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Financing and organisation of Veterinary Services

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Summary

This paper analyses the different ways of financing official Veterinary Services (VS) and the effects of these choices on the performance of such Services. The links between governance, organisational effectiveness and financing arrangements are seen as particularly important. The paper comments on some of the advantages and disadvantages of financing VS with service fees, as compared to budget transfers from general government revenues. Evidence is presented on the considerable heterogeneity in the size of VS and on the impact of this heterogeneity on organisation and financing.

The paper concludes with a stylised case study, which emphasises the importance of collaboration and the division of labour between the official and the private sector of the veterinary profession.

Keywords

Financing sources – Official Veterinary Services – Organisational efficiency – Veterinary Services.

Introduction

Organisations have at least three basic ways of financing their activities. The first is to sell their outputs to consumers. This mechanism relies on consumers voluntarily purchasing the output produced: for this exchange to take place, the value placed by the consumer on the good has to be at least as large as the price charged. This type of transaction has many advantages: in particular, and barring negative spillovers to other individuals, the outputs that are produced are valued by consumers at least the same amount as it costs to produce them.

The second involves organisations that receive part or all of their inputs from donations by private (and in some cases public) contributors. They may or may not sell part of their output; however, income from output sales is, in general, less than the value of donations from contributors. Non-profit organisations operate in this way. The *voluntary* nature of contributions received by non-profit organisations encourages efficiency in the attainment of organisational goals: if goal attainment is seen as unsatisfactory, contributions will fall or eventually cease. Contributions may be financial (e.g. private donors), or in the form of volunteer work, below-cost renting of buildings, etc. Note that efficiency in the attainment of *organisational goals* may or may not result in 'efficiency' in a *social sense*: the non-profit organisation may, for example, engage in lobbying for a particular issue or interest group, which benefits some or all donors, while harming society as a whole.

The third type of organisation finances its activities by compulsory contributions. In general, these organisations produce goods that are characterised, at least partially, by *(i)* non-exclusiveness and/or *(ii)* non-rivalry. Non-exclusiveness means that, once the good is produced, it is impossible or very costly to decide who should receive the benefit of the good and who should not. Knowledge that pasteurisation of milk eliminates the danger of brucellosis infection in humans who drink milk is one such example. Non-rivalry occurs when more than one person can use the goods or service without interfering with another person's use. Non-exclusivity and non-rivalry frequently (but not always) occur together. (Take the example of a bridge, used by both Mark and Jane. If congestion is absent, the use of a bridge is 'non-rival'. Mark and Jane can both cross whenever they wish. However, if a toll booth is installed, it is possible to allow or not to allow Mark and/or Jane to cross, i.e. excludability/exclusiveness has been obtained.)

Public, as opposed to *private,* goods are characterised by non-exclusiveness and non-rivalry (12).

Official Veterinary Services (VS) are financed predominantly by this third type of contribution (i.e. compulsory). However, as discussed below, VS activities exist side by side with many different (privately financed) veterinary and animal health activities.

The performance of firms that are subject to the discipline of the market can be evaluated with conventional measures, such as profits, growth in share prices, new product development and the like. Of course, broader-based measures of 'performance', such as employee turnover and community involvement, may also be relevant.

For organisations producing public goods financed not by *voluntary exchange* but by some form of *compulsory taxation*, alternative ways of measuring performance are called for. The concept of 'good governance' includes such aspects as financial sustainability, efficiency in production, accountability, transparency and others. For-profit as well as not-for-profit organisations can make use of good governance practices. However, these are of particular importance where the 'discipline of the market' is weak or non-existent. This is particularly the case for organisations where revenues are generated by taxes or some form of compulsory service fee.

This paper discusses issues surrounding the financing of VS. First, the authors present an outline of the nature of the 'public goods' produced by VS. The advantages and disadvantages of taxes over user fees are also discussed. Following this section, empirical evidence is presented on resource use by VS, and some comments are made on the distribution of contributions to support Veterinary Services along a 'vertical chain'. A stylised case study is used to highlight relevant issues and, finally, the authors draw their conclusions.

Public *versus* private goods

In the case of VS, for-profit organisations, not-for-profit non-governmental organisations (NGOs) and public organisations coexist:

– private-sector veterinarians sell services (including veterinary drugs)

– non-profit organisations (including cooperatives) sometimes undertake educational, outreach or research activities

– VS carry out a host of activities with public funding, or with (compulsory) payment of fees by the private sector.

Holden (6) presents a taxonomy of veterinary services based on rivalry and excludability (Fig. 1). As shown in the figure, these services include some that are purely of a 'public good' nature (e.g. surveillance and movement control); others that are partially public and partially private (e.g. diagnostic services, vaccine production) and still others that are primarily 'private goods' (e.g. control of diseases results in a negligible probability of transmission between herds and no adverse effects on humans or other species). The varied nature of outputs produced by VS underscores the need for careful analysis before recommendations are made about sources of financing, as well as the best way to put this financing to work.

An important part of the discussion about improving VS in developing countries has focused on the 'optimal mix' of private, non-profit and public activities (2, 3, 6, 8) (see also references in these works). For example, contracting out some activities to the private sector may lead to improved performance in the production of some veterinary public goods (upper left-hand box in Fig. 1). 'Arms' length' or *quid pro quo* contracts resulting from these types of arrangements in general imply increased reliance on prices and thus on explicit financial incentives. Incentives are an important determinant of individual and thus of organisational behaviour (11). However, formal incentives are only one of the many determinants of human behaviour in an organisational context (10). Aspects such as identification with organisational goals ('loyalty') and the selective channelling of information, among others, may be of equal or more importance (14). Furthermore, the use of market-type (arms' length) contracting may expose both the purchaser (the VS) as well as the contractor (private veterinarians) to opportunism. Indeed, if the service being transacted is 'custom made', and hence has a limited outside market, both parties to the transaction are, in a sense, 'captive' to the other (15). The danger of opportunism increases when the probability of

		Excludability	
		Low	**High**
Rivalry	**Low**	**Public goods** Epidemic or zoonotic disease control Some extension Some research Control of foodborne diseases	**Toll goods** Vaccine production Diagnostic services Veterinary clinics Dips
	High	**Common pool goods** Control using traps Control using aerial spraying	**Private goods** Endemic disease prevention and control Sales of drugs and vaccines Some extension Some research

Fig. 1
Characteristics of Veterinary Services (6)

contract renewal is low: in this case, 'misbehaving' may have higher pay-offs than carrying out contractual obligations. For example, a private contractor managing a disease surveillance programme may let the programme 'run down' if s/he thinks that the programme will be transferred to another supplier after contract expiration. Under these conditions, arms' length contracting may result in increased costs: thus, conventional public provision may be the answer.

Of course, agreement does not exist on what is the 'best' type of arrangement for delivering veterinary services. For example, in a survey of Chief Veterinary Officers (CVO), the authors reported that a 'larger budget' and 'better-trained staff' were the most important measures required to improve VS (1). Aspects such as decentralisation or the use of economic analysis had less importance. The authors pointed out that: '…CVOs view the best way of improving the delivery of veterinary services is to strengthen their own activity, with less emphasis on restructuring or change. Underlying this position must be the assumption that current approaches are satisfactory but that it is simply their *quantity* and *quality* that require attention' (italics added) (1).

This quote highlights the difficulties in identifying and acting upon constraints to efficiency. Indeed, different participants may view organisational challenges through very different lenses.

The links between governance, on the one hand, and efficiency, on the other, deserve attention. As pointed out by Niskanen (13), decision-making in public organisations may not always result in an 'optimal' (from the social point of view) choice. For example, bureau chiefs may place a 'larger budget' high on the priority list, although in some cases elimination of 'organisational slack' may allow increased organisational output with an unchanging budget (7).

Economics provides a useful starting point for analysing governance, efficiency and related aspects. However, a chasm must be crossed before general concepts result in practical recommendations. Consider the following examples:

– Cost efficiency. A necessary (but not sufficient) condition for VS efficiency is that public goods *A, B, C* (e.g. *A* = 'disease surveillance', *B* = 'contingency actions' and *C* = 'veterinary regulations') be produced at minimum (or, in practice, 'reasonable') cost. For this definition to be useful, some kind of 'benchmarking' (or comparison) is necessary. The comparison may be with another VS, or with 'standards' estimated by knowledgeable analysts. *In any case, measurements are needed*. However, cost comparison is not easy when the production of veterinary services is subject to *economies of scale* (lower average costs with increasing volume) or *economies of scope* (lower costs when producing two outputs jointly instead of producing them separately).

– Output efficiency. The organisation is efficient if the value of the last (or 'marginal') unit of public good produced is at least as large as the cost of producing this unit. Analysing this aspect of efficiency of course requires us to estimate the costs of additional resources (e.g. personnel, computers, fuel for vehicles). It also requires an estimation of the value of the output generated by these additional resources. Some type of 'benefit/cost' analysis (whether formal or informal) is called for. This benefit/cost analysis is especially problematic for services of the 'public good' type – precisely the services produced by VS.

The issue of financing cannot be separated from issues of efficiency. For example, different ways of financing operations may result in different demands for accountability. Similarly, different contractual arrangements with employees or private contractor firms may result in changes in the efficiency with which the VS transform inputs into valuable outputs.

A large literature exists on estimating different dimensions of the efficiency of both private and public organisations. Both sophisticated as well as 'back of the envelope' (but in many cases nevertheless adequate) approaches can be used. Scarce or non-existent data are a significant constraint that must be overcome for progress to be made. Cooperation from members of the organisation is another crucial factor if an analysis of governance and efficiency is to be adequately carried out. It is naïve to think that only 'technical' issues surround the study of how organisations carry out their tasks. 'Political' issues are frequently more important.

The funds necessary for the operation of VS may be raised by various mechanisms:

i) general tax revenues (from individuals and/or corporations) flowing to the government, part of which are allocated to the VS budget;

ii) levies or fees to specific industries, earmarked for the provision (directly, by a government agency, or by an organisation chosen by the government) of certain services. A slaughterhouse that pays a certain amount to a government agency for inspection services is an example of these kinds of 'taxes'. These fees may in turn be calculated:

– on the basis of output sold (or transported)

– on the basis of input purchased

– with a 'fixed' component independent of input or output volume;

iii) international donations and grants.

Taxes are the result of a political process carried out by the executive and legislative branches of government. In contrast, user fees are in some cases set directly by the regulatory authority – in this case, the VS. Relevant stakeholders (livestock owners, consumers, meat processors) may or may not participate in the determination of these fees. User fees are compulsory because the 'private' benefit resulting from the services for which the fee is charged is less than the 'social' benefit. Without compulsion, demand for the service from private individuals would be less than optimal.

In some cases, fees may approximate the per-unit cost of the service provided by the VS to the individual firm or consumer. For example, meat inspection costs in a plant are roughly proportional to the processed volume: a per-ton inspection fee may thus approximate the costs that the VS incurs in carrying out the inspection. In other cases, fees help to recover 'overhead' investments made by the VS in carrying out their functions. For example, a per-head fee charged on the transport of cattle may be used to finance setting up a disease surveillance programme. The fee charged to the livestock owner does not relate here to the cost of providing the service (prevention and rapid response) to his or her particular farm. However, even here a case can be made for fees, as the benefit the farmer receives is probably closely associated with the size of his or her herd, and thus also with the fees charged in the transport of cattle to market.

Fees *versus* taxes

Fees are a compulsory payment made for some service received: e.g. inspection fees of abattoirs, fees for inspecting cattle during transportation, etc. They flow directly from the agent receiving the service and making the payment (the livestock owner, the milk-processing plant) to the agency with the power to impose the fee (e.g. the VS). They are a form of 'tax'; however they differ from conventional taxes, which are not earmarked for a particular agency but instead flow into the government coffers as part of their general revenue. In the case of tax revenues, the VS 'competes for funds' with other government agencies. In contrast, in the case of fees, the right of the VS to impose charges on market participants results in some independence from the overall budgetary/resource allocation process – at least until the fee is overhauled or eliminated.

Some comments follow on the relative advantages and disadvantages of financing by user fees, as opposed to general tax revenues.

The advantages of user fees:

– Fees are charged for services that are costly to produce (e.g. inspection). This results in participants of the value chain 'taking into account' these costs in their decisions. This is efficient from an economic point of view.

– Fees may result in greater accountability of the VS to relevant stakeholders – it is they who are financing the VS directly and not through the 'black hole' of general tax revenues.

– Fee financing of the VS 'forces' the VS to collect information that might otherwise be collected in a more rudimentary fashion.

– Financing the VS through fees may result in greater flexibility in adjusting VS income to changing demands for services.

– Financing through fees may ease the transition from purely State-provided veterinary services, to those where the State assumes overall responsibility but devolves selected activities to non-profit organisations or even private organisations.

The disadvantages of user fees:

– The advantage of 'increased accountability', mentioned above, rests on the assumption that fee-paying stakeholders have a say in the overall functioning of the VS. If this is not the case, financing by fees may result in less and not more accountability, as funds flow directly to the VS, sidestepping the formal political process.

– Financing through user fees 'insulates' the VS from other government agencies. Budgetary reallocation of resources may be necessary, and this can more easily be done with centralised tax collection and disbursement than with different agencies (e.g. VS and others) obtaining resources through a decentralised fee collection process.

– Collecting fees may result in revenue uncertainty; e.g. a reduction in livestock output due to drought may result in income loss for the VS, when VS activities need to continue or even increase.

– In less-developed economies, the livestock sector is composed of small producers and informal processing plants. Subsistence production (for home consumption) does not involve transit through a formal market, and thus fee collection is impeded. In summary, fee collection may be difficult or impossible. In these cases, general tax revenues may be the most practical alternative for financing the public sector.

Some animal health activities pose their own problems in terms of financing. Consider, for example, compensating

livestock owners for the compulsory culling of diseased or suspect animals. Culling may be necessary because of the introduction of a highly contagious pathogen into an animal population: avian influenza is an example. Here, compensation to producers is an important tool for early detection, as producers themselves are the first to be aware of the existence of the disease. Without compensation, they will be reluctant to report the disease, hoping that it will pass unnoticed. Compensation is also used in the eradication of endemic diseases. The brucellosis eradication programme in Uruguay, for example, includes a compensation component. Livestock owners who are forced to slaughter milk cows and sell them for their beef instead (which generates much less income) are compensated for the loss incurred.

Compensation schemes may be financed in a variety of ways. In the case of Uruguay, compulsory appropriations are made on cattle sales and slaughter. The compensation fund may, of course, grow if the revenues are greater than the compensations made. If well-managed, part of the appropriation could eventually be refunded. This scheme has much in its favour, since livestock owners themselves bear both the costs and the benefits of the compensation programme. Uruguay is a net exporter of beef and milk, and any increase in price due to the eradication of brucellosis will primarily benefit livestock owners.

In other cases, arguments may be made for sharing the eradication costs between livestock owners and consumers. Consumers, in fact, may be the main beneficiaries of animal health programmes, since these programmes result in increased production and thus lower prices. In the United States (USA), resources for compensation flow from both federal as well as state funds, and not from specific levies collected from producers.

Private insurance schemes may also play a role in compensation programmes. In particular, an industry-wide programme may eliminate *adverse selection* and *moral hazard* problems common to many insurance situations. Premiums may be collected either from specific levies or general tax revenues, and the insurance contract may include provisions such as different compensation schedules, according to when the disease is reported, so that early reporting is encouraged.

Resources used by Official Veterinary Services

Data on resources used by VS are hard to come by. This is unfortunate, as cross-section and time-series data on total input use (human resources, capital inputs, non-durables) are necessary to understand the worldwide effort allocated to improving animal health. The available evidence suggests enormous inter-country differences in the resources used. A cross-country comparison for a sample of Latin American countries (Fig. 2) shows that the budget *per animal equivalent* ratio varies from an index of 50 to one of 400 (a 1:8 variation); an 'outlier' country having an even higher index of nearly 700. In turn, the index VS budget *per capita* of human population varies between 25 and 100 (1:4 variation), with two 'outlier' countries having indexes of more than 300 (4, 5). In part, variations in budget allocation can be accounted for by differences in the *per capita* income of the countries included in the sample. However, factors such as the total animal or human population also play a part. If economies of scale exist in the production of VS services, the budget per animal or *per capita* will be higher – for equal services provided – in smaller countries (in terms of their numbers of livestock or inhabitants) than in larger countries.

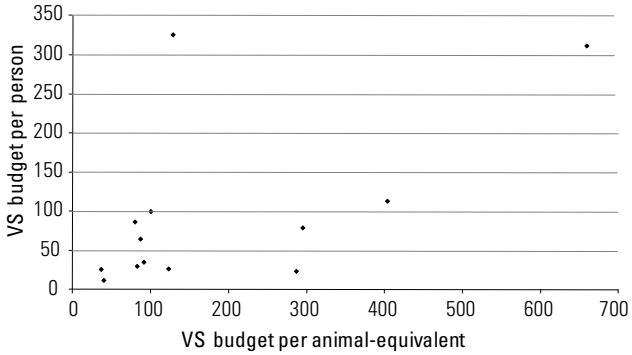

Fig. 2
Official Veterinary Services' budgets, a sample from Latin American countries (country X = 100)

Does a smaller budget per person imply that some sacrifice is being made in terms of food safety for the country's population? In particular, what impact will a budget increase from the 'low' level of 25 to the 'moderately high' level of 100 have on this aspect? Or, why do VS budgets vary more when measured by *budget per animal* as compared to *budget per capita*? If the two outliers are disregarded (those with a budget per person of more than 300), the former varies from 20 to 400 (1:20); the latter from 25 to 100 (1:4). On this evidence, one would suspect that a 'higher correlation' exists between the country's human population and the size of the VS budget, than between the livestock population and this same budget.

Trade in livestock products is an important determinant of the level of financial resources allocated to VS (Fig. 3). Trade is measured here as the ratio: *exports + imports* (in US$) divided by *2 × production* (in tons). As shown, a positive relationship exists between these two variables:

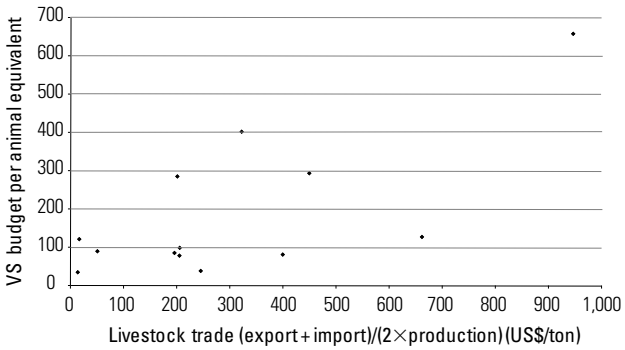

Fig. 3
Official Veterinary Services' budgets for the livestock trade

countries in which the trade index is 50 or less have VS budgets ranging from 30 to 120. In turn, a line fitted 'by eye' to the data predicts that, if the trade index increases to, say, 400, the VS budget should be of the order of 300. Despite the above, large variations exist in the VS budget-per-animal equivalent for countries in the same livestock trade index bracket. If we fit a line by eye linking trade with the VS budget, countries in the 300 to 400 trade index interval show deviations from this line in the budget interval 250 of plus or minus 150. That is, VS budgets for the same trade intensity range from 100 to 400. Are these differences due to a different output mix from VS? Or do they result from differences in the overall efficiency of resource allocation?

Analysis of the governance structures, financing and efficiency of VS should take into account the highly heterogeneous nature of the VS themselves. In particular, *total budgets* allocated to VS vary widely. In Latin America, for example, approximate investment in the VS is € 40–50 million in Argentina, as compared to € 1.4–2 million in Bolivia and € 3.5–4 million in Paraguay. As another example, in the Middle Eastern region, the budget of the 'largest' VS (Turkey) is more than 200 times that of the 'smallest' (Somalia) (VS budgets are approximate figures reported in [4] and [5]).

Different *absolute sizes* of VS result in different challenges for governance, organisation and financing. For example, funding *via* fees may require set-up, execution and control efforts that are well above those that can be sustained by a 'small' VS. In contrast, these activities may be carried out by a larger VS without undue difficulty. Furthermore, in smaller VS, motivating, coordinating and controlling personnel may be relatively straightforward. Thus, the potential advantages of 'contracting out' activities may be fewer than in large VS organisations, where 'in-house' management of large groups is a considerable challenge. Larger VS may obtain increased advantages in arms' length or *quid pro quo* contracting with private or NGO providers.

Who pays?

A relevant issue that arises when the production of public goods is financed by some form of tax or fee (the authors will use the terms interchangeably here) is: who ultimately pays for this charge? Is the fee paid by the farmer or the meat-processing plant? Or is it paid ultimately by the consumer? Consider, for example, Argentina, where in the meat value chain the following fees are charged:

– vaccine authorisation and inspection fees
– transport of cattle fees
– slaughter of cattle fees
– transport of processed meat fees
– wholesale and retail meat sales fees.

Who pays: the producer or the consumer?

A fee introduces a 'wedge' between the price paid by the purchaser and the price received by the seller. This occurs irrespective of the stage of the value chain at which the fee is imposed. If several stages of the value chain are subject to fees, a larger 'wedge' comes between the price received by the livestock owner and that paid by the final consumer. Standard economic theory suggests that the 'incidence' (on whom it falls) of a tax depends on the overall interaction of suppliers and demanders in the market, and not necessarily on who has the legal obligation of paying the tax (9).

Consider, for example, a simple value chain linking livestock producers with consumers. In this value chain, 'Stage 1' links primary producers with meat processors, and 'Stage 2' links processors with consumers (assume no wholesalers or retailers). Assume first that no fees are imposed in this value chain. Under these conditions, the difference between the price paid by the consumer and the price received by the livestock owner is the sum of:

i) the transport costs of Stage 1

ii) processing costs and

iii) the transport costs of Stage 2.

If 'free entry' exists into the transport and processing industry, then the transport and processing costs charged will just cover the costs incurred (they cannot be greater, otherwise other firms will enter into the industry). If, for example, the consumer pays \$8/kg and the farmer receives \$3/kg, the sum of costs *i)* to *iii)* can be estimated as \$5/kg.

If we now assume the imposition of a fee of \$0.5/kg in Stage 1 (transport from primary producers to processors), \$1/kg in Stage 2 (processing) and \$0.5/kg in Stage 2

(transport from processors to final consumers), the wedge between consumer and producer price will increase from $8 to $10. In general, 'free entry and exit' can be assumed in the transport and processing of the meat. If this assumption is valid, transporters and processors will not share (as in, contribute to) part of the fees charged, even if it is they who actually 'make the money transfer' to the public authority. These participants in the value chain will always be able to 'pass on' to the livestock owner and/or consumer any fee charged to them. The impact of fees will vary, according to whether fees are charges on:

– internal transactions or

– international trade.

This impact will also vary according to whether the country is a net exporter or importer of meat. For example:

– in the exporting country, an export fee is imposed. This will result in a fall in the domestic price equal to the amount of the fee. Consumers benefit through lower prices. Producers receive a lower price by the amount of the fee. The fee falls on producers;

– in the importing country, an import fee is imposed. Domestic prices increase by the amount of the fee. Consumers lose through higher prices by the amount of the fee. Local producers benefit for the same reason. The fee falls on consumers;

– in the exporting country, a fee is imposed on the output produced by meat processors. The price paid by consumers does not change but the price received by producers falls. The burden falls on producers.

The issue of 'who pays' is important. If (as is the case for many meat-exporting countries) the income levels of producers are considerably higher than those of consumers, public policy may aim to finance the production of public goods by taxes that 'fall' mostly on the former, as compared to the latter. Fees based on production or exports fall on livestock producers, as opposed to consumption-based taxes that fall on the whole of the population. A fee charged on exports is probably easier to collect; however, *export volume* (and hence the total fees collected) can be expected to be much more variable than *production volume*. (Since exports are the difference between domestic production and consumption, any 'small' change in these will result in a 'large' change in exports.)

A stylised case study

Consider, for example, the following stylised (but 'true') case study. Dairy production in a Latin American country takes place on two types of farms. The first type (Sector I) comprises medium-to-large farms, oriented to commercial production. Most of these farms belong to dairy cooperatives. Small farms make up the other sector (Sector II). These farms sell their output directly (and mostly informally) to milk retailers or to small cheese-producing plants.

Brucellosis control and eradication has progressed substantially in Sector I (disease-free status has been more or less achieved in practical terms, although a few herds test positive from time to time). The privately managed control and eradication programme has operated very well. Farms belonging to the cooperative receive a significant price premium for their output, and for farmers this is an important incentive to 'do things right'. A herd that tests positive cannot sell milk to the cooperative. Moreover, the private programme is carefully managed to keep down staffing, vehicle, laboratory and other costs. The total costs (salaries, laboratories, mobility, vaccines) per veterinarian average approximately €30,000 per annum; the total costs per cow average €4 per annum. The salaries of veterinarians working for the cooperative programme average €16,000 per annum, 20% to 40% lower than those in the VS.

In Sector II, control and eradication have progressed slowly and brucellosis is still a significant disease. In this case, the control efforts have been made by the VS but with marginal results. Indeed, the difficulty in eradicating the disease is considerably greater in Sector II than in Sector I: farms are more numerous and smaller and sometimes they are located in less accessible areas. Furthermore, there is only weak enforcement of culling in herds that test positive for the disease.

Success in brucellosis eradication has been greater in Sector I (a privately managed and funded programme) than in Sector II (publicly managed and funded). However, as mentioned previously, the difference in success cannot be explained by the fact that one programme is managed by dairy cooperatives and the other by the public sector, since brucellosis control in Sector II is much more challenging than in Sector I.

Notwithstanding the above, it is reasonable to ask whether the current private (Sector I) and public (Sector II) arrangement is the optimum. Would it be possible to design a programme in which the organisational know-how and flexibility of the private sector are extended from Sector I to Sector II? Can the 'large farmer' dairy cooperatives be induced (through subsidies) to extend their activities to the smaller farms? This could be in the interests of the cooperatives (less risk of brucellosis re-entry), as well as of the VS: programme costs could be reduced, and effectiveness increased. In the anonymous (but real) case mentioned above, the costs per veterinarian in the VS were significantly higher (30% to 40%) than the

figures mentioned for the private cooperative programme. Thus, potential savings could be made if some activities were contracted out.

The point made, of course, is how to take into account the *possible synergies* existing between a successful private brucellosis eradication programme and the 'heavy artillery' capabilities of VS in terms of surveillance, laboratory capability, epidemiological research, regulatory activities and others. In particular, routine veterinary work at the herd level could possibly be carried out at a lower cost in a privately organised (but publicly subsidised) programme.

Financing for the brucellosis programme would therefore originate from two sources. In Sector I, private farmers would continue to fund the programme (some €4 per cow per year, a very reasonable figure for commercial farms). In Sector II, revenues generated through taxation would be used to subsidise the private cooperatives operating in Sector I to extend their activities. The knowledge accumulated in the successful programme, 'economies of scope' in extending activities from Sector I to Sector II, programme flexibility and synergies with the VS can all be expected to contribute to the programme's success. Arrangements such as those proposed here, with joint interaction between the public VS and private-sector participants, require leadership, goodwill, the development of trust and, of course, appropriate contractual arrangements.

Final comments

The resources used by VS vary enormously from country to country across the world, not only in total volume but also when expressed per animal unit or *per capita*. If the 'One World, One Health' concept, promoted by organisations such as the OIE, the World Health Organization and the Food and Agriculture Organization of the United Nations, is to advance, increased attention should be given to finding ways in which VS activities can be sustained. The fact that epidemic diseases can move quickly across borders implies that the enormous differences in resources used by VS across these borders probably result in lost opportunities.

Increasing the amount of resources is important in many countries. However, the problems faced by VS are not only related to increasing the resources allocated to animal health, or to finding the 'best mix' of fees for services, budget transfers from the government and international grants. Designing organisational structures that maximise the results from a given resource mix also deserves attention. Issues such as leadership, motivation, training and the allocation of authority to make decisions can have an enormous impact on organisational efficiency.

Financial arrangements, both in relation to how funds are obtained and how they are used, are an important determinant of organisational performance. Different choices result in different incentives and, consequently they condition behaviour in different ways. The data presented in this paper show that VS differ widely in the resources used per animal equivalent, per person and per unit of livestock trade. Whether these differences result in differences in the outputs of animal health services is a topic worth investigating. Similarly, more work needs to be done on tracking the worldwide successes and failures of arrangements that involve synergies between the public VS with non-profit organisations and other private-sector participants. The public sector, NGOs and the private sector each have comparative advantages that should be fully exploited.

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Financement et organisation des Services vétérinaires

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Résumé

Les auteurs examinent les différentes modalités de financement des Services vétérinaires ainsi que les conséquences des diverses solutions sur les performances de ces Services. En effet, les liens entre la gouvernance, l'efficacité organisationnelle et les dispositifs de financement sont jugés particulièrement importants. Cet article tente d'élucider et de comparer les avantages et les inconvénients de deux méthodes de financement des Services vétérinaires, à savoir le versement d'une commission à l'acte d'un côté et la dotation prélevée sur le budget général de l'État de l'autre. Les auteurs

constatent des variations considérables entre pays pour ce qui concerne la taille de leurs Services vétérinaires, ce qui a des conséquences directes sur leur organisation et leur financement.
L'article s'achève sur une étude de cas schématique, qui met en avant l'importance de la collaboration et d'une bonne répartition des tâches entre les secteurs public et privé assurant des prestations vétérinaires.

Mots-clés
Efficacité organisationnelle – Services vétérinaires – Services vétérinaires officiels – Source de financement.

Financiación y organización de los Servicios Veterinarios

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Resumen
Los autores analizan las distintas formas de costear los Servicios Veterinarios y la influencia de una u otra fórmula de financiación en la eficacia de esos Servicios, atribuyendo especial importancia a los vínculos entre buen gobierno, eficacia organizativa y dispositivos de financiación. Asimismo, examinan algunas de las ventajas y desventajas de financiar los Servicios Veterinarios cobrando tarifas por servicio, en comparación con las transferencias presupuestarias procedentes de los ingresos generales del gobierno. También presentan datos sobre la notable heterogeneidad reinante en cuanto al tamaño de los Servicios Veterinarios oficiales y sobre los efectos de esa heterogeneidad en los modos de organización y financiación de esos servicios.
Los autores concluyen con un estilizado estudio monográfico que pone de relieve la importancia de la colaboración y la división del trabajo entre el sector oficial y el sector privado dentro de la profesión veterinaria.

Palabras clave
Eficacia organizativa – Fuentes de financiación – Servicios veterinarios – Servicios Veterinarios oficiales.

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