SOLVING THE COST CRISIS IN HEALTHCARE – CAN POLAND LEARN FROM THE KAPLAN AND PORTER'S MODEL?

MONIKA RAULINAJTYS-GRZYBEK
Faculty of Management Accounting
Warsaw School of Economics
Warsaw, Poland
mrauli@sgh.waw.pl

GERTRUDA KRYSTYNA ŚWIDERSKA
Faculty of Management Accounting
Warsaw School of Economics
Warsaw, Poland
gswide@sgh.waw.pl

Abstract: Recent publications by authors of Activity-Based Costing indicate that the cost analysis of the cycle of care is essential to reduce the growth in healthcare spending. Analysis of current situation in Poland reveals that the limit for the implementation of such solutions is the current organization of the Polish healthcare system. The aim of the article is to present the approach to calculating and controlling costs of health services used currently in Poland. This concept has been critically analyzed against the solution presented for the US health market. Analysis of primary and secondary sources describing organization of the Polish healthcare system has been conducted. Polish costing model is based on the Activity-Based Costing method. Contrary to the Kaplan and Porter's proposal, the cost calculation is conducted separately in each area of healthcare, currently mainly in relation to inpatient services. The comprehensive approach to the cost calculation of the cycle of care is not present, which results from a long-lasting division into autonomous sectors in healthcare.

Keywords: Cost Accounting, Activity-Based Costing, Value Chain in Healthcare, Healthcare in Poland.

1 Introduction

In recent years, health expenditure in most OECD countries has been growing - both in nominal terms and in relation to Gross Domestic Product (OECD, 2013). Some research proves that healthcare expenditure e.g. in the European Union is converging (Lau et al., 2014). The aging population, the development of modern and capital-intensive medical technology and increasing social expectations are among the basic reasons for the increase of expenditure (Walshe and Smith, 2006; Jones and Mellett, 2007; De Mello-Sampayo et al., 2013). Actions aimed at limiting the growth of spending should refer to optimization of the number of health services and shift the burden of healthcare to outpatient sector, which generates lower costs than hospital sector.

An example of such steps was the introduction of diagnostic groups (Fetter et al., 1976) and pricing of health services (particularly in the inpatient sector, which historically absorbed the highest share of funds) based on their costs. Such action has been taken, among others, in Poland (Czach et al., 2011). The pricing object is every contact of the patient with the healthcare provider separately for each area of healthcare – inpatient care, outpatient care, rehabilitation etc.

Experiences of other European countries as well as American ones show that although these actions have led to changes in the expenditure structure and shifting the healthcare process on the outpatient care (OECD, 2013; Averill et al., 1993; Duncan and Servais, 1996). However, due to perceiving the healthcare process in a fragmentary way – as a sum of numerous independent services – the actions taken so far have only lead to optimization of single services and did not affect the whole treatment process.

The aim of the article is to analyze the possibility of applying a theoretical model invented by Kaplan and Porter (2011) for managing Polish healthcare and controlling its costs. The current organization of healthcare management in Poland, with a specific emphasis on a method of calculating and controlling costs of health services, has been presented based on the analysis of appropriate legal acts as well as secondary analysis of published sector analyses. The assumptions of the Kaplan and Porter's proposal have been presented based on their publication. The critical comparative analysis has been performed regarding the possibility of applying theoretical model in Polish conditions.

2 Healthcare management using cost information – Kaplan and Porter's proposal

In 2011, Kaplan and Porter published an article "How to Solve the Cost Crisis in Healthcare" which presents best practices for healthcare management. Authors draw their conclusions based on practical experiences with several healthcare institutions as well as their previous experience and expertise. Kaplan is known as the co-author of the breakthrough concept of Activity-Based Costing (ABC) (Cooper and Kaplan, 1988) and Time-Driven Activity Based Costing (TDABC) (Kaplan and Anderson, 2004) – a modification of ABC allowing to assign costs accurately and relatively easily. Porter is the author of several publications on competition (Porter, 1980) and value management - also in healthcare (Porter and Teisberg, 2006; Porter, 2009; Porter, 2010). In the latest article the authors analyzed the reasons for malfunctioning of healthcare and presented the method to solve the problem.

Developing the concept of diagnostic groups in the 60s and its implementation to the practice of healthcare financing for the first time in the U.S. in the 80s was aimed to build a model in which third party payers will reimburse for outcomes of treatment rather than for the procedures performed. In practice, modern DRG systems rather group cases based on treatment- or patient-specific factors – such as procedures performed, duration of stay, age, birth weight – than based on outcomes – reflected with health status achieved or retained, process of recovery or sustainability of health (Kobel *et al.*, 2011). Research on the merits of supplementing the grouping systems with qualitative factors related to health condition of the patient was conducted in the Netherlands and confirmed the legitimacy of such movements, but it did not translate into changes in the local grouping system (Evers *et al.*, 2002).

Kaplan and Porter pay attention to the fact that in addition to the lack of sufficient recognition of aspects related to the effects of treatment, too little emphasis is placed on proper analysis of the expenditure required to achieve these effects. The role of economic evaluation is widely described in the healthcare economics (Drummond *et al.*, 2005; Folland *et al.*, 2010) and includes the identification, measurement, valuation, and then comparison of the costs (inputs) and benefits (outcomes) of two or more alternative treatments or activities (WHO, 2000). The most common methods include Cost-Effectiveness Analysis (CEA), Cost-Utility Analysis (CUA), and Cost-Benefit Analysis (CBA). All three assume comparing healthcare costs with outcomes expressed in natural units (CEA), quality adjusted life years (CUA), or monetary value (CBA). A common approach of all three methods is the payer-based approach to cost measurement. Costs are estimated based on the level of payer's expenditures. This perspective does not include the level of providers' costs related with a service.

In the U.S., costing model used by healthcare providers is a consequence of the model used

for pricing of health services. In the area of inpatient services, Ratio of Cost to Charges (RCC) approach is used, which envisages allocating costs to services according to their prices. This model is obligatory for hospitals providing services under Medicare to prepare the annual cost report and often determines the costing model used for management. In the area of physician services, Relative Value Units (RVUs) are used, which are based on selective and idiosyncratic estimates of resources. Both approaches have long been subject to criticism (West, *et al.,* 1996; Baker, 1998; Young, 2007).

The problem with the optimization of a treatment process results from the fact that it is highly fragmented, and health services within a single treatment process are provided by a number of independent service providers. There are also few treatment standards, both at the level of a treatment process and at the level of a single procedure within a treatment. Patients with similar characteristics can pass a different path through the healthcare system, and in addition each of the services provided can vary in terms of resources used depending on the service provider.

The existing system of reimbursement present in most developed countries, in which the pricing unit is a single service provided to a patient – reported as a diagnostic group, procedure or number of days of stay – creates an incentive for transferring costs from one service provider to another or within payers. An example of such a cost-shifting was increased spending on outpatient care as a result of the introduction of DRG-based pricing of inpatient services (Wilson *et al.,* 2005; Kulesher and Wilder, 2006).

The approach proposed by Kaplan and Porter counteracts both weaknesses associated with the healthcare management – the lack of adequate information about the cost of health services and lack of information to optimize treatment process. They propose application of TDABC to analyze the whole treatment process and cross-analysis of the costs of individual actions with the value they carry to the final outcome. Figure 1 shows a scheme of Kaplan and Porter's proposal.

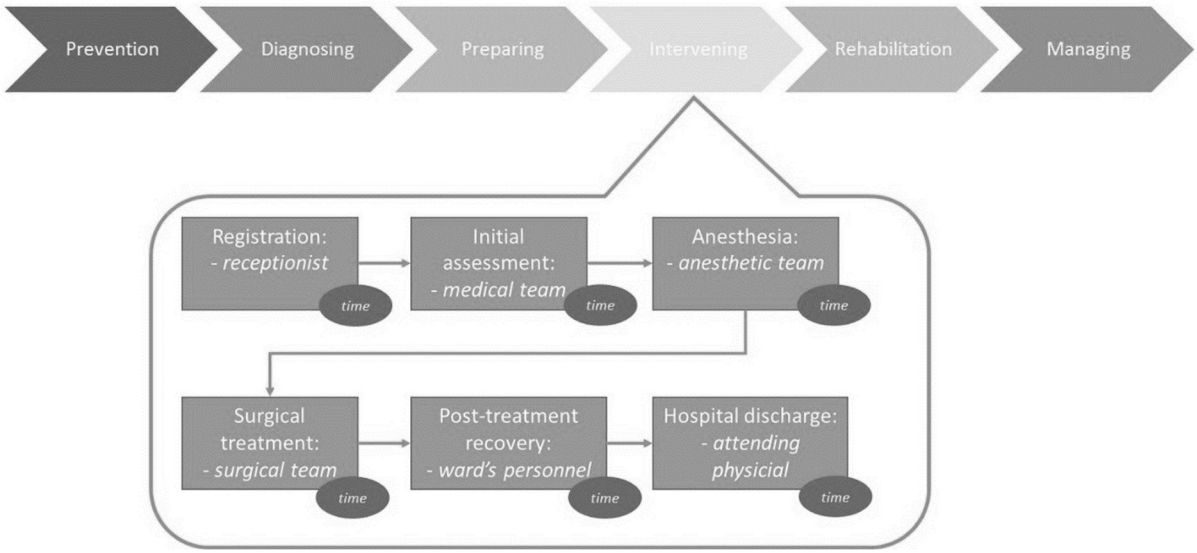

Figure 1 Kaplan and Porter's proposal

Source: Kaplan and Porter (2011)

Cost calculation applies to the entire treatment process (or a specified period of time in case of chronic diseases), and includes a path which patients pass during the treatment. The analysis also applies to all typical elements of the treatment process – prevention, diagnosing, preparing, intervening, rehabilitation and managing.

Each patient's contact with the healthcare provider is presented in form of actions taken. For every action in the treatment process the involvement of both capacity-supplying resources and consumable supplies is determined. The cost of each action is set by adding direct and indirect costs. Allocation of indirect costs is performed according to the amount of time each resource is involved in the action (e.g. the time of surgeon's work during the surgical procedure). The cost of the treatment process is the sum of the cost of all the supplies and the resources in all activities undertaken throughout it. Scenario approach based on the time equations allows for determination of multiple patient paths within a single treatment process. The proposed solution, by providing a comprehensive analysis of the whole treatment process using TDABC enables value management and cost optimization. Its main advantages are:

- elimination of unnecessary process variations and processes that don't add value,
- improvement of resource capacity utilization,
- delivery of the right processes at the right locations,
- matching clinical skills to the process,
- speeding up cycle time,
- optimization over the full cycle of care.

3 Polish experiences in the use of cost information

After 1989 most healthcare institutions in Poland have been public and therefore costing models for healthcare have been regulated by law. Increasing level of managers' needs as well as more developed information systems were the main reasons for its redevelopment. In 2011 a solution based on Activity-Based Costing approach has been developed by Świderska's team in the Warsaw School of Economics in cooperation with the Polish Ministry of Health (Świderska, 2011). The primary purpose was to develop a costing model useful for the management of a healthcare institution, including in particular decision-making and reporting inefficiencies. In 2015, a regulation came into force, making it the basis for cost-based pricing of health services. Figure 2 shows a scheme of the Polish costing model.

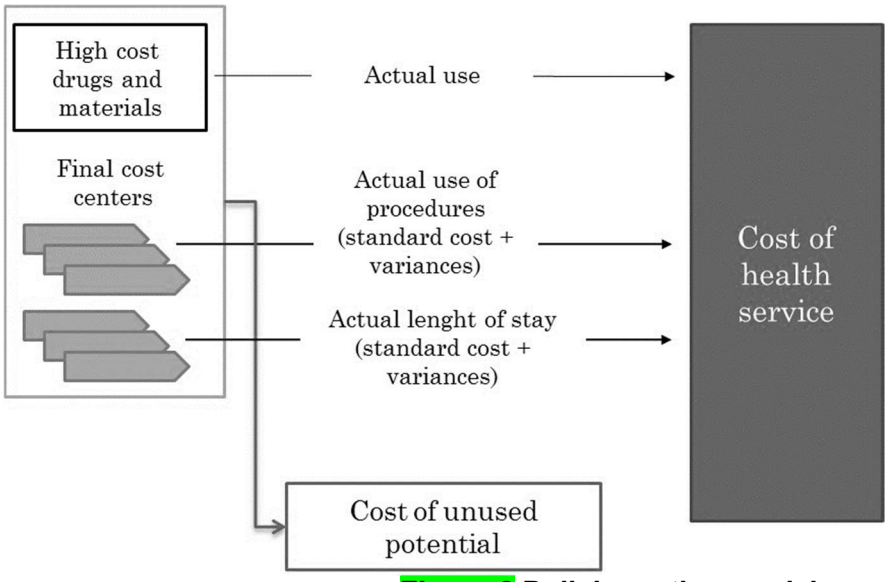

Figure 2 Polish costing model

Source: own work based on Ministry of Health (2015)

The calculation is based on microcosting approach, which assumes identification of numerous cost objects. Cost object is any object for which a cost is computed. This approach ensures more accurate calculation, because every cost object can be individually assigned to a health service using suitable cost driver. Polish model is a combination of top-down and

bottom-up approach. Top-down microcosting means that the average cost of each cost object is calculated (Chapko *et al.,* 2009). For example, the cost of stay in a hospital ward is set per day of stay. Bottom-up approach assumes that the cost of each object is determined individually for each service based on real data (Wordsworth *et al.,* 2005). For example, the cost of a surgical procedure for each patient will be determined based on the actual consumption of resources. Earlier research proves that such a combination is a good compromise between accuracy and labor-intensity of the calculation (Raulinajtys-Grzybek, 2014b).

Typical cost objects are identified in every cost center and their standard cost is calculated. Cost of each patient contact is set according to data on the actual use of cost objects – such as procedures, hospitalization or other services provided. Cost of high-cost drugs and materials are assigned in real values, and for other cost objects a standard cost is determined (and then corrected using variances). Using standard cost approach differs the Polish model from Kaplan and Porter's proposal that was based on actual values. Previous research (Świderska, 2011) showed that using standard times proved to be easier for data collection when information is not available from appropriate information systems (e.g. time tracking). The use of actual times may be implemented for most expensive procedures as part of the planning and control process.

A characteristic feature of this model is the determination of the cost of unused capacity which as a rule is not included in the cost of health service. The only exception from that rule are the costs of so called "standby". These are costs of unused capacity resulting from the constant readiness of specific areas (e.g. ICU or operating theatre) and should be taken into consideration when setting prices for healthcare provided in these areas (Raulinajtys-Grzybek and Świderska, 2015).

Similarly like Kaplan and Porter's solution, the Polish model:

- is based on process approach to costing patients and health services,
- calculates costs as the sum of all activities performed to the patient,
- sets cost of each activity based on resources involved,
- and determines cost of resources based on the available capacity.

It has been designed to provide information at the provider's level and has not yet been used to manage the whole patient treatment. The Polish model has been implemented only in few test areas regarding both inpatient (Raulinajtys-Grzybek and Świderska, 2015) and outpatient (Raulinajtys-Grzybek, 2014a) services, which proves its usefulness for different areas of healthcare. In the upcoming years it will be obligatory for all providers reporting data for the purpose of cost-based pricing and as such it could be used for healthcare management in line with Kaplan and Porter's proposal.

4 Limitations on the use of the Kaplan and Porter's solution in Poland

The Kaplan and Porter's proposal assumes a holistic analysis of the entire treatment process involving a variety of providers – from primary care to long-term care. Its aim is to optimize the costs of the whole treatment of a specific disease. The implementation of this solution in Poland can be complicated due to a number of institutional arrangements.

The budget for healthcare in Poland is divided between the 16 regions where branches of the public payer (the National Health Fund) operate. Approximately 97% of Polish citizens are insured by the National Health Fund, which is financed with health insurance premiums. Each branch is financing the treatment of patients from their region within the available budget. There are separate sub-budgets for different areas of healthcare – e.g. outpatient, inpatient, or long-term treatment. Provision of services is carried out by healthcare providers, who concluded an agreement for certain services with the National Health Fund. Healthcare

providers having a contract with a public payer can be either publicly owned (by central of local government) as well as privately owned (these are usually for-profit entities). The selection of service providers is based on an assessment of various criteria, including those related to price, quality and availability of services (Panteli and Sagan, 2011).

Some of the problems associated with the healthcare management have been presented below, which hinder the implementation of a holistic approach to value-added analysis of the treatment process.

4.1 Expenditure optimization within subbudgets

Management of public funds in Poland is carried out at a subbudget level in such a way as to ensure access to the greatest number of services of every type. Contracts with service providers are concluded to ensure the availability of particular types of services – e.g. inpatient care. So far the efforts of the public payer focused on signing agreements with the service providers guaranteeing the lowest level of costs and the implementation of more services within the same subbudget. There were some actions promoting the transfer of patients from inpatient to outpatient care but very limited – they included e.g. the organization of selected surgeries as one-day procedures, as well as the procedures fastening access to healthcare for cancer patients (Holecki and Romaniuk, 2015). However, these actions were not accompanied by a detailed analysis of the cost of individual services subject to change.

4.2 Bottleneck in the outpatient care

Approximately 43% of all public funds are spent on the purchase of hospital services, and only less than 8% on the purchase of specialist outpatient services (National Health Fund, 2016). This causes problems with the availability of outpatient services and long queues to specialists, lasting up to six months. Patients see the doctor late and often when the hospital treatment is necessary. This results in an increase in expenditure in the inpatient sector, which absorbs more and more public funds.

4.3 Shifting costs among providers

The unit of payment for most types of care is the number of health services provided – for outpatient care they are measured by the number of procedures and for inpatient care by the number of cases grouped into diagnostic groups (DRG) or, in specific areas, by number of days of stay. Here are fixed prices set for each unit of payment – procedure, DRG, and day of stay. Primary healthcare and hospital emergency departments are paid a flat rate - respectively through capitation rates and a fixed budget. The profit of the provider is set as the difference between prices that are fixed (either at the service level or provider level) and costs. As a result of such a formula, providers take actions to minimize costs associated with the treatment and sometimes transfer the problematic cases to other providers. In areas paid per service they might also multiply the number of admissions of other low-cost patients. The consequence of such a behavior are health services that do not bring value to the patient and generate additional costs.

4.4 Lack of treatment standards

Despite numerous attempts, no standards have been developed so far in respect of the whole treatment process, and there are just few medical standards for individual services. The same disease can be treated using different methods, and patients can go different paths in the health system.

The implementation of a holistic approach for the management of the whole treatment process would require changes in the way of setting the budgets of the National Health Fund

and shifting from subbudgets for areas of care into budgets for treating different health problems – for example, the treatment of heart diseases. Assessment of the entire treatment process would require analysis of large datasets on the services provided to patients to identify typical treatment paths. Such data is mostly already collected today by the public payer. Due to the features of the Polish healthcare system presented above, it would be necessary to provide a detailed verification of the data by the medical community. This would help to exclude services that do not bring added value, the implementation of which results from improper organization of healthcare, that occur due to the late initiation of treatment, and that are the result of multiplication of health services in order to generate additional revenue.

5 Conclusion

The costing model designed for Poland - like the Kaplan and Porter's solution – is based on the Activity-Based Costing concept. It assumes allocation of consumable supplies based on their use and the allocation of capacity-supplying resources based on time of their involvement in service. Separate calculation of costs for every patient helps identifying differences between them and allows for multiple patient paths. In contrast to the Kaplan and Porter's approach, the Polish model presented in the article uses information on the standard use of individual cost objects in each service and is not based on time equations.

The main area of improvement towards the Kaplan and Porter model is the implementation of a holistic approach towards treatment process. Analysis of the whole process including various services would require setting a different aim for the public payer. Instead of minimizing expenditure on different types of services it should concentrate on optimizing costs of treating specific health problems. Data on costs of different actions is necessary to analyze the area for improvement. The designed costing model can be adapted to different types of health services which forms a good starting point to begin the optimization process.

References

Averill, R. F., Goldfield, N. I., Wynn, M. E., McGuire, T. E., Mullin, R. L., Gregg L. W., and Bender J. A., 1993. Design of a prospective payment patient classification system for ambulatory care. *Healthcare Financial Review*, 15(1), pp. 71-100.

Baker, J. J., 1998. *Activity-based Costing and Activity-based Management for Health Care.* Gaithersburg, MD: An Aspen Publication.

Chapko, M. K., Liu, C. F., Perkins, M., Li, Y. F., Fortney, J. C., and Maciejewski, M. L., 2009. Equivalence of two healthcare costing methods: bottom-up and top-down. *Health Economics*, 18(10), pp. 1188-201.

Cooper, R., and Kaplan, R.S., 1988. Measure Costs Right: Make the Right Decisions. *Harvard Business Review*, 66(5), pp. 96-103.

Czach K., Klonowska K., Świderek M., and Wiktorzak K., 2011. Poland: The Jednorodne Grupy Pacjentów – Polish experiences with DRGs. In: R. Busse, A. Geissler, W. Quentin, M. Wiley, eds. 2011. *Diagnosis-related groups in Europe: moving towards transparency, efficiency and quality in hospitals*. Maidenhead: McGraw-Hill/Open University Press. pp. 359-381.

De Mello-Sampayo, F., De Sousa Vale, S., and Camoes, F., 2013. Substitutability between drugs, innovation and growth in the pharmaceutical industry. 10th EBES Conference Proceedings, pp. 13-28.

Drummond, M. F., Sculper, M. J., Torrance, G. W., O'Brien, B. J., and Stoddart, G. L., 2005. *Methods for the economic evaluation of healthcare programs*. Oxford: Oxford University Press.

Duncan, D. G., and Servais, C. S., 1996. Preparing for the new outpatient reimbursement system. *Healthcare Financial Management*, 50(2), pp. 42-49.

Evers, S., Voss, G., Nieman, F., Ament, A., Groot, T., Lodder, J., and Blaauw G., 2002. Predicting the cost of hospital stay for stroke patients: the use of diagnosis related groups. *Health Policy*, 61(1), pp. 21-42.

Fetter, R. B., Thompson, J. D., and Mills, R.E., 1976. A system for cost and reimbursement control in hospitals. *The Yale Journal of Biology and Medicine*, 49(2), pp. 123-136.

Folland, S., Goodman, A. C., and Stano, M., 2010. *The Economics of Health and Health Care*. New York: Pearson Education, Inc.

Jones, M. J., and Mellett, H. J., 2007. Determinants of changes in accounting practices: Accounting and the UK Health Service. *Critical Perspectives on Accounting*, 18, pp. 91-121.

Holecki, T., and Romaniuk, P., 2015. The oncological package: a new source of concern in Poland's health system. *Lancet Oncology*, 16(3), e104.

Kaplan, R. S., and Anderson, S. R., 2004. Time-Driven Activity-Based Costing. *Harvard Business Review*, 82(11), pp. 131-138.

Kaplan, R. S., and Porter, M. E., 2011. How to solve the cost crisis in healthcare. *Harvard Business Review*, 89(9), pp. 46-61.

Kobel, C., Thuilliez, J., Bellanger, M., and Pfeiffer, K., 2011. DRG systems and similar patient classification systems in Europe. In: R. Busse, A. Geissler, W. Quentin, M. Wiley, eds. 2011. *Diagnosis-related groups in Europe: moving towards transparency, efficiency and quality in hospitals*. Maidenhead: McGraw-Hill/Open University Press. pp. 37-59.

Kulesher, R. R., and Wilder, M. G., 2006. Prospective payment and the provision of post-acute care: how the provisions of the Balanced Budget Act of 1997 altered utilization patterns for Medicare providers. *Journal of Healthcare Finance*, 33(1), pp. 1-16.

Lau, C. K. M., Fung, K. W. T., and Pugalis, L., 2014. Is health care expenditure across Europe converging? Findings from the application of a nonlinear panel unit root test. Eurasian Business Review, 4(2), pp. 137-156.

Ministry of Health, 2015. *Rozporządzenie Ministra Zdrowia w sprawie zaleceń dotyczących standardu rachunku kosztów u świadczeniodawców* [Regulation on costing standard for healthcare providers] [online] Available at: <https://legislacja.rcl.gov.pl/projekt/268664> [Accessed 7 March 2016].

National Health Fund, 2016. *Annual budget for 2016*. [online] Available at: <http://www.nfz.gov.pl/download/gfx/nfz/pl/defaultaktualnosci/284/6356/1/projekt_planu_finansowego_na_2016_rok_zal_do_uchwaly_nr_10.pdf> [Accessed 7 March 2016].

OECD, 2013. *Health at a Glance 2013: OECD Indicators. OECD Publishing*. [online] Available at: < http://dx.doi.org/10.1787/health_glance-2013-en> [Accessed 7 March 2016].

Panteli D., Sagan A., eds., 2011. Poland: Health system review. Health Systems in Transition. *WHO Health Systems in Transition*, 13(8), pp. 1-216. Available at: < http://www.euro.who.int/__data/assets/pdf_file/0018/163053/e96443.pdf>

Porter, M.E., 1980. *Competitive strategy: Techniques for Analyzing Industries and Competitors*. New York, NY: Free Press.

Porter, M.E., 2009. A Strategy for Healthcare Reform: Towards a Value-Based System. *The New England Journal of Medicine*, 361, pp. 109-112.

Porter, M.E., 2010. What Is Value in Health Care? *The New England Journal of Medicine*, 363, pp. 2477-2481.

Porter, M.E., and Teisberg, E.O., 2006. *Redefining Health Care: Creating Value-Based Competition on Results*. Boston, MA: Harvard Business School Press.

Raulinajtys-Grzybek M., 2014a. Учет затрат по видам деятельности для амбулаторной клиники [Activity-based costing for an ambulatory clinic], *Экономика и современный менеджмент: теория и практика*, 5(37), pp. 43-55.

Raulinajtys-Grzybek M., 2014b. Cost accounting models used for price-setting of health services: an international review. *Health Policy*, 118(3), pp. 341-53.

Raulinajtys-Grzybek M., Świderska G.K., 2015. Payment by Results vs. costs of 24-hour standby in hospitals: evidence from Poland. *Argumenta Oeconomica*, 2(35), pp. 85-104.

Świderska, G.K., ed., 2011. *Rachunek kosztów w zakładach opieki zdrowotnej. Podręcznik*.[Cost accounting in healthcare institutions] Warszawa: Oficyna Wydawnicza SGH.

Walshe, K., and Smith, J., eds., 2006. *Healthcare Management*. Maidenhead: Open University Press.

West, T. D., Balas, E. A., and West, D. A., 1996. Contrasting RCC, RVU, and ABC for managed care decisions. A case study compares three widely used costing methods and finds one superior. *Healthcare Financial Management*, 50(8), pp. 54-61.

WHO, 2000. *Economic Evaluation.* [online] Available at: <http://whqlibdoc.who.int/hq/2000/WHO_MSD_MSB_00.2i.pdf> [Accessed 7 March 2016].

Wilson, S. F., Shorten, B., and Marks, R. M., 2005. Costing the ambulatory episode: implications of total or partial substitution of hospital care. *Australian Health Review*, 29(3), pp. 360-5.

Wordsworth, S., Ludbrook, A., Caskey, F., and Macleod, A., 2005. Collecting unit cost data in multicentre studies. Creating comparable methods. *The European Journal of Health Economics*, 6(1), pp. 38-44.

Young, D. W., 2007. The folly of using RCCs and RVUs for intermediate product costing. *Healthcare Financial Management*, 61(4), pp. 100-108.