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COST ACCOUNTING SYSTEM EVOLUTION IN HEALTH CARE ORGANIZATIONS – CURRENT STATE AND PERSPECTIVES

Introduction

An accounting system, which is a tool to generate economic information, is a subject to periodic updates and modifications that are made both as a result of disclosing areas that previously have not been the subject of its interest, or areas that have been transformed, resulting from the changing operating conditions of business entities in the market economy, primarily related to the intensification of globalization, economic development and a high rate of technological progress. An accounting element that requires appropriate modification is a cost accounting subsystem, which affects not only the changing requirements of the environment, but also the transformation of product creation processes of the entities involved. The industry specificity, in which the business entity operates, the size of business operations, as well as the information requirements imposed by management, are the main determinants of endogenous formative requirements in the accounting system, including the cost accounting.

The purpose of the presented article is to analyze and assess the currently operating cost accounting system of public health care entities in Poland as well as prospects of and challenges facing the system in terms of efficient use of limited health care funding.

The considerations, as well as drawn conclusions will be based on the domestic and foreign subject literature analysis, the examination of national regulations, the methods of deduction and synthesis.

1. Systemic specific determinants of medical entities cost accounting

A health care entity is an entity performing medical activities in the light of the provisions of the Act on Medical Activity¹. The medical activity consists in providing health services, namely the implementation of activities aimed at preserving, saving, restoring or improving health, and the implementation of other medical activities, resulting from a treatment process or other regulations defining rules for their implementation. The medical activity, in addition to health care services, also includes activities in the field of health promotion and the implementation of teaching and research tasks in connection with providing health services and health promotion (in clinical hospitals, research institutes, organizational units of other health care entities available to a medical university to implement these activities)².

The activity in the field of health care is a subject to strict regulation by the state. The main reason for this is the fact that health care is an exceptional area specifically designed to meet some of the most important human needs – health and life protection. For this reason, and also taking into account the progress of civilization, social development, economic development, directions of state policy, health care is financed from public funds. The level of funding varies, often measured by share of public spending in GDP; it is generally higher in developed countries and lower in developing countries with medium or low rate of economic growth, as well in the period of political and economic transition. At the same time, with a view of the presented factors, a trend is observed to increase the range of health care services financed from public funds. This trend, however, meets with counterbalance factors, which are mainly the phenomena of: an aging population, the disclosure of civilization diseases, the rapid increase rate in the cost of new technologies used in medicine, the rise in the health awareness of the society, which all cause not only an increase in the consumption of health services (quantitative), but notably the increase in the cost of providing these services (globally and individually).

In the case of financing health services by the state we deal with the expenditure of public funds, which allocation lines should be a subject to tight control, not only in terms of their proper disbursement, but also their proper allocation so important under the conditions of limited financial resources.

¹ The Act of 15 April 2011 on the Medical Activity (Journal of Laws 112, item. 654 as amended).

² See: Ibid. section 2, subsection 1, paragraph 10. and section 3, subsection 1.

The presented above factors constitute, it seems, important premises for the specific regulation of health services cost accounting, which, if meets the quality requirements set for it, can be one of the basic tools of effective and efficient allocation of public resources. Cost accounting also facilitates the purchase of health services by private insurance companies, which may provide a significant, additional financial source of health care system funding. The condition for such an allocation is simultaneous supporting of a health services financing system by data generated by a reliable cost accounting system of health care entities.

2. Cost accounting in health care entities – past state

The health care sector has been a subject to a profound transformation in the recent decades, not only in Poland, both in organizational and financial terms. The change determinants were different in each country, however, in all countries the main idea was based on the gradual expansion of concern for human health care and life, also by the way of regulating this system. A partial explanation of the current organizational, financial state of health care in Poland, and of other its aspects, should be sought in the previous years of its operation, particularly after World War I.

At the end of World War I, the health care was granted a high rank, which was seen by both the establishment of Patients' Funds (initially they covered about 15% of the population), but also the foundation of the Public Health Ministry in 1918. Among the entities conducting medical activity there operated both public (publicly funded) and private medical facilities. The development of the health care system was stopped and the available resources destroyed by the outbreak of World War II³.

At the end of World War II, the health care system in Poland was formed as a socialist model, based on the Siemaszko model formula, in which every citizen had equal access to health care. The responsibility for the organization and financing of health care fell, therefore, on the state. In connection with the political system operating at that time, the health system was, in fact, an additional tool to control society. Gradually, a private initiative was driven out, followed by the nationalization of pharmacies and health care institutions. The public health institutions did not have legal entity and could not have exercised control over their worked out financial results⁴. The first reforms of the legal form of health

³ More: *Health service in Poland*. Polish Medical Publishers, Warsaw 1975, s. 5, 15, 23.

⁴ J. Niżnik: *W poszukiwaniu racjonalnego systemu finansowania ochrony zdrowia*. Branta, Kraków 2004, p. 152, 153.

care entities were the result of changes in economic and political system, and were conducted from about 1991⁵, although it is generally believed that they began in 1999. In connection with the health care institutions becoming independent (so far they had been operating as budgetary units) there were successively introduced changes to the rules of public entities financing that ultimately were required to apply for public funding through general and competitive contests for the health services provision.

Until 1999 the financing of a large part of institutions was carried out in accordance with the subject based system, which involved the transfer of funds for specific entities, regardless of the amount of the costs incurred, the type, quantity and quality of services and the usefulness of the medical facility to the environment. In this system, the resources allocation algorithm was usually the number of hospital beds, regular posts or premises, as well as the amount of funds provided in the previous year, and the priority in the order of allocation was given to stationary health care. The subject based health care financing system was not a causative factor for the detailed cost accounting records in health care institutions, while being conducive to fraud and waste of public money.

At a time, when health care institutions operated as budgetary units, the only cost accounting record was the expenditure incurred by them, including chapters and paragraphs of budgetary classification, while the cost accounting was very poor, often coming down to cost value recognition in one cost by type account (with a possible further, slight analytical extension). Detailed cost accounting in these entities has been expanded from 1993 only, by enacting an ordinance on detailed rules for recording revenue and expenses in public health care institutions⁶. The cost accounting records of costs, previously carried out only by breakdown of costs by type, were expanded by the breakdown of costs by function, which highlights the direct and indirect sources of incurring costs. At the same time, the objective breakdown of costs was not used, although within the cost centres it was possible to establish the average and, therefore, a highly aggregated unit cost of a product created in this centre (not taking into

⁵ Passing: the Act of 30 August 1991. on Health Care Institutions (Journal of Laws No 91, item. 408, as amended), The Council of Ministers Regulation of 13 July 1993. on defining the tasks and competences in the field of general and special government administration, which may be provided to some municipalities about the status of the city, along with property used, as well as the rules and procedures for the transfer (Journal of Laws No 65, item. 309) , the Act of 24 November 1995 amending the scope of some of the cities and urban areas of public services. (Journal of Laws No. 141, item. 692).

⁶ Ordinance of the Minister of Health and Social Welfare of 15 June 1992 laying down detailed rules for recording revenue and expenses in the public healthcare institutions (MP 1992, No. 19, item. 1943).

account product differentiation of primary centres). Within the cost centres there were established performance centres, being a final patient treatment site (a hospital ward, clinic, emergency centre) and of supportive (ancillary) nature centres, which are intermediate points, supporting the treatment processes. Among the service centres were distinguished medical (diagnostic and medical laboratories, admission room, pharmacy, etc.) and non-medical ones (kitchen, laundry room, Management Board and administration, and other). There were two methods used of indirect costs allocation between centres: the top-down method and dual cost sharing method for service centres, in which the centres' direct costs were transferred to other performance and service centres, and indirect costs to performance centres only⁷. In this system it was possible to determine the average cost of treating a patient regardless of the type of illness or the average cost per one bed or per-diem of care and, therefore, highly aggregated data, and not very useful. Determining the average cost of treating a patient, without taking into account the particular type of disease, is a big generalization, often implying a dramatic difference in a treatment cost⁸.

An attempt to solve the presented defects was the issue of the regulation on the cost accounting in public health care institutions⁹ in the form of the provisions of Section 62 of the Act on Health Care Institutions. This Act, with effect from 1st July 2011 was replaced by the Law on Medical Activity¹⁰, that did not manifold the legal basis for the quoted regulation, which means that from that date it ceased to apply formally. However, the provisions of this regulation are still used in business practice in the public health care entities, resulting in the cost accounting being still based on the specified, already outdated legal basis in these institutions.

3. Cost accounting in health care entities – current state

The presented regulatory changes in the cost accounting of public health care institutions were not only caused by the transformation of most of these units, from the business entities operating in the form of budgetary units to the business entities conducting business activity on their own account and having legal personality. Simultaneously, there was introduced a completely revolutionary, based on the directives of the Council of the European Union, Accounting

⁷ These methods are known in the literature as iterative method (successive approximation) and direct costs method.

⁸ More: F. Gajek: *Nowy rachunek kosztów w opiece zdrowotnej*. Key Text, Warszawa 1999, s. 23 and further.

⁹ The regulation of the Minister of Health and Social Welfare of 22 December 1998 on specific cost accounting principles in public health institutions (Journal of Laws No. 164, item. 1194).

¹⁰ The Act of 15 April 2011 on the medical..., op. cit.

Act¹¹, but, first of all, the change of health care financing methods, from the subjective based to the objective based, which linked the allocation of public funds to the actual performance of health services. The new approach to medical entities financing has forced the need to manage these entities on the basis of economic calculus, allowing for the effective management of available resources, which in turn has forced the need to provide timely, reliable and useful economic information, generated mainly by the cost accounting. Therefore, the primary objective of the newly introduced legislation was to allow the health care entities to determine more reliable unit cost of provided health services.

The currently used cost accounting in medical entities is systematic full cost accounting mostly. The existing cost accounting solutions in medical entities bring the following division into the cost centres, including¹²:

- a) cost centres: a core activity, in which health services are provided (including final and indirect), an ancillary services, supporting the core activity; the Management Board, involved in the unit management as a whole;
- b) separated areas of activity.

The freedom of determining a detailed list of these centres with special reference to the cost objects was given to director of medical entity. However, the basic cost drivers (objects) were indicated, subject to the separation of the core and ancillary activity centres (Fig. 1).

Cost centres of an ancillary (non-medical) activity		Cost centres of a core (medical) activity
Hospital wards	Medical laboratories, diagnostic rooms	Sterilization, laundry, kitchen, boiler room, repair and transport departments, etc.
Per-diem of medical care, a patient (group) with assigned for medicines and medical procedures	Medical procedures (individual, group)	Services provided by the centres (sterilized packaging, kilograms of washed laundry, the number of meals delivered, meters of heated surface, the number of hours, number of kilometres driven, etc.), transport, etc.

Fig. 1. Cost objects in medical entities

Source: Own study.

¹¹ The Act of 29 September 1994 on accounting (consolidated text: Journal of Laws 152, item. 1223, from 2009, as amended).

¹² See: Clause 1, Subsection 1 and 2 of the regulation on specific..., op.cit.

In the currently used cost accounting solutions of most health care entities the record of cost accounting is conducted in two systems: by type (Table 1), in which more detailed records than required under the Accounting Act are carried out¹³, and a subjective-objective system, in which direct costs and indirect cost drivers (objects) are also highlighted in the distinguished cost centres¹⁴. The development of costs by type analytical records is governed by the provisions of the discussed regulation, however, in practice of health care entities it is a subject to even greater particularization, mainly to meet a number of reporting obligations (budgetary reporting)¹⁵.

Table 1

Types of prime costs in medical entities

Type of cost	Analytical explication
Material consumption	<ul style="list-style-type: none"> – medicine – food – disposable equipment – chemical reagents and diagnostic materials – fuel
Energy consumption	<ul style="list-style-type: none"> – electric power – heating energy
Outsourcing	<ul style="list-style-type: none"> – repair services – transport services – medical services – other services
Taxes and charges	–
Wages	<ul style="list-style-type: none"> – wages from employment relationship – wages of mandate contracts and contracts to perform specific Tasks
Employee benefits	<ul style="list-style-type: none"> – social insurance and health contributions, labour fund – deductions for employee benefit fund
Amortization /Depreciation	
Other costs	<ul style="list-style-type: none"> – business trips – civil liability and property insurance

Source: Own study based on Art. 2, section. 2 of the regulation on the specific cost accounting principles in public health care entities, op. cit.

¹³ See: Appendix No. 1 to the Accounting Act, op. cit

¹⁴ For more on the records of costs by type and by type/activity centre in a health care entity writes M. Hass-Symotiuk in: *Wzorcowy plan kont a rachunkowość finansowa i zarządca podmiotów leczniczych*. Red. M. Hass-Symotiuk. Wolters Kluwer Poland, Warszawa 2012, s. 310-363.

¹⁵ More: A. Szewieczek: *Elementy rachunkowości w podmiocie leczniczym*. Wydawnictwo Uniwersytetu Ekonomicznego, Katowice 2011, s. 85-100.

From the perspective of determining the unit cost of treating a patient or a group of patients are important indications of the cost calculation procedure. The cost of treating a patient includes the cost of assigned medicines¹⁶ with pharmacy mark-up costs, medical procedures, but also the cost of per-diem of care in a hospital ward. Thus, the job-order costing methodology is used to determine the total cost of patient's treatment, as well as a process costing (for fixing the cost of per-diem of hospital care). In addition, another commonly used method of calculation is the RVU (Relative Value Unit) costing, used for determining the unit cost of the implementation of medical procedures (diagnostic and laboratory tests, rehabilitation). Each diagnostic or medical laboratory has a list of procedures performed, together with an indication of normative quantities of direct materials and direct labour used for their typical execution and they are adequately priced. The values obtained in such a way are conversion factors used to account for the overhead costs of common procedures execution. In practice, due to the limited capacity of some commonly used computer programs, these values are summed up and applied together as a single coefficient for the total centre cost. While in the expanded calculating formula value of normative direct material consumption is used to charge costs of direct materials centre, the value of normative direct labour consumption is used to charge the centre direct payroll, and the sum of these two values of normative costs is used to calculate other centre costs.

The almost-twelve-year practice of applying the above synthetically presented cost accounting solutions pointed to many inconsistencies and irregularities. Health care entities have considerable scope of activity, for which there is no uniform methodology¹⁷ for determining the unit cost, but also great scope of activity that has not been regulated enough or not at all. The current solutions are based on the full cost accounting system, however, the changes taking place in the business environment during the last years set new goals and objectives before the accounting system of entities. Therefore, the operating solutions are sub-

¹⁶ There are different methods of allocating costs for medicines use for particular patients, which may vary considerably given the unit cost of treatment, more broadly Szewieczek A.: Analiza elementów składowych świadczenia medycznego w aspekcie tworzenia jego wartości, in: *Zintegrowany system pomiarów dokonań w rachunkowości*. Red. H. Buk, A.M. Kostur. Wydawnictwo Akademii Ekonomicznej, Katowice 2009, s. 365-366.

¹⁷ More: D. Negrini, A. Kettle, L. Sheppard, G.H. Mills, D.L. Edbrooke: *The Cost of a Hospital Ward In Europe: Is there a Methodology Available to Accurately Measure the Costs?* "Journal of Health Organization and Management" 2004, Vol. 18, No. 2/3, s. 195-206; J. Sobiech: *Mechanizmy finansowania szpitali*. W: J. Rój, J. Sobiech: *Zarządzanie finansami szpitala*. Wolters Kluwer Polska, Warszawa 2006, s. 173; P.T. Nerlewski: *Wnioski i uwagi z badań sprawozdań finansowych przeprowadzonych w samodzielnych publicznych zakładach opieki zdrowotnej*. „Rachunkowość w Jednostkach Ochrony Zdrowia” June 2003, No 1(1), s. 16; A. Musiałowicz: *Zgadywanka*. „Służba Zdrowia” 23.01.2006, a supplement: Szpital Polski No. 2/2006, s. 32.

ject to criticism, mainly in the field of cost accounting. The most important, most often indicated flaws and shortcomings of the currently used cost accounting solutions in medical entities include:

- the use of full cost accounting system, not taking into account the cost of unused health resources (necessary to hold and unnecessary);
- the use of cost driver for indirect costs based mainly on the size of entity's operations, not reflecting a causal relationship between the settled costs and the selected driver;
- the settlement problem of increasing the indirect costs share and the fixed costs in the value of calculated health services costs;
- the lack of possibilities to distinguish the stand-by costs of providing health care services, which are necessary for meeting the contracts with the National Health Fund, follows from the probabilistic nature of the health needs occurrence and resulting in fluctuations in the demand for health services;
- the lack of connection with the process nature of providing health services.

Apart from the above defects, or shortcomings of traditional cost accounting system solutions, the actual level of its use in health care should be mentioned. Despite the fact that the cited regulation on specific cost accounting principles in the public health care entities took effect from 1999, its widespread implementation in these entities took the following years, while the degree and quality of this implementation raises many questions. In many cases, the evaluation of medical procedures was clumsy, unreliable or with a considerable delay. Very often the problems of reliable medical procedures valuation were related (and still are) to the need to prepare the basics of their valuation by medical personnel, often not understanding the nature of economic issues.

The usefulness of cost information for management purposes, evaluated on the basis of questionnaires conducted in the health care entities, has been confirmed and it can be stated that the cost information plays an important role in the information provided to different groups of stakeholders. At the same time, for the management purposes of one of the most important cost information piece is a breakdown of the costs to individual hospital wards, and information on the total cost of health care products and services. On the other hand, from the perspective of assessing the health services cost for the process to enter into contracts with the National Health Fund, one of the main drawbacks of the currently used solutions is the lack of cost accounting adjustments applied to the financing of the procedures by DRG¹⁸.

¹⁸ See: H. Jakimowicz: *Szpital jako podmiot generowania informacji na potrzeby oceny dokonań w świetle badań*. W: *Koncepcja sprawozdawczości szpitali na potrzeby zintegrowanego systemu oceny dokonań*. Red. M. Hass-Symotiuik. Wydawnictwo Naukowe Uniwersytetu Szczecińskiego, Szczecin 2010, s. 58-61.

4. Cost accounting in health care entities – perspectives

The presented, as well as many other, disadvantages of the currently used cost accounting solutions in medical entities result in a complete lack of industry comparisons. When hospitals with similar characteristics, present financial data, there is no possibility of an objective and fair comparison. Considering the freedom of conducting an economic activity there is no need for this, but the activity in health care is different from a typical, operating entirely on market principles economic, activity. Firstly, in the entities of this industry the public resources are consumed, and secondly, these entities work for the protection of human health and life. At the same time this industry, not only in Poland, is facing major problems of funding. Thus, if a bargaining chip in the ongoing financial negotiations with payers is reliable cost information, it must not only be generated on the basis of properly, timely and reliably maintained cost accounting, but first of all, on the basis of such a system that corresponds to the changing demands of the environment, including the methods of financing health services.

In fact the cost accounting is designed to determine the most actual cost of health care services, and further to be a tool of the cost management support through optimal allocation of resources to maximize capacity utilization, to support the process of continuous quality improvement¹⁹. This system fulfils a number of functions, among which the most important are: information, evidence, reporting, control and analytical²⁰.

The change of financing health services methods, introduced in 2008, which omits the used before, a very detailed directory of services, and introduces the funding on the basis of the so-called: Diagnosis Related Groups (DRG), is an important causative factor affecting the pressures to introduce changes to cost calculation rules²¹. The valuation of services combined in uniform groups, very similar in terms of process and financial aspects of disease entities, requires reliable cost information, allowing for their optimal profitability. On the one hand, this cost information ensures effective spending of public funds, on the other hand, it allows for following the principle of self-financing and development of health care entities.

¹⁹ See: J.J. Baker, G.F. Boyd: *Activity-Based Costing in the Operating Room at Valley View Hospital*. „Journal of Health Care Finance”, Fall 1997 (24), 1.

²⁰ See: K. Sawicki: *Ogólne zagadnienia rachunku kosztów*; in: *Rachunek kosztów*. Red. K. Sawicki. Fundacja Rozwoju Rachunkowości w Polsce, Warszawa 1996, s. 37.

²¹ The analysis of the areas generating the cost information, in terms of their adjustment to the funding procedures based on Diagnosis Related Groups are presented in the article: A. Szewieczek: *Wpływ finansowania w systemie jednorodnych grup pacjentów na ewolucję systemu rachunku kosztów jednostek opieki zdrowotnej*. W: *Kierunki doskonalenia usług w ochronie zdrowia*. Red. M. Lisiecka-Bielanowicz, B. Samoliński, P. Warczyński. Ministerstwo Zdrowia, Warszawa 2010, s. 194-204.

In response to the deficiencies of implemented cost accounting solutions the Ministry of Health has been undertaking the effort to make changes in this area for several years. Finally, the co-operation on the development of cost accounting solutions in health care has been established with a team of scientists from the Warsaw School of Economics led by Professor G.K. Świdorska Ph.D. The work of the Health Ministry on the issue was conducted with varying degrees of intensity, but only in the last year its effects began to be seen and presented to the public. In the second half of 2011, the project on cost accounting standards in medical entities was created, but only in September 2012, the Ministry of Health announced the assumptions about cost accounting in hospitals²² to be enlisted to legislative work of the Council of Ministers. The proposed provisions, taking into account Diagnosis Related Groups as the cost objects, provide the resource approach to cost accounting, identifying the cost of unused resources, including readiness to provide health services²³. A new approach to cost accounting is to create a flexible and multi-dimensional system, allowing for the identification of the causes of cost, their planning, control and management²⁴.

This designed system still has a systematic character, but the standard cost accounting assumptions are applied to its large part. Among the main assumptions of the new system, the following should be noted²⁵:

1. The application of the current division of the cost centres into the core and ancillary activities as well as the Management Board.
2. Still highlighting – from the perspective of determining the patient treatment cost – the cost of used medicinal products and medical devices, medical procedures performed and allocated costs of per-diem care in a hospital.
3. Identification, especially for core activity costs, eight categories of prime costs (record of costs in cost centres is firstly conducted in section of eight cost categories and then the next level of detailed analysis in the form of specific prime cost) including:
 - medicinal products (e.g. medicines, blood, blood products, medical gases);

²² See: A. Pokojńska: *Tworzenie rachunku kosztów przez zakłady opieki zdrowotnej ma być uregulowane*. „Dziennik Gazeta Prawna”, 18.09.2012.

²³ See: G.K. Świdorska, M. Raulinajtys: *Rachunek kosztów działań jako podstawa wyceny usług*. Zeszyty Teoretyczne Rachunkowości, Volume 49 (105). Stowarzyszenie Księgowych, Warszawa 2009, s. 261-264.

²⁴ See: *Rachunek kosztów w Zakładzie Opieki Zdrowotnej. Podręcznik*. Red. G.K. Świdorska. SGH, Warszawa 2011, s. 17.

²⁵ See: *Ibid.*, s. 20-36; *Instrukcja kosztów dla Zakładów Opieki Zdrowotnej*. Red. G.K. Świdorska. SGH, Warszawa 2011, s. 25-27.

- medical and non-medical materials used at one time (e.g. syringes, catheter, bandages, sutures, office supplies and cleaning products);
 - multiple use medical products and other materials which are not fixed assets (e.g. bedding, small surgical tools, small equipment for diagnostic testing);
 - fixed assets and intangible assets;
 - Human Resources (e.g. wages from employment contracts and civil contracts, and mark-ups on wages, allowances for funds established in connection with the employment of staff, the research cost, health and safety activities, personnel liability insurance costs);
 - premises (including costs: rent, depreciation, ongoing operation, repair and maintenance, insurance, taxes and charges associated with them);
 - external services purchased for the patient, mainly of medical nature, but also other services such as food;
 - services from other centres costs of core and ancillary activities.
4. Distinction of flexible resources among the economic resources used and involved, acquired as the needs of their current use arise (e.g. medicines, medical procedures), and involved resources which are required to be purchased ahead of time, to maintain the capacity to provide health services (such as human resources, premises, equipment).
5. Determining the theoretical and practical²⁶ availability of resources, including stand-by costs incurred, i.e. mainly the costs associated with the need to ensure constant access to health care services (e.g. providing equipment and personnel in order to meet the requirements of the payer, maintenance of the round-the-clock access to services, etc.).

The process of creating cost system information is implemented using three basic modules (elements), representing together one cost accounting system:

- medical information about patients;
- financial and accounting system, recording the costs incurred currently, taking into account the highlighted above prime costs categories;
- controlling module used to determine the planned costs, significant for cost control and management (i.e. resources, medical procedures, hospitalization, patients, readiness, cost centres, etc.), in which are identified and grouped financial and non-financial data.

²⁶ The practical availability of resources is the adjusted theoretical availability for such factors as: the planned interruptions for maintenance, repairs, services, downtime due to sickness leave and employees' leave, time spent on physiological functions, training, and preparation for work, working shifts.

A new feature in this approach is the application of controlling module that allows to connect real costs of medicinal products and medical devices (flexible resources, whose costs are determined on the basis of actual consumption and actual prices – in different, individual cases, or on the basis of standard consumption and standard prices – in typical cases, or as the ratio of the total planned costs and planned cost driver volume – in the case of insignificant cost) consumed to treat a patient with the projected cost of per-diem or per-hour of the patient's stay, and also with planned cost of medical procedures. In the process of determining the consumed resources planned cost²⁷ for per-diem or per-hour care in the hospital (with the separation of stay costs and nursing and medical care costs), as well as for the medical procedures the resources needed to provide the stand-by and resources unused are separated. Determining the value of unused potential is the difference of practical ability (or availability) of resource and the amount of that resource used to provide services. The unit cost of the resources involved is calculated by dividing the planned cost of resource and practical resource availability expressed in the unit of its measurement. The unused potential set in this manner is divided into stand-by costs and unused potential costs²⁸. The stand-by costs are calculated in the controlling module and are the part of the resources involved, but which are not used in the process of providing health care services, because they are required to maintain the entity ready to carry health services.

Finally, to the determined cost of treating a patient are added the stand-by costs and overhead costs²⁹. As a result, the final cost of patient treatment is established, which does not include the cost of unused potential.

In parallel to the relatively slow ongoing legislative changes some training sessions for practitioners of health care institutions are carried out. Training on changes in the medical entities' cost accounting are implemented as a partnership project of the Ministry of Health and the Warsaw School of Economics, within the framework of the Human Capital Operational Programme³⁰.

²⁷ The basis for determining the cost of the planned costs are the costs shifted in the previous period adjusted accordingly to the conditions of the current operation.

²⁸ See: *Rachunek kosztów...*, op. cit., s. 92.

²⁹ See: *Ibid.*, s. 47-49.

³⁰ This project is called: Modern management in health care entities. In its framework, manuals have been developed in the field of cost accounting in the new medical entities and the restructuring and consolidation of these entities, as well as training series (for about 6,000 people) on this subject. The main objective of the project is the training of medical entities management of the possibilities of using management accounting tools and methodologies for the creation of information about the costs of health services, and dissemination of knowledge about the restructuring tools of these entities, creating models of integrated health care and others. More about the project: www.nzzoz.mz.gov.pl, access: 21.09.2012.

Generally, the new concept of cost accounting in medical entities aims to provide useful and reliable information for the purposes of cost management, in particular with regard to:

- the costs of resources used and unused, also in particular cost centres,
- stand-by costs of providing health services,
- the cost of the treatment of individual patients (or their groups)³¹.

5. Polish solutions and international trends

The main accusation against the cost accounting in medical entities is the inability to establish a credible and reliable cost of a health service and its comparison with the price proposed by the payer. This defect has been heightened by the introduction of the financing principles based on the DRG groups. Bearing in mind that these rules (DRG) are developing in other countries, it is possible to state that the problems of adequate cost information also occur there, although their scale will undoubtedly vary, and will depend mainly on the quality of previously used solutions of records, calculation and reporting of costs, their universality as well as obligatory or voluntary use (Table 2).

Table 2

Cost accounting of health care entities in different countries

Country	Mandatory cost accounting system	National costing guidelines	Cost accounting data used for developing DRG prices	Number (share) of cost collecting hospitals
Austria	-	-	X	20 reference hospitals (~8% of all hospitals)
England	X	X	X	All hospitals
Estonia	-	-	X	All hospitals
Finland	-	-	X	5 reference hospitals meeting particular cost accounting standards (~30% of specialised care)
France	-	X	X	99 volunteering hospitals participating in the hospital cost database ENCC (~13% of inpatient admissions)
Germany	-	X	X	125 volunteering hospitals meeting InEK cost accounting standards (~6% of all hospitals)
Ireland	-	X	-	-
Poland	-	-	-	-
Portugal	X	X	-	-
Netherlands	X	X	X	Unit costs: 15-25 volunteering general hospitals (~24% of all hospitals)
Spain	-	-	-	-
Sweden	-	X	X	Hospitals with case costing systems (~62% of inpatient admissions)

Source: A. Geissler: *DRGs and Cost Accounting Across Europe: Which is Driving Which?* http://eurodrp.projects.tu-berlin.de/publications/Bayreuth_2011.03.22.ag_DGGOE.pdf, access: 21.09.2012.

³¹ See: *Rachunek kosztów...*, op. cit., s. 125.

At the same time, common international initiatives are conducted to study the functioning of DRG groups mainly, including the costs aspect in health care entities and their accounting. The international project *EuroDRG – European system of Diagnosis-related Groups*, implemented within the 7th Framework Programme, in which the National Health Fund was the Polish participant, was implemented in the period from early 2009 to late 2011. The main objective of the project was the comparison of the hospital services costs and prices including structural factors at the national, regional and hospital (patient's perspective) level, to clarify the differences in the levels of these values in particular European countries, but also the systematic comparative analysis of selected groups of European hospitals³². In order to verify the cost data, the entities participating in the project were provided with a computer program for the collection of uniform cost data. One of the formulated conclusions was (on the example of a selected case of illness), the statement that it is common what we see in the Polish health care system, namely that no one knows the true costs of treatment³³. Another statement was that in the process of setting prices for medical services the demographic and clinical factors, not only the actual costs, should be considered in the process of determining them. At the same time, the cost accounting system is essential not only for proper medical cost management and identifying sources of resources consumption (internal perspective), but also for the proper development of the DRG (external perspective). Currently, it is difficult to conduct cost comparability of European hospitals, not only because of the significant differences in the amount of overhead costs, but also because of the different solutions used in the cost accounting. On the other hand, the issue of diversity of applied cost accounting solutions is important from the perspective of the development of DRG systems uniformity. In addition, the differences in the cost accounting system design and the quality of the generated cost information, as in Poland as in other countries, varies, among hospitals too. In such a case, based on the poor quality cost data, payments in the DRG system, are inadequate, and management actions may be misguided.

There is a mutual interaction between these two systems (cost accounting and DRG). Undoubtedly, the introduction of the health care services financing system based on DRG increased the usefulness of cost accounting solutions applied, and the data generated in this system, in turn, affect the modification in the

³² 11 countries took part in the project: Austria, the United Kingdom, Estonia, Finland, France, Germany, Ireland, the Netherlands, Poland, Spain, Sweden). Among Polish hospitals to participate in the project were selected large entities that meet the criteria for inclusion in the research group. The object of the analysis was 10 commonly occurring medical episodes.

³³ See: A. Street: *The Ability of DRG Systems to Explain Variations in Resource Consumption*. European Conference Health Economics, Zurich, 18-20 July 2012; www.eurodrgr.eu, access: 21.09.2012.

DRG. However, the introduction of national guidelines allows for the further development of cost accounting, whereas from the management perspective it is possible to use clear incentives to improve the quality of cost accounting in medical entities³⁴. Observing the development and widespread use of DRG system for financing health services in other European countries it is possible to conclude that the cost accounting systems will evolve in many countries.

Conclusion

The current cost accounting functionality in medical entities does not meet the requirements imposed on the system by the environment. Neither is this system widely used in health care, because its obligatory application does not refer to the private entities, even if the owner is the public sector, nor does it reflect the actual product development process in the form of health services.

However, in conditions of limited funding, the allocation of financial resources, adopted to the real needs, is particularly important, including detailed procedures for their use, and the most important tip in this regard is accurate and reliable cost information. It is, therefore, necessary not only to adjust the cost accounting solutions to the system of public funds transfer to healthcare providers, but also to take into account the characteristics of health services that differentiate the cost accounting solutions in relation to entities from other industries, and simultaneously need to be taken into account in the development of cost information. From the perspective of medical entities there is an urgent need both to adapt cost accounting solutions to the cost objects in the form of DRG groups, as well as to take into account the necessary and often high costs of maintaining readiness to protect the health needs of the population.

The lack of useful management information of costs in health care is a fact repeatedly confirmed in Poland, but also the international research shows that this problem occurs not only in our country. Simultaneously, the mandatory and widespread nature of the uniform cost accounting solutions application in each country is different. What remains is to determine not only the principles and rules of the new solutions, but also the universality of their application in all medical entities, or public medical entities only, or only in some representative group of entities.

³⁴ See: A. Geissler: *Op. cit.*

COST ACCOUNTING SYSTEM EVOLUTION IN HEALTH CARE ORGANIZATIONS – CURRENT STATE AND PERSPECTIVES

Summary

The article presents the evolution of cost accounting in the Polish health care system. There are presented the causal factors of poor quality cost information, and the characteristics of currently operating solutions is given. In the focus of considerations are: the nature and elements of the newly designed account system, based on the resources approach in which one of the main cost objects are DRG groups which, in turn, determines the considerable practicality of this system for the current medical entities management. The usefulness of cost accounting solutions in European countries, in the context of significant growth in the DRG funding, is also discussed.