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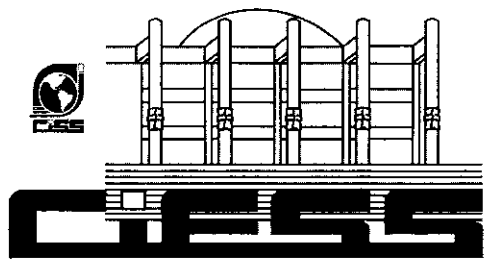

INTER-AMERICAN CENTER FOR SOCIAL SECURITY STUDIES

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THE ECONOMIC TECHNIQUES FOR THE EVALUATION OF THE EFFICIENTY OF HEALTH PROGRAMS AND SERVICES

*Jaume Puig-Junoy and José Luis Pinto-Prades**

Summary

The objective of the article consists in presenting the two most important groups of techniques for the micro-economic evaluation of the efficiency of health services. In the first place, we describe the techniques to measure the efficiency in the production of health services based on the approach known as "frontier approach"; the parametric and non parametric techniques. In the second place, we describe the economic evaluation techniques of public investment applied to health programs and services: cost-effectiveness analysis and cost-benefit analysis. In both cases emphasis is made on the applicability of techniques, and their presentation is developed by means of examples applied to health programs and services, with special reference to the Latin American area.

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Introduction

In the field of health, the economy studies those decisions related to the use of resources (always scarce) destined to satisfy the needs for health of the population with the objective of maximizing its well-being (improvement in the level of health). The objective, therefore, of the economic evaluation of the efficiency of health services will be to study the manner of using resources so as to obtain from them the maximum yield, a yield measured by the increase in the level of health of the population (economic efficiency) or by the increase in the production of services (productive efficiency).

When speaking of the need to make an economic evaluation we should add the adjective "explicit". In the health sector, decisions are constantly being taken about how to assign resources and this means that "implicit" economic evaluations are continuously made. When a hospital decides to spend 5% of the resources in SIDA patients and 10% in kidney transplants, this is due to the fact that an "evaluation" has been made, implicitly, on how to assign resources. What has to be decided is whether this distribution of resources must be the fruit of the pressures from one or the other, or whether it must have its origin in a more objective decision taking process.

When we have to assign scarce resources, the key word is efficiency. The greatest and better utilization of resources must be attained. However, the concept and implications of efficiency is diverse. This paper is structured, therefore, around the key types of efficiency, such as productive efficiency and economic efficiency. We show the techniques that have been developed as from the economy to obtain efficient assignments of resources, such as the involving analysis of data and the economic evaluation.

Productive efficenciency: production and costs of health services suppliers

Technical efficiency and assignment efficiency

A fundamental aspect in the evaluation of the operation of sanitary organizations (service suppliers, insurance companies, buyers, etc.) should be the capacity to identify and separate those organizations that, according to a certain *standard* operate correctly from those that do so under the level of their possibilities. In economic literature this task is performed by means of the frontier analysis, parametric or non parametric, of the efficiency of the organizations of the sector (hospitals, primary care centers, pharmacies, insurance companies, purchasing agencies, etc.) or of the departments of one single organization (for example, the different services of a hospital).

The research in sanitary services and the clinical operation have offered other solutions to the problem of the measure of efficiency in health services – medical efficiency (Cochrane, 2000). Among them are the risk adjustment systems as a measure of the intermediate product and the no frontier approaches: studies on quality, on adequacy and, especially, the resolution capacity studies of the different types of health services.

The information obtained through the evaluation of the efficiency of organizations can be useful at different levels of the operation of sanitary services. In the first place, to improve the *operation efficiency* of sanitary organizations by identifying the best and the worst practices associated to a high or low efficiency and productivity, respectively. In the second place, to contribute useful information in the design of public policies, by means of the valuation of the effect of the property, of the organizing design, of payment systems, of mergers, and of other

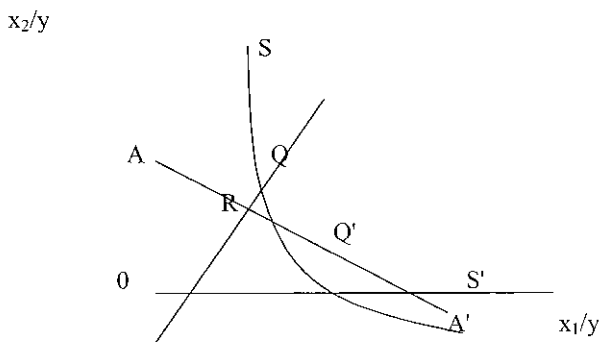
regulatory instruments on efficiency. And in the third place, to lead the interest of research towards the description of the efficiency of a market, the classification of its organizations in the light of the level of efficiency, or to analyze how the measures obtained are sensitive to the different measuring techniques.

It is evident that efficiency is a relative concept. In fact, the analysis of frontiers is basically a form of making a comparison with respect to a reference ("benchmark") of the relative efficiency of a decision unit. The analysis of frontiers furnishes a global measure, determined in an objective and numeric manner, of the value of efficiency that permits an ordering of organizations, and that cannot furnish other approaches. In accordance with economic theory, costs may be higher than the minimum possible level (*economic inefficiency* or costs inefficiency) due to two reasons. Farell (1957) introduced a radial measure of the efficiency of an organization made up of two elements: *technical efficiency (TE)* that reflects the ability of an organization to obtain the maximum level of production with certain resources, and *assignment efficiency* (AE), that corresponds to the capacity of an organization to use resources according to optimum proportions, in the light of their respective prices. These two measures are combined to obtain a measure of *economic efficiency (EE)* or costs efficiency.

Graph 1 illustrates the concepts of productive efficiency in an organization that produces a product Y using resources X^1 and X^2. The curve SS' represents the minimum combinations of resources to be able to produce one unit of Y. The straight line AA' represents the quantities of each one of the two resources that can be purchased with the minimum budget that permits producing a unit of Y. Now, let us assume that we want to measure the efficiency of organization P. The radial measure of the efficiency will be obtained as from the comparison of the distance (segment) from the origin (O) through the SS' (OQ), that represents the minimum consumption of resources needed to produce a unit of Y and the distance from the origin up to P (OP). The OQ/OP ratio measures the technical inefficiency (TE) of the organization P in the production of one unit of Y. The distance from Q to P represents the excess of resources consumed or technical inefficiency.

The level of assigning inefficiency is measured with respect to the straight line AA' that represents the minimum budget necessary to produce one unit of Y. Then the measure of assignment inefficiency (AE) will be the ratio between the distance from the origin up to the minimum cost (OR) and the distance to the point where the organization Q would reach technical efficiency (OQ). Economic efficiency in the production of a unit of Y on the part of the organization P will be the product of the technical efficiency and of the assigning efficiency, or: EE = OR/OP = (OQ/OP) (OR/OQ).

Graph 1. Illustration of technical efficiency (TE) and assignment efficiency (AE)



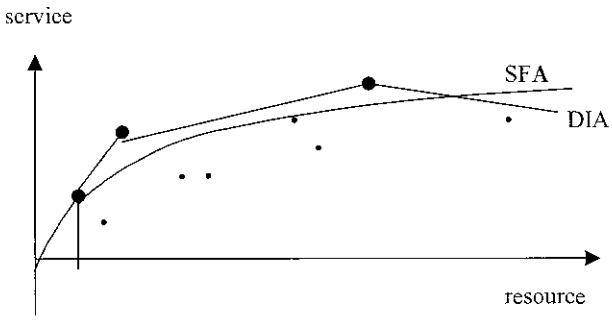
Techniques for measuring productive efficiency

The principal problem to measure inefficiency is to separate that which represents an inefficient behavior in the strict sense of the aleatory circumstances that affect production or costs for reasons other than the responsibility of the operation of sanitary organizations. In this article we devote our attention to the frontier approaches to measure efficiency, that is, to those approaches that evaluate how near a sanitary organization is to the *best practice frontier.* The measure of frontier efficiency is based on the more or less precise information on costs, products and resources to impute an index of relative efficiency with respect to the best practice within the sample of organizations analyzed.

In the case of sanitary organizations, the two mostly utilized methods are the approach of the *stochastic frontiers (SFA)* and the *data involving analysis (DIA)* which require econometric methods and lineal programming, respectively. The principal difference between these two techniques is the form in which the so-called best practice frontier is determined, that is, the benchmark with which the results of each organization are compared.

Graph 2 illustrates graphically the difference between these two techniques for organizations or suppliers of health services, whose activity is represented in a simplified manner by means of one only resource and one only product. The frontier estimated by means of the DIA is obtained as a lineal combination of the most productive suppliers. On the other hand, the frontier estimated by means of SFA is obtained through the estimation of a statistical regression model.

Graph 2. Illustration of the measuring techniques for productive efficiency



In international literature there is an important and growing number of studies on measures of the efficiency of sanitary organizations using both parametric and non parametric techniques. Rosko (1999) and Hollingsworth (1999) present a review of the application of DIA models to sanitary organizations. Hollingsworth et al identified 91 applications in the sanitary sector, including papers published up to 1997. The paper of Puig-Junoy and Dalmau (2000) presents a review of the papers on evaluation of the efficiency of health services in Spain.

In spite of all, the measure of the efficiency of sanitary organizations using economic instruments, is often darkened by the well known difficulty to measure production precisely in this sector. The validity and interpretation of empiric measures of efficiency depend to an important extent on the data available to measure production. The economic approach of the measure of efficiency relates consumed resources with the production of sanitary services. However, just as in the case of other public services and/or activities, there is an important difference between the intermediate product and the final product. The final product is the contribution of sanitary services to the improvement of the state of health of individuals.

In general, empiric studies measure the product of the sanitary services through measures of activity (intermediate products). The selection of the group of variables representative of the product and of resources, always implies the implicit adoption of diverse assumptions on the quality of production, the adequacy of care and the seriousness of the patients attended.

The methods for measuring efficiency in the production of health services of the frontier type, make it possible to obtain quantitative indexes of the efficiency of hospitals and health centers which are very useful in the operation, financing and planning of the health sector. We present below a simple example of application of the involving analysis of data to the activity of primary care centers, with the purpose of illustrating the usefulness of this type of techniques.

Data Involving analysis: a simple illustration

In a region we have five health centers in which medical and nursing services are offered. The population attended by each one of the five centers has an identical composition by age and by sex and does not present socio-economic characteristics or characteristics differentiated by state of health. To simplify, we will measure the activity of each one of the five enters exclusively through the number of visits made. The quality of the care offered and the state of health of the population of each one of the centers do not present significant differences. The situation of these five centers can be defined according to the activity performed (number of visits) as the only product and the volume of resources employed (number of doctors and of nurses) as may be observed in the following chart:

Chart 1. Production and resources of health centers

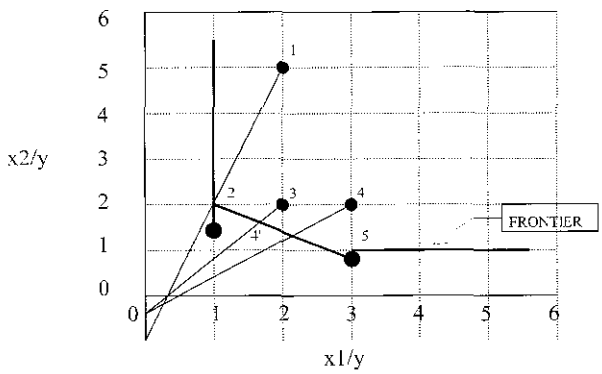
Health center	Visits (thousands)	Doctors	Nurses	Doctors/Visits	Nurses/Visits
1	1	2	5	2	5
2	2	2	4	1	2
3	3	6	6	2	2
4	1	3	2	3	2
5	2	6	2	3	1

The number of visits is expressed in thousands per year and constitutes the measure of product (Y) for our efficiency analysis. The resources used by these centers are doctors (x^1) and nurses (x^2) at full time during the entire year. The doctor is the only one who visits patients, while nurses perform tasks of support to the medical activity. The last two columns of Chart 1 indicate the volume of resources that each center utilizes to produce 1000 visits. Thus, for example, in Center number 2 there is one doctor for each 1000 visits made and two nurses. These proportions indicate the combination of resources or technologies that characterize the production of services of each one of the health centers of this region.

Our objective is to evaluate the efficiency of each one of these centers by means of one only quantitative indicator that will permit us to establish comparisons among the five centers. The criterion to identify a center as efficient will be that it is able to produce a specific volume of services (visits in our case) with the lower volume of resources in physical units (doctors and nurses in our case).

In the first place, we will represent in a two-dimension graph the combination of resources per unit of product employed by each health center. In Graph 3 we have represented the number of doctors (x^1/y) and of nurses (x^2/y) that each center uses to produce the same number of visits (1000 visits). Each one of the five health centers is represented in the graph by the corresponding ratio of resources per unit of product.

Graph 3. Best production frontier



In the second place we will identify the best practice frontier. The measure of technical efficiency of these five centers that we will calculate will be of a relative type, that is, it will be a measure that locates each center in comparison to the others. For this purpose it is necessary to know which of these five centers are those that use a lower amount of resources to produce a unit of product. That is, we must identify where is the best practice observed among the five health centers of our example.

The initial criterion to identify the best practice frontier will be that one center, represented by the resources/product ratios, is in the frontier if there is no other center among those analyzed that is capable of producing the same product (1000 visits per year) with a lower quantity of at least one of the two types of resources. By applying this criterion, for example, it may be observed how health center number 4 cannot be a part of the frontier because health center number 5 uses the same number of doctors for 1000 visits that health center 4, but utilizes only 1 nurse while number four uses 2. If we compare health center number 2 with centers 3 and 4 we will also observe that they use the same number of nurses per visit, but number 2 uses only 1 doctor while number 3 uses 2 doctors and number 4 uses 3. Hence, we can affirm that health centers number 1, 3 and 4 are not among the most efficient of the group, because we have identified another center that is capable of producing the same number of visits with less resources.

Now we are going to amplify the criterion to identify the best practice frontier. Health centers number 5 and number 2 are in the best practice frontier, that is, they are efficient, because we cannot find another health center that can produce the same product (1000 visits) with less resources than the them.. We will consider that the frontier is a continuous function that is made up by a lineal combination of the health centers that we have identified as efficient. The result is the FRONTIER function of graph 4.

This frontier function represents the best practice with which we will compare each one of the five health centers with the objective of calculating an index of technical efficiency. This index is defined in an arbitrary manner between values 1 and 0. Value 1 indicates the highest level of technical efficiency possible, that is, it indicates that the health center is at the best practice frontier. On the other hand, the lowest the value of the index, the highest will be the level of inefficiency of the health center. In terms of

graph 4, this index is calculated as the ratio between the distance from the coordinate of origin (O) to the frontier and the distance from the origin to the point actually observed for the health center. In the case of the health centers that are on the frontier, number 2 and 5, it is evident that the value of this index is 1.

For health center number 4, for example, the index of efficiency will be calculated as the distance represented by segment 04' divided by segment 04, whose value will be 0.714. This value will be interpreted as health center number 4 being able to use 71.4% of the resources used at present to produce 1000 visits if it were as efficient as the centers of the group analyzed that are on the best practice frontier (the efficient centers). Hence, health centers number 1, 3 and 4 are inefficient. In Chart 2 we present the value of the indexes of technical efficiency for these five centers, calculated by means of the lineal scheduling programs that use the involving analysis of data.

Chart 2

Indexes of technical efficiency

Health center	Index of technical efficiency
1	0,500
2	1,000
3	0,833
4	0,714
5	1,000

Economic efficiency: the evaluation of health programs

The stages of an economic evaluation

The different steps of an economic evaluation of health programs can be summarized in the following figure:

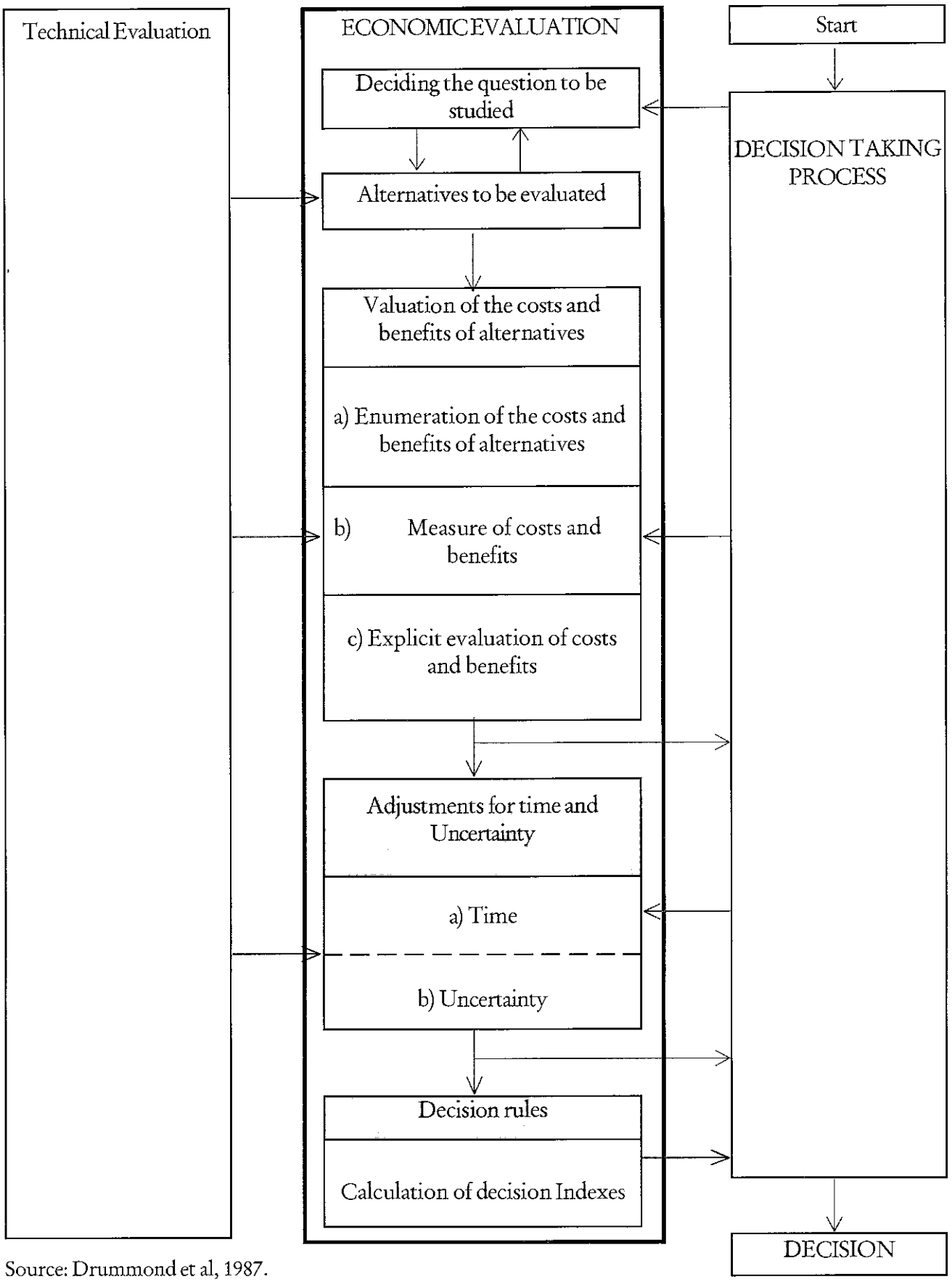
In the first place, we face a problem that requires taking a decision; let us assume that we want to evaluate Hormonal Substituting Therapy (HST) as a method of prevention of osteoporosic fractures. The next step to take is to pose the question that we have to reply in our study: 1) what is the cost of this treatment?, 2) what is the benefit of this treatment?, 3) which is the most efficient manner to apply the treatment? 4) is the treatment worthwhile?

A complete economic evaluation must meet two requisites (Puig-Junoy et al, 2000): i) compare several alternatives and ii) take into account both costs and results. The next step to be taken, therefore, to make an economic evaluation is to present the alternatives available. Otherwise, we would not be truly before an evaluation but before a description, which would be a description of costs (if we only answer question 1), description of results (if we only answer question 2), or description of costs and results (if we answer both). In this latter case (benefit-cost study of one intervention only) we should bear in mind that normally we are comparing with the "do nothing" alternative, that is, if the benefits are higher than costs we carry out the intervention or otherwise.

Cost analysis

We have already mentioned that an economic evaluation requires taking into account both costs and results. If we only compare the costs or the results of several alternatives we will be talking of a partial evaluation. A partial evaluation that

Figure 1



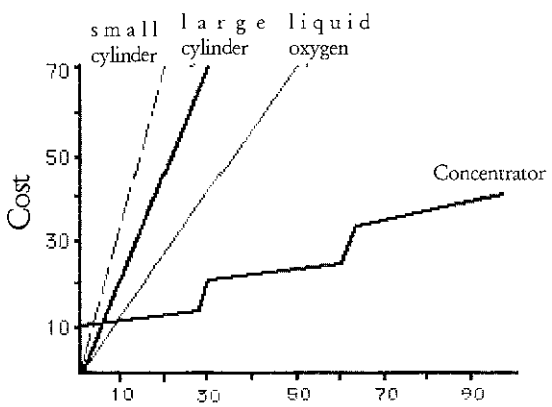
Source: Drummond et al, 1987.

will take into account only the costs, which is called Cost Analysis (answers question 1). An example of this type of analysis is the article by Lowson, Drummond and Bishop (1981). The problem they present is: which would be the best method to supply oxygen at home to those who suffer a chronic bronchitis. Three alternatives are contemplated: a) large cylinders (3400 liters) or small cylinders (1360 liters), b) liquid oxygen and c) an oxygen concentrator which is an apparatus that separates oxygen from the rest of the gases. Of the three methods, the latter is the most intensive in capital and, therefore the most sensitive (in terms of cost/patient) to the number of patients.

In estimating costs, a distinction was made between costs that were relatively fixed (as the need for maintenance service for concentrators) and those that vary with the number of patients (the electricity consumed by concentrators). The result can be seen in Graph 4. The diagram shows that concentrators were the most economic oxygen supply system in almost all cases (except for a number of patients lower than 13).

GRAPH 4

Cost of supplying oxygen through different methods



Number of patients

In this case, the evaluation has consisted only in comparing costs. In principle, the concentrator could be considered as the best alternative if the results of all the alternatives were the same, that is, if all the methods would supply the same oxygen. A complete evaluation would require estimating also the production of oxygen of each one of these methods.

Cost of opportunity

A complete evaluation is neither that which only takes into account the benefits of various alternatives. A partial evaluation that takes into account only the results is an Evaluation of Effectiveness. This evaluation must be made, if possible, through Aleatory Controlled Tests. It is the type of evaluation with which professionals in health services are more familiar. For some of these professionals, the story ends here. If it can be proven that a treatment is effective, if it produces some benefit, it must be made available to the patient.

The vision of the economist is different. Not every treatment that produces some benefit must be put in practice. The economist is used to think in terms of assignment of scarce resources. Since there will not be sufficient resources to put in practice all those treatments that produce some benefit, it will be necessary to select those that produce more benefits.

One of the reasons why we believe that health professionals may be against the rationalizing of effective treatments is because they are not used to think in terms of costs of opportunity, something very familiar to the economist. The cost of opportunity is the economic concept of costs. The true costs of an investment are not the amount of money we spend, but the benefits that are not obtained in the best alternative available to us. This is why, using resources to finance a treatment that produces benefits, measured not in terms of money but in terms of

health gained, has a cost that can be measured also in terms of improvement to health which cannot be achieved because we have spent our money in other treatment. Let us see an example.

Propanol is an effective medicine for the treatment of moderate hypertension between 35 and 64 years of age. For $13,640 it is possible to gain a year of life; one million dollars "buys" 73.3 years of life. The Lovastatina, a hypolipidemiant succeeds in men with a low coronary risk, between 35 and 44 years of age, to gain one year of life for $727,260; one million dollars would buy 1,4 years of life. Both medicines are used for primary and secondary prevention of coronary diseases. If these were the only two interventions possible, the cost of opportunity of one million dollars in each one of the alternatives would be different. The cost of opportunity of investing $1,000,000 in Propanolol would be the 1,4 years of life that would be gained with the Lovastatine - the following best use of the resources. The cost of investing $1,000,000 in Lovastatine would be the 73,3 years of life lost because the million dollars was not used in Propanolol. Propanolol is clearly the best investment in health between the two alternatives proposed (Russell, 1992).

We consider that this illustrative example of the costs of opportunity shows the need to take into account costs in addition to benefits at the time of taking decisions in the health sector. After showing the need to compare costs and benefits, we go on to comment those types of economic evaluation that meet the two requisites commented: they compare several alternatives and take into account both costs and benefits.

Cost-Effectivity Analysis

The first case that we are considering and that refers to the Cost-Effectiveness Analysis (CEA) is that in which the effect of the programs to be evaluated is in the same units although quantitatively it may be different for each one of them. An example could be that of selecting the best method to prolong human life after a kidney failure. In principle, there are two programs that can reach this objective: dialysis at a hospital and kidney transplant. The two programs may differ in cost and in the result obtained, and therefore we cannot choose automatically the less expensive one.

In this case that we have just described, we have the advantage that the result may be measured in the same units: years of life gained. Therefore, we can compare both treatments using one of these two indexes: a) cost per year of life gained, or b) years gained for each monetary unit spent. Therefore, when we have problems with one only and common effect, although different in magnitude, we can apply the CEA.

A specific example of CEA is the study of Ludbrook (1961) in which he compares three treatments for a chronic kidney failure. The two most customary manners to substitute the function of the kidney was the hemodialysis (artificial kidney) and the kidney transplant. Patients usually start receiving the hemodialysis at the hospital and when they have learnt how to do it with their own means they continue at home, returning to the dialysis at the hospital if problems arise. When they receive a transplant (if indicated) they can live quite a normal life although they have to return to the dialysis if the transplant fails at a given moment. The study includes three possible treatments. The first one consists in treating the patient only with dialysis at the hospital. The second one consists in treating the patient preferentially at home with periodical check-ups at the hospital. The third one consists in making the transplant after a period of dialysis at the hospital and at home. In Chart 3 we show the principal results of the study.

Chart 3. Cost per year of life gained (£)

		All Ages	15-34	35-44	45-54	55-64
Treatment 1						
Discount rate 7%	{High	11,200	11,500	11,200	11,200	11,250
	{Low	7,100	7,050	7,050	7,100	7,150
Discount rate 15%	{High	11,250	11,200	11,250	11,250	11,250
	{Low	7,150	7,100	7,150	7,150	7,200
Treatment 2						
Discount rate 7%	{High	5,800	5,750	5,800	5,800	5,850
	{Low	5,150	5,100	5,150	5,150	5,200
Discount rate 15%	{High	5,850	5,850	5,850	5,900	5,900
	{Low	5,150	5,150	5,150	5,200	5,200
Treatment 3						
Discount rate 7%	{High	4,650	4,450	4,750	4,950	4,650
	{Low	3,250	3,100	3,400	3,650	3,350
Discount rate 15%	{High	4,800	4,650	4,900	5,100	4,850
	{Low	3,400	3,250	3,550	3,750	3,550

Source: Ludbrook, 1981

Treatment 3 is shown as the best cost-effective for all ages, for the two rates of discount and for the high or low estimates of costs; then comes treatment 2. For treatments 1 and 2 we see that the influence of age is negligible due, mainly, to the fact that costs are practically the same at all ages. Treatment 3 shows more variation both with age and with the rate of discount. The evolution of costs if much more variable in the case of transplants, because the mot important costs are those of surgery, while after surgery the patient needs very low expenses. The variation between the different age groups is due, mainly, to the duration of the transplant. The treatment for the most advanced age group is the second more cost-effective, because the transplant lasts long, but this is due, mainly, to the fact that the eldest persons receiving a kidney are carefully selected. The conclusion of this study is that the method that permits us to increase the number of years of life at a higher cost is the transplant.

After having seen the comparison of programs whose results can be measured in the same units, we now have to face the problematic and difficult case of programs with different results. We can think of two types of situations: a) programs that produce various effects, common to all of them, but each program in a different degree, b) programs that produce one or several different effects.

An example of the first situation could be found if we included variations in the quality of life comparing dialysis at home, dialysis at the hospital and kidney transplant. We could also include the medical complications in each one of the systems. In this case, each one of the programs has three effects and each one of them to a different degree. A cost-effectiveness analysis would require finding three ratios for each one of the effects. The problem would lay on the fact that no one program would be superior to the others in each one of the three ratios. Which program should we choose then? Here there are two alternatives: establish priorities of effects or combine the effects and produce a common denominator. That is, let us assume that the dialysis produces more years of life, with a low quality and with few complications, while the transplant produces less years of life of a better quality and with few complications. To select between these two alternatives we can establish

priorities (for example, length of life before quality or vice versa) or combine the effects in one common denominator (for example, 1 year of life in state X is equal to 8 months in state Y).

An example of the second situation would be the comparison of a program of detection of hypertensive patients to prevent deaths from infarcts and a vaccination program to prevent influenza in order to diminish the number of work days lost. There is no manner, in principle, to compare these programs.

Cost-usefulness analysis

Another common denominator of health programs is the "Usefulness". Let us assume two persons facing the same problem: a pain in the knee that requires extirpating the meniscus. One of them is a nature lover that goes on an excursion to the woods every Sunday while the other one is a person eminently sedentary. It seems evident that solving this damage is something of vital importance for the excursionist, while the sedentary person could lead quite a normal life even without a surgical intervention. Evidently, the usefulness that each one of them will obtain from the intervention will be different.

From a general viewpoint the question would be now to assign a numerical value to the usefulness that each individual obtains from the improvement in the state of health after receiving the treatment. This idea has lead to the Cost-Usefulness Analysis. The unit of measure used is the QAYL (Quality Adjusted Years of Life) or the much less frequent, Equivalent Year of Health (EYH). This type of analysis is the most adequate one when the monetary benefits are lower than monetary costs, that is, when the introduction of a new treatment is going to produce an increase in costs, hence displacing other treatments, we must justify said increase by the benefits in terms of health that will be attained. Benefits in health are measured in QAYLs. The results of this evaluation are expressed in the form of cost/QAYL as can be seen in the following chart.

Chart 4. Quality Adjusted Years of Life (QAYL) of different therapies: Provisional estimates

	Cost/QAYL (£ 1990)
Cholesterol test and diet therapy (adults 40-69)	220
Neurosurgical intervention for head wounds	240
Advice of family doctor to stop smoking	270
Cholesterol test and treatment (adults 25-39)	14,150
Hemodialysis at the hospital	21,970
Neurosugical intervention for malignant intra-cranial tumors	107780

Source: Maynard, 1991

We can interpret this chart as follows: The cost of obtaining 1 QAYL is five hundred times higher through a neurosurgical intervention for an intra cranial malignant tumor than through cholesterol tests accompanied by diet therapy for adults. If our objective is to maximize the health of population (measured in QAYLs) and we have £100.000 to spend, we will obtain a benefit five hundred times higher if we spend this money in cholesterol tests followed by diet therapy than if we spend that same money in the above mentioned neurosurgical interventions. In other words, the cost of opportunity of gaining 1 QAYL through a neurosurgical intervention for an intra cranial malignant tumor is five hundred QAYLs.

Final notes

One of the most frequent errors of persons not well familiarized with the economic analysis is to mistake the economist for the accountant. In accounting, a cost is that which provokes a cash expenditure and a benefit must be translated into income. Costs and benefits have to be translated into monetary payments. This is not the approach of economy but what matters is that an activity that consumes a specific volume of physical and monetary resources improves or diminishes the well-being of people (efficiency).

Clinical efficiency goes through the maximization of the quality of care and the satisfaction of the users with the lesser social costs possible. The route to social efficiency passes through clinical effectiveness. The problem lays now on how to stimulate the yearn for effectiveness, how to reinforce the concern for the probability that the patients of the environment close to the doctor will tend to benefit from the action of the doctor. In order to become concerned about the effectiveness of practice, it is necessary to be conscious of the fact that things can be made in more than one way and not necessarily one's own way is the best (Ortun, et al, 2001).

In the economic evaluation of the productive efficiency of health service suppliers (meso-level) the measures of activity still predominate (number of visits, tests, etc.) to identify the product, and the measures of adjustment of the quality of care are scarce. The principal problem of the of productive efficiency measuring methods in sanitary organizations lays on the selection and definition of the resources and products, as well as on the adjustment of quality, severity of the processes attended and hotel type supplementary services (Puig-Junoy, 2000).

To consider the diagnostic or therapeutic benefit, that is not obtained in the best alternative reasonably available, constitutes a form of making sure that the maximum result is obtained in terms of impact on well-being, starting from certain resources. The true cost of sanitary care is not money, nor the resources measured by money. It is the sanitary benefits – palliation of symptoms, functional recovery, longer life expectation – that could be achieved if that money had been used in the best alternative.

The cost of opportunity can be estimated through prices and other mechanisms when prices do not exist. The greatest difficulty is the conceptualization and the measuring of benefits. Benefit in a diagnostic decision is measured in terms of reduction of uncertainty. In therapeutic decisions, benefit is measured in terms of effectiveness. This effectiveness has, as a minimum, a pair of dimensions, length and quality of life. The consideration of the cost of opportunity assumes a reflection about the benefit of the treatment being considered under the best possible alternative.

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repercussion of local and global aspects. It may even be pointed out that projects developed as final products of several academic activities, whether at-a-distance or semi attendance, have been incorporated with the pertinent adaptations, as a reference of application of knowledge in the didactic material of the following version of the course. Without being limited to a technical outline of the final project, the courses insist in *learning how to be and learning how to live together*, which are demonstrated in the efficient and responsible exercise which is the obligation of the participant as social security official.

It should be mentioned, finally, that if in the consolidation of a net for learning with the demands mentioned, the advantageous use of technological resources is very useful, the true overcoming of frontiers which is required with the internationalization of knowledge, is fulfilled in the measure that reconstructions and applications are incorporated which, from the local ambits, contribute to the circulation of information, the sense of which is found only in the possibility of joining together a know-how that will permit facing the reality in all its dimensions. In this scenery, the perspective of at-a-distance education is promising because it is focused, not to the gathering of persons to transmit knowledge, but to propitiate that by giving sense to the transmission of knowledge, the gathering of persons and institutions is motivated.

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