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Cost Accounting for Management of Health Services in a Hospital

Abstract: In Polish hospitals there are clear standards for cost accounting which can be used to report information on costs and to correctly price health care services. Medical activities of hospitals are very diverse because of the existence of different types of entities and a variety of services. The article aims to discuss the essence of the subject of cost accounting in medical entities (hospitals), in particular activity-based costing. The article includes the conclusions of the study of the literature in the field of the subject matter and legal documents concerning the Polish health care system, especially the existing costing standards, using the research method of literature and legal acts analysis. The article, in the theoretical part, presents the essence of cost accounting systems. Additionally, elements of the new legislation are presented, with the emphasis on those that are potentially important in generating cost management information. The article provides an example of the use of resource costing in a gynaecology and obstetrics department of a hospital.

Keywords: hospital, cost accounting, activity-based costing

JEL: H51, H83, M41
1. Introduction

Presently in Polish hospitals there are clear standards for cost accounting which impose specific solutions that guarantee comparability of cost information generated by hospitals. The Regulation of the Minister of Health and Welfare on specific rules for cost accounting in public health care institutions (Journal of Laws 1998, No. 164, item 1194) that was in force in Poland from January 1, 1999 to June 30, 2011 was not widely used in hospitals, and thus was subsequently repealed. The Act amending the Act on health care services financed from public funds and certain other acts (Journal of Laws 2014, item 1138) was introduced on July 22, 2014. The Act introduced changes to the law on health care services financed from public funds. Under this Act, the name and scope of operation of the Agency for Health Technology Assessment and Tariff System (Agencja Oceny Technologii Medycznych i Taryfikacji – AOTMiT) were changed. The Act entered into force on January 1, 2015. The competences of the Agency include setting tariffs for health services. Furthermore, the Agency is supposed to develop proposals for recommendations on cost accounting standards and to collect and publish information on rules of determining the services tariff. The data necessary for the tariff system process will be provided to the Agency by the National Health Fund (Narodowy Fundusz Zdrowia, NFZ) and selected hospitals. In contrast, standard cost accounting is specified in the form of the Regulation of the Minister of Health of July 8, 2015 on recommendations for standard costing in dealings with service providers. According to the amendment of the Act, the duty to apply this regulation is imposed on providers who wish to conclude a contract for the transfer of data from the Agency. This obligation will enter into force on January 1, 2020 (Journal of Laws 2015, item 1126). The regulation is an important document as it has determined the rules of organisation, identification, grouping, recording and settlement of costs of health care services and the method of their calculation.

The complexity of processes and the multiplicity of resources within health services make their calculation a difficult task. Settlement of health services requires the collection of numerous necessary cost and statistic data. The Polish health care system does not use the information on costs from hospitals to price health services provision by the payer (Kludacz, 2014: 39), while it is known that the cost is the carrier of information about resources used.

The purpose of this paper is to characterise the possibilities of using cost accounting in improving decision making processes in hospitals. The choice of the right model of cost accounting is difficult, yet very important. Medical activity of hospitals is very diverse because of the type of organisations involved and a variety of services provided. A theoretical analysis was carried out on the basis of information published in Poland, including: thematic pub-
lications, scientific papers featured in journals and in other literature. Legal acts, laws and regulations concerning the Polish health care system, were another source of data.

2. Hospitals as a subject of cost accounting

A public hospital is a specific business entity that meets all the criteria of a non-profit organisation, while its services exhibit the humanitarian nature. This results in a reluctance to treat hospitals in economic terms (Kludacz, 2015: 160). However, nowadays hospitals have to find their place in the market economy, as they operate on the principles of market entities. The health services market has become competitive and governed by market mechanisms. According to the Act on medical activity, a hospital is “a medical institution where a medical entity performs medical activity in the type of hospital services” (Act on medical activity, 2011: Article 2). Pursuant to the Act (Act on medical activity, 2011: Article 4), a hospital can operate, inter alia, in the form of:
1) an independent public health care institution,
2) a budgetary unit,
3) a limited company.

Basic activity of hospitals includes the provision of various health services aimed at saving, preserving, restoring or improving the health of patients. Hospitals provide 24 hours a day comprehensive health services, involving diagnosis, treatment, nursing and rehabilitation, which cannot be provided within other stationary and twenty-four-hour health services or outpatient health services. Hospital services are also services provided with the intention to complete their provision in a period not exceeding 24 hours (Act on medical activity, 2011: Article 2). Health services include e.g.: medical examination and advice, treatment, medical rehabilitation, care of the pregnant woman and her foetus, childbirth, care of the newborn, care of the healthy child, diagnostic tests including medical analytics, nursing the ill and disabled, and also preventing injury and illness through protective measures and vaccination\(^1\). A health service comprises a set of professional activities using available medical knowledge and equipment. It is a diagnostic procedure which results in a healthy patient.

Financial accounting provides significant but insufficient cost information for hospital management. Cost accounting is the main tool generating cost information for pricing health services in hospitals, and can also be used to analyse and control medical activity costs. The application of cost accounting is aimed at the acquisition of cost information that will be used for reporting purposes, but its primary task is to support the current and strategic hospital management. It generates information

\(^{1}\) More on this subject: Hass-Symiotuk, 1999.
useful (significant) in the process of decision making and in the process of decision implementation control. As emphasised by J. Chluska, reliable information on costs incurred is a necessary condition for making right decisions both at operational and strategic levels by managers and decision makers in the health sector (Chluska, 2011: 17). According to its definition, cost accounting is “a process of identifying, collecting, processing, presenting and interpreting information on costs for making evaluation and decisions by the users of that information” (Świderska, 2013: 10). It provides information for management processes in the short and long term.

Cost accounting is a subsystem of an information system of modern accounting, a collection of cost information prepared according to a specific model tailored to the information needs of users of the information which is employed to calculate the unit cost of health services and to prepare financial statements. According to M. Hass-Symiotuk (2008), the purpose of using cost accounting is to enable making right decisions related to the determination of settlement prices for health services and their provision, but also:

1) to obtain information on unit and total costs of provided health services;
2) to determine the factors affecting the level and structure of costs;
3) to enable making right decisions related to the allocation of financial resources in a hospital, the implementation of new medical technologies, the development of activity plans, etc.;
4) to determine the outcome of each cost centre together with the evaluation of its share in the total financial outcome;
5) to control the costs incurred and obtained activity outcomes of individual organisational units or activity types;
6) to test and evaluate the validity of using the resources available in a hospital in order to improve the effectiveness of its operation;
7) to provide economic education for all hospital employees.

As mentioned above, most hospitals operating in Poland did not comply with the regulation in force until 2011 (Hass-Symiotuk, 2010: 58). Costing of the regulation was based on full cost accounting. Calculation of unit costs was based on traditional methods of cost calculation. Kogut (2006: 61–84) notices the following reasons for which the regulation was not implemented in hospitals:

1) information technology reasons – i.e. a lack of an adequate information system that would enable the combination of medical and economic data, as well as the low level of computerisation in hospitals;
2) legal reasons – a lack of consistency between the Accounting Act and laws introduced by the Minister of Health, as well as difficulties in interpreting the regulation provisions, which resulted in the development of individual solutions for cost calculation;
3) organisational reasons – a lack of applicable standards for medical treatment, which has subsequently led to a considerable diversity of methods used to pro-
vide health services in hospitals. Administrative staff are excessively engaged in the preparation of reporting documentation.

All the above factors lead to a lack of reliable cost information which could constitute the basis for the determination of health services prices in Polish hospitals. In addition, there is a risk of improper pricing of health services by the payer and of inefficient management of public funds in this area.

3. Nature of cost accounting in a hospital

Since mid-2008 medical procedures which generate remuneration for health care entities (including hospitals) in the Polish health care system have been priced in the system of Diagnosis-Related Groups (DRG)\(^2\). These are groups of hospital cases characterised by a similar diagnostic and treatment approach (in clinical terms) as well as a similar level of resources used (similar costs) (Kludacz, 2015: 164). The pricing is based on flat rates assigned to clinically and cost similar disease cases which form specific groups. In practice, the payer’s financial resources are an important element that affects the price of health services. The settlement of health services is based on the contracts made between hospitals and the National Health Fund (the contracting party and payer) using the combination of ICD-10 (International Statistical Classification of Diseases and Related Health Problems) disease codes and ICD 9 (International Classification System for Surgical, Diagnostic and Therapeutic Procedures\(^3\)) codes. The ICD-9 includes various diagnostic examinations, therapeutic and rehabilitation treatments, and medical consultations grouped into 16 chapters. Each item in the classification is labelled with a unique number (code) and an explanation which medical activities it includes. Then, based on this classification of data, a relevant group of DRG system is selected, with relation to diagnosis-related groups. The DRG system was intended to harmonise the rules of financing services for all service providers and to group individual patient groups (Orliński, 2014: 483).

Each hospital maintains detailed records of expenses. Basic activity costs relate to costs arising from performing the activity for which the hospital was appointed, i.e. providing health services. These are realised by basic units of the organisational structure, i.e. departments providing health services (e.g.: internal, surgical, gynaecological, paediatric, gastrointestinal) and auxiliary activities units: clinics (e.g.: allergological, laryngological, ophthalmological), laboratories (pathomorphology with an autopsy room), centres (diagnostic imaging, diagnostic laboratory), and other entities (a blood bank, a hospital pharmacy). The proper operation

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\(^2\) Inspired by English solutions.

\(^3\) Developed by the WHO.
of a hospital also requires administrative, economic, technical and organisational staff (Orliński, 2014: 479). The Regulation of the Minister of Health and Welfare on specific rules for cost accounting in public health care institutions was aimed at making changes in cost accounting, involving the use of not only the existing system of generic costs, but also the subjective-objective system recognising cost objects. This would enable the calculation of many different cost objects, ranging from the simplest medical events to the settlement of complex health services. The assumption for cost accounting was supposed to be the generation of information necessary to determine prices of contract services set by payers to the benefit of service providers, and also to determine the correct financial outcome of a hospital. Costs are generated as a result of intended use of resources available in a given health care institution (Świderska, 2013: 8). In hospitals, medical procedures and patients are the object of calculation. The calculation of the unit cost in hospitals relates also to the provision of health services performed by auxiliary activity cost centres (boiler rooms, kitchens, laundries, blood donation centres, and sewing rooms). This generates information on both unit and global costs. Costs within the subjective-objective system can be distinguished into direct and indirect costs (Table 1).

<table>
<thead>
<tr>
<th>Distribution of costs within the subjective-objective system</th>
<th>Cost description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct costs</strong></td>
<td>Relate to the unit of service provided and can be precisely – by measurement or source documents – assigned to the proper object of calculation. Typical direct costs are: consumption of direct materials costs, direct wages with overheads, and other costs arising directly from documentation or measurement that can be assigned to cost drivers.</td>
</tr>
<tr>
<td><strong>Indirect costs</strong></td>
<td>If a specific cost item does not meet the above condition, then it is treated as an indirect cost. It relates to some or all services provided, and on the basis of source documents, it cannot be assigned to a specific calculation subject.</td>
</tr>
</tbody>
</table>

Source: Czubakowska, Gabrusewicz, Nowak, 2014: 59

The division of those costs requires the use of adequately selected settlement (division) keys.

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4 The cost object is something that we want to measure in terms of cost calculation, e.g.: a patient, medical procedure, activity or process, while the cost driver is each item of the cost calculation for an object. Aggregate information on unit and global costs (objects) should, in turn, be the major factor in decision making processes, affecting the financial planning and budgeting in terms of process or activity cost.
According to Anders and Łącki (2011: 11), cost accounting used in hospitals should meet the following objectives:

1. Cost accounting should enable the effective control of costs incurred.
2. Cost information provided should result in effective resources management (resources cost minimisation, optimisation of resources use levels).
3. Use of available cost information should allow continuous quality improvement of services provided.

Hospitals should use uniform rules of cost accounting, as it would enable the comparison of cost information and the evaluation of available resources use. The complete system of cost accounting in hospitals should consist of three elements (Świderska, 2014: 13):

1) medical information on patients,  
2) a financial and accounting system,  
3) a controlling module.

The basis for calculating costs of health care services is medical information related to the course of treatment of each patient from the moment of his/her arrival at a hospital till the end of the treatment, i.e. individual treatment tracks of patients. Identification and collection of actually incurred costs is made in the financial and accounting system which provides the possibility of preparing the financial statements of the medical entity, i.e. the balance sheet and the profit and loss account along with additional information. The basis for the recognition of the cost existence (its identification) is provided by accounting documents, both external and internal ones. The controlling module includes:

1) determination of costs of medicinal products and medical devices delivered to the patient,  
2) determination of costs of medical procedures realised for the patient,  
3) determination of costs of patient hospitalisation in individual departments,  
4) determination of costs of readiness per patient.

The total costs of the first three items above allow to calculate the cost of each individual patient reflecting the costs of only those elements which are essential in the provision of health care to the patient. That cost does not include the cost of unused capacity and the readiness costs. It is defined as the cost of health care services provision. The total costs of all four items (i.e. the planned cost of providing health care services increased by the planned costs of readiness) represent the planned cost of health care services. The determination of total planned cost of health care services for all patients requires summing up those costs for all patients within a given period (Świderska, 2013: 55).

According to the literature on the subject, hospitals can successfully use modern cost accounting systems such as: Resource Consumption Accounting, RCA or Activity Based Costing, ABC.
Resource Consumption Accounting (RCA) is based on resources costs and their interrelations. The concept, within the framework of individual cost centres, defines in the first step resource pools representing particular resources or resource groups, and then adds to the pool adequate generic cost accounts, which are analytics for synthetic accounts, i.e. resources. RCA, going down to the level of resources, focuses on costs of medical equipment, employees in individual departments, electricity, etc. (Miller, 2000: 12). Table 2 presents an example of traditional cost accounting for a gynaecology and obstetrics department. Costs are recorded by type of cost. This method does not recognise resources.

Table 2. Costs by nature – a gynaecology and obstetrics department

<table>
<thead>
<tr>
<th>MPK Gynaecology Department</th>
<th>Cost (PLN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depreciation</td>
<td>12 100</td>
</tr>
<tr>
<td>Consumption of materials and energy</td>
<td>60 450</td>
</tr>
<tr>
<td>Wages</td>
<td>85 000</td>
</tr>
<tr>
<td>Social security and other benefits</td>
<td>14 625</td>
</tr>
<tr>
<td>Taxes and fees</td>
<td>9 430</td>
</tr>
<tr>
<td>Outsourced services</td>
<td>94 200</td>
</tr>
<tr>
<td>Other costs</td>
<td>1 874</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>277 679</strong></td>
</tr>
</tbody>
</table>

Source: own elaboration

Table 3. Resource Consumption Accounting – a gynaecology and obstetrics department

<table>
<thead>
<tr>
<th>MPK Gynaecology Department</th>
<th>Cost (PLN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctors, nurses, midwives</td>
<td>94 625</td>
</tr>
<tr>
<td>Medicinal products</td>
<td>19 450</td>
</tr>
<tr>
<td>Medical devices and other disposable materials</td>
<td>45 000</td>
</tr>
<tr>
<td>Surgical instruments</td>
<td>6 550</td>
</tr>
<tr>
<td>Incubator</td>
<td>12 000</td>
</tr>
<tr>
<td>CTG device</td>
<td>8 999</td>
</tr>
<tr>
<td>Sterilising device</td>
<td>3 495</td>
</tr>
<tr>
<td>Ultrasound scan device</td>
<td>55 000</td>
</tr>
<tr>
<td>Operating table</td>
<td>32 000</td>
</tr>
<tr>
<td>Other</td>
<td>560</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>277 679</strong></td>
</tr>
</tbody>
</table>

Source: own elaboration

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5 J.A. Miller proposes the definition of a resource: “Term resource is defined as an economic component used or consumed in the course of activities implementation”. Cf. Miller, 2000: 44.
Resource Consumption Accounting, introducing an additional level of analytics, generates information on resources available. For comparison, Table 3 presents the same value of costs as in traditional cost accounting in terms of resources. Such a record allows to make decisions on costs as well as strategic decisions.

Resource Consumption Accounting is a method of calculation that employs a multi-stage settlement of costs among four basic categories of objects: resources, activities, cost objects, and direct costs, while maintaining a full resolution of costs. Within four basic categories of objects, their specific types are extracted, based on strictly defined rules.

Since 1998, following the introduction of the reform of the financing of medical entities, there have been good cost accounting systems introduced in public hospitals. In 2009–2013, representatives of the Ministry of Health and Warsaw School of Economics in cooperation with employees of medical entities completed the research project entitled “Modern management in health care – training cost accounting and management information and tools for restructuring and consolidation of health care institutions”. The effect of the cooperation was the development of solutions for cost accounting tailored to the specific therapeutic entities. Also, they developed a methodology for the collection and presentation of cost data for valuation purposes, and trained more than 6,000 people (mostly representatives of executive bodies in medical entities). A new costing model was proposed – object costing (based on activity-based costing) adapted to the specific therapeutic entities. As Świderska has pointed out, it is a universal solution which enables the use of cost accounting for external reporting purposes (to determine the financial result and the valuation of unfinished services), management of a medical entity (making short and long-term decisions, planning and control), and the valuation of health care services (defining tariffs of health care services). The object of cost was characterised as any object reference, grouping or costing. The basis of the relationship between objects is a causal stream of costs. Object costing is a concept linking the area of accounting and information systems in order to build a complex information system (Świderska, 2014: 31–33).

The use of cost accounting in medical entities in Poland is governed by the law. On July 8, 2015, the Minister of Health issued the Regulation on recommendations for standard costing in dealings with service providers (Journal of Laws 2015, item 1126). Its implementation was preceded by an additional empirical research project in which about 30 employees of hospitals participated by providing medical and financial data directly from their hospitals. The Regulation provides guidance on methods for the identification and collection in the accounting system of costs actually incurred and for the calculation of the cost of health care services in the controlling module. Currently, the statutory delegation points to the obligation to use costing models (since 2020) in relation to the data providers for the
valuation of health care services. A transition occurs from a set of cost accounts by type to a set of cost accounts by function. The set of cost accounts by function comprises a division into cost centres (the provider’s units where costs are incurred) of core activities, auxiliary activities, and activities of the board, as well as a detailed list of cost centres in each of the indicated areas. At least three additional levels of analytics in terms of core activities have been introduced along with at least two additional levels of analytic accounts in terms of auxiliary activities and activities of the board.

4. Activity-based costing in hospitals

In the 1980s, Robin Cooper and Robert Kaplan developed Activity-Based Costing. It assumes that the direct reason for cost generation is related not to products manufactured but activities undertaken in the enterprise. Processes occurring in the enterprise cause the consumption of various resources (material, monetary, labour, etc.), which subsequently generates costs. Therefore, the cost carrier is not the product itself but activities necessary to make it. Activity Based Costing requires that indirect costs, affected by various factors, should be accounted for the cost objects using many different allocation keys.

Kaplan and Porter confirm that the application of the ABC method in hospitals promotes the generation of more accurate cost data, improves the effectiveness of hospital operation, and raises awareness of hospital managers in terms of the value of care provided to the patient (Kaplan, Porter, 2011). As early as in the 1990s, the possibilities of using Activity Based Costing in Polish hospitals were highlighted (Cf: Ohl, 1996: 124–127; Ohl, 1999: 46–68; Hass-Symiotuk, 1999: 68–77) and the advantages of this method were emphasised (Chluska, 2007: 25–35). Its use in hospitals is justified in particular by (Bryla, 2006: 401):

1) complexity of health care service provision process (the service can consist of one or more simple medical procedures);
2) existence of simple interrelated activities within a given service;
3) dominance, within costs generated in the process of patient treatment, of indirect costs and fixed costs the contractual settlement of which causes significant distortion in unit costs.

The advantages of using ABC calculation include: more accurate calculation of unit costs, enhanced cost control, better quality of decisions made and increased competitiveness, which subsequently implies more precise determination of costs of the use of individual medical procedures and costs of individual patient hospitalisations. A very interesting summary is presented by Kalandyk, who gathers selected opinions of researchers on the use of Activity Based Costing in health care institutions (see Table 4).
Table 4. Use of ABC in the opinion of researchers

<table>
<thead>
<tr>
<th>Author</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. Porębski (2002)</td>
<td>The author notes that the use of ABC system in health care institutions is favoured by the scope of their activity, the existence of a large share of fixed costs in total costs, and significant diversity of services provided.</td>
</tr>
<tr>
<td>J. Gierusz, M. Cygańska (2009)</td>
<td>Activity Based Costing in hospitals involves a two-step process of resources allocation. In the first step, the costs are assigned to previously separated activities, in the second phase, costs of individual activities are assigned to the final cost object, which in the case of a hospital are hospital patients.</td>
</tr>
<tr>
<td>G.K. Świderska, M. Raulinajtys (2009)</td>
<td>The use of Activity Based Costing in the calculation of service costs is beneficial from the point of view of managers of health care institutions, as they receive clear information on objects responsible for cost generation. It enables the employment of active measures aimed at the decrease of cost level and effectiveness increase. Activity Based Costing also allows to calculate the level of unused resources engaged in activity maintenance.</td>
</tr>
<tr>
<td>M. Kludacz (2005)</td>
<td>At first, Activity Based Costing attracted mostly industrial enterprises, and then gained great popularity among service enterprises, also in health care. The basis of ABC calculation is the perception of a hospital not in terms of departments and other organisational units but of processes and activities essential for the provision of health care services to the patient.</td>
</tr>
<tr>
<td>J. Chluska (2007)</td>
<td>According to the author, the unquestionable advantage of the use of the ABC method in health care institutions is accurate and insightful identification of processes occurring in the institution and generating costs, as well as the recognition of absorption of those costs in individual units.</td>
</tr>
</tbody>
</table>

Source: Kalandyk, 2015: 211

When comparing Activity Based Costing with absorption costing (a method in financial accounting), it can be observed that indirect costs account for an even larger share in total costs of the enterprise and they can be assigned to those products (services) which actually consume a given resource.

5. Conclusions

Without a doubt, medical activity carried out by hospitals is associated with incurring costs and collecting revenues. The point of many activities in the field of health care services management is to determine these costs, and subsequently the effectiveness of processes initiated within the framework of health care services. The main tool for meeting decision and control needs of hospital management is properly done cost accounting, a significant element of the process of hospital
management. It provides information which is used in financial accounting and establishes an information foundation for management accounting.

In Polish hospitals there are certain standards of cost accounting which can be used to report information on costs and to correctly price health care services. There is a need for uniform rules relating to the system of cost accounting that would provide an opportunity to make comparisons. The biggest challenge that Polish hospitals are currently facing is the application in practice of the concept which was developed by the team from Warsaw School of Economics and the Ministry of Health, as well as overcoming many barriers – organisational, human, and financial. It should be noted that physicians, nurses, and managers must be part of developing hospital costing, as only a combination of knowledge of these people about the activities of a given hospital will allow the achievement of the target model of hospital costing.

This paper is only an attempt to introduce the issue. Details of introducing Activity Based Costing into hospitals will be presented by the author in the subsequent publications.

References

Rachunek kosztów w zarządzaniu świadczeniami zdrowotnymi szpitala

**Streszczenie:** W polskich szpitalach istnieją określone standardy dotyczące rachunku kosztów, które mogą służyć do raportowania informacji o kosztach oraz do właściwego ustalania taryf świadczeń medycznych. Działalność medyczna szpitala jest bardzo zróżnicowana ze względu na rodzaj podmiotów oraz różnorodność świadczonych usług. Artykuł ma na celu omówienie istoty tematyki rachunku kosztów w podmiotach leczniczych (szpitalach), a w szczególności rachunku kosztów działań. Metodą badawczą wykorzystaną w niniejszym opracowaniu była analiza literatury przedmiotu oraz aktów prawnych obowiązujących w polskim systemie ochrony zdrowia, ze szczególnym uwzględnieniem standardów kosztów. W części teoretycznej artykułu zaprezentowano istotę zarządzania kosztami w różnych systemach rachunku kosztów. Dodatkowo zaprezentowano elementy nowych regulacji prawnych, wskazując na te, które są potencjalnie istotne w generowaniu kosztowej informacji zarządczej. W artykule przedstawiono przykład wykorzystania zasobowego rachunku kosztów na oddziale ginekologiczno-położniczym w szpitalu.

**Słowa kluczowe:** szpital, rachunek kosztów, rachunek kosztów działań

**JEL:** H51, H83, M41