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Diagnosis Related Groups System - Managerial Tool for Estimating the Cost of Hospital Services (Empirical Study)

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Abstract: Public health services in Romania are in a complex and continuous process of reform, a major priority of government. In the light of future trends of development of health care, we can say that healthcare is becoming more and more a "market" operating on the principle of supply and demand. The patient becomes a consumer; he is interested in health care and wants to be adept at maintaining and improving his health. Therefore, the Romanian health sector must intensify efforts to develop management because success and even its existence depend exclusively on an appropriate management system that continuously improves to the needs of the patient (customer) and to the market economy. Thus, we considered it necessary for costing approach in the health sector in Romania due to the high complexity of health services and the high consumption of resources.

Key words: managerial accounting; public accounting; costs; health economics; financing

JEL Classification: M41; H83; I18

1. Introduction

Hospitals in Romania are currently facing a problem of low financing services, which no longer keep pace with medical technology, demand for services growing and more diverse, need for salary increases in public sector and the need to align to European standards for medical assistance. Given that the national level has not yet performed a study of hospital care costs, indicating the need for funding, cannot say with certainty that hospitals are underfunded or not.

On the other hand, neither hospital providers have developed a well-documented offer of services, defining health care packages, which could help financier and patients in the purchase of services. Bridge between the two poles (supplier and buyer of services) can be achieved by better defining the types of services, manner and quality standards to which they should be provided and the appropriate level of funding. If into a private health system, these elements come by itself, because the service is defined first, then how much delivery, and then sets its price, in the public system, the principle of universality and gratuity access to medical services makes this approach to come much later, or never come (Haraga&Ţurlea, 2009).

The purpose of our study is the one of the main concerns in lately of the hospital managers, namely: *to demonstrate that the Romanian public system of hospital services must estimate the economic efficiency through a coherent system of costing*. The approach it is not unrealistic in the context of the emergence of profitable health care systems, so economically efficient, even if they are the majority of hospital services under private management.

By appeal to the particularities of the health system in Romania, we present model costing hospital services currently used in hospitals, based on the Diagnosis Related Groups System (DRGs).

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2. Diagnosis Related Groups System (DRGs)

The Diagnosis Related Groups is a classification scheme for patients based on diagnosis. This system is similar to International Classification of Diseases (ICD) in which diagnoses are classified into classes and subclasses. In contrast, the DRG system is used an additional criterion for classification, ie *the cost of consumed resources for patient care*. Thus, through the DRG system, patients may be simultaneously classified as pathology and cost of care, which provides the ability to associate types of patients with hospital costs incurred. For patients classified in the same group of diagnoses, procedures performed and costs are similar.

DRGs are assigned by an application "grouper"[1] based on the characteristics of each discharged patient: age, sex, duration of hospitalization, primary and secondary diagnoses, procedures, status at discharge and birth weight (for neonates), and according to them, the patients are classified in a distinct category (a group of diagnoses) (www.drg.ro).

The DRG system is conceptually oriented in **the standard cost**. There are many papers of specialty literature describing the process of estimating the average cost of medical services. However, very little has been written about the estimation of standard health care costs, by "standard" meaning those costs which would consume resources when treating patients in an efficient manner by a well managed team of clinicians, and taking account the existing realities, including resource constraints which may limit providing the best care. Knowing standard cost actually means knowing the "expected" cost of the supplier for a patient when he falls into a common and agreed treatment scheme (Haraga&Ţurlea, 2009).

DRG system moves the paradigm functioning of a hospital from the resources and the process conducted to the results of activities, reflected in hospital patients. The system provides a "picture" of the hospital results. Diagnostic groups are designed in the light of standardization of hospital results (results expressed in terms of patients discharged, "homogenized" within these groups) and go in a direction opposite to the aphorism "*there are no diseases but sick people*."

3. How to fund hospitals based on DRG system?

For each patient discharged and sent in a diagnostic group was established a charge which will be paid to the hospital, regardless of the resources consumed by the patient. From this point we can say that it intervenes on resulted "photo" of hospital, because hospitals will changes activity to achieve a "photo" to bring them more income.

Specifically, the DRG is a complex mechanism of financing of hospitals based on what actually happens in the hospital. It establishes a method of reporting. Suppose it performed surgery "A" and maneuver medical "B"; the hospital will report, and, depending on the reporting, resulting severity and complexity of a case. Each patient is more or less severe. Number of patients is a criterion for payment. Gravity of the case is another criterion for payment. And multiplied these two, gives the budget, i.e. funding.

DRG system is the best tool for evaluating the results of a hospital, which is why it was taken over and adapted to be used to finance hospitals. Many doctors and hospital managers in the Romanian health system have criticized and still criticize the introduction of the DRG system in Romania. Most of them do not know in detail the DRG system, which are the alternatives to it, the advantages and disadvantages. They do not know the direction in which the DRG started in Romania, how it has come and what's left from this path, how it will look after completion of the reform system.

[1] Grouper - software that allows automatic allocation of a patient in a DRG based on data that characterize each discharged case.

It is considered that the DRG is responsible for repeated financial crises of the hospitals, although DRG does not bring more money to Romanian health system, but no money removing from there, and just divide the amounts available, whether many or few they are.

4. SWOT analysis

The SWOT analysis is a strategic planning method aimed at evaluating the ***S***trengths, ***W***eaknesses, ***O***pportunities and ***T***hreats underlying a particular project/strategy/objective. Each management tool for estimating the cost has strengths and weaknesses, but their effect may vary depending on the specific sector. On the one hand DRG has been criticized as not adequately accounting for severity of illness, but on the other, paying by DRGs improves technical efficiency and productivity within hospitals.

Internal Evaluation

Strengths	Weaknesses
• It is a patient classification system based on discharge diagnosis; within each diagnostic group are included patients with similar pathology and treatment costs, achieving a better match between services provided to patients and hospital resources used. • It examines the characteristics of each patient discharged and, according to them, patients are classified in a distinct diagnoses group, DRGs provides a more transparent in terms of hospital activity. The key word in the DRG system is *discharged patient* (case solved). • It starts from the hospital results, expressed in number and type of patients effectively treated in hospital and not from hospital structures (number of beds, staff). • It is a useful tool in increasing hospital efficiency (by identifying the resources required for each type of patient), improving the quality of services provided (by assessing the quality and definition of patterns of practice), in hospital activity and structure modeling (staff, departments) and in achieving a results-based management rather than resources or processes. • Allow fair comparison between hospitals (although not the same type), departments or physicians. • Through DRGs, hospitals that will have costs for a specific DRG, lower than tariff established in that category, will earn resources to that category of patients and those with higher costs than tariff established for a specific DRG will lose resources in that category of patients. • It is based on the principle "*money follows the*	• Lack of self-management - the question arises whether hospital managers will have the strength and motivation to intervene in order to increase efficiency, in terms of achieving a "photo" of the results, it is necessary that hospital management can have sufficient autonomy to intervene in such modeling services to increase efficiency and quality of healthcare provided. • Uncertainty on the responsibility of hospital management - the question is to whom will go the responsibility, if the measures are unpopular (but not at the expense of patients) for increasing the efficiency of hospital, or if it is decided reorganization of departments which produce losses (but community are required). • Uncertainty in the management of profit / loss in the hospital - must be regulated how to manage the profit (surplus) generated by an increase in efficiency and how to manage the hospitals with loss (deficit). • Affecting the quality of services provided - some hospitals tend to have short term benefits and thus to sacrificing the quality of services provided for increase efficiency; in this way, unless DRGs monitors quality of service can be reached at extreme that "*you will die in the hospital, but you will die more efficiently*".

Strengths	Weaknesses
patient" - the basic principle of health insurance. • Allows hospital to clearly highlight the types of patients and resources attracted to them, ie the hospital is able to know the types of patients for whom lose resources (and to intervene in ongoing processes to reduce costs) and patients for whom have financial benefit (and try to attract as many patients of this type). Hospitals are stimulated to keep costs at a lower price for each type of patient, in order to save resources and use them for different purposes for the benefit of patients. The method allows hospitals to clearly outline the types of patients and resources attracted for them, and through comparison with the costs required, it generates the framework for the greatest possible efficiency (savings are kept in the hospital). • Implies transparency in the use of resources - financing is "on sight" and is known by everyone (patients, hospitals, home insurance, ministry, unions). • Shows weaknesses of previous methods of funding, per day of hospitalization, which takes into account the number and complexity of cases, but also the number of days in hospital - hospitals were encouraged to hospitalized milder cases in departments with higher tariffs and keep patients as many days in these departments. • Funding is not differentiated by type hospital, but according to complexity of cases, so that hospitals will not search for change permanently the structure and name in order to attract more money, but will get more just for more complex cases. • Through DRG, at the same hospital for a patient, for example, with myocardial infarction will be pay more than for one with hypertension, even where the two patients stay in hospital the same number of days. • The hospital is stimulated to treat patients faster and in the best conditions because tariff received depends on the patient (diagnosis) and not by the number of days of hospitalization. • Lead to a more objective allocation of money between hospitals (if a hospital has few patients or has no patients with severe disease, will have reduced funding). • Data reported by DRG system allow an assessment of clinical activity of hospital (at the	

Strengths	Weaknesses
level of department and even at the doctor).	

External Evaluation

Opportunities	Threats
• At central level, through this system there is a transparency of hospital resource use (which is over 60% of total health funds), which leads to a better use of resources and reduce the potential for corruption in the process of allocating funds. • DRG allows the global assessment of hospital activity in a geographical area or a specific area. Thus, information about patients, collected from hospitals, underlying the hospital activity reports, can be used to assess the accessibility and appropriateness of services provided (for example, can generate reports about the number and type of patients who did not have suffered surgery, although were hospitalized in surgical departments), to compare departments or hospitals, concerning the average length of stay by type of patients, to analyze the existence of suppliers in terms of services provided. For example, university clinics with very simple pathology, or pathology and procedures performed in inadequate hospitals. In this way, decisions can be made for better access of patients to hospitals. • DRG helps modeling hospitals by type of patient charges, based on the idea that "*you have what you pay*". Thus, it can intervene when setting tariffs to stimulate supply of certain services and to decrease providing other services. For example, you will pay less for a surgery that can be provided in excess by hospitals, only to raise funds, even if it was not required to be made to the patient.	• Legislative and financial instability. • Existence or emergence of other hospitals on the health services market - potential health service providers. • Policy of the National Health Insurance House (NHIH) - by which hospital budgets are set at centralized way, without taking into account the actual achievements of hospitals and the established tariff, has undermined their equalization process and increased the inequity in funding. There were counties in which NHIH grossly underestimated the amount realized, and in other districts, hospitals have had big budgets and some of them have failed to cover the services through budget allocations. Another obstacle to the smooth functioning of hospital funding has been NHIH allocation of a very small budget for hospital services, so hospitals have been forced to sign contracts to 70-80% of the number of discharges from the previous year. With these policies, NHIH undermines the functioning of DRG, and managers of hospitals who do not know these details better, blame the DRG method for organizational and financial problems in the system. Actually it comes to two main criteria of a financing system: *sustainability* and *equity*. How should a system to be ideal? From the perspective of the financier, a better method of financing must be sustainable (which does not really succeeded in Romania in recent years, neither in hospitals, neither to drugs), fair for both providers and for patients (the greatest deficiency of the Romanian health system is almost complete lack of equity), to motivate for quality services and be efficient. Inequity is inherited from the past, and shall be take steps to eliminate them but on the other hand NHIH, by its policy and measures, hinder this process. And sustainability is not ensured, some of the issues above arising from this. On closer analysis we see that is a contradiction between DRG funding technique and financing hospitals with budgets semi-decentralized.

5. Practice use of DRG method

It is said that the DRG-based financing system is a type of "*money follows the patient*" - that hospitals which have many patients with complex pathology will receive more resources and those with fewer patients will have fewer resources. Thus, the allocation of financial resources is based on the results of the hospital and less its structure. From reverse to this principle resulting in practice a number of issues frequently encountered that prevents objective allocation of resources to hospitals:

- *Incorrectness of tariffs per DRG* - in this sense it is necessary that DRG tariffs to cover costs largely for different types of patients; in addition, the quality of services must be evaluated, but very expensive services should be clearly defined. How DRG does not directly assess the quality of hospital services and it just analyzing the number and type of patients discharged, can hide big differences in quality of services provided to patients of the same type, and thus resulting tariffs unrelated to the costs allocated to case;

- *Reporting false or* altered - also experience shows that, when known exactly the types of patients receiving better funding, hospitals will try to "arrange" the data reported to benefit for "more" patients (false reports) or "more complicated" patients (modified reports). This phenomenon is commonly found in systems using DRGs to finance and is called "*DRG creep*" and can generate even fraud by reporting data for non-existent patients, by readmission of patients, by "complication" the patient. DRG creep is a well-recognized means of boosting hospital income, by obtaining more reimbursement than would otherwise be due (the reclassification of patients to more profitable categories);

- *Choice of prospective or retrospective* payment - through retrospective system should be considered all the weaknesses of a model of payment per patient, the most important being the tendency to admit as many patients and, if possible, of those for which funding is higher; through prospective system is induced rather a selection of cases, ie those consume less resources, for compliance in the budget negotiated with the Health Insurance House (HIH);

- *DRG is a financing method of output type,* ie are funded the outputs, achievements of hospital. In the case of DRG, discharged patient means output. As the complexity of each case discharged differs, the same, the cost of treatment varies. For this reason, it is important that funding also take into account to the resources consumed during treatment. It is a matter for specialists and authorities, which must find a method of funding to be corrected, but also simple to implement and manage.

As long as the DRG system is used in real mode, with data really performed by hospitals, it is really *a management tool to estimate and control costs of hospital services* (Table 3). In practice of the health sector in Romania, DRG system is used only as *a method of financing hospitals* (Table 2), because it uses standard data, imperative imposed by legislation, obviously for reasons of saving all extremely limited resources, with serious consequences for the Romanian health system, highly publicized and well-known.

DRGs are not used solely for payment purposes. Many hospitals, even if they are not reimbursed on a DRG basis, will use a DRG grouper for budgeting, payment evaluation and to conduct hospital utilization review and quality assurance activities to support their operations (www.iha.org).

For these reasons we used the DRG method from both perspectives through a calculation system on medical departments in the City Hospital Targu Bujor Galati, a system that allows quantification of economic efficiency and highlighting the performance achieved by each department taken in the analysis.

To understand the specific terms for hospitals and DRG system, we will do the following comments (www.drg.ro):

- *Number of cases contracted with HIH:* number of patients (cases discharged) which HIH buys and pays them to the hospital. *Number of cases discharged and validated DRG:* the effective number of patients treated and discharged from hospital, cases were validated by the National School of Public Health, Management and Development in Health Bucharest (SNSPMPDSB) - the body that check,

validate and quantify in DRG system all cases discharged in public hospitals in Romania. Validated results are transmitted by SNSPMPD to HIH for settlement to the hospitals (www.snspms.ro).

- *The complexity of the cases (Case-mix):* types of patients treated in a hospital, depending on diagnosis and severity. *Case-Mix Index (CMI)* - index of complexity of cases: number (without unit) expressing the hospital resources, in accordance with patients. For a hospital: CMI = Total number of weighted cases ÷ Total number of cases solved. CMI is the measurement of the average severity of illness of patients treated by a hospital. Basically, CMI helps determine the amount assigned to a diagnosis related group (DRG).

- *CMI contracted with HIH:* index of complexity of cases settled (imposed) annually to each hospital by the Framework Agreement on the conditions of the medical assistance provision within the social health insurance system. *CMI achieved:* index of complexity of cases effective achieved for patients discharged from hospital, CMI validated by SNSPMPDSB.

- *Discharged cases (solved cases):* all cases discharged from hospital, regardless of the type of discharge (discharged, discharged on request, transfer, deceased).

- *Normal cases:* discharged cases, classified in the same DRG, with similar duration of hospitalization of statistically.

- *Extreme cases (such as duration of hospitalization) - "outliers":* discharged cases classified in the same DRG with very different durations of hospitalization than that of normal cases: "low outliers" and "high outliers". *Coefficient K of extreme cases:* a coefficient reflecting the financial impact of "outliers" in the hospital. This coefficient is calculated quarterly by SNSPMPDSB based on discharged cases reported and validated by each hospital.

- *Weighted cases:* "virtual" cases, results by adjusting the discharged cases, depending on complexity. For a hospital: Cases weighted = Number of cases resolved x CMI. *Rate per Weighted Case (RWC):* reimbursement value for the weighted case at the level of hospital. The value of rate per weighted case is fixed for each hospital separately and is set annually by the Framework Agreement on the conditions of the medical assistance provision within the social health insurance system. *Cost per Weighted Case:* a reference value that reflects the cost of a weighted case. For a hospital: Cost per case weighted = Budget for acute cases ÷ Total number of weighted cases.

Evaluating the economic efficiency of the hospital is impossible in the absence of methods to quantify the economic efficiency of the current system of hospital services. The approach will be used only to study the economic efficiency of hospital services reported in the DRG system. Thus, using data from the City Hospital Targu Bujor Galati, through the application DRG, will be assessing the total economic efficiency of the hospital, as the sum of subsystems that provide hospital services (medical departments).

Table 1 Indicators achieved and actual expenditure in 2010

Indicators		HIH contracted	Hospital effectively achieved
Number of cases discharged		2,790 patients	4,195 patients
Number of readmitted and transferred cases		0 patients	40 patients
Case-Mix Index (CMI)	January-March	0.6015	0.6793
	April-December	0.6417	0.7426
Rate per Weighted Case (RWC)	January-March	1,222 lei	1,222 lei
	April-December	1,390 lei	1,390 lei
Coefficient of extreme cases (K)	January-March	1.0000	0.9978
	April-December	1.0000	0.9865
The amount of cases		2,327,096 lei	3,954,897 lei

Actual expenditures	Lei
Total actual expenditures of financing sources	3,918,462
1. Health actions financed from state budget	122,827
2. Capital expenditure	1,017,187
3. Costs for medical services, of which:	2,778,448
a) Direct Costs	2,351,775
• Identifiable per patient	232,890
- medicines	113,734
- sanitary materials	29,786
- laboratory reagents	26,940
- materials laboratory	10,258
- food for patients	52,172
• Unidentifiable per patient	2,118,885
- staff costs	2,118,885
b) Indirect Costs	425,739
- office supplies	10,120
- cleaning materials	5,923
- lighting, heating and motive power	141,526
- water, sewerage and sanitation	19,897
- fuels and lubricants	15,300
- parts medical equipment	2,671
- transport patients	2,865
- post, telecommunications, internet	16,309
- functional materials and services	110,659
- current repairs	55,549
- disinfectants	6,507
- linen and bedding	2,522
- inventory items	3,628
- internal displacements	423
- books and publications	206
- consulting and expertise	29,740
- professional training	1,066
- advertising and publicity	1,457
- other expenditure	305

Table 2 DRG system as a method of financing

Medical Departments		Number of cases contracted with HIH	CMI contracted with HIH	Number of weighted cases	Rate per weighted case (lei)	Coefficient K of extreme cases	Amount financed by HIH (lei)
1		2	3	4=2x3	5	6	7=4x5x6
January-March	General Surgery	234	0,6015	141	1,222	1.0000	171,998
	Internal	279	0,6015	168	1,222	1.0000	205,074
	Neonatology	51	0,6015	31	1,222	1.0000	37,487
	Obstetrics	234	0,6015	141	1,222	1.0000	171,998
	Pediatrics	231	0,6015	139	1,222	1.0000	169,793
	Total period	1,029	0,6015	619	1,222	1.0000	756,349
April-December	General Surgery	387	0,6417	248	1,390	1.0000	345,190
	Internal	490	0,6417	314	1,390	1.0000	437,062
	Neonatology	79	0,6417	51	1,390	1.0000	70,465
	Obstetrics	411	0,6417	264	1,390	1.0000	366,597
	Pediatrics	394	0,6417	253	1,390	1.0000	351,433
	Total period	1,761	0,6417	1,130	1,390	1.0000	1,570,747
Total year 2010		2,790	X	1,749	X	1.0000	2,327,096

Table 3 DRG system as a management tool

Medical Departments		Number of cases discharged and validated DRG		CMI achieved	Number of weighted cases		Rate per weighted case (lei)	Coefficient K of extreme cases	Amount realized (lei)
		Total, *of which:*	Readmitted and transferred		Total, *of which:*	Readmitted and transferred			
0		1	2	3	4=1x3	5=2x3	6	7	8=(4x6x7)-(5x6x50%x7)
January-March	General Surgery	284	0	0.5409	154	0	1,222	1.0028	188,244
	Internal Medicine	349	0	0.8362	292	0	1,222	0.9926	353,982
	Neonatology	39	0	0.6603	26	0	1,222	1.0026	31,550
	Obstetrics	242	0	0.6834	165	0	1,222	1.0000	202,098
	Pediatrics	200	0	0.5970	119	0	1,222	1.0000	145,907
	Total period	1,114	0	0.6793	756	0	1,222	0.9978	921,781
April-December	General Surgery	719	14	0.6067	436	8	1,390	0.9897	594,254
	Internal Medicine	897	17	0.8816	791	15	1,390	0.9762	1,062,876
	Neonatology	144	0	0.7733	111	0	1,390	0.9987	154,583
	Obstetrics	681	5	0.8114	553	4	1,390	0.9953	761,647
	Pediatrics	558	4	0.6023	336	2	1,390	0.9877	459,756
	Total period	2,999	40	0.7426	2,227	30	1,390	0.9865	3,033,116
Total year 2010		4,113	40	X	2,983	30	X	X	3,954,897

Table 4 Achievements and actual costs of medical departments in 2010

Medical departments	Number of patients discharged	Patient days	Number of hospital beds	Patients existing and remaining in hospital*	Average length of stay (ALOS)	Bed utilization rate (%)	Cost per day of hospitali-zation (lei)	Total costs (lei)
0	1	2	3	4	5=2÷4	6=2÷3÷365 days x100	7	8=2x7
General Surgery	1,024	2,884	10	1,039	2.78	79.01	204.93	591,018
Internal Medicine	1,261	6,815	20	1,261	5.40	93.36	119.96	817,527
Neonatology	186	1,118	5	190	5.88	61.26	121.32	135,636
Obstetrics	932	2,937	10	941	3.12	80.47	203.57	597,885
Pediatrics	762	3,264	15	764	4.27	59.62	194.97	636,382
Total year 2010	**4,165**	**17,018**	**60**	**4,195**	**4.06**	**77.71**	**168.95**	**2,778,448**

** Patients at the start of the period + Patients entering in the period + Patients transferred from other department during the period*

Thus in the table no. 1 by the formula [a], resulting amount of 2,327,096 lei, representing the hospital services bought by HIH from the analyzed hospital.

[a] **Number of cases x CMI x Coefficient K x RWC**

In the table no. 2 by the formula [b] resulting amount of 3,954,897 lei, representing the exact quantification of the amount achieved by each department in part by funding of cases discharged.

[b] **(Number of discharged cases - 50% x Number of cases readmitted and transferred) x CMI x K x RWC**

In the table no. 3, costs of each department can be calculated simply by using the following formula, proposed further: The result of this calculation, ie amount of 2,778,448 lei, represents the actual cost which patients treated and discharged from each department have generated in the hospital analyzed.

[c] **Rate per day of hospitalization x ALOS x Number of cases discharged**

The advantage of the analyzed hospital is that has a powerful Integrated Medical Information System, purchased under a project funded by external grants, which allows calculation of costs per patient, respectively on each hospital observation form (admission episode), and thus, calculating the tariff for a day of hospitalization in each department. [1]

The difference between the amount realized theoretically [b] and the amount contracted with HIH [a] is clearly positive (+1,627,801 lei) and is the amount that the hospital would have had to cash in addition to contracted budget, because, regardless of the resources consumed by patients discharged, the amount of 3,954,897 lei reflects the actual funding of cases discharged in the hospital analyzed according to the DRG mechanism.

[1] The rate per day of continuous hospitalization includes the value of medicines, medical materials or services that can not be identified at the patient level.

By comparing the actual value of discharged cases [b] with the cost to treat patients [c], it results a surplus of 1,176,449 lei - savings achieved which would have been kept in the hospital for investment activity.

The difference between the contracted budget [a] and the costs incurred to resolve all cases [c] is a negative (- 451,353 lei), representing a deficit resulting from the fact that the hospital has treated a total of 4195 patients, and charged the equivalent of only 2790 of cases.

In concrete terms, although the hospital activity is profitable, so economically efficient, resulting in more than 50% (4195 realized cases to 2790 contracted), the hospital received 17% less than it spent (2,327,096 lei cashed to 2,778,448 lei expended) and 41% less than realized (2,327,096 lei cashed to 3,954,897 lei realized).

The situation is almost unreal and unfairly, as follows: the hospital has treated 4195 patients, of which only 4113 cases validated by DRG and only 2790 cases paid by HIH(!) Therefore, it results a number of 1405 cases discharged from hospital, for which there was no "leu" returned from the National Unique Health Insurance Fund (FNUASS), patients being treated from the hospital savings.

If the HIH, as a customer of the hospital, would have bought all medical services performed by the hospital, we can say with conviction that healthcare, led by a management team well prepared, is a very profitable activity: the value of all cases discharged and validated in 2010 ie 4113 cases, mean revenues totaling 3,954,897 lei, plus the 82 cases invalidated by DRG (4195 realized cases *minus* 4113 validated).

To obtain at least *fictional this revenue*, the hospital performed the *actual expenditures* 2,778,448 lei, resulting in a surplus of 1,176,449 lei, the absolute amount sufficient to purchase modern medical equipment, for example, a chapter that most hospitals in Romania are very poorly. In fact, although the hospital has spent 2,778,448 lei for 4195 discharged cases, the revenue from HIH, under contract, were 2,327,096 lei cashed for only 2790 cases.

Extrapolating, if the hospital would be treated only 2790 patients (cases reimbursed by HIH), the costs were worth 1,909,795 lei, and the surplus would have been 868,654 lei, as follows:

Table 1 Costs for cases contracted with HIH

Medical departments	Number of cases contracted with HIH	Cost per day of hospitalization (lei)	Patient days	Total costs (lei)
1	2	3	4	5=3x4
General Surgery	621	204.93	1,786	366,005
Internal Medicine	769	119.96	4,206	504,552
Neonatology	130	121.32	795	96,449
Obstetrics&Gynecology	645	203.57	2,053	417,929
Pediatrics	625	194.97	2,692	524,859
Total year 2010	**2,790**	**168.95**	**11,532**	**1,909,795**

6. Conclusion

Our approach generates only type sintetico-analytical results and is not therefore in the category of high-performance solutions. But no matter how comforting conclusions reached, it seems, however, very little credible that in a hospital in Romania to be a real economic efficiency so great. Practical experience makes experts to affirm that such a situation can be caused by several possible causes [2]:

a) The absence of certain costs from general calculation of efficiency of hospital, such as those generated in departments that do not report discharges. For example, Emergency Room costs are not included in the cost of hospitalization day calculated for each medical department from within DRG. The simplest solution would be the breakdown of expenditure made by ER evenly over all the beds

that are reported in DRG. The correct solution is, however, the distribution of those costs to departments they belong the patients who stayed in the ER. This method however requires dedicated software.

b) Some deficiencies in monitoring DRG: tariffs by groups of specialties are not consistent with the complexity of disease and thus laborious medical maneuvers such as malformations of the neonate, are undervalued. Also, the cases of admissions under 24 hours or children without personal identification number are not scored. Failing a real score based on the degree of difficulty and complexity of cases resolved is another impediment to accurate assessment of hospital efficiency.

c) Reducing deliberate, for various reasons, of expenditure commitments by the credit holder, but with compromised quality of healthcare, is a situation where economic efficiency is only apparent; option of credit holder is based on the need to generate financial resources, or for payment of prior debt, or for commitment to infrastructure expenditure absolutely necessary in the absence of dedicated funding (eg, lack of participation by the County Council or the City Hall, as owners, to capital repairs or investments necessary for the strategic development of the hospital).

d) Application of statistical calculations on small time intervals (monthly versus quarterly or annually) can generate the emergence of significant errors. It was found that the maximum distortion of method is due to the calculated average length of stay (ALOS), which is highly negatively influenced by the number of patients (patients existing and remaining in hospital) during the reporting month. Specifically, the average length of stay is calculated by the following formula:

$$ALOS_{department} = \frac{\text{Patient days for patients discharged}}{\text{Patients at the start of the period + Patients entering in the period + Patients transferred from other department during the period}}$$

Returning to our example, we emphasize the difference between «number of patients discharged» (4195) and «number of patients at the start of the period + patients entering in the period + patients transferred from other department during the period» (4165). The difference in 30 patients can give distortions in DRG monthly calculations.

Therefore, economic efficiency calculated monthly is higher than the real one. The manager, as direct beneficiary of the data, must know, however, that values of economic efficiency will regulate constantly, having the exact value at the end of the financial year.

It is clear that the factors explained above can influence major the economic efficiency analysis of activity in a hospital, so it is mandatory to be discussed with the utmost honesty.

Most of these deficiencies in estimating the economic efficiency of hospital services can be remedied by using costing tools provided by management accounting.

7. References

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