health, a key alternative continues to be financing official VS from public resources.

The use of animal health economics

In pursuit of the financial sustainability of official VS, there are two broad categories for the use of animal health economics.

1. *Economic impact studies to promote advocacy: explaining the problem*

It is increasingly common for potential funders, whether public or private, to request that funding requests be accompanied by an economic impact evaluation of a disease. As in the private sector, ministries of economic affairs or finance now need to know the economic impact of a disease to weigh their allocation of resources against other options.

In line with the principles of animal health economics, the economic impact of a disease is divided into direct and indirect losses [16]. The economic impact of a disease is the quantification of these losses along the value chain, as well as at local, regional, national and international levels.

Direct losses are caused by the occurrence of disease in animals or humans (public health). Such direct losses may be visible or invisible. Visible direct losses are easier to see and are assessed on the basis of mortality, a decline in physical output (for example, litres of milk) or poor-quality products. Invisible direct losses are disease impacts whose identification or assessment necessitates a more extensive data review, calculations or the use of parallel measurement methods. The value of direct losses will depend on the epidemiology of the disease, its expression as disease occurrence and its knock-on effects. It will also depend on the structure and level of production and on prices, and hence on the markets to which the lost product belongs.

Indirect losses are caused by human responses to disease. They may be reactive or proactive. Responses can therefore be divided into two major groups: those that result in disease risk management measures and those that impact on various sectors of the economy, as a consequence of the responses of others. Indirect losses occur in the presence or absence of disease. To a large extent, they stem from actions based on individuals' perceptions and beliefs.

The indirect impact of **risk management** actions usually refers to the costs of a programme or animal health service intervention.

The second group of indirect losses involves several sectors of the economy, not just the agriculture and livestock sector. Indirect losses are expressed as a **reduction in income or increase in costs**. For example, market access is denied because of animal health requirements or consumption falls because of consumer perceptions.

Economic impact studies help to position the problems in order to secure funding and provide a sound basis for ensuring the efficient use of resources.

2. *The design and economic evaluation of animal health programmes in pursuit of efficiency*

In principle, a well-designed animal health programme facilitates optimum use of existing technical and economic resources in order to achieve optimum results at the lowest cost.

The design of intervention strategies follows a four-stage sequential process: prioritisation of problems; definition of animal health objectives; setting out alternatives; and selection of alternatives [16, 18]. It is based on the economic impact of disease, which serves as a variable for prioritisation and as the foundation for setting programme objectives, in that the economic impact is potentially the maximum benefit of the intervention (the benefits of a programme are understood to be avoided losses).

A good economic impact evaluation identifies the main sources of losses and, on that basis, technical tools are sought for preventing or mitigating those losses. Once the tools are in hand, competitive strategies are developed and then cost-benefit analysis is used to evaluate and compare them [16, 17].

The critical point is the generation of benefits and how they relate to intervention costs. Cost-benefit analysis provides the net present value, cost-benefit ratio and internal rate of return. These

indicators allow for a comparison of alternative investments and are used by funding decision-makers on a daily basis.

Experience and application of these methodologies in LAC indicates that, apart from the numerical results it provides, cost-benefit analysis leads to an improved, evidence-based design of alternatives.

The proper use and application of animal health economics contributes to the sustainability of official VS, provided that such tools are used to help make more efficient use of resources.

The challenge of the new tasks

Countries' achievements in disease control and eradication pose a challenge to the sustainability of official VS. Clearly, the strategies described above have been used chiefly to control and eradicate diseases.

A new and growing concern is that private sector co-financing or incentives for producers to invest resources rely on their perception of the benefits of disease control. So, the higher the disease occurrence and the more disastrous its impact, the greater the incentive will be for them to finance activities. The reverse is true where there is low prevalence or absence of disease.

Furthermore, many of the new tasks described contain a significant fixed-cost component and, as pointed out earlier, they often require better-trained and experienced staff. Staff stability and incentives are therefore critical to tackling the new tasks.

The solution may be to work with organised producers because, within a trade association, they find it easier to perceive the risks and effects of losing official disease status or of ending the eradication process when disease occurrence is low and their direct losses are close to zero.

VS sustainability will be ensured by identifying the benefits of the new tasks and making programme design and evaluation routine, provided that the recommendations are validated and implemented in the desired manner.

Conclusions

Based on the premise that official VS, which have been rooted in the public domain since their inception, generate and sustain global public goods, the financial sustainability of official VS must start with efficient use of public resources, which are fundamental to their operation.

Efficient resource use requires appropriate goal-setting, proper division of responsibilities between the public and private sectors, and a process of prioritisation that allows for the adjustment of complementary funding mechanisms.

Recent experience suggests that private participation in the delivery and direct financing of disease control and eradication programmes has been successful from both an economic and a technical standpoint.

The significant progress with respect to OIE official recognition of countries' disease status in the Americas poses a challenge to sustainability, in terms of maintaining this disease status and managing it to generate benefits and tackle disease emergence and re-emergence. The management of official disease status necessitates new, complex functions that call into question the financing strategies implemented to date.

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