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CONSIDERATION REGARDING COST'S EVALUATION IN HEALTHCARE AREA

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Abstract
Efficiency in health service sector is particularly important. This is especially important as the medical sector is a major consumer of resources (financial resources, human resources, material resources). Correct assessment of costs within the health system is a priority for any government, manager of an institution in the field, specialist etc. This paper aims to present some aspects considered relevant for assessing the costs in the health sector.
Keywords: Costs, Models, GDP, Evolution.

1. INTRODUCTION

There are different possibilities for medical services, which are the result of several factors' action. In practice, proceed to separate the two categories of care: ambulatory (in clinics or at home) and in hospital. Medical personnel from the first category of ambulatory care in the public or the private system are usually general practitioners with the role of a filter in the flow of current illnesses. At this level, are treated persons which are least affected by the disease, complementary examinations are carried out, appealing to the opinions of specialists and is decided the hospitalization. Staff attitude from the ambulatory sector is explained by objectives followed, terms of pay, degree of addressability. According to theories specific to microeconomic field, in applying the charge of medical services, general practitioners will be more numerous in areas with dense population and great demand for health services. When establishing charges depending on patients' income (U.S.A.), the medical services supply will tend to concentrate in areas with high financial resources.

These rational important factors do not allow, however, notification of all reality and common situations where a low volume of medical ambulatory activity appears. Interesting notes were provided by P. Le Fur, C. Ordonneau and C. Sernet (1991) by studying a sample of 750 physicians with free practice. Low amount of profit made by that sample was obvious and was explained by the medical establishment without feasibility studies (two thirds of cases) or lack of public trust which leads to practicing simple medical acts. Reluctance on professional competence and level of education acquired does not encourage the establishment in rural areas and isolated towns complete hospital units, but favours their

installation in crowded urban areas with high health care offer (MO Carrere - 1991). Also, there are situations in which one neglects the difficulties arising as a consequence of low income. The absence of economic management initiatives in national health programs may affect the functionality of the whole medical system.

All this specific aspects of ambulatory care creates difficulties in interpreting health activities according to traditional medicine, which says that individual time of work is essential input into the production of health. Worldwide, ambulatory medicine has evolved as well as the number of medical offices for groups of employees with different skills, requesting improved assistance. The degree of specialization is increasing also and physicians practice complex activities, technically and economically. Their behaviour must be properly manifested, through competence and based on models specific to big medical institutions, that are hospitals.

Hospitals are the second largest group of institutions (public or private) health care is performed in. The scale of these hospitals makes possible to compare them to the economic enterprises management, through specific factors of health production and under the influence of some special laws of the state. No government can ignore these health institutions through their strategic importance and as effect of the necessary funds for medical system functionality ensurance. So, the problem of supply and production of health (in the economic sense) is in the medical acts analysis in hospitals and under ambulatory sector influence, through actual costs, through costs development and expenditure control techniques.

2. ASSESSING THE COST OF A DISEASE

Establishing the cost of an illness is an important economic problem, since taking into account the global consequences of the disease on society. Also, this model allows a comparison between diseases and priority setting in health programs.

Assessing the costs of diseases show that adequate health funds are not "financial loss" to society, but can be regarded as true investment, high efficiency.

For example, if we consider the total cost of a disease (X) that is transmitted and the cost of a program of prevention of this disease (Y) by allowing the decrease of disease's incidence by 10%, then this cost leads to a saving for the society (X • 10%) which is greater than the Y. The society has a potential gain on account of obtaining the saving: (X • 10%)-Y, E-saving.

For E> 0 is demonstrated the efficiency of a preventive strategies.

Business Excellence and Management
Volume 1 Issue 1 / December 2011

Business Excellence and Management
Volume 1 Issue 1 / December 2011

The cost of a disease is given by the direct costs and indirect costs.

2.1. Direct costs

Direct costs are set at a medium level, because it is not possible to calculate the actual costs for each case of disease.

Direct costs represent the amounts used for medical care, counselling, medical supplies, hotel and microclimate conditions, transport costs and other sums of that kind, accounted for the disease and on a representative sample of patients. The greatest difficulty is to establish depreciation of property (movable and immovable) that were physically used in some degree in medical acts related to the disease.

2.2. Indirect costs

Medical illnesses have social and economic costs far outweigh the costs of treatment. The patient is compelled to suspend work on a variable duration which harms both the person and society.

In addition, the disease leads to numerous collateral expenses and loss of time, for the patient and his family (childcare expenses in the absence of sick father, charges for hospital visits, home-hospital travel expenses, etc.). All these costs should be taken into account when calculating the cost of disease, representing for economists social costs due to potential losses.

It follows that the medical disease has an indirect cost, expressed as the amount of potential work that the patient could have done if he/she was fit for work. Obviously, these costs refer to the economic active population of production sectors.

Establishment of indirect costs of a disease is possible by using several methods.

Method of Gross Domestic Product (GDP) is applied to the so-called "diseases of human capital" GDP being the resultant of whole product made in a society, goods and services produced in a year, the rate of reduction of this indicator is calculated and that value is extrapolated to GDP per capita.

Advantages of the method relates to simplicity and the possibility of comparative analysis among the diseases and among nations.

Disadvantages of this method are related to inaccuracies in assessing the indirect costs, whereas the diseases are not all distributed to the population in the same manner and the degree of activity is not the same for all patients.

The method of comprehensive indirect costs consists of compiling a list of collateral costs, inherent in a disease, in relation to the wage of the patient. In determining the value of losses caused by patient care, the average hourly wage of people with whom come into contact is used and time consuming, such as, for example: nurses, drivers, maintenance personnel etc.

At these expenses are added the effects of disease on quality of life, patient's morale and anxiety caused by illness, suffering, loss of regular relaxing times, and not ultimately the reduction of the welfare level. All these issues are real, but very difficult to evaluate in financial terms. They are known in developed countries, as "intangible effects" or "pretium dolores".

The main solution to evaluate these effects is called "Willingness to pay" and derives from King Solomon's proverbs (sec. X b.c) that the suffering losses are equivalent to the amount the patient or his family would have paid to avoid that condition. Accordingly, it is advisable that a survey to be conducted on a representative sample of the population regarding the monetary assessment of the disease's effects on quality of life.

Although the calculation of indirect costs is laborious and approximate, however, its importance is special by considering the social role of an individual and profound consequences of health disorders on society.

3. COSTING HUMAN LIFE

Illness and death are natural phenomena that affect the functioning of society. Similarly assessing the cost of an illness, death covers both funeral expenses and values that the individual could bring to society if they were still alive, that is the price of human life.

In the "Conquerors" André Malraux said: "A life worth nothing, but nothing worth as a life".

There are several evaluation criteria established in general by practitioners in carrying out their profession, namely:

- Age, meaning care for the elderly less insistent than in other age groups.
- Personality, meaning the special care of people with different social positions from anonymous individuals.

The concept of "cost of human life" appeared two decades ago not to set an arbitrary value of life, but to reveal the advisable economic strategies to save that life. In fact, it is preferable to use the "price of

Business Excellence and Management
Volume 1 Issue 1 / December 2011

Business Excellence and Management
Volume 1 Issue 1 / December 2011

saving lives". The price of life or, as appropriate, the death price are concepts that cannot be dissociated and include direct costs and indirect costs.

Direct costs

These costs are related to amounts paid due to death, that funeral expenses and other expenses caused (surveys, insurance, etc.).

Indirect Costs

These expenses are related to productive values, that work and labour potential outcomes if the individual remains in life (the case of active population).

The calculation of these costs is similar to that on the disease, potentially life time being set as the difference between life expectancy and the age at which death occurred. Cost of living is the expansion of the disease's cost and it is used for comparisons of death causes and for establishing socio-economic measures to increase life expectancy.

For example, if achievement of an intensive care unit costs 100 million monetary units, could save 100 lives a year in expenses of 10 million m.u. per year, then the average cost of life saved is (100+10) mil: 100 = 1.100.000 m.u.

By comparison, if the realization of a childhood vaccination center costs 5 million m.u. and annual operating expenses are 1.5 million m.u., which can save 1000 children per year, then the average cost of life saved is:

(5 +1.5) million : 1000 = 6500 m.u.

In this case, the decider will be able to choose one of two hypothetical projects, while for the first version, life costs 1.1 million m.u., and for the second option, the life costs 0.0065 million m.u.

Using the average cost of saved human life "facilitates" making a hypothetical decision, having informational role in the medical and economic issue.

The problem of determining the cost of human life is linked to morality, the basic idea being that of saving as many lives as possible with available resources, since "life is priceless".

4. THE ANALYSIS OF MEDICAL SERVICES' COSTS EVOLUTION

Level and trend research on health costs relate mainly to hospitals because of the essential role of these sanitary units on medical care and because of the fact that ambulatory medicine refer in particular the development value of medical prescriptions.

The main difficulties in assessing the costs are financial and accounting.

Economic analyses are based on incomplete non exhaustive study, of current operating and functioning expenses as accounted in the current system. These costs do not fully express the actual costs of resource endowment, and the following two aren't registered: the degree of equipment depreciation and materials stocks influence from the state institutions. Costs may be undersized and the emergence of bonuses, gifts or grants. In private health sector, costs are more accurately measured, at least in appearance. The principle of self-financing, as practiced in some countries, closer expenses incurred by financial and accounting records to actual costs. In the last period of time, frequently resort to specialized services of separate entities (service distribution facilities, utilities, health care facilities, imaging and computer tomography, etc.), so additional service charges occurred.

Heterogeneous and imprecise databases that influence the stringency of economic calculations are resulting.

Operating and functioning expenses on medium and long term are recording fluctuations in the structure and volume. These changes have caused a change in calculation base, the correction of the weights of different factors to constant periods of time. Method of correction factors in the health system (B.A. Weisbrod, 1991) started from examining in detail the items of expenditures. Establishment of expenditure variations is achieved by series indices.

Thus, during (t, t +1) evolution is calculated by weighting coefficients of the various elements of costs in total costs. For the next period, the weights held are those of the moment (t +1). Price variations (in volume and structure) in the interval (t, t +2) are obtained by calculating the product of each element's (of the series) changes.

Global evolution of health costs in developed countries has been established using the indicator: cost of use on hospital bed (an indicator calculated also by the Romanian medical statistics). This indicator recorded in the period 1965-1978 an annual average increase of 16%, according to the "Centre d'Etudes des Revenus et des Couts" (France, 1984). This level is largely close to the inflation rate because during that period the changes in prices averaged 8.5%. There are differences between the

Business Excellence and Management
Volume 1 Issue 1 / December 2011

university clinics and small hospitals (for clinics) due to unequal modernization and to differential complexity of the given treatment.

Additional analysis of global development in health costs is made by studying the indicator: hospital costs per in-patient, reflecting the intensive nature of healthcare. From the previous French institute study presented, it showed that during 1965-1978 average annual growth of hospital costs per in-patient was 11%. There were significant differences between public health centers and private medical companies (in favour of state hospitals).

The overall conclusion of the economic analysis carried out - under the influence of inflation and demand for medical care – is that actual costs have grown in importance. Within the total health care spending, the largest share is held by personnel expenses. Moreover, it is necessary to study both the amount of wages and the share of each type of medical staff in the total human resources, in particular the number of doctors and medical specialties.

The necessity and advisability of increasing the number of personnel in sanitary units, especially the Romanian ones, are undeniable. They must reflect the application of technical progress as a result of the emergence of new methods for diagnosis and treatment.

Share of medicines and sanitary materials costs is relatively low in relation to personnel costs. This is explained, in the stable economies of developed countries, by increasing labour productivity in manufacturing companies, by reducing trade margin and by widespread use of price negotiations. However, prices are stubbornly high and are growing due to high demand, frequent requests to "excessive quality" to the pharmaceutical products and unequal distributions of patients on public and private health sectors.

4.1. Influences of rising demand for medical services

This important thesis which presents the increase of demand for medical services as a fundamental cause of increasing health costs was initiated and developed by M.S. Feldstein (1971). According to the American model made, for most pathologies at a time "t", the demand for medical services (Nt) and length of hospital stay (St) depend on the financial opportunities related to health care of each patient, after appealing to social protection and payment of other goods and services required. Variables of the mathematical model refer to the total cost of hospitalization day (Pt) and the health insurance level and commodity prices in relation to various factors (financial income, demographic structure and other elements that act on the demand). This set of variables is designated by the vector (Xt).

The mathematical relations are the following:

$N_t = N(P_t, X_t)$
$S_t = S(P_t, X_t)$

Total demand (Dt) of hospital day is calculated by:

$Dt = Nt \cdot St$

In relation to this request for medical services, the supply changes, the increase in the number of hospital beds is discontinuous and medical institutions have limited budget. In addition, the occupancy rate (R) set by the management of hospitals vary slowly over time due to the need for reserve (excess capacity) of beds to meet major medical emergencies and to maintain a balance in the cost and quality relation. The supply for hospitalization opportunities related to the number of hospital beds (Bt) and occupancy (R) will be:

$St = 365 \cdot R \cdot Bt$

Given the total demand for hospitalization (Dt) and the total supply for hospitalization (St), while the Xt and Bt values are given, it results that the equilibrium price (P t *) is verified by the relationship:

$$N(P_t^*, X_t) \cdot S(P_t^*, X_t) = 365 \cdot R \cdot B_t$$

Increasing the equilibrium price (P t *) determines the current price increase in hospitals without an increase in the profit or other positive financial effects. Also, specific medical care market does not lead to an increase in charges depending on demand growth rates in public institutions. Hospitals management is constantly subject to pressures of rising costs. The medical staff require sophisticated diagnostic and treatment equipment while patients want hotel conditions improved and a substantially medical staffing. Also, all staff of sanitary units call for a better pay, with influence on cost increase.

If demand for medical services would be constant, regardless of the elasticity degree of the variable components or of the maintenance period related to price, then the usage would be below the acceptable threshold. But the demand is growing and its corresponding mathematical function moves upward as the cost of hospital day (P) increases. It appears that the high level of cost does not result in reduction of the usage index (R).

Total cost of hospitalization day (Pt) is partly adjusted based on equilibrium price (P t *), for moderate changes in medical fees. Thus, it is verified the equation:

$Pt - Pt\text{-}1 = \lambda (P^*t - Pt\text{-}1)$, where $0<\lambda<1$.

Business Excellence and Management
Volume 1 Issue 1 / December 2011

According to B.A.Weisbrod's (1991) theory, the level of social protection influences the attitude of choosing types of medical devices and medicines, with effects on increased costs. Market launching of the modern medical equipment and of new pharmaceutical products is achieved after many years of study and research (in the literature, at least 14 years). But what interest is the protection system at a time. Changing the value system of reimbursement of medical services generates the investments orientation to cost savings research. On the contrary, if it considers that payments be made on the basis of actual costs, then investments will be made unconditionally, to increase work efficiency.

4.2. Influences of "quality in excess"

The phenomenon of "excess quality" was highlighted in 1970 by J.P. Newhouse and subsequently by M.L. Lee (1971). First of them, studied this phenomenon in an isolated hospital, and the second one examined the relationship of interdependence between sanitary units.

Situation 1. It is considered the management of a state hospital as having the highest level of satisfaction achieved by two variables: quantitative and qualitative. Quantitative variable has an important role whereas when medical services are made in high volume, the state of health improves. The qualitative variable of medical services influences the wages and the medical staff status, the healthcare prestige, having the general sense of income substitute. Work organization on the considered hospital is subject to budgetary constraint. As qualitative elements (qx) increase, the curves representing medical demands (Dx) move to the right and curves representing the average costs of medical services realization (ACx) are moving up, as shown in Figure 1.

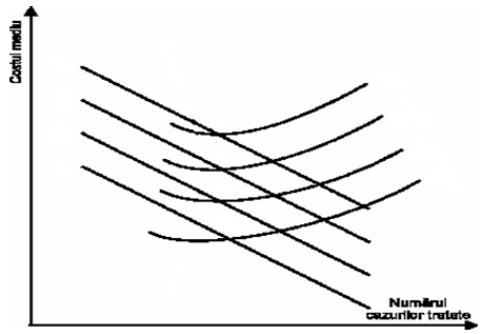

FIGURE 1 – DEMAND AND THE AVERAGE COST FOR DIFFERENT LEVELS OF QUALITY

The intersections of Dx demands with ACx costs are corresponding to different levels of quality plotted through the points Bx, where x = 0, l, 2 .... n.

From these values (Bx) are derived quality-quantity pairs capable of achieving economic balance. Equal quality increases are leading to higher health care costs increases because of the marginal cost of

quality influences, also in increase Displacement of curves representing the average cost are greater than those of curves representing the demand and the optimum combination of quantity-quality ratio (FF') has the graphical representation of Figure 2.

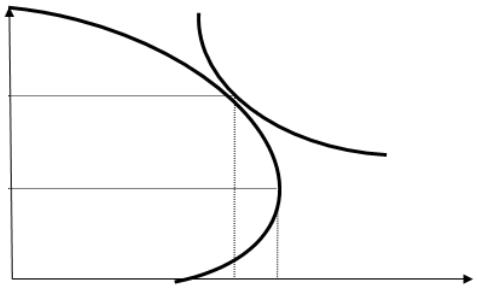

FIGURE 2 – OPTIMUM COMBINATION OF QUANTITY AND QUALITY

The managers of sanitary units are investigating the optimum combination, for the economy, the quantity-quality ratio located at the point of contact between the FF' and the classic allure curve 11' corresponding to the importance given to the new techniques. The optimum number of cases treated N* is numerically lower than the maximum number of cases treated Nmax., and the optimal level of medical care quality q* is greater than the current level of quality q, attracting higher unit costs. The difference between the values (q*) and (q) is excess quality.

This theory is fully valid in the private sector, but less applicable in the state sector due to low competition and a demand for medical services less sensitive to quality. Moreover, in the public medical institutions there is a level required by government agencies regarding technical equipment, so that the improvement of services is achieved through a reduction in the amount of health care and curve FF hasn't got a positive slope portion. It follows that the optimal level of state institutions is reflected in its maximum amount of treated cases and the minimum level of quality health care, is close to the x-axis. However, this result is influenced by the degree of importance given by the management of state hospitals to production of technical progress and to achieving superior endowment funds, leading to a qualitative level superior to the minimum and a quantity of services that is inferior to the maximum.

Theoretically, reducing the number of cases treated is not directly with an unsatisfactory result, since it provides high quality of medical treatments and a high probability of success. But this must be shown and followed by a comparison of the advantages of the reverse situation.

Situation 2. The application of research results and of technical development has a dynamic nature and the degree of miniaturization makes accessible the new medical equipment to small and medium

Business Excellence and Management
Volume 1 Issue 1 / December 2011

hospitals. Large medical institutions should, under normal circumstances, be at an appropriate level of technical progress.

This problem questioning of medical inventions and innovations application is specific to staff eager to implement a specialized therapeutics, higher to that existing in other similar institutions. The use of complex equipment and numerous investigations is subject to logic of the medical progress significance, according to the expression made by E. Levi (1982). This logic is a scientific approach and reflects the position of followers in the medical hierarchy.

This attitude is supported by administrative staff, despite current disagreements, on the use of the health funds, with medical staff. Managers of hospitals using methods specific to economic management are keen to make expenditures to ensure a high activity with patients. The increased number of patients treated ensures the depreciation of medical devices and shortens hospitalization, but determines high costs of hospital day and of expenditures on the diseases.

Currently, there is a continuing high level of importance given to quality of medical care, with special financial efforts. Of course, that neutral people outside the health system may disapprove this trend leading to major financial difficulties and extra endowment. However, there are significant categories of people who accept the thesis according to which health state is an essential personal preference, so that financial efforts cannot be criticized and the increase in the quality of medical activity meets people's wish.

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