

**11th Conference of the OIE Regional Commission for the
Middle East**

Beirut, Lebanon 03-06 October 2011

Preparation of Veterinary Strategic Plan and Cost-Benefit Analysis

Marcos Gallacher

**Professor of Economics
University of CEMA (Buenos Aires, Argentina)**

Summary

Performance of the Veterinary Authority (VA) is determined by the interaction of three different but complementary types of know-how: (i) biological and veterinary science (including epidemiology), (ii) organizational and (iii) economic. This paper argues that knowledge types (ii) and (iii) will be of increasing importance in order to allow knowledge type (i) to reach its full potential. In many cases, indeed, the problem faced by a VA is that organizational and economic “frictions” hinder efficient action.

This paper uses a wide and “non-conventional” definition of “Cost-Benefit Analysis” (CBA). In this definition, all economic evaluation of alternatives, either in the choice of projects to be carried out, the magnitude of resources of these projects or the specific ways of carrying them out are candidates for CBA. The paper argues that “internal” or “organizational” issues are significant in relation to benefits resulting from a given budget effort. Human-factor issues, traditionally analyzed by specialists in public administration and general organizational theory, are of crucial importance for organizational performance.

Results from a survey of fourteen Middle East countries are used to illustrate selected organizational and economic issues faced by a VA. The survey shows that challenges faced by VA’s vary widely among countries. Although generalizations are difficult, it appears that for all countries priorities include improved “forward looking” capabilities, as well as increased use of cost-benefit analysis for the allocation of resources. In addition, in the lower-income countries of the region VA priorities include a wide variety of issues: improved linkages with policy makers and producer organizations, surveillance and disease control methods, improved data-handling capabilities and others. VA of the two lowest income countries of the region have budgets of, respectively, 0.02 and 0.4 €/Animal Equivalent per year. These figures clearly illustrate difficulties that these VA face.

Survey results also show resource use priorities of VA vary according to per-capita income levels. In the sample of countries analyzed here, higher per-capita incomes was associated with increased allocation of resources to investment as opposed to operational activities and (ii) emphasis in the increasing salaries of employees. These patterns are of course tentative, and are presented here for discussion purposes only.

The paper argues that additional efforts should be directed towards understanding resources used by VA at the world wide level, and that attempts to create and maintain data bases related to this issue would have considerable value for researchers.

Preparation of Veterinary Strategic Plan and Cost-Benefit Analysis

Marcos Gallacher

**Professor of Economics
University of CEMA (Buenos Aires, Argentina)**

I. INTRODUCTION

The term “Cost-Benefit Analysis” will be used here to include all types of economic evaluations of costs and returns done with the objective of improving animal health. This broad definition includes economic impacts of animal-health projects (e.g. eradicating brucellosis) as well as narrower evaluations of alternatives: i.e. allocation of funds to (for example) hiring additional personnel instead investing in additional information technology. This (non-conventional) definition of CBA allows inclusion in of important issues related to the “economics of the VA organization”.

CBA analysis may be done with several objectives in mind: (i) lobbying for increasing funds, (ii) deciding alternative uses for resources (iii) exploring the possibility of doing more with the current resources or (iv) doing what is done now but with less resources. Unfortunately, in many cases CBA is seen only as a tool for (i) above. Indeed, the danger exists for CBA to transform itself in a tool for convincing ministers to hand over more cash. If this is the case, the usefulness of CBA will be severely compromised. Moreover, economic analysis and CBA will lose all credibility. Results to a questionnaire sent to the OIE Delegates of the Middle East region will be used to illustrate some issues. A total of 14 questionnaires were completed, of these 12 are used in the results presented here (the remaining two were incomplete). These results, it should be cautioned, do not constitute a “diagnosis” of challenges faced by VA’s of the region but should instead be considered a preliminary description for discussion purposed only. Survey results are discussed in Section IV below.

II. COST-BENEFIT ANALYSIS (CBA)

Understanding the impact of an VA requires counterfactual thinking: what takes place when the VA exists, as compared to the situation where the VA does not exist or exists in a different form. In order to understand the different scenarios where CBA may be called into play consider the following:

Situation 1: As shown in Figure 1, the dramatic increase in Brazilian livestock exports that occurred since the mid 1990's occurred as a consequence of an equally dramatic drop in the number of foot-and-mouth disease (FMD) outbreaks. Clearly, when a graph such is available, policy-makers will "not need much convincing" in order to allocate resources to a VA. Even in this clear-cut case there still exists the problem of deciding *the magnitude of resources* to allocate. A. Important organizational issues also must be addressed: How is responsibility partitioned between the federal and the state ("provincial") governments? Will vaccination be done by veterinarians employed by the VA, or by private non-profits (as in the case of Argentina) supervised by the VA? The issue then is that even if agreement exists on the need to eradicate FMD many alternative ways exist to do this. These alternatives result in different costs and benefits, and as such need to be evaluated.

Situation 2: "Productivity" is defined as the ratio of outputs obtained to inputs used. Productivity may be measured in relation to *one input* (e.g. output per animal equivalent or per ton of feed) or in relation to *all inputs* (the output/total input, the "Total Factor Productivity" or TFP measure). Productivity of a livestock herd depends on many factors: overall management (e.g. milking or grazing practices), feed availability, genetics and of course animal health. A reduction in productivity growth will have – over time – dramatic impacts on output.

The animal health-productivity linkages are particularly difficult to analyze because of inter-country differences in productivity: for example, FAOSTAT data shows a (meat) output per animal-equivalent of 450 kg for the Netherlands, 250-300 kg for Canada and the USA, 60-80 kg for Argentina and Uruguay and less than 15 kg for Tanzania, Ethiopia and Sudan. In absolute terms (which are the ones relevant for economic analysis) the per-animal equivalent impact of slower productivity growth will vary substantially among countries. A case-by-case analysis is thus necessary.

Situation 3: In a presentation delivered in 2007, Lonnie King discusses potential impacts of the "3rd Epidemiologic Transition". The argument is that conjunction of

several factors result in increasing importance (and threat) from emerging and re-emerging diseases affecting not only animal but human health (King, 2007). Microbial adaptation, climate change, human demographics and behavior and other factors result in substantial change in the probability and potential severity of epidemics. King points out that many microbes are “ecological generalists”; further 60 percent of all human pathogens are zoonotic. Many human health risks are better controlled by focusing on animal populations. Poverty in particular is seen as a critical factor increasing the potential threat of many kinds of diseases. The enormous increase in livestock production that is expected to occur in developing countries in the next decades (Delgado et.al. 1998 and 1999) is an additional factor contributing to the “epidemiological transition” mentioned by King.

The three examples mentioned above indicate the considerable difficulties involved in analyzing costs and benefits of animal health programs in general, and of VA in particular. In the case of FMD in Brazil, it is clear that eradication is justified, however the question remains what resource mix and resource level will better contribute to this objective. In the case of impacts of animal health on TFP growth, in order to pin-down costs and returns to expenditures considerable expertise is needed in order to disentangle the relative importance animal health vis-à-vis others. Finally, the increasing importance of zoonotic diseases pointed out by Dr. King indicates that economic analysis must take into account scenarios which in some cases can only be speculated on. Low-probability but high-potential loss events (such as an epidemic threat to human population) may justify relatively “high” expenditures in prevention or early detection: as in a conventional insurance policy, the “best” decision may be to invest sums even if these are greater than the “actuarial value” of losses.

III. THE PRODUCTION OF ANIMAL HEALTH SERVICES

The analysis of the VA organization involves three interrelated sets of issues:

1. Veterinary and epidemiological knowledge: main tasks to be performed, design of tasks, necessary inputs and expected outputs.
2. Organizational knowledge: coordination of individuals with the aim of furthering organizational (in this case VA) objectives. Issues related to “Organizational Architecture”: partition of decision rights, human motivation

and evaluation of individual and group performance (Brickley, Smith and Zimmerman, 2005)

3. Economic knowledge: estimation of social costs and benefits associated with alternative public (in this case VA) interventions.

Considerable progress has been made in relation to item (1) as compared to (2) and (in particular) to (3). That is, more is known about “what has to be done” in relation to animal health, then “how much is to be done” and “how to overcome constraints” (financial, human and political) to carry plans through.

Organizational knowledge

Organizational knowledge related to VA has of course been furthered by the use of tools such as the OIE PVS Evaluation and GAP Analysis. In the case of the OIE PVS Evaluation, a blueprint for the VA organization is produced, with pointers as to technical aspects, human aspects, interactions with the private sector and access to markets. In turn, GAP analysis allows planning the process of change from the current to the desired situation. Financial requirements for these changes are also included. Despite the above, different kinds of “frictions” may hinder the proposed changes. The extent to which the PVS/GAP “blueprint” is followed through is thus critical.

The problems involved in organizational design and change have been subject of considerable attention. In a classic text, Simon, Smithburg and Thompson (1964) analyze general principles related to administration in a public-sector setting. It is worth listing some of topics on which attention is focused:

1. Characteristics of human behavior, groups and the role of leaders and values
2. Specialization and assignment of tasks
3. Authority and status
4. Communication and conflict
5. Tactics for organizational survival
6. Evaluation of administrative efficiency, formal and informal controls

The point made is that organizational effectiveness (and thus costs and benefits of organizational intervention) is critically linked to a host of *human factor issues* many of

which receive in general only cursory analysis. Analysis of organizational performance, both in the public as well as the private sector shows considerable differences in efficiency: the same total resources invested can have very different results according to how the *human factor issues* mentioned above play out. This topic is of particular importance when constraints make it difficult or even impossible for significant budget increases to be obtained. Little published work exists comparing resources and budgets used by VA in different countries of the world. Comparisons, of course are plagued with difficulties: salaries of professional and support personnel vary widely across countries, thus “similar” financial resources in two countries may result in considerably different human resource inputs. Notwithstanding these issues, Figure 2 shows the ratio between VA financial resources and animal-equivalents (horizontal axis) and VA financial resources and human population (vertical axis) for a sample of Latin American countries. In order to preserve anonymity, both metrics for one of the countries takes a value of “100”, and all countries are compared to this.

Of course, the “ideal” situation (at least from the point of view of animal health) would be for all VA to have resource availability comparable to those of the country on the upper right-hand corner: 650 per animal-equivalent, and 320 per person. But this is not the case: in the lower left-hand corner several countries show resource levels of less than 100/AE and less than 100/person. As shown in the figure, in the sample of Latin American countries resources per AE vary by a factor of 6, resources per person by a factor of 3.5 to 7. These are significant differences.. A wide difference in VA output. Or assuming similar output VA organizational efficiency is probably present.

Economic knowledge

Complexity of undertaking CBA increases for organizations with multiple objectives, and in particular with organizations that produce “public”, as compared with private goods.

The author’s experience in CBA applied to animal health resulted from participation in an OIE project made in collaboration with the World Bank. The projects’ objective was to apply the CBA methodology to the analysis of animal health problems in Latin American countries. Highlights of the project include:

- During 2006 and 2007 an overview report was prepared in order to understand basic issues surrounding animal health economics in the Latin American and Caribbean region. In this period, two CBA workshops were undertaken. Participants in these workshops were asked to present a summary of problems and opportunities faced by their VS.
- In early 2008, invitations were distributed to countries in the Latin American and Caribbean region to participate in a CBA of a specific disease of animal health problem of their choice.
- The invitation stated that:
 - The objective was to carry out a practical CBA of a specific animal health issue.
 - The work was to be done in collaboration between local professionals and project coordinator (economist).
 - The project was designed in such a way so as to maximize input from local professionals: the objective is to develop hands-on capabilities.
- Case studies were carried out beginning in 2008 and completed in late 2009.

The project resulted in the completion of 13 case-studies. These included brucellosis (5 studies), foot and mouth disease (3 studies) and Avian Influenza, Bovine Tuberculosis and Classical Swine Fever (1 study each). An additional paper was presented on the use of decision-support systems in VA. All studies achieved the objective of “putting numbers” to animal health problems. In some cases, “rates of return” to resources invested in VA action were extremely high (e.g. FMD in Bolivia or Brazil, bovine TB in Chile). In others (e.g. brucellosis in Argentina and Uruguay) rates of return, while still attractive, were considerably lower. Careful project design is in these cases a critical issue.

The following are some conclusions of the project::

1. Participating in a CBA study forces one to “think through” aspects that are frequently overlooked. ¿What data is needed to understand economics of a specific disease? ¿What time-lags are involved in a project? ¿What are the critical factors determining success or failure in the investment of public funds?
2. CBA allows the setting of priorities. This is particularly important in situations where VA face significant resource constraints.
3. The CBA may provide a measure of the returns resulting from *different levels* of expenditure in a given project.

4. CBA forces participants to think in terms of *efficiency in resource utilization*. A narrower, technical perspective is replaced with one that takes into account both ends produced as well as means used in producing them.
5. Finally, dialogue between VA representatives and representatives of other sectors are improved as a result of attention given economic and organizational issues.

The FMD study carried out in Bolivia illustrates the importance of CBA for analyzing the impact of different resource levels on benefits resulting from VA action (item 3 above). The comparison was made here between three levels of expenditure in VS activities: Scenario (1): no significant VA activities exists, producers decide themselves what disease control strategy they will use (if any), Scenario (2): the VS undertakes activities with significant resource constraints and Scenario (3): an “improved” situation where additional resources allow upgrading VS activities. Historical analysis of livestock production in Bolivia allows the impacts of Scenario (1) to be ascertained. These are severe indeed, not only for Bolivia but for neighboring countries as well. Indeed, Scenario (1) was the *de-facto* existing situation until the early 1990’s.

But what is relevant to analyze is not a return to “Scenario 1”, but instead the impact of a “correctly functioning” VA (Scenario 3), as compared to a “cash constrained” one (Scenario 2). In the case of Bolivia, and for the Beni region, a significant part (70 – 75 percent) of total program cost is accounted for by vaccination by producers, VA costs totaling the remaining 25 – 30 percent. The interesting point here is that “penny pinching” on VA may result in considerable loss in the effectiveness of vaccination efforts made by producers, and thus in large economic losses.

Resources in the “Scenario (3)” are 65 percent higher than those of “Scenario 2”. The difference appears quite large in percentage terms; however, in absolute terms the difference (some US\$ 400.000) *is less than 15 percent of total expenditure in vaccines undertaken by producers*. Figure 3 shows the impact of upgrading the VA from the “Scenario (2)” to the “Scenario” (3) situation: costs increases are modest, while increases in returns are considerably larger.¹ Having a resource constrained VA may be then a poor decision: the VA consumes considerable resources, but cannot ultimately

¹ The figure does not show actual figures. Results of the Bolivia study are reported in Gallacher and Barcos (2009).

carry out its task. Injection of relatively modest amounts of resources may then have a significant impact.

IV. RESULTS FROM THE MIDDLE EAST QUESTIONNAIRE

An important issue to be addressed is how required budgets (organization costs) costs change when output produced, input prices and technology changes. For example:

- An VA is considering upgrading services produced from a “Level 3” as described in the PVS manual to a “Level 4”. ¿Can this be achieved only with better management of existing resources or are additional resources necessary?
- The fall in computer and information technology suggests that organizational change is needed to use this technology effectively. ¿What changes are called for? ¿ What cost reductions, or given constant costs what service expansions are possible?
- An economic development agency wants to compare costs of improving or running VA services in different countries. ¿What adjustments have to be made in order to enable VA budget comparisons between countries facing very different professional and other personnel salaries?

A questionnaire was sent to member countries of the OIE Commission for the Middle East. The objective was to gather preliminary data in order to explore VA priorities and organizational challenges. The survey did not attempt to make a diagnosis of courses of action as this would require a much more detailed analysis. Instead the questionnaire is used here for exploratory and discussion purposes. A total of 14 countries (of the 20 comprising the region) completed the questionnaire. Twelve usable questionnaires were obtained.

This paper focuses on strategic planning in VA. Answers to the questionnaire highlight the difficulty in applying the “generic” concept of strategic planning to VA that face dramatically different environments. In particular the sample includes countries characterized by:

- Per-capita incomes varying from less than € 500 to more than € 25.000 per year (World Development Indicators).

- Total Animal Equivalents population ranging from less than ½ million to more than 50 million (question I.1). Human population ranging from less than 1 million to 40 million (question I.2)
- VA employing from less than 100 to more than 6000 veterinarians (question II.1)
- Total VA budget ranging from less than € 1/ million to more than € 140 million (question II.2)
- Poultry production (which poses its particular problems to VA) varying in importance: countries answering the questionnaire reported from less than 10 to more than 80 percent of Animal Equivalents corresponding to poultry (question I.1).
- Differences in funding sources: for at least two countries, transfers from donor countries are significant (question II.3). For one country, an important portion of funds originates in user fees. Differences in funding sources probably result in different challenges as well as opportunities.

Clearly, it is expected that not only “problems faced” by VA but also “ways to solve problems” vary widely. Smaller VA organizations are unlikely to rely on costly “specialist based” CBA ; moreover in these organizations much of the strategy takes place via face-to. face and other informal procedures. The larger VA not only have access to additional financial resources. Larger size, indeed, allows tapping into highly specialized human resources. Thus, additional “division of labor” takes place allowing considerably more sophisticated CBA. Also, in larger VA considerably more effort goes into improving organizational performance via standardization of procedures.

Table 1 shows “budget ratios” of selected countries of the region. Data for this table resulted from answers to the question of total operating budget allocated to the VA (question II.2, answer in Euros in most recent 12-month period). Selected budget ratios were then derived. Analysis of results suggests significant variation in VA budgets as expressed per Animal-Equivalent, per population and other statistics. Countries included in the top of the table are those with per-capita incomes of € 11.000 or less. The bottom of of the table includes countries with per-capita income higher than € 11.000 (“PPP” or “Purchasing Power Parity” figures, that is corrected for domestic

prices are used). The minimum, maximum and median values of several budget ratios are reported.

As shown, significant variability exists in all of these indicators: for the group of countries with per-capita income lower than € 11.000 , the VA budget per capita varies by a factor of 50, budget per veterinarian by a factor of 30, and the budget per animal equivalent by a factor of 540. In turn, animal equivalents per veterinarian vary by a factor of 94. Variability in VA budget ratios is still high if the calculations are made now not by comparing the “maximum” with the “minimum”, but the “maximum” with the “median” values of alternative budget ratios. Further, these variations are still large for the countries belonging to the higher-income group.

Caution is needed in order to interpret these findings as available data does not provide evidence on the level of service produced by the VA. However, evidence points out – if these results can be generalized on a world-wide basis – that enormous inter-country differences exist in resources allocated to animal health. Diseases, however, know no borders. Thus it may well be the case that improvement in the global animal health status is thwarted by the difficulties some countries have in mobilizing necessary resources. In consequence, efforts should be made to understand the reasons for these inter-country differences, as well as the resulting implications for efforts aimed at improving the animal health status. A data base listing for every country resources used for animal health (classified in 6-10 classes) would be a useful addition to knowledge. Results from the questionnaire allow additional issues to be addressed. In particular, the following question was posed to the respondents:

Question III.1

“Suppose the **current annual operating budget** of the VS were **increased by 30 percent**. Please indicate what portion (in percentage terms) of this budget increase should in your opinion be allocated to.....:”

Eight alternative uses of funds follow. These include increasing personnel salaries, hiring extra personnel, increasing funds for mobility, purchase of new equipment and others. We compare here what portion of this budget increase would be allocated to **increasing salaries**. Salaries and working conditions are of course an important factor in human productivity and thus resulting benefits from VA action. Response varied from none to 30 percent. Figure 4 reports the results (a log scale for income was used in

order to facilitate comparison between countries of very different income levels). As shown, the importance of higher salaries increases with per-capita income of the country: in the less-developed economies, the income gap between private and public employment may be lower than in economies with a higher income level.² This points out to the following:

- Priorities for allocating a hypothetical budget increase vary substantially among countries. Priorities reported here result from a “rough and ready” evaluation of returns of resources in alternative uses made by survey respondents. A rough “CBA” has been carried out.
- Substantial “disequilibrium” may exist in some countries (but not in others) between professional prospects of those working in VA as compared to alternative occupations. This may result in considerable difficulties in retaining qualified personnel. Or, if personnel is retained, organizational performance is likely to suffer because of the low morale. In contrast, in the lower income countries of the sample VA priorities may be to increase staffing and investment in technology.

Figure 5 shows additional results related to budget allocation priorities in the countries of the sample. Here, answers to question III.1 (how to allocate a 30-percent budget increase) are reported dividing uses of funds in two groups: (i) operating activities and (ii) capital investment (durables). The figure shows how allocation to these two categories of uses-of-funds change with changing per-capita income. *A pattern seems to emerge from the data:* as per-capita income increases, allocation of additional funds to operating expenditures falls, and allocation to investment increases. For the lower income countries, some 80 percent of additional budget would be allocated to operating expenditures (the remaining 20 percent to investment). In contrast, for the higher-income countries operating expenses claim 60 percent of additional budget, and investments the remaining 40 percent. Note that in higher income countries in particular, additional investments could well result in VA activities taking an increasingly “capital-intensive” character. This “intensity” in the use of capital results in additional computers, laboratory equipment, monitoring devices and the like. Change in capital intensity result in a corresponding shift in educational and training requirements of VA personnel: as has been frequently pointed out, capital inputs (computers,

² Only countries with per-capita income of € 11.000 or lower are included in the figure.

laboratories and the like) are complementary with “human skill” inputs: i.e. productivity of either one is positively associated with the availability of the other. Figures 4 and 5 analyzed jointly seem to bear this out: as per-capita income increases, an additional portion of a hypothetical budget increase is allocated to capital investments. But this “calls for” improved incentives in order to attract and retain qualified personnel.

Of course, the point made here is not to take these results at face value, but instead to use them as motivation for the need – when undertaking cost-benefit studies - of analyzing organizations in all their complexity. Indeed, relatively small changes in incentives, information flows and controls may well result in relatively substantive differences in the performance. The point also raised – at the risk of making mistakes – is that effort is needed in understanding general patterns underlying economic and organizational aspects of VA activity. *Single-country case studies are necessary but are not enough.* In particular, or inter-country comparisons need to be made regarding the impact on VA resources and budgets of factors such as cost of professional services and capital inputs, characteristics of the geography over which the VA operates as well as characteristics of the prevalent production activities (e.g. poultry vs cattle) and human population of the country.

An important aspect as relates to VA “strategy” is that related to priorities for action. Question III.2 asked the following:

“In a scale of 1–5 (1=lowest, 5=highest), please indicate the *degree of priority* of the following actions aimed at improving the overall effectiveness of the VA of your country”.

Actions were classified in five basic groups: (i) improved information, (ii) improved linkages, (iii) improved organizational practices, (iv) professional development/incentives and (v) strategic planning. Table 2 reports results. Countries are classified according to whether per-capita income is less or more than € 11.000. An additional column is included for the 2 countries with lowest per-capita income (less than € 700). The table highlights actions with highest grade. In the case of ties all actions with the same grade are included.

Two results can be singled out. First, independent of income levels, the actions “Disease and risk trends” and “Resource allocation and planning” are included in the two most important actions. This points out to the importance of *forward looking*

activities in the VA. Second, VA of the countries with lowest income place increased stress on improved communications of the VA with producer organizations and policy makers. Third, these countries also appear – as it to be expected – to grade a higher number of actions in the “highest” level of priority.

V. CONCLUSION: STRATEGIC PLANNING AND CBA

Consequently, what CBA can offer to the “strategic planning” undertaken by VA? The word “strategic planning” brings to mind concepts such as “forward looking”, “important”, “long range”, “partly irreversible” (or at least “difficult to modify”) and “contingent on future events”. Also, it suggests “a general framework into which other actions fit in”. Strategic thinking in organizations has always been considered important; however as pointed out by Mintzberg (1979) “strategy” can take the form of top-down plans carefully laid out in advance or, in contrast, it can include “emergent” or “adaptive” response of the organization to changing demands and opportunities. Veterinary services will use a mix of both approaches.

A CBA “mindset” may be more important for strategy formulation than specific CBA quantitative results per-se. Results (for example rates of return in specific projects, or predicted impacts of organizational change) frequently depend crucially on the choice of that assumption. The “final number” then may be in some cases less relevant than the process by which the number was arrived at.

It is highly improbable that every significant VA action is to be preceded by a careful CBA evaluation – “paralysis by analysis” could well result. This is done only in few countries, and even here only for projects with impacts or costs above a certain threshold. However, substantial benefits probably will result from increasing interdisciplinary collaboration in data-gathering and analysis, as well as discussion for a wide variety of efforts related to economic and organizational evaluation of VA activities. These efforts will lead to sounder evaluation of resource allocation in VA, and thus improved strategic planning. In many cases, this “planning” will not reside in the procedures manual of the organization, but will instead be embedded in behavioral patterns of the organization’s members.

Strategic planning in the VA will involve activities of very different types. Some are routine procedures, and as such need to be designed with the objective of reducing costs consistent with a certain service delivery standard. Standardization of procedures

and control are key issues to focus on. Other activities require participation of increasingly trained professionals and scientists. Here, the quality of the professionals, and the environment in which they work are crucial determinants of results. Yet other activities require adaptation to new and sometimes confusing scenarios. Here professional quality is also important, but additional factors enter the picture. Here a premium is put on increasing teamwork and information exchange, as well as flexibility in setting up temporary “tasks forces” to deal with new challenges that suddenly “pop-up. In summary, “strategic adaptation” will require a multi-pronged approach.

Improving prevention, early detection and response to animal-related diseases requires of course an approach based on solid veterinary, epidemiologic and human health science. The OIE PVS Evaluation and GAP Analysis tools developed by the OIE provide a unified approach for using these tools in real-world settings. These tools also allow progress to be made in addressing organizational and resource-allocation problems faced by the Veterinary Services and especially Veterinary Authority.

Countries of the Middle East region face challenges for which organizational and economic analysis can offer solutions. For some, the issue is how to operate VA severely constrained by financial resources, in an environment where severe poverty is prevalent. Rough-and-ready solutions and adaptation is at a premium. Other VA face a very different set of problems: organizations with thousands of employees and “mature” protocols and procedures need to think through how to design work and decision flows so as to improve coordination. Provision of adequate incentives, improvement of information flows and controls are key issues related to efficiency in these complex organizations.

VI. REFERENCES

Brickley, J., C.Smith and J.Zimmerman (2005), *Managerial economics and organizational architecture*. McGraw-Hill

Delgado, C.L., C.B.Courbois y M.W.Rosengrant (1998), Global food demand and the contribution of livestock as we enter the new millenium. IFPRI MSSD Discussion Paper 21.

Delgado, C.L., M.W.Rosegrant, H.Steinfeld, S.Ehui, C.Courbois (1999), The growing place of livestock products in world food in the twenty-first century. IFPRI MSSD Discussion Paper 28.

Gallacher, M. and L.Barcos (2009), Análisis Costo-Beneficio del programa de erradicación de aftosa en el departamento del Beni, Bolivia. Unpublished manuscript.

Mintzberg, H.(1979), *The structuring of organizations: a synthesis of research*. Prentice-Hall.

Simon, H.A., D.W.Smithburg and V.A.Thompson (1964), *Public administration*. Alfred A.Knopf, NY.

Figure 1: Brazil - FMD Outbreaks and Beef Exports

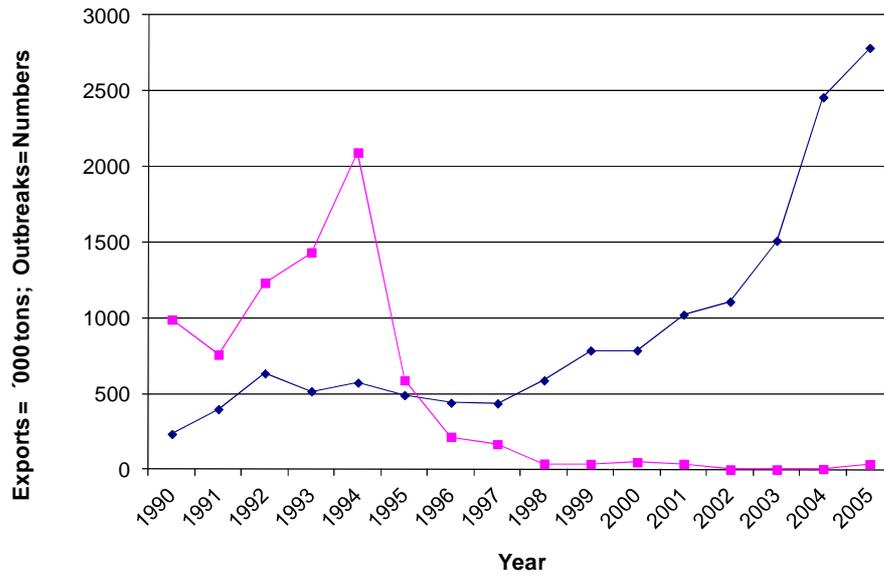
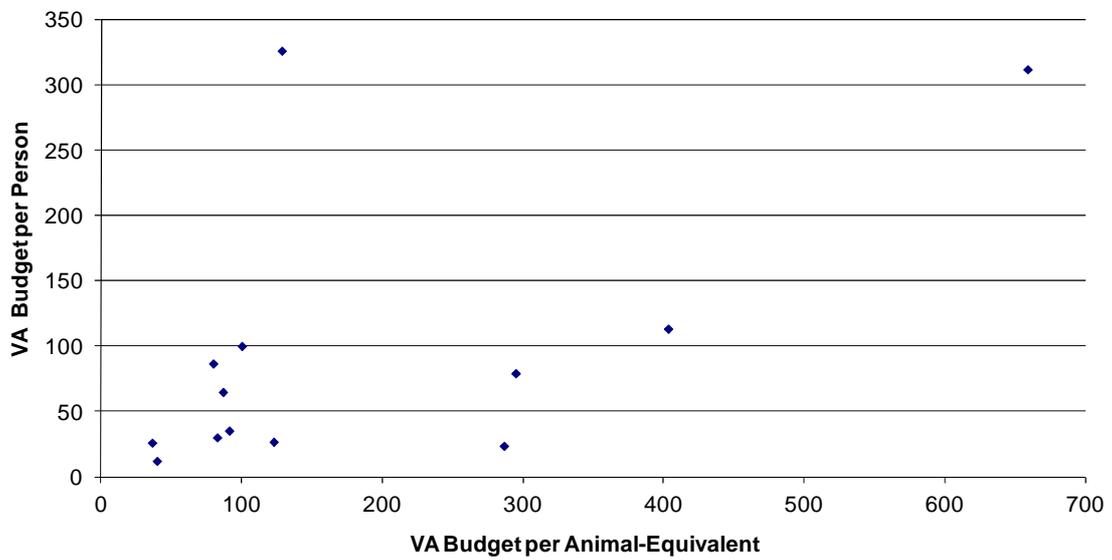
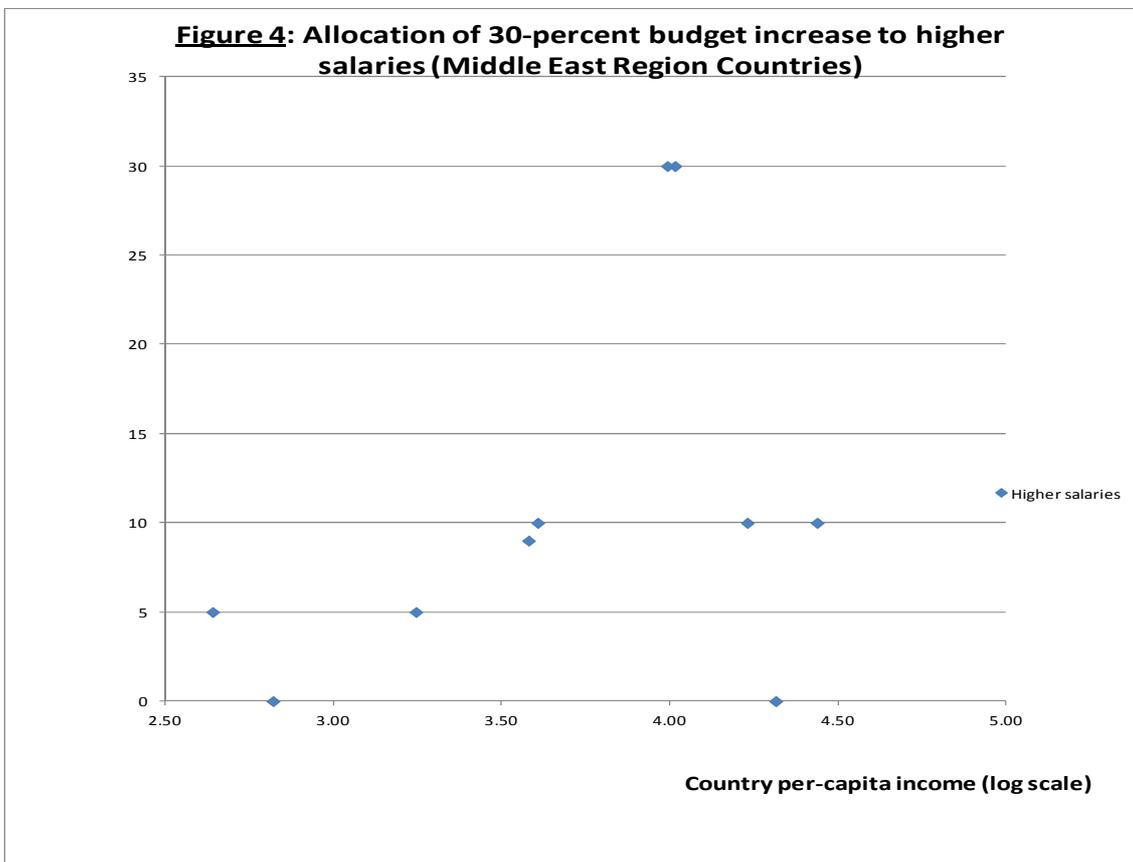
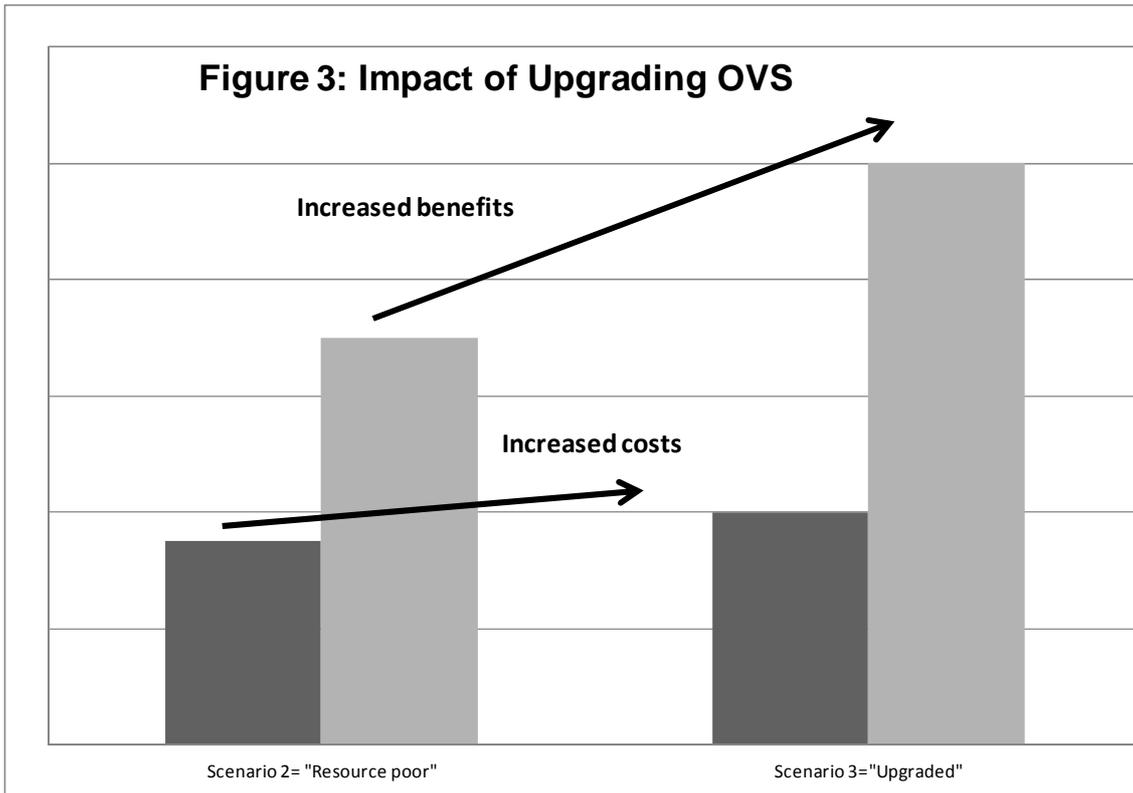


Figure 2: VA Budget - Sample of Latin American Countries (Country "X" = 100)





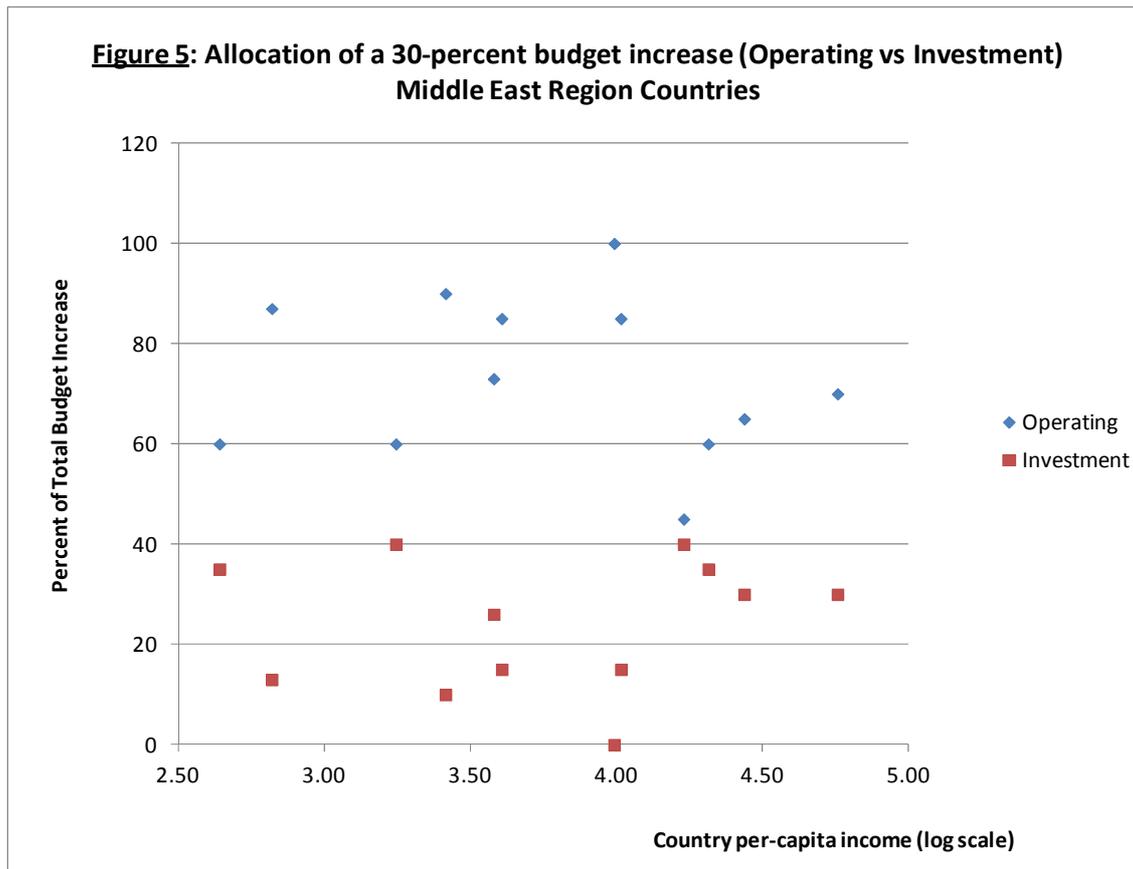


Table 1. "Budget ratios" of selected VA - Middle Eastern Region

Countries with per-capita income ≤ € 11.000		Minimum	Maximum	Median	Max/Min
AE/Vet	AE/vet	3106	292609	11426	94
Budget/Pop	€/capita	0.04	2.07	0.39	54
Budget/Vet	€/vet	2584	78947	9390	31
Budget/AE	€/AE	0.02	13.33	0.62	542
Budget/Product	€/Ton meat equivalent	0.5	247.9	7.2	500
Budget/Per Cap	€/€	290	21517	2972	74
Countries with per-capita income > € 11.000		Minimum	Maximum	Median	Max/Min
AE/Vet	AE/vet	4755	38414	17740	8
Budget/Pop	€/capita	0.64	10.70	4.88	17
Budget/Vet	€/vet	57213	110221	88734	2
Budget/AE	€/AE	1.49	20.77	11.08	14
Budget/Product	€/Ton meat equivalent	15.98	129.40	69.03	8
Budget/Per Cap	€/€	417	1027	622	2

Note: PCI according to PPP measure, IMF figures converted to Euros

Data source: Survey results, countries belonging to the OIR Regional Commission for the Middle East (countries included = 12)

Table 2: Priority of alternative VA actions

	Per-capita income level (Euros)		
	< 1000 (2 lowest)	< 11000	> 11000
Improved information on			
a. Disease impacts and cost on animal production	3.5	3.6	4.3
b. Disease and food safety issues impact on human health	4.0	4.6	4.0
c. New passive and active surveillance methods	4.5	4.5	3.7
d. New disease controls methods	4.5	4.3	4.0
e. Disease controls methods	4.5	4.1	4.0
f. Better on-farm animal health practices	2.5	3.6	4.3
g. Disease and food safety hazards in the food chain	4.0	3.9	4.0
AVERAGE	3.9	4.1	4.0
Improved linkages with			
a. Ministerial policy makers	5.0	4.4	3.7
b. Legislators	4.5	3.8	4.7
c. Producer organizations	4.5	3.6	4.0
d. Consumers	3.5	3.9	3.3
e. Private veterinarians	4.0	3.9	3.3
AVERAGE	4.3	3.9	3.8
Improved organizational practices			
a. Personal management	4.0	4.0	4.3
b. Data management	5.0	4.3	4.3
c. Physical resource management	3.5	3.4	3.0
d. Communication	4.5	3.9	3.3
e. Compensation fund for epizootics	4.0	3.6	3.7
AVERAGE	4.2	3.8	3.7
Professional development/incentives			
a. Field veterinarian incentives and career development opportunities	5.0	3.6	3.7
b. Field veterinarian training	4.0	4.1	3.7
c. Incentives and career development opprtunities for managers	4.0	3.6	4.0
d. Training for managers	3.5	3.8	4.0
AVERAGE	4.1	3.8	3.8
Strategic planning: improved information on			
a. Human and animal demographic trends	4.0	3.8	3.7
b. Food production trends	3.5	3.8	3.3
c. Food consumption, imports/exports, and trade trends	4.0	4.3	3.7
d. Disease and risks trends	5.0	4.6	4.3
e. Resource allocation planning and Cost/Benefit analysis of programs	4.5	4.5	4.7
AVERAGE	4.2	4.2	3.9

Data source: Survey results, countries belonging to the OIR Regional Commission for the Middle East (countries included = 12)