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The Performance Management Design in Public Hospitals: A Case Study

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Abstract

In response to the growing pressure on public budgets, many countries introduced various private-sector-inspired management practices to improve the performance of publicly funded health systems. Regardless, the non-negligible share of healthcare spending is still considered wasteful, and the search for efficiency gains in healthcare is still relevant. The relevance even increases in the context of events related to the outbreak of the coronavirus disease in 2020, presenting new challenges for performance management in hospitals. Considering the gaps between the environmental settings of various countries, a finding of one universal theory of effective hospital management is unlikely. The contextual examination of hospital management on the national level and knowledge-sharing is then a more suitable approach to aid the practitioners in search of the most appropriate mix of management practices.

This study employed a mixed methodological approach to examine individual aspects of performance management from the hospital management's perspective to identify the areas of potential efficiency gains. The core research phase consisted of on-site visits in three public hospitals taking place since September 2019 with the respondents from various management levels and both clinicians and non-clinicians. During an approximately hour-long session the respondents were asked to fill out the questionnaire examining the aspects of the performance management system employed in their institution (e.g., the scope of measurement, reliability of data, communication of results, engagement of management) and interviewed to examine the rationale of provided responses. The on-site research stage resulted in 87 complete data sets further analyzed using statistical analysis with results interpreted using commentaries and rationales obtained from interviews.

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The findings were similar among all examined institutions and mostly consistent with similarly natured studies. While the performance measurement appeared to reflect the clinical performance better than the organizational one, it is also perceived as inadequate to the complexity of service. The management seemed to consider performance management for operational purposes rather than being incentive-oriented or exploratory, in line with the perceived lack of connection between the performance measurement and the organizational strategy. Combined with poor communication of performance management principles, this discrepancy appears to contribute to the potential tension between the hospital and clinical management in setting priorities between the economic performance and the quality of care. Overall, these findings should provide insight into aspects influencing performance management employed in public hospitals in the Czech Republic and present the evidence for the discussion of potential efficiency gains in practice.

Keywords:
Performance management; performance measurement; public hospital; Czech Republic; healthcare management.

1. Introduction

The latest demographic and economic development in European countries established a trend of increasing healthcare expenditures, adding to the existing pressure on the public budgets of countries where public funds represent the predominant source of healthcare provision coverage. Simultaneously, up to one-fifth of health spending might be considered wasteful and related to potentially unnecessary tests, procedural inefficiencies, and wasted pharmaceuticals and could be reallocated for better use (OECD/EU 2018). While the frameworks and applied policies of individual national healthcare systems may differ, according to Joumard et al. (2010), no broad type of system appears to be systematically better in delivering cost-effective healthcare. Thus the adoption of best policy practices from similar settings in combination with the most appropriate mix of practices might be the way to increase efficiency. However, any search for best practice should be preceded by an understanding of the mechanics behind performance management practices and aspects that influence these practices on an institutional level.

The relevance of the search for efficiency gains in healthcare provisioning became higher regarding the events of 2020 when the hospitals experienced an increased need for capacity management as the inflow of patients rapidly grew with the outbreak of the coronavirus disease. According to the results of an annual survey inquiring quality of healthcare in the Czech Republic among the hospital directors, over ninety percent of respondents considered the Czech health system to be of good quality (HICR 2020). At the same time, over three-quarters of respondents acknowledged the need for improvement in the efficiency of man-

agement in their institution (HICR 2020). Within such an environment the topic of healthcare performance management is highly relevant, just as is the identification of possibilities that might yield gains in efficiency to maintain a good quality of service in the long-term.

Although the literature provides useful knowledge regarding the theoretical approach to performance management in general, there are still plenty of opportunities for the research of performance management in the various contextual settings. The examination of performance management in the context of public hospitals presents one such research gap, where the common issues related to performance management practice in public institutions combine with the complexity of the healthcare environment. Such an environment is challenging for any research effort, which might explain to date scarcity of any related literature, but also present a potential for additional knowledge gains.

To fill this gap, this paper aims to present the evidence on the current state of performance management practice on an institutional level while discussing the contextual aspects influencing the performance management practice to identify the potential efficiency gains and contribute to the knowledge available to practitioners and policymakers. Following this introductory chapter, Chapter 2 reviews the literature relevant to examining performance management in healthcare to determine the specific areas for research focus. Chapter 3 goes through the research design and presents the utilized methodological approach. Data results are presented in Chapter 4 as well as the discussion of findings and implications. The final chapter concludes the study results and outlines the main points for the practitioners and further research.

2. Performance measurement and management in public hospitals

2.1 Performance in public hospitals

Just as the public institutions differ from private organizations in complexity and ambiguity of their goals (Hvidman and Andersen 2014; Rainey and Bozeman 2000), the concept of performance in the public hospital goes beyond financial results, stakeholder demands, and market position. Based on expert knowledge from the field, the World Health Organization Regional Office for Europe defined hospital performance in six different dimensions for assessing the hospital performance: clinical effectiveness, efficiency, staff orientation, responsive governance, safety, patient-centeredness (Veillard et al. 2005). A different classification of performance dimensions is offered by Mettler and Rohner (2009), who summarize the potential areas of healthcare performance as healthcare financial strength, healthcare operations, healthcare people development, patient service and satisfaction, and healthcare marketing. Either way, the concept of performance appears to be multidimen-

sional, dealing not only with aspects of economy and efficiency but also with the qualitative patient-oriented and procedural aspects of healthcare delivery.

Although the performance assessment in healthcare has its own history reaching to the eighteenth century (McIntyre et al. 2001), many authors regard the New Public Management (NPM) as the primary driving force behind the implementation of performance measurement systems (PMS) and private sector techniques to improve the efficiency of public healthcare (van Elten et al. 2019; Bortolocci Espejo et al. 2017; Schwartz and Deber 2016; Speklé and Verbeeten 2014; Nyland and Pettersen 2004). Although the specific form of NPM reforms varied across the countries, the issues accompanying the introduction of PMS in this environment appear to be similarly natured.

2.2 Issues accompanying performance evaluation in healthcare

In their study of PMS concepts in the hospital sector in Norway, Nyland and Pettersen (2004) pointed out the crudeness of measurement being the leading cause of the reduced information value of PMS as the measurement insufficiently reflected the complex nature of provided service and thus provided little guidance for the performance management. Other authors also mention the inadequacy of the measurement to the complexity of service (Speklé and Verbeeten 2014; Mannion and Braithwaite 2012). Speklé and Verbeeten (2014) pointed out the narrow focus on accountability and incentive provision of NPM-inspired PMS, which disregards the other possible uses of PMS (e.g. organizational learning, strategic management) for the public sector in general. Both these pitfalls of PMS implementation are in line with the observation of Mannion and Braithwaite (2012), who categorized observed adversities of PMS introduction in English National Health Service (NHS) into four categories: poor measurement, misplaced incentives and sanctions, breach of trust, and the politicization of performance systems. Although these adversities may have arisen for various reasons, PMS use appears to be the common mediator of PMS success (van Elten et al. 2019; Speklé and Verbeeten 2014).

Van Elten et al. (2019), in their study of PMS employed in Dutch hospitals, observed and categorized three different uses of PMS with different impacts on hospital output. Regarding the quality of care, the results of this study presented the operational use (e.g. for budget control, process monitoring) being positively related to operational performance and negatively to patient-oriented care and exploratory use (e.g. to learn and improve) having a positive influence on work culture and patient-oriented care (van Elten et al. 2019). Further results of this study suggest that incentive-oriented use (e.g. to align employee motivation and institutional goals) has no relevance to hospital outcomes (van Elten et al. 2019). The result of this study has been in line with the findings of Speklé and Verbeeten (2014) in the case of exploratory PMS use. However, the case was different for incentive-oriented PMS

use in public institutions, where Speklé and Verbeeten (2014) observed a negative relation to performance stemming from opportunistic behavior.

Regarding the operational use, Schwartz and Deber (2016), in their work examining the PMS employed in health systems of various English-speaking countries, pointed out the existing performance measurement-management divide arising from the little use of measurement results for the improvement in performance management and the PMS instead serving as a surveillance tool providing information for the public. Similar results were observed by Zidarov et al. (2016), who closely examined the process of PMS implementation in the Canadian rehabilitation hospital and identified the factors influencing this state. As they conclude, insufficient planning about the potential use of PMS and lack of senior management engagement, combined with insufficient resources dedicated to the PMS implementation process, resulted in the creation of sub-optimal PMS incompatible with the information needs of hospital management (Zidarov et al. 2016). This resulted in degradation of intended use of the PMS from a decision-making supporting tool to a tool serving for monitoring and accountability purposes (Zidarov et al. 2016).

Similarly, Mettler and Rohner (2009), in their exploratory survey of performance management applied in Swiss hospitals, raise the question about the quality of examined performance management practices, as the core processes of PMS design (e.g. data collection and evaluation) were not adequately solved, and the linkage between performance management on the operational level and the strategic level was not established. They also highlighted the influence of the healthcare regulatory framework and market dynamics on the adoption of performance management (Mettler and Rohner 2009), as these factors may affect quality, safety, and efficiency via management changes (McConnell et al. 2014). According to further studies (Bardhan and Thouin 2013; Angst et al. 2011), the sound informational infrastructure and its adequate support by information technologies (IT) also present enabling factors of effective performance management.

Another important factor supporting the successful adoption of policies affecting performance appears to be the professional background of the management involved in performance management implementation (Naranjo-Gil 2016) or, more specifically, its clinical professional background (de Harlez and Malagueño 2016; Zidarov et al. 2016; Fiondella et al. 2016; Lehtonen 2007). In their examination of Spanish public hospitals, Naranjo-Gil (2016) identified the broad design of management control systems and the diversity of the top management team as being factors facilitating the adoption of sustainable policies achieving both short-term and long-term performance. The involvement of clinicians in performance management facilitates the alignment between the use of PMS and strategic priorities, which in turn affects hospital performance (de Harlez and Malagueño 2016), as the cost-consciousness increases among the clinical managers (Lehtonen 2007).

Regarding the regional settings of the Czech Republic, the pace of public administration reforms appears to be slow with the only recent introduction of performance management elements in public administration (Špaček 2018). While the results of this performance-related effort still appear to be inconclusive, as suggest the conclusions of Plaček et al. (2020) in their study examining the impact of the implementation of performance management tools into Czech public institutions, the use of advanced management practices could be observed even in hospital management (Krupička 2020). For example, Popesko et al. (2015) illustrate the application of Activity-Based Costing in the Czech regional hospital and the beneficial effect of this practice on the decision-making activity of hospital management. Regardless, the studies comparing the efficiency of public and private hospitals in the Czech Republic provide contradictory results (Mastromarco et al. 2019; Łyszczarz 2016; Papadaki and Staňková 2016) and thus the definitive example of practices leading to an efficient hospital is yet to be identified. Lastly, the EU requirements for the allocation of funds appear to be an important driver of the introduction of healthcare reforms leading to the introduction of elements of performance management (Dubas-Jakóbczyk et al. 2020; Špaček 2018); nonetheless, this process is accompanied by challenges (e.g. political instability, uncertainty about reform effects) which are common among the countries in Central and Eastern Europe (Dubas-Jakóbczyk et al. 2020).

2.3 Identified aspects of performance management

The identified issues accompanying the introduction of PMS and the factors influencing performance management are thematically similar for public hospitals regardless of the different healthcare settings and the variety of countries in the mentioned studies. The themes of alignment of PMS users' needs and PMS design with its intended use, of proper understanding of the activity-output transformation mechanism, of close cooperation with clinicians in the adoption of performance management practices, or of the ability to decompose organizational strategy on the operational level, provide hints aiding to steer the direction of performance management in public hospitals step by step towards the hypothetical best practice. Understanding these areas appears to be the enabling factor of organizational learning in performance management, which could lead to improved performance, and thus these aspects (Table 1) are a subject of analysis in this case study.

3. Methodology and research design

Following the established practice in survey research design (Van der Stede et al. 2005; Kelley 2003), this part focuses on the definition of the research question, explanation of the research method, design of the employed research tool, sample selection, description of methods used for data collection and data analysis.

Table 1
Examined aspects of performance management

ID	Individual aspects of performance management	Related sources
A	Scope of measurement and its ability to reflect clinical and hospital performance	Speklé and Verbeeten 2014; Mannion and Braithwaite 2012; Nyland and Pettersen 2004
B	Reliability of performance information and its value for decision-making	Nyland and Pettersen 2004
C	Relation of performance measures to operational performance and strategy	Mettler and Rohner 2009
D	Quality of data collection and evaluation process	McConnell et al. 2014; Mettler and Rohner 2009
E	Support of PMS processes by IT	Bardhan and Thouin 2013; Angst et al. 2011; Mettler and Rohner 2009
F	Use of performance information and orientation of PMS (operational, exploratory, incentive-oriented)	van Elten et al. 2019; Schwartz and Deber 2016; Speklé and Verbeeten 2014
G	Communication of performance information to the personnel	Jääskeläinen and Roitto 2015; Wettstein and Kueng 2002
H	Influence of regulatory framework and market dynamics on performance management	McConnell et al. 2014; Mettler and Rohner 2009
I	Engagement of clinical managers in performance management	de Harlez and Malagueño 2016; Zidarov et al. 2016

Source: Authorial compilation.

3.1 Definitions and research question

Since the research objective of this study is to examine the aspects of performance management in Czech public hospitals, it is necessary to first clarify the scope of understanding the performance and the performance management, given the possible ambiguity in the understanding of these concepts. In line with its multidimensional nature (Mettler and Rohner 2009; Veillard et al. 2005), *performance* is understood as how the organizational activity affects the hospital output measured by financial and non-financial indicators. Therefore, an improvement in these measures (e.g. financial position, case-mix output, patient feedback) would represent an improvement in performance. The *performance measurement system* represents the activity of measurement and evaluation that results in the comprehensible presentation of performance information. The *performance management* in this context includes the management of performance on both operational and strategic levels, leading towards the fulfillment of organizational strategy regarding the hospital output and the supporting aspects of these activities (e.g. information technologies supporting PMS). However, as this topic is rather vast, the specific focus of this paper lies with

the identification of areas of potential efficiency gains in hospital performance management by examining individual aspects of performance management from the perspective of public hospital management.

3.2 Research method and the choice of research tools

This study uses a combined methodological approach as it aims not only to provide measurable evidence to answer the defined research question but also to enhance its informational value by obtaining the contextual rationale behind the answers. The complexity of the examined relationship induces the application of qualitative methods besides quantitative ones to adequately address this multi-faceted problem in the healthcare environment (Doyle et al. 2009; Johnstone 2004). Although this approach might have some limitations (Bryman 2007; Morgan 2007), a sufficiently elaborated research design should aid in their mitigation. The research itself thus consisted of the preparatory stage, the on-site research stage, and the post-data collection analytical stage. The preparatory stage dealt with the methodological design of employed research tools, the literature review mapping the findings and design of similar studies, and the preliminary testing of selected research tools with potential respondents. The on-site research stage concluded the face-to-face interview for each respondent with data collected using the pre-interview questionnaire and post-questionnaire interview notes. The post-data collection analytical stage concluded the statistical analysis of survey results and their interpretation to solve the defined research task of capturing the relationship between the performance management aspects and hospital performance management.

3.3 Survey design and examined variables

Since the purpose of the survey was rather descriptive, as it focused on capturing the current state and thus providing the basis for further learning, the cross-sectional design was adopted in a rather conventional way for the research in management accounting (Van der Stede et al. 2005). The written questionnaire had a structured design containing the examined variables, their written description, and the 7-point Likert-type scale with the respondents supposed to indicate to what extent they agree with the presented statements. Although the use of written assessment criteria has been considered an alternative as it would find its justification in the research practice dealing with the assessment of performance management (Jääskeläinen and Roitto 2015), the choice for the use of the Likert scale was motivated by three aspects. The subjective nature of the examined phenomena in the questionnaire, the use of a post-questionnaire interview mitigating the limitations of the use of the Likert scale (Jääskeläinen and Roitto 2015), and the common research practice for the examined environment (e.g. van Elten et al. 2019; Bortolocci Espejo et al. 2017; de Harlez and Malagueño 2016; Naranjo-Gil 2016; McConnell et al. 2014; Speklé and Verbeeten 2014). The response categories are listed as strongly agree (=7), agree

(=6), rather agree (=5), ambivalent (=4), rather disagree (=3), disagree (=2), and strongly disagree (=1).

The questionnaire consisted of two parts. The introductory part presented the definitions of the *performance*, the *performance measurement system,* and the *performance management*, similar to those presented above. The examples of financial and non-financial measures followed, with the choice of the presented measures affected by the public ownership and non-profit orientation of the examined subjects. Therefore the financial indicators stood for financial stability and economic soundness, while the non-financial indicators illustrated other dimensions of hospital performance, such as patient satisfaction, quality of care, employee satisfaction, or organizational ability to learn. The second part of the questionnaire consisted of individual statements presented in Table 2 and the use of the Likert scale. The questionnaire presented the individual statements in a numbered list from 1 to 25, with the first letter of the assigned ID representing each statement's relation to examined aspects of performance management from Table 1. The development of exact phrasing took place during the preliminary research stage, with their discussion on the academic level and their testing with the focus group of potential respondents.

The post-questionnaire interview was selected for its suitability to examine the respondent's point of view and ability to gain an adequate understanding of the subject (Kallio et al. 2016). The structure of the interview corresponded with the structure of the questionnaire as it primarily comprised review and discussion of provided responses. While the main aim of this review was to obtain a justification for presented responses, it was optional to the extent of allowing respondents to skip the justification of responses for any statement or to provide broader accompanying commentary instead. Provided commentary for each reviewed response was recorded and confirmed with the interviewed respondent to mitigate the potential wording bias.

Table 2
Individual statements used in the questionnaire

ID	Statement
A1	The financial performance measures reflect hospital performance.
A2	The non-financial performance measures reflect hospital performance.
A3	The financial performance measures reflect clinical performance.
A4	The non-financial performance measures reflect clinical performance.
B1	The performance measurement system provides reliable information about performance.
B2	The scope of the performance measurement system supports decision-making.
C1	The relation of financial performance measures to operational performance is comprehensibly defined.
C2	The relation of non-financial performance measures to operational performance is comprehensibly defined.
C3	The relation of financial performance measures to organizational strategy is comprehensibly defined.
C4	The relation of non-financial performance measures to organizational strategy is comprehensibly defined.
D1	The performance data collection process is automated (no manual data collection is required).
D2	The performance data evaluation process is automated (e.g. automated standardized reports, on-demand visualization).
E1	The performance measurement system is adequately supported by information technologies in the data collection process.
E2	The performance measurement system is adequately supported by information technologies in the data evaluation process.
F1	The performance information is used for budget control and operational planning (operational use).
F2	The performance information is used for the performance assessment of employees.
F3	The performance information is used for the performance assessment of managers.
F4	The performance information is used for rewarding employees (incentive-oriented use).
F5	The performance information is used for rewarding managers (incentive-oriented use).
F6	The performance information is discussed with organizational members to identify their cause (exploratory use).
G1	The performance information is communicated to the personnel.
H1	The performance management is influenced by the regulatory framework (e.g. Reimbursement Decree).
H2	The performance management is influenced by market dynamics (e.g. competition).
I1	The clinical managers are involved in performance management.
I2	The non-clinical managers are involved in performance management.

Source: Authorial compilation

Table 3
Characteristics of examined institutions (2018)

ID	No of departments	Total assets (bn, CZK)	Total expenses (bn, CZK)	No of employees	No of beds	Founding body	No of respondents
X	26	2.4	4.4	2508	1113	Teaching hospital	32
Y	28	4.6	9.0	4811	1537	Teaching hospital	28
Z	30	2.4	3.0	2254	1063	City hospital	27

Source: Authorial compilation, financial statements of examined institutions, personal inquiry.

3.4 Sample selection and data collection approach

Sample selection followed the logic set by previous research focusing on the population of public hospitals in the Czech Republic as a whole (Krupička 2020). Since this group of healthcare providers accounts for nearly half of national healthcare expenditures, public hospitals essentially determine the health system's performance. The selection of examined institutions from this group was based on accessibility and willingness to participate in the research. While the first criterion's selection was arbitrary, its choice aimed to ensure the most time-efficient data collection process during the on-site research stage. Institutions were contacted one after the other, with eleven entities addressed before successfully establishing the cooperation with three subjects. The following table presents the main descriptive characteristics of these institutions, with all of them founded by the Ministry of Health of the Czech Republic. All three subjects were quite similar in range and organization of provided service, with operational capacity (personnel, number of beds) causing the differences between the examined institutions. Furthermore, subject Y recently went through significant investments in tangible assets resulting in its asset value being significantly above the asset value of subjects X or Z, mainly due to the use of historical cost as a measurement basis in recognition of assets.

The personal on-site visit was selected as the approach for data collection since it allows achieving a higher response rate, albeit at the cost of time (Kelley 2003) and enables the use of post-questionnaire interview, which allows approaching the potentially sensitive issue carefully (Kallio et al. 2016). Before the on-site visits, the researcher contacted the hospital administration and discussed the research intention to obtain the management's support for the realization of the survey. The selection of the respondent mix followed these initial discussions with the respondents chosen to represent a cross-sectional mix from both the top and middle lines of management and both the clinical (e.g. nurse managers) and non-clinical (e.g. economic director) professional backgrounds. The individual on-site visits followed, consisting of approximately hour-long sessions with both the questionnaire and the interview. The questionnaire was presented to the individual respondent in paper form, but the responses were noted down to MS Excel on the researcher's laptop. During the whole time the respondent was assisted by the researcher for clarification of any statement if necessary. The questionnaire was presented in Czech, and the follow-up interview was also conducted in Czech to ensure the respondent's full understanding.

The original research timeline assumed the on-site research stage to take place from September 2019 to May 2020 and the completion of 40 sessions per examined institution. However, the on-site research stage had to be terminated early in March 2020 due to the closure of healthcare institutions to the public, except for patients and staff, caused by the coronavirus outbreak. Since the closure lasted for a significant period, the on-site research stage consolidated existing results without

resuming the on-site research stage. The consolidation of results led to approximately thirty completed interview sessions per examined institution, with the share of respondents with a clinical professional background ranging from 64 % to 70 % between the subjects.

3.5 Data analysis

Data from the questionnaire were analyzed using tools of descriptive statistics and correlation analysis. For each of the statements the mean and standard deviation was calculated to determine the respondents' sentiment regarding individual statements' content. Each mean value was tested for significance using a two-tailed t-test to test the significance of results against the base hypothesis of respondents being ambivalent (mean = 4) on a confidence level of 99 %. Descriptive statistics were also estimated and tested separately for each of the examined institutions to examine the similarity of results between the different institutions. A correlation analysis was performed to examine the possibility of a significant connection between the assessments of individual statements. Correlation coefficients above 0.5 and below –0.5 were further analyzed, assuming their correlation not being random. Each of the coefficients was also tested for significance using a two-tailed t-test performed against the base hypothesis of no significant correlation between the responses for the examined pair of statements on the confidence level of 99 %.

Following the quantitative analysis, the individual results were analyzed in a prism of responses obtained during the post-questionnaire interview. The nature of individual commentaries ranged from brief feedbacks to provided responses (e.g. "I agree with the statement") to broad expressions of sentiment towards the area of inquiry. Despite their diversity, the provided commentaries captured the general sentiment regarding the individual aspects of performance management and thus aided with the interpretation of quantitative results. Therefore, the results are presented in the following text in the form of tables summarizing the key quantitative results for each statement, followed by the discussion of findings separately for each of the examined aspects with a comprehensible overview of key findings presented at the end. An asterisk was used in the following tables to mark the means and correlations reaching statistical significance at the examined level of alpha.

4. Data results and findings

4.1 Analysis of results

Any kind of performance-related decision-making activity requires relevant information provided by a sufficiently robust measurement system. The capability of the measurement system to reflect the actual performance thus might be considered an enabling factor for effective performance management. Regarding this area, similar tendencies were observed across all subjects, with respondents being rather inclined

Table 4

Results: A – Scope of measurement and its ability to reflect clinical and hospital performance

Statement ID	N	Mean				St. Dev	p-value	Significantly correlating variables (r)
Subjects	*All*	*All*	*X*	*Y*	*Z*	*All*	*All*	*All*
A1	87	4.483*	4.719*	4.214	4.481	1.119	0.0001	B2 (0.51*), C3 (0.51*)
A2	87	4.874*	5.219*	4.464	4.889*	1.087	0.0000	none
A3	87	4.805*	4.844*	4.964*	4.593*	1.044	0.0000	none
A4	87	5.241*	5.313*	5.000*	5.407*	0.862	0.0000	none

Source: Research results.

Table 5

Results: B – Reliability of performance information and its value for decision-making

Statement ID	N	Mean				St. Dev	p-value	Significantly correlating variables (r)
Subjects	*All*	*All*	*X*	*Y*	*Z*	*All*	*All*	*All*
B1	87	5.195*	5.313*	4.964*	5.296*	0.950	0.0000	B2 (0.59*), E2 (0.54*)
B2	87	4.529*	4.750*	4.464	4.333	1.218	0.0001	A1 (0.51*), B1 (0.59*)

Source: Research results.

towards the measurement providing relevant data about performance. Financial indicators were considered slightly less capable of reflecting the performance than non-financial indicators, with both types providing more relevant information on departmental rather than organizational performance. The measurement was often regarded by the respondents as too "synthetic" or "crude" to reflect the complexity of overlapping activities, which was similar to the results of Nyland and Pettersen (2004) regarding the crudeness of measurement as disruptive for the implementation of effective performance management in healthcare institutions. The reserved attitude towards the performance measurement system was shared across the individual interviews, with comments suggesting the lower quality of measurement being context-driven. Similar results were discussed by Mannion and Braithwaite (2012) in the case of NHS, where the poor measurement considered was an adverse consequence of performance evaluation itself.

In addition to the relevance, the reliability of performance information provided by the measurement system is another determining factor in its usefulness for decision-making activity. According to the results, the respondents of all examined subjects found the measurement system providing rather reliable performance information. On the other hand, the respondents perceived the performance information as slightly above neutral in its usefulness to support decision-making. The respondents mentioned causes such as the narrow scope of measurement, aggregated measures, or insufficient details, suggesting an issue of poor measurement as was discussed in the previous section.

Whereas the performance measurement system fulfills its role by providing reliable and relevant performance information for performance management, the required content of performance information differs in the case of operational and strategic management, which also applies to the scope and focus of performance measurement. Regarding the operational performance, the respondents perceived the connection of measurement to the performance to be relatively comprehensible as they understood the measures in the context of cost management or productivity. However, the situation was different for the connection between the measurements and the organizational strategy. While the results were inconclusive regarding the financial measures, the respondents perceived the connection of non-financial measures to the strategy as less tangible. The commentaries pointed out the departmental contribution to the fulfillment of organizational strategy being unclear and the connection between the organizational activities and the strategy being generally difficult to grasp. These findings are not that remote from those made by Mettler and Rohner (2009) in their analysis of Swiss hospitals, where the performance management appeared rather operationally oriented with a somewhat weak link to strategy.

The gathering of data and their evaluation represent two processes of the performance measurement system whose quality has an impact on the reliability and

Table 6

Results: C – Relation of performance measures to operational performance and strategy

Statement ID	N	Mean				St. Dev	p-value	Significantly correlating variables (r)
Subjects	*All*	*All*	*X*	*Y*	*Z*	*All*	*All*	*All*
C1	87	5.034*	4.844*	5.071*	5.222*	0.958	0.0000	None
C2	87	4.655*	4.938*	4.393	4.593*	1.044	0.0000	None
C3	87	3.977	4.438	3.893	3.519	1.257	0.8650	A1 (0.51*)
C4	87	3.425*	3.469	2.893*	3.926	1.369	0.0002	None

Source: Research results.

Table 7

Results: D – Quality of data collection and evaluation process

Statement ID	N	Mean				St. Dev	p-value	Significantly correlating variables (r)
Subjects	*All*	*All*	*X*	*Y*	*Z*	*All*	*All*	*All*
D1	87	4.126	3.906	4.107	4.407	1.098	0.2856	E1 (0.67*), E2 (0.54*)
D2	87	4.644*	5.094*	4.321	4.444	0.927	0.0000	None

Source: Research results.

relevance of performance information. The automatization was selected as a proxy for the qualitative aspect of both processes assuming less room for human error in automated processes. Together with the provided commentary, the near ambivalence of results for data gathering processes suggests the data being gathered at least partially manually. Different results for individual hospitals in the data evaluation processes suggest various approaches between the examined hospitals. While some commentary mentioned the automated evaluation supported by business intelligence, other respondents commented on the analytical effort on the economic department. Overall, these findings suggest the space for further improvement in data handling and thus in the quality of performance measurement system, as was the case in other studies (Mettler and Rohner 2009; Nyland and Pettersen 2004).

The quality of measurement is also affected by the magnitude of IT support as IT facilitates both data collection and evaluation processes. Similar to the results for the quality of processes, the results for the level of IT support suggest variability between the institutions. While the respondents were generally inclined to rather agree with the adequate support of PMS by IT, only a few respondents mentioned any specific tool, such as management information systems (MIS) or business intelligence (BI). These results might suggest either the limited use of these tools or the limited understanding of their nature. Nonetheless, the results of correlation analysis suggest that IT support of PMS is one of the key determinants of PMS quality, which is in line with findings in studies made by Bardhan and Thouin (2013) and Angst et al. (2011) analyzing the impact of IT on performance management in U.S. hospitals.

Following the classification of performance information use developed by Speklé and Verbeeten (2014), this area of inquiry examined the use of performance information in subsequent performance management as it determines its purpose. In all three examined subjects, the respondents agreed with the PMS being used for operational purposes, which is consistent with the previous study's result (Krupička 2020), identifying budgeting as the most frequently used management practice in public hospitals in the Czech Republic. Regarding the use of performance information for the assessment of personnel performance, the respondents inclined towards a slight disagreement with incentive-oriented use on the employee level, which the respondents justified by citing insufficient details in the provided information and the existence of fixed time-based remuneration. A possible explanation for the lower importance of performance in the personnel assessment might lie with the general shortage of medical personnel perceived by the Czech hospital directors (HICR 2020). Further results for the use of performance information in the assessment of managers or exploratory use of performance information were inconclusive, with the respondents pointing out the function of PMS being rather informational and the difficulties in identification of responsibility for performance results. The findings of the general use of PMS for operational purposes are aligned with the results from Dutch hospitals (van Elten et al. 2019) and suggest a similar state to that in

Table 8

Results: E – Support of performance measurement system processes by IT

Statement ID	N	Mean				St. Dev	p-value	Significantly correlating variables (r)
Subjects	*All*	*All*	*X*	*Y*	*Z*	*All*	*All*	*All*
E1	87	4.747*	4.281	4.821*	5.222*	1.070	0.0000	D1 (0.67*), E2 (0.61*)
E2	87	4.920*	4.781*	4.786*	5.222*	0.918	0.0000	B1 (0.54*), D1 (0.54*), E1 (0.61*), F6 (0.70*), I2 (0.55*)

Source: Research results.

Table 9

Results: F – Use of performance information and orientation of PMS (operational, exploratory, incentiveoriented)

Statement ID	N	Mean				St. Dev	p-value	Significantly correlating variables (r)
Subjects	*All*	*All*	*X*	*Y*	*Z*	*All*	*All*	*All*
F1	87	5.931*	6.094*	5.786*	5.889*	0.728	0.0000	None
F2	87	3.310*	3.875	2.964*	3.000*	1.288	0.0000	F3 (0.60*), F4 (0.67*)
F3	87	4.184	4.563	4.143	3.778	1.167	0.1451	F2 (0.60*), F5 (0.54*)
F4	87	3.586*	4.063	3.071*	3.556	1.196	0.0018	F2 (0.67*), F5 (0.70*)
F5	87	3.874	4.063	3.679	3.852	1.043	0.2615	F3 (0.54*), F4 (0.70*)
F6	87	3.931	3.969	3.679	4.148	1.265	0.6124	E2 (0.70*), I2 (0.54*)

Source: Research results.

English speaking countries, where the performance indicators were predominantly used for informational purposes (Schwartz and Deber 2016).

The extent of communication of performance information provides information on the involvement of personnel in performance management. In all three hospitals, the findings support the established communication of performance information to the management, with commentary mentioning the standardized reports and the management meetings discussing organizational results. However, the respondents also acknowledged the communication of performance information only at the top and middle levels of management, with general personnel rarely being informed. This finding might partially explain the existence of adverse consequences of poor measurement since the communication of performance information is one of the key factors facilitating the performance measurement implementation, as was pointed out by Jääskeläinen and Roitto (2015).

Changing regulation and increased market dynamics are often considered key drivers for the adoption of modern performance management practices (McConnell et al. 2014; Mettler and Rohner 2009). The ambivalence of respondents regarding these factors may suggest the neutral influence of these factors on performance management or potentially the lack of external stimulus caused by the absence of competition and the low frequency of related regulatory changes. The rigidity of regulation might be caused by a lack of political consensus, which also obstructs the realization of required financial reform, as was suggested by Alexa et al. (2015) in their analysis of the Czech health system. In addition to these results, the respondents commented on performance being affected by quality standards and input prices of material.

The continuous engagement of managers in performance management facilitates the effective use of performance information to achieve management goals. The respondents rather agreed with the engagement of both clinical and administrative managers in performance management. The results also suggested that while both clinical and non-clinical managers regard themselves as being involved in performance management, each group focuses on different aspects, thus balancing priorities between economic performance and quality of care. This state could be considered positive in line with the suggestions of de Harlez and Malagueño (2016) that the participation of both groups of managers in performance management should facilitate the fulfillment of various goals. As Zidarov et al. (2016) suggest, the involvement of managers facilitates the implementation of PMS, while the lack of planning and the sub-optimal quality of PMS dampens its use. Therefore in line with this suggestion and the context of previous findings, while the managers are generally involved in performance management, the lower quality of measurement and lack of connection to strategy appears to lower performance management effectiveness.

Table 10

Results: G – Communication of performance information to the personnel

Statement ID	N	Mean				St. Dev	p-value	Significantly correlating variables (r)
Subjects	*All*	*All*	*X*	*Y*	*Z*	*All*	*All*	*All*
G1	87	5.253*	5.375*	5.179*	5.185*	0.766	0.0000	None

Source: Research results.

Table 11

Results: H – Influence of regulatory framework and market dynamics on performance management

Statement ID	N	Mean				St. Dev	p-value	Significantly correlating variables (r)
Subjects	*All*	*All*	*X*	*Y*	*Z*	*All*	*All*	*All*
H1	87	4.023	4.125	4.179	3.741	1.201	0.8587	None
H2	87	3.690	3.531	3.786	3.778	1.350	0.0348	None

Source: Research results.

Table 12

Results: I – Engagement of clinical managers in performance management

Statement ID	N	Mean				St. Dev	p-value	Significantly correlating variables (r)
Subjects	*All*	*All*	*X*	*Y*	*Z*	*All*	*All*	*All*
I1	87	5.080*	5.344*	4.929*	4.926*	0.892	0.0000	None
I2	87	5.046*	5.125*	4.643	5.370*	0.975	0.0000	E2 (0.55*), F6 (0.54*)

Source: Research results.

4.2 Overall findings, their discussion, and implications

Given the similarity of responses across the examined subjects, the results lead to the following findings and implications. While the performance measurement appears to provide relevant data and to reflect the clinical performance better than the organizational performance, the inadequacy of measurement to the complexity of service limits the informational value of performance information for the management. The issue of measurement crudeness is not uncommon in healthcare (Speklé and Verbeeten 2014; Mannion and Braithwaite 2012; Nyland and Pettersen 2004) and thus presents an opportunity for organizational learning, as the improvement of measurement would provide the management with enhanced performance information. The potential cause of poor measurement might lie with the insufficient communication of performance management principles to the general personnel.

This cause, combined with the unclear nature of the relationship between the organizational strategy and performance management, contributes to the potential tensions between the hospital and clinical management in setting priorities regarding the economic performance and the quality of care. As a result, the PMS appears to be used rather operationally and not to its full potential, as was the case in performance measurement systems examined by Schwartz and Deber (2016) and Zidarov et al. (2016). The improvement in the communication of performance management principles thus presents another challenge for hospital management that might yield gains in management effectiveness, to the solution of which the exploratory use of PMS might contribute, as the literature suggests (van Elten et al. 2019; Speklé and Verbeeten 2014). The performance information does not appear to play a significant role in the context of employee assessment due to the currently perceived shortage of medical personnel (HICR 2020), but any similar conclusions should consider that improvement in performance information could potentially lead to the optimization of hospital activities, which in turn may relieve the pressure on existing medical personnel.

The current state of support of PMS by informational technology presents another opportunity for improvement. As the informational technology essentially enables effective performance management (Bardhan and Thouin 2013; Angst et al. 2011), the application of more sophisticated technological tools followed by proper education in their use should improve the information value obtained from the PMS. While the factors of market dynamics and the healthcare regulatory framework may affect the adoption of performance management (Mettler and Rohner 2009), the results provide little evidence of any influence on the current state of performance management. This finding might suggest a lack of an external stimulus for further development of performance management practice, with the cause of this possibly being the rigidity of the legislative process, as was the case in other countries (Dubas-Jakóbczyk et al. 2020).

The respondents generally acknowledged the need for improvement in performance management, but it also seemed that there was a general sentiment of pessimism regarding any potential change towards improvement. Further discussions with the respondents suggested the cause being the introduction of many half-measures in the past, which might have responded to the requirement of management at the time but were not part of any comprehensive concept of performance management. This sentiment, and a rather voluntary basis of any performance management practice in turn, potentially creates an environment discouraging from the introduction of any complex concept encompassing all areas of performance management, which could offer the solution to the issue of management effectiveness. Given the current state of market dynamics, incorporating the performance management principles into the regulatory framework might be one solution to spark off the required advancement in performance management practice in public hospitals in the Czech Republic.

5. Conclusions

Although Czech healthcare is considered to be of good quality, the events of 2020 have pointed out the need for management to be able to flexibly respond to the dynamics of the health situation in the population. In this context, the efficiency of public hospital management is more relevant than ever, with effective performance management playing a crucial part in management's effort to achieve efficiency. Nevertheless, effective performance management requires reliable and precise performance information relevant to the decision-making activity of management. This study used a mixed methodological approach to examine various aspects of performance management in three public hospitals to provide evidence on the current state of performance management practice on an institutional level and to identify specific areas of potential efficiency gains.

The results suggest that the performance measurement systems employed in the examined subjects reflect the clinical performance better than the organizational performance, while also being too synthetic in their measurement and rather not adequate to the complexity of service. The performance information obtained from these systems is used for operational management rather than to improve the understanding of the measured processes or for the evaluation of employee performance. The limited use of performance information combined with insufficient communication of performance management principles makes the understanding of performance management goals and their relation to organizational strategy for the general personnel difficult. While these adverse consequences contribute to the potential tensions between the hospital and clinical management in setting priorities between the economic performance and the quality of care, they are also not uncommon for the examined environment, according to similar studies. The commonness of identified adversities presents an opportunity for organizational learn-

ing and improvements in current performance management practice if adequately addressed by managers. These adversities also present an opportunity for further research. It could examine the effectiveness of various management responses to this issue in different institutions and enrich the available knowledge base.

The key findings regarding the performance management practice were similar across the examined institutions and generally in line with the findings of other studies examining the individual issues in health systems of different countries, despite the limitations of this study. Although the limitations of the survey approach were potentially mitigated by methodological triangulation and detailed documentation of methodology, the limitations given by the sample selection approach must be considered when drawing any conclusions. Therefore the results of the survey should be carefully considered to be evidence on the current state of key areas of performance management in public hospitals in the Czech Republic and serve as a basis for the discussion of areas of potential efficiency gains in the examined healthcare system. On the other hand, a detailed description of the used methodology allows the relatively simple replication of this study in the future, thus creating a basis for further cross-sectional comparative studies or monitoring of the development of applied performance practice in time.

Findings are appliable mainly by practitioners in performance management in public hospitals as they point out the crucial aspects of system design, enhancing the institutional capabilities to influence the actual performance. Core aspects lie with establishing clear and comprehensive strategic goals able to be decomposed to specific operational objectives and the design of a measurement system capable of reflecting the accomplishment of these targets on all levels of management. Furthermore, the implementation of the measurement system should be the result of cooperation between the clinical management and hospital administration to cover the economic and medical complexity of healthcare service adequately. Insufficiently addressing these aspects might result in the crude design of the measurement system failing to reflect the essential aspects of performance, thus not serving its purpose and creating space for potential tensions between the various levels of management. This state creates an organizational environment potentially obstructing the use of more sophisticated performance management practices and the management tending to adhere to the basic practice of budget control.

In conclusion, the actual situation in healthcare increased the need for improvement in the management of hospital capacities as well as the demand for quality performance information, which potentially represents a much needed stimulus for further development of performance management practice in public hospitals. Whereas the performance management might have been considered adequate in the past, it provides suboptimal performance information in the current period characterized by volatility in the health situation in the population and by long-term economic pressure.

The acknowledgment of the need for improvement in the efficiency of management by hospital directors also points to the existing demand for further development of currently employed performance management practice. The proper understanding of the connection between the design of performance management, decision-making activity, and hospital performance is essential for any such development. Nevertheless, the knowledge base regarding performance management is broad, and the hospital managers should hopefully be able to find inspiration to remedy the shortcomings of performance management identified in this study.

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