Promises and pitfalls of value-based reimbursement in healthcare

A mixed method health economic approach

Thérèse Eriksson

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To my family.

The fate of our times is characterized by rationalization and intellectualism and, above all, by the “disenchantment of the world”.

– Max Weber, (2009)

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ABSTRACT

Financial incentives can be an effective tool to influence behaviour in almost any context and healthcare is no exception. The healthcare market is, however complex, characterised by uncertainty, information asymmetry and multiple agency connections. The reach and limits of financial incentives in healthcare has been widely debated for decades. Some argue that financial incentives increase efficient use of scarce resources, while others voice that it provides a hotbed for unintended and unethical behaviour. A well-functioning value-based reimbursement programme (VBRP) should facilitate alignment between financial incentives and professional values to secure both efficient and equitable healthcare. This thesis explores the promises and pitfalls of value-based reimbursement in the context of a value-based reimbursement programme within elective spine surgery in Region Stockholm, Sweden.

By using mixed methods, this thesis explores what incentives arise from introducing a value-based reimbursement programme and how these incentives affect the provision of healthcare services. This thesis consists of four papers. Paper I examines the performance of healthcare providers (spine surgery clinics) on patient-reported outcome measures after the introduction of a value-based reimbursement programme and whether it has any effect on case mix regarding clinical and socio-economic factors. Paper II examines how a value-based reimbursement programme affects the cost of elective spine surgery to a third party payer/regional authority. Paper III explores how the intended incentives of the reimbursement programme was perceived by healthcare providers. In Paper IV, institutional logics within healthcare-providing organisations are identified and how their centrality and compatibility affect the institutionalisation of a value-based reimbursement programme in Region Stockholm.

The results show that the VBRP had no effect on patient-reported outcome measures but decreased the mean cost per surgery. Thus, elective spine surgery in Region Stockholm may be considered more effective after the introduction of the VBRP. The removal of a production ceiling allowed healthcare providers to surgically treat more patients than was previously possible. The volume increased by 22 per cent, and the total cost increased by 11 percent. No indications of discrimination against sicker patients were

found. A higher value was generated in elective spine surgery after the introduction of the VBRP. The idea of a VBRP was aligned with professional values. However, not all incentives were perceived as intended. The focus on minimising costs of post-discharge care was perceived to have a negative impact on quality aspects of physiotherapy and nursing.

Taken together, a well-designed VBRP has the potential to promote a holistic healthcare perspective through 1) the level to which healthcare providers are held accountable for healthcare provision that increase the willingness to collaborate across healthcare providers and medical disciplines, 2) a better overall picture of patients healthcare utilisation and 3) challenging the traditional structures and ideas within healthcare that quality foremost depends on the performance of physicians. However, there are also challenges that needs to be addressed, 1) functioning routines for communication and follow-up between healthcare providers and the regional health authority, 2) to get different professions within a traditional hierarchical organisation to cooperate on equal terms, and 3) to create IT systems that create transparency and an understanding of the reimbursement programme. Continuous communication between healthcare providers and the regional health authority is therefore crucial to make the incentives of the reimbursement programme meaningful.

SVENSK SAMMANFATTNING

Finansiella incitament kan vara ett effektivt verktyg för att påverka beteende i nästan alla sammanhang, hälso- och sjukvården är inget undantag. Sjukvårdsmarknaden är dock komplex, präglad av osäkerhet, informationsasymmetri samt många aktörer som kan ha olika motiv. Användningen av finansiella incitament inom hälso- och sjukvården har diskuterats flitigt i decennier. Vissa hävdar att användningen av finansiella incitament leder till en bättre användning av knappa resurser, medan andra hävdar att det leder till oavsiktliga och oetiska resultat. Ett värdebaserat ersättningssystem kan eventuellt få finansiella incitament och professionella värderingar att dra åt samma håll. Region Stockholm introducerade ett värdebaserat ersättningssystem inom elektiv ryggkirurgi 2013.

I avhandlingen utforskas möjligheterna och utmaningarna med ett värdebaserat ersättningssystem, både utifrån ersättningssystemets design och utifrån den kontext som det implementeras i, genom att kombinera kvantitativa och kvalitativa metoder. Avhandlingen består av fyra artiklar. I den första artikeln jämförs patientrapporterade utfallsmått och patient-sammansättning, före och efter införandet av det värdebaserade ersättningssystemet. I den andra artikeln jämförs hur mycket beställaren (Region Stockholm) betalar för elektiv ryggkirurgi före och efter införandet av det värdebaserade ersättningssystemet. I den tredje artikeln undersöks hur det värdebaserade ersättningssystemet mottogs av de ryggkirurgiska klinikerna samt hur de anpassade sig till de nya förutsättningarna. I den fjärde och sista artikeln undersöks om ersättningssystemet upplevdes olika beroende på profession samt om relationen mellan dessa professioner påverkade hur vårdgivarna anpassade sig till det värdebaserade ersättningssystemet.

Resultatet visar att införandet av ett värdebaserat ersättningssystem inte hade någon effekt på patientrapporterade utfallsmått, däremot minskade genomsnittskostnaden vilket indikerar en effektivare elektiv ryggkirurgi i Region Stockholm. Inga tecken på diskriminering av sjukare patienter identifierades. Antalet opererade patienter ökade, likaså den totala kostnaden för elektiv ryggkirurgi, däremot genererade varje spenderad krona en större effekt efter införandet av ersättningssystemet. Själva idén med ett värdebaserat ersättningssystem gick i linje med professionella värderingar. Däremot framkom det att alla incitament inte uppfattades som det

var tänkt och att uppfattningen varierade mellan olika professioner. Fokus på att minimera kostnader efter utskrivning upplevdes påverka kvalitetsaspekter inom fysioterapi och omvårdnad negativt.

Sammantaget pekar studierna på att ett värdebaserat ersättningssystem möjliggör ett holistiskt perspektiv inom hälso- och sjukvården genom att 1) vårdgivarnas kostnadsansvar ökar viljan att samarbeta med andra vårdgivare, 2) vårdgivare får en bättre helhetsbild och kan ta bättre ansvar för patienters vårdutnyttjande och 3) traditionella strukturer och idéer inom hälso- och sjukvården att kvalitet främst beror på läkarnas prestation utmanas. Samtidigt finns det stora utmaningarna som följer med ett värdebaserat ersättningssystem, så som 1) skapandet av fungerande rutiner för kommunikation och uppföljning mellan beställare och utförare, 2) att få olika professioner inom en traditionellt hierarkisk organisation att samarbeta på lika villkor, samt 3) att skapa anpassade IT-system som skapar insyn och förståelse för ersättningssystemets mekanismer. Kontinuerlig kommunikation mellan beställare och vårdgivare är därför avgörande för att göra ersättningssystemets incitament meningsfulla, det finns ingen magisk lösning.

LIST OF PAPERS

- I. Thérèse Eriksson, Hans Tropp, Ann-Britt Wiréhn, Lars-Åke Levin. (2020). A pain-relieving reimbursement program? Effects of a value-based reimbursement program on patient-reported outcome measures. *BMC Health Serv Res*, 20(1), 805.
- II. Thérèse Eriksson, Hans Tropp, Ann-Britt Wiréhn, Lars-Åke Levin. A cost-reducing reimbursement programme? Effects of value-based reimbursement on healthcare costs. Submitted.
- III. Thérèse Eriksson, Lars-Åke Levin, Ann-Charlotte Nedlund. The introduction of a value-based reimbursement programme: alignment and resistance among healthcare providers. Submitted.
- IV. Thérèse Eriksson, Lars-Åke Levin, Ann-Charlotte Nedlund. (2021). Centrality and compatibility of institutional logics when introducing value-based reimbursement. *J Health Organ Manag*, 35(9), 298-314.

ABBREVIATIONS

CEA	Cost-effectiveness analysis
CCI	Charlson Comorbidity Index
DRG	Diagnosis-related group
EQ-5D-3L	EuroQol-5 Dimension 3 Level Questionnaire
GA	Global assessment
HRQoL	Health-related quality of life
ICER	Incremental cost-effectiveness ratio
IT	Information technology
NKS	Nya Karolinska Sjukhuset (New Karolinska hospital)
NPM	New public management
ODI	Oswestry Disability Index
OR	Odds ratio
PRO	Patient-reported outcome
PROM	Patient-reported outcome measure
P4P	Pay-for-performance
QALY	Quality-adjusted life year
QoL	Quality of life
SCC	Stockholm County Council
SD	Standard deviation
SEK	Swedish currency (Swedish crowns)
STHLM-VBRP	Stockholm value-based reimbursement programme
VBHC	Value-based health care
VBRP	Value-based reimbursement programme

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INTRODUCTION

I was at this birthday dinner once where I was asked what my thesis was about. I answered that I explored the effects of a value-based reimbursement programme in healthcare. As many times before, when I have mentioned *value-based*, the person that asked the question related it to value-based healthcare (VBHC) and the construction of New Karolinska Hospital (NKS, Nya Karolinska Sjukhuset).¹ The person opposite to me asked me to clarify my definition of VBHC. Happy that the question started in how VBHC can be understood, and not in what happens at the NKS, I started to explain my point of view. But I had only said a few words when the man, sitting to my left, interrupted and explained in an authoritative voice, that: it is all about putting costs in relation to effects, which means that it is not worth treating the elderly, that is what value-based healthcare is about, but no one dares to say it. Just as he finished his sentence, the toastmaster announced the last speaker for the evening and I had no opportunity to tell them my understanding of VBHC, which would not have been the same as that of the man to my left.

In 2006, Michael Porter and Elizabeth Teisberg published the book *Redefining Health Care*. In this book they described the concept of value-based healthcare (VBHC) that came to be diffused especially by the Boston Consulting Group and the International Consortium for Health Outcomes Measurement on an international level. In Sweden, it was diffused by the national collaboration for value-based reimbursement and monitoring of healthcare in Sweden (SVEUS), which was coordinated by Ivbar, a research and development company. In 2013, Region Stockholm introduced a value-based reimbursement programme (VBRP) in elective spine surgery that had been developed by Ivbar in collaboration with Region Stockholm and the Swedish Society of Spinal Surgeons.

The Stockholm value-based reimbursement programme (STHLM-VBRP) is unique because of the combination of bundled payment and performance-based payment. The bundled payment extends the financial responsibility of healthcare provider to one year, and the performance-based payment is based on how much pain the patient experience one year after surgery. It is the introduction of the Stockholm value-based reimbursement programme (STHLM-VBRP) this thesis is based upon.

¹ NKS is one of the largest hospitals in Sweden with 15 200 employees, 1.35 million patient visits per year and 1 100 hospital beds Karolinska Universitetssjukhuset. (2021, 2021-10-01). *Om Karolinska*. Retrieved 2021-10-19 from <https://www.karolinska.se/om-oss/om/>.

In a Swedish context it is almost impossible to talk about value-based reimbursement without questions regarding NKS. Value-based healthcare went from being the hottest latest management trend to a word that could not be mentioned in a Swedish context. Even I refrained for a while from using value-based reimbursement, instead I chose to go with the phrase *bundled payment in combination with performance-based payment*. However, I will not elaborate further on what happened at NKS, since it does not concern VBRP *per se*. In my thesis, focus will be on how financial incentives, in a value-based reimbursement programme, affect the provision of healthcare and how healthcare providers perceive and respond to these incentives.

Aim

The general aim of this thesis is to explore and analyse the promises and pitfalls of a value-based reimbursement programme within healthcare. I will explore and analyse what incentives that arise from introducing a value-based reimbursement in healthcare and how these incentives affect healthcare providers and the provision of healthcare. More specifically, the following research questions will be answered:

- How did the performance of healthcare providers change after the introduction of a value-based reimbursement programme? (Paper I)
- How did the cost to the third party payer/purchasing organisation change after the introduction of a value-based reimbursement programme? (Paper II)
- How did healthcare providers adapt their practices to or resisted the value-based reimbursement programme? (Paper III)
- How did the perception of the value-based reimbursement programme vary between different professional groups among the healthcare providers? How did the relation between these professional groups affect the adaption to the value-based reimbursement programme? (Paper IV)

Outline of thesis

In the background section the reader is introduced to topics, definitions and theories that are central to my thesis, but also aspects that are important in order to understand the context in which VBRP was introduced. In the method section I will discuss the methodological assumptions that the choice of the methods is based upon, and describe the methods used in the thesis. In the results section I will present and discuss the findings from

the included papers. In the discussion I will discuss the promises and pitfalls of VBRP based on the contribution of the papers, and how this thesis contributes to the research field of health economics and my thoughts regarding future research. In the last section I will conclude the main findings of the thesis.

BACKGROUND

In 2013, Stockholm county council (SCC, today Region Stockholm²) introduced a value-based reimbursement programme (VBRP) within elective spine surgery. It was also decided by SCC that private healthcare providers within elective spine surgery would be accredited through LOV instead of LOU³ (LOV and LOU are described more in depth on page 15). Thus, the introduction of the VBRP also implicated free establishment for healthcare providers that fulfil certain criteria and the freedom of patients to choose healthcare provider. The VBRP is based on ideas from value-based healthcare (VBHC) that strives for holistic healthcare through integrated care chains with the patient in focus to create a value-generating organization (Porter, 2008). In 2014, the Centre for Medical Technology Assessment (CMT) at Linköping University was commissioned by Region Stockholm to evaluate the introduction of the VBRP. The evaluation was published in a report in 2018 (Eriksson & Levin, 2018).

In order to understand why a policy reform is successful or not, it is important to be aware about the context into which the reform is implemented. The Swedish healthcare market is characterised by strong autonomy of regional health authorities with a strong medical profession, but is also strongly influenced by politicians.

Healthcare organisation and management

The healthcare market is characterised by uncertainty and information asymmetry (Arrow, 1963). This is in great contrast to the typical market that we usually talk about in economics where buyers and sellers have access to perfect information about quality and price, without any barriers to entry into the market. In a perfect market, demand and supply determine quantity and price. Due to the nature of the goods traded on the healthcare market it is difficult for potential patients to assess the expected value of a treatment and the willingness to pay would most probably be highly correlated to the severity of their condition and the chances of a successful treatment. Hence, the so called “invisible hand” is not functioning in the

² The 1st of January 2020, the term county council was abolished and replaced by region. After this paragraph, I will refer to Stockholm county council (SCC) as Region Stockholm, also before 2020.

³ Since the reimbursement was introduced at the same time as LOV it is difficult to distinguish the effects caused by the change in reimbursement from the effects caused by the change of accreditation. The free choice of patients and free establishment of healthcare providers is essential, therefore LOV is necessary for a value-based reimbursement. Thus, when referring to the value-based reimbursement programme, it includes both the reimbursement and the accreditation through LOV.

healthcare market. One solution to this problem is public involvement through governmental or regional authorities. Another reason for public involvement is equity. Since the actual service is provided from the physician to the patient, the governmental or regional authority becomes the third party in the transaction.

In accordance to principal agent theory, healthcare providers serve as agents to both the patient and the funding authority (e.g. regional or national health authority or an insurance company) and can therefore be characterised as double agents (Blomqvist, 1991). In short, following challenges arise as an effect of agency:

... an agent may deliberately break his contract for his own gain at the expense of a principal, engaging in what is loosely termed “moral hazard”. Even where there is no explicit formal agreement, implicit understandings may be violated. Allegations that physicians overprovide (or underprovide) services to patients are familiar example. (Dranove & White, 1987)

Another aspect is that patients may deviate from what healthcare providers consider as an optimal behaviour to enhance health. Thus, the healthcare market contains multiple agency connections that need to be taken into account when managing care. In Swedish healthcare, there are three principals in addition to patients; the state, the regions and the municipalities. The responsibility of regions and municipalities to ensure that everyone in Sweden has access to good healthcare is stated in The Health and Medical Services Act of 1982. There are 21 regional authorities (regions, previously county councils) that are responsible for the provision and financing of healthcare, mainly through tax revenues. Since the regions are responsible both for the provision and the funding of healthcare, they can be considered as both commissioning and purchasing organisations. As a commissioner, the region decides under what conditions healthcare organisations (hereafter called healthcare providers) may provide care in the region. As a purchaser, the region pays for the healthcare consumed by the inhabitants within the region.

Regardless of whether the healthcare providers are publicly or privately owned, different strategies have been deployed through history, to make sure that healthcare providers act in line with the objective of the regional health authority – the principal. To understand why incentives do not always have the desired effect, it is important to understand the context in which the incentives are used. Thus, the historical development plays an important role in understanding the context. Some reforms that have been introduced in Swedish healthcare is shortly described below. For those who

are interested to read more there are several sources in both Swedish⁴ and English⁵. The following section will highlight some of the structural changes in Swedish healthcare.

A short description of reforms in the Swedish healthcare system

Swedish healthcare has undergone many structural changes over the years. The first government intervention in the management of healthcare appeared at the beginning of the 16th century (Garpenby, 1992). In the beginning of the 19th century, the Swedish healthcare system was fragmented and the hospital was considered to be a place to avoid. However, innovations in the late 1800s, such as anaesthesia and aseptic techniques, fundamentally transformed the hospitals. The transformation of the hospital led to an increased demand for healthcare, and by the early 1900s the earlier stigma associated with hospitals started to fade (Cutler, 2002). The present structure of the Swedish healthcare system has its roots in the establishment of the county councils (today regions) in 1862 (Karlberg, 2011). The hospitals had been owned by the government, but when the county councils had been established was the ownership transferred from the national government to the county councils. The legal responsibility for providing inpatient hospital care to the residents was, however, not transferred until the passing of the Hospital Act of 1928 (Anell et al., 2012).

With inspiration from the Beveridge Report, the transformation of the Swedish healthcare system started in the middle of the 1940s with a considerable expansion of Swedish healthcare, similar to other western developed countries. Regional authorities only covered the costs for inpatient services; outpatient care was paid for directly by patients according to a fee-for-service scheme (Anell et al., 2012). Patients had to pay the entire cost of consultations out-of-pocket, and were then reimbursed by the national health insurance. It was also common that physicians were employed by the hospital and were able to use facilities at the public hospitals for their private outpatient practice. In 1970, was the responsibility for outpatient care also put on the regional authorities and hospital doctors became full-time salaried employees (Garpenby, 1992). This was called the Seven Crowns reform because patients only had to pay a fixed co-payment for outpatient services that amounted to 7 SEK (corresponding to €0.77⁶). This

⁴ E.g. Karlberg, I. (2011). *Från Vasa till vårdval : om ansvar och styrning av svensk hälso- och sjukvård*

⁵ E.g. Anell, A., Glenngård, A. H., & Merkur, S. (2012). Sweden health system review. *Health Syst Transit*, 14(5), 1-159. , Cutler, D. M. (2002). Equality, efficiency, and market fundamentals: the dynamics of international medical-care reform. *Journal of economic literature*, 40(3), 881-906.

⁶ Approximately €6 in 2020 years price level converted with Consumer Price Index 1949=100 Statistics Sweden. (2021a).

paved the way for a more equitable distribution of outpatient service but generated side effects such as a lower productivity, continuity and to some degree quality (Karlberg, 2011). The responsibility for payments to private practitioners was transferred from the government to the regional authorities in 1985.

There was a strong belief that services could be improved under public ownership and values such as equity was strong. However, at the end of the 1980s, the strong belief in the regional authorities' ability to provide care faded and critical voices started to grow and the regional authorities were criticised for a lack of cost control and poor efficiency (Anell et al., 2012). The lack of choice for inhabitants was also debated and in the beginning of the 1990s, all the major political parties in Sweden agreed that citizens should have more freedom of choice between healthcare providers (Garpenby, 1992). The possibility for patients to choose their provider increased in Sweden from the early 1990s (Glenngård et al., 2005). The focus on distributive justice in the governance of healthcare was now accompanied by objectives related to cost control, efficiency, value and quality (Anell 2012). This paved the way for a number of new public management (NPM) reforms in the late 1980s and early 1990s, such as implementation of a purchaser–provider split and payment based on diagnosis-related groups (DRGs) (Anell et al., 2012). NPM can be seen as an umbrella term referring to management concepts adapted from the private sector. Concepts such as Lean (Liker & Morgan, 2006), Six Sigma (Raisinghani et al., 2005) and balanced scorecard (Kaplan & Norton, 1992) have also been adopted into healthcare settings.

Accreditation of private healthcare providers and the freedom of choice

For private healthcare providers to receive public funding today, they must be accredited by establishing a commissioning contract with the regional authority in which they wish to deliver care. The regional authority decides whether this is done through the Public Procurement Act (SFS 2016:1145) (LOU) or through the Freedom of Choice Act (SFS 2008:962) (LOV). Under the LOU, healthcare providers are permitted a certain volume each year to a negotiated price, specific to each healthcare provider. Whereas LOV is a continuous contract that usually has no restriction on volume but with a set price, making providers compete based on quality and ultimately the patients' choice, a requirement for value-based healthcare (Porter, 2008). An important difference between LOU and LOV is that healthcare providers are not guaranteed a renewed contract in the next procurement process under LOU. This creates uncertainty for healthcare providers because they

may lose the right to provide care in the procurement process. The procurement process under LOU has been criticised to decrease quality in healthcare but also to increase costs (Swedish Association of Local Authorities and Regions [SALAR], 2013).

In 2009, the Swedish Parliament decided that accreditation of private healthcare providers in primary care must be done through LOV. To rely on market forces, through patients' free choice and the free establishment of healthcare providers, to solve the problems in primary care was criticised because of the risk that it would increase the gap between social groups even further, regarding access and utilization of healthcare services (Burström, 2009). Since LOV became mandatory in primary care, the healthcare utilization has increased, indicating a better access (Rehnberg & Vårdanalys, 2014). However, primary care still struggles with lack of continuity and coordination, especially for those with special or extensive needs (Rehnberg, 2014). Further, it is difficult to distinguish the effect of LOV from other contemporary changes (Janlöv et al., 2013; Wohlin et al., 2012). Approximately 60 per cent of the publicly financed primary care services are provided by private enterprises today (Wohlin et al., 2021).

In specialist care, however, it is still optional with accreditation of private healthcare providers through LOV. Thus, regional health authorities (such as Region Stockholm) can choose whether healthcare providers within a certain healthcare area should be accredited through LOV or LOU. Region Stockholm has applied LOV to 39 healthcare areas and thus the region with the most areas with LOV in Sweden (SALAR, 2020). This can be compared to the regions with the second most areas with LOV, Region Uppsala and Region Skåne, with 11 areas each (SALAR, 2020). There are many empirical studies from different healthcare setting that have investigated the effects of free establishment and free choice, however, the effects are mixed (Goddard, 2015). In Region Stockholm, free establishment and free choice in specialist care have shown both positive and unchanged effects on quality (Goude et al., 2021; Wohlin et al., 2021). However, there are also indications of shifts in case-mix that raise concerns whether private healthcare providers are “gaming the system” (Wohlin et al., 2021) but also threaten the equity in healthcare (Hanning et al., 2012). Thus, the effects of competition and free choice in a publicly funded healthcare system is still unclear.

It is important to take structural, organisational and contextual factors into account when implementing a reform to better understand why unforeseen side-effect may arise (Conrad et al., 2014; Kondo et al., 2016; Robert et al., 2009; Sligo et al., 2017). The involvement of healthcare professionals is one

important aspect for a successful implementation (Porter & Teisberg, 2007). The idea of involving the medical profession is, however, not a new idea:

Policymakers have realized that productivity in the health care system can only be achieved through co-operation with the doctors, and through the involvement of professional bodies. (Garpenby, 1992)

Healthcare professionals can contribute substantially to the evaluation and development of policy reforms, since professional insights can be used to predict possible effects of a policy reform on multiple stakeholders (Korlen et al., 2017).

Value-based healthcare

In 2006, Porter and Teisberg published their book “Redefining healthcare” in which they addressed the organisation of healthcare and their concept of value-based healthcare (VBHC) (Porter & Teisberg, 2006). In their book, Porter and Teisberg propose a reorganisation of healthcare that abandons the structure based on physician specialisation and instead implement a structure based on inter-professional teams to promote a holistic healthcare with integrated care chains that encompass all services or activities that jointly determine success (Porter 2010). Value is defined as “the health outcomes achieved that matter to patients relative to the cost of achieving those outcomes” (Porter & Lee, 2013). Thus, value is defined as the ratio between outcome and cost:

$$Value = \frac{Outcomes}{Cost}$$

A central part of VBHC, is to provide the right tools and incentives to follow up healthcare to enable improvement, similar to other management trends. In contrast to other management trends, however, Porter also withholds the importance of integrating care and emphasizing the perspective of full care episodes that are extended to include all care that matters for the outcome of importance (Porter 2010). VBHC is, however, no magical solution, it requires continuous follow-up and evaluation. Therefore, it is important that involved healthcare professionals understand the value of evaluation which in turn highlight the importance of choosing outcome measures that matters. Several challenges have been identified, such as 1) the outcomes must be standardised, yet be sensitive enough to capture the specific needs and goals of the specific patient, 2) it must be clear which outcome relates to which performance, 3) an understanding among involved healthcare professionals, but also patients, of how evaluating outcomes can facilitate quality-improvement (Elf et al., 2017). Due to the complexity of healthcare, and the many factors that may affect health outcomes, it is especially chal-

lenging to understand what outcomes that can be related to what performance (Elf et al., 2017). This is important for patients in general, but especially for patients with complex long-term conditions. To facilitate the transition to VBHC, the reimbursement has a crucial role. Linking reimbursement to outcomes that matter to providers will promote a continuous follow-up among healthcare providers (Porter 2010).

Value-based reimbursement

The reimbursement programme is crucial in the transition to VBHC (Porter, 2008). By using risk adjusted bundled payment, healthcare providers will be motivated “to work together to understand the actual cost of each step in the entire care process, learn how to do things better, and get care right the first time” (Porter & Kaplan, 2016). To measure and being accountable for results is a powerful driver of innovation and continuous improvement (Porter & Kaplan, 2016). A value-based reimbursement should contain the following aspects (Lindgren, 2014):

- The payment should cover the full care episode
- The provider should be responsible for complications
- All providers that can affect the patient outcome should be included in the payment
- The payment should be adjusted for case-mix
- The payment should be based on patient-relevant outcome measures

Bundled payment that is adjusted for case-mix in combination with performance-based payment fulfils the required aspects of a value-based reimbursement to promote VBHC. In the choice of what measure should be used, outcome measures as a proxy for quality are to prefer instead of process measures (Conrad, 2015; Damberg et al., 2014; Donabedian, 1966; Porter, 2008). In particular, patient-reported outcome measures (PROM) have gained an important role in the assessment of quality of healthcare (Halawi et al., 2019). Relating the reimbursement to PROM is also in line with Porter’s theory of outcome tiers (Porter, 2010a; Porter 2010b). Still, research on the effect of linking reimbursement to PROM is limited (Finkelstein et al., 2018). However, process indicators are still more prevalent as a proxy for quality than outcome measures (Pross et al., 2017).

In 2009, Region Stockholm introduced LOV with a bundled payment for elective hip and knee joint replacement, the so called “OrthoChoice” (Porter et al., 2014). The evidence of the effect on quality is however mixed.

Several studies on elective hip replacement surgery with bundled payment and LOV show mixed results. Wohlin et al. (2021) found 1) increased quality based on patient administrative data and quality registries, 2) reduced waiting times and improved access to care and 3) improved staff satisfaction. Goude et al. (Goude et al., 2021) found no effect on quality based on PROM, but did only include hip replacement in their analysis.

Systematic literature reviews on value-based reimbursement (Damberg et al., 2014; Scott et al., 2018), performance-based payment (Christianson et al., 2008; Eijkenaar et al., 2013; Kondo et al., 2016) and bundled payment (Feldhaus & Mathauer, 2018; Shih et al., 2015) provide mixed evidence of their effect on quality. Scott et al (2018) reached the conclusion that financial incentives used to promote VBHC had mixed effect. Further it was concluded that paying for performance improvement was less likely to be effective while paying for specific purposes was more likely to be effective (Scott et al., 2018). Another issue is the size of the incentive-based payment in relation to the total reimbursement. Some argue that it does not seem to have any effect (Scott et al., 2018) whereas others argue that the size of the performance-based payment does affect the effectiveness of the reimbursement programme (Roland & Campbell, 2014; Roland & Guthrie, 2016; Roland & Olesen, 2016). However, it is difficult to synthesise the effect of different reimbursement programmes due to the heterogeneity in outcome measures used (Scott et al., 2018).

It is difficult to predict what effects will arise as a result of various incentives. Uncertainty about the effects of a reimbursement programme is high, partly due to the fact that it is difficult to isolate the effect of the reimbursement programme from other influences. Thus, research must take both the design of the reimbursement programme but also contextual factors into account when analysing the effect of the reimbursement (Conrad, 2015).

The case of the Stockholm value-based reimbursement programme and elective spine surgery

Region Stockholm

With a population of 2.4 million⁷, corresponding to 23 per cent of the total population (Statistics Sweden, 2021c), Region Stockholm is the largest out of the 21 regions in Sweden. In 2013, Region Stockholm introduced Patient

⁷ Measured at the end of July, 2021.

Choice⁸ for elective spine surgery with a VBRP. Before the introduction of the VBRP, private healthcare providers were accredited through the Public Procurement Act (LOU) and reimbursed based on DRG and fee-for-service with individually negotiated price levels for a specified amount of surgeries each year. Thus, before the introduction of the STHLM-VBRP, the commissioning organisation decided how many healthcare providers that were allowed to provide care but also how many surgeries each healthcare provider was allowed to perform.

At the time of the introduction of the STHLM-VBRP, there were three accredited private healthcare providers in Region Stockholm. A fourth provider was accredited in 2017. All of the providers were for-profit, one clinic was a professional partnership, whereas the other three clinics were part of a larger healthcare organisation (however, some had a history of being a cooperative/professional partnership). Two providers were located in Stockholm city, one in a Stockholm suburb and the fourth in a neighbouring region (Region Sörmland). Despite being located in different regions, all healthcare providers were providing care under the same contractual conditions.

Elective spine surgery

Low back pain is estimated to affect 80–85 per cent of the world's population (Hoy et al., 2010). The economic burden of low back pain is large and growing (Olafsson et al., 2017). Most patients recover without surgery; 80 per cent of patients recover within 8 weeks and 95 per cent recover within one year (Legrand et al., 2007). When patients consult a physician for low back pain, conservative treatment (e.g. physiotherapy) is recommended as a first-line treatment. Surgery should not be performed until it is established that the patient has not recovered with conservative treatment only (Kreiner et al., 2014; Kreiner et al., 2013; Watters et al., 2009). Surgery is considered if a degenerative spine disorder, such as disc herniation or spinal stenosis, is diagnosed and confirmed by radiological methods. Approximately 85 percent of surgically treated patients are fully recovered (Legrand et al., 2007) but it can be difficult to distinguish which patients in the end will benefit from surgery. Recommendations and clinical guidelines within elective spine surgery vary (Foster et al., 2018). Therefore, it is important that financial incentives only encourage surgery on patients that actually benefit from surgery. However, it is also important that there is incentive to further investigate why some patients do not benefit from surgery and what treatments are better suited for those patients.

⁸ In this thesis, Patient Choice will be synonymously used with LOV.

In the Swedish quality registry for spine surgery, there were 9 826 patients registered for lumbar spine surgery in 2019 (Swespine, 2020). In 2020, the number of treated patients was 15 percent lower due to Covid-19 (Swespine, 2021). Surgical procedures have been considered suitable for value-based reimbursement because of the discrete beginning and end of a care episode (Foster et al., 2018). Further, the variation in recommendations in clinical guidelines for spine surgery make it suitable for a value-based reimbursement since the reimbursement is conditioned on the outcome of the surgery. With a value-based reimbursement, the financial responsibility is transferred to the provider to avoid paying the same amount no matter the quality. Hence, the provider must assess whether the patient will improve enough to outweigh the cost of performing the surgery. Socio-economic factors affect the outcome of the surgery (Iderberg et al., 2019), also psychological factors seem to affect the outcome (Abtahi et al., 2015). Therefore, it is important to prevent patient selection based on medical irrelevant factors such as socio-economic status. A well-functioning reimbursement programme within spine surgery is important.

The value-based reimbursement programme in Stockholm

In this thesis, the introduction of LOV with a value-based reimbursement in elective spine surgery will be referred to as the Stockholm value-based reimbursement programme (STHLM-VBRP). LOV can be seen as a requirement for a value-based reimbursement since VBHC requires free establishment of healthcare providers and free choice of patients (Porter & Teisberg, 2006). The contractual aspects of the STHLM-VBRP is published in a commissioning contract (also referred to as a “rule book”) (Public Healthcare Services Committee Region Stockholm [HSF], 2013). This commissioning contract describes i.a. the criteria regarding professional competence, physical care environment, what patients they are allowed to treat and what combination of diagnosis and surgical procedure that generate reimbursement.

Before the introduction of the STHLM-VBRP, each spine surgery clinic was reimbursed based on an individually negotiated fee-for-service schemes based on DRG with restrictions on volume. After the introduction the STHLM-VBRP, all private healthcare providers within elective spine surgery received the same reimbursement without restrictions on volume. The price level in the new reimbursement programme was decided based on the cost per patient data from one of the healthcare providers who chose to be

⁹ *Förfrågningsunderlag* in Swedish.

transparent regarding their internal costs. The STHLM-VBRP consisted of two parts: lumbar spine surgery and cervical spine surgery. Only lumbar spine surgery was mandatory in order to attain accreditation for elective spine surgery. The focus of this thesis is therefore on lumbar spine surgery.

A new way of grouping patients

Instead of using diagnosis-related groups (DRG), the structure of the STHLM-VBRP is based on categories for degenerative lumbar spine surgery that had been used for a long time in the national quality registry for spine surgery: Swespine (Stromqvist et al., 2013). Patients are grouped based on diagnosis and surgical procedure but in a different way compared to DRG. Table 1 presents the categories that are used within the STHLM-VBRP to generate a prospective payment.

Table 1. Diagnosis, surgical procedure and global assessment (GA) for the included categories

Category	Diagnosis	Surgical procedure	GA
A	Disc herniation	Discectomy	Leg
B1	Spinal stenosis	Decompression	Leg
B2	Spinal stenosis	Fusion	Leg
C	Segmental dysfunction	Fusion	Back
D	Spondylolisthesis	Fusion	Back

When the surgical procedure is registered, the healthcare provider receives a prospective payment that entails the bundled payment and the expected performance-based payment (Figure 1). The prospective payment is paid as a lump-sum and healthcare providers cannot distinguish the bundled payment from the expected performance-based payment. To promote need-based healthcare, differences in financial risk between patients has to be limited. Hence, the prospective payment is adjusted for age, gender and comorbidity level. Failing to adjust for case-mix leads to an increased risk of cherry picking, i.e. providers avoiding clinically complicated patients to the benefit of healthier patients with higher chance of a successful result. Procedures that requires implant or surgery on more than two levels of the back generate an additional payment to the provider. The expected performance-based payment is 10 per cent of the bundled payment, the prospective payment for each category can be found in Table 2. However, the payment does not include the individual adjustment and the additional payment for implants and performing surgery on more than two levels.

Figure 1. Illustration of the value-based reimbursement programme for elective spine surgery in Region Stockholm. The healthcare provider receives the prospective payment when the surgery is registered, one year after surgery is the performance-based payment adjusted based on the actual outcome on global assessment. It also shows the extent of the care episode and examples of healthcare utilization that the provider needs to pay for

Table 2. The prospective payment for each category converted from the original commissioning contract (HSF, 2013)

Category	Prospective payment	Bundled payment	Expected performance-based payment
A	3 398 €	3 089 €	309 €
B1	5 449 €	4 954 €	495 €
B2	8 749 €	7 953 €	795 €
C	8 892 €	8 084 €	808 €
D	9 702 €	8 820 €	882 €

The bundled payment

The bundled payment extends the clinical episode to one year after surgery, which is a longer period compared to most other bundled payment programmes previously assessed (Ryan, 2018; Ugiliweneza et al., 2014). The bundled payment should cover the individual patient's expected healthcare utilisation related to the spine surgery (e.g. potential complications, re-operation, rehabilitation), for the full care episode of one year. That means that the bundled payment includes the patient's rehabilitation, primary, specialty and hospital care provided by external healthcare providers. The provider that performs the surgery receives an invoice from the purchaser if an external healthcare provider (i.e. not the provider that performed the surgery) treats their patient after the surgery. Hence, the bundled payment covers a multi-organisational bundle of service. The bundled payment should stimulate an effective and integrated care chain by using a fixed payment to the provider for all services provided during the entire care episode (Porter & Kaplan, 2016).

The performance-based payment

The performance-based payment is a complement to the bundle payment, to avoid healthcare providers stinting on necessary care. The expected performance-based payment is 10 per cent of the bundled payment but is adjusted one year after surgery. The adjustment of the performance-based payment is based on the outcome measure global assessment (GA). The measure is a retrospective transition question asked one year after surgery (“How is your back/leg pain today compared to before the surgery?”) (Parai et al., 2017). The patient can choose between six response options (pain free, much better, somewhat better, unchanged, worse, did not have pain before the surgery). The registration of GA is administered and managed by the quality registry for spine surgery in Sweden, Swespine (Swedish society of spinal surgeons, 2018). Healthcare providers were not in any way involved in this process. When calculating the level of the performance-based payment, the outcome of GA for the specific patient is compared to national historical outcomes, adjusted for patient characteristics. If the level of pain turned out better than expected, the healthcare provider receives an additional payment. If the level of pain turned out worse than expected, the healthcare provider has to repay money to Region Stockholm. Hence, the size of the adjustment depends on the discrepancy between the actual and the expected outcome. This provides incentive to find ways of improving patients with patient characteristics that historically do not benefit as much from surgery. Due to the fact that healthcare providers cannot distinguish the expected performance-based payment from the bundled payment in the prospective payment, healthcare providers only perceive the adjustment of the performance-based payment. Thus, if the patient report the same level of GA as expected, the healthcare provider will not receive any adjustment.

The intended incentives of the Stockholm value-based reimbursement programme

Based on the thoughts of VBHC, the overall intention with the STHLM-VBRP is to create a more efficient healthcare with a holistic perspective and the patient's health in focus (HSF, 2013). All healthcare providers that fulfil the requirements and accept the price offered by Region Stockholm, can provide elective spine surgery due to the free establishment and a continuous commissioning contract. The healthcare providers compete based on the same contractual conditions. Hence, the barriers to entry the market are lower and is expected to lead to increased competition among healthcare providers and better availability for patients. The idea is that patients will choose the healthcare provider with the highest quality. In theory, this means that the actors compete based on quality instead of price,

which is expected to increase quality and value in healthcare (Porter, 2008).

The intended incentive of the bundled payment is to generate a more holistic perspective as the healthcare provider has a (financial) responsibility for the entire care episode, from surgery to post-discharge care and rehabilitation. With an extended financial responsibility, it is in the healthcare provider's interest to coordinate necessary care for the patient also after surgery. Thus, there are incentives to collaborate with other healthcare providers and professionals, such as physiotherapists, to design optimal care chains to avoid over- or under consumption of healthcare and rehabilitation. The extended financial responsibility also provides incentives to perform as safe surgeries as possible to avoid complications. If complications nevertheless occur, there is an incentive for the healthcare providers to make the patient return to their clinic for treatment instead of seeking care elsewhere. To avoid cherry-picking, the bundled payment is adjusted for differences in financial risk between patients, to avoid that patient with certain characteristics become financially advantageous to operate compared to others. The intended incentives of the performance-based payment is to give the healthcare providers incentives to design their care processes in such a way that the patient achieves the best possible health during the care episode. The expectations is that a value-based reimbursement programme generate a better understanding of what can be done differently to attain efficient and holistic healthcare. Thus, hopefully aligning financial incentives and professional values.

The STHLM-VBRP is the first programme to relate a part of the reimbursement on PROM, reported one year after surgery. Therefore, it is particularly interesting to study both the design and the effects of the reimbursement programme but also the context into which the programme is introduced.

Understanding the response to financial incentives through neo-institutional theory

[Institutions] are perfectly analogous to the rules of the game in a competitive team sport. That is, they consist of formal written rules as well as typically unwritten codes of conduct that underlie and supplement formal rules.

Douglas C. North (1990)

What North (a famous neo-institutional economist) nicely captures here is the character of institutions (e.g. organisations), such as Region Stockholm

and healthcare providers such as the spine surgery clinics. Thus, institutions restricts but also enables behaviour and organisations cannot be fully understood in isolation from the external influences that arise from a wider contextual perspective (Scott, 2014). Hence, the introduction of the VBRP does not happen in a vacuum and it is therefore of interest to understand the response to incentives and external demands in terms of how these affect the behaviour of the healthcare providers. To understand whether the VBRP is institutionalised or not, the institutions of interest in this thesis are the healthcare providing organisations accredited by Region Stockholm in elective spine surgery with STHLM-VBRP.

Neo-institutional economics was developed from the shortcomings of neo-classical economics in explaining human behaviour. The basic assumptions of neo-classical economics is that people have rational preferences, perfect information and maximise utility. However, the healthcare market is characterised by information asymmetry, thus violating at least one of the three assumptions of neo-classical economics. The idea of value-based healthcare (VBHC) is heavily influenced by the same logic as neo-classical economics. Through competition and the patient's free choice, market forces will make sure that the best-performing healthcare providers are thriving, whereas low-performing providers will run out of business (Porter 2010). Neo-institutional economics relax the strict assumptions of neo-classical economics and the focus of interest is institutions. Compared to other research fields within neo-institutional theory, neo-institutional economics have a rather instrumental approach. As the following quote by North shows, emphasis is put on the creation of new rules and the central role of "those with bargaining power":

Institutions are not necessarily or even usually created to be socially efficient; rather they, or at least the formal rules, are created to serve the interest of those with the bargaining power to create new rules. In a zero transaction cost world, bargaining strength does not affect the efficiency of outcomes; but in a world of positive transaction costs it does – and thus shapes the direction of long-run economic change. (Douglas C. North et. al., 1997)

From an economist's point of view, it could therefore be beneficial to be influenced with more cognitive approaches from fields such as sociology, anthropology and ethnology. Neo-institutional theory is an interdisciplinary field of research that includes a variety of fields such as economics, political science, sociology, anthropology and ethnology. Even though the different fields of research may be based on contradicting assumptions, they can be used as input to develop existing theories further. Putting theories based on contradicting assumptions against each other may serve as

a catalyst for new ideas in how to further develop each specific theory further. Therefore, institutional theory provides suitable frameworks to examine the nature of external demands and the behaviour of organisations. In order to analyse how the STHLM-VBRP was perceived among healthcare providers, a neo-institutional framework by Scott (Scott, 2014) was used.

Alignment and resistance between the institutional pillars

Institutions comprise regulative, normative, and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life. (W.R Scott, 2014)

According to Scott, institutions consist of regulative, normative and culture-cognitive pillars that in relation to each other have stabilising and meaning-making properties. The pillars are derived from research within different fields, and focus on different aspects that could enhance the understanding of individual and organisational behaviour.

The regulative pillar refers to the practice of rule-setting, monitoring, sanctioning and incentivising. It comprises formal legislation, but also less formal rule making. Instrumentalism is very central within the regulative pillar, i.e. individuals conform to laws and rules because they seek rewards or wish to avoid sanctions. Hence, focus on the regulative pillar sheds light on the more formalised control systems (Scott, 2014). The normative pillar encompasses values and norms. Values refer to conceptions of the preferred or the desirable, whereas norms refer to the scripts for how to reach the desirable goals and what means are legitimate in attaining them (Scott, 2014). A focus on the normative pillar emphasises the stabilising influence of social beliefs and norms, both internalised and imposed by others, and highlights the “moral roots” of behaviour and institutions. The cultural-cognitive pillar refers to the processes and frameworks of the shared perception, which enable sense making when meeting the “external world of stimuli” (Scott, 2014). The culture-cognitive pillar emphasizes features of shared understanding, professional ideologies, cognitive frames or sets of collective meanings. These aspects condition how actors interpret and respond to the world around them. The essence of the saying “think outside the box” could be compared to expanding the culture-cognitive frames. A focus on the culture-cognitive pillar sheds light on how knowledge is constructed and codified in models, assumptions and schemas, and to what extent it informs and constrains behaviour. Confusion among actors usually indicates lack of support from the culture-cognitive pillar because they do not know how to process or interpret the information.

Institutions are more robust when the regulative, normative and culture-cognitive pillars are aligned and reinforce each other. Changes in one of the pillars may cause misalignment and resistance, thus weakening the institution if the pillars motivate different behaviours. However, institutions tend to converge over time, and institutional theory considers misalignment of pillars as a catalyst for change (Scott, 2014).

The framework by Scott provides a structure to the analysis by focusing on respective pillar, but also the interrelationship between the pillars. The introduction of the STHLM-VBRP imposed contractual changes regarding the provision of elective spine surgery in Region Stockholm and can thus be regarded as a change in the regulative pillar. This change may work as a catalyst for institutional change if its introduction causes a misalignment between the pillars. If healthcare providers resist the aspects of the VBRP, they will not be institutionalised. If healthcare providers align to the institutional elements imposed by the VBRP, they will be institutionalised. By focusing on all three pillars the intention is to provide a deeper understanding on how and why certain aspects of the new reimbursement programme were institutionalised, or not.

Centrality and compatibility of institutional logics

Another factor that may affect whether the reimbursement programme is institutionalised or not is the presence of multiple institutional logics within the healthcare organisations. Different institutional logics can exist within a healthcare organisation and be more or less compatible (Dunn & Jones, 2010; Greenwood et al., 2011). These logics do often overlap in such a way that actors confront and draw on multiple logics (Thornton et al., 2012). Within a healthcare organisation, there is a variety of potential areas of disagreement, e.g. goals, means, appropriate material or human resources (Scott, 2014). Contradictory institutional logics may cause conflicts, e.g. professional logics versus market logics (Scott et al., 2000). Many organisations that were traditionally operating in professional partnership mode, e.g. healthcare (Brock et al., 1999; Greenwood et al., 2017), have been invaded by corporate practices and subjected to greater market controls (Scott et al., 2000).

The relation between institutional logics within organisations can vary. In some organisations is the core mission and strategy influenced by several institutional logics (Pache & Santos, 2013), whereas other organisations may be influenced by a single logic and other logics being secondary or peripheral (Jones et al., 2012). It is debated whether multiple logics within

organisations is good or bad for organisational functioning and survival. Multiple logics can evoke contestation and conflict (Battilana & Dorado, 2010; Zilber, 2002), threaten the performance of the organisation and ultimately lead to a collapse (Tracey et al., 2011). However, multiple logics can also coexist (McPherson & Sauder, 2013) or blend (Binder, 2007), making organisations more enduring, sustainable and innovative (Jay, 2013). Thus, the consequences of logic multiplicity vary and might depend on how these logics are manifested within the organisation (Besharov & Smith, 2014). When external demands are asserted upon e.g. healthcare providers, these demands may be perceived differently depending on the institutional logics that are present within the organisation. To better predict the outcome of external, but also internal, demands, it is important to understand how institutional logics manifest within an organisation.

To understand how multiple logics manifest, two dimensions are essential: compatibility and centrality (Besharov & Smith, 2014). Centrality describes the extent to which these logics are apparent in core features that are central to the functioning of the organisation. Compatibility describes to what extent the logics, that are present in the organisation, imply consistent organisational actions.

METHOD

Methodological assumptions

Commonly, ontological and epistemological assumptions are not discussed to a greater extent within health economics; one explanation could be the field's close relationship to medicine. Qualitative and quantitative methods are often based on contra dictionary ontological and epistemological assumptions which have implications on what conclusions that can be made from different data material. In this thesis, quantitative and qualitative methods are combined to answer different questions to deepen the understanding of a VBRP. I would align myself with the pragmatic approach because of the possibility of choosing the most appropriate research method in order to address specific research questions (Ritchie et al., 2013).

All research is based on ontological and epistemological assumptions. Ontology is about the nature of social reality (Ritchie et al., 2013). A simplified description of ontological assumptions can be represented by a spectra, with realism at the one side of the spectra and idealism at the other side. Realism is based on the thought that an external reality exist, independently of people's belief about, perception or understanding of it. That means that there is a difference between the nature of the world and the meaning and interpretation of it made by individuals. Idealism is based on the idea that the social reality can only be known through the human mind and socially constructed meanings. On one hand, I would argue that a social reality could not exist without socially constructed meanings by the human mind. On the other hand, I can see the benefits of realism but I would argue that it is a simplification of the world to assume an external reality. However, due to the complexity of the world, assumptions must be made to have a common ground, but it is important to not hold on too tight to these simplifications. Epistemology is concerned with the nature of knowledge and how it can be acquired (Ritchie et al., 2013). Epistemological concerns regard for example the way in which knowledge can be acquired (e.g. deductive or inductive approach) and the relationship between the researcher and what is researched. As a researcher I will do my best to be objective. However, I also think that the interview, for example, is a relationship between me as a researcher and the representative is a social phenomenon that is interactive. Therefore, it is important to be transparent in assumptions and values and as far as possible be neutral and non-judgmental in my approach.

Within positivism and post-positivism (usually based on realism in combination with a deductive approach) are methods of natural science appropriate because of the assumption that human behaviour is governed by law-like regulations. Interpretivism, on the other hand, stress the importance of interpretation as well as observation in order to understand the social world. Constructivism claims that knowledge is constructed rather than independently out there waiting to be discovered. Both interpretivism and constructionism focus on understanding through lived experiences (Ritchie et al., 2013). Thus, methods of natural science is not appropriate within interpretivism and constructivism. However, I can see the benefits of both post-positivism and constructivism, but it all depends on the context.

Alan Williams defines economics as a discipline as “a systematic body of knowledge with its own distinctive concepts and models of thinking” (Williams, 1997). Thus, the discipline of economics is a mode of thinking that forms a conceptual focus on issues such as resources, scarcity, rationality, incentives and values (Williams, 1979). Some economists remain suspicious of qualitative methods due to the presence of relativist and constructivist worldviews (Basole & Ramnarain, 2016). Questions of the nature of being and theories of knowledge are often taken for granted by economists, because realist, positivist and deductive approaches are more commonly used and often seen as standard (Coast, 1999; Coast, 2017). However, the utilisation of qualitative methods in health economics has increased during the last 20 years (Coast & Allegri, 2018). I would argue that without qualitative methods we would limit our understanding of individual and organisational behaviour. Qualitative research makes it possible to explore dynamic elements, such as interactions and processes, aspects that are too complex or sensitive to be captured by quantitative methods. Qualitative research provides information about both processes and results (Ritchie et al., 2013), complex interactions can be identified rather than cause-and-effect relationships (Creswell & Poth, 2017).

Therefore, it is important to remember that quantitative and qualitative research offer different ways of describing a phenomenon, which means that the different methods can generate different results. There are those that argue that it is no longer reasonable to distinguish between qualitative and quantitative inquiry:

All research is interpretive, and we face a multiplicity of methods that are suitable for different kinds of understandings. So the traditional means of coming to grips with one's identity as a researcher by aligning oneself with a

particular set of methods (or being defined in one's department as a student of "qualitative" or "quantitative" methods) is no longer very useful. If we are to go forward, we need to get rid of that distinction. (Schwandt, 2000)

Schwandt express very well my position regarding the use of qualitative and quantitative methods. Different methods can be used to answer different questions, but different methods can also be used to approach the same question as an attempt to generate additional perspectives. Hence, the combination of quantitative and qualitative methods is of particular importance when studying complex interventions.

The use of mixed methods

Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration. (Johnson et al., 2007)

The approach of this thesis, to combine quantitative and qualitative methods conforms to the definition of mixed methods proposed by Johnson et al. (2007). The aim and method for each paper is summarised in Table 3. In the first two articles, a quantitative approach was used by analysing register data. In the second two articles, a qualitative approach was by interviewing representatives at the four accredited healthcare providers.

In this thesis, the STHLM-VBRP is compared to the individually negotiated fee-for-service programme that was previously used. The VBRP is part of a continuous commissioning contract without restrictions on volume. The fee-for-service program was part of the reoccurring procurement with individually negotiated prices with restrictions on volume. Even though it is the introduction of LOV with a value-based reimbursement programme that is compared with a reoccurring procurement process with reimbursement based on DRG and fee-for-service with restrictions on volume, we will hereafter refer to the change as before and after the introduction of the STHLM-VBRP.

In order to evaluate the VBRP it is important to understand how the intended incentives were perceived among healthcare professionals to better understand the effect on PROM and costs to the third party payer. Therefore, the effects of the reimbursement programme were approached in two ways: (1) by analysing registry data on PROM and cost, and (2) by interviewing representatives to understand their perception of the reimbursement programme. Figure 2 shows the timeline of when different data was

collected. The quantitative analysis was based on register data from 2006 to 2016. The quantitative analysis is therefore based on data from only three healthcare providers, since the fourth provider was accredited in 2017. Qualitative data was collected in two blocks with the fourth provider included in the second block. The result of the quantitative analysis was not known at the time the interviews were conducted.

Table 3. Summary of the papers included in the thesis

	Paper I	Paper II	Paper III	Paper IV
Title	A pain relieving reimbursement programme? Effects of a value-based reimbursement programme on patient reported outcome measures	A cost-reducing reimbursement programme? Effects of value-based reimbursement on healthcare costs	The introduction of a value-based reimbursement programme - Alignment and resistance among healthcare providers	Centrality and compatibility of institutional logics when introducing value-based reimbursement
Overall study aim	To analyse the effect of a value-based reimbursement programme (STHLM-VBRP) on patient reported health outcomes. In addition, we explore whether selection bias towards less complicated patients occurred, regarding medical and socioeconomic factors.	To analyse the effect of introducing a value-based reimbursement programme on the cost to third-party payer.	To analyse if and how healthcare providers adapt their practices to a value-based reimbursement programme that combines bundled payment with performance based payment.	To identify institutional logics within healthcare-providing organisations. Further, we analyse how the centrality and compatibility of the identified logics affect the institutionalisation of external demands.
Data material	Register data	Register data	Interviews	Interviews
Approach	Quantitative	Quantitative	Qualitative	Qualitative
Data analysis/result	Segmented regression analysis of patient reported outcome measures	Segmented regression analysis of healthcare costs to third party payer	Thematic analysis	Thematic analysis

Figure 2. Timeline to illustrate when interviews were conducted and for what time period register data was extracted

Ethical approval (2015/94–31) was obtained from the Regional Board of Ethics in Linköping before data were received and prior to commencing the fieldwork. A signed consent to participate from each representative that was interviewed was also obtained before conducting the interviews.

Paper I and Paper II

Data management

Registries and data

Patient level data was extracted and interlinked from three different registry holders, Region Stockholm, Swespine and Statistics Sweden. Data on diagnosis, surgical procedure, age, gender, total payment (from purchaser to healthcare provider), performance-based adjustment, individual adjustment and healthcare utilisation the following years were extracted from the Stockholm regional patient registry (VAL). Socio-economic data (educational level, annual income, country of birth, employment status) was extracted from Statistics Sweden. Targeted and non-targeted patient-reported outcome measures, weight and height were extracted from the Swedish spine register (Swespine). The National Board of Health and Welfare anonymised and interlinked data, see Figure 3. When interlinking the data from the regional patient registry to the data from Statistics Sweden (SCB) and Swespine, the coverage corresponded to 99.7 per cent and 95.4 per cent respectively.

Figure 3. A schematic illustration of the registries used and the process of interlinking and anonymization

Identifying the population

The population was identified in the regional patient registry based on specific ICD-10 codes. When a patient was identified, all healthcare consumption that followed was extracted as well. The dataset that was delivered from Region Stockholm contained 45.6 million observations with almost 480 000 unique patients. These patients were identified because they had been registered with the relevant diagnosis, thus, not everyone had undergone surgery. The first step of data management was to identify the population that had been surgically treated by combining the diagnostic code with the relevant surgical procedure code. The first surgical procedure that was registered for each patient was considered as the index surgery. The index surgery indicated the start of a new care-episode, and each care-episode extended to one year. A macro was created to sort all healthcare utilisation, both related and unrelated to the spine surgery, into the correct care-episode. Hence, healthcare utilisation that occurred more than one year after the index surgery was excluded. This resulted in 23 822 care episodes between 2006 and 2016.

Only private healthcare providers were accredited within STHLM-VBRP. Thus the data was sorted to only include patients that were surgically treated by private healthcare providers with the following combinations of diagnosis and surgical procedure: disc herniation and discectomy, spinal stenosis and decompression, spinal stenosis and fusion, segmental dysfunction and fusion, spondylolisthesis and fusion. Furthermore, patients that were surgically treated in 2016 were excluded since they lacked data for the full care episode and follow-up on PROM. Therefore, the data used

for analysis include patients that were surgically treated from 2006 to the end of 2015. This resulted in 10 389 observations with 9 632 unique patients. Each care episode contained all healthcare utilisation (inpatient, outpatient and primary care) within the one year period.

Patient-reported outcome measures

EQ-5D-3L is a standardised instrument developed by the EuroQol Group to be used as a measure of health outcome. It comprises five dimensions (mobility, self-care, usual activities, pain/discomfort and anxiety/depression), with three levels (no problems, some problems, and extreme problems). In Swespine, the EQ-5D-3L was converted into a single summary index using the tariff by Dolan (Dolan, 1997). The index value can vary from -0.594 to 1 and enables the calculation of quality-adjusted life years (QALYs) (EuroQol Research Foundation, 2018).

The Oswestry Disability Index (ODI) is one of the most commonly recommended condition-specific outcome measure for spinal disorders (Fairbank & Pynsent, 2000; Hills et al., 2019). The ODI comprises ten items: pain intensity, personal care (washing, dressing, etc.), lifting, walking, sitting, standing, sleeping, sex life, social life and travelling. For each item there are six severity levels scoring from 0 to 5. The total possible score is 50, and a standardised formula is used to transform the score to a percentage score of disability, where 0 per cent corresponds to no disability and 100 per cent corresponds to full disability.

Figure 4. A timeline to illustrate when EQ-5D-3L, ODI and GA is measured in relation to the care episode of one year

Global assessment (GA, described in more detail on page 29), the targeted performance measure is a measure of improvement of clinical symptoms and thus registered solely at the one-year follow-up, see Figure 4. EQ-5D-3L and ODI, however, are registered both prior to surgery (baseline) and at one-year follow-up. All three patient-reported outcome measures (PROM) are reported by patients to the quality register Swespine. Almost 90 per

cent of the patients reported baseline values and just over 70 per cent reported follow-up values. The proportion of patients that PROM to Swespine is presented in Table 4.

Table 4. The response rate on PROM for EQ-5D-3L, Oswestry Disability Index (ODI) and global assessment (GA)

Variable	Response rate of PROM
EQ-5D-3L baseline	88%
EQ-5D-3L one year follow up	71%
EQ-5D-3L both baseline and follow-up	67%
ODI baseline	87%
ODI one year follow up	71%
ODI both baseline and follow-up	67%
GA one year follow up	71%

Patient characteristics

We used Charlson comorbidity index (CCI) (Sundararajan et al., 2004) to calculate comorbidity level based on diagnoses registered in the Stockholm regional patient registry. A macro was constructed to identify diagnoses included in the CCI and thereafter summarised to an index value per patient.

Monetary values were adjusted to the 2016 price level using the Swedish consumer price index with fixed index numbers (1980=100) (Statistics Sweden, 2021b). The values were converted from SEK to EUR with an exchange rate corresponding to 1 SEK=0.11 EUR.

Analysis

Due to the fact that Region Stockholm receives patients from all over Sweden and performs the majority of the elective spine surgeries nationally, it was difficult to find an appropriate region for comparison. Therefore we used segmented regression analysis to compare outcomes and costs before and after the introduction of the STHLM-VBRP. Patients with missing values in reimbursement were excluded from the analysis. Statistical significance was assessed at the 5 per cent level. Analyses were performed using SAS 9.4.

Patient-reported outcome measures (Paper I)

A chi-square test was performed to compare the distribution of answers on GA before and after the introduction of the STHLM-VBRP. Patients that had answered that they had no pain before the surgery were excluded from the analysis. Since GA only was measured one year after the surgery, the

outcome is based on the patient's subjective notion of the pain before the surgery. EQ-5D-3L and ODI are registered both before and after the surgery which enables a somewhat less subjective estimation of the effect of surgery. It also made it possible to analyse whether there was any difference between targeted and non-targeted PROMs, thus controlling for "tunnel vision" (Greenhalgh et al., 2018).

To analyse the association between the STHLM-VBRP and the non-targeted outcome measures (EQ-5D-3L and ODI) we used segmented regression analysis to assess potential changes in level and trend over time (Wagner et al., 2002). The introduction of STHLM-VBRP interrupts the time series and creates two segments of interest. The following regression model (Model 1) was specified to estimate the monthly level and trend of EQ-5D-3L and ODI score, at baseline, at one-year follow-up, and the difference between one-year follow-up and baseline level.

$$\text{Model 1} \quad Y_t = \beta_0 + \beta_1 * \text{time}_t + \beta_2 * \text{VBRP}_t + \beta_3 * \text{time after VBRP}_t + \beta_4 * \text{July}$$

The dependent variable Y_t (i.e. EQ-5D-3L level or ODI score) in month t was explained by four independent variables where β_0 estimated the baseline level at time zero. The variable *time* indicated time in months at time t from the start of the observation period to the end (2006–2015) where β_1 estimated the monthly change (i.e. the baseline trend). The dichotomous variable *VBRP* indicated whether time t occurred before ($\text{VBRP} = 0$) or after ($\text{VBRP} = 1$) the introduction of STHLM-VBRP, corresponding to month 92 in the time series. The β_2 -coefficient estimates the change in the outcome level after the introduction of STHLM-VBRP. The variable *time after VBRP* indicates the number of months after the introduction of STHLM-VBRP, coded 0 before STHLM-VBRP and $t-91$ after the introduction of STHLM-VBRP, and the β_3 -coefficient estimates the change in the baseline trend after the introduction of STHLM-VBRP. The time coefficient β_1 is present through the entire time period 2006–2015. Consequently, the sum of β_1 and β_3 is the post-intervention slope. The variable *July* is a dummy variable (0 or 1 to indicate the month of July), and β_4 estimates the impact the month of July has on the outcome (due to summer holidays, far less patients underwent surgery during this month).

Case-mix (Paper I)

To make sure that any potential effect on PROM was not caused by selection bias, the case-mix of patients was compared using Student's t-test and Wilcoxon rank sum test.

To assess whether socio-economic aspects seemed to affect the odds ratio (OR) of a successful surgery was a logistic regression analysis performed. The logistic regression is presented in Model 2. The surgery was coded as successful if the patient had answered “the pain is gone”, “the pain is much better” or “the pain is slightly better” on GA. Thus, we transformed the five response scale to a binary variable (successful surgery vs. unsuccessful). Patients that had answered “had no pain before the surgery” were excluded from the analysis since that option cannot be put on an ordinal scale. Low education was coded as 1 if the highest attainment was primary school (≤ 9 years), and 0 for higher educational attainment. The variables age and income were continuous.

Model 2 Successful surgery = $\beta_0 + \beta_1 * \text{VBRP} + \beta_2 * \text{age} + \beta_3 * \text{female gender} + \beta_4 * \text{comorbidity level} + \beta_5 * \text{low educational level} + \beta_6 * \text{income} + \beta_7 * \text{born outside of Europe}$

To analyse whether patient characteristics with lower odds ratio of a successful surgery also had lower odds ratio of being surgically treated, a logistic regression analysis was performed based on Model 3. The odds of being surgically treated after the introduction of VBRP was compared to the odds of being surgically treated before the introduction of VBRP, with regards to age, gender, comorbidity level, educational level, income level and country of birth.

Model 3 Surgically treated after the introduction of VBRP = $\beta_0 + \beta_1 * \text{age} + \beta_2 * \text{female gender} + \beta_3 * \text{comorbidity level} + \beta_4 * \text{low educational level} + \beta_5 * \text{income} + \beta_6 * \text{born outside of Europe}$

Cost to the third party payer (Paper II)

We compared the cost to the third party payer before and after the introduction of the STHLM-VBRP. To make the costs more comparable, the cost of the surgical procedure and the cost of healthcare consumption during the following year was combined into one measure – episode cost. Thus, the episode cost covers both the cost of the surgical procedure and the healthcare consumption during the year following the surgery (i.e. the cost of post-discharge care). Since the financial responsibilities of healthcare providers accredited within STHLM-VBRP is extended to one year, we compared the episode cost for surgically treated patients. The primary outcome was total and mean episode cost for patients undergoing lumbar spine surgery, from the perspective of a third-party payer, which in our case

was Region Stockholm. The costs included were all healthcare costs during the one-year care episode after lumbar spine surgery, which includes inpatient care, outpatient care, primary care and rehabilitation. The segmented regression analysis of costs was also based on Model 1, but with the monthly total episode-cost and the mean episode-cost as dependent variables.

Paper III and Paper IV

A case study of the introduction of the VBRP was conducted using representatives' own reports, since neo-institutional analysis assumes that institutions are, in effect, manifested through individuals' attitudes, beliefs and motivation.

To recruit representatives for interviews, we used a purposive sampling approach (Suri, 2011) in dialogue with the respective manager at the four healthcare providers. We wanted the representatives to reflect the heterogeneity among staff, thus clinically active as well as administrative staff were included from different professions to attain a more comprehensive perspective. Another reason for this was that one of the outspoken intentions with the VBRP was to facilitate interdisciplinary assessment and treatment of patients. All representatives that were interviewed, were employed by the healthcare provider with a monthly salary that was not directly affected by the VBRP.

The interview guide was constructed based on five areas of interest; the role of the representative, work processes at the spine surgery clinic, communication within the clinic and with other actors (the commissioning organisation, patients and other healthcare providers), the value-based reimbursement and attitudes towards the new commissioning contract. To make the representative feel comfortable in the situation, the interview guide started with more general questions about the representative's profession and responsibilities (Ritchie et al., 2013) and were finished off by asking about their opinions of the new commissioning contract. The interview guide was designed as an aide-memoire (Burgess, 1991), to ensure that all aspects were covered but still allowing for the representative to talk freely about the topics.

Semi-structured face-to-face interviews were conducted with employees at the four accredited healthcare providers, at the respective spine surgery clinic. The interviews were carried out by TE in two blocks to cover any

potential time factor affecting representatives' experience of the reimbursement programme. The first block was between May 2015 and May 2016 and the second block between June and September 2017. In total there were 41 interviews carried out. Seven representatives were interviewed in both the first and the second block, thus 34 unique representatives were interviewed. Three interviews were conducted with two representatives at the same time after a query from the representatives. Two interviews were conducted over the telephone, both in the second block, with representatives who had already been interviewed face-to-face in the first block. In the first block each interview lasted 53 minutes on average. The corresponding number for the second wave was 31 minutes. The interviews were carried out in Swedish. All but one interview were audio recorded and transcribed verbatim in Swedish.

Analysing alignment and resistance (Paper III)

The interviews were analysed using a thematic analysis (Braun & Clarke, 2006). An abductive approach was adopted, allowing for interaction with previous and newly discovered knowledge, thus combining an inductive and deductive approach (Alvesson, 2011). The transcribed material was sorted based on healthcare provider. The analysis was carried out by TE but emerging themes were continuously closely discussed with A-CN. As a first step, everything that somehow was related to the VBRP was highlighted in the transcribed material. The highlighted parts were cut out and sorted into different groups using post-it notes. The highlighted parts were reassessed in an effort to find the distinct unit of meaning of the highlighted aspects. The themes were renamed and regrouped in an iterative process. The result was entered into Excel, where the process continued. The original interview transcripts were read through again, free from themes, to see the identified aspects in their original context and whether new aspects could be identified. The findings were continuously discussed together in an iterative process with A-CN and L-ÅL. The iterative process resulted in three main themes: the bundled payment, the performance-based payment and the continuous contract. Each theme had 1–5 sub-themes.

The identified themes were thereafter sorted into the neo-institutional framework by Scott (2014), to connect the empirical findings to the conceptual framework based on institutional pillars. Again, an iterative process followed, where identified themes were inspected through the lens of the regulative, normative and culture-cognitive pillars. To start with, the regulative pillar was treated as the perceived external demands that the commissioning organisation was asserting onto healthcare providers. The findings within the normative and culture-cognitive pillar were assessed in

order to see if there were aspects that could be related to the regulative findings. Again, this was an iterative process where aspects were divided and re-sorted under the pillars. We also realised that identified normative and culture-cognitive aspects did not always have any counterpart in the regulative pillar, because new ideas and values arose as the providers adapted to the new regulative framework. Hence, the adaption generated new ideas and values that highlighted the lack of regulative support. Therefore, the regulative pillar did not only consist of perceived external demands asserted by the commissioning organisation on healthcare providers, but also what regulative aspects healthcare providers identified as lacking in order to adapt to the new commissioning contract. In addition to the continuous discussions with A-CN and L-ÅL, the findings in relation to the pillars were discussed at a seminar at the research unit.

The quotes used in the results section will be denoted A-D to indicate the healthcare provider followed by a number indicating the representative.

Analysing centrality and compatibility (Paper IV)

When starting the analysis of the material in Paper IV, the transcribed interviews were sorted into five groups based on occupation/function: spine surgeons (n=5), physiotherapists (n=4), nurses (n=8), managers (n=10) and administrators (n=7). In the managerial group, three out of six CEOs/operational managers were also working part-time clinically as spine surgeons. Five out of the eight nurses also had administrative support functions and did not work full-time clinically. The administrators group comprised bookkeepers and clinical invoicing assistants. Hence, the focus of this paper was to see if there were any similarities and differences in the perception of the VBRP within and between different professional groups within the healthcare-providing organisation.

The analysis was based on the concept of thematic analysis (Braun & Clarke, 2006) with an abductive approach (Alvesson, 2011). The neo-institutional framework by Scott (2014) was used to structure the findings in order to challenge the mind to deepen the analysis and to connect the empirical findings to theory. An iterative process followed, where aspects within the respective pillars were identified by TE and A-CN. The findings were continuously discussed with L-ÅL throughout the process. The identified aspects were compared between the groups to see if there were any differences and whether multiple institutional logics could be identified. The findings were thereafter analysed in order to assess whether the centrality and compatibility of the identified logics had changed after the introduction of the VBRP.

The representatives will be denoted with their first letter of their group name followed by a number indicating the specific representative (i.e. Spine surgeon 1 = S1, Nurse 1 = N1, etc.).

RESULTS

In this chapter the result of each paper is presented. The result of the four papers facilitate a better understanding of what works and why when using financial incentives to manage care.

Paper I and II: Patient-reported outcome measures in relation to the cost to the third party payer

In the first paper, PROM were analysed and compared before and after the introduction of the VBRP. In the second paper, the cost of elective spine surgery to third party payer was analysed. The same population was used for both papers, 6 738 patients were surgically treated before the introduction of the VBRP and 3 651 patients were surgically treated after introduction (2006-2015). Baseline characteristics of patients surgically treated with and without the VBRP is presented in Table 5.

Table 5. Baseline characteristics of surgically treated patients before and after the introduction of the STHLM-VBRP

	Mean (SD)		Δ	t-test (p)
	Without VBRP n=6,738	With VBRP n=3,651		
Age	56.49 (15.34)	56.45 (15.77)	0.036	0.910
Female (%)	53.77 (49.86)	52.12 (49.96)	1.65	0.108
BMI	26.65 (7.10)	26.65 (7.94)	-0.0009	0.995
Comorbidity level (CCI)	0.24 (0.705)	0.31 (0.78)	-0.0652	<.0001
At least one comorbidity (%)	15 (35.61)	19 (39.22)	-4	<.0001
EQ-5D prior to surgery	0.377 (0.325)	0.364 (0.330)	0.013	0.061
ODI prior to surgery	41.88 (15.87)	41.16 (16.409)	0.722	0.041
Annual income (€)	27 449 (26 053)	31 185 (44 929)	33 915	<.0001
Low educational level (%)	20.48 (40.36)	20.05 (40.04)	0.432	0.602
Employed* (%)	52.67 (49.93)	54.73 (49.78)	2.06	0.045
Born outside of Europe (%)	8.22 (27.47)	12.01 (29.34)	3.79	<.0001

BMI=Body Mass Index (measured as weight/height²), CCI=Charlson Comorbidity Index, low educational level refers to patients that have not finished secondary education.*Without the VBRP 81% of patients <65 years old were employed whereas corresponding number with VBRP was 86 %

The targeted performance measure (Paper I)

There was no difference in the distribution of the patients' answers on GA (χ^2 (4, N = 6 964) = 4.64, p = 0.326)¹⁰. Thus, linking the performance-

¹⁰ It did not affect the result if patients that had answered "I had no pain before surgery" were included in the analysis.

based payment to GA did not change the pain patients experienced one year after surgery.

The result further showed that age, low educational level and being born outside of Europe were associated with a lower odds ratio of experiencing a successful surgery. However, we found no evidence that patients with these characteristics were surgically treated to a lower extent, rather the contrary. Patients with higher comorbidity level and being born outside of Europe had a higher odds ratio of being treated after the introduction of the STHLM-VBRP.

The non-targeted performance measures (Paper I)

Our results show that the introduction of the STHLM-VBRP had no effect on EQ-5D-3L and the Oswestry Disability Index (ODI).

The cost to the third party payer (Paper II)

Before the introduction of the VBRP, Region Stockholm paid on average €6 000 for a surgical procedure. After the introduction of the VBRP, this payment amounted to almost €6 400 on average (Table 6). However, the payments are not comparable since they cover a different amount of services. After the introduction of the VBRP, the payment from Region Stockholm also covers healthcare consumption during the full care episode of one year, i.e. the cost of post-discharge care. The cost of post-discharge care amounted to approximately €2 700 before the introduction and approximately €2 300 after the introduction of the VBRP.

Table 6. The average cost of the surgical procedure, the average cost of healthcare consumption during the year following surgery and the average cost of the care episode

Mean cost	Without VBRP	With VBRP	Δ	t-test (p)
Cost of surgery (2006–2015)	6 017 €	6 366 €	- 350 €	<.0001
Cost of post-discharge care (2006–2015)	2 696 €	2 309 €	387 €	0.0032
Cost of care-episode (2006–2015)	8 713 €	8 620 €	37 €	0.8013
Cost of care-episode (2011–2012 vs. 2014–2015)*	9 681 €	8 676 €	903 €	<.0001

*2 641 patients were treated without the VBRP and 3 215 patients were treated with the VBRP

Comparing the two last years without VBRP with the two first years with VBRP, the mean episode cost of surgically treated patients decreased by 11 per cent. However, due to a 22 per cent increase in the number of surgically treated patients, the total cost increased by 8 per cent.

By only comparing costs between two groups, we cannot distinguish potential effects on trends and level over time. This is however possible with segmented regression analysis. The total episode cost per month for all surgically treated patients to the third party payer decrease by almost €20 000 each month after the introduction of the VBRP, see Table 7. Thus, the VBRP seems to have had an effect on the trend of total cost, but no immediate effect on level. When looking at the mean episode cost on the other hand, there was no significant differences before and after the introduction of the VBRP.

Table 7. Parameter estimates predicting the total and mean episode cost of surgically treated patients, 2006–2015

Parameter	(A) Total episode cost per month (€)			(B) Mean episode cost (€)		
	Estimate	SE	p-value	Estimate	SE	p-value
Intercept	236 862	60 758	0.0002	7 104	408	<.0001
Time	10 051	1 146	<.0001	29	8	0.0003
VBRP	204 010	128 300	0.1146	-360	861	0.6763
Time after	-18 735	7 178	0.0103	-76	48	0.1185
July	-820 354	105 189	<.0001	-808	706	0.2547

SE, standard error; Intercept, cost level in January 2006; Time, number of months from January 2006; VBRP, indicates the introduction of the STHLM-VBRP at the end of 2013, which is 92 months after January 2006 (Time = 92); Time after, number of months after the introduction of VBRP (hence Time-91); July, indicates the month of July.

With a shorter time perspective, the mean cost of a care episode decreased after the introduction of the VBRP. This effect could not be seen with a long-term perspective (2006–2015).

The cost put in relation to effect (Paper I and Paper II)

The register data includes seven years without the VBRP but only two years with the VBRP which makes it difficult to compare the number of surgically treated patients and the total cost of elective spine surgery and the aggregated amount of generated quality-adjusted life-years (QALY) based on EQ-5D-3L. Therefore, the last two years without VBRP (2011 and 2012) are compared to the first two years with VBRP (2014 and 2015) in Table 8. Between 2011 and 2012, the total cost of care episodes within elective spine surgery¹¹ amounted to €25.6 million. The corresponding amount between 2014 and 2015 was €27.7 million. The total cost¹² increased with €2 million and generated 157 additional QALYs.

¹¹ Lumbar spine surgery (categories: A, B1, B2, C and D)

¹² Total cost of elective spine surgery (including the full care-episode)

Table 8. The number of surgically treated patients, the aggregated amount of QALY, the total cost, the incremental cost-effectiveness ratio and the generated value per euro spent

	Before VBRP	After VBRP	After-Before	ICER $\Delta\epsilon/\Delta QALY$
Number of patients	2641	3215	574	
QALY (aggregated)	476	633	157	-
Total cost*	25 566 910 €	27 712 289 €	2 145 379 €	13 687 €
Value QALY/€	0.000019	0.000023	0.000004	-

*Total episode cost of elective spine surgery (cost of surgery + cost of post-discharge care)

Since both cost and effect increased after the introduction of the VBRP, the commissioning organisation needs to assess whether the increase in effect is worth the additional cost. If a traditional cost-effectiveness analysis (CEA) were to be applied, the incremental cost of the VBRP compared to the previous fee-for-service program would be set in relation to the incremental effect. This would result in an incremental cost-effectiveness ratio (ICER). The ICER of the VBRP compared to the previous fee-for-service programme resulted in an ICER corresponding to almost €14 000 per QALY, see Table 8.

The value-ratio suggested in value-based healthcare (VBHC) can also be used to compare how much value that was generated before and after the introduction of the VBRP. Before the introduction of the VBRP, elective spine surgery generated a value of 0.000019 QALYs/€. With the VBRP were 0.000023 QALYs generated for every € spent. Thus, the value increased by 0.000004 QALYs per € after the introduction of the VBRP. As illustrated in Table 8, the value-ratio gets rather difficult to interpret due to the difference in magnitude in cost and effect. To make it easier to interpret the ratio, QALY can be converted to quality adjusted life minutes. Thus, every € generated almost 10 quality adjusted life minutes before the introduction of the VBRP. After the introduction of the VBRP, each € generated 12 quality adjusted life minutes.

Paper III: The introduction of a value-based reimbursement programme – Alignment and resistance among healthcare providers

The thematic analysis generated three main themes with 1-5 subthemes that are presented in Table 9.

Table 9. Identified themes and sub-themes

<u>The bundled payment</u>	<u>The performance-based payment</u>	<u>A continuous contract</u>
<ul style="list-style-type: none"> - A more holistic perspective - Post-discharge care an administrative nightmare - A more prominent role of physiotherapy - The free choice and better accessibility for patients without responsibilities - Incentive for cooperation with other healthcare providers 	<ul style="list-style-type: none"> - The lack of transparency and financial impact - Concerns regarding potential shifts in case-mix 	<ul style="list-style-type: none"> - A decreased level of uncertainty allows for long-term planning but with a diminishing reimbursement level

The general idea of a VBRP was appreciated among healthcare providers. The reimbursement programme was in theory aligned with their professional values. During the implementation, however, certain aspects did not turn out as expected, which caused confusion and uncertainty in how to act and respond. In Table 10, the findings are sorted based on the perceived regulative change the VBRP brought, and how normative and culture-cognitive pillars either supported or resisted these aspects.

The bundled payment

Due to the *increased financial responsibility* of post-discharge care (a regulative change), healthcare providers received *invoices of external care*, i.e. healthcare provided by other healthcare providers. Thus, the reality of elective spine surgery clinics changed because of the additional cost each patient caused them for post-discharge care, but also because of the additional information about healthcare consumption the invoices entailed. The bundled payment implied a new way of thinking about elective spine surgery. The idea of taking a greater responsibility for the care chain and increased cooperation among providers was supported by all three pillars.

What I think is the difference, when I look at other areas of patient choice, we have a more complete picture of the patient. Otherwise you only see the surgical procedure. So I think that is the major difference that you have a lot more patient responsibility for much longer. It also creates other routines; it creates another way of working. (C2)

A more holistic perspective on healthcare was aligned with professional values, thus the normative pillar of healthcare providers was aligned with

the incentives that arose with this aspect of VBRP. From a normative perspective, healthcare providers had to find strategies on how to handle this extended financial responsibility and the new information they received. Thus, they had to create new routines and new ways of working. It was challenging to find ways to cooperate with other healthcare providers; they struggled finding a strategy that was effective and would work in the long run. Thus, from a culture-cognitive perspective, a more holistic perspective was more or less forced upon them since they had to pay the additional cost of post-discharge care. However, how to act on these ideas was not obvious to healthcare providers. As mentioned in the background, confusion usually indicates a lack of support from the culture-cognitive pillar, especially relating to how better integrate physiotherapy and increase cooperation with external healthcare providers.

We've experienced that patients who have had minor surgery, that may not really be in need of much physiotherapy, go to a physiotherapist in town and then loads of invoices drop into our mailbox and we can't figure out how that happened. We don't really have any control of the situation. But the patients do have the right to consult a physiotherapist, and then the physiotherapist can bill us. (C1)

To know how to act they “must learn about the new contract and gain an understanding of it” (B7). Without a shared understanding they cannot find appropriate means of how to adapt their practice. Despite efforts to cooperate with external healthcare providers it was difficult to find solutions that would work in the long run. Representatives experienced the situation as rather hopeless, without any authority to impose sanctions if care, in their opinion, deviated from optimal medical practice.

And it can be frustrating if it is abused out there, that someone gets loads of mediocre unnecessary care, I don't think that's okay. So we can try to have a good dialogue with them, to write referrals and write some guidelines and such. (C3)

Since representatives experienced cooperation with other healthcare providers as difficult, they discussed a patient contract as a potential solution – by holding patients accountable for excessive rehabilitation.

But what we see is that the costs for physiotherapy are quite high because the patient still has a choice. We have no choice; we have signed this contract. The patient has a choice not to come here, where we already have the staff for that kind of activity. (B8)

Hence, this hopelessness resulted in new normative and culture-cognitive values that lacked regulative support. New normative and culture-cognitive

values should be taken into consideration by the purchaser when updating the reimbursement programme.

Table 10. The findings from the thematic analysis in relation to the neo-institutional pillars

Regulative	Normative	Culture-cognitive
The bundled payment		
Increased financial responsibility for post-discharge care.	(+) New identity, not only a spine surgery clinic. Must handle care-flows outside their clinic.	(+) A new way of thinking, requires creative solutions. No shared logic of action.
Invoices for external care.	(+) High financial impact, incentive to co-ordinate post-discharge care and discuss physiotherapy at a managerial level. (-) Reviewing and disputing invoices is time consuming for both administrative and clinical staff.	(-) Difficulties cooperating with other providers. It is beyond their conceptual world; do not have the right tools.
Information about post-discharge care.	(+) Increased focus on the relation between provider and patient resulted in better accessibility.	(-) The logic "the customer is always right" is not aligned with the professional logic and agency.
No authority to impose sanctions on other healthcare providers.	(-) Spine surgery clinics have no authority to sanction undesired behaviour.	(-) No constitutive schema.
Vague definition of related care in the responsibility for post-discharge care.	(-) Allows for different interpretation of related care. Unfair strategy by Region Stockholm, decreases trust between provider and purchaser. (+) Something Region Stockholm cannot sort out. As a provider of care, they are one of the best suited to solve the problem.	(-) Confusion. Long lead times on disputed invoices increase uncertainty and obstruct providers when developing new processes to handle post-surgery care. (-) Confusion because of vague definition of responsibility. (-) No constitutive schema or mental scripts
The performance-based payment		
Reimbursement based on patient-reported outcome measure one year after surgery.	(+) Aligned with professional values, no constraining effect on perceived autonomy.	(+) Perceived as an innovative step by the purchaser, proof that quality matters.
Healthcare providers only perceived the performance-based adjustment, not the full payment.	(-) The adjustment had no financial impact. Instead, providers focused on how to decrease post-discharge care that had a more direct impact.	(-) No difference with or without the performance-based payment; they were already working towards good outcomes. (-) Confusion caused by the lack of transparency in how the payment was calculated.
Healthcare providers did not receive information of how the payment was calculated for each patient.	(-) The performance-based payment was perceived as too complex. It was not worth the effort to understand it better.	
The continuous contract		
A continuous contract between provider and purchaser.	(+) The decreased uncertainty allows healthcare providers to make plans for the long term.	(+) Increased autonomy. Providers can design their own processes.
A set price without adjusting the price level in line with inflation	(+ -) Quality enhancing but the lack of adjustment makes providers uncertain about the purchaser's intentions.	(-) Healthcare providers still perceive Region Stockholm to put price before quality.
No restrictions on volume.	(+) The providers can assess patients without any restrictions; everyone in need should be treated.	(+) More information on which patients benefit from surgery is needed.
The importance of support and communication with the purchaser.	(+) More information, give control to providers to be able to follow-up on care.	(-) No constitutive schema to handle information.

The definition of what should be considered as related care is important since it affects the range of healthcare providers' responsibility, as well as whether infections should be included or not. Because of the vague definition, the responsibility could be perceived as both narrow and wide. Healthcare providers that adopted a narrower definition experienced invoices that pertained unrelated care as something unfair. It affected their

relations with the purchaser because they felt used and experienced it as an unfair strategy. On the other hand, healthcare providers that adopted a wider definition of related care had a more neutral perspective on the invoices from Region Stockholm. However, the experienced ambiguity resulted in healthcare providers not knowing how to design their processes, since they did not know to what extent they were responsible. The vague definition in the contract weakened the regulative pillar.

It is more this sense of justice, you have done your absolute best and sometimes you get hit, this penalty approach is not good. (D3)

Because healthcare providers did not know how to assess related care nor how to act on it, there was no support from the culture-cognitive nor the normative pillar to strengthen the regulative pillar. Hence, the vague definition weakened the institution by motivating different behaviours.

The performance-based payment

The idea of being reimbursed based on GA was supported by the normative pillar, since the financial incentive was related to an outcome that mattered to healthcare professionals and was developed by spine surgeons. It was also supported by the culture-cognitive pillar because representatives said that it gave the impression that quality mattered more to Region Stockholm than minimising the price.

I don't think we have different goals, rather that the financial goals are in line with the goal you have with the patient. (C2)

I agree with the idea – yes. But, then there's a lot that we don't really know so much about when it comes down to what matters when this performance-based payment is calculated. (A2)

However, representatives said that they lacked control and insight in how the payment was calculated, since they did not have access to the algorithm that was used to calculate it. This made it difficult to attain an understanding of what they could do to affect the performance-based payment. The support from the culture-cognitive pillar was weakened, since they did not receive enough information to get an idea of how they should act on it. In addition, the performance-based payment was perceived as too low in comparison to the bundled payment. Therefore, representatives claimed that it was not worth trying to figure out what affected the performance-based payment and whether it was correctly calculated. This indicates that the support from the normative pillar was weakened as well.

There is a certain idea behind it, you have to make sure that the bonus, that the quality bonus works. Because otherwise, if you only take a part of it and don't

care about the other part – then some can make as much money as they want while others can't. It's completely wrong! Why then, would you do all this, without doing that part right? There must be an incentive there. (A10)

The intended incentives to improve quality failed to have an impact on behaviour since it lacked support from the culture-cognitive pillar (they did not understand it) and the normative pillar (it was not worth understanding). Some representatives said the idea of the performance-based payment was to make it worth trying to find new ways of improving the outcome of patients with a lower probability of a successful result. However, with the current balance between the bundled payment and the performance-based payment, it was not worth it to put resources on how to improve performance, even though many patients are difficult to assess as to whether they will benefit from surgery or not. Thus, they lacked support from the culture-cognitive pillar since they do not know what affects the outcome of certain patients. Therefore, they could not find the right means of how to attain this result and thus lacked support from the normative pillar, since they did not know how to handle these patients. Some representatives worried that it may lead to a shift in case-mix towards healthier patients with a lower expected cost for post-discharge care.

The complication responsibility of post-discharge care feels much more concrete, that there we can do something and we know what we're doing. Whereas this performance-based payment, there we feel like we're just groping in the dark. (A6)

Since the bundled payment was perceived as more concrete, they received information of what care their patient had sought elsewhere and could develop strategies to handle it (even though they had not found a successful way yet). Because of the strong financial impact of the bundled payment, healthcare providers focused on how to minimise costs rather than maximising their outcome regarding the performance measure.

The continuous contract

The continuous contract, with no restriction regarding volume, was supported by all three pillars; it decreased uncertainty to healthcare providers and increased their autonomy.

Because of Patient Choice, we got more freedom to be able to decide ourselves what we think will be the best for the patient. That made us realise immediately that we must do something preoperatively and postoperatively. (A7)

The idea of a set price to promote competition based on quality was aligned with the normative and culture-cognitive pillars of healthcare providers. The recurring procurement process required a lot of resources from

healthcare providers when new contracts were decided upon. It also brought uncertainty and difficulties planning for a longer time perspective. According to some representatives, the procurement allowed for unserious providers to enter the market through low bidding, i.e. providing care at a very low price.

I've been involved in quite a few procurements and in the end it's only the price that matters. And there are many actors who are not serious, who don't take on the most difficult or weighty procedures, more difficult patients and put in really low bids during the procurement process. A serious clinic can't practise under those circumstances. (A1)

However, representatives experienced that the lack of adjustment of the price level in line with inflation was undercutting quality and the existence of their practice. As one representative (B7) put it "they squeeze every penny out of us, making it really hard for us to survive as a business". This caused normative resistance because representatives experienced it as unfair and it seemed like Region Stockholm still put price before quality despite the value-based reimbursement. Representatives did also express concern regarding research and education, which becomes even more difficult to afford when the price level increases every year but not the reimbursement.

Paper IV: Centrality and compatibility of institutional logics when introducing value-based reimbursement

In the fourth and final paper we analysed how the centrality and compatibility of identified logics within healthcare organisations affect the institutionalisation of external demands.

The identified logics are presented in Table 11. External demands affected existing institutional logics within healthcare providing organisations differently, depending on the managerial and spine surgeon logic. In our material we found evidence of how the centrality and compatibility of logics changed after the introduction of the VBRP, see Table 11.

The regulative pillar

Even though the commissioning contract entailed incentives for an interdisciplinary holistic care, how it was perceived within the healthcare organisations was often buffered through management. Managers, spine surgeons and administrators were more informed about the commissioning

contract and the reimbursement programme. The extent to which physiotherapists and nurses were informed depended on how much management and spine surgeons involved or informed them. Spine surgeons, management and administrators had more or less the same idea of what the new commissioning contract actually entailed. Due to the buffering of information, physiotherapists and nurses perceived the new contract differently. From the perspective of administrators, the new reimbursement programme entailed more manual auditing in order to assess invoices from Region Stockholm and medical records to assess if the care they were billed for was related to spine surgery or not.

Table 11. Institutional aspects brought up by the five actor groups based on the regulative, normative and culture-cognitive pillars.

	Regulative	Normative	Culture-cognitive
Managers	Increased financial responsibility generated information about post-discharge care. Management may have additional external demands to take into account, affecting the response to the new commissioning contract.	Strong incentives to minimise post-discharge care. Views on how to involve other professions differed. Highly influenced by spine surgeons' perception. Crucial, with a good dialogue with the commissioning organisation.	The VBRP imposed a holistic perspective on healthcare, which managers embraced differently. Time to comprehend and understand the new contract is important in finding strategies when adapting the business.
Spine surgeons	Increased financial responsibility generated information about post-discharge care.	The significance of involving other healthcare professionals in spine surgery was debated and whether post-discharge care should be their responsibility.	Broaden their perspective to see the entire care chain instead of only the surgical procedure.
Physiotherapists	Information about the VBRP was buffered through management and spine surgeons.	In conflict with their morals when physiotherapy was seen as a cost that should be minimised rather than a quality aspect.	Difficult for physiotherapist to find their way of contributing when the focus was on how to facilitate spine surgery.
Nurses	Less informed about the new regulative framework. Some received new tasks to ease the workload of surgeons to increase efficiency.	It was unfortunate that quality aspects within nursing had to suffer in order to better facilitate surgeons. Taking responsibility for quality aspects within nursing requires air in the system to allow reflection and quality assessment.	Nurses were responsible for providing adequate care from a nursing perspective but functioned also as a facilitator for spine surgery. The introduction of the VBRP refined the role of nurses to focus more on one of the two aspects.
Administrators	The VBRP entailed more manual auditing when assessing invoices and medical records.	Increased workload that also made administrators dependent on surgeons. However, the positive attitude from spine surgeons made the workload acceptable.	Impossible to do their work without supporting infrastructure.

The normative pillar

Management struggled with how to adapt to the more interdisciplinary care that the new commissioning contract entailed. With the extended financial responsibility for post-discharge care, they realised that physiotherapy had to be managed. How it was to be managed was not that clear.

Spine surgeons expressed different opinions in how much other professions should be involved in the spine surgery practice. Some said that since they are the ones that are specialised in spine surgery, they must focus on how to perform as many surgeries as possible. Therefore others must/should facilitate them in accomplishing that. Others said that the new reimbursement programme gave them incentive to focus more on what, in addition to surgery, they could do to minimise post-discharge care and also maximise the outcome one year after surgery.

Physiotherapists expressed that their role was either to maximise the outcome of the surgery by providing an optimal level of physiotherapy, or to minimise the amount of physiotherapy after surgery. Relative to external physiotherapists, the former stressed the importance of communication and to agree upon an optimal rehabilitation programme, whereas the latter stressed that patients in general should not consult external physiotherapists. Physiotherapists that said that patients were in general not to be recommended physiotherapy after discharge struggled, since it was motivated by financial incentives rather than professional.

Nurses experienced that they either had to take over tasks that were previously performed by surgeons in order to better facilitate them, or take more responsibility for quality aspects within nursing that could improve the outcome even further.

Administrators experienced an increased workload due to the manual auditing of invoices and reimbursement from Region Stockholm. They also needed the help from spine surgeons to assess medical records. However, spine surgeons had a positive attitude to the new contract despite the increased manual workload, which made it acceptable.

The culture-cognitive pillar

Managers were involved to a differing degree in the design of the new commissioning contract and reimbursement programme. Hence, they were prepared for the more extensive responsibility to varying degrees. They stressed the fact that it took time to understand the new contract. The first

step was to make sure everything was correct administratively to ensure reimbursement. When that was done, they could start thinking of how to adapt their practice to the extensive (financial) responsibility for post-discharge care.

Spine surgeons' perception of their role as a spine surgeon could be related to what they considered to be the mission of the spine surgery clinic. Some said that their mission was to perform surgery on the patients that had clear indications for surgery, more like a factory where they are specialists on spine surgery. Others said that it was their role to guide patients with back problems, especially since it is not always that easy to determine who will benefit from surgery and who will not. Hence, the perception of their role as a spine surgeon depended on how they viewed their role in their healthcare system.

Physiotherapists that were encouraged by managers and spine surgeons felt that they could contribute in the search for an optimal treatment for patients with low back pain and also took a professional pride in their job. Physiotherapists that were told to minimise physiotherapy, on the other hand, found it difficult to know in what way they could contribute to a better outcome, and felt that this was not aligned with their professional values.

With the introduction of the VBRP, the role of *nurses* was refined to focus more on facilitating spine surgery, or how to develop and improve the care process from a nursing perspective. Hence, nurses experienced their role to be either a facilitator of spine surgery or as a member of a team aiming to improve healthcare for patients with back problems.

From a culture-cognitive dimension, *administrators* were very dependent on the infrastructure of the IT systems. They had less control after the introduction of the VBRP since they had no ability to control the adjustments of the reimbursement. They were also dependent on the surgeon's medical knowledge when assessing clinical records to determine whether they were correctly billed or not.

The centrality and compatibility of identified logics

The centrality and compatibility of the identified logics are presented in Table 12. Before the VBRP, the managerial and spine surgery logic was dominating and physiotherapist and nursing logics were peripheral. The compatibility was high because it was obvious that other professions were

there to facilitate spine surgery. Physiotherapists and nurses took care of patients during their hospitalisation. After discharge, the patient was not the responsibility of the clinic anymore (except during follow-up that some patients were offered over the phone, or a physical meeting with the surgeon). Spine surgeons know how to perform surgeries; it was only surgery that generated reimbursement. Hence, spine surgeon logic becomes the dominating logic. Spine surgeons, managers and administrators were needed to generate reimbursement.

Table 12. Centrality and compatibility of identified institutional logics among actor groups within healthcare providers in elective spine surgery

Group	Centrality	Compatibility
Managers	High Managers were an essential link to receive reimbursement and facilitate provision of healthcare.	High and low Managers had strong impact on other actor groups but were highly influenced by spine surgeons. Neglecting quality aspects of peripheral logics could cause contestation and estrangement.
Spine surgeons	High Spine surgeons had the knowledge of how to perform the surgeries that generated reimbursement. They were also crucial to assess invoices after the introduction of the VBRP.	High and low The spine surgeon logic had strong influence on other logics within the organisation. Following VBRP, the dominance of the spine surgery logic was challenged by other logics. If spine surgeons were unwilling to allow higher centrality for other logics, the compatibility decreased and the balance between logics was estranged.
Physiotherapists	High and low Peripheral in facilitating spine surgery. Central to improve back problems and minimising cost of post-discharge care.	High and low If physiotherapists experienced support from managers and/or spine surgeons, the logics attained high compatibility. If physiotherapists experienced that quality aspects were neglected, the compatibility was low.
Nurses	Low Nurses cared for patients before and after surgery. Nurses facilitated surgeons by taking over tasks previously performed by surgeons.	High Having a supportive function in facilitating spine surgeons and contributing with a nursing perspective. Following VBRP, the role of nurses was refined with a more clear focus on one of these aspects.
Administrators	High Crucial in receiving reimbursement by sending correct information to the commissioning organisation, and assessing invoices.	High Having a supportive function in facilitating provision of healthcare.

After the introduction of the VBRP, the financial responsibility of healthcare providers increased to one year. Due to the extended cost responsibility, managers and spine surgeons became aware of healthcare utilisation in post-discharge care. Hence, the surgical procedure is only a part of the full care chain. In order to address additional costs, other logics can come in handy to minimise the need for post-discharge care. The idea of the performance-based payment giving incentives to further investigate how GA can be improved one year after surgery failed to have any effect,

since the adjustment was too low in relation to the bundled payment with potential invoices.

The dominating logics can allow higher centrality for peripheral logics

The spine surgery logic was dominant, and other logics existed in the periphery. The fact that almost all professional groups expressed that the clinic had to perform more surgeries in order to receive enough reimbursement, shows the centrality of the managerial logic. Spine surgeons and managers had a strong influence on the organisation. Hence, physiotherapy and nursing logics had a more supporting and facilitating function. This enabled the peripheral logics to be assimilated with the core logic.

Since we as physicians are the engines, the clinic needs to be managed by physicians. Because we know exactly what the problems are, when they arise and everything around it. But you see, that has not been the case. Instead we have a bunch of nurses who are manager trained in different ways and then you kind of live in different worlds. (S4)

Unfortunately this is how it has been, it is my private opinion, but it is no use having a medical organisation run by nurses who are to be managers. It usually doesn't work. Now she is a nurse, but in a completely different way. She includes us in the decision making process and involves us. Because she has realised that it must be that way. (S4)

They [physiotherapists] are not surgeons and this is a purely surgical business. (S3)

The three quotes reflect that some spine surgeons think that other professions seem to lack a true understanding of a spine surgery clinic. However, if the non-physician manager invites the surgeons in the decision making process, it could work. In the same fashion, managers that were not surgeons trusted the opinion of spine surgeons. Despite administrative problems and difficulties in adapting to the STHLM-VBRP, the spine surgeons had a positive attitude that was reassuring.

But I thought that the spine surgeons felt that, they have developed a Patient Choice here that was thought through with a good introduction. (M7)

The centrality of physiotherapy increased when physiotherapy brought additional costs to the healthcare provider; hence the expertise of physiotherapists was required to construct strategies in how to handle these costs. This is also an example of the centrality of the managerial logic; medical aspects receive attention when they cause additional costs. It should be noted however that some managers and spine surgeons meant that they

saw the potential of including other logics before the introduction of the VBRP.

A higher centrality for peripheral logics

The introduction of the VBRP reinforced a more holistic perspective, and physiotherapy reached a more central position due to the high costs for post-discharge care. Thus, the centrality of physiotherapy increased. However, this did not automatically mean a high compatibility.

I think the surgeons have done a great job of demolishing these hierarchical blocks that I experience that major hospitals have had. There is always an open door, high ceilings, we can vent and discuss with them. (P2)

We have received several of those invoices from Region Stockholm, the costs of physiotherapy. So from a business point of view I think there has probably been a certain increased understanding of this, that physiotherapy exists as well and that this is something that needs to exist and to be included in the budget. (P3)

The centrality of previously peripheral logics increased when managers and spine surgeons acknowledged the importance of other logics in spine surgery care. Logics of physiotherapists and nurses reached a higher centrality when managers and spine surgeons invited them to attain a more central role in how to take care of patients with low back pain, both before and after surgery.

The compatibility decreased if managers thought that the use of physiotherapy and nursing should be minimised in order to decrease costs. Both nurses and physiotherapists experienced that quality aspects of physiotherapy were neglected to better facilitate the ability of spine surgeons to perform surgery.

We have provided a very high level of nursing and had the space to give that little extra. Not that we don't give the patient adequate care now, because we do. But that little extra, sometimes you don't have time for it anymore, unfortunately. [...] That you take some extra walks, you go with them to the dining room, that you sit down and talk for a longer time. These are small things, it does not have any effect but it affects the patient mentally, so to speak. (N7)

It's difficult because we, our efforts, do not cause the patient to live or die, so to speak. So that there are no such efforts that are vital in that way, but on the other hand there are quality aspects related to our licence as a physiotherapist. (P3)

Nurses had a supportive function in facilitating spine surgeons and contributing with a nursing perspective. Following VBRP, the role of nurses was refined with a more clear focus on one of these aspects. It caused moral

dilemmas among physiotherapists and paved the way for growing discontent, since their logic was neglected. If information about the contract was buffered through management, and spine surgery was dominating, this only caused a modest conflict. However, it caused ethical stress among physiotherapists.

I feel really sad about it and I think it's pretty difficult to work that way. It would be nice to have an understanding of why I say it ... I do as I'm told but that doesn't always feel that good. (P4)

If information was not buffered, physiotherapists realised the increased centrality of physiotherapy, but also that they would have to fight for their professional values. Hence, physiotherapists contested spine surgeons' dominating logic and the compatibility decreased initially.

Yes, the thinking in any case, that it would be good to offer it [physiotherapy] and why it would be good and things like that. And that you try to assess patients from an interprofessional perspective and value that higher I definitely think, but there is not enough time for that sort of collaboration right now. (P3)

However, with time, the compatibility increased when the different professions built new mental frameworks on how to cooperate. This led to moving from being a dominated organisation, to a contested and after some years to approaching being an aligned organisation.

DISCUSSION

Based on the results of the four studies, the promises and pitfalls of value-based reimbursement are discussed below. The promises and pitfalls can be an effect of the characteristics of the reimbursement programme, but also an effect of the characteristics of the context within which the reimbursement programme was implemented. Hence, the discussion focuses on both the structure of the reimbursement programme and contextual aspects.

Promises

+Higher effectiveness and value

The average episode cost of surgically treated patients decreased with 8 per cent after the introduction of STHLM-VBRP, without affecting patient-reported outcome measures (PROM). Thus, to the third party payer, elective spine surgery was more effective after the introduction of the value-based reimbursement programme (VBRP). The lack of effect on outcome measures and decreased costs were in general concordant with other studies on value-based reimbursement programmes, bundled payment or pay-for-performance programmes (Agarwal et al., 2020; Eijkenaar et al., 2013; Roland & Guthrie, 2016; Scott et al., 2018). A multicentre observational study found that the cost for treating patients undergoing lumbar fusion decreased after introducing bundled payment (Martin et al., 2018). On the other hand, other studies on bundled payment in spine surgery have reported lack of effect but also increased costs; however, they also observed a more complex patient mix after the introduction of the programme (Bronson et al., 2019; Jubelt et al., 2017).

The total cost increased by 11 per cent due to a 22 per cent increase of surgically treated patients, hence more patients experience an improvement in HRQoL due to surgery. The incremental cost-effectiveness ratio of VBRP amounted to €13 700/QALY. After the introduction of the VBRP, each € generated a higher effect. Thus, value as defined by Porter (Porter 2010) increased after the introduction of the VBRP.

+Promotes holistic healthcare

A potential explanation for the decrease in care-episode cost could be better coordinated care due to the increased financial responsibility of

healthcare providers, thus avoiding unnecessary care. The bundled payment imposed strong financial incentives, thus making it crucial for all healthcare providers to assess the whole care chain of their patients. Due to the responsibility, healthcare providers became more prone to strive for optimal healthcare consumption also outside of their own clinic. Similar findings have been reported in other studies, where bundled payment reduced healthcare use and costs (Agarwal et al., 2020; Wohlin et al., 2021). With STHLM-VBRP, Region Stockholm moves towards integrated care with patient-centeredness and a greater responsibility to healthcare providers, in line with value-based healthcare (VBHC), according to Porter (Porter, 2008). However, decreased healthcare consumption may also raise concerns as to whether patients still receive adequate care after surgery. However, as presented in Paper I, we found no evidence of negative effects on PROM after the introduction of the VBRP.

Findings from Paper III also showed that healthcare providers actively worked for better communication and collaboration with other healthcare providers. In Paper III, representatives of healthcare providers expressed that they had to put a lot of effort into establishing communication and collaboration with other healthcare providers, such as primary care centres and physiotherapists, but also other spine surgery clinics and hospitals. To speed up the referral process from primary care, representatives said that the specialist clinic offered to pay for the scan to get it done. Another reason for them to provide this service to primary care centres was to ensure an inflow of patients due to increased competition after the fourth healthcare provider had entered the market. In Paper IV, representatives expressed that spine surgeons had an important role in order to demolish the hierarchical structure.

+A continuous contract

The transition from periodic re-contracting to a continuous commissioning contract decreased uncertainty about the future and allowed healthcare providers to make long-term plans. With LOU, healthcare providers were only permitted to perform a certain amount of surgeries each year. This means that if a patient would prefer to be treated by a certain healthcare provider, the patient may need to wait for a longer time since the provider is only allowed a certain amount of surgeries each year. Thus, by removing the limitation regarding the number of surgeries, a continuous contract facilitates the right for patients to choose the healthcare provider they prefer. The free establishment of healthcare providers did lead to increased competition for four years. One of the healthcare providers terminated the commissioning contract with Region Stockholm and stopped providing care from 2021. According to their web page the reason behind the decision was

a strained financial situation and tough competition for patients (Aleris, 2020).

+Increased financial responsibility increases the understanding of patients healthcare utilisation

A value-based reimbursement can facilitate the transition to a holistic perspective of healthcare by providing information of healthcare consumed by patients elsewhere after they have been surgically treated. To attain a holistic perspective of healthcare it is important to have an understanding of different professions and their logics. With information about additional cost for post-discharge care, input from other professions could be crucial to better handle this cost.

A concern regarding the choice reform was that it would increase the gap between social groups regarding access and healthcare utilization unless it was coupled with need-based allocation of resources but also an empowerment of the groups at risk (Burström, 2009). The STHLM-VBRP includes an individual adjustment of the reimbursement to promote a need-based allocation of resources to healthcare providers, so that the reimbursement reflects the resource consumption. Based on Paper I, there was no indication of discrimination against vulnerable groups. However, healthcare providers were also eager to get in contact with primary care physicians in order to sort out patients that would be in need of surgery as early as possible to prevent further deterioration. Hence, this could be seen as a way to empower these groups that normally would not benefit as much from a free choice.

+A better understanding of patients' needs with more information

The information healthcare providers received due to the invoices of post-discharge care allowed for a better understanding of their patients' needs. It was however difficult how they should assess this information and how to act on it. Some came to the conclusion that the spine surgery clinics must establish a good relationship with the patient before the surgery to increase the chance of the patient returning to the practice for post-discharge care and rehabilitation.

+Healthcare providers better suited to design an optimal care chain

Even though there were mixed opinions regarding what should be defined as "related care", healthcare providers agreed that they were probably best suited to optimise the care chain. For example, representatives said that

the high cost of physiotherapy was all of a sudden visible to them. A cost that the commissioning organisation previously had paid for, but now was shifted onto the spine surgery clinics. To be able to assess what physiotherapy that had been provided by an external healthcare provider, better procedures of how to register diagnosis and procedure performed is needed.

+Involvement of the healthcare profession in the design of the programme

Spine surgeons were included in the design of the STHLM-VBRP. The positive mind-set among spine surgeons seemed to be an important aspect for other professional groups to accept the transition to the VBRP and the increased administrative burden. However, physiotherapists experienced that it was evident that no physiotherapist had been involved in the design process – something they thought would have made the holistic perspective easier to adapt to.

+Sheds light on the importance of other perspectives when treating a patient

Paper IV showed that the different professional groups within a healthcare-providing organisation had different institutional logics. Thus, for a policy reformation to be successful, these different logics need to be taken into account. It is also important to acknowledge the importance of managers, who can dampen and modify external demands (Ellegard & Glennard, 2019). Some of the spine surgery clinics used interdisciplinary teams to assess patients before the VBRP was introduced. After the introduction, several clinics said that they were looking for similar solutions. Thus, a form of isomorphism seems to take place where the organisations are pressured to assume a certain form that is best adapted to survive a particular environment (Hannan & Freeman, 1977). With the invoices of physiotherapy, it became evident for management and spine surgeons that patients consumed physiotherapy after being surgically treated. As an effect, more attention was paid to what could be done with physiotherapy before and after surgery. The development of more holistic care requires shared understanding of the process amongst co-workers. Establishing understanding requires leadership skills such as communication with, and motivation of, involved staff (Nilsson & Sandoff, 2015).

+Payment based on performance rather than process measures is encouraging

The performance-based payment has been criticised as having a negative impact on some aspects of medical professionalism (Kuhn, 2003). Participants were positive as to the performance-based payment because it did not “force” them to focus on irrelevant outcome measures. In a paper from

1987, Dranove and White elaborated the possibilities of a “pay-only-if-cured contracts”, where patients would only have to pay for the healthcare provided if they were cured. They argue that the risk would be too high for physicians but also that it would pave way for disputes regarding definitions of when a patient is cured and the initial diagnostic. They add however, that “if accurate objective measures of need and outcome can be developed” this kind of contracts could actually work (Dranove & White, 1987). Further, they mean that it would be possible to imagine “money-back guarantees” for certain procedures that are easy to standardise. When comparing their thoughts from almost 35 years ago, the design is very similar to the STHLM-VBRP. In theory, the performance-based payment would weigh up the increased risk with an extra bonus if the performance turned out better than expected. The fact that the payment is based on historical data puts focus on improving those patients that tend to have worse outcome one year after surgery. A patient that on average is free from pain one year after surgery is an easy patient to treat and would therefore not generate much in bonus. Patients that are worse off (“no change” or “slightly better”) on the other hand, would be beneficial to improve. However, it was difficult for the spine surgery clinics to improve the outcome. Especially since the healthcare providers received no information about the patient’s expected pain reduction.

Based on the findings from the interviews, representatives were positive towards use of PROM that was measured one year after surgery, since it was not until then that it would show whether the result was sustainable or not. The STHLM-VBRP is unique due to the extended financial responsibility of one year, it is more common with an extended responsibility and measure performance after 30 days (Ryan, 2018; Ugiliweneza et al., 2014) or sometimes 90 days (Bronson et al., 2019; Jubelt et al., 2017; Martin et al., 2018).

+Sheds light on the importance of the relationship between healthcare provider and patient

Holding healthcare providers accountable for costs of post-discharge care, it is possible for healthcare providers to assess whether they consider the healthcare consumed to be reasonable or not. Based on the Paper III and Paper IV respondents said that they were struggling to inform patients of for example optimal rehabilitation programmes. Representatives of healthcare providers said that it was not always easy to make patients act in line with the recommendations.

Pitfalls

-Buffering and decoupling

By using Scott's framework of institutional pillars we were able to identify different aspects of institutions. From a regulative perspective it was evident that not everyone was informed about the regulative changes, since information was "buffered" through management. This has previously been shown to affect whether healthcare providers adapt to regulative changes (Ellegard & Glenngard, 2019). Furthermore, it was also clear that management had other demands to take into account, which was evident when quality aspects of physiotherapy were neglected. Thus incentives to minimise post-discharge care were too strong. The structure put more emphasis on the surgical procedure rather than other activities that potentially could enhance the outcome. Findings also showed evidence of "decoupling", as some managers accepted a higher cost for post-discharge care rather than adjusting their practice. Thus, healthcare professionals must be committed to change behaviour for a successful implementation (Weiner, 2009).

- External healthcare providers lack incentive to collaborate

Participants in our study experienced a need for better cooperation with other healthcare providers. It was, however, difficult to establish, basically because there was no incentive for other healthcare providers to put resources into communicating and collaborating with the spine surgery clinics. Similar findings were reported in a study that investigated the effects of introducing VBHC in another Swedish region (Nilsson et al., 2017). They found that the introduction of VBHC raised awareness about cooperation being necessary to create value for patients. The introduction of VBHC increased cooperation within the hospital, but it was difficult to establish cooperation with external healthcare providers. In the case of STHLM-VBRP, the private healthcare providers experienced difficulties in making other providers cooperate when there was no corresponding incentive for external providers. Thus, insufficient organisational structure of healthcare hinders structural changes (Sheard et al., 2017). The difficulty in establishing cooperation reflected how healthcare providers did not have cognitive schemas of how to coordinate post-discharge care, nor how to act on the information they received from the invoices of external care and rehabilitation. Better dialogue between purchaser and providers in combination with compatible and agile IT systems may enhance cooperation. The purchaser has to facilitate cooperation between healthcare providers to make

the cost of cooperation as low as possible. The struggle of healthcare providers does, on the other hand, show that patients have a free choice to choose whomever they prefer.

- The relative balance between the bundled payment and the performance-based payment

A performance-based payment can serve as a complement to a bundled payment to prevent healthcare providers from stinting on necessary care. Healthcare providers only observed the adjustment part of the performance-based payment. Thus, the full performance-based payment was not observed by the healthcare providers, which might contribute to the fact that it had no overall effect. Healthcare providers cannot perceive the full size of the performance-based payment, since it is included in the prospective payment; they only perceive the adjustment, if the actual outcome deviates from the expected. The reason that the expected performance-based payment was included in the prospective payment was that it was considered indefensible to withhold as much as 10 per cent of the total payment for a whole year. However, not withholding the money weakens the strength of the incentive tied to the performance-based payment, since the providers do not perceive the full performance-based payment, especially since the P4P adjustment was considered neglectable in comparison to the bundled payment and the increased financial responsibility.

Representatives in our study found that their focus on financial aspects had increased with the STHLM-VBRP, compared to before. A potential explanation can be the unbalanced incentive structure between the bundled payment and the performance-based payment. Thus, healthcare providers focused on minimising post-discharge care instead of maximising quality/PROM, contrary to other studies where VBHC decreased the focus on financial aspects (Nilsson et al., 2017).

- Not strong enough financial incentives for research to improve GA

The lack of effect on targeted or non-targeted outcome measures is in line with previously published results (Eijkenaar et al., 2013; Finkelstein et al., 2018; Mullen et al., 2010; Scott et al., 2018; Steel & Willems, 2010). Nonetheless, it is important to discuss the lack of effect and how this relates to the incentive structure imposed by the reimbursement programme (Damberg et al., 2014; Dudley et al., 2004). One explanation could be that the performance-based payment was too low compared to the bundled payment. Or in this case, the *perceived* adjustment of the performance-based payment. Based on the result in Paper I (supplementary material), healthcare providers perceived the performance-based payment as ± 3 per

cent on average. Another aspect could be that it takes time to adapt the practice to this new type of reimbursement programme. Further, using historical data as comparison at the individual level is quite a conservative measurement. On average, healthcare providers may already perform to the best level possible, but the challenge may be to identify those patients with an expected worse outcome and find ways to improve them. Today it can be difficult to know who will benefit from surgery and who will not. Due to the long follow-up period, it takes a long time before the result of a new method of treating patients makes any difference or not. A long-term strategy is needed to follow-up on new methods in how to treat patients with low back pain.

- Lack of transparency in how the value-based payment is calculated

One explanation for the lack of effect on PROM could be that the intended incentives of the performance-based payment did not turn out as expected. According to the contract, the performance-based payment was supposed to be 10 per cent of the prospective payment; however, since it was paid as a lump sum together with the bundled payment, healthcare providers were not able to distinguish the performance-based payment from the bundled payment. A majority of the patients (68 per cent) did not generate any adjustment of the performance-based payment. As in the data we retrieved from Region Stockholm, we were only able to see the adjustments of the performance-based payment. The lack of transparency and financial impact made the performance-based payment too complex to understand and follow-up. Without an understanding of how the performance-based payment is affected, providers lack the information needed for learning and improving, which is crucial for innovations in care (Porter 2010). Research has shown that audit and feedback generally leads to small but potentially important improvements within healthcare (Ivers et al., 2012). Further, research has shown that external audit and feedback can increase the “know-what” and “know-why” types of knowledge which may impact behavioural changes among healthcare providers (Glenngård & Anell, 2021). This is the kind of knowledge that is related to the culture-cognitive pillar. Due to the lack of this kind of feedback regarding the performance-based payment, healthcare providers did not know what to do to effect the payment and focused on minimizing post-discharge care instead, where the feedback through invoices was clear.

Based on the findings in Paper I, the financial incentive of the performance-based payment was primarily focused on avoiding negative outcomes rather than incentivising positive outcomes. Thus, the financial incentives associated with the performance-based payment was more of a whip than a

carrot for the healthcare providers. This incentive structure makes it even more important for healthcare providers to come to an understanding with which patients actually benefit from a surgery and which patients do not. However, the perceived performance-based adjustment was too low to be meaningful to healthcare providers.

-The free choice to choose healthcare provider

The patients do not face the actual cost of their healthcare consumption. Representatives among healthcare providers expressed the need of some kind of patient contract to ensure that patients stick to the plan and do not over- or under consume healthcare. In the USA, different campaigns have been implemented to better inform patients about potential treatments and diagnostic tests to make patients question the reasonability of performing them (Born & Levinson, 2018). Compared to healthcare, physiotherapy is not as strictly regulated when it comes to registering diagnosis and procedures. This makes it difficult to assess the actual necessity of provided rehabilitation. Physiotherapists at the spine surgery clinics expressed this to be frustrating, since they were worried that too much physiotherapy would be consumed and it is not easy to distinguish necessary from unnecessary physiotherapy based on invoices.

In order to make a choice, patients would need information but also be able to interpret and assess the information that is provided. However, studies have shown that patients do not tend to act on the information that are presented to them regarding for example the quality of outcomes by individual surgeons (Hibbard et al., 2003). On the other hand, the same information can be used by healthcare providers to improve their performance in relation to other healthcare providers because of professional pride (Le Grand, 2007).

-The hierarchical context

Not all occupational groups experienced the intended incentives within the reimbursement programme. In most countries, healthcare is organised based on the specialty of the physicians. Our findings show that this structure may hamper the transition to more integrated care. The mission for healthcare providers is often based on the specialisation of the physician. It is natural that other logics are peripheral because they are there to assist/facilitate the physicians to perform/accomplish their mission. As one nurse said, what they as nurses do for patients “does not have any effect, but it affects the patient mentally” (N7). This quote implies that 1) the work of nurses is not as important as what the spine surgeons do, therefore 2) they can take over tasks that spine surgeons do not have time for at the

expense of quality aspects within their profession, 3) that the mental part is not as important as the physical part. When using bundled payment, there is a risk that healthcare providers focus on activities that generate payment and try to minimise activities that do not, especially if one logic is dominating the organisation. In order to receive money, a spine surgery clinic needs someone to establish a contract with the commissioning organisation, someone that performs the surgery and someone that registers the procedures in the correct way to generate reimbursement. Even though other professions are needed in the care of the patient, they are not needed to generate additional reimbursement. The transition from a physician-dominated logic to an interdisciplinary logic may be difficult if the organisation is a “hostage to [its] own history” (Selznick, 1992). The VBRP challenged this structure, forcing healthcare providers to “think outside the box”. One logic that dominates the organisation may be appropriate when, for example, patient outcomes depended on a single surgeon’s operating skill, but are less functional when the outcomes depend on the effective collaboration of a clinical team (Kellogg, 2011). Research has also shown that outcome measures defined by healthcare professionals, do not always align with the outcome measures that patients would prefer (Tistad et al., 2012). This highlights the importance of not only involving concerned healthcare professionals, but also patient representatives in the design of VBRP.

-The third party payer lack control of volume

This is not necessarily a pitfall. The number of surgically treated patients increased with STHLM-VBRP. A potential explanation is the removal of the volume restriction that private healthcare providers were facing before VBRP was introduced, meaning that the increase was caused by a previously unmet demand. The lost control over the volume in elective spine surgery should be evaluated to come to an understanding of whether the increase was a previously unmet demand or if there has been a shift in indication for surgery due to incentives for increased production. When more patients were surgically treated, more health related quality of life was generated on an aggregated level.

The question the commissioning organisation needs to ask is whether they are willing to accept a cost of €13 700 per QALY as an effect of the increased volume. Scarce resources within healthcare put decision makers in difficult positions, yet the decision needs to be made. Health economic evaluation can contribute with important information to shed light on the opportunity cost that comes with a specific decision. However, no matter if we present the result as a traditional ICER or put health against health, the decision maker needs to decide whether they think it is worth it or not. In economics, we are taught from the very first day that there is no such thing as a free

lunch, and to acknowledge that everything comes with an opportunity cost, since we do not have an infinite amount of resources such as time and money. This can be related to Oscar Wilde's definition of a cynic: people who know the price of everything and the value of nothing. Thus, the focus on costs and opportunity costs makes us almost forget the effect (the value) we receive in return. And this is of particular importance in decisions regarding public resources, for even though it costs, it can still be worth it. Because even though "there ain't no such thing as a free lunch", the lunch can still be worth it. Health economic evaluation provides a structured way of comparing different alternatives. As an economist we can put the cost in relation to other alternatives in a structured way, to facilitate an informed decision. However, it is important that everyone pay attention to what other alternatives there are. And with that in mind, a decision has to be made whether something is worth it or not.

-No magical solution, it requires commitment from both regional health authority and healthcare providers

The general opinion regarding the VBRP was positive among the healthcare providers. There was a sense, however, of a rising discontent with non-adjusted reimbursement levels. Thus, follow-up from regional authority is important, especially during implementation or if a new healthcare provider is accredited. A continuous contract requires relevant feedback from the purchaser at the right time, especially during implementation. Quality improvement requires ongoing feedback at all stages and that everyone involved is aware of the complexity of changing the culture of the organisation (Nilsson et al., 2017). Paper III showed that the slow feedback from Region Stockholm caused frustration among healthcare providers. It made it more difficult for them to adjust to the new structure. A commissioning contract is open to interpretation (such as the definition of related care). Hence, until there is a common understanding of how to interpret the commissioning contract, the commissioning organisation must provide feedback to healthcare providers. This highlights the importance of good communication and supporting IT systems. Thus, the relationship between purchaser and provider is essential. It has been shown that the procurement competence among regional authorities with a big share of private healthcare providers has developed further compared to those regional authorities with few private healthcare providers (Karlberg, 2011).

Methodological discussion

The choice of methods have methodological implications which will be discussed in the following section.

The use of mixed methods, by combining the result of quantitative and qualitative methods, allowed for comparison of the outcome of the reimbursement programme with the representative's perception of it. Representatives experienced the performance-based payment as too complex because it lacked transparency and they had no way to control it. The STHLM-VBRP was promoted as a patient choice with a value-based reimbursement based on PROM. However, the payment related to PROM was ignored by healthcare providers. Without adequate IT systems, this kind of reimbursement is too complex, even though the idea is aligned with professional values.

In the dataset used, it was not possible to distinguish patients referred to a specialist that were not surgically treated. Hence, we cannot rule out that cherry picking, or a shift in indications occurred in that part of the care chain. The indications for surgery within elective spine surgery are sometimes vague and highly debated. Some surgical procedures only have a modestly better effect but are more costly and carry a greater risk of adverse events than non-surgical management (Dietz et al., 2019; Foster et al., 2018). Vague indications might lead to an increased procedural volume of spine surgery without regard to quality, and thus drive cost and diminish the value of spine care (Hills et al., 2019; Kazberouk et al., 2016; Sullivan et al., 2017). Potentially, VBRPs can weed out providers delivering high quantity/low value care and ultimately reward those who are delivering superior outcomes (Hills et al., 2019). In future research it would be of interest to perform subgroup analysis based on diagnosis and surgical procedure. The majority of patients were diagnosed with disc herniation or spinal stenosis treated with discectomy and decompression respectively.

Similar to other studies (Bronson et al., 2019; Jubelt et al., 2017), Paper I and Paper II indicated a more complex patient mix after the introduction of the STHLM-VBRP. Therefore, it would be of interest to adjust the result for case mix, to make costs and PROM more comparable between the two periods. As this thesis shows, a VBRP can reduce the average cost of elective spine surgery, thus indicating a more efficient care. In order to analyse the effects of a reimbursement programme on health, patient composition and care utilization adjusted for socio-economic factors, it is important with long-term followed up. For future research, it would be interesting with a longer follow up period. It would then be possible to analyse the effects of the new reimbursement programme that appears when the initial turbulence has subsided. Another aspect to further investigate is whether a VBRP affects on what indication patients are selected for surgery by analysing medical and socioeconomic characteristics of patients that are selected for surgery, compared to those that are not selected, and to what extent the

reimbursement programme affects this selection. Future research should also focus on the different categories in the STHLM-VBRP by comparing cost and effect within and between the categories within elective spine surgery. For some of the categories, the financial responsibility of healthcare providers is extended to two years after surgery which would be of great interest to look closer at.

The register data only covers the first two years with the new reimbursement programme. Previous research by Song et al. (Song et al., 2012) have showed that larger improvements in quality is likely to occur during the second year, when VBRP has been introduced. Thus, it takes time for providers to adopt to the structures of a new reimbursement programme (Walshe, 2009), which can be a possible explanation for the lack of noticeable effects on patient-reported outcome measures (Fredriksson et al., 2015). Furthermore, it is common that transition periods (Mullen et al., 2010) are characterised by so-called “child diseases” that occur during the implementation and may cause a drop in quality of care (Busse et al., 2013). Thus, in further studies with a longer timeframe it would be plausible to use a “wash-out” period to remove potential transition effects. Nevertheless, this limitation is simultaneously a strength, since it reflects the reality providers were facing during the first two years of using a VBRP.

Due to the lack of control group and the observational approach, it was only possible to test for association and not causality. Thus, Paper I and Paper II, relies on pre-post comparisons, without a comparison group that was not exposed to the intervention. To adjust for this we used segmented regression analysis to assess whether there had been any notable external changes in trend or level.

In Paper II, the cost to third party payer was investigated we did not adjust the cost for case mix. Since it was shown in Paper I that the patients on average had higher comorbidity, it is reasonable to think that the case mix after the introduction of the VBRP would be costlier to treat. An explanation could be a shift of patients that previously was treated by publicly owned hospitals. As a result of the removed volume-ceiling, the private healthcare providers could perform more surgeries and therefore extended their case mix to include sicker patients that previously was treated by public hospitals. In future studies it would be of great interest to also include the cost and outcome of patients that were surgically treated by hospitals even though they received a different reimbursement.

The cost for Region Stockholm to transition from using Public Procurement Act (LOU) with fee-for-service to LOV with a value-based reimbursement was not included in the analysis. If those costs were to be included before and after the introduction of the VBRP, it would better reflect the resource consumption of Region Stockholm, and thus the cost of elective spine surgery. Another aspect is that all monetary units were adjusted to 2016 years price level. However, the reimbursement level within STHLM-VBRP was not adjusted for inflation or other factors under the study period. Therefore, the cost of elective spine surgery for third-party payer after the introduction of the STHLM-VBRP may have been overestimated.

Further, our results only demonstrate the cost from the perspective of a third-party payer, which in our case is Region Stockholm. Hence, we do not know whether the cost for healthcare providers decreased or not, and therefore we do not know how sustainable this particular reimbursement programme is. It would be interesting to investigate the profitability for private healthcare providers under VBRP, in order to assess the true cost of spine surgery. Have the private healthcare providers succeeded in making post-discharge care more effective, or do they struggle to make ends meet? Do they have a chance to adapt to the new reimbursement level given the load of post-discharge care? Only time will provide answers to these questions. Time will also show whether these healthcare providers manage to treat these patients efficiently without any negative impact on quality. At the time of writing (November 2021), there are as yet only three private healthcare providers accredited within Patient Choice for elective spine surgery. Thus, from the perspective of competition, the amount of providers are back at the initial number.

By using the framework of institutional pillars, researchers challenge their mind to broaden their view of institutions and enable a more holistic perspective. The neo-institutional framework of Scott (Scott, 2014) can be used to combine the perspectives on institutional theory from different fields of social sciences. The regulative, normative and culture-cognitive pillar are all important building blocks (hence, pillars) in everyday life that affect each other and thus constitute the social reality. This could also be important to take into consideration in everyday life, within, for example, a healthcare organisation. Healthcare professionals may have different world views as implied by a spine surgeon that claimed that nurses “kind of live in a different world” (S4). Therefore these questions can also be important to reflect upon in the workplace and not only in methodological paragraphs in scientific articles.

The focus of this thesis was private healthcare providers, how their organisations were affected by a specific policy reform, entailing Patient Choice (LOV) and a VBRP. Our results may be limited in terms of their generalisability to other specialties or other healthcare systems. Yet, the focus on the different professional groups, such as physicians, managers and physiotherapists may be important knowledge in any healthcare system or specialties, since it highlights the different institutional settings for each professional group.

Health economics is about how to household with our common resources and in a systematic way compare the cost and effect of different alternatives, e.g. the choice between two different reimbursement programmes. This thesis contributes to the field of health economics by showing that costs can easily be affected by the commissioning organisation through the commissioning contract. To shift financial responsibility to healthcare providers lower the cost of post-discharge care. However, if cost-minimising incentives are not balanced with incentives to maximise outcome, aspects other than the physician activity may be neglected. This may cause ethical stress among other professions, who interpreted it as the quality aspects of their profession is not as important. However, if everyone that can affect the outcome is included in how the optimal care chain should be designed, it shows a lot of potential to attain a multidisciplinary holistic healthcare.

Reflections regarding value, management trends and health economics

VBHC is yet another attempt to organise and manage healthcare to create efficiency and make sure that value is prioritised. Like other management strategies, the main solution is to find outcome measures that matters to everyone involved. In VBHC, value is the ratio of a chosen outcome and the cost of achieving that outcome. Hence, it is up to every clinic to find meaningful values. Different healthcare professions may see different outcomes as most valuable, but also different means of attaining these outcomes. From a management point of view, it is therefore crucial to find an outcome that matters to everyone involved in order to agree upon reasonable means of achieving the outcome. Including those that can affect the outcome, to make everyone feel that their performance matter even if it “only affects the patient mentally”. As both nurses and physiotherapists express that their work is not as important as the surgeons’, it is not difficult to think that these thoughts also apply to patients. They feel more reassured about the treatment option if a surgeon is involved. However, as nurses and physiotherapists also claimed, they spend more time with the patient and make

sure that other needs are met. However, it is only the spine surgery that generates enough money to matter from a financial perspective.

Back to the birthday dinner, and the answer I never had the chance to give. I realise that the answer the man next to me gave was probably more interesting and easier to discuss, whereas my answer would have been slightly boring. My answer would most probably have been something like: Value-based healthcare is yet another attempt to motivate healthcare professionals to find meaningful outcome measures to register and follow-up, to enable systematic quality-improvement. However, value-based healthcare also emphasises the importance of involving healthcare professionals when deciding what measures that should be used. What differentiates VBHC from previous management trends is the inter-professional and holistic perspective on healthcare that would require reorganisation of healthcare in Sweden. I would also add that, in my opinion, there is nothing wrong with the idea of VBHC, and it is wrong to blame the failure of NKS on VBHC. When implementing a concept that implies fundamental organisational (institutional) changes, it is important that it is done with a degree of fastidiousness. It is important to have an understanding of the specific context into which the system is about to be implemented. This understanding, will not be attained by solely comparing and assessing numbers. Understanding and communication is crucial but difficult. I would argue that the key is to dare to question each other when we do not understand. We must be allowed to question each other and ask stupid questions. Communication will always be difficult, especially when we have different backgrounds and work in a context where prestige, jargon and protectionism is present. It is vital to foster a climate where people consistently dare to question the meaning of seemingly impressive statements. Constantly being overwhelmed by new concepts and abstract ideas which are not grounded in clinical reality makes it difficult to question, and in the end, difficult to care about external demands. This will in the end lead to “management overload”, thus ignoring management initiatives and de-couple. Using clinical narratives and involving healthcare professionals from all involved professions is important to create a holistic healthcare. Joint medical and financial responsibility, across healthcare levels, should be put on healthcare providers to encourage communication and collaboration. Today, managerial and medical logics are blended to the extent that it should be possible to find new ways of communication and collaboration, if the technological and jurisdictional infrastructure allows it.

CONCLUSIONS

The value-based reimbursement programme (VBRP) contains both promises and pitfalls. As identified in this thesis, the biggest threat to the success of any programme is that it is seen as a magical solution to all problems within healthcare. Stamina and systematic follow-up, with adjustments, by both the healthcare providers and the regional health authority, is crucial to adapt the programme from theory to practice. The STHLM-VBRP entails free establishment for healthcare providers without restrictions on volume but to a set price per care-episode and an extended financial responsibility for post-discharge care. Thus, the regional health authority can control the price level but not the number of surgeries performed nor the number of healthcare providers. The main findings of the introduction of the STHLM-VBRP is summarised below:

Paper I and Paper II

- The number of surgically treated patients increased by 22 per cent the first two years after the introduction of the VBRP whereas the total cost increased by 11 per cent.
- The VBRP had no effect on PROM, but since more patients were surgically treated, the aggregated amount of quality-adjusted life years (based on EQ-5D-3L) increased.
- After the introduction of the VBRP, each € generated a higher value. The incremental cost-effectiveness ratio of the VBRP amounted to almost €14 000 per quality-adjusted life year.
- There was no indication of discrimination against sicker patients after the introduction of the VBRP.
- The reduced average cost per care episode indicates a more effective care since patient-reported outcome measures were not negatively affected.

Paper III and Paper IV

- The general perception of the VBRP was positive among healthcare providers. An extended financial responsibility for post-discharge care and being reimbursed based on PROM was aligned with professional values.
- The increased financial responsibility for post-discharge generated information that healthcare providers could act upon.

- Healthcare providers did not receive enough information about what factors that affected the performance-based payment.
- The performance-based payment was also perceived as too low to be meaningful to act upon in comparison to the bundled payment (with enclosed invoices).
- Physiotherapy and nursing attained a higher centrality within the organisation if managers and spine surgeons thought it was important.
- It is important that all performance that is included in the bundled payment also can be related to the outcome measure that is used.
- Reimbursement based solely on physician activities may hamper the transition to holistic healthcare since activities performed by other healthcare professionals impose costs to the healthcare provider without generating any additional payment.
- Not only physicians, but representatives from all healthcare professions that can affect the outcome should be consulted when reimbursement programmes and other policy reforms are designed.
- The VBRP entailed a high administrative workload. Four years after the introduction, a relatively large amount of manual work remained, mainly because of inadequate IT-systems.

General

- The decreased average cost of elective spine surgery and the fact that healthcare providers focused on minimising costs rather than maximising outcomes, highlights the importance of acknowledging the institutional context when designing, implementing and evaluating reimbursement programmes.
- The combination of register data and interviews deepened the understanding of the VBRP.
- The use of a neo-institutional framework that combines regulative-normative and culture-cognitive aspects can enhance our knowledge on how and why external demands affect organisational behaviour.

Conclusions

Taken together, a well-designed VBRP has the potential to promote a holistic healthcare perspective through 1) the level to which healthcare providers are held accountable for healthcare provision increase the willingness to collaborate across healthcare providers and medical disciplines, 2) a better overall picture of patients healthcare utilisation and 3) challenging the traditional structures and ideas within healthcare that quality foremost depends on the performance of physicians. However, there are also challenges that needs to be addressed, 1) the creation of functioning routines

for communication and follow-up between healthcare providers and the regional health authority, 2) to get different professions within a traditional hierarchical organisation to cooperate on equal terms, and 3) to create IT systems that create transparency and an understanding of the reimbursement programme. Continuous communication between healthcare providers and the regional health authority is therefore crucial to make the incentives of the reimbursement programme meaningful.

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