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Healthy measuring

The use of performance measures in the Swedish healthcare system

A multi-case study at three Swedish county councils

Malin Lidforss (22266) and Robert Nyberg (40697)

Ever since the rise of New Public Management in the 1970s, public sector performance management has been increasingly important around the world. Despite many critics, the use of performance measures (PMs) as a solution to measure the impact of reforms and public sector performance has increased especially in the healthcare sector. Scholars have investigated the design, implementation and impact of these PMs, but limited attention has been given to its use and its use in relation to the context of healthcare. Given that literature defines the healthcare sector as a loosely coupled system, the dynamics of the healthcare system was in this study further unpacked with the concept of loose coupling. Therefore, this study aimed to explore *how the use of performance measures impacts the dynamics of the Swedish healthcare system*. To answer this question, a multi-case study was conducted at three Swedish county councils. The study consisted of a quantitative pre-study and 18 qualitative interviews. The data was then analyzed based on a conceptual framework developed from the performance administration and healthcare policy literature in the context of loose coupling. The findings identified four key uses of PMs which differed across hierarchical levels, contributing to more tight relations between the elements of the system overall. The change in relations further impacts the organizational outcomes of loose coupling and subsequently the dynamics of the Swedish healthcare system making some aspects of the system easier to govern and more prone to behavioral change than before. This study contributes to the limited research on the use of PMs by unpacking the complex healthcare context through the concept of loose coupling.

Keywords: Performance measures, public sector performance management, loose coupling, healthcare policy, use

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Thank you,

Malin & Robert

Stockholm, May 2nd 2016

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1. Introduction

This chapter starts by introducing the background of the study (1.1) and gives a brief overview of the Swedish healthcare system (1.1.1). In 1.1.2 the level of research within the actual use of performance measures (PMs) and its use in the healthcare context is detailed. Despite an apparent research gap, the Swedish government continues to invest in performance management reforms to improve the quality of care (1.1.3). Based on that, the research purpose and question concerning the use of PMs and the use in the context of the Swedish healthcare system is presented (1.2). The chapter ends with an outline of the study (1.3).

1.1 Background

Around the world "everyone is measuring performance",[1] at least according to Robert D. Behn (2003) and other frequently cited researchers within public sector performance management.[2] Performance management has been one of the hottest topics in the public sector since the rise of New Public Management in the end of the 1970s.[3] Despite the many critics of PMs in public sector performance management,[4] the past 30 years have witnessed an increasing spread of PMs in the public sector and growth in the public sector performance management industry.[5] One country that been in forefront of this area is Sweden and the Swedish healthcare system with its national PMs based on medical outcome data, as contrasted by cost measures for example, and covering numerous medical areas.[6]

1.1.1 The Swedish healthcare system

The Swedish healthcare system is a publicly financed and socially responsible system that covers public health and preventive services to all legal residents.[7] The system is highly integrated and consists of three independent government levels; the national government, the 21 county councils, and the 290 municipalities. All three levels are involved in the Swedish healthcare system and have a public commitment to ensure the health of all citizens. To further simplify the Swedish healthcare system, we have divided the system into four managerial levels; the policy level, the strategy level, the structural level, and the operational level (figure 1).

[1] Behn (2003), p. 586
[2] e.g. Espeland and Sauder (2007); Sauder and Espeland (2009); Hughes (2012)
[3] Johnsen (2005); Hughes (2012); Asplund, K. (2014)
[4] e.g. Lindgren, L. (2014); Rombach, B. (1991)
[5] e.g. Johnsen (2005); Behn (2003)
[6] Porter (2010)
[7] Anell et al. (2012)

The national policy level

The national government, through the Ministry of Health and Social Affairs, is responsible for the overall health and healthcare policy in Sweden (*the policy level*).[8] The Ministry collaborates with seven national governmental agencies, among them the National Board of Health and Welfare (NBHW). The NBHW is authorized by the government to provide national guidelines for priority setting in healthcare and social care.[9] The purpose of the guidelines is to ensure that citizens have access to good health and medical care. Together with other actors, the agency also conducts systematic reviews that are available to the public.

The regional strategy and structural level

The Health and Medical Service Act of 1982 specifies that the responsibility for the public health commitment lie with the county councils and municipalities.[10] The Swedish Association of Local Authorities and Regions (SALAR) represent the local authorities and county councils (*the strategy level*).[11] The county councils are responsible for the provision and funding of healthcare services, while the municipalities provide and finance social care services. The Act gives the county council and municipalities the freedom of local self-government, which implies that the organization of their health services is adapted to the local area (*the structural level*). The counties are grouped into six medical care regions to facilitate the cooperation between the policy, strategy, and structural level, and to maintain a high level of advanced medical care.

The local operational level

There are seven university hospitals and about 80 public and private hospitals in Sweden (*the operational level*).[12] This level also includes private practices and primary care. The majority of hospitals and primary care clinics are public, but the county councils also contract with private healthcare providers.

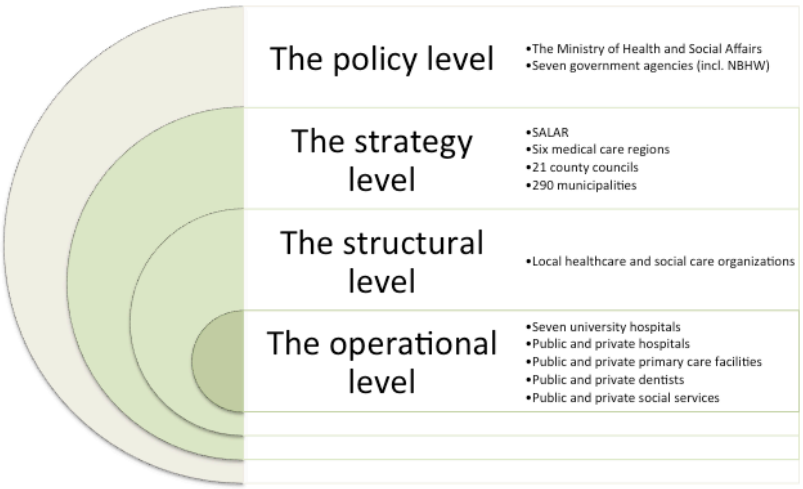

Figure 1: The organization of the Swedish healthcare system

[8] Glenngård (2015)
[9] The National Board of Health and Welfare (2015)
[10] Hälso- och sjukvårdslag (1982:763)
[11] Anell et al. (2012)
[12] Glenngård (2015)

The payment systems to hospitals and patients' fees are determined by each county council and are based on global budgets or a mix of payment methods.

1.1.2 Public sector performance management and the importance of use

Extensive reports are annually written by NBHW and SALAR to evaluate and compare the results of care in medical outcome PMs between the county councils,[13] but few evaluations have been made on the actual use of PMs in Sweden despite its key to understanding the implications and outcomes of the process.[14] The same goes for the international public administration and healthcare policy literature. There is extensive research on the design, implementation, and impact of clinical PMs, but little of this is focused on the different types of use and the use of PMs in relation to the context of healthcare systems.[15] In addition, studies on quantification in general states that outcomes depend on context.[16] However, there are several articles and researchers highlighting the misuse of performance measurements and their lack of, or unintended, effects in healthcare.[17] Some international studies on the use of PMs have been made in the US and the UK healthcare system showing varying results.[18] Moreover, many studies highlight the need for future research in this area (see appendix 9.1).[19]

In summary, the scientific literature exhibits several gaps. This thesis addresses two major gaps: (1) the lack of knowledge about how PMs are used and (2) the lack of knowledge about how different types of use may influence the dynamic relations in healthcare systems.

1.1.3 Public sector performance management to ensure a high quality of care in Sweden

Despite the lack of research and knowledge in the use of PMs, the Swedish government continues to invest in public sector performance management reforms to improve the quality of care.[20] The reforms are many and often aimed to different medical areas.[21] However, two recent reforms have been made on a national level to ensure a high quality of care; the National Quality Registry Reform and the introduction of absolute targets.

[13] Blomgren and Waks (2011)
[14] Höög et al. (2016)
[15] e.g. Bevan and Hood (2006a); Bevan and Hamblin (2009); Propper et al. (2010)
[16] e.g. Espeland and Sauder (2007); Sauder and Espeland (2009); Faure et al. (2010)
[17] e.g. Lilford et al. (2004); Hood (2006); Conway et al. (2015)
[18] e.g. Jiang et al. (2008a); Jiang et al. (2008b); Jha and Epstein (2010)
[19] e.g. Helden and Johnsen (2002); Helden et al. (2012); Pollitt (2006)
[20] Glenngård (2015)
[21] Ibid.

The National Quality Registry Reform initiated by the government in 2012, finances the development of an online database for PMs in healthcare.[22] The reform is an agreement between the Swedish government and SALAR that runs over five years. The aim of the reform is to support the specialist organizations and their *National Quality Registries*[23] to improve the quality of care in Sweden.[24] According to the Ministry of Health and Social Affairs, the reform will contribute to an increased use of the National Quality Registries and improve the quality of data.[25]

Apart from the *indicators*[26] provided by the National Quality Registries, the national guidelines provided by the NBHW also offer performance indicators to evaluate the medical outcomes of the guidelines.[27] The indicators are used as a tool to measure and compare results in health, medical, and dental care and social services. They can also be used for follow-up at regional and local level. Expert groups, consisting of special advisors and experts in data source and quality registries, develop the indicators according to the national guidelines in for example cardiac and stroke care. However, most of the indicators are based on the existing indicators from the National Quality Registries developed by the profession. Since 2014, the expert groups have developed absolute targets connected to the indicators.[28] The expected outcome of absolute targets is to provide the county councils with clear and measurable goals to use in their governance of the healthcare sector. The first medical areas to obtain these targets by the NBHW were cardiac and stroke care.

1.2 Research purpose and question

The purpose of this study is to examine the use of PMs in the context of the Swedish healthcare system by answering the following research question:

How does the use of performance measures impact the dynamics of the Swedish healthcare system?

By answering this question, this thesis could give insights or hints regarding the importance and role of public sector performance management and of PMs as a mean for improvement of the quality of care as a whole and how actors respond to their

[22] Socialdepartementet (2012)
[23] A National Quality Registry is defined as a registry that "contains individualized data concerning patient problems, medical interventions, and outcomes after treatment; within all healthcare production." Retrieved from Kvalitetsregister.se. *Quality Registries in Sweden.*
[24] Asplund, K. (2014)
[25] Socialdepartementet (2012)
[26] An indicator is defined as "a tool that allows us [the user] to measure and compare results in health, medical and dental care, as well as in the social services." The National Board of Health and Welfare (2015) p.2
[27] The National Board of Health and Welfare (2015); Socialstyrelsen.se. *Indikatorer i nationella riktlinjer.*
[28] Socialstyrelsen.se. *Målnivåer.*

results in the measurements. These results could also be applicable on a wider scale and provide insight in other areas both geographically and in terms of other empirical settings. Moreover, this will allow us to draw initial conclusions on the benefits, or lack thereof, of the work and resources extended by the NBHW and many international governments to introduce PMs with the national guidelines as well as if the actors governing healthcare receive these incentives constructively.

1.3 Outline of the study

In the **Literature review**, the concept of performance management is reviewed to provide an understanding of the identified research gap. Based on the review, the research question is operationalized and a conceptual framework is built to help us analyze our results.

In the **Methodology**, the choice of a qualitative explorative study method is presented together with our mainly deductive approach. Moreover, our pre study and our choices in analyzing the data are presented.

In the **Empirical results**, the data is presented according to the different type of use identified.

In the **Analysis**, the empirical results are analyzed and presented within our conceptual framework.

In the **Discussion**, the results are further discussed and new possible explanations for the use of PMs is given.

In the **Conclusion**, the main result is presented in the context of the Swedish healthcare system. Moreover, the theoretical and practical implications are discussed and suggestions for future research are given.

2. Literature review

During the last quarter of the 20th century, public sector performance management gained increased attention in the public administration and healthcare policy literature around the world. However, the research is scattered and the concepts included in performance management are many and diverse (2.1). Only recently, scholars divided performance management in the public sector into a simplified process with four main stages; design, implementation, use, and assessment and impact (2.1.1). Out of these four stages, use is identified as key to fully understand the impact of performance management in the healthcare system (2.1.2) and is also one of the most under-researched areas (2.2) when it comes to the type of use (2.2.1) and the context of use (2.2.2). Hence, there is little understanding of how the use of PMs impacts the dynamics of the Swedish healthcare system (2.2.3).

Drawing on Orton and Weick (1990), we argue that the concept of loose coupling serves as a tool through which researchers can work on difficult conceptual problems (2.3). Given that the literature defines the healthcare system as a loosely coupled system (2.3.1), the concept can contribute to understanding how the use of PMs impact the dynamics of the Swedish healthcare system in the context of loose coupling.

The literature review with its research gap is then summarized and the research question operationalized into three sub-questions, based on the understanding gained from the literature review (2.4). To answer these sub-questions, a conceptual framework is developed based on loose coupling theory (2.5).

2.1 Introduction to performance management

Performance management is seen as one of the offspring of New Public Management and often referred to as managing for results or result-based management.[29] In this study, *performance management* is defined as "an instrument for improving the efficiency, effectiveness and equity of programmes, organizations and services"[30] and is mainly used for increasing rationality in decision-making. Performance management receives input from *performance measures* (PMs) and reports *performance information* to relevant administrative and political bodies. In the public

Performance management	
Performance measures (PMs)	Performance information
Performance indicators & targets	Public disclosures - Open comparisons
Main users: Board members, managers & employees	Main users: Politicians, citizens & media

Table 1: Definition of performance management and its main users

[29] Nielsen et al. (2008)
[30] Helden et al. (2012), p.161

sector, these reports are known as public disclosures.[31] PMs consist of relevant performance indicators and assess "performance of (development) interventions against stated goals"[32] or in the form of league tables or star ratings.[33] Several authors also highlight the complementary roles of performance management and evaluation.[34] However, this study focuses on performance measures (PMs) within public sector performance management, as opposed to performance information in public sector performance management and the role of public disclosure in the sense of external actors such as citizens and media(table 1).

2.1.1 Four main research areas of performance management

Scholars agree that the process of performance management involves specific phases,[35] which Helden et al. (2012) summarized into four stages of public sector performance management that together "shape the so-called performance-management life cycle".[36] The specific stages of this process can also be found in empirical PM research and thus serve as a tool to divide the performance management and measures research into separate areas (figure 2). [37]

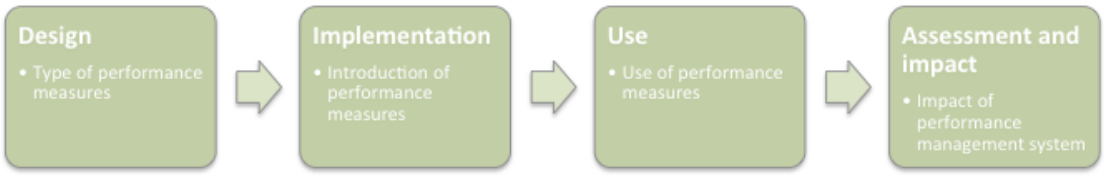

Figure 2: Simplified process of the public sector performance management life cycle adopted from Helden et al. (2012)

Within these research areas, scholars have followed various directions, such as the impact of public disclosures[38] and unintended consequences,[39] or strategies in dealing with the challenges of performance management,[40] which are reviewed in Appendix 9.1: Detailed categorization of PMs research in healthcare. All four areas are in need of further research, but use is one of the most under researched areas[41] and also by us identified as key to fully understand the impact of performance management and the entities involved in the healthcare literature.

[31] e.g. Marshall et al. (2000); Marshall et al. (2004); Heck (2016)
[32] Kusek and Rist (2004), p.227
[33] e.g. Berta et al. (2013); Bevan and Hamblin (2009); Bevan and Hood (2006a)
[34] Nielsen et al. (2008); Mayne (2007)
[35] e.g. Johnsen (2005); Johnsen (2013); Polltti (2013)
[36] Helden et al. (2012), p.161
[37] Ibid.
[38] e.g. Pollitt (2006); Fung et al. (2008); Lindenauer et al. (2007); Marshall et al. (2000); Marshall et al. (2004); Heck (2016)
[39] e.g. Lilford et al. (2004); Hood (2006); Conway et al. (2015)
[40] e.g. Bevan and Hood (2006a); Perrinn (1998); Bird et al. (2005); Saver et al. (2015)
[41] Helden et al. (2012); Pollitt (2006)

2.1.2 Performance management in the Swedish healthcare literature

In the Swedish context, the research done in the area of performance management in healthcare mainly regards the design and implementation of national guidelines.[42] The authors bring up both implementation challenges and strategies to overcome these challenges. However, the use phase stands out among these phases since the identified challenges are often related to the activities of the users in the systems such as monitoring, processing, feedback and communication.[43] Thus, the use phase is key to understanding the implications and outcomes of the process, as the use direct the other performance management steps and impact the success or failure of a performance management system. As Höög et al. (2016) states, the user of PMs "needs a reliable, accurate, and updated knowledge base, not only on health outcomes and organizational results, but also on processes, activities, and opinions."[44] This is especially relevant in terms of organizational monitoring and follow-up processes in healthcare. Hence, it is important to understand the use of PMs in the Swedish healthcare system and in relation to healthcare systems in general.

2.2 Under researched area of use

As discussed above, the research area of use in performance management systems is especially scarce in the context of the Swedish healthcare system. However, some international studies have been made on type of use on policy level and in the context of the US and the UK healthcare system.[45] To understand the use of performance management, the users must first be identified.

Most articles to not refer to the users of performance management systems as 'users', but do so implicitly by referring to ministers, parliamentarians, media and citizens use of performance information[46] or board members, managers and employees use of PMs.[47] Furthermore, studies have identified eight main uses of PMs: to evaluate, control, budget, motivate, learn, improve, promote, and celebrate.[48] Out of which, the real purpose of public managers is to *improve* performance, while the other seven type of uses raise improvement. However, no single performance measure is suitable for all eight areas of use.[49] Rather, several measures are needed for different purposes. Research on the use of PMs "lacks a detailed analysis of the 'user'"[50] and research in

[42] Richter-Sundberg et al. (2015); Kardakis & Nyström (2011); Nystrom et al. (2014); Mcalearney et al. (2013)
[43] Höög et al. (2016)
[44] Ibid. p.148
[45] e.g. Julnes and Holzer (2001); Joshi and Hines (2003); Vaughn et al. (2006)
[46] Propper et al. (2010); Pollitt (2006); Heck (2016)
[47] e.g. Jiang et al. (2008a); Jiang et al. (2008b); Jha and Epstein (2010)
[48] Behn (2003)
[49] Ibid.
[50] Helden et al. (2012), p. 165

this area is far from comprehensive, especially in the context of healthcare systems. Moreover, since the type of use is influenced by the context,[51] it is important to review both the type of use and the context of use. Hence, the section below is divided into the use of PMs and the use of PMs in the context of healthcare systems.

2.2.1 The use of PMs

After the design and implementation phase, PMs can be seen as products or processes.[52] In management control processes, the public administration and healthcare policy literature is often grounded in an assumption borrowed from the accounting literature that PMs are used to foster educated discussion about results of public activities and services and improve communication between and among branches.[53] As a product, PMs facilitate budget decisions by delivering relevant information to the upper management[54] and are also used at public disclosures in press releases and media articles.[55]

Despite the many areas of use and the local governments' strong belief in the impacts of PMs, earlier studies in the public administration literature uncovered limited use for PMs in the public sector.[56] These studies often use surveys or quantitative methods to analyze the products of PMs and report little use of indicators. They also look at units or parts of local governments rather than the use across hierarchical levels. For instance, Julnes and Holzer (2001) found that PMs were not used to improve decision-making on the policy level. However, qualitative studies can benefit this research area by investigating the use of PMs across hierarchical levels.[57] Scholars seem to find that PMs are also used in areas of high uncertainty and ambiguity,[58] which are hard to detect in quantitative studies. These inconsistent and puzzling results generate several questions, for example in what situations is PMs used, if used at all, and for what purpose? Researchers seem to know little about this area of use and this impedes our understanding of if, and how, PMs can contribute to improvements in healthcare and thus if investments in PMs are a sustainable path forward.

Regardless of these methodological problems, scholars show that PMs have an embarrassing effect, also known as the effect of "name-and-shame", which may result in unintended consequences if the measures are connected to monetary incentives (such as manipulation and symbolic use of PMs).[59] For example, Pollitt (2013) found

[51] e.g. Espeland and Sauder (2007); Sauder and Espeland (2009); Faure et al. (2010)
[52] Johnsen (2005)
[53] e.g. Pettijohn and Grizzle (1997); Melkers and Willoughby (2005)
[54] Melkers and Willoughby (2005)
[55] Johnsen (2005)
[56] e.g. Julnes and Holzer (2001); Poister and Streib (1999); Ketelaar et al. (2011)
[57] Johnsen (2005)
[58] Helden and Johansen (2002); Anema et al. (2013);
[59] e.g. Lilford et al. (2004); Hood (2006); Conway et al. (2015); Pollitt (2013)

that there are two crucial balances in limiting these unintended consequences. The first balance is between continuously updating performance management systems and keeping them stable, and the second balance is between loose or tight coupling of measures to incentives. However, some American and British studies point towards a successful use of performance management systems and that many local governments are active users of PMs.[60] For instance, Melkers and Willoughby (2005) focused on the specific understanding of the use of PMs in communication and budgeting for lasting impacts and found that the use of PMs is dependent on the transparency and density of the performance management system itself as well as its leaders. Nevertheless, how this use is identified and impact the dynamics of the performance management system in the context of healthcare sector has received limited attention.

2.2.2 The use of PMs in the context of healthcare systems

There is extensive scientific healthcare policy literature on the design, implementation, and impact of performance indicators in the healthcare sector and targets in the NHS, the publicly funded healthcare system for England (see appendix 9.1). However, little of this research is focused on the contextual characteristics of an introduction of PM.[61] The articles on targets also focus on the impact of waiting targets, as opposed to clinical targets that are more complex and often lack consensus among the professions, while the different type of indicators are more widely researched in the literature.

In contrast to the British healthcare policy research, studies of the use of PMs in the American literature are made on governing board practices and CEOs engagement and perception of performance management (see appendix 9.1).[62] These studies dive deeper into describing the context of performance management in healthcare, but fail to provide a theoretical framework to understand and explain their results. Instead, the researchers end with a list of recommendations on how hospital boards can improve their overall performance, while little attention is given to the importance of employees in the knowledge intense organizations.

2.2.3 Summary

To summarize, research provides no conclusive evidence of positive outcomes of the impact of public sector performance management, since the results are mixed. The lack of knowledge regarding the actual use of PMs and their use in the context of healthcare systems is also evident. There is a common understanding that users of

[60] Melkers and Willoughby (2005); Bevan and Hamblin (2009); Freeman (2010); Propper et al. (2010)
[61] Hauck and Street (2007); Bevan and Hood (2006a); Bevan and Hamblin (2009); Propper et al. (2010)
[62] Jiang et al. (2008a); Reinersten (2007); Joshi and Hines (2003); Jha and Epstein (2010); Vaughn et al. (2006)

PMs are grounded in the idea of hierarchical management control in the US healthcare system.

While today's public administration and healthcare policy literature provides broad brush categorizations of the potential or dysfunctional consequences of PM, we want to continue a more fine-grained approach to the question of how PMs are used and how this use impacts the dynamics of the Swedish healthcare system. Since scholars seem to have found that PMs are also used in areas of high uncertainty and ambiguity, we continue to review the particularities of healthcare system; their complexity, fragmentation, different levels and units, as a tool to deepen our understanding of the dynamics of the Swedish healthcare system and its users (figure 3). As Hibbert et al. (2013) acknowledged, more good quality studies on the use of PMs in the healthcare sector are needed and "A logical, acceptable and viable conceptual framework encompassing multiple domains and with balanced representation from structure, process, and outcome indicators, is deemed important."[63]

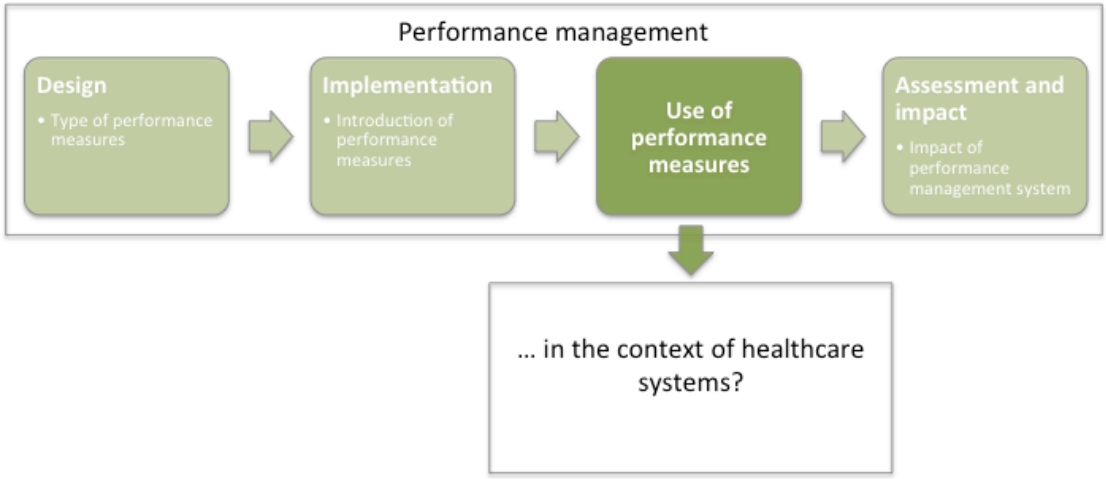

Figure 3: The use of PMs is the under-researched area and highlighted in dark green, the area will be further explored in the context of healthcare systems

2.3 Unpacking the healthcare context with the concept of loose coupling

It is widely accepted among researchers that the concept of loose coupling serves as a tool through which researchers can work on difficult conceptual problems.[64] Thus, the concept of loose coupling is widely used and defined in many different ways across research areas. This study defines loose coupling as "circumstances in which elements of a system retain separateness in structure and identity"[65] and "that their attachment may be circumscribed, infrequent, weak in its mutual affects, unimportant, and/or

[63] Hibbert et al. (2013), pp.6
[64] e.g. Orton and Weick (1990); Hinings (2003); Alter (2014)
[65] Hinings et al (2003), p.18

slow to respond."[66] Thus, in the case of the healthcare system, it may be the case that the physicians are loosely coupled to the healthcare managers, that they are somewhat attached but still retain some identity and separateness. Moreover, researchers have identified that the concept of loose coupling "should be a useful tool in identifying, measuring, and understanding interpretive systems", [67] such as performance management systems. As Pollitt (2013) acknowledge "if there is no coupling, or only a very faint connection [between measures and incentives], then performance targets may not have much effect on behaviour."[68]

Opposite to loose coupling, the concept of tight coupling is defined in this study as situations in which entities of a system maintain uniformity and respond fast with mutual effects.[69] In addition, researcher found that both tight and loose coupling coexists in systems, that the existence of one extreme implies the occurrence of the other.[70] Thus, in the case of the healthcare system, it may be the case that the physicians are tightly coupled to the specialist nurses, that physicians and nurses maintain uniformity and react fast when medical decisions are made.

The causes and types of loose coupling are referred to as the first and second voice in the loose coupling framework presented by Orton and Weick (1990). According to them, the causes of loose coupling steam from deeply embedded and large influences in a system (such as casual indeterminacy, fragmented external and internal environment), while the different types of loose coupling occur between levels, among entities and ongoing actions.

2.3.1 Healthcare as a loosely coupled system

Weick (1976) was the first to analyze the public sector in the context of loose coupling, but did so for educational organizations. Subsequently, a limited number of studies have used ideas from loose coupling theory to analyze the healthcare sector. For example, Covaleski & Dirsmith (1983) identified the healthcare sector as a loosely coupled system and since then the concept of loose coupling has been used among a few scholar in the context of healthcare.[71] Hinings et al. (2003) argue that healthcare is the essence of loosely coupled systems and define the system as highly fragmented with a distinguished casual indeterminacy among change initiatives. While other scholars argue that the improved efficiency with eHealth may reverse the trend towards more tightly coupled healthcare systems. [72] Nevertheless, the introduction of eHealth is far from complete and one potential reason for this is the

[66] Weick (1976), p.3
[67] Orton and Weick (1990), p. 218
[68] Pollitt (2013), p.358
[69] Weick (1976); Sauder and Espeland (2009)
[70] Weick (1976)
[71] e.g. Covaleski & Dirsmith (1983); Cook & Rasmussen (2005); Hinings et al (2003); Covaleski et al. (1985); Pinelle & Gutwin (2003); Marriott et al. (2011)
[72] Cook & Rasmussen (2005)

healthcare organizations resistance to change, discussed by Hinings et al. (2003). They found that when a loosely coupled system is subjected to change, the main opponents are the independent physicians.[73] Furthermore, Chang (2006) developed this reasoning and wanted to understand how to meet these conflicting demands in the British NHS. He found that local managers could use PMs as a tool for seeking legitimacy among their opponents, instead of using PMs as a tool for rational strategic management in a loosely coupled healthcare system.[74] In addition, PMs can also serve as a negotiating tool for the unit managers to advocate their needs to the upper level healthcare management.[75]

2.4 Summary of the research gap

This literature review indicates significant theoretical gaps in the knowledge of use in public sector performance management. A highly relevant gap is the limited understanding of the use of PMs and the use of PMs in the context of healthcare systems. Bridging this theoretical gap can indicate the importance of PMs and help us to understand their role and relevance to the users and thus to society in general. In line with our argumentation, Helden et al (2012) pointed out that "the understanding of the 'user' is limited …[and] additional research is needed on how the use (and users) shapes or reshapes the [performance management] systems".[76] Studies have also suggested the fact that healthcare is a loosely coupled system, which implies that the efforts to change the system or parts of it may often not succeed, reach some parts but not others, and generate unexpected consequences. In the context of this thesis, this means that the idea to start using national PMs, initiated at the policy level, may not have the expected outcomes on the lower levels. As a change in one activity is not necessarily spread to another in a loosely coupled system.

Therefore, we will attempt to answer our research question "*How the use of performance measures impacts the dynamics of the Swedish healthcare system?"* by investigating the following sub questions:

1. How are performance measures (PMs) used within and across the strategic, structural and operational levels of the healthcare system?
2. How the use of performance measures (PMs) tightens, weakens, or maintains the intra-system relations between levels, and among entities and ongoing actions?
3. How the change in intra-system relations impacts the outcomes of the Swedish healthcare system?

[73] Hinings et al. (2003)
[74] Chang (2006)
[75] Covaleski & Dirsmith (1983)
[76] Helden et al. (2003) p.167

In the following chapter, we will introduce our conceptual framework that will enable us to analyze how the use of PMs impacts the dynamics of the Swedish healthcare system in the context of loose coupling.

2.5 The conceptual framework

Given the above identified research gap and that the literature defines the healthcare sector as a loosely coupled system, it is necessary to use of a conceptual framework that contributes to understanding the use of PMs in the context of healthcare as a loosely coupled system. The model of loose coupling theory presented by Orton and Weick (1990), which combines five voices of loose coupling, will be used as a tool to analyze the use of PMs in the context of loose coupling. To analyze the use of PMs, the types of uses must first be identified and how these uses then tighten, weaken, or maintain the relations of loose coupling. This serves as an answer to our first and second sub-question. Identifying the impact of the change in relations will then be done on deeper level through analyzing the outcomes on the system and its users, which serves as an answer our third sub-question. The conceptual framework serves as a lens through which we can analyze the use of PMs in the context of healthcare as a loosely coupled system (figure 4).

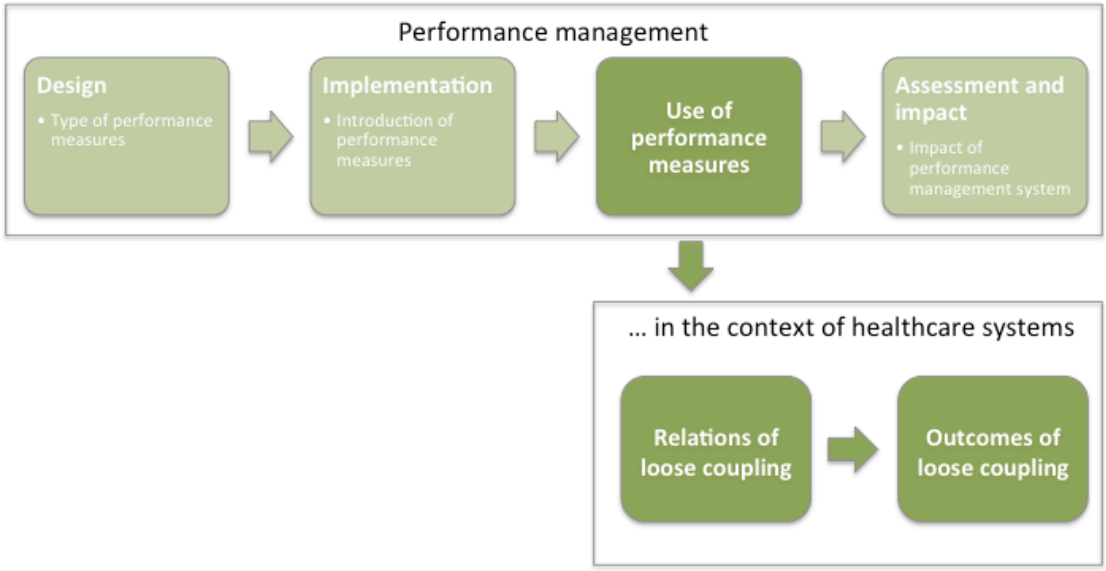

Figure 4: The conceptual framework in the context of healthcare as a loosely coupled system

2.5.1 The relations of loose coupling

After we identified the uses of PMs and thus answered our first sub-question, we want to know how the use of PMs impacts the dynamics of the Swedish healthcare system. To answer our research question and understand the impact of the PM, we need to understand which relations of loose coupling that are affected by the use through

answering our second sub-question. This can be done through the second voice of the Orton and Weick (1990) framework, which reviews the *types of loose coupling* that occur between levels, among entities and ongoing actions (figure 5).

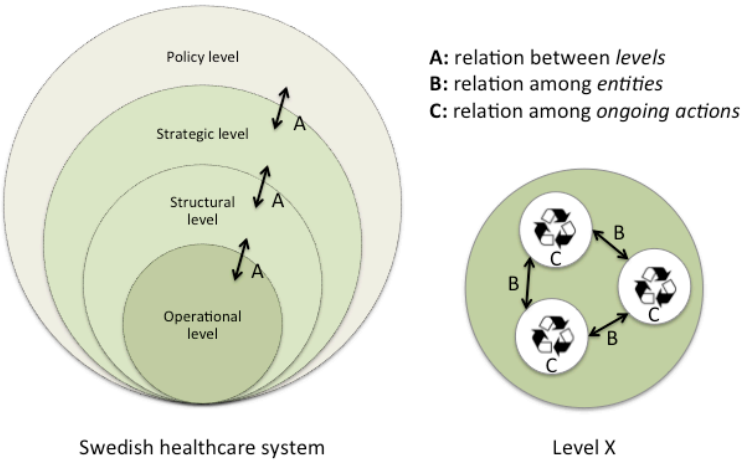

Figure 5: The three main relations of loose coupling; between levels (A), among entities (B) and ongoing actions (C)

There are eight frequently reoccurring types of loose coupling, which are divided into three main relations of loose coupling.[77] The first main relation occurs between *levels* (A), such as hierarchical levels, organization and environment. Followed by the second main relation among *entities* (B) that are individuals, subunits, and organizations. The last main relation occurs among *ongoing actions* (C) that are activities, ideas, intentions and actions. Through this voice of loose coupling, we can identify the change in relations of loose coupling that are tightened, weakened, or maintained by the use of PM.

2.5.2 The outcomes of loose coupling

To answer our third sub-question, we want to understand the impact that the identified change in relations have had on the Swedish healthcare system (the policy level) and its users (the strategic, structural, and operational level). This can be done though analyzing the impacts of loose coupling with its organizational outcomes found in the remaining voices of the framework.[78] In the final voice, scholars have investigated the organizational outcomes of loose coupling that allow for a more in-depth analysis of the impacts on a system and user level.

Organizational outcomes of loose coupling

Given that the literature defines the healthcare sector as a loosely coupled system, we seek to identify how the change in relations impacts the system and its users in the context of loose coupling. Since the users of PMs are found in the organizations in the

[77] Orton and Weick (1990)
[78] Ibid.

strategic, structural, and operational levels, we need to analyze the impact that the changes in relations of loose coupling have had on organizational performance. This can be done through the fifth voice of the Orton and Weick (1990) framework, *organizational outcomes of loose coupling*.

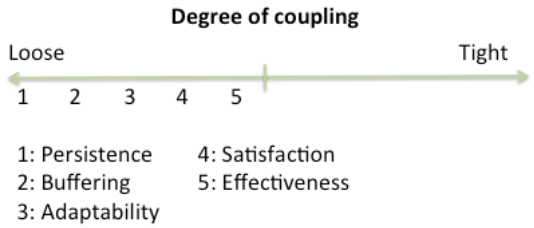

Figure 6: The five organizational outcomes connected to degree of coupling

The voice outlines the impact that all previous voices of loose coupling have on organizational performance.[79] In our thesis, this voice explains the outcomes connected to the degree of loose coupling (figure 6). The first and second outcome often occurs in the first phase of a change and the aim is to neutralize the impact of change through *persistence* (1) and *buffering* (2). The outcome of persistence resists changing, while buffering prevents the spread of problems by avoiding problems before they appear. Buffering in loosely coupled systems is partial rather than complete. The third and most extensive outcome is *adaptability* (3) through accommodation and assimilation of the change. Adaptability solves existing problems that a change initiative generated through experimentation, collective judgment, or dissent. The fourth outcome is *satisfaction* (4), in which loose coupling seem to have an impact on job satisfaction by reducing conflict, foster self-determination, create physiological safety and deepen social interactions. For the last outcome, *effectiveness* (5), the organizational impacts are binary. Some researchers argue that organizational outcomes in loosely coupled systems that are persistent, buffered, and adaptable with satisfied employees must be effective, while other researchers state the opposite.

2.5.3 Emerging theoretical propositions

This view suggests that loose couplings between levels, among entities and ongoing actions in a system (A-C) are associated with several outcomes (1-5) that may be both good and bad, depending on the observer. Through persistence and buffering, the responsiveness to change is reduced and loosely coupled systems are stable (closed to outside forces) and difficult to change in a certain direction since several mechanisms/behaviors impede a complete, system-wide adoption of a new idea. The system neutralizes the change, while it can be open to change as one element may respond to the environment without the other elements doing that. Thus, it is far from certain that the intentions of PMs, to be used in ways that increase the connectedness between elements of the healthcare system, will be realized.

[79] Orton and Weick (1990)

This creates the first proposition: *PMs may be used at one level, e.g. the structural level, to adjust to pressures from the environment/the political level, without having any real influence on the operational level, that is, the operational level continues as usual.*

The theory further suggests that if PMs will be used in ways that increases relations between the elements, this may have implications on the characteristic attributes of its adaptable capability. This may make the system more conducive to system-wide change, since it will be easier to govern.

This leads to the second proposition (figure 7): *If the use of PMs leads to tighter couplings, buffering (2) will reduce and the system will become more adaptable (3) and be easier to govern.*

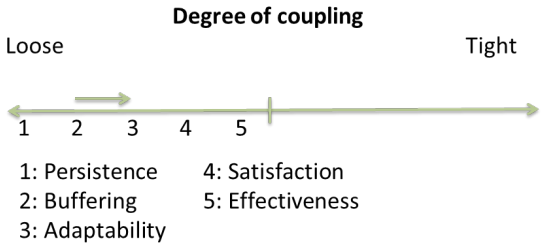

Figure 7: If the use of PMs leads to tighter couplings, buffering (2) will reduce and adaptability (3) increase.

On the other hand, the theory suggests that loosely coupled systems are characterized by an adaptive capability, as each independent entity or level may change their behaviors without changing the whole system increasing the buffering capability.

This creates the third proposition (figure 8): *If the use of PMs leads to tighter couplings, buffering (2) will increase and the adaptive capability (3) of the system will be reduced, thus limiting the tightening impact and governance of the system.*

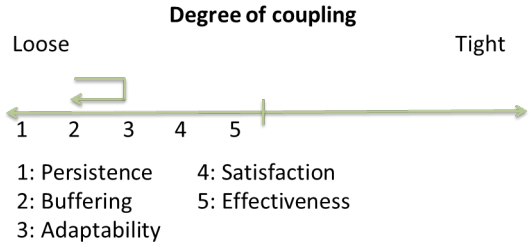

Figure 8: It the use of PMs leads to tighter couplings, buffering will increase (2) and adaptability decrease (3)

However, as argued by the authors, a system may exhibit tight couplings between some elements and loose couplings between others. The question if the use of PMs may lead to tighter couplings between some elements while weakening the couplings between other elements of a system, and how this may influence the system's outcomes of buffering and adaptability.

2.5.4 Summary

In order to study the use of PMs in the context of healthcare systems, the conceptual framework was developed based on a model of loose coupling theory by Orton and Weick (1990). The framework consists of two parts, the relations and outcomes of loose coupling, which serves as a guide to analyze the identified uses. The relations of loose coupling guide the analysis of how the identified uses may influence the relations between levels (A), among entities (B) and ongoing actions (C) in healthcare systems and therefore provide answer to the second sub-question. Lastly, the outcome of loose coupling directs the analysis of how the change in relations impacts the organizational outcomes (1-5) in the Swedish healthcare system and serves as an answer to the third sub-question. Importantly, the two parts of the framework will be tested against the empirical data in order to understand how the use of PMs impacts the dynamics of the Swedish healthcare system (figure 9), thus answering our main research question.

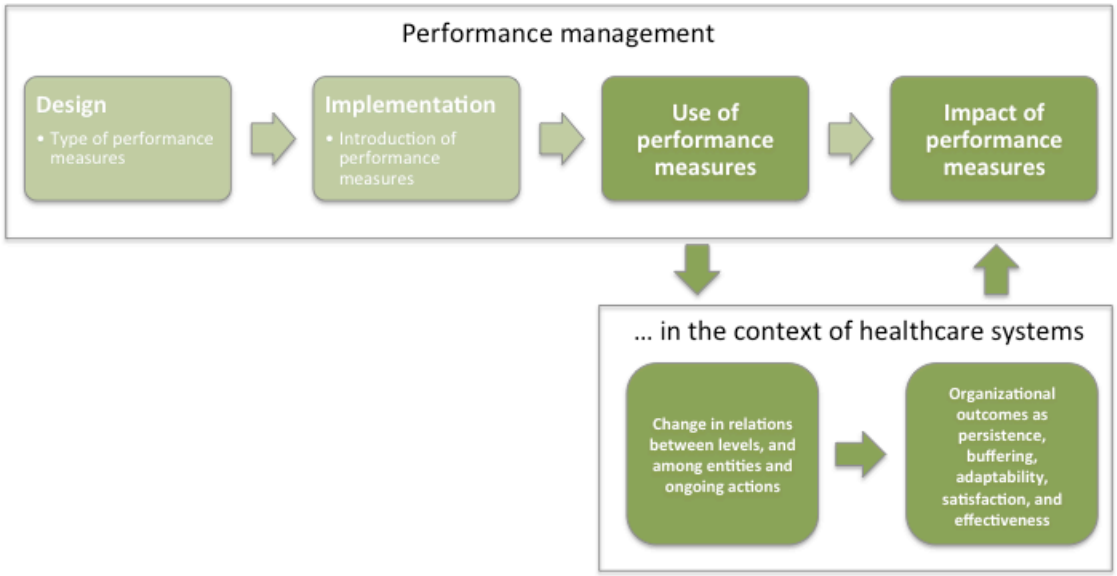

Figure 9: The conceptual framework

3. Methodology

This chapter details the methodological choices made for this study. The method stems from the epistemology of critical realism, is mainly deductive with inductive influences, and combines a qualitative main study with a minor quantitative pre-study in multiple case study. The chapter will cover research design (3.1); case selection (3.2); data collection and analysis (3.3); limitations (3.3.3); and reliability and validity (3.4).

3.1 Research Design

Using critical realism as a philosophical standpoint within research means that there are two steps to experiencing the world; (1) there is the thing itself and the sensations it conveys, and (2) there is the mental processing that goes on sometime after that sensation meets our senses. What we see is only part of the bigger picture and we can identify what we do not see through the practical and theoretical processes of social sciences.[80] As a critical realist, one should recognize the importance of multi-level study (e.g. at the level of the individual, the group and the organization) since each level has the capacity of changing the understanding of what is being studied.[81] This standpoint will have an effect on the analysis as detailed in section 3.3 and suits the multi-level perspective taken on the impacts of PMs in the Swedish healthcare system.

In terms of the study being inductive or deductive there is no clear-cut answer, and the analysis uses a two-pronged approach as detailed in section 3.3. Due to the exploratory purpose there is a lack of hypothesis and highly structured approach in order to strictly define it as a deductive approach. On the other hand, the study lets theory drive much of the data collection and analysis, which makes it impossible to define as inductive. On a continuum between inductive and deductive the method would place itself closer to being characterized as deductive, but with inductive influences coming from the exploratory purpose of finding out how PMs are used.[82] Having an exploratory purpose means that the study aims at seeking new insights, in this case, in an application of literature that is relatively under-researched. One characteristic of exploratory research is that it is flexible and adaptable to change. This means that the focus of the research starts out wider and becomes progressively narrower as the research progress,[83] which has been evident in our quest to focusing on the use of PMs within the public sector performance management and the informed decision to zoom in on the context of loose coupling.

[80] Bhaskar (2010); Saunders et al. (2009)
[81] Saunders et al. (2009)
[82] Ibid.
[83] Adams and Schvaneveldt (1991); Saunders et al. (2009)

By studying Swedish healthcare specifically and zoning in on three county councils, the study's design can most accurately be described as a case study, although not using as many sources of evidence as is common within case studies. Following the philosophy of critical realism, the approach of the case study places importance on the context. The boundaries between the phenomenon being studied, i.e. the impact of PMs on Swedish healthcare, and the context within which it is being studied, i.e. Swedish county councils, are not clearly evident.[84] Case studies are suitable for exploratory studies with 'how?' questions and benefit from using data from several sources, for example interviews. Within Yin's (2003) distinction of case studies, this is a multiple embedded case study in which multiple cases are used in order to establish whether the findings of one case occur in other cases as a way of generalizing and reaching a multi-level understanding. Moreover, it is embedded because levels of the organization of 'Swedish healthcare', such as county councils and hospitals, are analyzed in par with the overall organization.[85]

The method consisted of a qualitative study with semi-structured interviews conducted with 18 key people in 3 county councils and initial expert interviews. Using interviews as a means for data collection allows the study to capture a wider perspective and collect data that require open-ended questions with sometimes unexpected answers.[86] The qualitative data was complemented by a minor quantitative pre-study, consisting of analysis of county council performance in 38 PMs within heart, stroke, and diabetes care between 2013 and 2014. These measures were extracted from the NBHW online portal[87] to examine patterns and indications of county council behavior with the aim of guiding and facilitating the main qualitative data gathering and analysis. It is common that researchers use data from the administrative work of public authorities in a quantitative secondary analysis.[88]

To use one set of data, in this case the quantitative, to complement the other rather than weighting them the same when taking an approach that has aspects of mixed methods, facilitates a more precise and deeper analysis.[89] This study aims more to develop theory as opposed to testing or describing theory. This means that satisfactory explanations are sought within the chosen subject but the aim is not to test a certain theoretical framework,[90] coinciding with the inductive influences of the study.

The research question as such mainly leads to 'how' this certain phenomenon, the use of PMs, can be described and has impacted the Swedish healthcare system, which strengthens the choice of an approach with a qualitative focus.[91] Giddings and Grant

[84] Yin (2003); Saunders et al. (2009)
[85] Saunders et al. (2009)
[86] Esaiasson et al. (2012) p. 254
[87] Socialstyrelsens jämförelseverktyg
[88] Heaton (2004)
[89] Giddings and Grant (2006)
[90] Esaiasson et al. (2012) p. 111
[91] Huberman and Miles (1994)

(2006) defines a combination of qualitative and quantitative research as 'mixed methods' and argues that it is particularly useful due to its broader focus than single method design - it gathers more information in different modes about a phenomenon. However, the mix of methods in this study is heavily skewed towards being qualitative based. The study contains examination of a relatively small number of cases in which we aim to start developing generalizations.[92] This study does not unravel causal relationships since it cannot prove that PMs impacts coupling in an isolated manner, there are other factors which may have contributed to the symptoms this study identifies. It is rather focused on studying changes that we, the researchers, and the interviewees attributed to their use of PMs.

Figure 10 visualizes the choices made for the methodology of this study and their position in relation to alternatives.

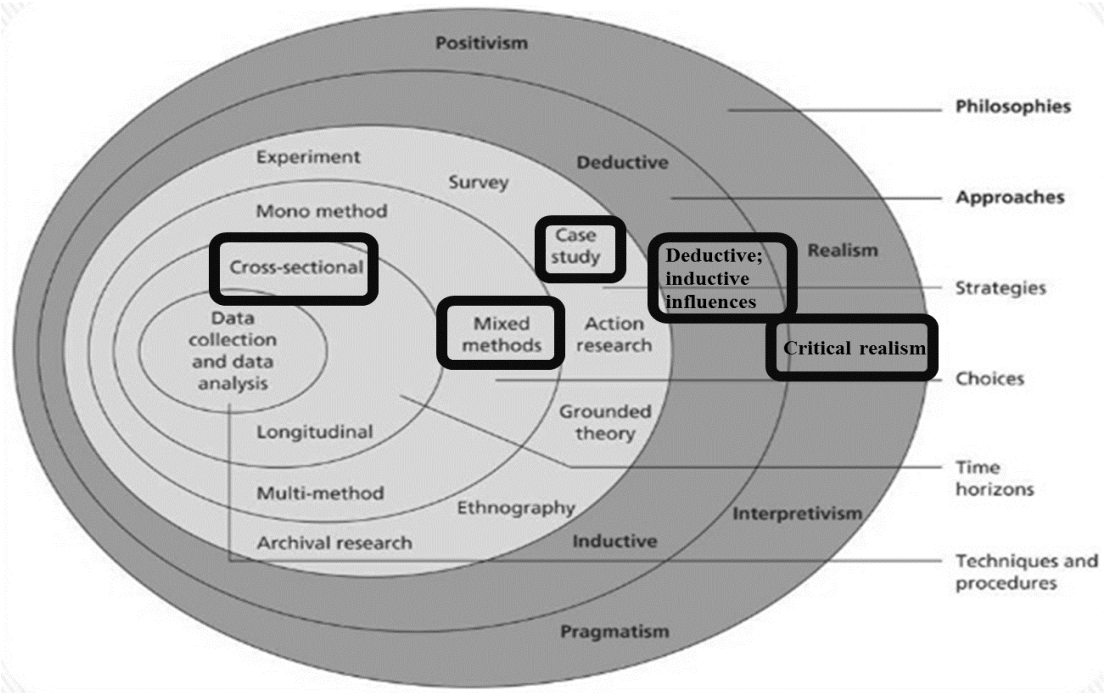

Figure 10: Saunders et al. (2009) "The Research Onion" visualization of positioning of methodology

3.2 Case selection

Several choices have been made on different levels with the aim of reaching a focus and a fit between the study and theory of performance management and loose coupling in order to pinpoint the use and implications of PMs across levels and activities in the healthcare system. These choices have been related to medical area and measures (3.2.1), county councils (3.2.2), and interview subjects (3.2.3).

[92] Granskär and Höglund-Nielsen (2012); Saunders et al. (2009)

3.2.1 Choice of medical area

The study was scoped to include PMs in heart and stroke care since these areas have been using measures for several years and are cornerstones of the national guidelines and PMs from the NBHW.[93] Moreover, it is an area in which the physicians and actors utilizing them consider the measures reliable and sensitive, and the measurements are susceptible to influence from practice improvement initiatives.[94] The pre-study pointed towards these medical areas by showing that both heart and stroke care indicate that county councils compare and react to their relative position to other county councils, implying that the PMs may be used and acted upon regularly. All in all providing the study with influences of extreme case sampling[95] and an empirical setting that may have relatively beneficial prerequisites for a strong influence of PMs on the intra-system relationships and operations of healthcare.

The PMs that are in focus in this study are the ones that are measured and available on a national level, in which all county councils are measured and have possibilities for observing each other's performance (see table 3 and appendix 9.2). These PMs are in part handled by the NBHW and other organizations responsible for the National Quality Registries in different medical areas.[96]

Stroke care measures examples	Heart care measures examples
Reperfusion therapy for stroke	*Reperfusion therapy for ST - segment elevation myocardial infarction*
Median time to thrombolysis	*RAAS inhibitor treatment after heart attack*
Lipid lowering therapy after stroke	*Restenosis of coronary arteries after PCI*
Functional ability after stroke	*Lipid lowering therapy after heart attack*
Antihypertensive therapy after stroke	*Goal attainment of LDL cholesterol*

Table 2: Examples of PMs from both stroke and hearth care

3.2.2 Choice of county councils

Specific county councils were chosen based on initial explorative interviews with experts from NBHW and SALAR, in which a few counties were recommended. The choices were made with the aim of examining three county councils with different size characteristics, but all with established processes for using PMs. Based on the assumption that different size of county council will affect how PMs are used, and that pre-existing operating processes around PMs will provide context for examining what impact they have had, three differing county councils were chosen:

[93] Socialstyrelsen.se. *Nationella riktlinjer.*
[94] Socialstyrelsen (2015)
[95] Patton (2005)
[96] Socialstyrelsen (2009)

1. County council 1 is one of the three biggest county councils in Sweden. They have a reputation of high quality in their healthcare and established practice of using PMs in their evaluation and improvement initiatives. They have a specific task force working with quality and PMs as well as an early history of implementing these processes.
2. County council 2's size, both in terms of population and organisation, is close to the mean and similar to 15 of the 21 Swedish counties and the size of their organization is comparable to the same extent. Moreover, they have recently implemented a plan to become the healthiest county in Sweden, a plan that includes evaluation through PMs and goalsetting.
3. County council 3 are also close to the mean of Swedish county councils and can be considered small in comparison to county council 1. They are also known for having established practices around PMs, for example they appointed a responsible medical professional to each measure.

A typical case is, as implied by the name, one that is as close to typical in the group of possible selections as possible. County council 2 and 3 can in this study be defined as the typical cases in terms of size, and all three county councils are critical cases with beneficial circumstances in terms of having established processes around PMs. Results from 2 and 3 will give initial possibilities for generalization, especially in combination with similar results from county council 1, whilst the results from all three could, if proven negative, possibly imply that no county councils use or are affected by PMs.[97]

3.2.3 Choice of interviewees

Through conducting initial expert interviews with associations within the sector and specific researchers, the sample was guided towards what type of roles might be applicable to interview in order to gain understanding of our research area. Sequentially, the interviewees in all county councils were chosen through snowball sampling based on our initial ideas on what types of informants would be beneficial, namely people who had positions which involved working with PMs. By accessing initial respondents, we gained access and recommendations to further interviewees applicable to our study. This was repeated until the data was saturated and actors on different levels in the county council who had different affiliations with processes around PMs had been interviewed (figure 11).[98] Our aim was to interview actors on the strategic, structural, and operational level in the county councils in order to create an embedded case study with aspects of multi-level analysis.

[97] Esaiasson et al. (2012) p. 161; Yin (2003)
[98] Noy (2008)

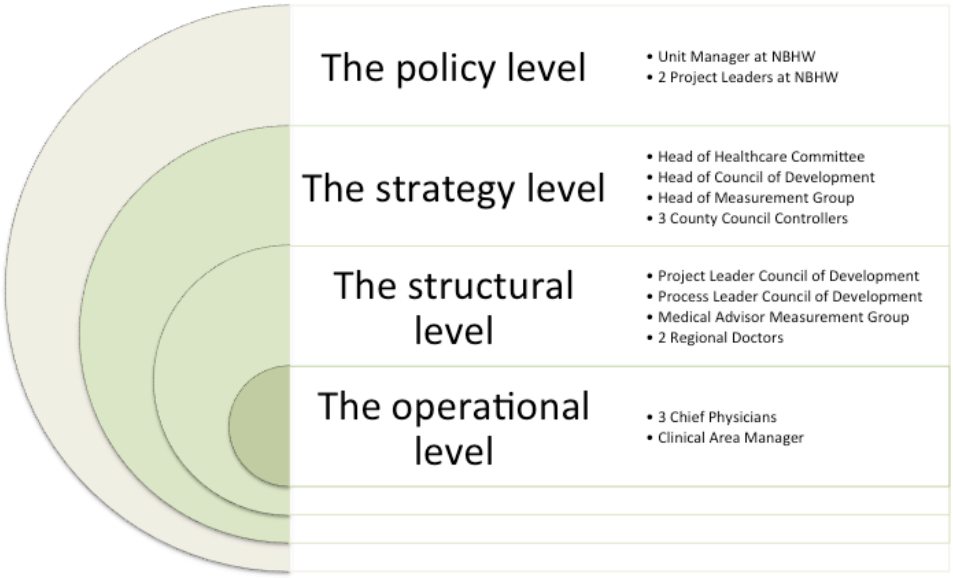

Figure 11: Classification of respondents divided by hierarchical level

3.3 Data collection and analysis

The main source of data collection was in-depth, semi-structured interviews conducted with key actors in the county councils' processes around PMs. These sources were combined with input from experts in the industry and a pre-study consisting of quantitative data from the measures and analyzed with both inductive and deductive influences suiting critical realism. Moreover, on the policy level of the system the study made use of initial document analysis of official reports and documents from the Ministry of Health and Social Affairs, the NBHW, the SALAR and other governmental agencies.

3.3.1 Data generation

This section details how the interviews and the quantitative data was collected as well as minor discussions around the benefit and purpose of this approach.

Quantitative pre-study

Before the interviews, the performance of all county councils in all measures for stroke, heart, and diabetes care available at the NBHW online portal through 2013 to 2014 were extracted (see appendix 9.2 for detail around specific measures).[99] By extracting the performance of all county council (21 pcs), in each PM (38pcs), for two

[99] Socialstyrelsens jämförelseverktyg

different measuring points, the aim was to see if there was any correlation between the relative position of the county councils to the national average or to other county council's performance in a measure in 2013, and their pace of change until 2014. As seen in table 4, each county council has one value for 2013 and one for 2014 in one of the 38 specific measures examined. Between these values, there is a differentiation that indicates how much progress the particular county council has had. A large positive number means improvement; a negative means a negative development. In the bigger picture, this would serve as data indicating the behavior and focus of county councils and enabling context upon which to analyze the impact of PMs. Moreover, the results of the three specific county councils examined in this study were analyzed to see if they differ from the behavior of the group as a whole.

Fully satisfied need support and help 3 months after stroke			
County council	2013	2014	Diff.
Gotland	79,7	67,5	-12,2
Jönköping	78,1	80,4	2,3
Dalarna	70,2	61,5	-8,7
Skåne	67,4	67,1	-0,3
Västmanland	66,2	64,8	-1,4
Sörmland	66,1	57,5	-8,6
Gävleborg	64,8	66,8	2
Värmland	63,9	62,8	-1,1
Östergötland	63,4	65,8	2,4
Kalmar	62,7	64,4	1,7
Västerbotten	62,6	68,6	6
Riket	61,5	61,9	0,4
Halland	60,2	57,1	-3,1
Jämtland härledalen	59,9	59,3	-0,6
Örebro	59,3	55,8	-3,5
Västra Götaland	57,6	59,7	2,1
Stockholm	57,5	58,9	1,4
Uppsala	56,2	54,4	-1,8
Kronoberg	55	60,9	5,9
Västernorrland	54	58,6	4,6
Blekinge	53,6	54,4	0,8
Norrbotten	51,2	55,2	4

Table 3: Example of 1 of the 38 measures with respective county councils and data

Interviews as main study

Around half of the interviews were conducted face-to-face at the offices of the county councils and hospitals, the other half through conference calls. By interviewing people from different hierarchical levels, several different perspectives were gathered and a holistic image of the use and implications of PMs could be more easily achieved. All respondents received an interview brief a few days before the interviews detailing what the study was about and what areas the questions would concern. This allowed the interviewees to give feedback on what areas were relevant in their

specific role. The interviews were then based on an interview guide with semi-structured questions. In order to capture as much of the impacts of PMs as possible, the interview guide was based on three perspectives connected to the loose coupling framework and the research sub-questions; (1) use of PMs (2) relations affected, and (3) outcomes of these uses and relational impacts. This was an informant-inquiry that means that the respondents are seen as witnesses or "truth-tellers" who can contribute with information about what their experience of reality looks like in their certain area, although influenced by their own experiences. This is in contrast with respondent-inquiry in which the respondent themselves are the subject of the inquiry and their own thoughts are of greater interest.[100] On the policy level, data was gathered from initial expert interviews together with a preliminary document analysis and insight from interviewees on other hierarchical levels.

3.3.2 Data analysis

The analysis of data first separates the data from interviews and the quantitative data by analyzing them separately. Quantitative data was analyzed for correlation, which then acted as context and insight into behavior of county councils, occurring sequentially before analysis of interview data in order to aid the direction of the study. Interviews were analyzed inductively by identifying emerging patterns of use on a multi-level basis, which then was deductively analyzed within the context of the loose coupling according to the conceptual framework defined in chapter 2. This section further details the process of analysis for both data sets, and the combination of them.

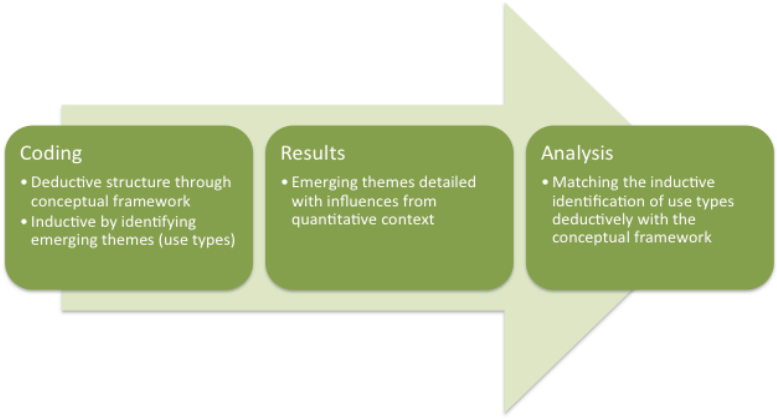

Figure 12: Sectioning of methodology and data analysis clarifying inductive and deductive influences

Quantitative data

This level of analysis was purely quantitative and provided the study with numbers and percentages, which when analyzed further facilitated insight into the responses and behaviors of county councils in relation to results in PMs. The following questions guided the analysis of the quantitative data that was conducted in Microsoft Excel:

[100] Esaiasson et al. (2012) p. 228; Granskär and Höglund-Nielsen (2012)

- In how many of the measures has the county councils that perform below average in 2013 changed more beneficially than the ones above, as a group, when measured in 2014
- Is the performance improving on average when measured 2014 for the group performing above average in 2013
- What percentage of the county councils experience a negative development between 2013 and 2014, and what was their relative performance in 2013

Qualitative data

The interviews were all transcribed and combined with notes taken during the actual interview session. The transcriptions were then coded within the coding software Nvivo. A deductive coding approach with inductive influences was chosen in order to apply the conceptual framework deductively whilst inductively analyze what parts of the framework were most substantial and what emerging patterns of PM use were evident. Meaning that coding was done by identifying examples of the sub-categories in the conceptual framework and then aggregating these into embedded cases behaving in a similar fashion in order to start grouping different uses of PMs. Yin (2003) describes parts of this process as a method of "pattern-matching", in which empirical patterns are compared with patterns from theory. The explorative character of this study and the foothold in critical realism, guided us to let the data inductively identify different types of utilizations of PMs, which then were analyzed by matching with the theoretical rhetoric and themes from the conceptual framework in a deductive manner. These uses stem from the responses of the interviewees and can be derived to some extent to the respondents' hierarchical level.

Combining the pre- and main study

The qualitative data was related to the context provided by the quantitative data where applicable. However, since the quantitative data came from a pre-study, it had a role of guiding the main study more than being part of the main data and analysis. Hence, it played a minor role in the main analysis, as opposed to the relative significance it had when guiding the study at the earlier stages.[101] Although, the quantitative data gave insight into how county councils behave and indications of what is prioritized and evaluated when working with PMs, which acted as a platform for further analysis and discussion. The results from the quantitative data were reinforced by the qualitative findings. For example, answers from the interviews reinforced the quantitative data indicating that county councils compare themselves in relative terms within PM results and act upon the results of that comparison. The results from the pre-study were reinforced by the data from the interviews, but not all results from the interviews are reinforced by the results from the pre-study. Hence, the combination is not substantial and the two sets of data were rather used sequentially.

[101] Giddings and Grant (2006)

3.3.3 Limitations

In order to conduct this study with an appropriate resource scope various choices and prioritizations had to be made about the method and the research design. Even though these choices were guided by theory and early experiences in the study there are limitations to the method. The following section elaborates on the main limitations with the research design and the data collection.

Limited case depth

Designing the study as a multiple-case study limits the possibility to solely focus on a single case, in a single context and in a detailed fashion map out how PMs are used within and between hierarchical levels. This study does not give a detailed view and structure, in for example a process schedule, over how PMs are used, which actors are involved at what point in the process, and what discussions are held on a day-to-day basis. In order to do this the method would have needed to consist of a single case with several more sources of data.[102] Focus groups, interviews, documents, and observation of everyday operations over a longer period of time would have been necessary. However, since this study has an exploratory character with the aim of starting to map how PMs are used and their impacts on relations and organizational outcomes, an exhaustive level of detail was not aimed for. Other studies might want to focus on exhausting all details of PM use in order to build on the findings made in this study, and will then need to have a different methodology as mentioned.

Focus on county councils

This study was limited to mainly examining the use and implications of PMs on the relations and organizational outcomes in the regional county councils. There are hierarchical levels within the Swedish healthcare system above these, such as the political level (the government, the ministry, and the NBHW), who also use PMs and are impacted by them. These levels were not examined in direct terms and should be considered in future research in order to gain a fuller holistic picture. However, one can argue that the county councils are the ones driving the Swedish healthcare system and the ones who are in fact the intended users. Therefore, this study decided to put the main focus on county councils, since these also could give initial insight into the remaining levels by being subject to connections with all of them. Moreover, by interviewing several hierarchical levels within the county councils, insights into the system as a whole (including the policy level) were achieved. Hence, this limitation was the most reasonable to do in order to achieve the most relevant view of the Swedish healthcare system within the scope of the study.

[102] Yin (2003)

3.4 Reliability & Validity

This section details the main concerns around reliability and validity of the data and the method. Reliability is focused on participant and observer bias and how these risks have been mitigated. Validity is focused on if the study has gained access to the participants' knowledge and if external validity has been reached. These areas within reliability and validity are the most prominent and therefore the ones discussed.

3.4.1 Reliability

Reliability generally refers to the extent to which results are consistent over time and an accurate representation of the total population, and if the results can be reproduced under a similar methodology.[103] One thing that is important in terms of reliability for this particular study is that the method is not necessarily intended to be repeatable since one of the aims of the study was to reflect reality at the time data was collected, in a situation that may be subject to change.[104] Reliability in our case is therefore more concerned with if the data is reliable and free of significant bias.

In our case, being a qualitative study based on semi-structured interviews, reliability is partly concerned with whether alternative researchers would reveal similar information.[105] This often depends on different types of bias. One is participant bias, meaning that the respondents are biased and in this case would for example focus on positive aspects of PMs or avoid to disclose information with a negative ring to it, since the data also show that these are competitive professionals. There were indications of interviewees focusing on positive and beneficial responses during the study. However, this threat was mitigated by keeping the respondents anonymous and continuously working during the interview to get the most accurate information from the interviewees.

Another threat to reliability is observer bias, which was partly alleviated by having two interviewers at the majority of the interviews with one focusing on interviewing and the other taking notes and observing body language. In the interviews where there was only one interviewer, the other researcher transcribed the recording in order for both researchers to gain a deep understanding of the respondent and a complete picture of the entire data set. There may have been observer bias stemming from the fact that the world of PMs in Swedish healthcare is complex with various measures from different organizations, which could have led to interpretation of answers to fit our research question and cases to a greater extent than the respondent intended. However, this risk was lessened during the execution of the interviews, by clarifying what the respondents were referring to and during the coding and analysis stage by

[103] Golafshani (2003)
[104] Saunders et al. (2009)
[105] Ibid.

distinguishing between the intended focus of the answers given by the interviewees.[106] The explorative character of the study was another aspect which diminished observer bias since the observers had no clear objective of testing a certain hypothesis, hence limited risk of 'wanting' a certain outcome. [107]

3.4.2 Validity

Validity in this study is concerned with if access was gained to the participant's knowledge and experience, and if we were able to infer a meaning that the participant intended from the language that was used by this person[108]. As mentioned under Reliability, the complex context that the interviewees operated in required clarification around what our questions were aimed at gaining an understanding of. Hence, validity was an ongoing concern that needed rectification by clarifying for the interviewees what we were discussing, at the same time as letting contextual matters be discussed in order to gain a wider understanding.

Validity concerning if access was gained to the knowledge and experience of the participant produced itself in large by the respondents being doctors with integrity who were opinionated about PMs in general and were eager to state their view, good or bad. Once again, anonymity, both regarding chosen county councils and respondents within those county councils, created a safe-zone for the respondents in which they felt free to share their knowledge and experience. [109]

The concept of external validity is another one which is applicable to the study. External validity refers to the extent to which the results of a study can be generalized to other situations and other samples. This study tries to use its findings to begin to generalize around how PMs have impacted the Swedish healthcare by examining three county councils. This means that trust is put into the reasoning behind these county councils as a group giving insight to begin to draw inferences for the entire group of 21 county councils and the system as a whole. Our sample provided external validity by two of the county councils as being similar to the majority of county councils, whilst one of the examined county councils had the characteristics of being big and hence was similar to a group of county councils which together represent more than half of the system (if population, patients, or resources are counted). By sampling in this manner the validity and possibilities for generalization should be strengthened through insight into how county councils, which represent the biggest group in terms of numbers of county councils, are impacted by PMs, and also how county councils, which represent the biggest part of the population and in several cases the system, are impacted. A threat to the external validity is that the county councils in fact operate in fairly different fashions and at their own discretion.

[106] Saunders et al. (2009)
[107] Ibid.
[108] Ibid.
[109] Ibid.

Presenting a risk that the sample in this study in fact represents a relatively particular set of county councils with specific impacts of PMs. Yet, during expert interviews and background research the findings and results were compared and discussed which softened this threat. [110]

[110] Esaiasson et al. (2012) p. 228; Saunders et al. (2009)

4. Empirics

This section will start with a short account for the results of the pre-study (4.1), followed by a detailed section around the results from the qualitative interviews (4.2). The main results are then summarized in a table (4.3), which serves as an answer to the first sub-question.

4.1 Pre-study results

All calculations in the pre-study point to the fact that county councils performing above average in one year, in general have a worse or less beneficial performance than the ones performing below average, between the two measuring points (see appendix 9.3 for raw data and calculations).

- Of the county councils that performed above national average in 2013, 45% experience a negative development until 2014. Comparable to 24% for county councils that performed below national average (Calc.1 in figure 13).
- Of all county councils that experience a negative development, 73% were from the group that performed above national average in year 2013. Consequently, 27% were from the group that performed below. Overall, 52% of the county councils perform above national average (Calc.2 in figure 13).
- The county councils that performed above the national average in 2013 have in 55% of the measures a negative development as a group until 2014, comparable with 16% for the county councils that performed below the national average (Calc.3 in figure 13).
- The county councils performing below national average in 2013 always improve more as a group until 2014, than the county councils that performed above national average. This goes for each measure (Calc.4 in figure 13).
- In 15 of the 38 measures, the county councils that performed above national average in 2013 have a negative development as a group at the same time as the county councils that performed below average have a positive development.

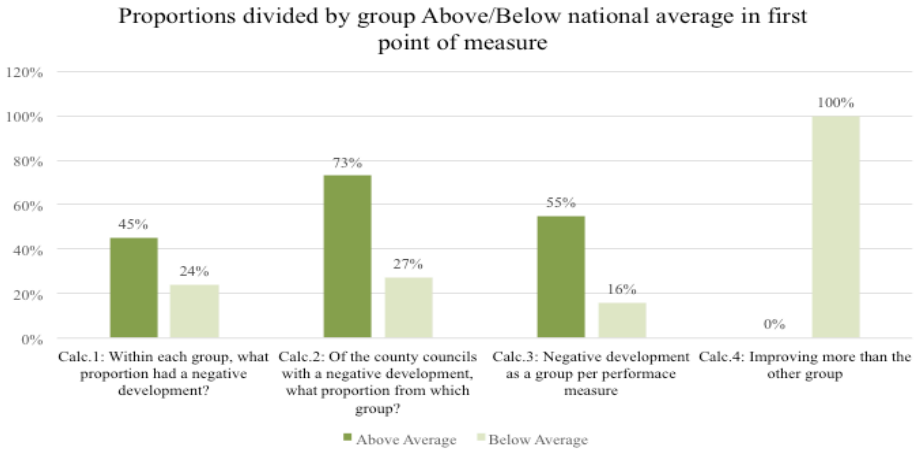

Figure 13: Visualization of quantitative findings based on dividing the county councils into one group below and one above the national average

The three specific county councils chosen for the main study follow a similar pattern as the entire group of county councils when analyzed separately. These results are reinforced by data from the interviews stating that significant focus turns on the measures in which performance is lacking in relative terms and that there is a competitive aspect at work within the whole system. Quote 1 and 2 from a Chief Physician and a Head of Measurement Group exemplifies this:

> "This becomes a regional benchmark, and it encourages, if you are marked as red or yellow (not being in the top in relative terms) we have very… It is somewhat if a bottom-level which one is supposed to reach."
>
> *-Chief Physician (Operational level), Quote 1*

> "The transparency is important; these are competitive people. You don't want to represent the worst place, right. No one wants to be the one who works at the worst place."
>
> *- Head of Measurement Group (Strategic level), Quote 2*

4.2 Main study results

In this section we present the main findings from our study. By focusing on the first sub-question posed in section 2.4, four differing general ways in which PMs are used have emerged. These are not mutually exclusive in terms of where they are used on a hierarchical level nor are they necessarily used sequentially, instead the same department or level can engage in more than one of these use types in different parts of their activities and at the same time.

The four ways, apparent by the data, PMs are used are; (1) to signal performance levels followed by an ad hoc, discussion based, response, (2) to signal performance levels followed by a structured response, (3) to communicate informally within the different entities in the county council, and (4) to communicate formally between hierarchical levels both within and outside the county and healthcare organizations. These four ways can be aggregated to two main use types; as a Signal and as a Communication tool. The loosely coupled organization dictates that the way the measures are used is adapted based on what hierarchical level is utilizing them. Here follows a detailed account on when, why, and by whom these uses are noticeable as well as what they entail combined with examples from the empirical data.

4.2.1 Using PMs as a signal

This type of use can be divided based on what follows in the process after the signal has been received; ad hoc or structured response. A common feature is that the result in the measure is in focus and discussions are used as a tool to make sense of the information.

Signals of performance followed by ad hoc response

A common use of PMs was to utilize the comparison and the relatively tangible evaluation that comes with the quantitative results in order to understand where quality and performance was lacking. The users seem to trust the numbers and the signaling effect primarily comes from measures in which performance is below national average, as also indicated by the pre-study, meaning that the users tend to respond to relative rather than absolute values. Once this insight was given by the PM results, the measure as such had limited importance and the focus turns to analyzing intuitively what could be done in order to raise performance and quality in a way that gave effect in the quantitative measure result. This process had an ad hoc character where the role of the measure was to illuminate performance, or lack thereof, in order for the next step in the process to gain a starting point upon which to prioritize and work on a case-by-case basis. Thereafter the process moved away from the measure itself and interpretative discussions are the basis for driving action and implementation of measures to raise quality. These two quotes from a process leader and a clinical area manager illustrates the two-fold process that several interviewees described:

> ”As of now we have the national average to compare ourselves to, since we have National Quality Registers. Then our job is to look at how we are doing things, and most of all if we are doing it well. Maybe we don’t have to change that much and then we just try to keep doing a good job. But, in some areas we can see that we are not performing well, and then we have to think about what we could do to improve.”
>
> *- Process Leader, Council of Development (Structural level), Quote 3*

> “Often we have discussions on a case-by-case basis on how to improve our results, and this of course differs based on what type of measure we are talking about, we need to test to see what works and gives an effect on the measure”
>
> *- Clinical Area Manager (Operational level), Quote 4*

The ad hoc character of this use of PMs is evident both by the varying frequency and the lack of a systematic way of responding to the results. However, note that this does not necessarily have to be a disadvantageous approach, but rather a way to adapt to the complexity of healthcare. Experimentation is used as a way to untangle causality by "thinking about what we could do to improve" and "looking at the routines and skipping the parts that are unnecessary" as indicted by quote 3,4 and 5. The numbers that the measures show exist in a complex context and it becomes central for the operations to some extent experiment and to find out what actions will lead to an improved performance in the measure.

Interviewees expressed that certain results triggered action more than others. Measures pointing to problems that would not be costly to solve had a bigger operational direct impact, as described by this clinical manager:

> "Measures that do not require more resources, but rather a change in behavior, are easier to improve. Look at the routines, skip the parts that are unnecessary and focus on that which truly benefits the patient."
>
> *- Clinical Area Manager (Operational level), Quote 5*

This complex context also provides incentive for the operational level to self-design the way PMs are implemented and included in processes, and as the pre-study shows with an aim of reaching a level of not being seen as 'bad'. Previous years the operational level showed persistence to PMs, a persistence that seems to have been mitigated in par with increased self-design. As evident by quote 6, the structural level experienced this resistance from the operational level:

> "From what I have heard in earlier cases, if you were not satisfied with the results in the measures, you criticized the measure itself. Stating that they are not measuring your particular patients or that you have very complicated patients compared to others."
>
> *- Medical Advisor, Measurement Group (Structural level), Quote 6*

Even though what the measures are aimed at and what they measure is quite clear, they are not followed by a nationally set structure or strategy on how to actually incorporate them in everyday operations or the existing healthcare governance in the county council. Hence, PMs are adapted, not in terms of what they show, but in terms of how they are utilized. This is mainly done through open discussions both based on and aiming for a collective decision. In the end, everything happens at the doctors' discretion, and county councils also govern their own processes and how measures

should be utilized. Several interviewees at the operational level described how decreasing or below-average results triggered ad hoc responses. For example, a physician stated that:

> "I usually, since I am responsible for registering thrombolysis in stroke patients, continuously or when I see that our performance is taking a downturn or getting better, try to notify the personnel. That's good, because if we have solid results, we can motivate people to improve even more, and if we are starting to go downhill, they usually pull together. But this is nothing systematic, it happens a couple of times a year or once per quarter."
>
> *- Chief Physician (Operational level), Quote 7*

This use of PMs is also characterized by the users themselves, who when talking about this particular use, tend to exist on the operational level, wanting more frequent and continuous feedback from the system on how the performance is changing and if current actions have an impact on the results in the measures. Moreover, since resources are limited there has to be prioritization. The process of prioritizing appears to be a driver of how PMs are used, especially in the use described in this section. The operational level receives multiple measures and incentives to adapt to. The choice of focus between these incentives is based on an ad hoc approach, especially when the operational level is complex with various departments and clinical areas having different views on what is important and what should be prioritized. It is difficult to know what choice of focus drives most benefit for the patient, hence a case-by-case approach is taken on the aspects the measure results illuminate and a somewhat subjective discussion takes place. This physician expresses the difficulty of weighing different areas against each other, as many respondents did:

> "When it comes to another important thing such as the restoration of a certain department, it is a very important question, but we understand that it will be very difficult to solve since there is a lack of personnel, leading to a half-hearted attempt to get a grip on it. It [the prioritization] is probably both a mix between what is realistic, meaning that we have the capacity to go through with it, and compared to how important it is for the patients, which is a bit subjective of course. A cardiologist finds it very important to start with the new cardiologic medicine, whilst a neurologist finds it very important to start with the new neurological medicine."
>
> *- Chief Physician (Operational level), Quote 8*

The particular use described in this section has mainly been evident on the operational level. Using PMs as a signal system with a following ad hoc approach is a use that is

applicable to a varying degree in different counties as well as in different entities within the counties, although they are all on the operational level. Some entities on the operational level have a structured response to the data and the results as explained in the section below.

Signals of performance followed by structured response

Another way to use PMs is to have a similar starting point as mentioned in the section above – gaining insight into performance through presenting quantitative results that can be compared. However, once this is done, there is a difference between the two ways that the following process can take. The first way described above has an ad hoc, discussion based, response, whereas the use detailed in this section is characterized by structured and strategy driven responses and activities leading to prioritization and implementation of improvement initiatives. The focus once again appears to be on PMs in which the county council has a declining or below-average performance.

This approach is clearly evident on the structural level in which results are evaluated and then acted upon if there is an anomaly in relative terms. This tends to happen regularly during the year and in a similar, if not same, fashion each time. In most cases, the evaluation itself is planned and yearly executed in a set number of times on specific dates, and then based on these evaluations reports are created and meetings are held centered on a standard process. It is important to remember that discussion is an important tool in this use as well. Quote 9 is an example of this standardized process:

> "On two occasions per year, we have so called 'quality controlling' with the healthcare sector (…) meaning that data from the medical quality registers is extracted and sent to the operational management and then we [the strategic, structural, and operational level] have discussions around these parts."
>
> *- County Council Controller (Strategic level), Quote 9*

The structural level tends to act as a buffer zone for the remaining hierarchical levels by interpreting, translating, and presenting the PM results. Usually meetings and discussions from the structural level with the operational level are both a support function for the operational level initiated by the structural level. Moreover, it is a way for the structural and strategic level to exert some pressure or incitement for improvement in PM results on the operational level. The process could also have an explanatory character stemming from the operational side with the aim of clarifying and justifying what has been, and is being, done to improve quality or maintain high

PM results. This quote from a county council controller is one of many examples of the impact of this structured process:

> "…the way I see it, and I have partaken in two 'quality controllings', the things that were addressed during the first one had had an effect the next year because then it is like 'you have to do something about this'."
>
> *- County Council Controller (Strategic level), Quote 10*

Part of this pressure appears to originate from the national guidelines of the NBHW and its PMs. The structural level works with clearly defined processes in order to aid the operational level in raising quality and consequently improving measurement performance. Hence, when PMs are used in this fashion, the process can be clearly defined on several levels in the organizations. Moreover, the process works in two directions, spanning several levels, in which the operational level reports and presents improvement activities to above hierarchical levels, whilst the structural level focuses on specific areas and initiate discussion around improvement initiatives and current operations of the operational level. A Project Leader at the Council of Development expresses how the structural level manages this use:

> "…if this is what NBHW says, what do we have to do to get there? Some kind of gap-analysis, which is deduced into financial, recruitment needs, organizational needs, or whatever it may be. And this is done in work-groups which are led by the knowledge based governance in the organization."
>
> *- Project Leader, Council of Development (Structural level), Quote 11*

Moreover, the operational level in certain hospitals with developed and structured processes tend to also use PMs this way with designated cross-functional groups initiating actions around quality improvement and consequently measure performance enhancement. One hospital in particular expressed rigid structures:

> "If we take stroke as an example, we have various performance measures from which we produce action plans. In this we have a process management group, healthcare director, operations manager, and a chief physician, who all evaluate the result and based on that take adjusting actions and action plans. Decision is made during the same meeting and then there are responsible process managers who feedback with a set action plan the next meeting. Right now we have six action plans in effect at stroke care, in which we have not reached the national targets."
>
> *- Chief Physician (Operational level), Quote 12*

Another aim of this is also to have more frequent feedback and adjustment of actions, as well as to use PMs to aid in the general work around quality improvement, as expressed by this physician:

> "We have follow-up every other month with the leaders of processes in which we work with performance measures leading to action plans to adjust and improve quality"
>
> *- Chief Physician (Operational level), Quote 13*

One of the more interesting aspects with this utilization is the cooperation it stimulates between the structural and operational level in particular. The processes and utilizations described for both these level appear to combine into an analysis with the aim of raising PM results. A Medical Advisor in the Measurement Group described what this process could look like:

> "…deep analysis reports are done together with the professionals, that is the sectors that are affected and in these cases we have most of the time found something that proofs, it can for example be differences within the region or compared to the national average, something that is different in some way that we want to know more about. Then we do deep analysis which are adapted to the operational level and their cognitive level (…) we look for the reason of the difference in performance, in general we pick about three areas per year to work with."
>
> *- Medical Advisor, Measurement Group (Structural level), Quote 14*

However, these processes are focused on more PMs and aspects than the ones that are national, which this study focuses on as described in chapter 3. On the other hand, national PMs are a part of this way of working and are in general combined with more regional measures rather than replaced.

4.2.2 Using PMs as a communication tool

This type of use can be divided based on the formality of the communication which the PMs impact or complement; informal and formal. A common feature is that the content of the measure, in terms of what they measure, is in focus. The communication can be both direct, as in communication through words and discussion, and indirect, as in PMs providing information of performance and focus between hierarchical levels.

Informal communication tool

The third way PMs are used is as an informal communication tool. By presenting clear, quantifiable, and aggregated performance results the PMs cut through the entities in terms of informal communication and understanding. Moreover, they give a firm reference point and an opportunity for governance and support functions with limited medical experience to interpret the performance and quality of the operational level.

Firstly, PMs act as a national communication tool from NBHW that has an effect on all entities of the county council organization leading to stimulation for internal discussions. The informal, day-to-day, discussions that take place seem to from time to time use the PMs as a platform upon which argumentation can be built and direction can be given. Rather than the results themselves, which tends to be the focus when using PMs as a signal, the aspects that are measured are the focus and support the informal communication through partly reasoning that 'what is being measured is important'. Several interviewees expressed how the content of the PMs can steer their discussions, these physicians argue that it is a good platform for dialogue:

> "A strive on operational level is created, it is hard to be an operational manager and not act on it. And in dialogue you talk about alteration actions, so I feel it has a purpose and it is a good platform for having a dialogue…"
>
> *- Chief Physician (Operational level), Quote 15*

And that they aid in communicating mainly between people who actually are concerned with the PMs:

> "These numbers are known by the people working in the department, yes, but mainly by the ones who have a responsibility around them. They sometimes talk about them among themselves for help."
>
> *- Chief Physician (Operational level), Quote 16*

The majority of all actors within healthcare have similar objectives and values, one of which is to provide high-quality care for their patients. These PMs and the transparency they have allow quality performance to be communicated openly within counties. A utilization has an impact on the informal communication mentioned above by providing entities with reference points and insight. Interviewees express that this has had an impact on several hierarchical levels, for example this Head of Measurement Group states that it is easier to communicate:

> "It is easier to communicate, the discussion has somehow changed with time and now it is easier to talk about quality, even on the operational level, there is a completely different awareness now."
>
> *- Head of Measurement Group (Strategic level), Quote 17*

One of the major compensations for the fragmented internal environment are these values that are shared between the majority of the actors and entities involved in the process of creating and running healthcare. The underlying ethics of doctors and the overall care for the patient and the quality of care facilitate functioning operations in which all actors to some extent operate at their own discretion, which is needed in this complex environment, but at the same time with similar motivations and prioritizations which keeps healthcare relatively homogenous and producing a less fragmented environment.

PMs clarifies ones' performance even further and allows these professionals to see the quality of the care they produce and increase the significance of their shared values. Several respondents in the study talk about a system with 'name-and-shame' influences. There would be no shame unless there were shared values guiding what is desirable and important. Moreover, it would be impossible to shame someone without having measures that allow comparisons between county councils and hospitals such as the ones evident in the pre-study.

The transparency in the PMs is an indirect communication which helps drive this homogenous development, this Medical Advisor in Measurement Group mentions both the transparency and the communicative aspects of it:

> "I think the transparency is very important and in fact decisive, both that other people see at but perhaps more that you can see for yourself. Most people within healthcare are very serious and very keen to do good work. If you see your own numbers you want them to be good, regardless of others."
>
> *- Medical Advisor, Measurement Group (Structural level), Quote 18*

It is also important to note that the several respondents state, and there seems to be a general agreement of it across hierarchical levels, that the starting point of these PMs and quality registers was on the operational level, by practicing doctors who created systems for it on a "hobby basis". The levels higher up in the hierarchy have adopted the measures and areas of measurement that were identified as important by the operational level, leading to consensus across the organization about what is

considered central. The national PMs from NBHW are rarely groundbreaking or even containing new insights. Instead, the expert group meetings of NBHW tend to be based on previous discussions and initiatives by the operational level. This development, this spread, of PM focus has affected the system by skewing the discussions and focus to turn from resources to quality. By providing a tangible process for evaluating if ones' performance is adequate for all hierarchical organizations in the system, all levels can evaluate each other based on if the results in PMs and discussion can take place with more ease. Moreover, the majority of the PMs are measured on the operational level and originally created on the operational level – allowing the structural, strategic, and policy levels to evaluate the operational level based on systems created by the same level. This tightens the relations and provides a common language throughout the organization. Many respondents wanted to emphasize the role of the operational level in the creation of this system, quote 19 is one of them:

> "In fact, the system as such has come retrospectively, it is the operational level who have driven the development, on a hobby-basis so to speak. What we see right now is that everybody has become interested and that is a rather new phenomenon. Actually. "
>
> *- Clinical Area Manager (Operational level), Quote 19*

The informal communication use of PMs is relatively difficult to pinpoint, but it is evident in the data that it is used as a basis for informal discussion and indirect communication within entities. It differs from being used as a signal by focusing on the content of the measures rather than the results of the specific county council one operates in. Moreover, this is closely connected to the following section on PMs as a formal communication tool since they are complementary and intertwined.

Formal communication tool

The fourth way that PMs are utilized is as a formal communication tool. This means that the results from, and content within, the measures complement formal communication processes – sending both direct and indirect signals to various actors and entities. Formal communication takes place both inter- and intra-organizational for the county councils by being used between the strategic, structural, and operational level as well as by the strategic level to communicate outwards from the county council.

This utilization of PMs leads to opportunities for the strategic level to communicate externally when performance has been good, most often in relative terms to other counties, hence it also sends a message internally that a comparatively good indictor

performance is valued by the strategic level. This differs from using PMs as a signal, which is about identifying and solve problems. The respondents gave examples of situations in which representatives from the county councils were eager to communicate their performance, such as the Process Leader in quote 20:

> ”I mean, there are officials and politicians who, when these annual reports come, go public with the results so they can turn up in media. For example, when we [the county council] had a very good national performance, we only had to mention it once and it was quickly in the media, because people think ‘We have to communicate this! Get the information out there!’”
>
> *- Process Leader, Council of Development (Structural level), Quote 20*

PMs increase communication between entities by making evaluation tools available to all hierarchical levels. This leads for example to the structural level being able to gain information about the operational level without actually talking to each other, a form of indirect formal communication. Several interviewees express how the accessibility aids communication, for example a Head of Council of Development expresses how this formal communication takes place between hierarchical levels:

> “In our software we follow PMs and results for the hospitals and such. Everything of that kind is accessible for us at the group-office so we do not have to ask the operations about it.”
>
> *- Head of Council of Development (Strategic level), Quote 21*

Often, the structural level facilitates internal communication through PMs by interpreting and presenting results as well as highlighting certain performances in order for all organizational levels to focus on their part and understand the other organizational levels performance without being as knowledgeable in their areas. This is most applicable in a downward hierarchical way from the strategic and structural levels in the organizations. By allowing these hierarchical levels to have easier access to the evaluation of performance of the operational level, the system compensates for its weak relations. However, the transparency which is built into these measures facilitate these shared values and the formal communication around them. This Regional Doctor talks about how the structural level analyze and interpret PMs:

"We work in two ways when it comes to performance measures. One is concerning the measures themselves, and the other, which might be a bit bigger, is to present, analyze and interpret the results."

- Regional Doctor (Structural level), Quote 22

Results in the PMs are also used as a tool to exert pressure and illuminate areas in which performance needs to improve through formal communication. This is closely connected to using PMs as a signal, but differs since the focus is on the communication as such rather than the process. The PM becomes a reference point which neither the structural nor the operational level can deny, which gives them a common language in the formal communication:

"With the numbers that exist in quality registers, combined with deepened analysis, we can convince operational management that this does not look good, and hence action is taken."

- Project Leader, Council of Development (Structural level), Quote 23

In sum, the result is that PMs are used as a piece of the formal communication both internally (within and between levels) and externally (between the system and its environment). The external parts of the communication stemming from the strategic level have an effect on the remaining organizational levels as well, not just on the external entities such as the media and the patients. The internal parts of formal communication around quality takes a foothold in PMs with a report based approach which seems to bare limited importance on the operational level, which tends to utilize informal communication and act at their own discretion to a larger extent. Hence, formal communication by PMs tends to be more rigid, less prone to self-design and adaptation, than informal communication, which leads to PMs being used with varying intensity on different levels.

4.3 Summary of main findings

The table 4 below summarizes the emerging use types from the data along with their content and applicability on a hierarchical scale and thus serves as an answer to the first sub-question.

	Summary	Hierarch. Level
Signal; ad hoc response	PMs signaling performance, based on the PMs results of the county council, followed by an ad hoc, discussion based, response adapted to the specific case. Mainly evident at the operational level.	Operational
Signal; structured response	PMs signaling performance, based on the PMs results of the county council, followed by a structured process based on set work groups, dates, frequency and action plans. Mainly evident at the structural level.	Structural
Informal communication tool	PMs used for informal communication by giving common reference points and focus based on PMs content rather than results. Evident at all hierarchical levels, both upwards and downwards in the hierarchy.	Strategic, Structural, Operational
Formal communication tool	PMs used as a part of the formal communication, both within and outside of the county council, based on PMs content rather than results. Tends to be based on structured reports and official communication, leading to both direct and indirect impact.	Policy, Strategic, Structural

Table 4: Summary of the emerged use types of PMs and their hierarchical application

5. Analysis

In this chapter, the empirical data is analyzed through the lens of the conceptual framework addressing the second and third sub-questions concerning the impact of the use of PMs on relations (5.1) and outcomes (5.2) of loose coupling. The analysis will then end with a short analysis of the relationship between the three sub-questions (5.3).

5.1 The impact of the use of PMs on the relations of loose coupling

To answer the second sub-question, the analysis of which relations that are affected by the use of PMs will be done for each identified use of PMs through the three main relations of loose coupling (figure 14); between levels (A), among entities (B) and ongoing actions (C). Subsequently, this section ends with a summary of the analysis.

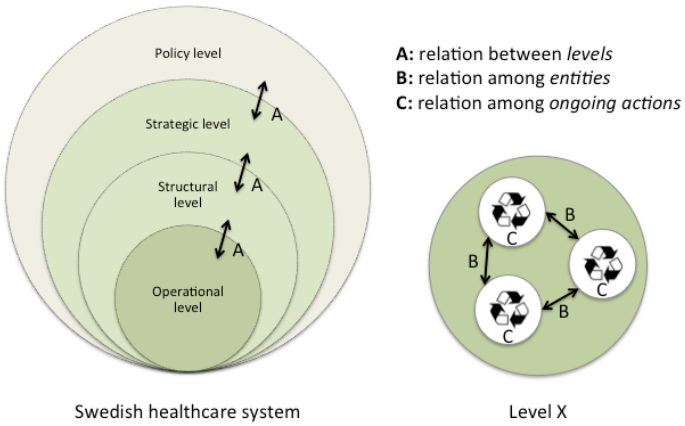

Figure 14: The three main relations of loose coupling; between levels (A), among entities (B) and ongoing actions (C)

The impact of the use of PMs on the relations between levels (A)

The use of PMs as *signals of performance followed by structured response* and as *formal communication tools* both impact the relations between levels (A). The structured response of the signal use is evident at the structural level and used to transmit behavioral and output control between the hierarchical levels. The entities within the structural level mainly act as a support function for the other hierarchical levels (see Quote 11) and thus tighten the relation between levels (A). The PMs are used as a tool to exert some pressure to the operational level, while clarifying and justifying results to the strategic level, thus increasing vertical communications and goal consensus between the hierarchical levels. Subsequently, the relation between the levels tightens. In addition, the use of PMs as a formal communication tool is evident during formal meetings where decisions are set on the agenda. These formal meeting mainly takes place between the hierarchical levels and thus also tighten the

relation between levels (A). These formal meetings are supplemented by formal report and document sent between the hierarchical levels, in accordance with the structured response to signaling. Apart from an internal communication tool used during formal meetings, the PMs are also used as an external communication tool to inform the environment, such as media or external websites, about their performance. As an external communication tool, the PMs decrease the barrier of understanding between the organizations and its environment, i.e. media and citizens, and thus tighten the relationship between the levels (A) and its environment.

Despite the impact on the relations between levels generated by the above uses of PMs, the two remaining uses generate less impact on these relations. The use of PMs as *signals of performance followed by ad hoc response* and as *informal communication tools* do not impact the relation between levels, since evidence on these particular uses were neither found between the hierarchical levels nor between the organizations and environments. Instead, the relations between the levels are maintained and do not contribute to these uses, since less informal decisions are made between the levels than among the entities (B) within the organizations. Thus, the impact on the relations among entities will be further analyzed below.

The impact of the use of PMs on the relations among entities (B)

The relation that occurs among entities (B) is tightened by the use of PMs as *signals of performance followed by ad hoc response* and as *informal communication tools*. This ad hoc response of the signal use is only evident on the operational level and thus serves as a tool to facilitate prioritization at the hospitals. In the highly fragmented internal environment of a hospital, the PMs are used as a tool to signal performance, or the lack of it (see Quote 18). The results of the PMs are perceived as unquestionable, but how they choose to respond to the signals is still debatable. As a result, the relation among the entities (B) tightens as the PMs facilitate the prioritization among individuals and medical departments. In addition, this relation is also tightened by the use of PMs as an informal communication tool. The PMs serves as an informal tool to increase the understanding among individuals, subunits, and organizations in their daily operations, which creates tighter relations among the entities (B) in a fragmented internal environment. Furthermore, a tight relation among the inter-organizations at the structural level is also evident, since the PMs are used as a tool to reach out and communicate among the county councils.

In contrast to the impact the use of PMs as *signals of performance followed by structured response* and as *formal communication tools* have on the relations between levels (A), their impact on the relations among entities (B) are more moderate. The impact on the relations among the entities is somewhat maintained since the aim of these particular uses are to transmit behavioral and output control through formal communication between the hierarchical levels, not among the entities.

The impact of the use of PMs on the relations among ongoing actions (C)

In contrast to the two above relations, the relation that occurs among ongoing actions (C) is tightened by all four uses of PMs. One reason to this is that the ongoing actions occur among all levels and entities in the system, making them respond to changes in relations both between levels (A) and among entities (B). Thus, we will analyze the relations among ongoing actions between the hierarchical levels and among the entities.

The increased cooperation between the hierarchical levels (A) contributes to a tightening relation among the relations among ongoing actions (C). For example, the use of PMs as *signals of performance followed by structured response* increases the feedback and adjustment of actions, thus strengthening the relation among information gathering and decision-making. The relation among intentions and actions are also tightened, since the planning and implementation is easier with an agreed action plan. The use of PMs as *formal communication tools* for internal and external communication also serve as a good example of how the use of PMs tighten the relation between the levels (A), but also the relation among the relations ongoing actions (C). The PMs tear down the language barrier between the healthcare professionals and county councils, since the two different professions now base their arguments on the same language (see Quote 23). The relation among intentions and actions thus tightens since the official structures and negotiated orders are the same. Coinciding with the structured response of signal use, the earlier weak relation among information gathering and decision-making is also tightened thanks to the introduction of PMs.

Moreover, the improved relation among the entities (B) also tightens the relation among ongoing actions (C). The use of PMs as *signals of performance followed by ad hoc response* act as a prioritization tool that argumentation can be built upon, and a somewhat subjective discussion takes place. This is especially efficient within the medical departments and among nursing and physicians subunits where decisions about prioritization would otherwise been made without information gathering. The intentions are the same and the relation among intentions and actions thus tighten, even though the actions still are made on a subjective basis. The use for PMs as *informal communication tools* also help to increase understanding in the fragmented internal environment, which in turn leads to tighter relations among ongoing actions (C). Coinciding with the ad hoc response, the measures act as an informal platform upon which argumentation among entities (B) can be built and direction given, which is especially efficient within the medical departments and among nursing and physicians subunits where the informal decisions are made. Since the informal decisions within the organizations are improved, the relation among the activities is also tightened.

Summary

Addressing the second research sub-question, we summarized the relations that are affected by the use of PMs in table 5 below. Despite the fact that the four types of uses are not mutually exclusive or necessarily used sequentially, they still together affect all three relations. Two main conclusions can be drawn, the first is that all four uses of PMs tighten the relation among ongoing actions (C) and the second is that the formality of the use depends on if the relation occurs between levels (A) or among entities (B). Hence, the more informal/ad hoc the use is, the tighter relation among the entities, while the more formal/structured the use is, the tighter relation between the levels. In addition to this, the signal uses are mainly evident at one hierarchical level, while the use of PMs as a communication tool is evident at several levels.

Relations / Uses	Levels (A)	Entities (B)	Ongoing actions (C)	Summary (A-C)
Signal; ad-hoc response	0	+	+	Tightening among entities (B) and ongoing actions (C), mainly evident at the operational level
Signal; structured response	+	0	+	Tightening between levels (A) and among ongoing actions (C), mainly evident at the structural level
Informal communication tool	0	+	+	Tightening among entities (B) and ongoing actions (C), mainly evident at the strategic, structural and operational level
Formal communication tool	+	0	+	Tightening between levels (A) and among ongoing actions (C), mainly evident at the policy, strategic and structural level

Table 5: Summary of impacts of uses on relations between levels, among entities and ongoing actions

5.2 The impact of the change in relations on the outcomes of loose coupling

The analysis of which outcomes that impacts the dynamics of the Swedish healthcare system, will be conducted by looking at how the tightening relations between levels, among entities and ongoing actions impacts the organizational outcomes of loose coupling (figure 15). The analysis of the outcomes details how the tightening relations, which emerge from the four identified uses, impacts the outcome of adaptability (3) and buffering (2) with the aim of answering the third research sub-question.

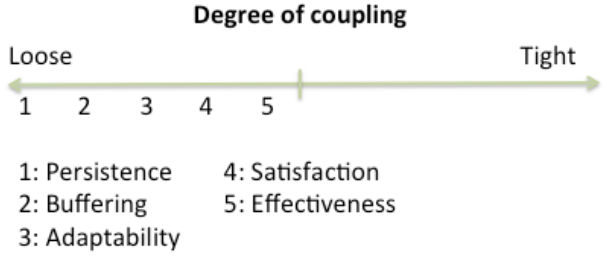

Figure 15: The five organizational outcomes connected to degree of coupling

5.2.1 The impact of the change in relations on the outcome of adaptability and buffering

This section will focus on how the organizational outcomes of loose coupling are affected by the tightening relations between levels, among entities and ongoing actions. In line with the second and third theoretical proposition (see section 2.5.3), adaptability (3) and buffering (2) are the outcomes that are most affected and in several aspects co-align with the tightening relations that emerge from the identified uses. The tightening relations between levels, among entities and ongoing actions both strengthen and reduce the adaptable and buffering capacity, which in extent contribute to the dynamics of the Swedish healthcare system. Hence, in this section the organizational outcomes of adaptability and buffering are further analyzed.

The impact of the change in relations that strengthen the adaptable (3) and reduce the buffering (2) capacity of the healthcare system

The ad-hoc and informal character of two of the identified uses described in the previous chapter tightens the relation among entities (B) and ongoing actions (C). In accordance with the second theoretical proposition (figure 16), these tightening relations in turn strengthen adaptability (3) and reduce buffering (2) as outcomes of loose coupling.

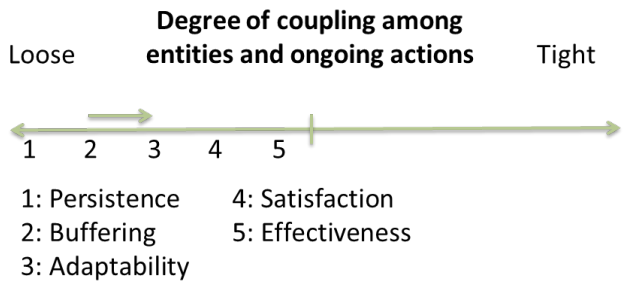

Figure 16: Impact of change in relations among entities (B) and ongoing actions (C) on organizational outcomes (1-5)

The measures merely show a number, but in the complex context of the Swedish healthcare system the numbers become important for the operations that to some extent experiment and communicate in order to untangle the causality behind the number (see Quote 4). The tightening relation among entities (B) provides motivation for the operational level to adapt and self-design the way PMs are utilized with an underlying aim of performing on a certain level as indicated by the pre-study results. This helps the healthcare system to move from the more buffered outcome (2), which was evident during the introduction of performance measure, to a more adaptable (3) and accepting environment. Thus, making the system easier to govern and more conducive to system-wide change. Furthermore, adaptability is a necessity due to the complexity of the healthcare context and the fragmented internal environment both on the operational and structural level. The tightening relation among entities (B) also accommodates change and experimentation through local learnings and solutions, which occur when the PMs are communicated, interpreted, and used on a case-by-case basis as described in the empirical results (see Quote 8). This should in theory lead to a rather beneficial combination of the loosely coupled character of the system and organization as such, and the tightening relation among entities contributes an improved communication and evaluation of performance.

Moreover, the tightening relation among ongoing actions (C) help the entities on the operational level to adapt by finding out what actions will lead to an improved performance in the measure and in extent reach the national targets (see Quote 3). Despite the fragmented internal environment with its disagreement on how to act on the different PMs, in theory the healthcare system coheres if there is consensus on preferences through collective judgment. Adaptability (2) is thus used to bypass the disagreement by resolving the existing problems at the operational level making it easier to govern. Hence, one of the impacts the PMs have had in this respect is once again to keep all entities related to a mutual reference point. In which communication can take place through tighter relations among ongoing actions (C), whilst in turn having enough loose coupling between levels (A) that the operational level can adapt the information from the measures to suit their needs and utilize the different uses as described in the results. This looser coupling between levels and among ongoing

actions is a result of the strengthening outcome of buffering (2), which will be further analyzed below.

The impact of the change in relations that strengthen the buffering (2) and reduce the adaptable (3) capacity of the healthcare system

The structured and formal character of two of the identified uses described in the previous chapter tightens the relation among levels (A) and ongoing actions (C). In accordance with the third theoretical proposition (figure 17), these tightening relations in turn strengthen buffering (2) and reduce adaptability (3) as outcomes of loose coupling. Thus, each independent level may change their behaviors without changing the whole system limiting the governance of the system.

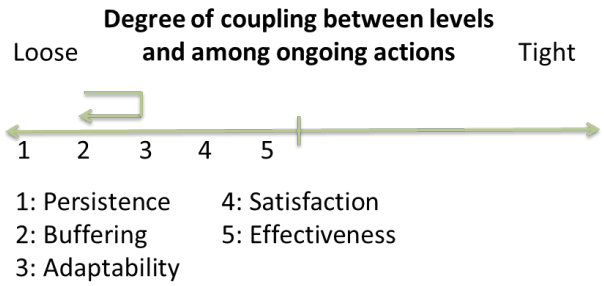

Figure 17: Impact of change in relations between levels (A) and among ongoing actions (C) on organizational outcomes (1-5)

PMs once again provide a firm reference point in this endeavor and tighten the relation between levels (A) and among ongoing actions (C) (see Quote 11). At first sight, buffering (2) becomes less significant when all hierarchical levels have a tight relation and can relate to common targets, common guidelines, and common measures. This correlates to the above analysis and suggests that the PMs provide a more tightly coupled system in which the outcome of adaptability (3) and buffering (2) is altered. A tightening relation between levels (A) and among ongoing actions (C), stemming from PMs giving direction on focus and prioritization, is in less need of buffering of other aspects in operations. Despite this, buffering (2) is still highly relevant in the relations among ongoing actions (C) when PMs are introduced into the organization and when implemented in existing processes. The empirics show that buffering is both a process that happens when the county councils relate to introduction of new PMs (see Quote 11), and a process that is impacted by the existence of national PMs when buffering is done in general (see Quote 13). Thus, every time the results in the measures are updated, buffering takes place in order to utilize these results and neutralize them on the operational level, reducing the adaptable capacity (3) and limiting the higher levels ability to govern the operational level.

In light of the reduced adaptable capacity (3), buffering (2) sometimes takes place when the operational level utilizes measure results in the ad hoc fashion described above. Results come and the actors on the operational level buffer them in order for them to make sense and become a suitable tool for the complex operations and context that they maneuver in. However, this buffering process (2) is not isolated to the entities (B) at the operational level, instead buffering is also relevant in the relations between levels (A). The tightening relation between levels help the structural level to buffer their structured response to the performance measure results, even though this buffering is a more set and rigid process. The structural level tends to act as a buffer zone for the tightening relation between the other hierarchical levels (A). They are the ones who interpret, translate, present and communicate the performance measure results to the remaining organizational levels (see Quote 14). Coinciding with adaptability, buffering is thus used to bypass the fragmented environment by preventing disagreements at the operational and strategic level. The strategic level then tends to receive their measure results and reports pre-buffered, whilst the operational level needs to buffer it even further in order to break it down and tweak it in a way that makes it functional on the grass-root level. Consequently, creating a paradox between buffering and the tightening relations (figure 18). On the one hand buffering tightens the relation between levels, while on the other hand the tightening relation between levels strengthen how this buffering process takes place.

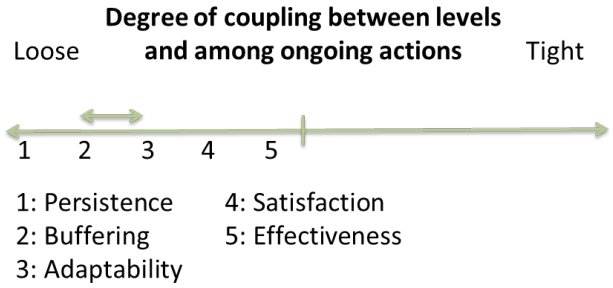

Figure 18: Revised impact of change in relations between levels (A) and among ongoing actions (C) on organizational outcomes (1-5)

Summary

Addressing the third research sub-question, the organizational outcomes that are most evidently impacted by the tightening relations, being adaptability (3) and buffering (2), and which relations that have this impact, are summarized in table 6 below. The impacts of the tightening relations among ongoing actions (C) support both adaptability and buffering by giving guidance for prioritization, comparison and discussion leading to a change in behavior. However, adaptability takes place in the tightening relation among entities (B), while buffering occur in the tightening relation between levels (A). To conclude, the tightening relation between levels, among entities and ongoing actions contributes to making the healthcare system both adaptable and buffered, and thus more prone to behavioral change than before.

5.3 Relationships between the sub-questions and findings

The first thing that becomes obvious when looking at the three sub-questions is that all four identified uses of PMs tighten two out of the three relations, summarized in table 6 below. However, all uses do not impact all aspects of the relations, but all three relations are tightened by at least two uses of PMs. Hence, part of the answer to the second sub-question is that PMs tighten relations by being used in both a formal and informal manner. This seems to be connected throughout the remaining sub-questions, in which question three is partly answered by the change in relations that impact the organizational outcome of adaptability and buffering. Therefore, one of the connections between the three sub-questions is that the varying ways in which PMs are utilized, and how this can differ between the different strategic, structural and operational level in a loosely coupled system, leads to a widespread impact of tightened relations between levels, among entities and ongoing actions, which in turn impact the organizational outcomes of loose coupling. Subsequently, the dynamics of the Swedish healthcare system are affected by the outcomes making the system more prone to behavioral change and thus easier to govern than before.

Uses	Relations	Outcomes
Informal communication tool Signal; ad hoc response	Tightening among entities (B) and ongoing actions (C)	Strengthen adaptability (3) and reduce buffering (2)
Formal communication tool Signal; structured response	Tightening between levels (A) and among ongoing actions (C)	Strengthen buffering (2) and reduce adaptability (3)

Table 6: Relationship between the four uses, change in relations and impacted outcomes

6. Discussion of results

In the following chapter, the results are further discussed by detailing the research and propositions that our explorative study confirm and challenge. First, we relate our findings to the loose coupling and performance management research that is confirmed (6.1), and second we challenge and extend the research our findings question (6.2).

6.1 Research that is confirmed

The main research findings addressed, helps us to confirm the scarce research in loose coupling and performance management that is both related to the use of PMs and the use in the context of healthcare systems.

Coinciding with the loose coupling theory, this study suggests that loose couplings between levels, among entities and ongoing actions in a system (A-C) are associated with several outcomes (1-5) that may be both good and bad, depending on the perspective of a change, i.e. the use of PMs. Through buffering (2), the responsiveness to change is reduced and the loosely coupled system remain stable and difficult to change in a certain direction since several mechanisms/behaviors impede a complete, system-wide adoption of a new idea. This is especially evident at the operational level that neutralizes the tightening relations of PMs, creating a paradox between buffering and the tightening relations. Thus, it is far from certain that the vision of PMs will be used in ways that tighten the relations between elements of the healthcare system, will be realized. This confirms the first and third theoretical proposition. In addition, the third proposition is further developed to mainly being evident when the degree of couplings tightens between levels (A) and among ongoing actions (C) creating a paradox between buffering and the tightening relations (figure 19).

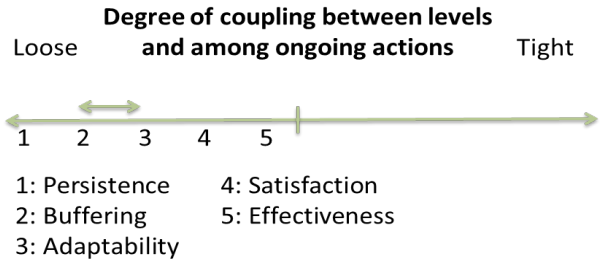

Figure 19: Revised impact of change in relations between levels (A) and among ongoing actions (C) on organizational outcomes (1-5)

In line with our study, loose coupling theory further suggests that if PMs will be used in ways that increases relations between the elements, this may have implications on the characteristic attributes of its adaptable capability (3). This may make the system

more conducive to system-wide change, since it will be easier to govern and thus confirms the second theoretical proposition. Further developed in the study, this tightening relation is mainly evident among entities (B) and ongoing actions (C) (figure 20).

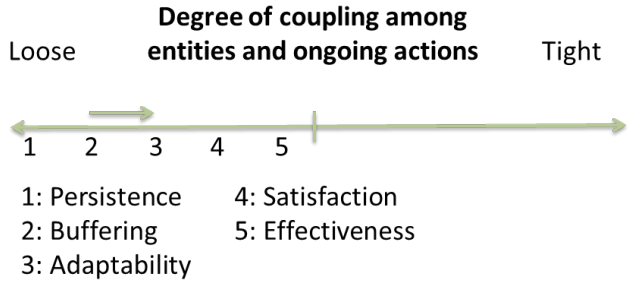

Figure 20: Impact of change in relations among entities (B) and ongoing actions (C) on organizational outcomes (1-5)

To summarize, this leads to a rather beneficial combination of the loosely coupled character of the system and organization as such, and the tightening relation between levels, among entities and ongoing actions contributes a system that is more prone to behavioral change and easier to govern.

Thus, creating a fourth new proposition: *The use of performance measures in a loosely coupled system may result in tightening couplings between levels, among entities and ongoing actions. These tightening relations may in turn weaken the responsiveness to change through buffering and at the same time strengthen its adaptable capacity among entities making the system more prone to behavioral change and easier to govern.*

The observed four general ways in which PMs are used in this study do also confirm the research on use of PMs. The four uses, apparent by the data, can be applied to Behn (2003) eight main uses of PMs. For example, the main purpose of the four uses is to improve performance and thus to some extent help to evaluate, control, budget, motivate, learn, promote and celebrate the dynamics in the healthcare system. However, in accordance to Behn (2003), the four uses found in our study do not correspond to one single measure, since no single performance measure is suitable for all eight uses. Moreover, Johnsen (2005) view of PMs as processes and products also correlates with the four identified uses. In line with our findings of PMs used as informal and formal communication tools, the PMs foster discussion and improve communication as processes and facilitate external communication as products. In addition, the uses of PMs as signals with structured and ad hoc responses can serve as products to facilitate budget decisions by delivering relevant information to the decision makers. The measures also contribute to name-and-shame influences, which may lead to more modest unintended consequences such as resistance, unfair

comparisons and lack of influence of above average results. The loose couplings of measures and incentives can answer this otherwise taken for granted issue, as being one of Pollitt (2013) crucial balances between tight or loose coupling of measures and incentives to limit the unintended consequences of PMs. Overall, as the American and British studies point towards local governments as active users of PMs, our study displays the same impact but in a different context. Thus, the following paragraph will bring up the research on the use of PMs in the context of healthcare systems.

It is widely accepted among researchers that different types of use is influenced by the context, which also our findings confirm. The Swedish healthcare system is complex, with a high causal indeterminacy and fragmented internal environment it fulfills the main causes for loose coupling and can be classified as the essence of loosely coupled systems. The loose couplings between levels, among entities and ongoing actions, are evident in healthcare systems all around the world and also in Sweden. However, in line with the research of Cook and Rasmussen (2005), our findings show that the new public performance management reforms result in trends towards a more tightly coupled healthcare system. After the introduction of the PMs, the healthcare organizations are more prone to behavioral change as they act in a more adaptable and buffered way. Similar to the way Chang (2006) identified PMs as a tool for seeking legitimacy among opponents of local managers in the British NHS, PMs are used as a communication tool to help to increase the understanding in the Swedish healthcare system. They also serve as a type of negotiation tool for the operational and structural level when the measures signal performance to discuss the response, as earlier identified by Covalenski and Dirsmith (1983).

6.2 Research that is extended

In contrast to the confirmed research in the area of loose coupling and PMs in the context of healthcare, the research that is extended is mainly found in the performance management literature on use.

Our research findings state the importance of exploring the relations between levels, among entities and ongoing actions, in order to fully understand the use of PMs. The concept of loose coupling gives a new way of viewing the use and impacts of PMs in the relations between levels, among entities and ongoing actions. This dynamic approach challenges the common understanding that users of PMs are grounded in the idea of hierarchical management control and that only exploring users at managerial level can give the whole picture. It also complements the quantitative studies that fail to provide the contextual characteristics of the healthcare sector. The earlier studies on local governments' limited use of PMs in the public sector mainly apply this quantitative approach and only look at the perspective of one user type. The appropriateness of their methodological approach can thus be questioned, since both

the context and relations are limited. Our study also provides a nuanced view that complements critics of PMs as a source to unintended consequences, such as manipulation of PMs, since the PMs in the Swedish healthcare system are not connected to monetary incentives. However, the embarrassing effect of being classified as ‘bad’ in a medical area seem to be an enough incentive for the users to actually work to improve the PMs, which in turn could trigger manipulation behaviors.

7. Conclusion

In this last chapter, the research questions and findings are summarized according to our three operationalized research questions (7.1). Moreover, the theoretical and practical implications are discussed (7.2; 7.3) and suggestions for future research are given (7.4).

7.1 Research question and findings

The aim of our study was to explore *how the use of PMs impacts the dynamics of the Swedish healthcare system*. Below we provide an overview of the use of PMs in accordance to our conceptual framework (figure 21), by summarizing the answers to our operationalized sub-questions.

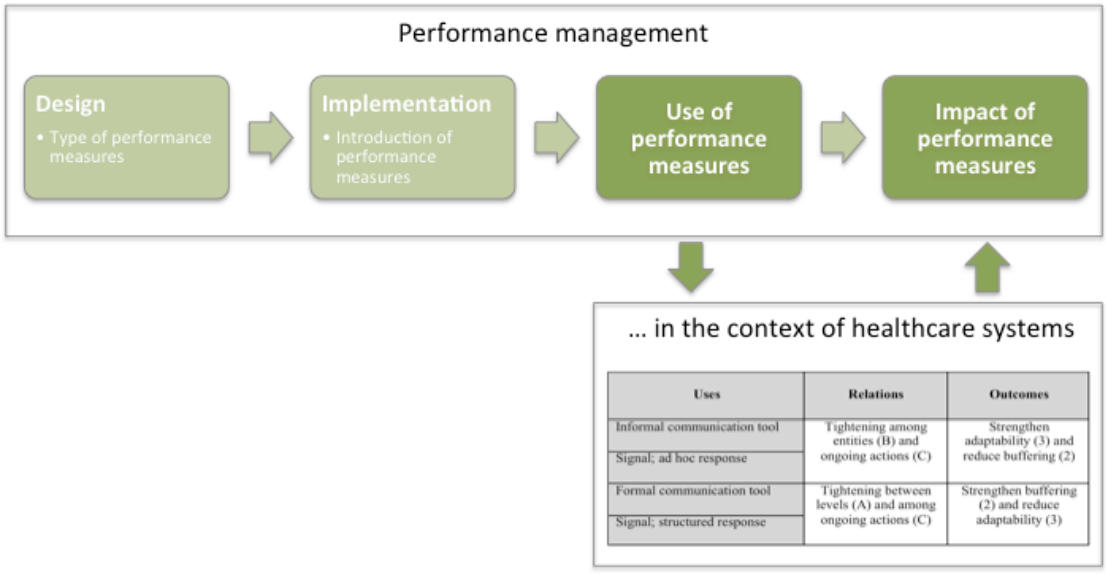

Figure 21: Findings in accordance to the conceptual framework

Overall, addressing the first sub-question, our empirical results support four uses of PMs in the context of the Swedish healthcare system; (1) signals of performance followed by an ad hoc, discussion based, response, (2) signals of performance followed by a structured response, (3) informal communication tool within the different entities in the county council, and (4) formal communication tool between hierarchical levels and between organizations and its environment.

Concerning the relations between levels, among entities and ongoing actions (second sub-question) the first conclusion drawn is that all four uses of PMs tighten the relation among ongoing actions and the second is that the formality of the use depends on if the relation occurs among entities or between levels. Hence, the more informal/ad hoc the use is, the more it creates a tighter relation among the entities,

while the more formal/structured the use is, the more it creates a tighter relation between the levels.

Concerning the outcomes of the change in relations (third sub-question), the organizational outcomes that are most evidently affected by the tightening relations following the use of PMs are adaptability and buffering. The effects of the tightening relations among ongoing actions support both adaptability and buffering by giving guidance for prioritization, comparison and discussion. However, buffering paradoxically takes place in the tightening relation between levels, while adaptability occur in the tightening relation among entities. As a result, the adaptable and buffered healthcare system contributes to a dynamic system that is more prone to behavioral change and easier to govern (fourth proposition).

To conclude, the varying ways in which PMs are utilized, and how this can differ between the different strategic, structural and operational level, leads to a widespread effect of tightened relations between levels, and among entities and ongoing actions, which in turn affect the organizational outcomes of loose coupling. Subsequently, the dynamics of the Swedish healthcare system are affected by the outcomes, i.e. the changed capability and behavior of the system, making the system more prone to behavioral change than before.

7.2 Theoretical implications

This study provides new findings to the limited research on the use of PMs in the following ways.

First, we extend the research on how PMs are used from Behn (2003) eight general uses of PMs to the four identified uses in context of the Swedish healthcare system. To the extent of our knowledge, we are the first to provide the public administration and healthcare policy literature with these four uses of PMs and to identify the effect these uses have on the dynamics of the Swedish healthcare system. Further, we could confirm the studies that point towards an active use of PMs and thus challenge the studies that prove the little use of PMs in the public sector.[111] As requested by scholars,[112] we contributed with the understanding of the uses of PMs and the impact of the uses in the context of healthcare systems.

Second, we confirm and develop the research on loose coupling with the three theoretical propositions grounded in the framework by Orton and Weick (1990) and develop a fourth proposition as a summary of our findings. Through operationalizing our research question, we produce findings that explore the dynamics of the

[111] e.g. Julnes and Holzer (2001); Poister and Streib (1999); Ketelaar et al. (2011)
[112] Helden and Johnsen (2002); Helden et al. (2012); Pollitt (2006); Hibbert et al. (2013)

healthcare system in relations between levels, among entities and ongoing actions, and the outcome of this change in relation. Given that the literature identifies the healthcare sector as a loosely coupled system, we could identify the impact the four uses have on relations and outcomes of loose coupling and thus the impacts on the dynamics of the healthcare system. In addition, we could confirm the literature review on the area of healthcare as a loosely coupled system and provide new insight on how the type of use is influences by the context.

Finally, we encourage future research on use of PMs by contributing with a research design that enables the researchers to unpack the complex healthcare context through the concept of loose coupling. While limited empirical research exists, those empirical studies on the use of PMs in the context of healthcare systems rely on quantitative studies[113] or a single perspective of the user.[114] We use a qualitative study that allows exploring the use of PMs in a context that is otherwise hard to understand. In the future, we hope that this research design with its conceptual framework can encourage further research in the use of PMs. Continuing this research is important for the future reforms and investments in public sector performance management systems.

7.3 Practical implications

This study provides new possible explanations for how the use of PMs impacts the dynamics of healthcare systems. The concept of loose coupling act as a tool through researchers can work on difficult conceptual problems and benefit this research area in the search for new uses of PMs and how these affect the dynamics of the Swedish healthcare system. Overall, there seems to be a beneficial combination of loosely coupled systems and tightly coupled values among the professionals in the knowledge intense healthcare organizations.

For the county councils, the respondents of the study, the results indicate that it is beneficial to embrace the loose coupling that the healthcare system is based on since it suits the complex world that they operate in. Whilst embracing this, there are areas in which it can be beneficial to produce tighter couplings, or new ways of working in a loosely coupled manner, by utilizing PMs and giving these loosely coupled entities within the county council healthcare a homogenous performance level and focus. On the other hand, the significance of the impact of PMs can be discussed since it is difficult to pinpoint what beneficial aspects and quality improving initiatives stem from PMs and which would have come to be either way.

For the strategic and structural level this study provides insights into how the PMs are used and how this use impacts the dynamic relations and outcomes of the Swedish

[113] e.g. Julnes & Holzer (2001); Poister & Streib (1999); Jiang et al. (2008a)
[114] e.g. Jiang et al. (2008b); Reinersten (2007); Joshi and Hines (2003); Jha & Epstain (2010)

healthcare system. In doing so, we also provide the users on all hierarchical levels with evidence on the actual use of recent public sector performance management reforms. Given the complexity of the Swedish healthcare system, it is still hard to give evidence on whether the increased investments on PMs have led to an improved efficiency. The large amount of public reporting and gathering of data also increased the administrative work at the structural and operational level, with a logical risk of leaving less time to the patients. Until the introduction of automated registration of data from the patient records is done, the investments in PMs and national quality registries will have less impact. Despite this, the outcomes of adaptability and buffering are positive and lead to a healthcare system that is more prone to change. As a result, the National Quality Registry Reform appears to have generated positive results, but the investments of the NBHW in expert groups who develop national indicators and targets seems unnecessary in this context. The Swedish healthcare system and the NBHW should benefit by combining the existing indicators and targets from the National Quality Registries with the national guidelines, instead of increasing the administrative work for the users on operational and structural level. In doing so, the impact of the NBHW and thus the investments of the government will be more rewarding through leveraging existing initiatives stemming from the operational level and minimizing double work.

7.4 Future research

There is a vast potential for future research in the research area on use of PMs. Our study and findings give new directions for future research in several ways.

First of all, we advise future research to further develop the use of our conceptual framework that enables the researchers to unpack the healthcare context through the concept of loose coupling, as other studies on loose coupling in healthcare done.[115] As indicated above, the complexity of healthcare contributes to the difficulty in identifying the impacts of PMs. However, future research can extend our insights by investigating how the use of PMs between levels, among entities and ongoing actions, can produce a more coherent and predictable healthcare system, or if PMs are used in ways that maintain the loose couplings between elements, thereby maintaining the unpredictability of care system. In particular, our study points at that certain uses may tighten some relations but not others, hence there is a need for more in-depth studies that do not discuss healthcare as a loosely coupled system in general, but more specific and analyzes different types of relations that may point in different directions.

Second, the influence that the context has on the four identified uses of PMs can further be investigated through the five voices developed by Orton and Weick (1990). When first applying the voices of Orton and Weick, we identified multiple effects in

[115] Covaleski & Dirsmith (1983); Hinings et al. (2003); Cook & Rasmussen (2005)

the five voice of loose coupling, especially in the fourth voice of compensation for loose coupling with its managerial strategy of shared values. This additional observation was made alongside our research question and regarded how the system compensates for the loose coupling by increasing the significance of shared values and the effect of name-and-shame. The fact that there would be no shame unless there were shared values guiding what is desirable, allow PMs to tighten this dynamic relation by public comparisons of results between county councils and hospitals. Investigating this dynamic relation further will thus give insight into how the healthcare sector as a loosely coupled system compensated for the introduction of new PMs.

Lastly, the three assumptions of use borrowed from the accounting literature would also be of interest to study. The assumption that performance measurements are used to foster educated discussion about results of public activities and services, improve communication between and among branches PMs and facilitate budget decisions by delivering relevant information to the upper management. These assumptions seem to correlate well with the four identified uses of PMs and to further investigate the relationship between the accounting and public administration and healthcare policy literature would be highly relevant to practice. Earlier studies have partly investigated this relationship, but only between accounting and public administration literature and not in the context of healthcare systems.[116] Since the type of use is influenced by the context, there is more future research to be done in this area.

[116] Chua & Degeling (1993); Covaleski & Dirsmith (1983); Chua (1995)

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9. Appendix

9.1 Detailed categorization of PMs research in healthcare

Research area		How	Challenges	Conclusion	Not covered
Design - *type of performance measures*	**Positive outcomes**	* Quantitative case studies that compare different performance management systems, *policy level* (Bevan and Hamblin 2009)	* Comparison without reputitional damange have no effect on waiting targets, but comparison with repeutitional damage instead have unintened effects (Bevan and Hamblin 2009)	* Government systems needs to be designed to "name-and-shame" those who performe poorly (Bevan and Hamblin 2009)	* Only look at the design of waiting targets (easliy measured intermediate endpoints), not clinical target (meaningful patient-centered outcomes) nor the dynamics of the system (Bevan and Hamblin 2009)
	Negative outcomes	* Literature reviw on the design faliures of PM and how to overcome these deadlocks on *policy level* (Pronovost and Lilford 2011)	* There is tension between the theoretical design and capabilities of PM (Pronovost and Lilford 2011)	* List of recommendations on how to advance the design of PM (Pronovost and Lilford 2011)	* How these tensions are effected by the dynamics of the healthcare system (Pronovost and Lilford 2011)
Implementation - *introduction of performance measures*	**Positive outcomes**	* Case study of the introduction of targets by identifying different motivations among users, *operational level* (Bevan and Hood 2006b; Guilfoyle 2012)	* Four types of motivation among producers/service providers identified and two of the types was conntected to gaming (Bevan and Hood 2006b) and reviewed by Guilfoyle (2012)	* List of recommendation on how to develope the governance of targets (Bevan and Hood 2006b), further developed by Guilfoyle (2012) and conntected to the *will-execution-constancy of purpose* framework (Reinsten 2007)	* Data set limited to waiting targets and do not look at the dynamics of the system (Bevan and Hood, 2006b; Guilfoyle 2012)
	Negative outcomes	* Case study of the introduction of performance measures at *policy level* (Bird et al. 2005; Saver et al. 2015)	* If PM is done badly, it can be very costly, ineffective and harmful (Bird et al. 2005) * Limited evidence that PM leads to improved health outcomes, despite this they are increasingly implemented in healthcare (Saver et al. 2015)	* List of recommendation on how to design and implement PM to avoid bad outcomes (Bird et al. 2005) * Set of core PM implementation principles for a greater validity and utility (Saver et al. 2015)	* Only at policy level (Bird et al. 2005; Saver et al. 2015)
Use - *use of performance measures*	**Positive outcomes**	* Quantitative analysis of the differences in hospital quality performance associated with hospital board practices, *strategic level* (Jiang et al. 2008a; Jiang et al. 2008b) or associalted with hospital leadership engagement, *operational level* (Vaughn et al. 2006)	* Hospital boards/leadersa are actively engaged in PM initiatives, but in a manner that can be enhanced (Jiang et al. 2008a; Jiang et al. 2008b; Vaughn et al. 2006)	* Hospital boards are activey engaged in PM and a list of recommendations on how to further enhance board practices in quality is given (Jiang et al. 2008a; Jiang et al. 2008b) or enhance hospital leadership engagement (Vaughn et al. 2006)	* Looks only at the engagement of the strategic/operational level on clinical quality, but not the dynamics of the system (Jiang et al. 2008a; Jiang et al. 2008b; Vaughn et al.)
	Negative outcomes	* Quantitative analysis of the engagement of hospital boards in quality and hospital performance, i.e. outcome of PM, *strategic level* (Joshi and Hines 2003; Jha and Epstein 2010) * Literature review on the use and misuse of PM (Lilford et al. 2004)	* The level of knowledge of outcome in PM among hospital boards were low and the association between hospital performance and board engagement in quality was weak (Joshi and Hines 2003), while others found a large difference between high and low perfoming hospitals (Jha and Epstein 2010) * The external use of PM can lead to institutial stigma and unintended effects (Lilford et al. 2004)	* List of recommendations on how to enhance board engagement in quality and PM, thus the overall hospital performance (Joshi and Hines 2003) * Large opportunities exists to shift the knowledge, practices and training of hospital boards in clinical quality (Jha and Epstein 2010) * Comparative outcome data should not be used by external agents and instead focus on direct PM on operational level (Lilford et al. 2004)	* Looks only at the engagement of the strategic level on clinical quality, but not the dynamics of the system (Joshi and Hines 2003; Jha and Epstein 2010)
Assessment and impact - *impact of performance measures*	**Positive outcomes**	* Case studies on hospital/social care performance scores at *operational level* (Bevan and Hood 2006a; Freeman et al. 2010; Winters-Van Der Meer et al. 2013) *or policy level* (Harrison and Appleby 2009; Clarkson et al. 2009; Propper et al. 2010)	* Evidence of gaming (Bevan and Hood 2006a; Harrison and Appleby 2009) *Hard to assess the impact of performance measures (Harrison and Appleby 2009; Bevan and Hood 2006a; Clarkson et al. 2009) * The problem of 'hidden waits' (Harrison and Appleby 2009)	* The star rating system have imporved reported performance key targets, but system has to be put in place to minimise gaming and unwanted effects (Bevan and Hood 2006a; Clarkson et al. 2009) * PM have a positive effect on patient care (Freeman et al. 2010; Winters-Van Der Meer et al. 2013),reduced admissions and waiting time (Propper et al. 2010; Harrison and Appleby 2009)	* The effect on services excluded from star ratings is unclear (Bevan and Hood 2006a) * Only look at medical outcomes, not the dynamics of the system (Clarkson et al. 2009; Bevan and Hood 2006a; Freeman et al. 2010; Harrison and Appleby 2009; Propper et al. 2010; Winters-Van Der Meer et al. 2013)
	Negative outcomes	* Quantitative case studies on hospital performance scores, *operational level* (Anema et al. 2013; Conway et al. 2015) *Quantiative assessment on the methods of specific PM, *strategic and operational level* (Shahian et al. 2010)	* Definition ambiguity on performance indicators (Anema et al. 2013) and variability in the PM (Shahian et al. 2010) *Significant unintended changes in other waiting targets, i.e. 'hidden waits' (Conway et al. 2015)	* To standardize the PM and the methods for calculating PM (Anema et al. 2013; Shahian et al. 2010) * The unintended changes in other waiting targets should be bore in mind when planning for new healthcare reforms (Conway et al. 2015)	* Only one level and do not look at the dynamics of the system (Anema et al. 2013; Conway et al. 2015) or two levels, but do not analyze their relations (Shahian et al. 2010)

9.2 Performance measure list

Stroke

-Slutat röka 3 månader efter insjuknandet av stroke *(Stopped smoking for 3 months after the onset of stroke)*

-Reperfusionsbehandling vid stroke *(Reperfusion therapy for stroke)*

-Mediantid till trombolysbehandling *(Median time to thrombolysis)*

-Test av sväljförmåga vid akut stroke *(Testing of swallowing function in acute stroke)*

-Antikoagulantia vid förmaksflimmer efter stroke, 55-79 år *(Anticoagulants in atrial fibrillation for stroke, 55-79 years)*

-Blodfettssänkande behandling efter stroke *(Lipid lowering therapy after stroke)*

-Blodtryckssänkande behandling efter stroke *(Antihypertensive therapy after stroke)*

-Funktionsförmåga efter stroke *(Functional ability after stroke)*

-Tillgodosedda behov av rehabilitering efter stroke - efter 1 år *(Catered need of rehabilitation after stroke - after 1 year)*

-Antikoagulantia vid förmaksflimmer och riskfaktor för stroke *(Anticoagulants in atrial fibrillation and risk factors for stroke)*

Heart

-Dödlighet efter sjukhusvårdad hjärtinfarkt *(The mortality for hospitalized heart attack)*

-Ny infarkt eller död i ischemisk hjärtsjukdom *(New infarction , or death from ischemic heart disease)*

-Reperfusionsbehandling vid ST-höjningsinfarkt *(Reperfusion therapy for ST - segment elevation myocardial infarction)*

-Kranskärlsröntgen vid icke ST-höjningsinfarkt och riskfaktor *(Coronary angiography in non- ST - elevation myocardial infarction and risk factors)*

-Blodproppshämmande behandling vid icke ST-höjningsinfarkt *(Antiplatelet therapy in non-ST - elevation myocardial infarction)*

-RAAS-hämmande behandling efter hjärtinfarkt *(RAAS inhibitor treatment after heart attack)*

-Återförträngning av hjärtats kärl efter PCI (*Restenosis of coronary arteries after PCI)*

-Blodfettssänkande behandling efter hjärtinfarkt *(Lipid lowering therapy after heart attack)*

-Måluppfyllelse för LDL-kolesterol *(Goal attainment of LDL cholesterol)*

-Måluppfyllelse för blodtryck *(Goal attainment for blood pressure)*

-Basbehandling vid hjärtsvikt (inom 6 månader) *(Base treatment of heart failure (within 6 months))*

-Antikoagulantia vid förmaksflimmer och riskfaktor för stroke *(Anticoagulants in atrial fibrillation and risk factors for stroke)*

-Läkemedelsbehandling 12-18 månader efter sjukhusvårdad hjärtsvikt *(Drug therapy 12-18 months hospitalized heart failure)*

-Antikoagulantia vid förmaksflimmer och riskfaktor för stroke (Anticoagulants in atrial fibrillation and risk factors for stroke)
-Basbehandling vid hjärtsvikt (inom 5 år) *(Base treatment of heart failure (within 5 years))*
-Slutenvård vid hjärtsvikt *(Inpatient care in heart failure)*

Diabetes (Only pre-study)
-Blodsockervärde, Diabetes i Primärvård *(Blood sugar, Diabetes in Primary Care)*
-Blodtryckskontroll vid typ 2 diabetes *(Blood Pressure Control in Type 2 Diabetes)*
-LDL-kolesterol vid typ 2 diabetes *(LDL cholesterol in type 2 diabetes)*
-Fotundersökning vid diabetes diabetes i primärvård *(Foot Exam in diabetes diabetes in primary care)*
-Ögonbottenundersökning vid diabetes i primärvård *(Fundus examination of diabetes in primary care)*
-Blodsockervärde vid typ 1-diabetes *(Blood sugar values in type 1 diabetes)*
-Blodtryckskontroll vid typ 1 diabetes *(Blood pressure control in type 1 diabetes)*
-Fotundersökning vid typ 1 diabetes *(Foot Exam in type 1 diabetes)*
-Ögonbottenundersökning vid typ 1 diabetes *(Fundus examination in type 1 diabetes)*
-Blodsockervärde hos barn och unga vid typ 1 diabetes *(Blood glucose values in children and young people with type 1 diabetes)*
-Ögonbottenundersökning för barn och unga vid typ 1-diabetes *(Fundus examination of children and young people with type 1 diabetes)*
-Slutenvård vid diabetes *(Inpatient diabetes)*
-Dödlighet i hjärt-kärlsjukdom vid diabetes *(Mortality from cardiovascular disease in diabetes)*

9.3 Pre-study data and calculations

Performance measure	Total number of county councils	Number of county councils above average	Number of county councils below average	Number of county councils having negative development	Number of county councils above average and having negative development	Number of county councils below average and having negative development	Proportion of county councils over average who have positive development	Proportion of county councils under average who have negative development	Proportion of the ones that have negative development who were above average	Proportin above average
Dödlighet efter sjukhusvårda	21	9	12	14	8	6	89%	50%	57%	43%
Ny infarkt eller död i ischem	21	9	12	18	8	10	89%	83%	44%	43%
Reperfusionsbehandling vid	21	12	9	8	5	3	42%	33%	63%	57%
Kranskärlsrönten vid icke S	21	10	11	8	5	3	50%	27%	63%	48%
Blodproppshämmande behar	21	12	9	6	6	0	50%	0%	100%	57%
RAAS-hämmande behandlir	21	10	11	12	8	4	80%	36%	67%	48%
Återförträngning av hjärtats	21	11	10	4	4	0	36%	0%	100%	52%
Blodfettssänkande behandlin	21	13	8	5	5	0	38%	0%	100%	62%
Måluppfyllelse för LDL-kole	21	8	13	0	0	0	0%	0%		38%
Måluppfyllelse för blodtryck	21	9	12	8	6	2	67%	17%	75%	43%
Basbehandling vid hjärtsvikt	21	15	6	1	1	0	7%	0%	100%	71%
Antikoagulantia vid förmaks	21	11	10	0	0	0	0%	0%		52%
Läkemedelsbehandling 12-1	21	13	8	6	5	1	38%	13%	83%	62%
Antikoagulantia vid förmaks	21	11	10	0	0	0	0%	0%		52%
Basbehandling vid hjärtsvikt	21	15	6	0	0	0	0%	0%		71%
Slutenvård vid hjärtsvikt	21	10	11	17	9	8	90%	73%	53%	48%
Slutat röka 3 månader efter	21	10	11	14	10	4	100%	36%	71%	48%
Reperfusionsbehandling vid	21	9	12	5	4	1	44%	8%	80%	43%
Mediantid till trombolysbehar	21	10	11	3	3	0	30%	0%	100%	48%
Test av sväljförmåga vid aku	21	14	7	13	10	3	71%	43%	77%	67%
Antikoagulantia vid förmaks	21	11	10	1	1	0	9%	0%	100%	52%
Blodfettssänkande behandlin	21	12	9	4	3	1	25%	11%	75%	57%
Blodtryckssänkande behandl	21	16	5	14	12	2	75%	40%	86%	76%
Funktionsförmåga efter strol	21	9	12	11	8	3	89%	25%	73%	43%
Fullt tillgodosett behov av st	21	11	10	10	6	4	55%	40%	60%	52%
Tillgodosedda behov av reha	21	9	12	10	6	4	67%	33%	60%	43%
Antikoagulantia vid förmaks	21	11	10	0	0	0	0%	0%		52%
Blodsockervärde, Diabetes i	21	5	16	5	2	3	40%	19%	40%	24%
Blodtryckskontroll vid typ 2	21	8	13	5	3	2	38%	15%	60%	38%
LDL-kolesterol vid typ 2 dia	21	11	10	1	1	0	9%	0%	100%	52%
Fotundersökning vid diabetes	21	11	10	9	5	4	45%	40%	56%	52%
Ögonbottenundersökning vid	21	12	9	14	7	7	58%	78%	50%	57%
Blodsockervärde vid typ 1-d	21	6	15	2	2	0	33%	0%	100%	29%
Blodtryckskontroll vid typ 1	21	9	12	12	5	7	56%	58%	42%	43%
Fotundersökning vid typ 1 di	21	12	9	5	4	1	33%	11%	80%	57%
Ögonbottenundersökning vid	21	15	6	12	10	2	67%	33%	83%	71%
Blodsockervärde hos barn o	21	11	10	4	2	2	18%	20%	50%	52%
Ögonbottenundersökning för	21	14	7	15	11	4	79%	57%	73%	67%
				Average			Average	Average	Average	Average
				7,263157895			45%	24%	73%	52%
				34,6%						

Performance measures	Total number of county councils	Number of county councils above average	Number of county councils below average	Total change for the county councils above average	Total change for the county councils below average	Change per county council above average	Change per county council below average	Negative development for county councils above average at the same time as positive development for county councils below average
Dödlighet efter sjuk	21	9	12	-11,5	-3	-1,28	-0,25	
Ny infarkt eller död	21	9	12	-19,2	-12,4	-2,13	-1,03	
Reperfusionsbehan	21	12	9	5,5	19,3	0,46	2,14	
Kranskärlsrönten v	21	10	11	-9,6	10,8	-0,96	0,98	x
Blodproppshämmar	21	12	9	-6,5	15,6	-0,54	1,73	x
RAAS-hämmande	21	10	11	-15,5	4,4	-1,55	0,40	x
Återförträngning av	21	11	10	3,01	13,67	0,27	1,37	
Blodfettssänkande	21	13	8	-2,5	17,6	-0,19	2,20	x
Måluppfyllelse för l	21	8	13	105,7	228,9	13,21	17,61	
Måluppfyllelse för l	21	9	12	-8,4	64,5	-0,93	5,38	x
Basbehandling vid l	21	15	6	9,5	6,4	0,63	1,07	
Antikoagulantia vid	21	11	10	159,3	171,7	14,48	17,17	
Läkemedelsbehand	21	13	8	6,1	23,5	0,47	2,94	
Antikoagulantia vid	21	11	10	159,3	171,7	14,48	17,17	
Basbehandling vid l	21	15	6	9,5	6,4	0,63	1,07	
Slutenvård vid hjärt	21	10	11	-341	-89	-34,10	-8,09	
Slutat röka 3 månad	21	10	11	-118,9	-11,2	-11,89	-1,02	
Reperfusionsbehan	21	9	12	-3	20	-0,33	1,67	x
Mediantid till tromb	21	10	11	13	66	1,30	6,00	
Test av sväljförmåg	21	14	7	-41	8	-2,93	1,14	x
Antikoagulantia vid	21	11	10	70,2	117,9	6,38	11,79	
Blodfettssänkande	21	12	9	18,1	31,7	1,51	3,52	
Blodtryckssänkand	21	16	5	-19,1	0,6	-1,19	0,12	x
Funktionsförmåga e	21	9	12	-10,9	14,4	-1,21	1,20	x
Fullt tillgodosett bel	21	11	10	-17,9	9,8	-1,63	0,98	x
Tillgodosedda beho	21	9	12	-10,4	33,4	-1,16	2,78	x
Antikoagulantia vid	21	11	10	159,3	171,7	14,48	17,17	
Blodsockervärde, L	21	5	16	1,7	16,9	0,34	1,06	
Blodtryckskontroll v	21	8	13	2,3	14	0,29	1,08	
LDL-kolesterol vid	21	11	10	37,5	59,1	3,41	5,91	
Fotundersökning vi	21	11	10	-4,5	-8,7	-0,41	-0,87	
Ögonbottenundersö	21	12	9	-6,3	3,9	-0,52	0,43	x
Blodsockervärde vi	21	6	15	4,6	33,2	0,77	2,21	
Blodtryckskontroll v	21	9	12	-14,8	-12,9	-1,64	-1,08	
Fotundersökning vi	21	12	9	-1,5	13,2	-0,13	1,47	x
Ögonbottenundersö	21	15	6	-15,9	2	-1,06	0,33	x
Blodsockervärde h	21	11	10	51,3	51,6	4,66	5,16	
Ögonbottenundersö	21	14	7	-42,2	4	-3,01	0,57	x
						Average	Average	Total
						0,24	3,25	15