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THEORETICAL FOUNDATIONS OF CALCULATION OF THE COST OF MEDICAL SERVICES

Calculating the cost of medical services is an important aspect of healthcare management that affects decision-making, pricing and the overall efficiency of medical institutions. The article investigates and summarizes the theoretical foundations of cost medical services with regard to the specifics of the healthcare industry.

The study emphasizes the complexity of determining costs in a market economy, as various fundamental concepts, such as cost accounting objects, costing units, and cost allocation methods, are important for accurate calculations. The choice of the costing method is particularly important, as it affects the formation of economically justified costs and the ability to analyze and optimize costs. The article emphasizes the need for an individual approach to cost accounting in healthcare institutions, suggesting that the object of calculation should be individual medical services, and cost accounting should focus on specific units (centres of responsibility) of healthcare institutions.

In addition, allocating indirect (overhead) costs is a significant problem, as these costs can account for a significant portion of total costs. The study analyzes various methods of allocating indirect costs, including direct, sequential and simultaneous allocation. It emphasizes the importance of selecting appropriate cost factors to ensure accurate pricing of healthcare services. Accurate cost allocation supports fair pricing and improves resource management and decision-making processes in healthcare organizations. Ultimately, the study emphasizes adapting traditional costing theories to the healthcare industry to increase healthcare delivery transparency, accountability, and efficiency.

Keywords: costing, cost price, expenses, accounting methods, methods of allocating indirect costs, responsibility centres, management, medical services.

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ТЕОРЕТИЧНІ ОСНОВИ КАЛЬКУЛЮВАННЯ СОБІВАРТОСТІ МЕДИЧНИХ ПОСЛУГ

Розрахунок вартості медичних послуг є важливим аспектом управління системою охорони здоров'я, що впливає на прийняття рішень, ціноутворення та загальну ефективність роботи медичних установ. У статті досліджено та узагальнено теоретичні засади калькулювання собівартості медичних послуг з огляду на особливості галузі охорони здоров'я.

У дослідженні підкреслюється складність визначення витрат у ринковій економіці, оскільки різні фундаментальні поняття, такі як об'єкти обліку витрат, калькуляційні одиниці та методи розподілу витрат, є важливими для точних розрахунків. Особливо важливим є вибір методу калькулювання, оскільки він впливає на формування економічно обґрунтованих витрат і можливість аналізу та оптимізації витрат. У статті наголошується на необхідності індивідуального підходу до обліку витрат в закладах охорони здоров'я, припускаючи, що об'єктом калькулювання повинні бути окремі медичні послуги, а облік витрат – зосереджуватися на конкретних підрозділах (центрах відповідальності) закладів охорони здоров'я.

Крім того, розподіл непрямих (загальновиробничих) витрат становить значну проблему, оскільки ці витрати можуть становити значну частину загальних витрат. У дослідженні проаналізовано різні методи розподілу непрямих витрат, включаючи прямий, послідовний і одночасний розподіл, підкреслюється важливість вибору відповідних факторів витрат для забезпечення точного ціноутворення на медичні послуги. Точний розподіл витрат не тільки підтримує справедливе ціноутворення, але й покращує процеси управління ресурсами та прийняття рішень в організаціях охорони здоров'я. Зрештою, дослідження підкреслює необхідність адаптації традиційних теорій калькуляції витрат до галузі охорони здоров'я для підвищення прозорості, підзвітності та ефективності надання медичних послуг.

Ключові слова: калькулювання, собівартість, витрати, методи обліку, методи розподілу непрямих витрат, центри відповідальності, управління, медичні послуги.

STATEMENT OF THE PROBLEM IN GENERAL TERMS AND ITS RELATIONSHIP TO IMPORTANT SCIENTIFIC OR PRACTICAL ISSUES

Healthcare services are a fundamental component of any healthcare system designed to maintain and improve the health of individuals and communities. The provision of medical services is based on the calculation of the cost of medical services, which is an effective tool for making management decisions in the course of a medical institution's activities and requires study.

The problem of calculating the cost of products (works, services) is one of the most important problems of economic science. The scientific literature widely develops methods for calculating the cost of materially produced products, but this problem has not yet been comprehensively and definitively resolved for the healthcare industry. Domestic scientists have proved the need to calculate the cost of medical services due to the importance of cost indicators and their practical application for the purpose of

- development of the medical market,

- pricing in the industry, determination of financial results and competitiveness of medical institutions in the market [1, p. 182],
- substantiation of management decision-making in health care institutions,
- formation of prices for medical services of health care institutions,
- determining the effectiveness of paid services and monitoring the performance of medical institutions,
- studying the effectiveness of medical programs [2, p.5],
- calculating the cost of medical care for insurance companies.

Obviously, the cost indicator is equally important for both state-guaranteed medical services and those paid for directly by customers.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

Many works of foreign and domestic scholars have been devoted to studying cost accounting and production costing. In particular, R. Kaplan, D. Norton [3]. Among Ukrainian scientists, it is worth noting the works of F. Butynets [4], O. Gaidarzhynska [5], A. Didyk [6], O. Chumak, I. Andriushchenko [7] and others.

At the same time, the analysis of the regulatory framework for the healthcare industry showed that there is no legislative definition of the cost of medical services. However, scientists interpret it quite clearly. Thus, Syziuk S. V. and Zoriy N. M. define the cost of medical services as the sum of costs for each type of service cost [8, p. 184], Shvets V. E. and Rura I. V. - as a set of actual costs of health care institutions related to the provision of medical services, based on the time, materials and other costs expressed in monetary terms [2, p. 4]. Obviously, the above definitions are based on the classical understanding of cost and do not contain fundamental sectoral differences, which led to the study's relevance and determined its main purpose and objectives.

FORMULATION OF THE GOALS OF THE ARTICLE

The purpose of the article is to study and summarize the theoretical foundations of the cost of medical services with due regard to their peculiarities and sectoral specifics of healthcare institutions.

PRESENTATION OF THE MAIN MATERIAL

The theory of costing of products (works, services) provides for scientific substantiation of several fundamental concepts: object of accounting and costing, costing unit, nomenclature of direct and indirect costs, method of cost accounting and costing, procedure for allocation of indirect costs, methods of work in progress valuation and procedure for recognition and write-off of costs (in the case of services whose term of provision exceeds the reporting period). A study of the professional literature shows that domestic experts have generally thoroughly developed these issues, which made it possible to systematize them (Table 1).

Table 1

Theoretical basis of production costing*	
Fundamentals of costing	Essence
The object of cost accounting	places where costs are incurred, namely: structural units of the main and auxiliary production, production processes, stages (phases) of the production process, depending on the organization of the production process and production technology
Calculation object	types of products (works, services), groups of homogeneous products or parts thereof, depending on the specifics of production
Calculation unit	a unit of measurement of an object of calculation. Based on the specifics of the organization and production technology, they are divided into: natural, natural conditions, labour, cost and operational
Methods of cost accounting and calculation	by objects of cost accounting: simple, out-of-order, and process accounting; by the degree of cost rationing - accounting for standard and actual costs; by the completeness of cost inclusion in the cost price - the method of accounting for full and variable costs (direct costing).
Methods of calculation	direct calculation, sequential addition of costs, exclusion of costs, coefficient, combined
Methods of allocating indirect production costs	based on the establishment of a single distribution rate for the entire enterprise
	determination of distribution rates for each production centre of the enterprise's responsibility
	itemized allocation of indirect costs in proportion to drivers (ABC calculation)
Methods for estimating and allocating the cost of internal services of responsibility centres	direct distribution
	consistent distribution
	simultaneous distribution of costs
	mutual services
Bases for allocating indirect production costs	quantitative - the number of machine hours worked, the number of man-hours worked, the number of products produced
	cost - estimated rates of indirect costs, basic salaries of production workers, number of products, etc.

*Source: systematized based on [6; 9 - 11].

It is necessary to consider the peculiarities of medical services and the sectoral specifics of healthcare institutions to adapt the theoretical foundations of cost medical services. Reforming the mechanism of financing the health care system requires a corresponding change in approaches to the selection of cost accounting objects. Thus, N. Z. Machuga proposes choosing a type of disease as an object of cost accounting. An alternative proposal is to consider one visit to a doctor as an object of cost accounting and calculation. That is, the cured patient (disease) is

the final result (goal) of the provision of medical services, and the number of doctor's visits is only an intermediate component of the final service [1, p. 186]. The object of calculation should be individual medical services, and the object of cost accounting should be the structural units of a medical institution (departments, laboratories, registries and other centres of responsibility). health care institutions. This approach allows for setting economically justified tariffs for paid medical services and is consistent with the current mechanism of financing healthcare institutions.

An important issue in the costing theory is the choice of costing units, interpreted as measures of the costing object. Based on this understanding, choosing the number of services provided as the main costing unit in a healthcare facility is advisable. This choice is explained by the observance of the basic principles of cost accounting, which are universal for any activity: the principle of economic convenience (the value of information obtained through cost accounting should not exceed the economic effect of its use), the principle of availability (the information necessary for the calculation should be formed in the accounting system), the principle of necessity (the calculation unit should take into account the information needs of management) [10, p. 449].

The most challenging issue of costing medical services is the choice of costing method since the chosen method or their combination not only contributes to the formation of an economically justified cost but should also provide opportunities to analyze the dynamics and structure of medical institutions' costs to optimize them, summarize relevant information for making effective management decisions. Traditionally, depending on the object of cost accounting, there are three most common costing methods: direct calculation, process-based and out-of-order methods. We agree with the majority of experts in the industry and believe that the out-of-order method is the most adapted to the peculiarities of the production process of medical services (individual and small-scale nature, small range of services and stability) and their features (personalized nature, provision of services on request, etc.) At the same time, it is true that to determine the best method for calculating the cost of services, "there is no need to apply one of the methods in its original version. That is, it is possible to combine several of them to obtain the costing methodology that is best suited for (medical) institutions" [10, p. 449].

One of the important issues in calculating medical services is the procedure for allocating indirect (general production) costs. Indirect costs of healthcare services are not directly related to specific patient care activities but are necessary for the overall functioning of healthcare facilities. Such costs may include general operating expenses that are not directly related to any specific healthcare service but are critical to the overall operation of the healthcare facility. This category includes, for example, costs related to utilities, administrative staff salaries and facility maintenance [8, p. 183]. By understanding these costs, healthcare providers can better allocate resources, ensuring each service is priced appropriately to cover direct and indirect costs.

Errors or inaccuracies in the allocation of indirect (overhead) costs can lead to incorrect decisions, as their share in the cost of healthcare services is quite significant - about 20%. The problem of allocating indirect production costs is not new to economic science, and scholars have proposed two main approaches to solving it: using one allocation base for all types of indirect costs; applying differentiated cost allocation using several allocation bases based on establishing a cause-and-effect relationship between costs and their factors (drivers). Clearly, the first approach is simpler and less labour-intensive. However, despite being much more labour-intensive, the second approach allows for more accurate costing calculations. The choice of the indirect cost allocation base depends on the specifics of the organization's activities or a particular production process and is crucial. It is advisable to consider using patient days, number of procedures, or labour hours as cost drivers for healthcare services. Correctly selected drivers guarantee a fair and proportional distribution of costs between centres of responsibility, as they directly affect the accuracy of calculating the cost of certain types of services.

Thus, accurate cost allocation in the healthcare sector is vital for several reasons. First, accurate cost allocation allows healthcare institutions to set fair prices for their services, ensuring financial stability while maintaining patient accessibility [11, p. 58]. In addition, it allows for a transparent understanding of where resources are used, contributing to more informed decision-making processes. This transparency helps identify areas where efficiency can be improved, leading to better resource management and improved patient care. Healthcare providers can benchmark their services against industry standards with accurate cost breakdowns, driving continuous improvement and innovation.

For multidisciplinary medical institutions that have a large number of clinical units and those that perform administrative, auxiliary and service functions, the problem of allocating indirect (general production) costs and including them in the cost of medical services is quite acute. The theory of costing contains appropriate tools for solving this problem, namely the methods of direct, sequential, simultaneous distribution and mutual services, the characteristics of which are systematized in Table 2.

In order to apply a particular cost allocation method, it is advisable to clarify the nature of the costs and choose the method that best suits the size and complexity of the healthcare facility. Direct allocation assigns indirect costs directly to a single cost centre without intermediaries, while incremental and reciprocal methods provide a more complex allocation, considering interdepartmental services. For example, larger hospitals may benefit from the reciprocal method of allocating services due to its complex nature.

In turn, the practical application of the cost allocation method allows to establishment of the contribution of each responsibility centre to the formation of the cost of medical services, taking into account the mutual services of service and support units to each other and the main cost centres. When deciding on the feasibility of using the

above tools in the practice of cost medical services of multidisciplinary medical institutions, one should proceed from the level of management automation, the level of implementation of accounting by responsibility centres, the characteristics of the relationship between responsibility centres, and the possibility of accounting for the number of internal services provided by the structural units of the medical institution.

Equally important and controversial is the issue of determining the list and composition of cost items for medical services. Under any circumstances, the right to choose them is delegated to business entities, which must take into account the specifics of the production (provision) of services.

Table 2

Characteristics of cost allocation methods of service and auxiliary centres of responsibility*

Method	Essence	Advantages	Disadvantages
Direct distribution	the costs of a service unit are directly charged to the cost of a unit of production, i.e., mutual services of service units are not taken into account.	Simplicity of calculations	Inaccurate calculation of the cost of basic CP and, accordingly, certain types of services
Consistent distribution	the costs of each service unit are distributed sequentially among production units and other service centres. The problem is to choose the sequence of the service centres whose costs are allocated. To simplify the calculations, the costs of the unit that is less serviced by others are allocated first.	Objectivity in the sequence of cost allocation between the centralized bodies allows them to establish their participation in cost formation clearly	The situation is changing with regard to the ratio of the number of internal services of the central office. Complexity and multi-stage distribution.
Simultaneous distribution	involves the distribution of costs of mutual services of service units by solving a system of equations.	A clear algorithm	The complexity of the calculation
Distribution of mutual services	provides for the full distribution of mutual services between the servicing units, with the cost of each unit determined by the formula: $SV = VV + VP - VN,$ where: Cc - own costs of the responsibility centre, CP - costs of services received CU - costs of services rendered	High enough calculation accuracy	Time-consuming and complex calculations, multi-stage cost allocation

*Source: compiled by the author

CONCLUSION

The importance of reliable calculation of the cost of medical services (both those financed from budgets of different levels and those paid by consumers) necessitates the adaptation of the classical foundations of the costing theory, namely the choice of objects of accounting and costing, the nomenclature and composition of cost items, the method of cost accounting, the procedure for allocating indirect costs in accordance with the specifics of the medical industry. This will make it possible to calculate the cost of medical services, which is most closely related to the actual resources consumed to provide specific types of medical services.

Thus, theoretical frameworks for calculating the cost of healthcare services offer significant benefits, including improved transparency, standardization, resource allocation, and policy development. However, challenges such as complexity, data availability, the dynamic nature of health care, and patient-related factors can limit their effectiveness. By applying robust methods and tools, integrating data, regularly updating systems, and personalizing cost analysis, healthcare providers can overcome these limitations and achieve transparency, accountability, and efficiency in healthcare delivery.

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