

USE OF MANAGEMENT INFORMATION IN HOSPITAL DECISION-MAKING

The research presents the scope and use of management information in health care institutions. The area has diverse international literature, so the article limit to logic of hospital operation, result of role conflict, economic and clinical factors in decision-making. In the research qualitative methodology was used for data collection: managerial interviews and in case of decision support, homogeneous focus group interviews.

The top managers typically put emphasis on financial information, and examine mostly the historical data, with negligible future scopes. The head of department (physician) decide on the basis of professional and use non-financial indicators. The use of management information in decision-making has more diagnostic style, only a few managers apply interactive controlling systems, basically in the absence of strategic thinking.

The author proposes to strengthen the use of controlling systems, which most important elements are the development of institutional internal communication and economic and managerial skills.

Keywords: health care, hospital, controlling, management information, decision-making

In the early 2000s, Scandinavian and Western European authors started to examine hospital management information systems. The movement and reforms of New Public Management (hereinafter NPM), which target are the market-oriented operation (Drótos et al., 2007) and radical improvement of public administration performance (ie. efficiency and effectiveness) (Bodnár et al., 2011), generated to apply the management techniques of business sector. The central element of NPM reforms is the application of accounting information; therefore, accountability and responsibility are key words (Nyland – Pettersen, 2004). The NPM brought radical changes in the field of financial/accounting systems and increased the transparency and flexibility of public sector (Rosta, 2012).

Many international researches were made in the field of healthcare management control and management accounting, which negotiate the scope and using of managerial information, logic of management, or even the role of conflict, the phenomenon of special sectorial decision making. In this paper the use of management information in health care organizations, usually hospitals, clinics, and centres was examined. The previous Hungarian research (Krenyá cz, 2017) presented how Hungarian healthcare system modifies the management tools in hospitals: most of the hospital managers have financial approach (with a strong focuses on liquidity and debt) and massive bailouts (Kornai, 2009) became natural and expected. Based on this research, I studied the use of Hungarian hospital management information with the following research questions: *Do the Hungarian hospital managers need past-oriented and financial data for decision making? How do the top managers and medical managers use management information?*

For the research questions, I accepted and applied the broad scope management information definition of Bouwens – Abernethy (2000) and I adopted the terminology of interactive and diagnostic perspective

from Simons (1995), who first examined the use of managerial information through an ‘innovation and control’ perspective (see below).

In the first part of the publication, I define the hospital characters and summarize the results of international literature then introduce the qualitative methodology. At the end of this paper, I present the results of the research and the conclusions.

Use of management information and decision making in health care institutions

Definition of hospital characters and institutional hierarchy

The lowest (first) level in hospitals hierarchy of decisions is the meeting between clinical staff and patients, the next level is the departmental level, where leaders meet with their colleagues, then the relationship between the department head and clinical leadership. Moving up on the hierarchy, the logic changes from the team-oriented, knowledge sharing, collective focus on patient care to a more individual focus, managerial perspective (Nyland – Pettersen, 2004).

The hospital key decision maker, on highest level, is the manager (director), the medical or clinical director, nursing director and financial leader. According to the definition of Kuntz – Scholtes (2008) the doctors are practitioners, the manager is not currently practicing his professionals; the categorization focus on roles, instead of educational background, due to the different way of thinking originating from activities (Schultz, 2004). (Table 1)

The clinical activity based on professional guidelines, doctors are strongly committed to professional values, so the clinical discourses separate from the economic area of the hospital. The strategy and budget documents have low express on clinical managers, who participate in the

preparation, but less use it (Pettersen – Solstad, 2014). According to Ferreira-Da-Silva et al. (2012), doctors will accept the economic criteria for clinical decision-making, but the professional, medical, ethical criteria still remain at a higher level.

Table 1.

Factors of decision-makers

| manager | clinical leader and his role | |
|--|--|--|
| decision-making in the interest of the organization | decision-making in the interest of individuals | participation in budgeting processes (based on previous period) long-terms plans, strategies and analyses are less used (cost, capacity, medical practice) planning of future activity or analysis of medical practice hardly used |
| accountable to multiple stakeholders | accountable to profession | |
| decisions led by organizational goals | decisions led by professional rules and norms | |
| group decisions, political environment, bargaining, compromise | normative and autonomous decisions | |

Source: Kuntz – Scholtes (2008) and Pettersen – Solstad (2014)

The Hungarian law names the members of the hospital *top manager team* (hereinafter TMT): the general director, finance director, medical director (supervises and coordinates the medical and pharmaceutical activity, controls the operation of departments), and the nursing director (monitoring and coordination of care activities). The *middle managers*, identified as medical managers in the literature review, are leaders of professional department. The medical manager is mediator between top manager and clinicians, and link between the strategic, central decisions on investments and wages and the operational decisions on clinical activity. They communicate in both directions, so in their behaviour it is perceptible the ‘budget mask’ and – communicating with colleagues – a ‘clan masks’ (Nyland – Pettersen, 2004).

Diverse logics in hospital operation and the resulting role conflict

Healthcare professionals follow several types of logic simultaneously in their daily work: first, the medical professional norms and values internalized in professional decisions, daily clinical practice (Llewellyn, 2001), and the doctors, professional staff and nurses focus on norms and values focused and see their work as carers (Kuntz – Scholtes, 2008). This can lead to ‘clash of cultures’ (Abernethy – Stoelwinder, 1995), because the administrative culture is built on the logic of consequentiality (rational choice), the clinical culture of doctors and nurses is built on the logic of appropriateness (how human action is to be interpreted) (March – Olsen, 1976, cited by Nyland – Pettersen, 2004). The medical activity is governed by professional and ethical logic and professional discourses which are based on communicative rationality (Pettersen – Solstad, 2014).

In their categorization, the clinical managers are facing at least three types of accountability: managerial, professional and personal accountability and, ‘managers tend to focus on the clinical indicators, which are in line with the enterprise logic’ (Torjesen, 2008, cited by Pettersen – Solstad, 2014). Torjesen (2008) introduces another kind of logic, which covers the political dimension of the hospital context and so ‘managers balance the professional logic and the enterprise logic with the political logic’.

According to Nyland – Pettersen (2004), the clinical responsibility is a collective responsibility; managerial responsibility, higher up in the hierarchy, is based on personal moral and norms. Despite the managerial importance of economic performance, ‘the budget deficits have had no negative effect on the evaluation of the clinical department managers’ performance. Furthermore, budget deficits were seen as a means of getting more resources from the owner and were in reality, considered as flexible budgets or soft budget constrain. Kornai (2009) says that the decision-maker is waiting to be saved in case of a low ex ante budget and then the excess of expenditure will be paid by some other institution typically by the State. As he composes ‘the stronger the hospital manager’s position is in relation to the hospital’s superior organizations, the insurer providing the funds and the institutional owner providing the subsidy, the greater the hope of rescue’ (Kornai, 2009)

‘Physicians’ belief, medical ethics do not allow resources to be wasted, however the economic cost in the decision-making process only occurs when the patient’s clinical situation is safeguarded. This means economic efficiency is subordinate to clinical criteria, i.e., in case of a conflict between economic and clinical criteria, the physicians’ priority is applying clinical criteria’ (Ferreira-Da-Silva et al., 2012). The medical-oriented perspective and quantitative focus on the economic point of view is a strong dilemma for doctors (Malmose, 2014), and involving medical professionals in commercial decision making generates a role conflict that has a detrimental effect on medical performance (Abernethy – Stoelwinder, 1995). This conflict can be reduced if the budgeting process is clearly and transparently linked to organizational objectives (Abernethy – Brownell, 1999).

The relationship between the budget and the medical profession is close and based on communication on the top management level. The further down in the hierarchy and closer to the clinical decisions, the looser the couplings are between budget and action (Nyland – Pettersen, 2004). As at lower levels in the hierarchy, close to the doctor–patient relation, looser couplings between formal budget plans and action are expected. This can be improved if the managers involve the physician more strongly in the decision-making (Goldstein – Ward, 2004, cited by Kuntz, 2008). Because goals and plans are external factors for doctors, it could lead to a strong resistance against the use of management information (Abernethy – Stoelwinder, 1995).

During the research of accounting information and clinical decision-making, Ferreira Da Silva et al. (2012)

found that therapeutic protocol (result of team consensus) and hospital forms (defined by high level hierarchy) are seen as two cost controlling tools, which reduce the doctors' autonomy, but the physicians recognise their economic, organisational and professional advantages of these tools. The involvement of physicians in designing economic controls facilitates their acceptance. Physicians have an approximate idea of costs, originated from external source, for the prescribed diagnosis and treatments. This limited to direct and explicit costs. However hospital and even service costs and revenues and their accounting assignation are frequently ignored by doctors because of their perceived irrelevance when compared to medical information. The clinical performance indicators (e.g. average duration of hospital stay) are acknowledged.

Scope of used management information

The broad scope management information is crucial for managerial decision making (Mia – Chenhall, 1994), organizations are facing complex situations, high environmental dynamism and strategic uncertainty. Bouwens – Abernethy (2000) define *broad scope of management accounting information: has external focus, future-oriented, and non-financial, which offers a wider range of solutions considered to managers*. The typical narrow-scope information (traditional management accounting, which is internal defined, financial and past-oriented) is supplemented for this purpose. The wider range of information supports managers to better understand the relationship between activities, processes and strategic outcomes.

According to Strauss – Zecher (2013), the authors (Merchant – Van der Stede, Anthony – Govindarajan and Simons) of three top-ranked textbooks provide similar definitions of management control systems, the first two authors represent 'command and control' perspective. According to 'innovation and control' approach definition of Simons (1995), management control is 'the formal, information-based practices and procedures used by managers so as to maintain or alter the patterns in organizational activities'.

'Controlling business strategy model' of Simons (1995) separates the diagnostic control systems used to motivate, monitor and reward achievement of specified goals and interactive control systems used to stimulate organizational learning and emergence of new ideas and strategies. The diagnostic perspective is a usual organizational point of view, which examine unusual incident and potential problems with quantitative data and analyses. But interactive control focuses on dialogue and formal, informal communication with helping to concentrate to the uncertainties and to fine-tuning the strategy. One of the most popular tools is the data analysis in the report, but there are four important characteristics which set the interactive control systems apart (ICFAI, 2006):

- focus on constantly changing data that are of a strategic nature,
- the strategic nature of the data warrants frequent and regular attention from all levels of management,

- data generated is best analysed in face-to-face meetings which include employees at all levels, and
- system stimulates regular discussions relating to the underlying data, assumptions and action plans.

In the interactive perspective, the managers focus on communication and monitoring of organizational processes, while diagnostic perspective focuses on output and has strong performance measurement (Ostergren, 2009). The interactive use of the management control system gives a better understanding of the strategy and understanding of cause and effect relationships between performance indicators and results (Tuomela, 2005).

Ostergren (2009) identifies characteristics of the two control systems. The clinical managers, used the control systems in interactive way, have direct contact with other classes, fewer activities are decentralized and have intense relationship with financing department. In these institutions, the consensus solution with the feeling of 'siting in the same boat' is important. If one department has deficits, one of the other departments gives some of their resources to the department in crisis. The leaders have a lack of knowledge, not only within accounting, but also with regard to strategy and human resources. The institutions, used controlling in a diagnostic way, are more decentralized organization with perception of more autonomy and balance of budget is in focus. Contact with the financial department is less intensive, which require accounting knowledge from managers. They became 'hybrid clinician managers': have experience in budget systems and budgetary processes and use their autonomy in decision-making. But clinician managers need time to build knowledge, structure, and culture in the new system.

According to research of Naranjo-Gil – Hartmann (2007), the use of budget in interactive approach lead to higher organizational performance in dynamic strategic environment; the low level of strategic change matches with diagnostic use of management information. The interactive use is essential for dynamic strategic change, while it supports the innovation (Naranjo-Gil – Hartmann, 2007; Naranjo-Gil et al., 2008). They found a positive relationship between the medical professional leadership and interactive controlling use and non-financial management information system (hereinafter MIS) and positively correlated the strategic change, interactive use of MIS and the heterogeneity of top management. In addition, interactive MIS can influence the individuals' behaviour and improve the management team's commitment and socializing (Gómez-Luiz – Naranjo-Gil, 2011).

The managers prefer the formal top-down control (Naranjo-Gil – Hartmann, 2006), focus on general and economic parameters of the organizations, and less emphasis on basic operation indicators (Benveniste, 1987) and innovation of the system (Young et al., 2001). Due to informal control preference of doctor-managers, conflict is generated between the leaders. However, the heterogeneous TMT has a positive assessment in the literature. The benefit of top management team with varying backgrounds and skills is the access to different

source information (Kuntz – Scholtes, 2008). For summarizing,

- heterogeneous top management has wide-range, more committed in the search for opportunities and provides a broader portfolio in the responses to environmental demands and has more ability to detect strategic opportunities and to and identify the strategic need for change,
- in strategic change, diversity is beneficial in terms of the backgrounds, such as age, experience, tenure, and education (Carpenter, 2004), but in the creativity, the age and the tenure is less important (innovative perspective and diversity of information),
- heterogeneity of TMT has more different opinion regarding the strategic change, resulting the creation of more alternatives (Wiersema – Bantel, 1992),
- heterogeneous TMTs appear to be more inclined towards organizational innovation and diversification, while they require a broad portfolio of strategic perspectives (Bantel – Jackson, 1989).

Several Hungarian literature (for example, Antal – Dobák, 2010; Bakacsi, 2004) discussed the managing and operation of groups or the impact of group roles, but analysis of the heterogeneous composition of TMT and its hospital relation has not been implemented nor the use of controlling.

Methodology

The previous research (Krenyácz, 2017) presented how Hungarian healthcare system modifies the management tools in hospitals. Built on these results, this research focuses on the management information that supports managers in decision making (which is a choice between the alternatives of action) and analyses the scope and style of management information, used by managers. In this focus I examined the research question from the managers' point of view. For deeper recognition and detailed presentation, I made individual and focus group interviews, the middle managers, top managers and decision supporters (chief financial officer and controller) were asked from different hospitals. I tried to develop a questionnaire, but it was rejected because of the strict control of Hungarian hospital maintainer. Consequently, the research has limitation: managers and decision supporters or controllers distort the reality, even though it is not conscious. They try to fulfil the expectations of an observer or the interviewer, as well, and to show a favourable picture.

The sample includes different types and sizes of institutions and private hospitals, paying particular attention to the response of universities. Community health centres, regional hospitals, national institutions, universities and rehabilitation centres are in the sample. For the selection of the institutions, the statistical analysis of healthcare management control system was taken into consideration (Krenyácz, 2015). The *Table 2* shows the interviewees' information about different hospital (Nota

bene, most of the managers rotate between the institutions and their opinion is shaped by the experience of several institutions). Three NHIF-financed but profit-based enterprises were interviewed, two of which are state-owned.

Table 2.
Ratio of surveyed institutions according to the role and the owner of the hospitals

| Owner of the institution | Total number of institutions | Ratio of interviewed institution |
|------------------------------|------------------------------|----------------------------------|
| Municipal health institution | 14 | 0,0% |
| State health institution | 100 | 11,0% |
| University Hospital | 4 | 25,0% |
| For-profit institutions | 24 | 12,5% |

| Role of institution | Ratio of interviewed institution |
|-------------------------------|----------------------------------|
| Community health center | 5,9% |
| Community hospital | 6,3% |
| National hospital | 33,3% |
| Specialized hospital | 12,5% |
| Regional center and co-center | 33,3% |
| Multi-profile hospital | 17,4% |

A total of eight personal interviews were made with managers of hospitals (citation with MI notation) and one homogeneous focus group interview (FGI) with decision supporters. To the better understanding of management information, experts (EI) who know whole healthcare sector were also asked.

The advantage of the focus group interviews is the more efficient data collection, except the careful preparation (Becker, 2006) and more information can be gained by using synergies between group members (Héra – Ligeti, 2006). Focus groups have a strong social influence on group (Vicsek, 2006), which is more dominant in the homogenous group of decision supporters (mainly controllers). The implementation of the focus group research unit was enormous challenge because of the overladen hospital managers; some colleagues' skype accession solved the problem for the second occasion. But the focus group study was indispensable: 'the deep understanding and knowing of potential features may offer and it may reveal such aspects that the researcher does not think' (Vicsek, 2006). The focus group was small (five persons), as the interviewees have experience from several institutions. Moreover, they are – according to their self-declaration – highly motivated and committed to managerial decision support. Characters of the focus group:

- homogenous group with two represented areas (finance and controlling), which are closely linked,

- participants have experience from various hospitals (different location, size, structure, management),
- dedication and forming strong, definite opinions have all been assumed based on the questionnaire,
- open and inquisitive team, but with participants typically women (this may be true in the profession as well).

During individual and group interviews, semi-structured interview situation was generated and ‘technique of funnel’ was applied – structure was increased thus using the advantages of strong and weak structured questions. Besides, additional questionnaires were used before the focus group discussion for better understanding of the research topic and the respondents' views (Vicsek, 2006). The results of previous and current study weren't presented in the questionnaires; the purpose is to think about the topic. It supported the identification of key leaders, definition of the information points in the hospital and characterization of management information. Two main questions were shared 1) for what do top/middle managers use the accounting information? 2) What kind of information do top/middle managers require?

The interviews were built on each other: starting with expert interviews (1.5 hours) followed by a focus group (1.5 hours). With the expansion of this knowledge, the interview questions of hospital managers were specified. The length of interview decreased from 1.5 hours to 1 hour, due to recurring information. The interviews were typed, after having read them several times a quick report was prepared to keep as a guideline during the final analysis.

Based on the text from the experts' interview major categories were marked with open source coding in Verbi MAXQDA 12 software, and then these were divided into subcategories during the encoding (axial coding). I returned to the initial coding, as long as new categories were not introduced by the re-encoding. For checking the coding infracoding was applied. The categories of coding are presented in *Table 3*.

Table 3.

Codes in the research

| Categories | Subcategories |
|----------------------|--|
| Defining | decision maker decision supporter |
| Scope of information | middle management top management |
| Use of information | middle management top management diagnostic interactive |
| Motivation system | – |
| Role of conflict | – |
| Management | attitude of management organizational specialities void of ‘system approach’ |

Empirical findings

Decision-makers and decision supporters in Hungarian hospitals

The role of financial director, medical director and nursing director is changing depending on the size of hospital, local conditions and the attitude of managers but the smaller hospitals are typically led by the director and the financial director or medical director. ‘The nursing director has very partial role’ (EI). The top managers often work closely together with directors of priority areas (e.g. strategic director or chief legal officer), and sometimes they also delegate powers to them in decision-making.

At mid-management level, heads of professional departments have little power to make decisions; in general they oversee the work of the department i.e.: coordination of patient administration, determination of the performance volume, management of curing equipment and medicines, so basically internal cost distribution. The head of the department is responsible for the curative care and related administration, the ethical standards and training of doctors and nurses. In theory, the leader monitors and evaluates the patient-, performance- and economic-data, but the intensity of this activity depends on the needs and commitment of the general director.

‘We have a manager, who looks at the controlling report each month – performance- and cost-wise – and examine all itemized coverage then asks for comparative data from the previous period and asks for justification in case of changes ... Let's see, let's talk about it. (FGI)

The results of additional questionnaire and focus group interview confirms that decision support of hospitals depends on professional heterogeneity, institutional size, attitude of managers, but it is typically scattered by function in the institution and/or is been next to top managers. Some institutions have/had stand-alone central decision-support department and staff. According to the managers asked, decision support is identified as controlling; surprisingly, even in those institutions where this function does not work. However after further thoughts about functions, they will also add other functions like financing, budgeting, engineering, information technology, legal or public procurement not to mention the weakest areas such as labour and human resources management and decision support.

Scope of information of top management and department leaders' thoughts

Due to healthcare financing, continuous debt and the ‘struggle with unpaid bills’ (Krenyácz, 2017), the focus on future trends is reduced and leaders are trying to maintain the operation with actual data from the past.

Financial focus. Financial data has the most weight in decisions and the management focus is on annual planned performance, budget, liquidity and financial situation. The role of revenue data is excessive; the leaders

are continuously monitoring performance which in turn affects their decisions. The managers feel that cost data is invalid ('blind flight') but recognizing the importance, they try to explore the department- and patient-level costs.

'The financial information, however, can no longer be omitted from our decisions. The underfinancing, the continuous rise of debt service, the lack of value follow-up, the price increase generated by economic crisis all cause deficit. If you do not pay attention, the institution can easily become inoperable. However, this should be done in a way that patient care does not get damaged and the institutions fulfil the protocol-based professional criteria and comply with requirements of the health act.'(MI)

Those hospitals which use a well-functioning coverage calculation, their decision making are not limited by the financial data. In several hospitals there are customer satisfaction measurements, medical and professional employee satisfaction measurements or Balanced Score Card analysis. Nevertheless, the leadership can decide only on the basis of financial data. A typical example is cost reduction methods such as energy investment, heating modernization, restructuring and in other questions, not concerning the patient care.

Past-oriented data instead of future-oriented data. Mostly the historical data is examined through a lens that highlights measures improving management, top management examines typically retrospective data and use its implications in daily operation.

'Regarding future concepts, we can always rely on past data; by reviewing them and after deducting the consequences we can expect better performance and optimized management.' (MI)

'Our days are unfortunately spent by mapping the past but there are already intervention areas where we have achieved rapid information services and thus we have an opportunity to intervene. But most of the activities are the follow-up.' (MI)

The continuous changes in legal and financial environment require managers to solve the everyday and past problems (revenue encodings repair, a more exact understanding of costs, etc.). Some management use information fully: not only the past-oriented information but also consider the future as well. For example 15 years ago, analyses of Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) investments were future-oriented.

'Those who did the controlling well – in the early 2000s –, had forward-looking information. Today unfortunately only retrospective data service works. Present is compared to the past.' (FGI)

'We have professional development plans, development concepts, so we deal with the future too but basically with the present. We make decisions at the present, but normally use the recent

numbers, so for some actions or conversions we usually look at the performance data of the past 1 year or 6 months.' (MI)

Currently, forward-thinking occurs once a year within the framework of the planning and because of the significant financial perspective, only the continuous forecast of performance and financing is important for the management.

Significant short-term and weak long-term thinking. The use of future-oriented information is already a kind of long-term thinking but this is more typical in profit-based institutions, where savings are invested into investments reducing operational costs. From investments major improvements are long-term; while minor ones are always very short term, a year maximum, depending on the results.

'So my strategy is simple: the renovation of real estate for the next five-years is in my head. We talked about the principles and the great improvements with the divisions but about the medium and small improvements we always talk during the previous year, depending on budget.' (MI)

The lack of resources, insecurity, continuing change of legislation and financing all encourage public hospitals to think short-term. Furthermore, there are institutional development plans but the realization always changes according to the sources: if there is a project for energetic modernization then that will be the focus.

Integrating internal and external data in decision-making. In the hospitals, typically, creation and use of internal data occurs which are more focused on the past and cover financing and performance. Out of the external benchmark data, the ones prepared by experts and National Health Insurance Fund will get to top management, typically once a year during budget planning. This gives an opportunity to compare revenues and costs of various professional units and to encourage them for more efficient use of resources.

The wide range of information is generally limited to professional decisions where the *department leader* is concerned. They must be involved in the classic planning (if the hospital does it) and they will also receive feedback on their performance with variable frequency. The management information sent to them is of wide range but it also is dominated by non-financial indicators: performance data, patient data, case-mix index, bed occupancy, SNH. Due to the financial focus of the top management, reports are complemented by economic indicators and data, financial balances, revenues, costs, commitments and sometimes benchmark data.

'The benchmark is probably the only tool that can be annoying to department leaders. In the benchmark profession meets money: high drug and personnel costs are incomprehensible for them. The comparative unit costs have to be taken into account.' (EI)

Some interviewees mentioned that monthly reports to the physicians about their performance and coverage of interventions are general practice but due to the absence of incentives, it could work effectively only in profit-based hospitals. The reports to physicians in public hospitals are solely limited to performance or income: patient data, interventions, number of reported cases, bed occupancy, surgical numbers and time, length of stay before and after surgery, average indicator of physicians etc. Regarding cost, department managers are interested typically in the costs of blood, drugs and so implantation.

Use of management information in decision-making of department leaders and top managements

Use of information by top management

The use of information depends on personal factors (age, family status, personal motivation and work commitment), professional factors (work experience, professional and personal perspectives, adopted ethical rules) and organizational factors (co-culture, management control system and interaction with superior leader) (Ferreira-Da-Silva et al. 2012). The use of the information is *'highly dependent on managers and they work in a broad medium'*. According to managers and decision supporters, the lack of economic and managerial education of doctors is a very serious problem.

'There are/were very few non-medical top managers, 10 or 20 hospital general directors in 20 years.' (E1)

'At medical universities management sciences are also taught but not at a level that is necessary to manage an organization. In addition, 95% of physicians did not go to medical school to learn management. However without this knowledge 70% of leaders are incompetent. This is not because they are not good people but because they have no idea what is expected of them, plus they do not know basic techniques, methods and tools, and therefore they do not create situations where efficiencies could improve.' (M1)

In hospitals operating a controlling unit top managers continuously rely on information and proposals of controller; middle managers provide and receive data and then base their decisions on them. However the use of management information *'is very dependent on people'*.

'How often do top managers use internal information for decision-making? Always. I have to prepare numbers and he always remembers it, every time. If next time, two decimals are wrong, he knows immediately this was not it the last time. He clearly remembers.' (FG1)

'Whoever has even a little economics in his veins in the top management, I think they will use it. Those who have not, will not necessarily use it because

they do not see into it ... So in one institution there is a very strict budgeting while in the other I just started to develop it because there was nothing.' (FG1)

Depending on the attitude and management knowledge of top management, the management information produced by controlling can be widely used, i.e.: to optimize revenue and performance. In general, the medical director plans manually, usually monthly or quarterly, the expected performance from the departments.

'We use the revenue side of controlling; units and performance are constantly monitored and we take these into consideration in case of decisions... but only on the revenue side. The expenditure data is not valid so we do not use them. Unfortunately this is blind-flying.' (M1)

'The main agenda of medical leaders' meetings is performance ... in in-patient and out-patient care. The units can, on daily frequency, ask for control on their daily status but they will be informed weekly during departmental meetings.' (M1)

Those managers who use the information for improvement of the professional portfolio (while by knowing the coverage the management of hospitals can be heavily influenced) are thinking like this:

'I start to play with the professional portfolio of the department and forbid the physician to carry out certain operations. Of course not the indispensable ones, and i.e. laparoscopic surgery with good coverage cannot be forbidden.' (M1)

'I need to see what portfolio I will compile. As, coverage-wise, I know the profitability and coverage-generating capability of the profession I can rearrange the professional portfolio according to what should be increased and what not. In addition I often undertake professions with bad coverage because of their patient indicator role. The great art is to maintain expensive professions e.g. endocrinology or internal medicine, which are absolutely unprofitable, but they generate patients and send them onto radiology and ultrasound both of which has a positive coverage. You should be able to optimize this like a master.' (M1)

'budget is given... the professions might be rearranged... with a lot of resistance ... due to termination of supplies and professions with a deficit... There is no top management that would dare this.' (E1)

The processing, analysing and interpretation of benchmark data is a special tool of top management to keep the operation of departments in hand. After understanding internal and external benchmark, management generally selects departments to be examined more thoroughly.

'They also have a picture not merely about the bad management of a department compared to a national benchmark but also about caring longer or diagnosing more, using more expensive drugs, or buying more expensive and more innovative products.' (EI)

'If you change these to unit cost in the benchmark and compare them, doctors will then have to start thinking about it and they will say that they are not like others... so you can annoy them... Gynaecologists do not only hear that they are uneconomic or even more uneconomic than others, but they will also find the main problem: too many doctors, too few patients, imperfect administrations, too much therapy, too long length of stay...' (EI)

To ensure optimal use of scarce financing and targeted project sources managers rethink hospital structures and try to operate them more economically and efficiently (e.g. optimal positioning of professions, use of modern techniques) within their budget and other capabilities.

'We use quite a large structure and there is often a need for analysis to rehouse a clinic to another location, with smaller number of beds. How then will that affect the economic balance of the clinical centre?' (MI)

'How central operation can be develop and reorganize? This is what is needed to know what to put the emphasis on during annual budget planning.' (MI)

The issues of patient safety and quality barely emerged at top management level, which leads us to the conclusion that, on one hand, these areas are the responsibility of medical leaders and, on the other hand, managers don't collect data about them.

Medical leaders' use of management information

The top managers of public hospitals define financial expectations (achievement of defined revenues and expenses or keeping coverages) for department leaders. The controlling helps physicians' work with administration, treating budget rows and with monthly or quarterly feedback. The use and communication of these reports vary.

'There's a very broad spectrum. There are hospitals where data is uploaded onto the intranet monthly and there are ones that print and post them to the departments. They make it available. Some hospitals prefer to keep the summary and if they see problems, then a random class discussion will be held, highlighting the critical points ... that is dependent on the institution.' (EI)

Due to the top management needs, medical leaders monitor performance and/or accounting and benchmark data, and intervene if necessary. The achieving of planned

performance has special emphasis: the performance indicators are available (online) and every week or fortnight data is provided by controlling. For doctors, professional information and performance are important, but they also need to monitor the use of medicines and materials, which do not necessarily occur.

'If they are within budget, department leaders are glad, but otherwise they do not deal with it... there is a soft budget constraint everywhere... department leaders mostly try to analyse and explain past data... controlling deals only with the actual cost processing...' (FGI)

On the level of department leaders, professional choices dominate but leaders are involved in planning and they also receive feedback on their performance. To what extent the economical and managerial aspects are taken into consideration depends on the personality and expectations of top management.

'The financial and economic consequences typically are not considered in clinical decisions.' (MI)

'But there are well-respected, famous chief medicals, which (still) use controlling and pay attention to the performance of the department. There are also the ones who use it less. This is a topic of constant debate.' (MI)

'It is rather the visions of the leader that have greater importance... to think perceptively and build the department with conscious organization regarding staff recruitment and to take into account the future changes in obligatory care per territory.' (MI)

Due to the existence of exclusive responsibility of patient care and the lack of economic responsibility on department level, the data is ignored. The job description of leaders does not contain the responsibility for departmental effectiveness and apparently there is no requirement in the system (see below in role conflict). For the use of controlling data and to strengthen management approach, physician leaders need education and skills training, on the one hand and, on the other hand, a motivation system is needed to be built and professional liability should be associated with economic responsibilities.

'The departments do not have any choices, the leaders are not responsible. The one main reason for this is the lack of a motivation system.' (MI)

'Lead physicians can only be persuaded to use financial/budgeting information and information related to performance by a financial motivation system.' (MI)

In these institutions, the planning is not just about revenue and cost planning, but also about the planning of capacity and continuous monitoring. Beside the information of performance and coverage, the physicians receive their plan and actual data of surgical capacity. Professional

discussion of cases occurs at weekly or monthly meetings but management information are discussed quarterly so numbers can be integrated into the professional thinking.

Role conflict of medical leaders

Due to the physician-patient work, professional decisions and patient safety is the primary consideration in departmental decision making. Medical leaders who manage their 'department as a company' experience the phenomena of conflicting roles. This is confirmed by the fact that

'leaders elected by someone other than their superior look into their colleague's eyes in a way... that they want to be looked at, to maintain a working community which is more conflict-free.' (MI)

The compliance to physicians and limited economic environment generate tension in doctors with management approach. In case of these role conflicts:

'The leader favours the medical profession and gives up the economy principles and expectations required from them. In case of conflicting roles the professional side appears as stronger; their decisions are influenced by these aspects. Moreover, because of their practice, they can have personal interest, which is contrary to the expectations formulated for a manager.'(MI)

According to controller and top manager opinions conflicting roles do appear and for them it is very important to emphasize that 'the economical and organizational management has to be part of the managerial appointment. They should not only be the boss in the operating room.' Expectations for departmental management and management approach are clearly rising towards lead physicians from the top management and controlling part.

Rather diagnostic than interactive perspective in management control

The hospital management control is typically used in a diagnostic manner, which typically comes from the fact that in the absence of planning and controlling means follow-up data analysis and evaluation. The department selected for more detailed analysis is examined and discussed at medical meetings and conferences. The interactive approach was appeared in hospital where the departments were actively involved in institutional budgeting. Today,

'the manager needs data and analysis; he does not have much time to talk informally. In general, the top manager is very busy, and if he has time... immediately and now... and he asks...' (FGI)
'Top managers ask and I have to give at least three options out of which he decides.' (FGI)

Interactivity often depends on the tasks:

'managers ask controlling for any idea (on starting an activity or buying assets) and cooperate in a plan affecting their future but otherwise during everyday operation of the clinic, I think, the diagnostic way is more commonly used.' (MI)

'The introduction of the controlling system was very interactive because the aim was to understand the organization and to see their costs. A lot of things emerged; for example accounting errors... and then we resolved them... finally somebody is looking at these. ... The compilation of data was interactive; obviously controlling reacted to these sensitive areas, where to provide more precise data.' (FGI)

In today's financial environment, the strategic thinking is very rare, the innovative approach is insignificant. There are best practices, waiting to share, the department leader is actively involved in the strategy planning and budgeting, and the top manager does not deal with operational tasks but he focuses on the future and management of hospitals by way of quarterly financial reports. Révész (2016) confirms that 'in Hungary the institutional budget planning does not start from the strategic or medium-term objectives'. It seems that in the hospital sector also, the involvement of department leader in strategic planning is crucial. The lack of identified managerial goals and values is the barrier of the effective use of controls in hospitals (Abernethy – Stoelwinder, 1991) so the platform of strategic planning and budgeting provides opportunity for middle and top managers to communicate, to think together and to improve the joint work – with the co-departments and the financial/controlling unit – and to highlight the need for management information.

Summary

The results of international research show that managers prefer diagnostic controlling systems and financial information. The top management with medical-professional composition will be more inclined to apply non-financial information and more interactive controlling device in decision-making (Naranjo-Gil – Hartmann, 2006). This is explained by the doctors in managerial positions (focusing on professional norms and values) tend to efface cost information. The further down in the hierarchy and closer to the clinical decisions, the looser couplings are between budget and action, clinician managers define control processes as an informal and 'hidden' processes (Nyland – Pettersen, 2004). The hospital managers should understand the role and motivation of doctors (Kuntz – Scholtes, 2008) and should encourage them to use the economic information. Doctors are basically willing to accept the economic criteria in clinical decision-making, but professional, medical and ethical criteria will always remain at a higher level (Ferreira Da-Silva et al., 2012).

In this research the scope and used of management information at various (top and middle management) levels was examined in Hungarian financial-oriented healthcare sector (Krenyácz, 2017). In this environment, I was looking

for the answer to that Hungarian hospital managers need past-oriented and financial data for decision making and how they use management information. For all this I used information categorization by Bouwens – Abernethy (2000) and definitions of diagnostic and interactive control from Simons (1995).

Because of the special characteristics of the Hungarian hospital sector, the managers essentially need past-oriented and financial data for decision making, but we can find best practices and well-operated management control system. The individual and focus group interviews proved that top managers typically put emphasis on financial information, and mostly historical data is examined through a lens that highlights management improvement measures (currently cost-reduction at the most). Thus the first research question is answered but it can be supplemented with other conclusion. In future-oriented hospitals it appears some kind of strategy and development plans but long-term thinking is rare. In this context, the role of the owner/maintenance raises another question: since the development of strategies is not supported by a unified framework for the hospitals, the managerial need for strategy, even if there is one, is overshadowed by a lack of resources.

The second question is how do the top managers and medical managers use management information? The use of data in decision-making has a classical diagnostic aspect and means follow-up data analysis and evaluation. The interactive approach was appeared in hospital where the departments were actively involved in institutional budgeting.

The medical leaders tend to make professional decisions. The data sent to them often contain short-term economic balances, revenue and cost data, but typically non-financial indicators are dominant (e.g. number of cases, hospitalization length, bed occupancy, emergency cases etc.). The department leaders often do not understand the management information or do not recognize their importance besides they have role conflict. According to controller and top manager opinions, it is very important to emphasize that economical and organizational management has to be part of the managerial appointment; consequently the economical expectations of lead physicians are clearly rising. In many institutions the physicians still do not understand the role and content of controlling reports, for which the only solution is the joint work of economic and medical units. Several top and middle managers question the validity of data, typically costs but the answer is, again, the development of controlling systems. There is more opportunity in controlling but to explore them, widening and sharing knowledge and the adoption of the systems are all essential.

With the knowing of use of management information we can understand the thinking of management and medical leaders and improve the operation of hospital. The analysis of debts is a current governmental topic which is examined in international and Hungarian hospitals as well, with few tangible results. We could examine,

with statistical methodology, the composition, economic competence, power or political activity of top management team and it may show the debt-related correlation. In medical decision-making, the key issue is to understand thinking of medical leaders but every medical profession has its own typical characteristics. The identification of this dissimilarity could be an actual and very interesting research, which result could support the integration of economic aspects into medical thinking.

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