# OPPORTUNITIES FOR THE IMPROVEMENT OF COST ACCOUNTING SYSTEMS IN PUBLIC HOSPITALS IN ITALY AND CROATIA: A CASE STUDY

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## ABSTRACT

*The purpose of this paper is to highlight similarities and differences between one Croatian and one Italian public hospital regarding the implementation of cost accounting and full costing method in their accounting systems. Moving from the theoretical background, it is evident that cost accounting methods introduced in healthcare sector bring benefits to the whole society through an increased efficiency of the healthcare services provided. It primarily ensures better governing of hospital's resources allowing more transparency in spending public funds. The main topic is that with the introduction of cost accounting system for internal purposes in public hospitals, the management would be able to govern them in a more efficient and effective way while reducing costs. The research for this paper was conducted through the interview of accounting officers in one Croatian and one Italian public hospital. The main results show that there are differences in legislation background regarding how they record costs, but also how they allocate costs to the cost objects and in how they use cost information in their decision-making process. In order to successfully manage public hospitals, it is crucial that true, timely and valid information are obtained as a base for the decision-making process. The cost accounting methodology is therefore essential to the management of public hospitals. It must provide information on the type and amount of resources spent, and thus enable the preconditions for control, management and potential reduction of costs.*

**Keywords:** *cost accounting, full costing method, public hospitals, Italy, Croatia*

## 1. INTRODUCTION

In this paper, we investigate the different approaches to the implementation of cost accounting systems in two public hospitals, aiming to highlight the differences between the managerial control systems in public hospitals in Italy and Croatia. We think that this comparison is meaningful, because the two countries have different regulatory frameworks; by comparing the healthcare management's needs in those two environments,

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we can gain some valuable insights on the benefits, in terms of quality and usefulness of information generated by the managerial accounting systems in public hospitals, of switching from cash-based public sector accounting to accrual accounting. In fact, healthcare institutions in Italy have been using accrual accounting for their financial reporting for more than two decades, while in Croatia a modified accrual accounting model prevails. Despite the fact that public hospitals in Italy may appear to be in a better position for reaping the benefits of accrual accounting, in terms of relevance and usefulness of the information provided by their managerial accounting system, it seems that there is still room for improvement in the cost accounting systems employed by both hospitals in Croatia and in Italy. Therefore, we have formulated our research questions in order to determine to what extent public hospitals in Italy and Croatia use cost accounting methodologies, calculate costs per patient or per provided service, and whether the accounting officers in public hospitals are ready for the implementation of the full cost approach to calculate costs in order to track costs per patient or healthcare service in Italy and Croatia. Since the research was conducted through interviews with accountants and accounting officers in two Italian and Croatian public hospitals, we believe that the answers represent their perception on the usage of cost accounting methodologies. The purpose of this paper is to highlight similarities and differences between one Croatian and one Italian public hospital regarding the implementation of cost accounting and full costing method in their accounting systems. The second part presents the theoretical background on the usage of accrual accounting basis and cost accounting methodologies in the NHSs of different European countries. In the third part of the paper, we comprehensively analyse the accounting system in Italian and Croatian public hospitals, in order to highlight the flaws of the current accounting systems, with regard to the recording and allocation of costs. In the fourth part of the paper, the empirical research results are provided. At the end of the paper, we also formulate relevant recommendations for the introduction of the cost accounting system in public hospitals.

## 2. LITERATURE BACKGROUND

Adoption of accrual accounting in public entities is normally a prerequisite for the development of advanced cost accounting methodologies that, in the case of healthcare, allow to correctly determine the costs of the services provided or costs per patient. Introducing accrual accounting for financial reporting and bookkeeping has become a movement in the public sector over the past twenty years (Mehrolhassani and Emami, 2013). This improvement is strongly connected with the principles of new public management (NPM) which advocates for accounting reforms in public bureaucracies, introducing performance measurement and managerial control procedures in public sector entities (Eriotis et al., 2011). In order to implement market-based principles in public hospitals and to achieve better budget transparency, it is necessary to provide objective information, based on the accrual accounting basis (Vašiček and Roje, 2010). The advantages of accrual based accounting are: comprehensive financial information, better asset management, calculation of full cost of public services, focus on outputs, better quality of management and decision-making information, and greater comparability of management performance results (Wynne, 2004). All this could lead to responsibility accounting in public hospitals. Disadvantages of accrual accounting basis are related to valuation of costs, development of accounting policies, establishment of costly

accounting information systems, and the necessity of training the employees of accounting departments in public hospitals in order to develop their skills (Wynne, 2004). Since 2000, adoption of accrual accounting basis has become a trend, if not at the national level, at least in specific public entities, such as public hospitals and higher education institutions. Countries that, across the levels of government, introduced accrual accounting basis include Denmark, Finland, Latvia, Estonia and the United Kingdom (FEE, 2007). Austria, the Czech Republic and Lithuania are moving toward a full implementation of accrual accounting (Dražić Lutilsky et al., 2016). However, from the available data in 2011, it is evident that Ireland (Connolly and Hyndman, 2011), France, Germany, Romania, Sweden, Portugal, Spain, Greece, Italy and Cyprus have also made considerable efforts to introduce the accrual accounting basis at the national level (Dražić Lutilsky et al., 2016). The most developed countries in the usage of the accrual accounting basis, not only for financial reporting, but also for budgeting purposes at all levels of government are Australia and Canada (Mehrolhassani and Emami, 2013). Regarding accrual accounting in public hospitals and cost accounting systems (including Activity Based Costing method), many of the countries mentioned above have introduced the DRG (Diagnosis Related Group) methodology at the sectoral level (at National Healthcare System – NHS) for calculating tariffs of public health services provided by public hospitals (Polyzos et al., 2013; Christensen et al., 2004; Pettersen, 2001; Helmig and Lapsley, 2001; Sanchez-Martinez et al., 2006). In some countries, such as Ireland, Germany, France, Finland, and the UK, funding based on DRG systems was also introduced at the institutional level, which means that they are using cost accounting methodology in public hospitals (O'Reilly et al., 2012). Moreover, it seems worth mentioning that Bosnia and Herzegovina implemented accrual accounting in public hospitals in 1998, and Slovenia did the same in 2001 but neither of these two countries has developed cost accounting methodologies in public hospitals (Dražić Lutilsky et al., 2016). So, it can be concluded that different combinations of the adoption of accrual accounting in healthcare systems are (Dražić Lutilsky et al., 2016): (1) introduction of accrual basis with the implementation of cost accounting in the healthcare at the sectoral level for the determination of DRGs; (2) introduction of accrual basis with the implementation of cost accounting in the healthcare at the sectoral level for the determination of DRGs and at the institutional level for cost accounting methodologies in hospitals; (3) introduction of accrual accounting basis on the sectoral level without any real advantage at the institutional level.

Cost accounting is a part of the accounting system in which all costs incurred in carrying out an activity or providing a service are collected, classified and recorded and then summarized and analysed to calculate a production cost or to determine where savings are possible (Horngren et al., 2003). Cost accounting is considered an internally oriented accounting procedure, providing information about costs and processes to managers and stakeholders (Horngren et al., 2003). Under cost accounting methodologies, we consider any cost allocation method that enables the calculation of costs per unit of product or service, such as the traditional costing system or modern costing system which is considered to be Activity-Based Costing method (hereinafter the ABC method). The costs of medical procedures and operations calculated by the ABC method show a big difference in the consumption of resources compared to the traditional costing system (Agyar et al., 2007). The use of bi-level cost allocation with the ABC method

has improved allocation of indirect costs because it is a more detailed and more accurate allocation based on the processes of hospitals. Furthermore, it takes into account the causal relationship between resources and activities through the causal relationship between activities and the final cost objects through cost drivers (Agyar et al., 2007). Using the ABC method, managers will be able to get a more accurate allocation of indirect costs, which ultimately enables meaningful analysis of revenue and expenses and more accurate prices, hospital budgets and planning strategies (Aldogan et al., 2014). The ABC method ensures calculation of unit costs per service and patient, depending on the specific characteristics of individual hospitals and healthcare services offered depending on the accounting information system (Dražić Lutilsky and Butorac, 2014). Therefore, it is possible to determine the cost of hospital care for each individual patient and to calculate the correct and objective cost of health services in public hospitals. This method of cost calculation would cause reimbursements from the National Health Funds that are more realistic and would allow hospitals to improve their liquidity, besides allowing them to better understand all of the costs incurred. Dražić Lutilsky and Butorac (2014) emphasize that the introduction of the ABC method in the public hospital system would secure payment of services on the market, if the hospital decides to enter the market with certain services, which would enable the potential excellence of certain services and hospitals, but would also provide new ways of financing. O'Reilly et al. (2012) investigate the implementation of the ABC method in public hospitals in Ireland, Germany, France, Finland, and UK. The main purpose of their study was to research the reasons for the implementation and development of the ABC method in public hospitals. The research shows how the ABC method can be implemented in different health systems with different organizational structures, different systems of funding and involvement of various public and private sector entities that provide health services. Despite the differences in approaches and ways of implementing the ABC method as the basis for the financing of health institutions, the examined countries share several common goals such as increasing efficiency, improving quality and improving transparency (O'Reilly et al., 2012). Each of the five countries adopted a different approach to comparing data with costs calculating either the cost per patient or the cost per service. The bottom-up approach is used in Germany and Finland, and is based on the use of resources per patient, which is considered a more accurate approach because it is based on real, rather than on the average use of resources. Due to the lack of data on costs per patient, the top-down approach is used in England, France and Ireland, and involves the allocation of hospital costs to certain services. In a relatively short period, the adoption of the ABC method has contributed to the improvement of efficiency of complex healthcare institutions and to the achievement of financial sustainability of the healthcare system (O'Reilly et al., 2012). Moreover, it also enables better cost allocation and tracking of costs per patient or per service. The future direction of the ABC method is clear; further adjustments are necessary to increase emphasis on quality of healthcare and on creating value. According to O'Reilly et al., (2012) the ABC method provides more accurate data for performance measurement of hospitals. The issue can be visible in the fact that the ABC method demands many comprehensive financial and nonfinancial data. Nonfinancial data can be collected through extensive analysis of hospital's processes and activities, which can be timely and expensive. Stamatiadis (2009) conclude, based on an empirical research on 54 public hospitals in Greece, that although

they use the accrual accounting basis, they still have not introduced cost accounting because only 10 out of 54 sampled public hospitals have introduced cost accounting into their accounting information systems. Even though all of them are satisfied with the possibilities provided by the accrual accounting basis, it seems that they are not using those opportunities completely (Stamatiadis, 2009). Out of 115 public hospitals in Spain, 86 of them use some kind of cost accounting methodology while the remaining 29 of them do not use any (Sanchez-Martinez et al., 2006). Sanchez-Martinez et al. (2006) emphasize that cost accounting methodologies are promoted by health authorities, while the payments to the public hospitals are based on public tariffs and because of that, they are losing interest in cost accounting methodologies. Bertoni et al. (2015) state that the relevance of information coming from the ABC method is associated with the ability to draw attention to the determinants of costs. Therefore, the ABC method does not necessarily represent the most efficient measurement of costs but it is a valid support for decision-making and a useful tool for the analysis of costs (Bertoni et al., 2015). A comparison of the ABC method and traditional costing methods leads to the conclusion that, based on the analysis of activities, the ABC method is prone to a high rate of obsolescence, and costs tend to be steep because the activities develop over time, especially in complex hospitals (Bertoni et al., 2015). Traditional costing methods, on the other hand, tend to be more stable and less expensive because the organizational units change less frequently than the activities (Bertoni et al., 2015). Unfortunately, the quality of information on costs they provide is not at the same level as information on costs given by the ABC method (Bertoni et al., 2015). Finally, empirical research conducted in Croatia on 34 public hospitals indicates that the cost accounting methodology is underdeveloped (Dražić Lutilsky et al., 2016). Research results on the application and development of cost accounting in Croatian public hospitals should be observed primarily by monitoring the overall level of costs and cost structure by nature and organizational units. Expressing the overall level of costs has special importance in the context of limited financial resources for the execution of contractual obligations regarding the volume of provided healthcare service (Dražić Lutilsky et al., 2016).

## 3. LEGISLATIVE FRAMEWORK FOR PUBLIC HOSPITALS IN ITALY AND CROATIA

In the last decade, we have witnessed constant reprimand of the Croatian national healthcare system (NHS) for its piled-up debts. The period from the beginning of 2002 until today in Croatia has been marked by the intensification of reforms in the Croatian public sector, including the reform of national accounting practices. Abandoning the concept of cash accounting and fund accounting and at the same time introducing the concept of modified accrual accounting basis was a further step towards modern international trends. Simultaneously, relevant international classifications have been comprehensively and consistently introduced in the reporting system to ensure transparency and comparability of the state and its entities. A reform in the financing of the public health system has changed the status of the Croatian Health Insurance Fund (CHIF) from an extra-budgetary user to a part of the central government budget through the State Treasury. Thus, public hospitals in the healthcare system are financed through contributions from CHIF, and behave in accordance with the established standards at the central government (Ministry of Health) but

in terms of the accounting regulations they are a classic form of budget user. However, a specific trait of the public health system is that the health institutions as budget users are not financed exclusively by certain types of expenditure approved in the financial plan, but based on the actual provision of services, within the framework of a contract with CHIF, or the state, which through public hospitals indirectly provides health services to citizens (Vašiček and Roje, 2010). The financial reform of the public health sector is included in the mandatory application of the current national accounting system based on the modified accrual accounting basis. The legal basis today of the current accounting system of public hospitals includes the Budget Law (Official Gazette, No. 136/2014), the Regulation on Budget Classifications (Official Gazette, No. 26/2010) and the Regulation on Budget Accounting and Planning (Official Gazette, No. 124/2014). The modified accrual accounting basis in particular has the following main features (Vašiček et al., 2015):

1. Expenses are defined as decreases in economic benefits during the reporting period, which means that they are recognized at the time of the transaction, regardless of the time of payment.
2. Revenues are defined as an increase in economic benefits during the reporting period in the form of inflows of cash and cash equivalents, which undoubtedly refers to the recognition of revenue retained at cash concept.
3. Revenues and expenses due to changes in the value and volume (value adjustments, deficits/surpluses, write-offs...) of non-financial assets and liabilities are not recognized, but these changes are reflected directly in ownership sources (public capital).
4. Costs of acquisition of non-financial fixed assets are not capitalized but they are entirely recognized as expenses of the period in which the acquisition occurs. Consequently, healthcare entities do not account for depreciation of the asset as well as the systematic allocation of the cost over the useful life of its usage, which directly undermines the possibility of monitoring the efficiency of activities.
5. Also, in direct connection with the aforementioned points, the recognition of funds received from the funders (the state and local government) to finance investments in assets, is not carried out according to the economic logic of the international accounting standards (profit or capital approach), but is recognized as a part of total revenues of the reporting period in which they are realized.
6. Acquisition or disposal of non-financial assets free of charge (donations) in the framework of the budget is not recognized as income or expense but is directly expressed as a change in ownership sources (public capital).
7. From the accounting point of view, it can be highlighted that in Croatian public hospitals revenues are not aligned with the expenses due to the modified accrual accounting basis. This is why it is impossible to achieve financial sustainability of the Croatian NHS. It should be noted that, since the beginning of 2015, CHIF as the dominant ”buyer” of public health services, after 13 years of functioning in the framework of the State Treasury, regained its financial independence. This fact, however, did not cause any change in the budget and the accounting status of public hospitals as was the case when CHIF was included in the State Treasury. For public hospitals that are fully

owned by the central government, this change has resulted in additional reporting requirements towards CHIF and the Ministry of Health as dominant stakeholders. From the position of public hospitals, external reporting is divided in accordance with the provisions of the Budget Law and CHIF. However, despite such a complex and challenging external reporting process, the fact remains that public hospitals are missing information needed to make business decisions and to manage hospitals in the short and long term. Accounting information systems in public hospitals are focused on assembling external financial statements. Internal reports needed for governing public hospitals are used occasionally, as the result of the current management demand, and not the quality of developed cost accounting and management accounting methodologies (Vašiček et al., 2016). The research conducted to assess the quality of accounting information for management purposes in public hospitals tests the hypothesis that the current accounting system is not appropriate for the needs of objective monitoring of activities and presentation of the results of public hospitals (Vašiček et al., 2011). Looking at the results of the research and ranking the importance of reasons for using the prescribed system of financial reporting, it is visible that the most important reason for using the prescribed financial reporting system is meeting the statutory reporting obligations. The other reasons, in order of importance, are the execution of the financial plan, the successful conduct of business policy and benchmarking with other equivalent institutions (Vašiček et al., 2011). The methodological basis for preparation of internal reports and selection of a suitable cost accounting methodology should take into account the specifics of the processes, management information requirements and development of the business and accounting system. It must be consistent with the purpose, goals and objectives of public hospitals and must ensure quality and complete internal reporting at all hierarchical levels of management (Vašiček et al., 2011). In order to achieve that, it would be appropriate to introduce the accrual accounting basis, which would allow recording and recognition of all costs and expenses. It would also allow allocation of costs to the patient or to the healthcare services, thus providing the transparency of resources spent in the healthcare system. From the perspective of public hospitals, the introduction of the accrual accounting basis and cost accounting methodology enables them to cut costs and to reduce piled-up debt.

Italy's healthcare system was founded in 1978, inspired by the United Kingdom's National Health Service, and today is a regionally organised National Health Service (*Servizio Sanitario Nazionale*, SSN) that provides universal coverage. The Ministry of Health, the main institution responsible for public health at the national level, sets every year the essential levels of healthcare services that must be provided by the SSN. The Regions[1] are responsible for organising and delivering healthcare, and they can offer services above the minimum level set by the Ministry of Health. Local Health Agencies (*Aziende Sanitarie Locali* or ASL) deliver public health, community health services

[1] Regions are first-level administrative divisions of Italy. There are twenty regions, five of which are constitutionally given a broader amount of autonomy, granted by special statutes: Friuli-Venezia Giulia, Trentino-Alto Adige (autonomous provinces of Trento and Bolzano), Sardinia, Sicily, and Valle d'Aosta.

and primary care services. Secondary and specialist care is delivered through either public hospitals or accredited private providers. The primary care network promotes the maintenance of health, health education and diagnosis and treatment of disease in different settings. Inpatient hospital care is delivered through a network of hospitals, which can be either public or private institutions. These facilities provide both outpatient care and inpatient care. Healthcare spending in Italy accounted for 8.9% of its GDP in 2016, an amount in line with the average spending in all OECD countries, but steadily increasing up from 6.9% in 1995 (OECD Health Statistics, 2017). The national healthcare system is funded by: a) a portion of the regional income tax levied on all productive activities (IRAP), a regional surtax on the general income tax, and other taxes levied locally (e.g., excises on fuel); b) co-payments from patients and other own revenues of the local health entities; c) for the remaining part, by the central government budget through the State Treasury. Italy's four autonomous regions (with the exception of Sicily, which funds only about 50% of its healthcare expenditures on its own budget) and the two autonomous provinces of Trento and Bolzano, fund their regional healthcare system entirely with their own budget, without contributions from the central government budget.

Accrual accounting was first introduced in public Italian healthcare institutions in 1992 (legislative decree No. 502/1992)[2]. The introduction of the new accounting system was part of a broader effort to increase the efficiency of healthcare spending, by streamlining the corporate governance of healthcare institutions and endowing the Regions with the duty of providing healthcare services (and stripping the city governments – or *Comuni* - from the power of regulating healthcare). A subsequent 1993 law (legislative decree No. 517/1993) imposed three-year financial plans, yearly budgets, and the adoption of traditional cost accounting based on cost centres, in order to compare costs and performances of the different Local Health Agencies. By 1999, thanks to the legislative decree 212/1999, the "healthcare reform" of the '90s was concluded, and all healthcare institutions had by then completed the switch from public government accounting to accrual accounting. The laws, however, only prescribed the preparation of an income statement and of a balance sheet, without providing any specific provision for the cash flow statement and the notes to the financial statements. Moreover, the relative freedom left to each Region in the field of regulating the financial reports generated by the different Local Health Agencies led to a variety of accounting practices that hindered comparability, sometimes even within the same Region (Torcivia, 2012).

The mandatory adoption of traditional cost accounting, based on cost centres, allows the production of a report, called "LA (level of assistance) model", that must be submitted by all Italian public hospitals to the government (Cislaghi et al., 2014). This model reports the full cost of all the essential levels of healthcare services that are provided by the institution. The model specifies the nature of the expenses (personnel, materials, depreciation, etc.) attributable to each service provided, as defined by the Ministry of Health (e.g., Emergency Room, Surgery on inpatients, Day Surgery, Transplants…). Despite the requirement of calculating the full cost of these services, on the basis of traditional cost centres accounting, the allocation basis used for indirect costs is,

[2] It is interesting to observe how the Regions did not switch to accrual accounting and continue to use public government accounting up to the present day.

in some cases, simplified (e.g., the cost of personnel). Consequently, it appears legitimate enquiring about the usefulness of these reports in the decision-making process of hospitals.

In 2011, in order to harmonize different financial reporting practices that had been developed in the meantime at the regional level, a new regulation (legislative decree No. 118/2011) imposed standardized formats for the financial statements of healthcare institutions, including the consolidated financial statements of the several Local Health Agencies of the same Region. The new law requires the preparation of the cash flow statement, and prescribes that the financial statements should be accompanied by notes. It is of particular relevance the provision that the existing private sector accounting regulations - civil code and national accounting standards issued by the Italian accounting standard setter (*Organismo Italiano di Contabilità* – OIC) should be applied, with some adaptations, to the financial statements of healthcare institutions (ASSIREVI, 2014). The formats chosen for the financial statements, in fact, are a direct adaptation to the needs of healthcare institutions of the mandatory formats used by Italian companies and regulated by Italy's civil code. In addition to the financial statements, the 2011 law standardized the chart of accounts of all healthcare providers, in order to assure a direct link between the accounts used in the bookkeeping system with the items reported in the financial statements (further levels of analysis are allowed at the discretion of the single healthcare institutions). Healthcare-specific issues, not covered by the national accounting standards, are regulated by specific provisions of the Ministry of Health (Ministry decree of 17 September 2012). Some relevant provisions for financial accounting in healthcare institutions are listed below.

1. Property, plant, and equipment are carried at historical cost, including Value Added Tax (not applicable to healthcare revenues). They are depreciated on the basis of depreciation rates stated by the 2011 law. However, if depreciable assets are acquired using non-specific funds (i.e. grants not specifically aimed at funding capital expenditures), they must be fully depreciated in the year of acquisition. This rules aims at reporting in the same income statement both the revenue from the grant and the full depreciation of the asset, and it is not consistent with private sector accounting standards, that always require depreciation over the useful life of the asset.

2. Inventories are carried at the lower of cost or market. Cost can be determined using the average weighted cost method, but not with LIFO or FIFO.

3. Revenues and expenses are recognized in accordance to the matching principle (accrual accounting) and to the prudence principle.

4. Grants are treated as increases of the institution's equity; however, if they are used for acquiring depreciable plant assets, they are matched to the useful life of the assets, appearing in the income statement as revenues in order to offset the depreciation charges (so called "sterilization" of depreciation charges). This provision is not consistent with national accounting standards, because it requires treating a decrease in an equity account as a revenue. National accounting standards only permit the deferral income method or the deduction from the asset value method (OIC 16, §88).

## 4. Research Objectives and Methodology

From the brief description of the legislation framework of Italy and Croatia reported in previous paragraphs, we can conclude that Italian public hospitals should enjoy better preconditions for benefiting from cost accounting information, since they are required to adopt accrual accounting and to calculate costs and results for each cost centre. In order to investigate to what extent cost accounting methodology is used in Croatian and Italian public hospitals and whether accounting officers are ready for the implementation of the full cost approach for calculation of costs in order to track costs per patient or healthcare service, we examined and tried to answer the following research questions:

**RQ1:** To what extent do public hospitals in Italy and Croatia use cost accounting methodology?

**RQ2:** Is there a calculation of costs per patient or per provided service with more detail than what the law requires?

**RQ3:** Are the accountants and accounting officers in public hospitals ready for the implementation of the full cost approach for calculation of costs in order to track costs per patient or healthcare service?

The principal area of research is to present the current opinion of accountants and accounting officers in Italian and Croatian public hospitals about the research questions. In order to gather the necessary information and answer the questions above, we conducted an empirical research using interviews in January 2016 in Clinical Hospital Centre Zagreb, Croatia and in September 2016 in the University Hospital of Trieste, Italy (*Azienda Sanitaria Universitaria Integrata di Trieste*). The chief accounting officers and their staff were given a questionnaire comprising 62 questions divided in three different areas: general information about the hospital, external financial reporting practices, and internal managerial control systems. The survey was conducted as a part of the project 8509 "Accounting and financial reporting reform as a means for strengthening the development of efficient public sector financial management in Croatia", financed by the Croatian Science Foundation.

*Table 1. Main characteristics of public hospitals*

| **Elements** | **Univ. Hospital of Trieste** | **CHC Zagreb** |
|---|---|---|
| Number of medical employees | 2,478 | 4,024 |
| Number of non-medical employees | 509 | 1.079 |
| Number of contracted beds with the National Health Insurance Fund (NHIF) | 774 | 1,795 |
| Used capacity of beds in 2015 | 82.2% | 80% |
| Percentage of processed cases in 2015:<br>- Hospitalization<br>- Daily hospital<br>- Policlinics | <br>21.03%<br>2.48%<br>76.48% | <br>5.5%<br>4.8%<br>90.7% |
| Public funding through the NHIF | 96.35% | 85% |

Observing the main characteristics of the two public hospitals, we can highlight how

the Croatian hospital is larger than the Italian one by the number of employees and by the number of contracted beds. However, both are University hospitals, which means that they are both institutions that combine the services of a hospital with the education of medical students and with medical research. In this sense, we believe that the results of the interviews conducted are comparable.

of DRG services. In Italian hospital, instead, the planning of costs by the funding source from the NHIF is done for the total hospital. The next question required the accounting officers to rank on a five-point Likert scale, ranging from 1 (that corresponds to the lowest degree) to 5 (the highest), how they settle costs and track performance in their hospitals. Grades about cost settlement and performance tracking are reported in Table 2.

*Table 2. Grades about cost settlement.*

| Cost objects | Univ. Hospital of Trieste | CHC Zagreb |
|---|---|---|
| 1. by nature in the entire hospital | 5 | 5 |
| 2. by the organizational units (departments, services, ...) | 4 | 5 |
| 3. the types of services and delivery of the DRG | 1 | 5 |
| 4. the type of service delivery and the internal calculation | 1 | 1 |
| 5. per patient | 1 | 1 |

## 4.1. Research results

In our interviews, we asked the accountants and accounting officers in the two hospitals about their internal system of calculating and reporting costs defined by internal accounting policies, rules and procedures. The questions were focused on the assessment of the quality system of cost accounting and the assessment of provided information to the management regarding decision-making and performance measurement.

Therefore, the first questions were about how they record, plan and settle costs in their hospitals. In both hospitals, for the purposes of planning, costs are recognized by nature (according to the chart of accounts) and by the organizational units (clinics, departments…). Regarding the planning of costs by the funding source from the NHIF, the Croatian hospital plans its costs at the organizational units' level, but also by the type

Although it is difficult to draw broad generalizations from the scale reported in Table 2, given the inevitable subjectivity of the answers provided by the two interviewees, we can still highlight some interesting points. For example, from the answers it can be concluded that neither Italian nor Croatian hospital settle costs by the delivered healthcare service or per patient as a final cost object. The Croatian hospital also settles costs by the DRG because they are suffering a financial loss and because of that, they are trying to calculate which DRG services are profitable to them and which are not. The Italian hospital, despite receiving a part of its funding on the basis of tariffs designed on a DRG-based system, does not consider the services provided as a cost object[3].

The following question was about the coverage of occurred costs of salaries, drugs and overheads with revenues achieved

[3] Italian hospitals are required to measure the full cost of the Essential Levels of Assistance provided, but the detail is not comparable with that offered by a cost analysis performed at the single DRG level.

through DRG price. Both hospitals answered that their costs are covered only partially with the DRG revenues from the NHIF. In table 3, we report the cost structure for both hospitals.

*Table 3. The structure of total expenses in percentage*

| Elements | Univ. Hospital of Trieste | CHC Zagreb |
|---|---|---|
| Expenses for salaries | 49.02% | 56.93% |
| Expenses for drugs, blood products, medical supplies | 19.55% | 25.17% |
| Expenses for overheads (utilities) | 17.94% | 9.83% |
| Administration costs | 13.49% | 8.07% |
| Total | 100% | 100% |

The structure of expenses is slightly different. Expenses for overheads in CHC Zagreb do not include depreciation. The expenses for salaries and expenses for drugs, blood products, and medical supplies are higher due to the higher number of contracted beds with NHF and because of that, they have more patients.

In order to answer the first research question, i.e. to what extent public hospitals in Italy and Croatia use cost accounting methodology, it can be concluded that the usage is poor in both hospitals, if measured by the parameters of modern managerial control systems. In Croatian hospital, salary costs and materials are allocated to the entire hospital and to organizational units. In Italian hospital, those costs are allocated to organizational units only (responsibility centres).

When we asked the two hospitals if they allocated the direct and indirect costs (of the hospital or of the organizational units) to the healthcare services rendered, the accounting officer in CHC Zagreb answered that they allocated and that they used allocation bases such as cost of salaries and cost of material. This means that they use a traditional allocation method even though they do not recognize all indirect costs while recording their costs, given the modified accrual accounting they adopt. The accounting officer in Italian hospital stated that they did not allocate direct and indirect costs of the hospital or organizational units to the healthcare service rendered, even though those costs are certainly recorded by their accounting system under the accrual basis. In Croatian hospital, they allocate the indirect costs to organizational units, without including depreciation in the allocation. Therefore, regarding the second research question on the calculation of the costs per patient or per provided service, we can conclude that neither the Italian nor Croatian hospital attempt to measure the cost of those.

We were also interested in knowing how the two hospitals defined market prices for equivalent healthcare services that are directly offered on the market. In Italian hospital, the market price for equivalent healthcare service is calculated according to the same prices that are established by contract with the NHIF, and they use cost allocation to cover all the expenses, with the exception of depreciation (even though this expense is recorded by their accounting system). In Croatian hospital, they use the same prices that are established by contract with the NHIF as a starting point, and they use cost allocation to cover all the expenses includ-

ing depreciation, even though they do not record such expense in their accounting system.

The third research question asks whether accounting officers in public hospitals are ready for the implementation of the full cost approach for calculating costs in order to track costs per patient or healthcare service. Both officers in the Italian and Croatian hospital believe that for their hospital it would be acceptable to determine the prices of their healthcare services using more advanced costing methods (such as the ABC method), which would ensure precise monitoring of all the direct and indirect costs for individual healthcare services or healthcare programs. For Croatian hospital, it would mean adopting accrual accounting in its accounting information system, which is more of a political decision that involves changing the Budget Law. This would allow the hospital to develop appropriate cost accounting methodology for the allocation of costs to cost objects, rather than to develop separate cost accounting information system used for internal purposes, and keep using modified accrual basis for external financial purposes. The Italian hospital is already in a better position, since it has already satisfied all the preconditions for the introduction of activity-based costing. Yet it should develop its cost accounting information system as an integral part of its accounting information system.

According to the answers provided, both officers in the Italian and Croatian hospital consider the determination of the full cost of their specific healthcare activities a desirable goal. They also state that it would be acceptable to determine the prices of their services using the ABC method. Since currently neither hospital tracks and allocates costs per patient or per provided healthcare service, there is an unfulfilled demand for cost accounting information. Moreover, this makes it difficult for them to measure performances of the healthcare services provided. It is likely, therefore, that the evaluations currently performed in both hospitals may be based more on intuition and on acquired knowledge and experience, than on hard data. In both hospitals, the interviewed officers also said that they used data from the internal accounting system for performance evaluations, but since they record and allocate costs only at the organizational unit level, it can be concluded that those measurement are also limited to that level.

The full costing approach is a precondition for the development of internal reports that should be produced not only for the benefit of the higher echelons of management, but also for the managers of various organi-

*Table 4. Significance of internal reports*

| Usage of internal reports | Univ. Hospital Trieste | CHC Zagreb |
|---|---|---|
| As an important source of information for decision-making and governance. | 4 | 5 |
| For compliance with legal reporting obligations. | 2 | 4 |
| To monitor the execution of the financial plan. | 3 | 5 |
| For a comparison with other similar institutions and organizations. | 3 | 3 |
| In order to inform the general public and promoting. | 4 | 3 |
| For the purposes of internal and external audit and control. | 2 | 5 |

zational units. In both hospitals, the officers interviewed confirmed that they prepared internal reports to satisfy a requirement expressed directly by the management. In Croatian hospital, those reports are prepared on a monthly basis, while in the Italian one the frequency of reporting is monthly and quarterly. Table 4 shows the answers related to the purposes of internal reports and their significance on a scale from 1 to 5.

The data reported in Table 4 shows how, in Croatian hospital, internal reports are mostly used for decision-making, but also for compliance with external reports and for the purpose of internal and external audit and control. However, the objectivity and the accuracy of internal reports generated by CHC Zagreb could be undermined by the adoption of a modified accrual basis for their accounting. In Italian hospital, the most widespread uses of internal reports are for decision-making, informing the public, and promotion.

In order to get a further insight on the relevance of internal reports, we asked the interviewees to grade the importance for taking the decisions listed in Table 5 (1 = not used at all, 2 = largely unused, 3 = neither used or not used, 4 = usually used, 5 = fully used).

In Croatian hospital, the decisions made based on internal reports include the award and allocation of budget funds, approval of individual programs, asset acquisition, planning, and cost control. In addition, internal reports are also used to monitor the effectiveness of the services provided and for fiscal responsibility. In Italian hospital, the internal reports are used for awarding and allocating budget funds, for the approval of individual programs, for planning and cost control, and for employment decisions. Internal reports are also used, to a lower degree, to monitor the effectiveness of the services provided and for fiscal responsibility, but not for determining the prices of healthcare services nor for capital expenditure decisions.

*Table 5. Usage of internal reports for different decisions*

| Different decisions | Univ. Hospital of Trieste | CHC Zagreb |
|---|---|---|
| For the award and allocation of budget funds. | 4 | 5 |
| For the approval of the implementation of individual programs. | 4 | 5 |
| To determine the price of public health services. | 1 | 3 |
| For the purchase of asset. | 1 | 5 |
| For planning and cost control. | 4 | 5 |
| For employment decisions. | 4 | 4 |
| To measure the effectiveness of the services provided. | 3 | 4 |
| To monitor the effectiveness of the services provided and fiscal responsibility. | 4 | 5 |

## 4.2. Recommendations for the Introduction of Cost Accounting methodology

Despite all the problems and demanding process of introduction of cost accounting methodology, it seems to be definitely worth the effort. The implementation of cost accounting methodology has a number of

management functions such as budgeting, control and decrease of costs, pricing and reimbursement, measurement (assessment) of activities, evaluation of the program and the possibility of making economic choices, instead of observing it only through its historic role in determining the value of inventories or other assets in financial accounting (Dražić Lutilsky et al., 2016). In addition, the introduction of cost accounting is a necessity and a precondition for improving the effectiveness and the efficiency of the healthcare system, which would require the application of a number of techniques and methods of cost allocation tailored for each hospital. Before any implementation of the cost accounting system, however, it is necessary to define its objectives, purpose and necessary resources (human resources, additional education, additional material resources, additional records, IT support, etc.) (Dražić Lutilsky et al., 2016). Tracking and monitoring all direct and indirect costs for each patient or service provided in a hospital and method of cost allocation should be defined separately for every hospital. The cost accounting system should be designed internally, in such a way that the results of the analysis are available not only to the management of the institution, but also to the managers of organizational units. This means that based on cost information they could make decisions regarding different examinations on a patient and they would be managing resources of the hospital more efficiently. The managers of organizational units are important because their work has a direct impact on the structure of costs and revenues, and internal reports based on costs should be mainly addressed to them. In addition, with the introduction of internal reports, it is necessary to define the responsibilities of employees, but also to motivate them and, in the end, to reward them. The whole system should be redesigned, because a formal introduction of additional records and monitoring alone would not produce the necessary effect. Based on the cost information from the ABC method, the management of the hospital could: (1) optimize processes of providing healthcare services, (2) decide to use some services from another hospital or to provide it themselves, (3) decide to provide a part of healthcare services to a full recovery of the patient or the full service, (4) introduce some new healthcare services, (5) stop providing some services, (6) close down some department, (7) choose overtime or a new shift in the hospital. The ABC method, but also time-driven ABC method (TDABC method), is most frequently mentioned in both foreign and domestic literature as the cost allocation method that should be used in healthcare systems as an advanced full costing method (Dražić Lutilsky et al., 2016). The most prominent advantage of the ABC method is that it provides more realistic cost estimates through determination and allocation of costs. This is achieved mainly in a way that the total costs are allocated to patients or to provided services according to cost drivers with which they are most closely associated. Currently, there are no manuals containing practical instructions for implementing the ABC method in hospitals. The reason for this lies in the fact that each hospital has a different organizational and functional structure, set of programs and activities, as well as type of services and consumed cost and different types of patients, and, therefore, generates different outcomes and problems.

## 5. CONCLUSION

The purpose of this paper was to highlight similarities and differences between one Croatian and one Italian public hospital regarding the implementation of cost accounting and full costing method in their respective accounting systems. We identified three research questions. With regard to the first research question on the extent of the

usage of cost accounting methodologies in public hospitals in Italy and Croatia, it can be concluded that the usage is poor in both hospitals. In Croatian hospital, indirect costs are allocated to organizational units, but depreciation is not included. The accounting officer in Italian hospital expressed that they did not allocate direct and indirect costs of the hospital or organizational units to the healthcare service rendered, even though those costs were certainly recorded by their accounting system under the accrual basis.

Regarding the second research question, on whether there is a calculation of costs per patient or per service provided, our research suggests that such allocation on cost objects does not exist either in Italian or in Croatian hospital. The third research question asks whether accounting officers in public hospitals are ready to implement the full cost approach to calculate costs, in order to track costs per patient or healthcare service. Both officers in Italian and Croatian hospital believe that for their hospital it would be acceptable to determine the prices of their healthcare services using the full costing method (the ABC method), which would ensure precise monitoring of all the direct and indirect costs for individual healthcare services or healthcare programs. For Croatian hospital, it would mean adopting an accrual accounting basis in their accounting information system regarding recording of costs, which would involve the political will to change the current law. This would allow the hospital to develop an appropriate cost accounting methodology for the allocation of costs to cost object, rather than to develop separate cost accounting information systems used for internal purposes, and still use modified accrual basis for external financial purposes. The Italian hospital is in a better position, since all the preconditions have already been satisfied. However, the cost accounting information system should be developed as an integral part of their accounting information system.

From the interviews conducted, we can argue that Croatian hospital uses different allocation bases to allocate indirect costs, which means that they take into account the nature of the costs, allocating them to different allocation bases, even if they do not adopt full accrual accounting. We can conclude from the research results that Croatian hospital allocates costs to organizational units, which is the first level of allocation under the traditional costing systems. The second level of allocation would be allocation to patients or to provided services, but this level of analysis is not reached either by the Croatian or by the Italian hospital, although it is indicated as a desirable goal by both the interviewees. Further research is needed to assess the full relevance of cost accounting systems in public hospitals in Italy and Croatia, especially by extending the survey to other hospitals, but it is possible to assume that the existing managerial accounting systems, which is based on traditional cost allocation methods, does not complete meet the management's information needs. Accounting officers see that the governance in public hospitals can be improved through implementation of the full costing approach to calculate all costs in order to track costs per patient or per provided service. The full costing approach is a precondition for the development of internal reports about costs that should be produced not only for the top management, but also for the managers of organizational units. From the research results, it can be concluded that the accounting officers in the examined Italian and Croatian public hospital are ready for a change in the accounting system and that they believe it can be achieved by implementing the accrual accounting basis and cost accounting methodology.

The limitation of this paper is that it only investigates the accounting system and does not take into consideration the social, political and other economic influences on the financial sustainability of the NHS.

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# MOGUĆNOSTI UNAPREĐENJA SUSTAVA TROŠKOVNOG RAČUNOVODSTVA U JAVNIM BOLNICAMA U ITALIJI I HRVATSKOJ: STUDIJA SLUČAJA


## Sažetak

*Cilj ovog rada je ukazati na sličnosti i razlike između slučaja hrvatske i talijanske javne bolnice, a koji se odnosi na primjenu troškovnog računovodstva i metode obračuna punih troškova u računovodstvenom sustavu. Iz teorijskih je razmatranja poznato da uvođenje metoda troškovnog računovodstva u zdravstveni sustav donosi društvene koristi kroz povećanje učinkovitosti. U prvom redu, na taj način osigurava se bolje upravljanje resursima, što donosi i veću transparentnost u korištenju javnih sredstava. Uvođenjem sustava za troškovno računovodstva za interne potrebe javnih bolnica, njihov bi menadžment mogao efikasnije i efektnije upravljati te smanjiti troškove. Istraživanje za potrebe ovog rada provedeno je putem intervju s osobama koje se bave računovodstvenim poslovima u jednoj hrvatskoj i jednoj talijanskoj javnoj bolnici. Rezultati pokazuju da postoje razlike u zakonima, koji se odnose na troškovno računovodstvo, kao i u praksi alociranja troškova na troškovne objekte te u korištenju troškovnih informacija u procesu odlučivanja. Kako bi se uspješno upravljalo javnim bolnicama, ključno je osigurati točne i pravodobne informacije za potrebe odlučivanja, što troškovno računovodstvo čini ključnim čimbenikom menadžmenta. Njegova se uloga ogleda u pružanju informacija o vrsti i iznosu potrošenih resursa, kao preduvjetu za kontrolu, upravljanje i potencijalno smanjenje troškova.*


**Ključne riječi:** *troškovno računovodstvo, metoda punih troškova, javne bolnice, Hrvatska, Italija*