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# THE ADOPTION, ADAPTATION, AND ABANDONMENT OF VALUE-BASED HEALTH CARE

Pedro Ramos


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Cover illustration: A representation of the research, conducted in the contexts of two hospitals – one in Sweden and one in Brazil

# The Adoption, Adaptation, and Abandonment of Value-Based Health care

Thesis for Doctoral Degree (Ph.D.)

By

**Pedro Ramos**

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**Principal Supervisor:**
Associate Professor Pamela Mazzocato
Karolinska Institutet
Department of Learning, Informatics, Management and Ethics, Medical Management Centre, KI

**Co-supervisor(s):**
Carl Savage, PhD
Karolinska Institutet
Department of Learning, Informatics, Management and Ethics, Medical Management Centre, KI

Professor Johan Thor †
Jönköping University
Department of Quality improvement and leadership, School of Health and Welfare

Professor Rifat Atun
Harvard University
Department of Global Health and Population, Harvard T.H. Chan School of Public Health

**Opponent:**
Professor Federico Lega
Università degli Studi di Milano; Bocconi University
Department of Biomedical Sciences for Health

**Examination Board:**
Associate Professor Anders Ahlsson
Karolinska Institutet
Department of Learning, Informatics, Management and Ethics, Medical Management Centre, KI

Associate Professor Birger Forsberg
Karolinska Instiutet
Department of Global Public Health, K9

Professor Martine De Brujne
Amsterdam UMC
Department of APH - Quality of Care (VUmc)

*Para o meu pai e para a minha mãe*

# Abstract

**Introduction**: Value-based health care (VBHC) is a strategic framework designed to improve care in parallel with lowered or sustained costs. It was soon touted as "the strategy that will fix health care", garnering increased attention in different countries. The contextual differences between and within health systems, in addition to the wide range of strategies employed by organizations adopting VBHC, create an opportunity for developing empirical evidence on the adoption, adaptation and potentially abandonment of VBHC.

**Aim**: To explore the adoption, adaptation, and potential abandonment of VBHC.

**Methods**: The empirical data has been collected from the contexts of the Karolinska University Hospital and the Hospital Israelita Albert Einstein. Study I is an observational, cross-section survey exploring physicians' awareness on core concepts of VBHC in the context of Latin America. Study II is a mixed-methods study investigating how healthcare providers in Latin America are implementing VBHC. Study III is a comparative case-study of how VBHC was adopted in two contextually different hospitals – Karolinska and Einstein - and how its application was influenced by contextual factors at the system and organizational levels. Study IV is a longitudinal case-study exploring how VBHC management innovations were adopted, adapted, and abandoned at Karolinska. The Complex Innovation Framework was used to analyze the findings and suggest potential feedback loops driving adoption, adaptation, and abandonment of VBHC.

**Findings:** Study I found that high cost of healthcare was identified as the key driver for VBHC discussions in Brazil, and that awareness on VBHC amongst clinical staff was low. Study II showed that healthcare organizations adopting VBHC failed to conceptually define it and adopt it as an integrative strategy – instead they identified management practices unrelated with the Value Agenda as VBHC. Study III showed that organizations adapted VBHC to emphasize components that best translated into their system, e.g. Karolinska focused on health outcomes and Einstein on costs. VBHC adoption challenged established business models - Karolinska had difficulties matching the new organizational model with the research and education missions; Einstein with aligning the new financing models with their independent physician staff. Study IV further shows that VBHC adoption was driven by a coalition of interests at Karolinska; adaptation was required early in the adoption process due to several misfit examples - between the

specialization mandate and delivery of multidisciplinary care; the decentralization of management and the organization's IT and data systems, financial model and cultural values; and the models of patient participation. In the end, abandonment was characterized by a return to previous practices – merger of flows resulting in larger units; re-center of outcomes improvement narrative around NQRs; - and the "silent death" of VBHC artifacts, such as the PFCs or outcomes steering cards.

**Discussion:** VBHC adoption is largely influenced by contextual factors at the health system level, leading to a phenomenon of piece-meal adoption. Since systemic and organizational business model alignment with the components of VBHC is generally low, organizations emphasize those that are most aligned with their health system goals and contextual circumstances.

**Conclusion:** If adopters of VBHC are able to focus attention on integrated understanding of both outcomes and costs (the hard core of VBHC), we may start to unpack the specific care-related processes that contribute to value creation for different patient populations.

# List of scientific papers

I. Makdisse, M., **RAMOS, P.,** Malheiro, D., Felix, M., Cypriano, A., Soares, J., Carneiro, A., Cendoroglo Neto, M., Klajner, S. What Do Doctors Think About Value-Based Healthcare? A Survey of Practicing Physicians in a Private Healthcare Provider in Brazil. *Value Health Reg Issues. 2020* Dec;23:25-29. doi: 10.1016/j.vhri.2019.10.003. Epub 2020 Mar 18. PMID: 32199171.

II. Makdisse, M., **RAMOS, P.,** Malheiro, D., Katz, M., Novoa, L., Cendoroglo Neto M, Ferreira, J.H.G., Klajner, S. Value-based healthcare in Latin America: a survey of 70 healthcare provider organisations from Argentina, Brazil, Chile, Colombia and Mexico. *BMJ Open. 2022* Jun 6;12(6):e058198. doi: 10.1136/bmjopen-2021-058198. PMID: 35667729; PMCID: PMC9171220.

III. **RAMOS, P.,** Savage, C., Thor, J., Atun, R., Carlsson, K. S., Makdisse, M., Cendoroglo Neto, M., Klajner, S., Parini, P., Mazzocato, P. It takes two to dance the VBHC tango: A multiple case study of the adoption of value-based strategies in Sweden and Brazil. *Soc Sci Med. 2021* Aug;282:11. doi:10.1016/j.socscimed.2021.114145. Epub 2021 Jun 23. PMID: 34192620.

IV. **RAMOS, P.** ; Savage, C.; Thor, J.; Atun, R.; Mazzocato, P., Adoption, Adaptation, and Abandonment of Value-Based Health care: A longitudinal case-study of a Swedish University Hospital, *Manuscript submitted to journal*

## Related publications

1. Makdisse, M., Katz, M., **RAMOS P.,** Pereira, A., Shiramizo, S., Neto Cendoroglo , M., Klajner, S. What Is a Value Management Office? An Implementation Experience in Latin America. *Value Health Reg Issues. 2018* Dec;17:71-73. doi: 10.1016/j.vhri.2018.02.002. Epub 2018 May 3. PMID: 29729500.

2. A version of Study III has been a chapter on:
   - EIT Health (2020), Implementing Value-Based Health Care in Europe: Handbook for Pioneers
   - Marta Marsilio, Angelo Rosa (2020), Lean e Value Based Management. Modelli e strumenti per la creazione di valore nelle aziende sanitarie, ISBN-13: 9788835112686; Date of first publication: 2020-12-11

## Related Master thesis projects (supervisor)

1. Magalhães, A.C., *To bundle or not to bundle: A scoping review of the introduction of bundled payments in healthcare,* Integrated Masters in Medicine, Faculty of Medicine, University of Porto, Porto, Portugal
2. Alagic, Z.., *Large scale implementation of value-based health care at a university hospital - A mixed-methods case study of the effects on health care, research and education,* Master's Programme in Health Economics, Policy and Management, Karolinska Institutet, Stockholm, Sweden
3. Reis, D.., *Adoption, adaptation and abandonment of value-based health care – a realist review,* Master's Programme in Biomedical Engineering, Instituto Superior Técnico, Portugal

# Contents

# List of abbreviations

| | |
|---|---|
| BP | Bundled Payment |
| CIF | Complex Innovation Framework |
| EMR | Electronic Medical Record |
| IPU | Integrated Practice Unit |
| IT | Information Technology |
| MI | Management Innovation |
| NQR | National Quality Registry |
| QI | Quality Improvement |
| TDABC | Time-Driven Activity-based costing |
| VBHC | Value-Based Health Care |

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# Introduction

Health care systems face increased financial challenges due in part to exponential innovation in technology and therapies, rising prevalence of chronic diseases, and an ageing and more complex population (Bohmer & Lee, 2009; McKee & Healy, 2002). This shift in health care needs, in a context where resources are increasingly limited, has generated a quest for value creation in health care (Berwick et al., 2008).

Value creation is a common theme behind several experiments with different management theories in health care in recent decades, such as Total Quality Management, Lean or Patient-centered care (Institute of Medicine Committee on Quality of Health Care in, 2001; Mazzocato et al., 2010; Oliver et al., 2020). However, these models are often poorly understood, and abandoned before they have been properly assessed or able to prove their true potential (Kieran Walshe, 2009). This makes it difficult to understand the reasons behind what is adopted, adapted, or rejected.

In this thesis, we have chosen to study the most recent health care management framework, Value-Based Health Care (VBHC) (Porter & Teisberg, 2006).

Theoretically, what appears to differentiate VBHC from other management models, is that it requires changes at the macro (system), meso (organizational), and micro (care delivery value chain) levels for "competition over value" to occur (Porter & Lee, 2013). Yet, in practice, empirical evidence is failing to provide high-quality examples of such holistic adoption. Instead, VBHC seems on its way to become yet another example of pseudo-innovation (Fredriksson et al., 2015), with high enthusiasm in recently-adopting countries such as The Netherlands, the US, or Canada, while already showing a downward curve in other countries, such as Sweden, which has been at the forefront of management innovations in health care.

If health care is to break the cycle of pseudoinnovation and avoid the subsequent high costs, disruptions in care, poor patient experience, rise in staff turnover rates, and risks to patient safety, we need to learn more about what happens when management theory meets health care in practice.

# 1 Literature review

## 1.1 Value and Value Creation in Health care

For economists, *value* is the surplus in welfare in a free market exchange by customers and suppliers, and value creation the activities contributing to this welfare gain (Windsor, 2017).

In health care, "value" holds more elusive definitions, from allocative value (how equitable the available resources are allocated to different patient populations), to technical value (how allocated resources are being used optimally for people in need in those populations) (Gray, 2017), personal value(s) (how each person's individual values and beliefs are taken into account when using allocated resources) and societal value(s) (how each investment in health care contributes to social solidarity and cohesion, connectedness, mutual respect and openness to diversity) (EU, 2019). Value creation has evolved from professional ethos to more industrial-driven frameworks, such as quality improvement (QI) (Thor et al., 2004) or lean (Mazzocato et al., 2010). QI, in particular, has gained solid foothold in Sweden, with a few examples of enduring, sustained development (Staines et al., 2015). In QI, value is created from the "continuous effort to create changes, that lead to better patient health, better care, and professional development" (Batalden & Davidoff, 2007). In lean, staff redesign processes by identifying non-value adding (waste) and value adding activities using tools such as "value stream maps". This may be behind the observation that staff associate lean to operation (process-level) management and QI to organizational-wide development (Savage et al., 2016).

Strategic management has long debated how to structure organizations to enhance value creation for, and more recently, with customers to gain a long-term competitive advantage. Stabell and Fjeldstad (Stabell & Fjeldstad, 1998) crystalized this discussion in three broad business models (Fjeldstad & Snow, 2018; Fredriksson et al., 2017) working to deliver value to their customers: value chains, value shops, and value networks (table 1). Value chains - based on Michael Porter's work (Porter, 1985) - create value by linking standardized treatment processes to deliver a desired therapeutic outcome. Ambulatory surgery (such as cataract or hip and knee arthroplasty) is a typical example of an established value chain in healthcare. Value shops use technology and knowledge intensively to solve highly customized patient problems. Traditionally, hospitals have been described as value shops, with a significant breadth of technologies, medical

specialties, and therapeutic services for patients. Value networks use technology to facilitate value-creating relationship between people (patients and healthcare professionals), places (primary, specialized or rehabilitation care) and things (EMR systems, patient technologies, research databases), and through that create value. Examples of true value networks in healthcare are rare (Fjeldstad et al., 2020).

**TABLE 1:** ORGANIZATIONAL DESIGNS TO DELIVER VALUE TO CUSTOMERS; SOURCE: OWN ELABORATION, BASED ON (Stabell & Fjeldstad, 1998) AND (Fjeldstad et al., 2020)

| | | Value chains | Value shops | Value Networks |
|---|---|---|---|---|
| **Value creation logic** | | Standardization | Customization | Knowledge exchange |
| **Key value driver** | | Volume and focus (economies of scale) | Reputation (signaling) | Positive network externalities |
| **Competitive advantage** | | Cost | Differentiation | Cost and differentiation |
| **Main benefit for** | **Patient** | Efficient, predictable treatment | Solution to a particular highly complex problem | Co-producer of care |
| | **Payer** | Lower cost per treatment | Increased effectiveness | Increased accessibility |
| | **Provider** | High depth (the "technician") | High breadth (the "consultant") | Breadth and depth (the "facilitator") |
| **Key IT use** | | Automation technologies | Decision support systems | Professional collaboration and connection (connectivity and data sharing IT Systems) |
| **Value-based system structure** | | Interlinked chain(s) | Referrals between shops ("archipelagos") | Layered and interconnected networks |
| **Example** | | Ambulatory surgery (cataract, hernia, hip and knee surgery) | Emergency departments of tertiary hospitals | The GLA:D programme network for osteoarthritis (Roos et al., 2018) |

VBHC is more clearly associated to the model of (care delivery) value chains. Yet, there are reasons to believe that there is the need to apply all value configurations, as a way to balance standardization and customization, and through that create value for patients in an increasingly complex healthcare. (Colldén et al., 2021)

## 1.2 Introduction to Value-Based Health Care (VBHC)

VBHC is a strategic framework designed to improve care in parallel with lowered or sustained costs (Porter & Teisberg, 2006). It has roots in Porter's theories on strategic management and competition, inspired by the U.S. Health System failure to contain spending and address patient needs. It was soon touted as "the strategy that will fix health care" (Porter & Lee, 2013), garnering increased attention in different countries, including in Sweden.

A central theme in Porter's theory is how health care is afflicted with "zero-sum competition". Unlike other industries, where competition usually leads to efficiency, Porter and Teisberg debate that health care costs continue to increase with unjustified variations in quality (Robert S Kaplan & Michael E Porter, 2011). They argue this is due to competition at 1) "the wrong level" (between plans and providers, and not at the medical condition level); 2) "the wrong objective" (cost reduction, and not value improvement); 3) "the wrong form of competition" (to increase volume, and not to create value for the patient); 4) "the wrong geographic market" (local, and not regional/national); 5) "the wrong strategies and structures" (indistinct providers without unique value propositions); 6) "the wrong information" (lack of information about outcomes and costs); 7) "the wrong incentives for payers" (focus on attracting healthy subscribers and dumping high-cost populations); 8) "the wrong incentives for providers" (focus on volume and process metrics for all patients, and not on creating value for specific populations) (Porter & Teisberg, 2004).

According to Porter, value is defined in the "value equation" as the health outcomes achieved that matter the most to patients, relative to the cost of achieving those outcomes (Porter 2010). The unit for value creation is the medical condition. The medical condition is an interrelated set of patient medical circumstances that are best addressed in an integrated way. It is defined from the patient's perspective, may include common simultaneous conditions and complications, and may involve multiple medical specialties, services and activities that target these conditions and complications (Porter 2010). For instance, heart failure should involve care for co-existing conditions (e.g. hypertension, diabetes,...), behaviors (e.g. tobacco cessation, weight loss) and complications (e.g. arrhythmia,...). This draws extensively on Porter's value chain framework, developed outside health care. (Porter, 1985)

Porter and colleagues prescribed six strategies of a "value agenda" for organizations adopting VBHC (Porter & Lee, 2013):

1. Health care institutions should organize into Integrated Practice Units (IPUs). In an IPU, a dedicated team delivers the full care cycle for each medical condition (e.g. from preventive care to inpatient care and rehabilitation, including supporting services, patient education, engagement and follow-up).

2. Health care institutions should measure outcomes and costs for every patient in a specific medical condition along the full cycle of care. For any medical condition, outcomes may be considered in a three-tiered hierarchy, ranging from patient health status (e.g. survival; degree of health – Tier 1) to process of recovery (e.g. time to recovery and disutility of treatment processes – Tier 2) and sustainability of health (e.g. long-term consequences of treatment,… - Tier 3) (Porter 2010). Thus, VBHC emphasizes a shift from a focus on measuring volume and process indicators to measuring outcomes. Just as with outcomes, costs must be measured at the medical condition level and for the full cycle of care. (R. S. Kaplan & M. E. Porter, 2011) suggest that it should be done using Time-Driven Activity-based costing (TDABC). A review on TDABC found that it may be applied to overcome challenges faced by traditional accounting systems, but evidence for using it for supporting care coordination or value-based payment is still missing. (Keel et al., 2017)

3. Health care institutions should be financed through bundled payments**.** While other authors refer to a broader array of "value-based" reimbursement models (Friedberg et al., 2015; Scott et al., 2016), (Porter & Teisberg, 2006) explicitly limit VBHC to bundled payments.

4. Health care institutions should integrate care delivery across different care facilities. VBHC considers 4 stages for care delivery integration: the choice of medical condition(s) the provider will focus on; reducing care delivery dissemination across locations in order to increase volume and to gain expertise in those specific conditions; choosing the best location for each medical service, according to complexity, cost intensity, patient convenience,…; and integrating the full care cycle delivered across different locations under one single IPU structure.

5. Health care institutions should expand their geographic reach. Providers of excellent care should focus on increasing their clinical influence through direct

(e.g. satellite sites) or indirect (e.g. clinical affiliation) involvement with other providers.

6. Health care institutions should build an Information Technology platform that reinforces this agenda, by covering data around a specific medical condition for the entire cycle of care which is available for all care providers for that medical condition.

## 1.3 Current evidence on VBHC strategies

In this section we review the existing evidence on VBHC strategies advocated by Porter and colleagues. Only three strategies were selected since they are the ones with direct relation with the studies that are part of this thesis.

### 1.3.1 Strategy 1: Organize according to IPUs

Porter and Teisberg argue that health care providers need new organizational structures that re-center health care competition at the medical condition level. These are IPUs, an adaptation of Porter's strategic business units from outside health care(Porter, 1989; Springer, 1973). IPUs, "a dedicated team made up of both clinical and nonclinical staff who provide the full care cycle for the patient's condition"(Porter & Lee, 2013) compete amongst each other for delivering patient value - the best outcomes at the lowest costs. According to Porter, IPUs improve care through a volume-outcomes relationship ("practice makes perfect"), where sub-specialization reinforces this virtuous cycle (Porter & Teisberg, 2006). There is high-quality evidence of the effect of volume on patient outcomes. A systematic review concluded that higher patient volume is associated with better outcomes in several procedures and clinical conditions (Halm et al., 2002). This performance difference is seen between high and low volume centers (Birkmeyer et al., 2002), and between high and low volume surgeons at high-volume centers (Birkmeyer et al., 2003).

Opponents of VBHC emphasize an IPU's inadequacy to the management of multimorbid, chronic and highly complex patients (Enthoven et al., 2007). Patients with multiple conditions would have to be followed-up by different IPUs, and there would be inefficiency and possibly loss of care continuity in the transition between these "archipelagos". The risk of building new silos has been a recurrent critique to the organizational transformations at Karolinska University Hospital, which has adopted a New Operating Model based on some of the IPUs concepts(Wise, 2017).

### 1.3.2 Strategy 2: Outcomes Measurement

Outcomes measurement has been advocated for a long time (Ellwood, 1988), including with mandates by national-level health policy (Morrison, 2016; NHS, 2000; VWS, 2018). Nonetheless, measuring the "end result" (Howell & Ayanian, 2016) is still met with ambivalence by health care professionals (Duncan & Murray, 2012), and it is mostly a mirage in clinical practice in most countries.

Sweden has been an exception, with a long-standing tradition of building NQR (Louise Emilsson et al., 2015). Proponents of VBHC in Sweden have built on this legacy and, from the onset, attempted to harness the power of these NQR (Larsson et al., 2010). By examining improvement developments after the establishment of NQRs, these authors have argued that, by making outcomes data transparent, they can foster continuous learning and sharing of best practices, and promote competition between providers (Larsson et al., 2012). Yet, VBHC does not provide clear guidance for how care processes will be improved when outcomes data becomes transparent. Instead, the underlying rationale is that health care professionals have the freedom to (re) design processes based on their professional knowledge, guided by standardized outcome indicators. This led to some authors alluding to value-based health care as a physician-in-the-lead strategy (Malik et al., 2018; Porter & Teisberg, 2007).

In the original VBHC model, patient involvement was limited. It has since grown to include outcomes reported by the patients themselves using patient-reported outcome measurements (PROMs). PROMs are standardized, validated reports of a patient's health status coming directly from the patient, without interpretation by clinicians. This shift is in line with the view of patients as co-creators described in the Swedish roadmap laid out in "Effektiv vård".(Stiernstedt et al., 2016) However, it does not ensure that the outcomes matter to patients. Ebbevi and colleagues found that outcomes not included in Porter's outcome hierarchy may have intrinsic value to patients (Ebbevi et al., 2016), and that PROMs routinely used in clinical practice may be misaligned with the patient perspective (Ebbevi et al., 2017).

A systematic review (Kampstra et al., 2018) found evidence that outcomes measurement can lead to better health outcomes, in terms of mortality/survival (Carlhed et al., 2009; Jakobsen et al., 2013; Jakobsen et al., 2009) and degree of health (Baty et al., 2010; Bauer et al., 2011; Peterson et al., 2008) (Tier 1), disutility of care (Carlhed et al., 2009; Han et al., 2016) (Tier 2) and sustainability of health

(MacLean et al., 2009) (Tier 3). Yet, none of these health outcomes was assessed using PROMs. PROMs have faced great enthusiasm for their potential to transform health care delivery(Black, 2013), and their use may effectively lead to better health outcomes(Basch et al., 2017), but a literature review showed that widespread evidence is still missing(Valderas et al., 2008). Therefore, the literature seems to point towards positive effects of outcomes measurement in driving health care improvement, yet only a few studies are of sufficiently good quality to draw definitive conclusions (Kampstra et al., 2018; Valderas et al., 2008).

If outcomes measurement may contribute to care improvement, it does not automatically do so (Eldh et al., 2014). There are several mechanisms reported in the literature driving such improvement: benchmarking, collaborative care models, chronic care models, conducting PDCA cycles, enhancing learning and leadership, and IT interventions (Kampstra et al., 2018), providing feedback to clinical teams and clinical guidelines/courses of action on the results (Govaert et al., 2016; Valderas et al., 2008), and public outcomes reporting (Marshall et al., 2000).

Still, on the outcomes side, VBHC avoids prescriptive descriptions for improvement, leaving to "physicians-in-the lead" the rationale of "putting in place the set of interdependent steps needed to improve value", and hence contributing to organizational learning (Malik et al., 2018; Porter & Teisberg, 2007). Recent studies show that for medical leadership to live up to such expectations, organizations must embrace a virtuous cycle of leadership creating physician leaders through medical engagement (Savage et al., 2020).

### 1.3.3 Strategy 3: Bundled Payments

Episode-based payments, also referred as bundled payments (BP), is suggested by Porter and colleagues as an alternative payment model to FFS (Feeley TW & Mohta NS, 2018). BP are an "one-off or periodic lump-sum payment for a range of services delivered by one or more providers based on best practice or following clinical pathways with an increasing emphasis on outcomes with possible shared savings" (OECD, 2016). BP intend to improve efficiency by promoting cooperation between different providers, and to improve quality of care by reducing complications and readmissions.

In the US, the Patient Protection and Affordable Care Act (also known as "Obamacare") pushed the system into restructuring payment models by setting clear targets for the roll-out of value-based payment: 85% of Medicare FFS

payments tied to value by 2016, and 30% of Medicare payments tied to value through alternative payment models by 2016 (50% by 2018). This has led to the emergence of several BP initiatives, which are now starting to be evaluated in the scientific literature (Agarwal et al., 2020).

In the published literature, the vast majority of the initiatives were deployed in the USA, and the remaining in OECD countries (Netherlands, Sweden, Portugal, England). Particularly in the Netherlands, there is growing interest from payers on piloting new payment models (Steenhuis et al., 2020). BP were mostly applied in clinical conditions with high volume (prevalence or incidence), with high cost or with high variability between different providers in terms of quality or costs (Hardin et al., 2017; Steenhuis et al., 2020). Frequently, surgical episodes managed to maintain or even increase quality (diminishing the risk of iatrogenic and nosocomial complications) by more correctly selecting the post-acute care setting for each patient (Chandra et al., 2013; Froimson et al., 2013; Zhu et al., 2018). However, patients within medical episodes have generally more clinical needs and the services provided in the post-acute care setting are more complex and multifaceted. So, it is yet unclear if these same strategies can be applied for medical episodes, especially in this area. For chronic conditions, there is an increased complexity to outline the cycle of care since different episodes may occur during disease progression, such as acute exacerbations, or co-occurring conditions. This increased unpredictability of the care cycle and spending patterns is a difficulty compared to surgical episodes (Elf et al., 2017). Furthermore, there is also the involvement of different caregivers from different contexts in the selection of indicators that represent the care provided throughout the cycle (Elf et al., 2017).

The duration of the episode is a critical criterion to be agreed upon, considering payers and providers have conflicting agendas. On the one hand, providers prefer episodes shorter in time, so costs and quality are more in their control and applied to a more restrict and homogenous population to decrease financial risk; payers, on the other hand, prefer longer episodes to cover more services and with broad inclusion criteria to encompass as many patients as possible (Polite, 2018; Ridgely et al., 2014). This equilibrium (between volume and financial risk) is challenging and may be a cause for a "no-go" during implementation (Hussey et al., 2011). Alignment of payers and providers is critical, especially considering that more than three-quarters physicians and executives emphasize this as a major barrier to improve value.(Swensen S & Mohta NS, 2018) Risk-sharing may help to do so by

giving physicians financial incentives to change their behavior and increase their efficiency of care (Froimson et al., 2013; Liao et al., 2017).

Stakeholder participation early in the process was also described as paramount for creating the BP. Professionals may accept and commit to the changes associated with the implementation of bundled payments more easily, when they are allowed to be involved in the policy and its objectives (Froimson et al., 2013; Kivlahan et al., 2016; Whitcomb et al., 2015). However, there is still a wide heterogeneity in awareness about value-based health care and BP among physicians, with higher degrees of knowledge amongst those with management roles (Makdisse et al., 2020). Additionally, physicians have for many years implemented QI programs, with few focusing – or avoiding - the cost dilemma (Gordon R et al., 2018; Storkholm et al., 2017). All of this suggests that discussions over value are not being diffused and are still reserved to the highest levels of the decision-making process.

### 1.4 Adoption, adaptation and abandonment of VBHC

Managerial models seldom survive intact their first contact with the real world of health care. VBHC is no different, and since 2006, the model has been adopted and adapted in several countries by diverse organizations.

Benders and van Veen argue this is because "any concept must necessarily lend itself to various interpretations to stand a chance of broad dissemination"(Benders & Van Veen, 2001). Multiple interpretations give managers and policymakers the opportunity to "pick out the raisins of the pie", purposefully omitting hard-to-implement or context-conflicting parts. This seems to be the case with VBHC, which has garnered much attention, but has been diffusing erratically. A literature review discovered that its concepts, application, and effects are poorly understood. (Fredriksson et al., 2015) In practice, VBHC is often a refurbishing of previous management concepts, such as lean (Goretti et al., 2020) or patient-centered care (Andersson et al., 2015), with a greater emphasis on outcomes. This management fashion trend (Abrahamson, 1991) has also been described for TQM (Giroux, 2006), for QI (Kieran Walshe, 2009) and for Lean (Savage et al., 2016).

This ambiguity surrounding VBHC has been attributed to lack of theoretical knowledge and conceptual confusion (Fredriksson et al., 2015), a commensalist relationship between gurus and managers that aim to push forward "new"

management ideas (Giroux, 2006), a need for the theory's translation into a certain context (Christian Colldén & Andreas Hellström, 2018) or frame of reference (Steinmann et al., 2020), or yet an intrinsic vagueness of the model itself (Christian Colldén & Andreas Hellström, 2018).

In addition to this superficial understanding and conceptual ambiguity of VBHC, empirical evidence on the model's effects is lacking. A mapping of the literature conducted by the Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU, 2018) found that most of the examples used to substantiate VBHC claims still come from Porter's cases and presentations, and not from academic literature; and that only one study in the published literature had focused on the entire VBHC model (ie. all the six components). Instead, literature focuses mostly on one, seldom two, components of the value agenda, with limited verifiable evidence beyond what could already be demonstrated for certain components that were not specific to VBHC, and that we describe in the previous section. Subsequent literature reviews confirmed this concern (van Staalduinen et al., 2022; Vijverberg et al., 2022).

In the USA, VBHC is often restricted to "Value-based payment"; it has become a synonym of payment reform and a move away from costly FFS (Liao et al., 2018; Mayes, 2011; Miller, 2009). Translation to fit the context has been also found by Steinmann and colleagues (Steinmann et al., 2020) when studying the development of "Dutch VBHC" into a "shared decision-making" framework (Damman et al., 2020).

Hence, this raises the question whether it is possible to assess the effectiveness of VBHC when all its levers have not been pulled simultaneously. These discernable patterns indicate a risk that VBHC could develop into a management fad as other previous efforts to improve health care (Kieran Walshe, 2009), and therefore call for a more detailed understanding of how VBHC is adopted, adapted or rejected.

Most health systems were described as in the early stages of alignment with the VBHC components (EIU, 2016). Sweden was the exception, receiving full marks in the dimensions evaluated: an enabling context, policy and institutions for value in health care; measurement of outcomes and costs; integrated and patient-focused care; and an outcome-based payment approach. Supporting Sweden's pioneering role were the infrastructure investments the country had made in the previous decades at the political and health system levels: in IT-platforms,

electronic health records, quality registries, public benchmarking, reimbursement systems, QI, and health care management. Jönköping's efforts in QI were described by Porter and Teisberg (Porter & Teisberg, 2006).

Regardless, international policy organizations have embraced VBHC over time. In 2017, changes were made to the model by the Value in Health care working group of the World Economic Forum. (WEF, 2017) The value equation remained and to it have been added principles, enablers, and policy. The principles are: 1. The systematic measurement of outcomes and costs for the full cycle of care, 2. The identification of clearly defined population segments, and 3. The development and customization of segment specific interventions to improve value. The enablers are informatics; benchmarking, research and tools; reimbursement; and the delivery organization. And policy changes to the legal and regulatory environment are needed to support changes at the system, organizational and clinical micro-system (patient-caregiver) levels. Albeit toned down, the underlying idea remains that in order to discourage zero-sum competition and to accelerate value creation, health systems should promote value-based competition by measuring and reporting outcomes and costs for each population over the full care cycle.

In 2019, the European Commission also published a report by the Expert Panel on effective ways of investing in Health. (EU, 2019) The report presented new definitions for Value in VBHC, mostly to adapt the ("narrow") concept to the social solidarity history and valueS of EU health systems. Overall, recommendations are high-level and do not translate into concrete actions or reforms: for instance, the report recommends that EC supports the implementation of VBHC by creating awareness to health as essential investment, supporting research on methodologies on appropriateness of care, creating learning communities of practice, encouraging health professionals to feel accountable for low-value care, and support initiatives for patient engagement in shared decision-making.

In 2020, the European Institute of Innovation & Technology (EIT) Health launched the High Value Care Forum. High value care seems a paraphrase of VBHC, since many of the principles ("define and measure outcomes that matter to patients", and "set up the right incentive structures for payers to pay for outcomes") remain the same. The forum has set up an online library for disseminating case studies and will start funding joint initiatives that need to include both providers and payers developing pilots that adopt some of the "high value care" principles (EITHealth, 2020).

In summary, current evidence seems to show that, as it is adopted in different countries, VBHC adapts to slightly different "versions" that best mirror the underlying context. Moreover, adaptations have grown to include a stronger system perspective, which go as far as to demand joint work between payers and providers in VBHC pilots. This may be a potential solution to the misalignment between providers adopting VBHC and the system they are embedded in.

## 1.5 VBHC as a complex innovation

The challenge of complexity is being increasingly acknowledged in healthcare: health systems are conceptualized as complex systems, those with fuzzy boundaries where different agents (individuals or organizations) may be simultaneously and intermittently members of different groups and may behave in an unpredictable, yet interconnected manner (Atun, 2012; Plsek & Greenhalgh, 2001). Unlike other clinical management models, VBHC requires that changes occur on several elements of the organizational structure, financing models and care delivery processes and on different layers of the healthcare system - the system (macro), the organizational (meso), and value-care chain (micro) levels. This makes VBHC particularly well-suited to be studied as a complex innovation in a complex adaptive system: it has a "hard core" - the irreducible elements of VBHC itself, which are consistently adopted - and a "soft periphery" - the organizational structures and systems that are adapted for the implementation of VBHC in a given context (Greenhalgh et al., 2004)

Hence, we argue that VBHC should be evaluated through a complex innovation lens, drawing on the plethora of management literature on the adoption of innovations in healthcare (Atun et al., 2007; Atun et al., 2006; Greenhalgh et al., 2004; Plsek & Greenhalgh, 2001; Rogers, 2010).

We consider VBHC a Management Innovation (MI) - new ideas, practices, objects or institutional arrangements perceived as novel by an individuals and/or organizations(Rogers, 2010) – in a complex adaptative system, where the interconnected actions of these different agents are dependent on the context where the innovation is being applied, and influence the adoption and adaptation of the innovation by other agents.

The complexity of adopting VBHC is slowly being acknowledged (Steenhuis et al., 2020). In a global assessment of the contextual "readiness" for VBHC, about half the countries were scored with low alignment with VBHC. Sweden was the

standout, depicted as the only country with "very high" alignment (EIU, 2016), while all Latin American countries were evaluated with low alignment, except for Colombia. Despite these contextual differences, high-profile VBHC efforts have emerged in these different countries, creating an opportunity to improve our understanding of VBHC through the lens of complexity science.

# 2 Research aims

## 2.1 Positioning the thesis

Since VBHC is unproven and may be suffering from pseudo-understanding, empirical evidence that supports decision-making at the system, organizational, and care delivery levels is needed. The contextual differences between and within health systems, in addition to the wide range of strategies employed by organizations adopting VBHC, create an opportunity for developing empirical evidence on the adoption, adaptation and potentially abandonment of VBHC.

Two recent scoping reviews have similarly concluded that there is a lack of attention for the health managerial aspects of the adoption and adaptation of VBHC, and called for more research describing different initiatives in diverse health systems, with the ultimate outcome of developing implementation recommendations for different organizational contexts.

In a direct response to such call, this thesis uses studies of adoption, adaptation and abandonment of VBHC to provide recommendations for healthcare teams, managers and policymakers, and to advance our theoretical understanding on value creation in healthcare through a complexity lens.

## 2.2 Overall Aim

This thesis builds on a multiple case study design using mixed methods with an overall aim to explore the adoption, adaptation, and potential abandonment of VBHC.

We considered *adoption* the rationalization process emerging form the implementation of management innovation practices related to VBHC, as conceived by Porter and Teisberg, whereas *adaptation* is generated from the translation, co-construction, and editing activities of these MI among the different cultural and social contexts, leading to divergence and variability in the VBHC practices adopted. *Abandonment* decisions are the formal discontinuation of the adoption and adaptation practices (Rogers et al., 2014), as the result of formal or informal organizational decision-making activities that may or may not coincide with the abandonment decision (Greenhalgh et al., 2017; Greve, 1995).

The contribution of the four studies to the general aim is:

- To explore physicians' awareness on core concepts of VBHC (Study I)
- To investigate how healthcare providers in Latin America are implementing VBHC (Study II)
- To compare and contrast how VBHC was adopted in contextually different hospitals that publicly touted it as an organization-wide complex innovation and how its application was influenced by contextual factors at the system and organizational levels. (Study III)
- To explore how VBHC management innovations were adopted, adapted, and abandoned at a Swedish university hospital (Study IV)

# 3 Materials and methods

This chapter begins with a description of the research design used in the thesis, followed by a description of the study context. Data collection and analysis are then presented separately for each of the four studies.

## 3.1 Study Design

The four studies included in this thesis build on a cross-sectional survey (Study I), mixed methods (Study II), multiple case-study (Study III), and longitudinal case-study (Study IV).

A Cross-sectional survey was chosen in Study I because it is a frequent research design for descriptive studies on participants' opinions on a certain study phenomenon. It has been used extensively for studying physicians' and managers' views on healthcare innovations, from quality improvement (Gosling et al., 2021), to prescribing patterns (Hartnett et al., 2020), patient-physician shared-decision making (Forcino et al., 2018). The main advantages of cross-sectional surveys are that they are relatively fast and inexpensive to conduct, and may generate findings which be used to create more in-depth research studies, using more resource-intensive methods (Wang & Cheng, 2020).

Mixed methods was chosen for Study II because it allows to develop a more comprehensive understanding of a research topic(Creswell & Clark, 2017); in this case, the survey (quantitative) allowed to prepare the qualitative phase, by grounding the interviews and document analysis better into the healthcare provider context.

Study III and IV are case studies as this type of research design is suitable to "investigate a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009). Including the context is particularly important when the setting is complex and dynamic, as it is the case in organizations adopting VBHC. Case study research is also well-suited for situations where the goal is to depict the historical context of a past phenomenon and/or gain insight into processes that have not been thoroughly explored. The general aim of case study is, therefore, to better understand, in depth, the dynamics that are present in a certain context.

The phenomenon of interest for this study was the adoption, adaptation and abandonment processes of VBHC within complex organizations in different health systems.

### 3.1.1 Complex Innovation Framework

The complex innovation framework we used has been developed by Atun and colleagues (Atun et al., 2010) and applied to study the diffusion of complex health innovations in

different countries (Atun et al., 2007; Atun et al., 2006). The framework is represented in figure 1. It integrates five dimensions of the diffusion process(Rogers, 2010) that may influence the rate and pattern of adoption of VBHC in different health systems: the nature of VBHC and its attributes; the adopters of VBHC and their characteristics, both individuals and organizations (adoption system); the health system characteristics; the context within which VBHC diffusion takes place; and the interactions and interconnections between VBHC, adoption system and the context (within and beyond the health system boundaries). In this thesis, the context refers to the political, economic, technological, social and cultural environment the organizations implementing VBHC are embedded in; the innovation refers to VBHC, seen as the model for maximizing value for the patient (ie. increased outcomes and reduced costs) and the adoption system are the organizations and key actors (e.g. patients, clinical teams, managers, policymakers,…) who are implicated by the implementation of VBHC.

This framework informed all stages of the research process, including the design (e.g., selecting documents, interviewees and implementation strategies on which to focus), data collection and analysis (e.g., using the key blocks of the framework for the data extraction form or the interview guide) and dissemination (e.g., compare and contrast our findings to other complexity studies).

**TABLE 2:** *COMPONENTS OF THE COMPLEX INNOVATION FRAMEWORK (Atun et al., 2010)*

| **COMPLEX INNOVATION FRAMEWORK (CIF)** | |
|---|---|
| **Problem** | The social narrative around the urgency and the scale of the socio-economic burden, influencing the perceived necessity of a robust response |
| **Innovation** | Ideas, practices or institutional arrangements perceived as new by adopters, encompassing multiple elements (including technological, organizational and process innovations) and multiple levels |
| **Adoption System** | Key stakeholders and health system or societal organizations, with diverse interests, values, power influence and perceptions of the innovation's benefits and risks |
| **Health System** | Organizations, people and actions, including regulatory, organizational, financing and clinical functions, whose primary goal is to promote, restore or maintain health |
| **Context** | Interaction between the demographic, socio-economic, political, legal, and technological aspects in the environment where problem, innovation, adoption system, and health system are embedded |

The individual studies that are part of this thesis explore different organizations that are experimenting with VBHC, through the lens of its interaction with the different components of CIF.

Study I and Study III use the contextual differences at the organizational-level and health-system level in Latin America (Study I) and between Brazil and Sweden (Study II) to uncover the relationship between VBHC as an innovation, the social narrative behind its adoption (problem) and the health system and broader societal context. Study II-IV go more in-depth into the adoption system of two different hospitals adopting VBHC to understand how VBHC interacts with the organizational factors during its diffusion process.

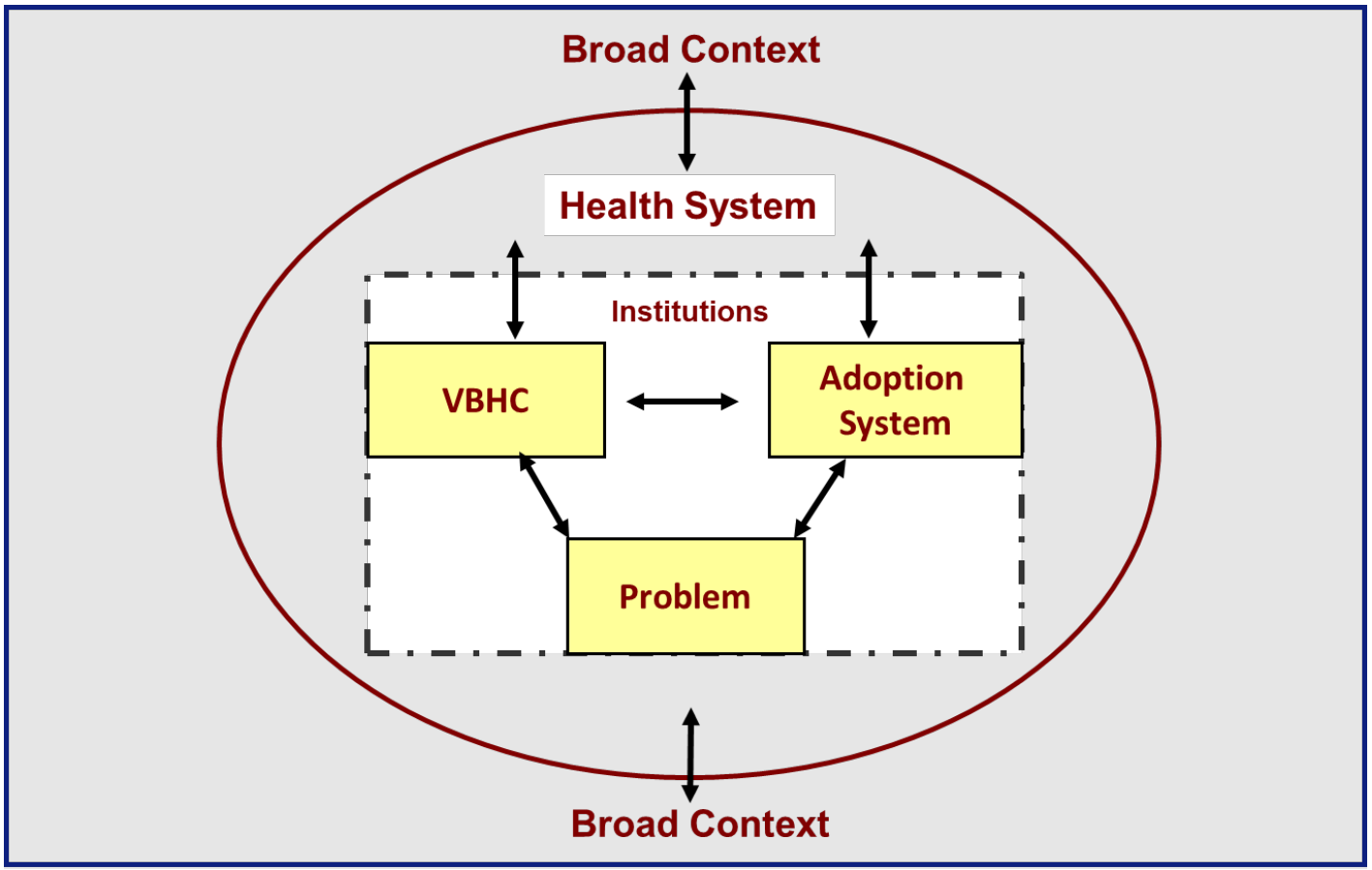


**FIGURE 1:** COMPLEX INNOVATION FRAMEWORK; ADAPTED FROM THE FRAMEWORK FOR ANALYSING ADOPTION AND DIFFUSION OF COMPLEX INNOVATIONS IN HEALTHCARE (© PROF. RIFAT ATUN, HARVARD UNIVERSITY, 2017)

## 3.2 Study Setting

The empirical data has been collected from the contexts of the Karolinska University Hospital (hereafter referred to as Karolinska) and the Hospital Israelita Albert Einstein (hereafter referred to as Einstein), and made possible through a collaborative partnership between the hospitals and Karolinska Institutet (KI). Table 3 presents Key characteristics of the organizations involved in this thesis.

**TABLE 3:** KEY CHARACTERISTICS OF THE STUDIED ORGANIZATIONS

| | KAROLINSKA UNIVERSITY HOSPITAL, SWEDEN | HOSPITAL ISRAELITA ALBERT EINSTEIN, BRAZIL |
|---|---|---|
| **Ownership Status/type** | Public (Stockholm County Council) | Private, not-for-profit |
| **Beds** | 1,400 | 993 |
| **Employees** | 15,800 | 12,900 |
| **Discharges** | 106,000 | 84,038 |
| **Case-Mix Index** | 1.2 | 1.1 |
| **Revenue (2017)** | 1.700M€ | 2.825 M$R (~ 626 M€) |
| **Reimbursement model** | Budget | Fee-for-service |

The two organizations were a convenience sample based on data accessibility by the Research Group. The organizations were also selected based on their similar history with quality improvement (QI) (Table 4) and organizational development work, their location at two extremes of the VBHC contextual prerequisites alignment, and theoretical replication (Yin, 2009), as the settings and their health systems were expected to produce contrasting results for predictable reasons, with contextual differences expected at the system, organization, and care delivery value chain levels. Additionally, the time of the beginning of this thesis, both organizations had created dedicated structures for rolling-out VBHC (Makdisse et al., 2018), with senior leadership promoting VBHC nationally and internationally, which created favorable conditions to study this thesis phenomena together with these organizations.

**TABLE 4**: HISTORY OF QUALITY IMPROVEMENT AT EINSTEIN AND KAROLINSKA

| PREVIOUS INITIATIVES DEVELOPED BY THE TWO ORGANIZATIONS | | |
|---|---|---|
| | **HOSPITAL ISRAELITA ALBERT EINSTEIN** | **KAROLINSKA UNIVERSITY HOSPITAL** |
| **EARLY QUALITY IMPROVEMENT EFFORTS Einstein (1990s – today) Karolinska (1997-2004)** | Accreditation by several organizations (e.g. first non-US hospital certified by the Joint Commission in 1999; ...) – full list: https://www.einstein.br/sobre-einstein/qualidade-seguranca/acreditacoes-certificacoes-designacoes | National Board of Health and Welfare's regulations for "Quality systems in health and medical care", in particular the requirements for systematic self-monitoring (SOSFS 1996: 24, § 5), and Regional (SLL) quality policy for interpreting services in healthcare, (Hälso- och sjukvårdsnämnden 1994-02-22). |
| | Guideline adherence monitoring and quality of care (described on 10.1093/intqhc/mzz115) since 2006 | Use of Total Quality Management to identify and improve problems in several clinical areas (described on 10.1097/00019514-200404000-00005; https://doi.org/10.1108/09526861011029370) 140 projects started between 1997 and 2004 |
| | Periodic personal feedback to physicians based on key performance indicators of quality of care since 2011 | |
| | In 2014, started a partnership with the US Institute for Healthcare Improvement to disseminate Triple Aim principles (described on 10.1136/bmjoq-2018-000354) – this includes the coordination of several national QI projects (e.g. "Adequate Childbirth" - https://doi.org/10.1186/s12978-018-0636-y) | Participation on 66 of the 76 Swedish quality registries (coordinator of 3 Level 1 NQR) |
| | Participation on international quality registries – e.g. National Cardiovascular Data Registry (NCDR) of the American College of Cardiology | |
| **PATIENT SAFETY EFFORTS Einstein (2007 – today) Karolinska (2004-today)** | High awareness over patient safety using as a reference the principles of the US Institute of Medicine (IOM) | |
| | Extensive work to improve patient safety using the high reliability framework inspired on Virginia Mason | Use of Crew Resource management to improve patient safety since 2009 (described on: 10.1093/intqhc/mzx113) |
| | Conducted surveys for improving medication error prevalence (described on: 10.1097/NCQ.0b013e3182641b1b) | Several studies conducted on patient safety (described on: 10.2147/DHPS.S232604; |

| | | |
|---|---|---|
| **LEAN INITIATIVES Einstein (2008 – today) Karolinska (2007-2013)** | Established a Lean and Six Sigma office dedicated to managing lean implementation in 2008 | Lean efforts facilitated by the hospital's Strategic Services Development Unit starting in 2007 |
| | 1,000 lean six sigma projects deployed in the past 10 years in the organization (examples described on https://doi.org/10.31744/einstein_journal/2018GS4200; https://doi.org/10.1590/S1679-45082012000400015) | Lean improvement efforts in the 16 Emergency services (described on https://doi.org/10.1186/1472-6963-12-28; https://doi.org/10.1108/JHOM-03-2013-0060 |
| | Work developed at the Hospital disseminated through courses and conferences promoted by the organization | Work developed on Lean presented on healthcare management conferences |
| | Co-hosts the Patient Safety and Care Quality Conference for Latin America, together with IHI, and several patient safety courses yearly | Internal courses and training led by the department of Quality and Patient Safety |
| **EARLY OUTCOMES MEASUREMENT EFFORTS Einstein (2011 – today) Karolinska (2013-today)** | Established an outcomes unit in 2011 and started measuring patient-reported outcomes in some clinical areas (cardiology, orthopedics and oncology) | Partnership with the International Consortium for Health Outcomes Measurements as a strategic partner in 2013 (later terminated), and in the development of several outcomes standard sets |
| | Participation on national benchmarking programs promoted by the Brazilian Private Hospital Association | Started measuring electronic patient-reported outcomes in Rheumatology |

### 3.2.1 The Karolinska University Hospital (Karolinska)

Studies III and IV were conducted at the Karolinska University Hospital, in Stockholm, Sweden. Karolinska is an academic hospital operating at two hospital sites (Solna and Huddinge), responsible for secondary and tertiary healthcare in Region Stockholm. Karolinska also provides highly specialized care for patients from other Swedish regions, and from other countries. Together with Karolinska Institutet, Karolinska conducts research and student education. It has a long history of organization-wide improvement initiatives, from TQM in 1997 (Thor et al., 2004) to lean management in 2007 (Mazzocato et al., 2014). In 2022, Karolinska had 15,600 employees, and delivered in excess of 57,000 surgeries, 85,000 hospital inpatient admissions and 1.3 million hospital outpatient visits, conducted more than 1,500 clinical trials, and managed an annual operating budget exceeding SEK20 billion (€1.7 billion). Karolinska is governed by a Board, to whom responds an administration that is independently responsible for ensuring that decisions of the Regional Council are implemented within the allocation framework. Evaluation is conducted using a Region Stockholm framework that is not directly related with VBHC. It includes organizational goals for a balanced economy, delivery of quality healthcare, and employee satisfaction. Temporally, the development of VBHC coincided with a trend of recurrent budget deficits, inability to meet waiting time guarantees, and declining employee satisfaction (Table 5).

**TABLE 5:** EVOLUTION OF KAROLINSKA'S ORGANIZATIONAL GOALS DURING THE 2011-2022 PERIOD.

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BALANCED ECONOMY** | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| *Net income* (M SEK) | +58 | +35 | -9 | -561 | -98 | +89 | -97 | -822 | -1,867 | +73 | +740 | +18 |
| **HIGH QUALITY HEALTHCARE** | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| *% of patients <4h in the ED (target >80%)* | 72 | 69 | 68 | 59 | 57 | 54 | 55 | 54 | 56 | 54,2 | N/A | N/A |
| *% of patients with a 1st specialist visit <30 days* | 72 | 78 | 82 | 84 | 72 | 67 | 66 | 62 | 49 | 63,5 | N/A | N/A |
| *Hospital-acquired infection rate (target <10%)* | 14 | 12,2 | 13,4 | 10 | 11 | 14 | 10 | 10 | 11,8 | 11,3 | 9,8 | N/A |
| **ATTRACTIVE EMPLOYER** | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● |
| *Employee Index (1-100)* | N/A | 72 | 71 | 71 | N/A | 72 | 73 | 73 | 74 | 78 | N/A | N/A |

N/A refers to data that was not available from Region Stockholm public information. The colored dots are presented in Region Stockholm public documents and represent whether the organizational goal was achieved (green) or not achieved (red).

#### *3.2.1.1 The context of VBHC at Karolinska*

In the early 2010s, Region Stockholm started discussing an ambitious Future plan for health care (SLL, 2011). This included decentralizing hospital care to specialist centers and primary healthcare, strengthening eHealth and patient-centered care, streamlining emergency care and mandating a special assignment to Karolinska as a highly specialized academic hospital. Senior leadership of the hospital, the university and the Region signaled then the strategic direction for the "New Karolinska" under construction: an increased concentration of highly specialized care, and a thematic structure with patient flows managed by specific teams where the different medical specialties were embedded, inspired by the Cleveland Clinic in the United States of America and the Imperial College London in the United Kingdom. Karolinska and KI were also central to the development of the entire life science investment in the Region, and to improve the cooperation between healthcare, research and industry. In 2013, this context fueled an enthusiasm in Sweden over VBHC, with the Boston Consulting Group (BCG) being instrumental in developing such vision. This ultimately led to the three leading University Hospitals - Karolinska University Hospital in Stockholm, Sahlgrenska University Hospital in Gothenburg, and Uppsala University Hospital - publicly advocating for VBHC and adopting VBHC models with consultancy support to varying degrees. At Karolinska, VBHC adoption began in 2013, when it started being piloted in ten patient pathways constituting approximately 10% of patient volume. In late 2014, a new executive team was appointed and developed a new operating model plan (Nya verksamhetsmodellen, "NVM") (Box 1). In 2018, Karolinska changed the executive team and initiated a review of VBHC. This led to potential adaptation and abandonment of the management innovations adopted in previous years. An abandonment decision was formally communicated by the Board in 2019.

**Box 1: Karolinska University Hospital's New Operating Model ("NVM") Plan**

- Organizational matrix structure with seven medical themes (Ageing, Cancer, Children and Women's Health, Heart & Vascular, Infection & Inflammation, Neuro, and Trauma & Reparative Medicine) and five functions (Allied Healthcare Professionals, Emergency Medicine, Laboratory Medicine, Perioperative Medicine & Intensive Care, and Radiology & Imaging), comprising 260 diagnosis-based patient care flows
- New managerial roles, including the patient flow captain (PFC) – a flow manager with the responsibility and resources to design, manage, and continuously evaluate the entire patient flow, regardless of where in the organization activities take place
- *Oval* table meetings, hosted by the PFC, where interprofessional and interdisciplinary teams (doctors, nurses and allied healthcare professionals, researchers, business comptrollers and patient representatives) make strategic decisions and co-design optimal pathways for each flow
- Transparent measurement of outcomes and costs using digital scorecards (*steering cards*) on patient flow team meetings, patient flow management, and continual improvement
- Integration of care, research, and education, through collaboration with KI at all management levels
- Responsibility to implement the new operating model rests with the Chief Operating Officer and the Strategic Healthcare Development and Care Production team.

Source: Internal documents

### 3.2.2 The Hospital Israelita Albert Einstein (Einstein)

Studies I, II and III were conducted at Hospital Israelita Albert Einstein, in Sao Paulo, Brazil. Einstein is a private, non-profit hospital system managed by the Jewish Community in São Paulo. It has three hospitals and 29 outpatient clinics. It operates under an independent physician staff model (Box 2), similar to most US hospitals(Casalino et al., 2008), which means that most doctors (83%) are not directly employed by the hospital, and instead they have to go through a registration process in order to practice at the organization.

**Box 2: Einstein's independent physician staff model**

Relationship with doctors has evolved since the organization's founding in 1971. Initially, the President of the hospital would invite young physicians to work at the hospital. With tougher accreditation and quality requirements, a framework for physician registration and evaluation of their qualification and skills was created in the 1990s. This evolved into a thorough fit-for-practice evaluation process which monitors outcomes and costs for specific high-volume/high-cost clinical conditions and rewards physicians in a 5-tier model (physician segmentation model), according to patient volume, quality, research and education, and social responsibility indicators; and annually provides individualized peer-benchmarking feedback to physicians. In 2016, physician-led multidisciplinary groups (GMAs) were created for better integrating clinician's practices. They meet regularly to discuss and organize processes to improve care quality and patient safety. In 2018, the hospital designated a core reference group of physicians for each specialty to support 2nd opinion programs and the development of innovative reimbursement models.

Source: (Klajner, 2016)

Einstein's history with QI initiatives can be traced back to the 1990s. In 1999, it was the first non-US hospital to be accredited by the Joint Commission International. In 2005, it began monitoring guideline adherence and clinical outcomes for specific medical conditions, and provide feedback to physicians on their clinical practice. In 2008, these quality indicators were firstly published online. In 2011, it established an outcomes unit which started to call patients after discharge and collect patient-reported outcomes. In 2014, the hospital and the US Institute for Healthcare Improvement formed a partnership to disseminate Triple Aim principles in Latin America.

#### *3.2.2.1 The context of VBHC at Einstein*

In 2015, VBHC started to generate attention by healthcare organizations throughout Brazil, particularly in Sao Paulo. High profile conferences presented experiences from other countries, particularly from Sweden and the Karolinska University Hospital, together with ICHOM and BCG. A newly-formed think tank (Instituto Coalizão Saúde), supported by some of Einstein's thought leaders, organized workshops with managers from private hospitals,

payers, and suppliers to discuss value-based reimbursement transformations. In 2016, the Brazilian Private Hospital Association initiated a pilot program for outcomes measurement with 8 hospitals in Heart Failure, supported by ICHOM.

At Einstein, a Value Management Office was created as a dedicated center to support VBHC initiatives in 2017 (Makdisse et al., 2018). It started working in close connection with the organizational structures already working at the hospital - the medical practice division (tasked with all the clinical and marketing activities directed towards the independent physician staff) and the GMAs - for diffusing VBHC core concepts and engaging the Hospital clinical staff in VBHC initiatives. In 2018, the hospital formally started selecting a core physician group, per medical specialty, who would serve as the reference for second-opinion programs and piloting of new payment models at the organization.

### 3.3 Data Collection and Analysis

This thesis relies on an empirical foundation derived from mixed methods (qualitative and quantitative) and analysis techniques. The data were gathered through a combination of institutional documents, semi-structured interviews to top and mid-level managers (study II and III) and to healthcare teams (study IV), and two surveys applied to the physician staff (study I) and to top and mid-level managers (study II). Subsequently, the collected data underwent analysis employing both inductive and directed content analysis methods, leading to thematic synthesis and case study description. The data collection period spanned from October 2013 to January 2020, and the results are presented as four distinct studies, as outlined in Table 6.

**TABLE 6***:* OVERVIEW OF STUDIES I-IV

| STUDY | AIM | DESIGN | SETTING AND PARTICIPANTS | DATA COLLECTION | DATA ANALYSIS |
|---|---|---|---|---|---|
| I | To explore physicians' awareness on core concepts of VBHC | Cross-sectional survey | Brazilian doctors who were registered to practice at Einstein | Online Survey administered to the total number of doctors registered at the hospital in September 2018 of whom we had updated contact details (N=7875) | Multivariate analyses to describe different physicians' characteristics associated with their views on VBHC |
| II | To investigate how healthcare providers in Latin America are implementing VBHC | Mixed Methods | Senior and middle-level managers appointed by the CEO in 70 healthcare providers in 5 Latin American countries (Argentina, Brazil, Chile, Colombia and Mexico) | Phase 1: online survey (n=70)<br>Phase 2: semi-structured interviews (n=58) and analysis of documents (n=+150), including meeting notes and published documents. | Inductive qualitative content analysis to identify patterns of VBHC adoption<br>Univariate analyses to identify differences between the organizations in relation to VBHC adoption. |
| III | To compare and contrast how VBHC was adopted in contextually different hospitals that publicly touted it as an organization-wide complex innovation and how its application was influenced by contextual factors at the system and organizational levels. | Multiple case-study | Senior and mid-level managers instrumental to the VBHC adoption at Karolinska University Hospital and Hospital Israelita Albert Einstein | Official documents & presentations (n=50), and interviews from a sample of 42 participants, 21 from each country | Directed content analysis, with meaning units sorted under the broader domains of the CIF, separately for each case |
| IV | To explore how VBHC management innovations were adopted, adapted, and abandoned at a Swedish university hospital | Longitudinal case-study | Healthcare professionals and patient representatives of six patient flows active at Karolinska between April 2018 and March 2021 | Official public documents and internal presentations from the hospital and Region Stockholm (n=+100), and two rounds of semi-structured interviews with a group of 32 study participants | Inductive qualitative content analysis condensed into a case description |

### 3.3.1 Study I

Study I is an observational, cross-section survey study of physicians' awareness on core concepts of VBHC. It uses data from a survey administered to Brazilian doctors who were registered to practice at Hospital Israelita Albert Einstein (Einstein). The universe was therefore the total number of doctors registered at the hospital in September 2018 of whom we had updated contact details (N=7875). The survey (Appendix 1) was administered online through the SurveyMonkey platform and sent via email and SMS from September 14th to November 14th, 2018, with one "reminder" in October. The questionnaire design was based on 2 steps, ie, a literature review and a subsequent pretest among 14 physicians.

The survey assessed the knowledge of physicians on core aspects of VBHC, namely their understanding of the definition of value in healthcare, the reasons driving the discussions for new financing models and the importance they gave to core value-based strategies that are being proposed for reforming health systems.

The first part of the survey assessed physicians' awareness over value in health and value-based health care. For the value in health, we considered whether physicians knew the definition of value, according to Porter, and the value equation. Furthermore, we asked physicians how they rated their level of awareness over VBHC (on a Likert scale). This self-reported VBHC awareness is a key metric we used to correlate with other answers given by physicians, and with their socio-demographic and medical practice characteristics.

The second part of the survey assessed physicians' perceptions of the reasons behind the discussions over new value-based financing models and the degree of importance they attributed to a list of strategies that have been argued to improve health system performance.

The last part of the survey assessed physicians' satisfaction with the current payment model and their willingness to consider innovative payment models under discussion.

We also linked physician responses to their demographic characteristics (age, sex) and practice characteristics (medical specialty, employment status, management position, participation in physician-led medical groups, physician segmentation at the hospital, among others).

Descriptive statistics and t-tests were calculated to determine differences in physicians between survey respondents and non-respondents and adjusted multivariate logistic regression analyses were used to describe different physicians' characteristics associated

with their views on VBHC models. All analyses were conducted using IBM SPSS software v.24 and a significance level of 5% was considered.

### 3.3.2 Study II

Study II is a mixed-methods study investigating how healthcare providers in Latin America are implementing VBHC.

Quantitative methods included the application of an online questionnaire developed to assess the level of implementation of the six elements of the value agenda and to identify VBHC initiatives. Qualitative methods included semi-structured interviews and analysis of relevant documents, including meeting notes and published documents.

Participants were selected using the intentional sampling method. We started by selecting countries. Argentina, Brazil, Chile, Colombia and Mexico comprise the five biggest Latin American economies and together represent over 50% of the population living in the region. An initial list of healthcare providers was created for each country derived from the published lists of América Economia ranking of best clinics and hospitals in Latin America between 2009 and 2018 and Joint Commission International-accredited organizations. To that list other providers were added based on a review of scientific and website publications and from interviews with healthcare stakeholders from different organizations in the region aimed at identifying organizations working on VBHC.

From a total of 182 organizations considered to participate in the study, a final sample of 70 participants was included in the study. Respondents of each organization were top or middle-level managers appointed by the CEO or President.

A structured questionnaire was developed in Portuguese and then translated into Spanish by a native speaker. It included questions on the organizational profile, the level of implementation of the six core elements of the value agenda, support of VBHC implementation through a value management office or similar structure and whether VBHC initiatives had been implemented or were under implementation in the organization (Apprendix 2). Online surveys and interviews were applied between December of 2018 and June of 2020. Telephone and videoconferencing interviews used a semi-structured format (Apprendix 3) where respondents were requested to comment and give examples of implementation according to the answers given in the online survey, and to describe the VBHC initiatives listed in the online survey and invited to share documents, if available. All interviews were digitally recorded, transcribed into Portuguese and summarized as categories through conventional content analysis (H. F. Hsieh & S. E. Shannon, 2005). Quantitative and qualitative data was then analyzed using descriptive statistics and

univariate analysis. Fisher's exact test was used to compare organizations that had (or had not) adopted VBHC initiatives.

### 3.3.3 Study III

Study III is a comparative multiple case study of the Karolinska University Hospital (Karolinska) and Hospital Israelita Albert Einstein (Einstein).

Data sources included interviews, official documents, and presentations. We interviewed senior and mid-level managers instrumental to the VBHC adoption (purposive sampling). An initial key stakeholder list was identified based on existing contacts. Thereafter, both groups were expanded through snowballing, where each participant was asked to identify others with insights into the organizations' VBHC strategies. For Einstein, we were also able to include an additional five interviews with senior managers from insurance companies and MedTech suppliers to better understand health system aspects. Data collection stopped when no new relevant content emerged during interviews (saturation), yielding a final sample of 42 participants, 21 in each country.

Interviews were conducted in Swedish or English, in Sweden, and in Portuguese, in Brazil, between April and December 2018 at participants' workplaces. Interviews followed a semi-structured interview guide with open-ended questions addressing key domains of the CIF (Appendix 4). The guide was pilot tested twice in both countries, resulting in minor wording changes. Interviews were digitally recorded, transcribed *verbatim* in the interview language, and analyzed using NVivo QSR International,V.10.2012.

Interview data were analyzed deductively using directed content analysis(H.-F. Hsieh & S. E. Shannon, 2005). A codebook was developed using the CIF. Coding was conducted in English, with meaning units sorted under the broader domains of the CIF, separately for each case. Thereafter, condensation occurred inductively where codes were independently and iteratively categorized by the first author, and 2 other researchers, until consensus was reached. The CIF was used to create and compare the two case descriptions, which were then validated and refined with key informants and senior managers.

### 3.3.4 Study IV

Study IV is a longitudinal case study (Audulv et al., 2022; Yin, 2009) of the adoption, adaptation and abandonment of VBHC at Karolinska.

Qualitative data were collected from more than 100 official public documents and internal presentations from Karolinska and Region Stockholm covering the period from 2011-2022, and two rounds of semi-structured interviews with a group of 32 study participants. – a

first round of 21 participant, between April and December of 2018 with a sample of senior and mid-level managers instrumental to the initial VBHC adoption (Ramos et al., 2021), and a second round of 11 participants between June 2020 and March 2021, with a sample of patient flow groups to explore the adaptation and abandonment phases. From an initial planning of 260 patient flow groups, 110 were active at Karolinska in 2020. From these, a purposive informed sample of six patient flows were selected based on the criteria of operating for more than 3 years, data availability and recommendation by in-house business intelligence and improvement professionals with insights into the development of VBHC at Karolinska. We also sought to include patient flows with different complexity levels. An initial list of 6 patient-flow leaders was identified purposively and approached by the first author and his supervisors. Thereafter, participants were selected to capture a representative sample of professional roles within each flow, including doctors, nurses and other healthcare professionals, patient representatives, comptroller.

Interviews were conducted online in Swedish or English by the first author and his supervisors, and followed a semi-structured interview guide with open-ended questions addressing aspects of VBHC and the management innovations (Appendix 5). Each interview lasted between 45-70 minutes. Interviews were digitally recorded, transcribed verbatim in the interview language, and analyzed using NVivo QSR International, V.10.2012.

Interviews were read line-by-line to identify meaning units describing the different value-creating innovations, and summarized as categories through conventional content analysis (H. F. Hsieh & S. E. Shannon, 2005).

The qualitative data collected was condensed into a case description that was guided by the authors' contextual knowledge of VBHC developments at Karolinska and nationally, the vast documental collection referred above and the categories identified in interviews, and reviewed by the author and supervisors to improve trustworthiness. The case analysis summarizes key events, observed effects related to the adoption, adaptation and abandonment of VBHC, and formulates tentative explanations for the findings.

### 3.4 Analys of the findings from the four studies: casual loop diagrams

Causal loop diagrams (CLDs) have been used to represent non-linear relationships and feedback between elements in complex systems, and hence can be used as a tentative "map" for complex interactions in health systems (Chang et al., 2017). CLDs contain arrows showing the direction of causal influence between system variables – healthcare providers awarded financial or non-financial incentives to meet certain health outcomes feel encouraged to meet such results (positive causal link); healthcare providers criticized on

the media for a new care model reduce their commitment with the transformation (negative causal link). In the discussion, we use the findings from the four studies to describe CLDs that emerged during the adoption, adaptation and abandonment of VBHC. These feedback loops are represented by numbered circular arrows and represent reinforcing (R) – favoring adoption - or balancing (B) – favoring abandonment - behaviors. The CDL are not included in each of the studies, but are presented in the thesis as a combined analysis of the results from all the studies.

### 3.5 Ethical considerations

The research team was granted access to discuss the hospitals' VBHC strategy with the management and clinical teams. Staff was informed about the planned research and about the fact that this research was performed outside the direct clinical setting and did not influence the delivery of medical care. All the participants interviewed gave their written informed consent for participating in the study and interview data will be kept confidential. Sub-study III uses retrospective patient data (patient outcomes). Patient data was made anonymous and stored securely according to Regulation (EU) 2016/679. For the Swedish cases, ethical vetting was applied for and approved by the Regional Ethics Committee (2018/1139-31/5). For the Brazilian case, the research was approved by the Brazilian Research Ethics' Committee (CAAE: 85658117.7.0000.0071; SGPP approval number: 2.731.483).

# 4 Results

## 4.1 Study I

The aim of Study I was to explore physicians' awareness on core concepts of VBHC.

### 4.1.1 Awareness on VBHC

Only a quarter of doctors at Einstein knew Porter's value equation, and self-rated their awareness as high or very high related to topics of VBHC.

High awareness of VBHC concepts was associated with high engagement with hospital managerial practices, namely ranking higher in the Hospital's physician segmentation models, Involvement in physician-led multidisciplinary groups, and holding management positions.

### 4.1.2 Reasons for ongoing VBHC discussions at Einstein

According to physicians, the main causes fueling the discussion over VBHC were financial. The majority of doctors referred that the increase in healthcare costs (79% of respondents) was the main reason for the discussions over new payment models, or that it was due to the pressure of payers for greater cost predictability (60% of respondents).

### 4.1.3 Importance of different VBHC strategies employed by Einstein

Regarding the importance they attributed to different VBHC strategies, physicians considered greater engagement with doctors in organizational decision making and measurement and dissemination of outcomes and quality measures as the most important measures, whereas dissemination of satisfaction surveys (PREMs) were seen as the least important initiatives for improving health system performance.

## 4.2 Study II

The aim of Study II was to investigate how healthcare providers in Latin America are implementing VBHC.

### 4.2.1 Misunderstanding of VBHC

A plethora of concepts was mentioned by healthcare executives when asked how VBHC was conceptualized in their organization (Figure 2). The 'value equation' was mentioned by 24% of the participants, and only 8% actually alluded to 'outcomes/costs'.

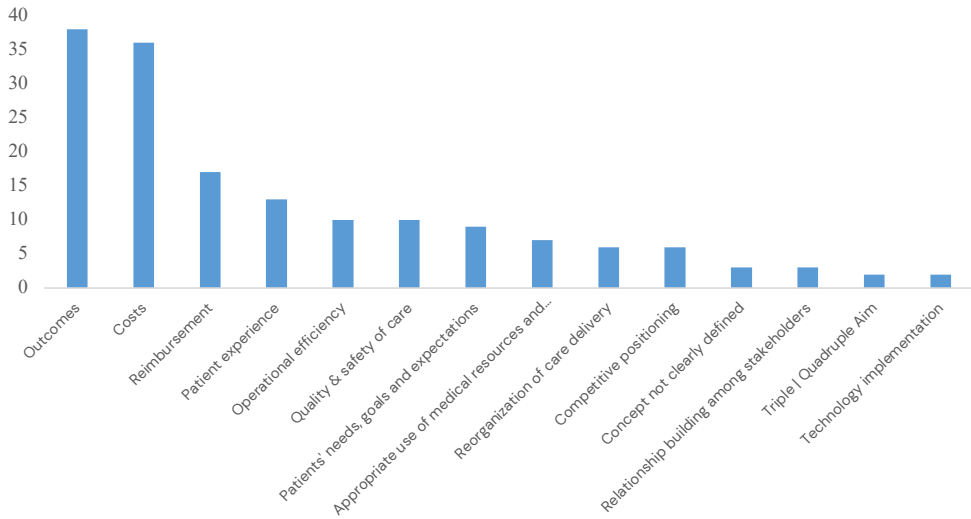


**FIGURE 2 :** THE MEANING OF VALUE-BASED HEALTH CARE FOR PARTICIPATING HEALTHCARE ORGANIZATIONS. THE FIGURE DISPLAYS THE DISTRIBUTION OF CODES DERIVED FROM THE QUALITATIVE ANALYSIS.

Similarly, when looking at the VBHC initiatives that organizations referred they were adopting, only about one-third of initiatives were aligned with VBHC. These were related to the 3 first strategies of the Value Agenda, namely organization of care delivery (57%), outcomes and cost measurement (34%), and bundled payments (10%).

### 4.2.2 Misalignment with the Value Agenda

Overall, there was no single organization that had a high degree of alignment across all the dimensions of the value agenda evaluated. The degree of alignment was highest on the organization of care delivery according to clinical conditions (53%), and lowest on the

measurement of outcomes (9%) and value-based payment models, with no organization actually adopting any payment model tied to outcomes.

### 4.2.3 Challenges for the adoption of VBHC

Regarding the challenges to VBHC implementation shared during the interviews, most references were related to the unavailability of meaningful and actionable information (34%), followed by stakeholders buy-in (22%) and reimbursement/compensation (17%).

### 4.2.4 Organizational factors associated with adoption of VBHC

A univariate analysis was used to assess the factors associated with the implementation of VBHC initiatives. Specialty hospitals were associated with adoption of VBHC initiatives ($p=0.05$), while all other organizational characteristics such as being public/private, teaching/ non-teaching, for-profit/not for-profit, number of beds, JCI accreditation or participation in the ranking of best hospitals were not associated with adoption of VBHC initiatives.

## 4.3 Study III

The aim of Study III was to compare and contrast how VBHC was adopted in contextually different hospitals that publicly touted it as an organization-wide complex innovation (Karolinska and Einstein) and how its application was influenced by contextual factors at the system and organizational levels.

### 4.3.1 Different conceptualization of VBHC as a management innovation

The two organizations highlighted distinct issues VBHC aimed to tackle: outcome measurement and care fragmentation at Karolinska, and escalating healthcare costs stemming from an inadequate FFS reimbursement model at Einstein.

Similarly, different rationales emerged for what constituted VBHC and how to generate value. Diverse problem perceptions led to distinct VBHC approaches: Karolinska aimed to implement new structures, processes, and tools for outcomes measurement and care integration, while Einstein focused on creating new financing models and population health strategies that reduced costs for the health system.

In both organizations, the adoption of VBHC posed a challenge to existing business models, "the logic behind how an organization generates, delivers, and captures value" (Osterwalder & Pigneur, 2010). Karolinska encountered difficulties aligning the new organizational model with its research and education mission, while Einstein's new financing models could require changing the relationship with their independent physician staff and with their patients.

### 4.3.2 Health System and broader Context influence VBHC adoption

In both cases, we observed that the adoption of VBHC was contingent upon system-level conditions that either required time to materialize or did not fully manifest. At Karolinska, the introduction of the new operating model occurred without a network reorganization or the implementation of new care financing models, resulting in misaligned organizational structures within the hospital. Likewise, at Einstein, the ties between insurance companies, patient care monitoring, and regulatory requirements remained closely linked to FFS principles, presenting obstacles to the development of innovative reimbursement models.

**TABLE 7:** VBHC – THE PROBLEM, THE INNOVATION, AND THE ADOPTION SYSTEM

| | KAROLINSKA UNIVERSITY HOSPITAL, SWEDEN | | HOSPITAL ISRAELITA ALBERT EINSTEIN, BRAZIL | |
|---|---|---|---|---|
| **PROBLEM** | **Care fragmentation** | Siloed approach to patient care; Lack of ownership over the full patient pathway | **Rising healthcare costs** | Financial unsustainability of the current system; Increase in costs due to overutilization of care |
| ***WHY IS YOUR ORGANIZATION WORKING WITH VBHC?*** | **Lack of outcomes measurements** | Insufficient knowledge on care quality; Inability to demonstrate excellence in care delivery | **Counterproductive logic of Fee-for-service** | Incoherence of the financing model generates overutilization and does not reward effective and efficient practices |
| ***WHAT IS IT TRYING TO SOLVE?*** | **Rising healthcare costs** | Need to demonstrate accountability for money invested | **Opportunity to demonstrate leadership role** | Pioneering attitude of the organization; Interest in anticipating transformations in healthcare |
| **INNOVATION** | **New Operating Model** | Connect care in a patient flow perspective; New managerial roles and multidisciplinary team to guide decisions for each patient group | **New Financing Model** | Bundled payments for specific medical conditions; Built upon previous successful 2nd opinion programs |
| ***HOW DO YOU DEFINE VBHC IN YOUR HOSPITAL?*** | **Put the "*patient first*"** | Prioritize patient needs – shift from provider-centered to patient-centered care; Measure success from the patient perspective | **Minimizing costs** | Provider competition on costs; Shift from maximizing revenues to managing costs |
| | **Outcomes measurement – *Steering cards*** | Outcome measurement to drive QI; Measure outcomes from the patient perspective (PROMs); Overcome limitations of NQR | **Designing population health management strategies** | Health prevention and promotion strategies, including primary healthcare |

| | | | | |
|---|---|---|---|---|
| **ADOPTION SYSTEM**<br><br>***WHAT ARE THE CHALLENGES OF VBHC AND HOW DID THE APPROACH CHANGE IN RESPONSE TO THEM ?*** | **Collision with traditional medical specialty-based organization** | Challenges to harmonize patient flows with traditional medical specialties and the academic organizational structure | **Collision with prevailing fee-for-service model** | VBHC as a concept under early exploration, still nascent in the market; financing mechanisms tied to FFS logics |
| | **Challenges to existing power structures** | Change management failures tied to creation of new roles challenging established power structures | **Challenges for the independent physician model** | Need for greater hospital-physician integration and physician involvement in VBHC discussions |
| | **Lack of mandate and support for newly established roles** | Difficult to decentralize budget and adapt data and IT-structure to the flow level; unclear role for patient representatives at the oval tables | **Data challenges** | Data fragmentation between providers |
| | **Data challenges** | Data infrastructure misaligned with the NVM; lack of patient-reported data | **Patients as challenging stakeholders** | Patients demand for high-cost treatments and low-value clinical practices |
| | **Challenges for the education and research mission** | Mismatch between organizational models of the hospital and the university; Fragmentation of educational responsibilities for residents between themes; Lack of clear definition of undergraduate students' paths from the beginning; Increased complexity for driving clinical research projects | | |

**TABLE 8:** THE INFLUENCE OF THE HEALTH SYSTEM AND OF THE BROADER CONTEXT

| | KAROLINSKA UNIVERSITY HOSPITAL, SWEDEN | | HOSPITAL ISRAELITA ALBERT EINSTEIN, BRAZIL | |
|---|---|---|---|---|
| **HEALTH SYSTEM** *WHICH FACTORS IN THE HEALTH SYSTEM HAVE INFLUENCED YOUR EFFORTS IN VBHC?* | **Systemic aspect of the transformation** | Three concurrent large-scale transformations create management difficulties and spill-over effects | **Systemic aspect of the transformation** | Requirement for holding a multi-stakeholder approach for conducting VBHC strategies |
| | **Consequences for research and education** | Mismatch of the organizational structure for VBHC, research and education of students and residents in a healthcare network (the "University Health System") | **Challenges involving insurance companies** | Lack of trust; Passive behavior of payers; Challenges in deciding which market segments could be involved in VBHC |
| | **Care Fragmentation** | Patient flows limited to Karolinska; need to link to other providers for a full cycle of care | **Care Fragmentation** | Limited ability to follow-up patients and their outcomes throughout the full cycle of care across disparate providers |
| | **Misaligned financing model** | Main purchaser's fixed budget allocation misaligned with the new patient-flow organization | **Misaligned regulatory requirements** | Challenges to innovative financing models due to regulation reflecting fee-for-service logics |
| **CONTEXT** *HOW DID THE BROAD CONTEXT AFFECT THE INTRODUCTION OF VBHC?* | **Political influence and Media inquiries** | Media pick up associations' and unions' critique over transformations and question consultancy role; Political uncertainty due to election cycles | **Economic crisis** | Financial crisis as an impetus for health system financial sustainability discussions |

## 4.4 Study IV

In Study III, we identified three management innovations initiated during the VBHC transformation at Karolinska: a new operating model, digital steering cards, and patient flow leadership teams. These management innovations were the focus of study IV, which used them as use cases with the aim to explore how VBHC management innovations were adopted, adapted, and abandoned. Table 9 presents an overview of the adopter's ideas for VBHC MI.

**TABLE 9:** IMPLEMENTERS' IDEAS ON HOW VBHC MI WOULD DELIVER VALUE AT KAROLINSKA

| MANAGEMENT INNOVATIONS | IMPLEMENTERS' IDEAS ON HOW INNOVATIONS WOULD DELIVER VALUE (KUH, 2015) |
|---|---|
| **PATIENT FLOW ORGANIZATION (NEW OPERATING MODEL)** | - A matrix organization consisting of Theme and Function, where the main feature of Function is to provide the medical skills and meet the needs of multiple patient flows based on the respective Theme (competence that is largely patient-specific) to ultimately create the highest value for patients;<br>- Stronger integration of care, education and research, in close collaboration with KI, to be supported by matching parallel line organizations, and the appointment of R&D Managers at each management level<br>- New management roles were created – key among them the Patient Flow Manager (PFC) responsible for designing, managing, and continuously evaluating each flow. The first job openings for these positions in 2017 made expectations and responsibilities explicit – *"(…)the role of PFC is a completely new managerial role (…), you lead the interprofessional and interdisciplinary team with patient representation. This is a unique opportunity to be part of creating something new based on VBHC (…)"* |
| **DIGITAL STEERING CARDS** | - Focus on outcomes per patient group allows to establish common and shared goals for all employees who contribute to a patient group, regardless of where in the organization they work<br>- Outcome measures included on steering cards was decided by the PFLG, where a patient representative is included - the patient's and relatives' perception of care are an important part of the quality evaluation, aligned with the newly adopted maxim "put the patient first"<br>- Follow-up should be based on easily accessible data with quick feedback.<br>- Data should be available for all dimensions of the tasks of Karolinska, and data from care, research, education and economy should be integrated |
| **PATIENT FLOW LEADERSHIP GROUP** | - Interprofessional and interdisciplinary team - consisting of both direct reporting employees to PFCs and employees acting in parts of the patient flow but reporting through other online organizations - that works in a common and coordinated manner, synthesizes and analyzes common knowledge and works towards common goals;<br>- PFC is accountable for designing, controlling and continuously evaluating work throughout the entire patient flow, regardless of where in the organization the flow activities take place |

### 4.4.1 Patient-flow organization

**Adoption**. An important goal for the new organizational model was to contribute to a more highly-specialized organization (Ramos et al., 2021). However, its operationalization revealed incompatibilities between specialization and care coordination: managers started to express concerns of increased care fragmentation between flows, which were seen as "too small, too thin, and too narrow", especially for patients with multiple diseases (and hence included in multiple flows) and emergency and acute flows. Comorbidities and complications that were previously treated within the same department were now treated within another patient flow, increasing the need for referrals. Patients from different flows were treated at the same ward which led to issues related to the distribution of beds and care responsibility. New boundaries between patient flows resulted in many meetings between different managers to solve issues and to plan. Concerns were raised about a new "divided hospital" – managers had a focused mandate and scope and only cared about their own patient flow.

**Adaptation.** Several approaches were attempted for improved cooperation: patient flows initiated weekly joint ward rounds with the goal of providing more standardized care to multimorbid patients; some themes started journal clubs between the flows to maintain expertise; internal tools were promoted to increase staff communication; geriatric teams were created within specific themes to provide better frailty assessments and discharge planning; and new units were created to address multi-morbidity challenges which were now more visible in the highly-specialized hospital.

By 2018, Karolinska was still unable to decentralize management to the flow level. The organization's old data structure showed that the budgeting and controlling processes - which resided at the divisional level - were unfit for the intentions with the new Karolinska structure. PFC and other front-line managers only received fragmented and incomplete follow-up information, both in terms of care production and finance, which generated concerns about access to the necessary organizational support, IT systems and competence to materialize their mandate. In an internal survey, PFCs were the individual staff category with the lowest percentage responses for reasonable workload.

**Abandonment.** Following several internal reports and audits during 2019, the hospital management formally revised the operating model on January 2020. The role of the Chief Operating Officer (COO) – a leading actor behind the new operating model – was removed. Several units were merged and management levels were condensed, resulting in larger medical units and reduced number of managers by 20-25%. According to the

board, the new organization contributed to a clarification of the managerial role, by placing the ultimate responsibility for operations and responsibility for finance, production and personnel – previously resting on the PFC - in the new figure of the "operations manager". Several themes and functions opted for a so-called "two-legged structure", with one Head of Department, often a physician, and one Head of Care Unit, often a nurse, responsible for nursing operations, instead of the previous operating model with one PFC, often a physician.

### 4.4.2 Digital Steering Cards

**Adoption**. The hospital and the university had strong relationships with international benchmarking organizations. One of the founders of ICHOM (International Consortium for Health Outcomes Measurement) was the Dean of Research of KI at the time, and the Hospital was a strategic partner of ICHOM until 2018. Nonetheless, the steering cards' creation followed mostly the metrics available for the National Quality Registries (NQRs) (L. Emilsson et al., 2015). Initial success stories for using the steering cards included improvement initiatives such as education courses for patients generated from "problems" identified by data. Meanwhile, the lack of development of financial measures in the steering cards was evident, since structured accounting systems to follow the patient flow did not facilitate calculation of costing measures such as the cost per patient.

**Adaptation**. Since they were firstly adopted, steering cards were compared with the NQRs. For many employees, NQRs and steering cards were complementary: NQRs provided the benchmarking with other hospitals and regions, while steering cards integrated data directly from the medical records, could include more patients and had more specific and precise data. An initial ambition to include a stronger patient perspective in the steering cards did not materialize and they were ultimately seen as clinician-focused tools. For instance, the few patient-reported outcomes included were mentioned by some allied healthcare professional as the only relevant metric in the steering card. Outcomes for research or education were also absent in most steering cards.

Discrepancies between data in the NQRs and the steering cards contributed to increased suspicion over the credibility of steering cards. For some PFCs, it was surprising that even small errors in the steering cards generated criticism, even if these included more patients than NQRs; for others, the fact that NQRs had team members manually re-checking all data generated higher trust in the NQR information. Ultimately, the lack of follow-up to adjust the steering cards and integrate them with the NQRs contributed to loss of interest in the use of the steering cards.

**Abandonment**. After 2017, the financial situation (Table 2) became a matter of concern expressed in Board meeting minutes and external audit reports. The hospital lacked IT systems to support accurate financial management, resulting in managers lacking the conditions to take responsibility for their budget. The newly-appointed hospital board and an external audit recommended to strengthen financial transparency and control, by improving financial information systems and adopting cost-containment measures to reduce hospital deficit. Hospital management was to report in all meetings the work progress on developing a data structure to supply to front-line managers the care production and financial information against the budget ("Project X"). Steering cards development was deprioritized, and instead there was a renewed reliance in NQR to disseminate quality achievements, specifically by using them to follow-up on theme specific clinical outcomes. The rhetoric shifted from measuring outcomes to care queues: reduction of waiting times was announced as the new focus for organizational steering, translated into the slogan "Queue-Free Karolinska".

### 4.4.3 Oval Tables

**Adoption.** Oval tables were adopted as an arena for discussion and operationalization of improvement projects within flows. Improvement projects mostly focused on care delivery issues, analyzing quality data coming from steering card and NQR, to guide the improvement projects. Economic aspects and teaching or research topics were seldom addressed. Improvement projects ranged from educational courses for patients, to improving post-acute rehabilitation, initiating joint ward rounds with other flows, or increasing adherence to guidelines. As with steering cards, the initial intention to include representatives of research and education at the oval tables did not materialize.

**Adaptation.** When the oval tables were initiated, there was the expectation that they could become a forum for discussing strategic questions for the patient flow; but because economy and strategic discussions continued to reside higher up in the organization, oval tables became mostly "operational", and not strategic. Eventually, there was a clear separation between oval table flow meetings and strategic medical unit meetings, where decisions on production, economics, and long-term strategy were made.

Patient participation was one of the hallmarks of the oval tables. By 2018 and 2019, approximately 60 patients and relatives were involved in oval tables, accounting for almost half of the management groups. Additionally, a Strategic Patient and Relatives Council was established in 2018, consisting of ten members, with the task of cooperating with the hospital management by providing a patient and relatives perspective. Patient

representatives were mostly involved in consultation activities with an "informal" relationship (no payment, and no formal time commitment): they supported production of educational materials for other patients and provided feedback on their experience of treatment at the hospital. Although patients and professionals acknowledged the value of patient input, both expressed challenges in taking part in technical discussions, and questioned whether representatives views' reflected the wider group of patients and other disease subpopulations. Some patient flows chose to broaden patient participation by including more than one patient representative or rotating between different representatives. Additionally, patient representatives met several times a year in a hospital-wide network to exchange experiences and foster cooperation.

In 2021, an internal audit by the board at Karolinska found unclear governance and follow-up on how strategic patient influence should be realized. There was a confusion of concepts in the organization, leading to a lack of clarity in what was to be achieved, and patient influence varied depending on the area of operation and patient group.

Contrary to the other MIs, in the case of the oval tables, no formal abandonment decision was made

# 5 Discussion

The aim of this thesis was to explore the adoption, adaptation, and potential abandonment of VBHC. Table 10 presents a summary of the main findings, which were analyzed in the next section to suggest potential feedback loops driving adoption, adaptation, and abandonment of VBHC, tied to the main components of the Complex Innovation Framework - indicated in figure 3 and throughout the text with the symbols R(reinforcing) and B(balancing).

**TABLE 10:** SUMMARY OF MAIN FINDINGS IN STUDIES I-IV

| STUDY AIM | MAIN FINDINGS |
|---|---|
| **I**<br>Explore physicians' awareness of core concepts of VBHC | Low awareness on VBHC amongst clinical staff, with the highest aware physicians those who were very engaged with the hospital managerial practices<br>Financial reasons identified as the key driver for VBHC-related discussions in Brazil |
| **II**<br>Investigate how healthcare providers in Latin America are implementing VBHC | Organizations adopting VBHC failed to conceptually define it and adopted it as an integrative strategy. They instead identified "VBHC" initiatives unrelated with the original Value Agenda.<br>Overall alignment with value agenda strategies was very low in Latin America, especially in relation to item 3 (value-based financing), item 6 (unavailability of meaningful and actionable data), and stakeholder buy-in, including physicians.<br>Adoption of VBHC was significantly associated with hospital specialization, where specialty-focused hospitals had the highest likelihood of successful VBHC adoption |
| **III**<br>Compare and contrast how VBHC was adopted in contextually different hospitals that publicly touted it as an organization-wide complex innovation and how its application was influenced by contextual factors at the system and organizational levels | Organizations adapted VBHC to emphasize components that best translated into their system, e.g. Karolinska focused on health outcomes and Einstein on costs.<br>VBHC adoption challenged established business models - Karolinska had difficulties matching the new organizational model with the research and education missions; Einstein with aligning the new financing models with their independent physician staff |
| **IV**<br>Explore how VBHC management innovations were adopted, adapted, and abandoned at a Swedish university hospital | VBHC adoption was driven by a coalition of interests, including regional alignment (hospital thematic organization and specialization mandate), hospital-university relationship with data benchmarking organizations and industrial partners,<br>Adaptation required early in the adoption process due to several misfit examples - between the specialization mandate and delivery of multidisciplinary care; the decentralization of management and the organization's IT and data systems, financial model and cultural values; and the models of patient participation<br>Abandonment characterized by a return to previous practices – merger of flows resulting in larger units; re-center of outcomes improvement narrative around NQRs; - and the "silent death" of VBHC artifacts, such as the PFCs or outcomes steering cards. |

## 5.1 What does VBHC fix? (Problem)

**High costs is what health care tries to solve with VBHC (B1)**

VBHC was envisioned as a health system strategic transformation to respond to "high costs, uneven quality, frequent errors, and limited access to care" (Porter & Teisberg, 2006). However, in Study I-III, we found that high costs (N1) acted as the strongest motivator in practice. Increased financial restrictions (N2) – such as those of the financial crisis of 2013, or inflation– compounded this desire and served as an additional source of pressure to look for a "solution", such as adopting VBHC.

To maintain the financial sustainability of a health system requires a comprehensive approach, with strategies directed at multiple health system levels. The VBHC framework suggests this type of integrative approach that requires changes at the system, organizational, and care delivery value chain levels. This was seen as an attractive feature of VBHC as a management innovation, and hence, was potentially a strong reinforcing loop for its adoption. Nonetheless, if VBHC is evaluated solely on the basis of producing short-term cost savings (N3) for payers (public or private), it may fail and be abandoned (Study IV). Instead, VBHC should be "based less on short-term transactional negotiations and more on long-term collaborative relationships between payers and providers" (Steenhuis et al., 2020). A long-term perspective makes it easier to accept the upfront investments and costs incurred during the adoption of VBHC, which can lead to "short-term financial hits before longer-term costs decline"(Catalyst, 2017).

## 5.2 Context and health system

### 5.2.1 A coalition of contextual-specific interests drove VBHC adoption (B2)

Adoption of VBHC was driven by a coalition of interests where VBHC was attractive because it was aligned with either a narrative for public health or market-based reform (N4).

In Sweden, the coalition included several different management logics, power structures, and development strategies between hospital and university senior management, the (commissioning) Region Stockholm health system, private stakeholders in the industry, and later even EU and OECD-level policies (Study IV). Aligned contextual interests between the hospital, university and regional health system mirrored previous MI adoptions in the same ecosystem (Choi & Brommels, 2009; Tragl et al., 2022; Öhrming, 2017). Since VBHC suggests a new operating model with a thematic organization and care specialization (IPUs), it fit well with the regional strategy for care decentralization. The oval tables with patient representatives fulfilled the concept of patient-centered care that has been advocated as a corner stone in Swedish national policy as Good Care (God Vård) (Ekman et al., 2015; SKR,

2018). The steering cards aligned with the outcomes improvement narrative driven by external organizations (e.g. ICHOM) and consultancy companies with ties to both the hospital, the university, and nationally supported projects (Tolf et al., 2020; Tragl et al., 2022)

In Brazil, wide consensus on the need to reduce costs of healthcare in the private health sector generated pressure on prominent private hospitals, the national private hospital association, not-for-profit think tanks, and influential universities to claim leadership in the market reform.

In both cases, the narratives created a favorable societal climate (N5), which contributed to accelerate adoption efforts. This also generated higher expectations and societal scrutiny. If VBHC fails to demonstrate effectiveness in the short term – or, moreover, is associated with industry or political interests, as was the case for Karolinska in the context of a skepsis about the new operating model (Röstlund & Gustafsson, 2019) - societal support may erode (N6) and counteract the favorable context. Eventually, multiparty engagement may be lost, contributing to VBHC abandonment. This erosion of societal support contributes to abandonment. This phenomenon was also seen in the abandonment of the SVEUS VBHC-based analytical programme initiative, part of which occurred in the same ecosystem (Tragl et al., 2022)

## 5.3 Adoption system

### 5.3.1 Multidisciplinary care dissuaded specialization mandated by VBHC (B3)

In Study II, most VBHC initiatives were associated with specialized hospitals (N7), which mirrors the focus on surgical and less complex patient flows in the VBHC literature (van Staalduinen et al., 2022; Vijverberg et al., 2022). This led to doubts regarding whether or not VBHC can be applied in primary health care (Putera, 2017). Porter and colleagues have proposed broader patient segments (e.g. healthy adults, elderly multimorbid, etc.), which could be addressed using similar rationale as for acute, specialized care (Porter et al., 2013).

This is unsurprising since, at its core, VBHC is a specialisation-oriented management framework developed on a foundation of volume and focus (Porter's "Virtuous circle of Value") where the unit for creating value is a medical condition requiring specialist care, with a structure (IPUs – value agenda component #1), measurement (outcomes and costs – value agenda component #2), financing (bundled payments – value agenda component #3) and tools (IT platforms – value agenda component #6) that optimize for the specialization.

In Study III, Karolinska's experiment with a new operating model based on 110 patient flows (inspired on IPUs) casts doubts on the optimal hospital structure to foster VBHC (Steinmann et al., 2022). The relative benefits of focus and breadth in hospital organization have been studied empirically, with specialization (focus) demonstrating positive effects on improved outcomes (Kuntz et al., 2019) and reduced costs (Freeman et al., 2021), especially if focused areas are complementary (Clark & Huckman, 2012) (an example is a cancer center with complementary cancer-related service lines). Yet, these benefits of focus diminish with higher patient comorbidities, which cross diseases/flows and physician specialty boundaries (Clark, 2012). Study IV showed that coordinating care within these hyper-specialized organizations was challenging, signaling incompatibilities between VBHC adoption and the delivery of complex care for patients with multimorbidities (N8) and the integration of care with other providers (N9) (Enthoven et al., 2007). Specialization created the need to add new cross-function structures (managers, processes and tools) to foster cooperation between these "focused factories". These investments are hindered by financially stressed health systems (N2) and pose a barrier for short-term efficiency (B1). Ultimately, the example of Karolinska with the merger of several units, condensation of management levels and abandonment of coordination structures (such as centralized offices) is a visible balancing loop, counteracting the hyper-specialization mandate.

While there is an inherent conflict between specialization and generalization (Cook et al., 2014), it does not mean that they cannot necessarily coexist through well-functioning integration agreements and networks (van Veghel et al., 2020), or even that it is not viable to have IPU-based models focusing on a set of coexisting conditions or patient populations (Porter et al., 2013). Such a center has been recently created in Stockholm and initial results on the quality of care delivered are favorable (Rafiq et al., 2019). Innovative "value-based" delivery models, such as patient-centered medical homes (PCMH), have also been growing in the USA in parallel with more focused models (e.g. bundled payments for surgical flows), trying to address some of these care coordination concerns (Catalyst, 2017; Heiser et al., 2019; Rollow & Cucchiara, 2016). A potential facilitator may be the use of data and new technologies (namely Artificial Intelligence) to cluster subgroups of multimorbid patients and improve the management of clinical processes in patients with multiple chronic conditions (Rafiq, 2022)

#### 5.3.2 Organizations did not have the Data infrastructure required by VBHC (B4)

The lack of IT platforms and data infrastructure to support VBHC adoption is a recurring challenge mentioned in the VBHC literature (Conrad et al., 2014), although included as one of the components mentioned in the value agenda (component #6) . Since outcomes data took the front-seat in the VBHC narrative (Porter et al., 2016), organizations tend to direct

their initial effort towards creating systems for measurement of outcomes (Varela-Rodríguez et al., 2021), and particularly patient-reported outcomes (del Olmo Rodríguez et al., 2023). However, Study III and Study IV show that the lack of IT platforms and data analytics' capabilities manifest in other VBHC components, contributing to their potential abandonment. Firstly, the lack of financial systems (N10), including cost data, was more visible than the lack of outcomes data, a finding also described by leading European Hospitals adopting VBHC (Cossio-Gil et al., 2022). Since the high cost of care is a recurring motivator for introducing VBHC (Study I-III), and cost data is needed to design and implement bundled payments (Study III), a lack of financial data may prevent accurate evaluation of the impact (return on investment) with the VBHC lens (the cost of care relative to the observed outcomes). Other authors have also found that the lack of financial information may erode the interest of administrators and finance directors and reduce support for scale-up (Tragl et al., 2022).

Secondly, VBHC implies the redesign of hospital organizational structures – from the creation of specialized "IPUs" to deeper integration with affiliated hospitals in the community through the care delivery value-chain. IT Platforms do not have the fluidity to assume these new structures effortlessly and data does not "follow the patient". Study III showed there was lack of data integration (N11): at Karolinska, the data infrastructure was not prepared for the creation of a hyper-specialized organizational design with 160 small units, each with its own data needs – this generated challenges in internal cross-referrals between flows, and external data sharing with regional healthcare providers and the Stockholm Region; at Einstein, patient data was spread across different hospitals and insurance companies, making it more difficult for the hospital to follow patient flows and design bundled payments over long follow-up periods.

Finally, data granularity is important for the adoption of VBHC. In Study III, both organizations had to analyze outcomes and financial data at different organizational levels – patient flows at Karolinska and a core "institutional" group of physicians piloting bundled payments at Einstein. If these new organizational levels brought about by VBHC, at first, are considered "virtual levels", with no direct correspondence on the operational systems, it may create challenges to structure the data that is needed to demonstrate impact of VBHC adoption. One example from Einstein was the need to design a bundled payment for diabetes in pregnancy: inpatient costs for pregnant patients with diabetes were not significantly higher than those for pregnant patients without diabetes. It was only when integrating the cost of newborn care that the true (higher) cost of providing care for diabetic pregnant women was captured because newborns from diabetic pregnant women were more likely to be

admitted to neonatal ICU and have prolonged lengths of stay. This integration of data for analysis had to be done manually, since the system was designed to register admission of two patients (the mother, and the newborn).

#### 5.3.3 Organizations' business models faced significant challenges – and may need to be revised (B5)

Adoption of VBHC may trigger tensions with traditional business models. We encountered three examples of such tensions - the physician/team-in-the-lead (N14), the patient representative mandate (N15), and the relationship with education and research mission at Academic Medical Centers (N16).

VBHC promotes a so-called 'physician in the lead' approach for VBHC, where healthcare teams, and physicians in particular, are expected to lead the changes in clinical pathways that may contribute to improved value (increased outcomes and reduced costs) (Porter & Teisberg, 2007).

Study I and Study III showed that the relationship with the clinical staff was indeed a key organizational factor for the adoption and adaptation of VBHC. At Karolinska, the "physician-in-the-lead" approach was acknowledged by the institutionalization of a first-line manager, a "patient flow captain" (PFC) with a strong mandate to manage each flow. However, the original ambition to decentralize the management of resources, outcomes and improvement work did not materialize, mainly due to data requirements (B4) and conflicts with the specialization mandate (B3). Difficulties on decentralization of mandate in Swedish hospitals has been described by other authors (Colldén & Hellström, 2022) Lega and Pietro argue that this is due to a fundamental flawed structure of "functional silos" (Lega & DePietro, 2005), particularly evident in AMCs – a phenomena one of the PFCs in Study III alluded to as a "cutthroat business, where clinical leaders have very sharp elbows".

At Einstein, similarly to the USA where VBHC was born, physicians operate as an "independent body". This business model created challenges for the adoption of VBHC, which requires different organizational structures, tools, and financing mechanisms than the ones doctors have been practicing in. In the USA, the trend has been for increased integration between practicing physicians and healthcare organizations (Scott et al., 2017), in order to have more control over the risk-based performance mandated by value-based programs (Page et al., 2013). Hence, models of physician-hospital affiliation may evolve in Private Health Systems, leading to physician-salaried models and/or competition from specialized clinics. (Casalino et al., 2008).

Tensions were also identified with the incorporation of patient representatives in the patient flows' teams. Patient representatives and healthcare professionals in Study IV mentioned technical knowledge limitations, "patient-employee" relationships, and representativeness bias by single patients. Patient representatives were seen as a detached element from quality improvement, with their involvement limited to the initial patient consultation in a "co-creation continuum" (Carman et al., 2013). Previous authors mention this "tug of war" (Bergerum et al., 2020) which prevents this "co-creation continuum" from evolving into true partnership and shared leadership. A recent literature review confirmed that the degree of patient engagement during VBHC adoption is still low (van der Voorden et al., 2023).

Finally, Academic Medical Centers (AMCs) faced unique challenges with VBHC (Kocher & Wachter, 2023; Miller, 2015), as shown in Study III. Firstly, education and research missions of AMCs lead to higher infrastructure costs – these are usually not considered on value-based financing agreements and pose an additional challenge for these organizations to show cost-savings with VBHC adoption. This may lead AMCs to be focused on the highest acute care – reflected by the Karolinska case - transforming them on hyper-specialized hospitals for complex surgery, transplant, and intensive care (Kocher & Wachter, 2023). Yet, if the VBHC mandate leads to a reduced care mission, it may generate a mismatch between the care portfolio and access to the more general patient populations needed for medical and residency training and for maintaining funding levels in clinical research. Additionally, if education (training, licensing, continuous professional development, etc.) remains structured around medical specialties, it creates additional conflicts between the organization for care delivery (Hospital) and the organization for education (University), a finding also described during for Lean (Mazzocato et al., 2014). At Karolinska, the university's organization of undergraduate education was supposed, but eventually did not adopt a mirroring structure to the hospital – research and educational activities became then scattered across the newly formed hospital organizational structures.

Finally, clinical staff at AMCs may have less time to exert the "physician in the lead" role – they have less time to plan and implement the care delivery changes anticipated, simply because they are divided between their care delivery, teaching and research engagements. Moreover, AMC-affiliated physicians may require more evidence on the impact of VBHC – lacking today (Vijverberg et al., 2022) – before supporting adoption.

## 5.4 Interaction of problem, context, health system, and adoption system with the innovation

### 5.4.1 Piecemeal adoption may prevent VBHC scale-up and spread (B6)

We found several examples of piecemeal adoption of VBHC (N17), with adopting organizations supporting the components best aligned with their system (e.g. the outcomes component of VBHC in Sweden, and the cost component in Brazil), while filtering elements that could be perceived as unattractive in their context (e.g. the cost component of VBHC in Sweden).

Piecemeal adoption of VBHC may be a two-edged sword for the adopting organization: initially, it may contribute positively for an early and fast adoption, preventing decoupling (superficial adoption) and/or active resistance (Ansari et al., 2010) and demonstrate short-term efficiency (B1); in the long term, it may lead to organizations refraining from adopting VBHC as an integrative strategy, contributing to further misalignment with the value agenda and preventing scale-up and spread of VBHC.

We found that this piecemeal adoption may be due to three phenomena:

- Misalignment at the health system level with the value agenda (N17) may encourage organizations to tone down those strategies that are harder to adopt. This is specially relevant considering the high percentage of healthcare organizations which are misaligned with the core VBHC prerequisites of outcomes and cost measurement, care delivery organization centered around medical conditions, and value-based reimbursement (Study II). Moreover, alignment is not an immutable quality: in 2016, Sweden was described in a unique position in terms of having the greatest number of prerequisites conducive to implementing VBHC (Shah, 2016); yet, in 2020, VBHC was not sustained, and later abandoned (Study IV). This signaled that prerequisites are important, but not sufficient, and instead active and continuous multistakeholder engagement is needed to sustain alignment between VBHC as an innovation and the health system. This is in line with findings from other authors in the same context (Tragl et al., 2022).
- Lack of understanding about the underlying concepts of VBHC (N18) may also contribute to selective adoption. We show that both clinical staff (Study I) and healthcare executives (Study III) associate VBHC with concepts different from those of the original VBHC theory. Pseudo-understanding has been described before in studies of VBHC (Fredriksson et al., 2015), leading to recent proposals for a "new strategic agenda" for VBHC, integrating components of education and learning platforms for healthcare professionals. (van der Nat, 2022)

- "Hybridization" of VBHC with historical practices (N19) may also stimulate piecemeal adoption (Ansari et al., 2014). In Study III, we showed that VBHC was embedded in previous lean efforts (Karolinska) and on the Medical Practice Division workflow (Einstein). Similar findings are observed with organizations adopting VBHC in other countries (Goretti et al., 2020; Heijsters et al., 2022; Varela-Rodríguez et al., 2021). Hybridization can be extreme, with the adopted "VBHC" initiatives being completely unrelated with any VBHC concepts (Study I).

Furthermore, piecemeal adoption reduces opportunities for benchmarking (N20), preventing new adopters from learning from successful organizations and diffuse best practices (Daniels et al., 2022).This is problematic because adoption by a single provider organization is challenging, if not impossible (Steenhuis et al., 2020)

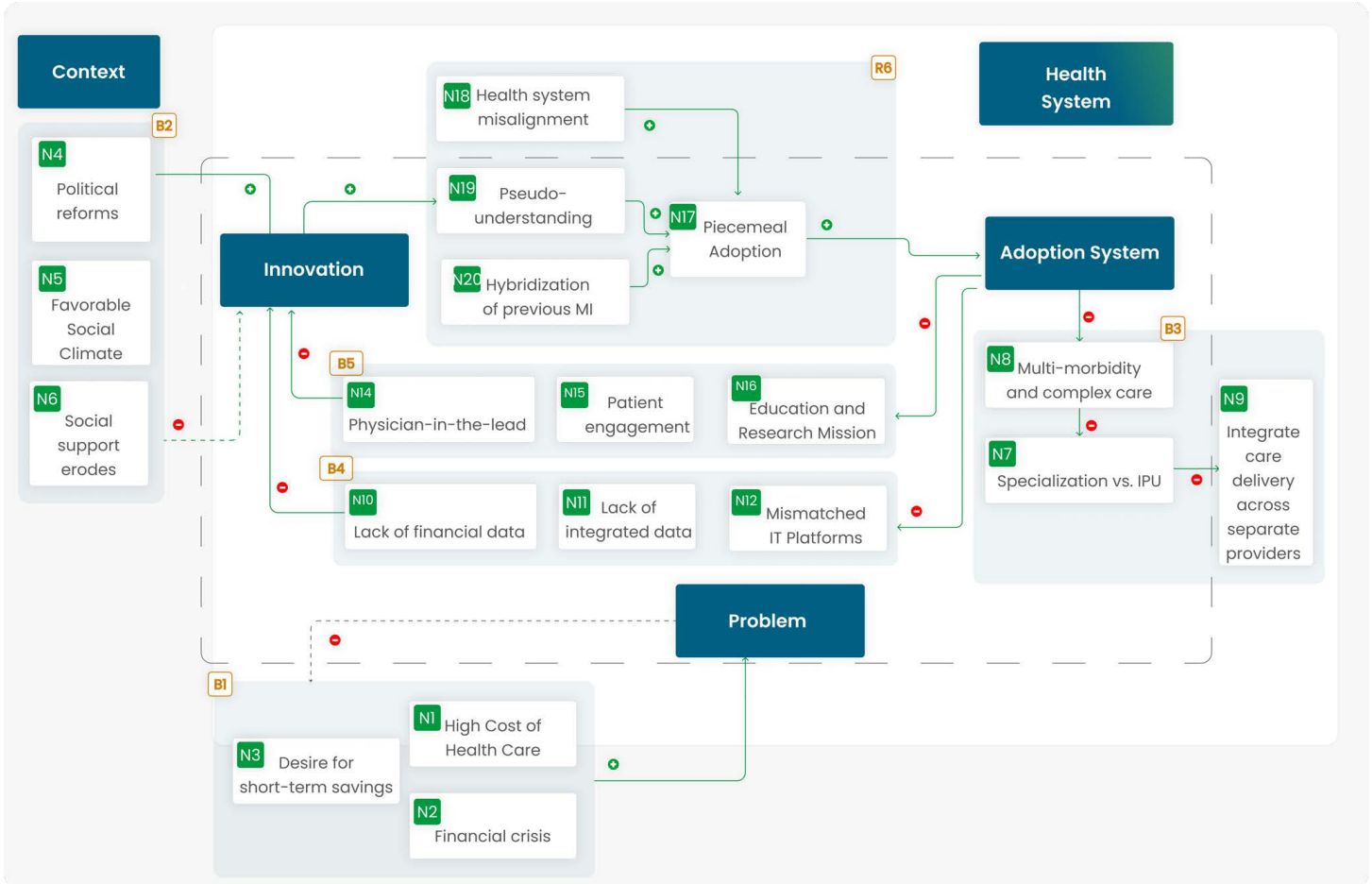


**FIGURE 3 :** REPRESENTATION OF THE FEEDBACK LOOPS INVOLVED IN ADOPTION, ADAPTATION AND ABANDONMENT OF VBHC, TIED TO THE KEY COMPONENTS OF THE CIF. R REPRESENTS REINFORCING LOOPS; B REPRESENTS BALANCING LOOPS; N REPRESENTS THE KEY FACTORS MENTIONED IN THIS SECTION. DASHED ARROWS REPRESENT A DELAY IN IMPACT

## 5.5 Implications for the Adoption, Adaptation and Scale-up – instead of Abandonment - of VBHC

**Moving beyond Piecemeal adoption.** Since VBHC adoption involves the alignment of several health system stakeholders (Study III), piecemeal adoption may feel like a natural first-move for managers - adoption starts through pilots (Steinmann et al., 2022) in areas where there is wide enthusiasm of charismatic clinical leaders (Nilsson, Bååthe, Andersson, et al., 2017) or where there are other international successful cases they may refer to (Larsson et al., 2012). Yet even when piloting, organizations may need to be strategic on where to start, so that it maximizes the possibility to show impact to health system stakeholders – payers and other health providers – and contribute to system-based alignment that favors scale-up and spread. If organizations choose to pilot VBHC adoption according to three parameters – volume, cost and cost variability – capability to show return over the investment could be easier, generating more enthusiasm from the broader context – and hence maximize alignment. The rationale is straightforward: clinical conditions with higher volume and higher cost are the ones where the largest impact may be achieved; conditions with high variability on costs are the ones where there are stronger opportunities for standardization, benchmarking with others and reducing unwarranted variation in clinical practice.

On the contrary, if organizations start adopting VBHC with full-scale transformations – as was the case of Karolinska, where multiple levers had to be pulled simultaneously – they may not have sufficient room for VBHC to achieve "wins" (for instance, in terms of financial efficiency) and make adaptations (e.g., partnerships with other regional providers).

**Reducing data requirements.** VBHC has been associated with the need to capture new outcomes data points. (Porter et al., 2016) This data collection generates significant burden, which limits its scalability and create an additional barrier for VBHC. New metrics, such as PROMs and PREMs, also require alignment between different stakeholders on the different purposes to use the data for. (Van Der Wees et al., 2014) Additionally, there is not always a solid historical reference or external benchmark for these metrics for internal teams and health system stakeholders (e.g. other healthcare providers, payers and suppliers), which may limit acceptance from physicians to use them in clinical care (Mou, Sisodia, et al., 2022) and from managers to adopt them as a meaningful performance metric (Mou, Mjaset, et al., 2022).

Similarly, on the costing side, the emergence of micro-costing methodologies, such as Time-driven activity-based costing, and the significant investment needed to adopt it, may be a

barrier for implementing simple improvements on current costing systems and methodologies (Keel et al., 2017).

A different approach may be for organizations to start using what they already have in their IT system, through for instance data linkage (Walshe et al., 2021).

**Funding investments required by VBHC**. In order to scale-up and spread to less-aligned areas (clinical, processes or systems-wise), organizations adopting VBHC require investments in "liaison devices" (Steinmann et al., 2022) - cross-functional structures, processes and systems. Arguably, if initial experiments are able to demonstrate shared savings, these can be used by payers for supporting the necessary investments. In the USA, Medicare's VBHC payment programs include specific reimbursement lines for care coordination activities and capabilities for sharing data, and private equity investment for companies developing "value-based" models is on the rise, growing faster than capital expenditures on new hospital construction. Nonetheless, in current financially strained public health systems, innovative investment mechanisms may be required, involving cooperation with other stakeholders. An example in Sweden is Region Stockholm's Health Impact Bond, developed together with a Private Insurance Company. The financial investment is used to finance type 2 diabetes prevention programmes for prediabetic populations, where the risk sharing is achieved by linking the financial return to the outcomes of the preventive programme. On a 2-year follow-up of the programme, Region Stockholm announced that the bond reached its goal, with ~50% of patients no longer in the risk zone, according to their HbA1c measurement. Success of smaller, targeted public investments are required, before Governments commit to large "VBHC public investment fund", as suggested by proponents of VBHC (Larsson et al., 2023).

**Building on payer-provider partnerships.** VBHC has been mostly explored from the perspective of the healthcare provider, and smaller attention is devoted to the role of payers. This thesis argues that VBHC should be approached as systemic endeavors, and not as single experiments by healthcare providers, in line with more recent "iterations" of the VBHC framework, asking for public-private moonshot agendas (Larsson et al., 2023). Learnings from successful initiatives show that enduring payer-provider collaborations serve as an indispensable structure for VBHC to thrive (Conrad et al., 2014). Yet, payers need to serve as more than a "no turning back" pressure – they need to adopt a framework of strategic purchasers (Steenhuis et al., 2020), willing to engage in traditionally difficult conversations for payers, such as volume agreements (Ramos et al., 2021) or updating coding and coverage policies to include outpatient monitoring technologies and care coordination structures (Agba et al., 2022). I agree with the view that for VBHC to be

sustained, payers and providers relationships need to evolve from the yearly cycles of renewals and reconciliations (of private reimbursement pricelists or public budgets) to a regular and iterative working relationship (Agba et al., 2022).

**Defining the hard core and soft periphery of VBHC.** The value agenda involves a complex package of elements which are not exclusive of VBHC, but instead exist alone or as components of other quality improvement frameworks (K. Walshe, 2009). Which of these constitute its irreducible 'hard core' and which must adapt to optimize its effectiveness? These findings, together with evidence from other research groups (C. Colldén & A. Hellström, 2018), seem to indicate that adopters interpret that every component of VBHC can be adapted (a wide 'soft periphery'). Defining the 'hard core' of VBHC – the well-defined and fixed elements that characterize its fidelity – may allow to manage trade-offs between extensiveness and fidelity of VBHC, maintain some integrity on the "VBHC agenda", reducing piece-meal adoption, and giving it a better chance for scale-up and spread. If current evidence on VBHC serves as a guide (van Staalduinen et al., 2022; Vijverberg et al., 2022), Porter's characterization of health value as outcomes/costs, and the need for comprehensive understanding of both numerators and denominators of the value equation, seem more consensual and can serve as the 'hard core' that payers and providers, managers and clinical teams, shall keep if one is to consider their efforts an adoption of VBHC. On the contrary, health structures (Steinmann et al., 2022), financing (Joynt Maddox et al., 2018; Milad et al., 2022), IT systems (Walshe et al., 2021) and data standards (Benning et al., 2022) components seem more flexible and context-dependent, and hence prone to adaptation.

## 5.6 Methodological Considerations

**Research process.** One of the main aspects related with my research process is my role as an insider researcher (Dwyer & Buckle, 2009). I started my professional job at Hospital Israelita Albert Einstein coincidentally with the start of my PhD, and studying a topic which was directly tied to my professional responsibilities.

The ability to conduct "research from within" involves the explicit awareness of the possible risks and effects of the researcher role within the organization (Sikes & Potts, 2008). Together with my supervisors, I discussed on what it meant to be a researcher in my own organisation, particularly on how to maintain high awareness and reflexivity (avoid researcher bias). It was particularly important to maintain an objective assessment of the study phenomenon, specially considering that, in some circumstances, it could overlap with the (self-)assessment of my own work and the Value Management Office team I was part of at the Hospital. This was particularly important in an organization with a culture of overachieving and where success was the norm. As an insider researcher, I benefitted from a deeper knowledge and understanding (known as "pre-understanding") of the organization within I was based. This was beneficial for going deeper in the analyses (i.e. ground the work in the everyday experiences of the organization adopting VBHC), a reflection that is consistent with other studies in VBHC (C. Colldén & A. Hellström, 2018; Nilsson, Bååthe, Erichsen Andersson, et al., 2017). Nonetheless, there is also the concern that some assumptions may be misleading (Coghlan & Brannick, 2014). The fact that my supervisors were not part of the organization (external supervision in Study III and IV), and that data analysis was conducted in collaboration with them provided the adequate balance between maintaining the appropriate critical judgment and having a deeper understanding of the organizational culture.

Moreover, I had personal preconceptions related to VBHC. The first time I heard about VBHC was in 2012 at a Michael Porter conference in Lisbon - I recall thinking "this makes sense". One of my Medical School essays on that year was on how to organize diabetes care in primary healthcare in Portugal according to VBHC concepts. Acknowledging this researcher bias early on my PhD was key for maintaining a credible research process, and partnering with my supervisors was influential for developing an "outsider view" (Breen, 2007). Recurrently, I confronted the most recent literature on VBHC, and the original literature, in light of my most recent professional/research experience. I also regularly reflected on my observations – both at Einstein and at Karolinska – together with the research team, with multidisciplinary colleagues in Brazil, Portugal, Sweden and The Netherlands (including those adopting VBHC in other organizations), comparing it with my own perspectives. On the other hand, I recognized my medical background, and made attempts to look at the phenomena

from Porter's Economic and Business Strategy Academic lenses, and trace this back to my observations and readings.

A second aspect related with the research process was tied to research resiliance, the ability "to adapt and continue the research throughout a crisis while maintaining consistency with the overall research design to successfully complete the research project" (Rahman et al., 2021). We started to discuss the study design of the 4th study during the 2nd semester of 2019 and, shortly after, COVID-19 was declared a global pandemic. Naturally, this had a significant impact in my research, delaying many interviews and field work. Additionally, Karolinska faced a significant political turmoil with unfavourable media exposure, and the VBHC management innovations we were studying were gradually put on hold. This created additional challenges for engaging with participants to study VBHC. This was ultimately a learning for me as a researcher, namely by allowing me to adapt the initial study – which was meant to study mostly adoption and adaptation of VBHC – to have a deeper focus on the abandonment of management innovations – a topic rarely studied.

**Internal validity.** This thesis follows a case study methodology (Yin, 2009). I followed several recommendations to maintain internal validity throughout the data collection and analysis process:

- Triangulation: this refers to the use of multiple methods, datas, theories and investigators to develop a broad understanding of the phenomena. In this thesis, I triangulated findings of multiple organizations, stakeholder groups (managers, healthcare professionals and patients), using multiple data sources (interviews, surveys, official documents,..). This allowed me to develop convergent/divergent lines of thought which I then used for developing hypothesis for the adoption, adaptation and abandonment of VBHC. The risk for bias was addressed by making sure that two of the supervisors – who were not affiliated to any of the hospital organizations - challenged my assumptions, proposing alternative explanations. This does not preclude other research groups from generating different hypothesis using the same findings.
- Study database: All data collected was stored and catalogued using qualitative research software (NVivo 12.0). The interviews were recorded, transcribed verbatim (de-identified) and stored as Word files (with password protection). Organizational documents were also stored in their original format. In NVivo, this data was linked to the different CIF components, as well as to key VBHC concepts using themes, categories and subcategories. Reversely, data in each category was

directly linked to the source (original data), through a database with information on the interview and interviewee, alowing for tracing back the chain of evidence.

As in any qualitative research, the results are faithful descriptions of the statements of different participants, which differ from VBHC as a theoretical concept. In Study I-III, I included illustrative quotations from the participants, allowing readers to cross-reference the empirical data and the results, increasing trustworthiness on the hypothesis generated from these findings. Moreover, differences between the two hospitals in the positions of participants may influence the results; for instance, I had fewer system-level participants in Sweden. Additionally, media scrutiny at Karolinska could have influenced recollections. Finally, analyzing VBHC through the lens of healthcare providers gives it a narrow perspective, as discussed in the previous section. In order to reduce these biases, I included several participants from payer organizations, completed by a vast collection of documents, and making use of the deep contextual understanding among members of the research group (ie. the research team had two researchers working in the Stockholm Region Health System).

Finally, I faced the challenge of obtaining reliable quantitative data, specially at Karolinska. I found that the very challenges described by participants regarding data quality and sources behind the steering cards made it difficult to draw robust conclusions regarding outcomes and costs in Study IV. While this may be seen as a limitation, it is also a finding in itself, considering that the value agenda posits organizations should be able to follow outcomes and cost data to understand and improve their performance, a finding I reflect upon in the Discussion.

**External validity.** The two organizations were a convenience sample based on data accessibility by the Research Group. While the "special" circumstances of the diffusion of VBHC at Karolinska and Einstein deemed it well-suited for case study research, as described in the Methods section, this choice of cases may impact generalizability. I addressed this issue by triangulating the results with a wide body of literature – within and outside VBHC - , providing a thick description of the context of the management innovations, and translating the findings to an established framework (the CIF). This should allow readers to assess the degree of transferability of the findings from this thesis to their particular context.

# 6 Conclusions

Value-based Health Care evolves through a process of self-development, adapting to a web of relationships and interactions between managers and clinical teams, organizations and resources, learning from experiences, and dynamically transforming in unpredictable ways. These developments are non-linear, shaped by feedback loops where, at different moments, distinct "system inputs" yield different outputs.

VBHC adoption is largely influenced by contextual factors at the health system level, leading to a phenomenon of piece-meal adoption. Since systemic alignment with the components of VBHC is generally low, organizations emphasize those that are most aligned with their health system goals and contextual circumstances.

Historical business models – such as the physician-hospital commensalist relationship under fee-for-service, or the tripartite mission of Academic Medical Centers – may be challenged by emerging VBHC business models. Since these core business models are hard to adapt, they may become barriers for scale-up and sow the seeds for VBHC abandonment. Abandonment develops through an "accordion effect", with a return to previous practices and an almost complete obliteration of VBHC innovations.

## 6.1 From value-based health care to value co-creation

If adopters of VBHC are able to focus attention on integrated understanding of both outcomes and costs (the hard core of VBHC), we may start to unpack the specific care-related processes that contribute to value creation for different patient populations. This is important considering concerns that VBHC is less associated with processes for value creation, and more with assigning goals (Colldén et al., 2017). This may be related with who has been seen as the protagonist of VBHC. The protagonism must be given to healthcare professionals and patients – the only ones with the technical expertise and personal experience to co-create and capture value in healthcare. There is evidence that patients and healthcare professionals are willing to engage as partners in value co-creation (Scott Duncan et al., 2023), and resonates how VBHC is increasingly conceptualized through shared decision-making (Steinmann et al., 2021). However, this does not preclude other stakeholders, especially healthcare managers, from taking an active role: they can support the protagonists on moving beyond piecemeal adoption; reducing data requirements; funding investments required by VBHC; and building on payer-provider partnerships.

# 7 Points of perspective

## 7.1 Future research

I recommend some areas for further research on VBHC:

- VBHC adoption in multimordid patient populations. One of the findings of Study III was that it was difficult to reconcile VBHC concepts for multimorbid patient groups. New studies in VBHC may delve into multimorbidity and value creation through identification of patient needs, integration of care within and across healthcare providers, and data systems that can adjust better to multimorbid populations. Aditionally, research that shares empirical examples of organizational design that supported – not hindered – value creation can advance our knowledge on the shortcomings identified by the Karolinska experiment.
- VBHC and staff wellbeing. Despite the abundance of literature on VBHC in the past 15 years, there is a striking lack of evidence on the influence of staff wellbeing on VBHC adoption(and vice-versa) (Vijverberg et al., 2022). This is concerning considering there is no value creation for patients without staff wellbeing (Sikka et al., 2015).
- Including social determinants of health (SDoH) in VBHC models. VBHC research and practice has failed to acknowledge that patients' SHoH (e.g. how patients live, how patients feed, how patients work,...) have an impact on how they perceive value in their care. An open question is: where do SDoH position in Porter's outcomes hierarchy ? This is important considering SDoH are significant predictors of outcomes and costs (McCarthy et al., 2022), including for clinical conditions typically involved in VBHC programs (Delanois et al., 2022).
- Patient participation in value creation. This thesis' studies, together with findings from other research groups, point towards a superficial understanding on how patients can be involved in value creation beyond participation in surveys and interviews. Future research may dive deeper into this topic, namely by exploring feasible mechanisms for "regular" patients to be involved in value co-creation processes; and necessary adaptations on patient co-creation for patients of lower socio-educational status, in line with above. Including patients as co-participants of the research process may provide a richer understanding of these questions.
- Systemic alignment on Value creation. Studies sharing empirical examples on multistakeholder collaboration on the adoption of VBHC are key to understand how to foster systemic alignment on VBHC (through governance, financing, data

sharing,...) (Conrad et al., 2014). This is an important research avenue to understand barriers and facilitators for scale-up of VBHC (Larsson et al., 2023).

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# 10 Appendices

## 10.1 Appendix I – Survey (Study I)

**QUESTIONÁRIO SOBRE ASSISTÊNCIA À SAÚDE BASEADA EM VALOR (VALUE-BASED HEALTH CARE)**

**Número do CRM:**

**1 Como você classifica seu grau de conhecimento sobre "Assistência Baseada em Valor (Value Based Healthcare - VBHC)"?**

- ☐ Muito alto — Sou entusiasta do tema e procuro me manter atualizado sobre as iniciativas envolvendo VBHC
- ☐ Alto — Interesso-me pelo tema e já li alguns artigos ou assisti palestras sobre o tema
- ☐ Médio — Interesso-me pelo tema mas nunca li artigos e nem assisti palestras sobre o tema
- ☐ Baixo — Tive pouco contato com o tema e não me sinto confortável em discuti-lo
- ☐ Muito baixo — Não tenho conhecimento sobre o tema

**2 Na sua opinião, o que está provocando a necessidade de transformação do sistema de saúde, partindo do modelo atual que remunera por volume (Fee-for-Service) para um modelo baseado em valor (Fee-for-Value) que remunera pelos resultados clínicos obtidos? (Mais que 1 alternativa poderá ser selecionada)**

- ☐ A escalada dos custos da saúde que compromete a sustentabilidade do sistema de saúde
- ☐ A demanda dos pagadores (pacientes, empresas e operadoras) por maior previbilidade de custos
- ☐ A mudança no perfil do paciente que passou a demandar mais informações e a comparar os prestadores
- ☐ O movimento dos forncedores em direção à atrelar a compra de materais e equipamentos à contratos de prestação de serviço(tendência neste segmento ligada à sustentabilidade)
- ☐ Não estou ciente que este movimento vem ocorrendo

**3 Como você definiria "Valor" em Saúde?**

- ☐ É a percepção do paciente em relação aos benefícios que obteve do tratamento em relação à quantia paga pelo mesmo, independente do resultado clínico obtido.
- ☐ São os resultados clínicos (desfechos que importam para o paciente) obtidos em relação aos custos de oferecer tais desfechos.
- ☐ É a quantia de dinheiro paga por determinado tratamento.
- ☐ É atingir um alto grau de satisfação do paciente mesmo que os resultados clínicos e os custos estejam fora do valores esperados.

**4 Você já ouviu falar na Fórmula de Valor (Michael Porter, Redefining Healthcare, 2006)?**

- ☐ Não, nunca ouví falar.
- ☐ Sim, mas não me recordo dos seus componentes (numerador|denominador)
- ☐ Sim e conheco seus componentes:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Numerador: | ☐ Custo | ☐ Preço | ☐ Desfechos | ☐ Satisfação | ☐ Expectativa |
| Denominador: | ☐ Custo | ☐ Preço | ☐ Desfechos | ☐ Satisfação | ☐ Expectativa |

**5 De 1 a 5, qual o grau de importância que atribui a cada uma das seguintes estratégias que buscam melhorar o desempenho do sistema de saúde atual (onde 1 é a que considera mais importante e 5 menos importante)?**

| | | | | | |
|---|---|---|---|---|---|
| Ações que reduzam a variabilidade a prática clínica (protocolos e padronização de materiais) | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Maior participação do médico nas decisões institucionais | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Mensuração e divulgação de desfechos e indicadores de qualidade | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Mensuração e divulgação dos custos envolvidos no atendimento | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Implementação de novos modelos de remuneração baseado em valor | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Divulgação pública da pesquisa de satisfação dos pacientes com os médicos que o atenderam | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Prontuário eletrônico | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Implementação de novas tecnologias como Big Data, Machine learning, Telemedicina, etc | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |

**6 Os protocolos assistenciais e a padronização de materiais são ferramentas usadas para ajudar a reduzir a variabilidade indesejada da prática clínica. Qual seu grau de concordância com as afirmações abaixo:**

| | | | | | |
|---|---|---|---|---|---|
| A presença de protocolos e de padronização de materiais, desde que elaborados com a participação dos médicos, ajudam a melhorar a qualidade da assistência e a reduzir os custos | ☐ Concordo totalmente | ☐ Concordo | ☐ Nem concordo, nem discordo | ☐ Discordo | ☐ Discordo totalmente |
| Os protocolos e a padronização de materiais engessam a prática do médico pois limitam a capacidade de tomar decisões clínicas | ☐ Concordo totalmente | ☐ Concordo | ☐ Nem concordo, nem discordo | ☐ Discordo | ☐ Discordo totalmente |
| Os protocolos e a padronização de materiais tem aspectos positivos e negativos e considero que os positivos suplantam os negativos | ☐ Concordo totalmente | ☐ Concordo | ☐ Nem concordo, nem discordo | ☐ Discordo | ☐ Discordo totalmente |
| Os protocolos e a padronização de materiais tem aspectos positivos e negativos e considero que os negativos suplantam os positivos | ☐ Concordo totalmente | ☐ Concordo | ☐ Nem concordo, nem discordo | ☐ Discordo | ☐ Discordo totalmente |

**7 Em ordem crescente de importância (onde 1 é a que considera mais importante e 5 a menos importante), quais as informações que considera mais relevantes para receber feedback da Instituição, em relação à sua prática clínica?**

| | | | | | |
|---|---|---|---|---|---|
| Indicadores de qualidade (adesão a protocolos, preenchimento de prontuário, alta até as 10h, etc) | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Desfechos clínicos (infecção, mortalidade, readmissão, etc) | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Desfechos reportados pelos pacientes (qualidade de vida, funcionalidade, dor, etc) | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Satisfação e experiência reportada pelos pacientes (Satisfação e recomendação) | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Custos dos procedimentos | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| Não considero importante receber esse tipo de feedback da instituição | ☐ | | | | |

**8 Como você é remunerado atualmente pelo seu trabalho?**

- ☐ Atuo principalmente como médico autônomo e recebo por cada atendimento que realizo (Sistema Fee-For-Service)
- ☐ Atuo principalmente como médico autônomo e recebo por cada atendimento que realizo porém já tenho algum acordo no qual ofereço "garantias" caso ocorra alguma complicação e recebo um "bônus" caso meus resultados estejam acima do acordado (Sistema Fee-For-Value)
- ☐ Atuo principalmente como médico contratado e recebo um salário mensal

**9 Com relação à questão 8, qual seu grau de satisfação com o seu modelo atual de remuneração?**

- ☐ Estou satisfeito e não quero mudar
- ☐ Estou satisfeito mas estou aberto para discutir modelos alternativos
- ☐ Estou insatisfeito com o modelo e acredito que uma mudança é necessária

**10 Você estaria disposto a participar de projetos em parceria com o Hospital que envolvessem os conceitos de Fee-For-Value (Remuneração baseada em valor) na qual tanto o hospital quanto os médicos incluiriam garantias de resultados clínicos e satisfação dos pacientes?**

- ☐ Sim.
- ☐ Não.
- ☐ Ainda não tenho uma ideia formada à respeito mas gostaria de ouvir mais.

## 10.2 Appendix II – Survey (Study II)

**QUESTIONÁRIO SOBRE ASSISTÊNCIA À SAÚDE BASEADA EM VALOR EM ORGANIZAÇÕES DE SAÚDE DA AMÉRICA LATINA**

**PAÍS:** ☐Argentina ☐Brasil ☐Chile ☐Colômbia ☐México

**DADOS DA ORGANIZAÇÃO DE SAÚDE**

**NOME:**

**PERFIL:**

**Setor em que atua** ☐ Setor Público ☐ Setor Privado ☐Ambos
**Tipo** ☐Hospital geral ☐ Hospital especializado
**Fins Lucrativos** ☐ Com fins lucrativos ☐ Sem fins lucrativos
**Hospital de ensino** ☐ Sim ☐Não
**Total de leitos**

**DADOS DO RESPONDENTE**

**NOME E SOBRENOME:**

**CARGO:**

**EMAIL:**

**TELEFONE DE CONTATO:**

**GOVERNANÇA**

**POSIÇÕES DE GESTÃO OCUPADAS POR MÉDICOS** ☐ CEO ☐ Presidente

Total de Diretores Médicos — Total de Diretores
Total de Gerentes Médicos — Total de Gerentes

**ESTRUTURA DO CORPO CLÍNICO**

Total de Médicos cadastrados
Total de Médicos autônomos
Total de Médicos contratados
Média de idade dos Médicos

**VOLUMES DE ATENDIMENTO (2017)**

Total de pacientes internados
Total de procedimentos cirúrgicos
Total de atendimentos Pronto socorro
Total de partos

**PARTICIPAÇÃO EM AÇÕES DE VBHC**

O hospital participa de iniciativas ligadas à VBHC ? ☐Sim ☐Não

O hospital tem uma Unidade dedicada à estratégia de VBHC? ☐Sim ☐Não

Descreva como estão organizadas as áreas de informações e análise de dados institucionais

O Hospital tem uma área responsável por medir desfechos? ☐Sim ☐Não

O Hospital reporta desfechos para Registros Nacionais ou Internacionais? ☐Sim ☐Não Cite:

O Hospital reporta publicamente os seus desfechos? ☐Sim ☐Não Website:

Enumere iniciativas de benchmarking de desfechos e/ou custos (nacionais ou internacionais) em que o hospital está participando

Os membros do Hospital participam em treinamento (e.g. cursos, congressos,...) na área de VBHC? ☐Sim ☐Não Cite:

Número de Publicações Científicas na área de VBHC Cite:

Número de Projetos em andamento na área de VBHC Cite:

| | |
|---|---|
| Descreva brevemente práticas e projetos que o hospital desenvolve em VBHC | |
| Descreva as práticas instituídas para medição de desfechos para cada paciente | |
| Descreva as práticas instituídas para medição de custos por paciente | |
| O Hospital tem fluxos clínicos padronizados (clinical care pathways) ao nível da condição clínica? | ☐Sim ☐Não Em quais patologias? |
| Caracterize novos modelos de pagamento por valor (pagamento que leva em conta os desfechos do tratamento) em que o hospital está participando | |
| Share de pagamento baseados em valor no total de financiamento do Hospital | |
| Descreva brevemente iniciativas de integração dos cuidados entre diferentes prestadores do sistema de saúde que pretendam melhorar os desfechos dos pacientes | |
| Descreva brevemente iniciativas de integração dos cuidados entre diferentes prestadores do sistema de saúde que pretendam melhorar os desfechos dos pacientes | |
| Enumere brevemente reformulações e/ou investimentos nos Sistemas de Informação (IT) que estejam alinhados com a estratégia de VBHC | |

## 10.3 Appendix III – Interview Guide (Study II)

### Guião de Entrevista (Português) – Representante do Hospital

O objetivo desta entrevista é tentar entender mais sobre as **iniciativas de implementação de estratégias de Medicina baseada em valor (value-based healthcare) na sua organização**.

A entrevista será gravada digitalmente. Também tomarei notas durante para prevenir falhas na gravação.

A entrevista levará uma hora. Vou fazer perguntas usando um guia de entrevista, focado em diferentes áreas. **Tudo o que será dito durante a entrevista será tratado cuidadosamente e só será visto pelo grupo de pesquisa**. **Os resultados serão apresentados anonimamente e agregados**. Sua participação é voluntária e você pode decidir interromper sua participação a qualquer momento.

### Pergunta de abertura

1. Você poderia descrever brevemente o(s) seu(s) papel(s) na organização?

### Principais perguntas

2. O que se entende por VBHC na sua instituição?
3. Onde você diria que começaram a aplicar conceitos de VBHC? Como estão trabalhando com VBHC na prática? Em quais áreas começaram a trabalhar e porquê?
4. No questionário inicial que nos enviaram, referiram algumas iniciativas para [ver abaixo]
    - organizar a assistência em torno de condições clínicas
    - medição de desfechos e custos por condição clínica
    - desenvolvimento de novos modelos de remuneração baseados em valor
    - incorporação tecnológica relacionada com VBHC

   como por exemplo .....

   Quer nos contar um pouco mais a respeito desta(s) iniciativa(s)?

   [Objetivos da iniciativa? Contexto? Quem teve um papel importante? Resultados já encontrados?]

5. Quais foram os principais desafios para a implementação destas iniciativas de VBHC?
6. Como sua abordagem e pensamento sobre VBHC mudou em resposta a estas experiências iniciais?
7. Como o hospital está desenvolvendo competências (conhecimento, habilidades, atitudes) para abraçar os esforços de implementação do VBHC?
8. Existem alguns fatores no sistema de saúde que influenciaram estes vossos esforços no VBHC?

[ Organização / Financiamento (pagamento do prestador) / Recursos (inc. RH) / Necessidade de novos modelos de cuidados ]

9. Como as relações que sua organização tem com stakeholders da cadeia de saúde mudaram em virtude destas iniciativas de VBHC?

   [pagadores ?, fornecedores? outros hospitais?]

**Perguntas de encerramento**

10. Existe alguma coisa sobre a qual você gostaria de adicionar?
11. Há alguém com quem você acha que nós deveríamos conversar?

Chegamos ao final desta entrevista. Gostaria de agradecer o seu tempo e estou ao dispor para responder quaisquer perguntas que possa ter.

## 10.4 Appendix IV – Interview Guide (Study III)

### Interview Guide (English) – Hospital team

### Introduction

The purpose of this interview with the members of the hospital team is to try to understand more about the implementation of value-based healthcare in this hospital, as well as the contextual factors that may influence its implementation. The interview will be digitally recorded. I will also take notes during the interview in case the recording malfunctions.

Is this ok with you?

The interview will take one hour. I will ask questions using an interview guide, focused on different areas. Everything that will be said during the interview will be treated with care and will only be viewed by the research group. The results will be presented anonymously and aggregated at the group level. A preliminary analysis will be presented for the management group. Your participation is voluntary and you may decide to discontinue your participation at any time.

If this is ok with you, perhaps we can start?

### Opening Question

1. Could you briefly describe your role(s) and your tasks in the organization?

### Main Questions

<u>The Problem</u>

1. Why is your organization working with VBHC?
   Can you give me examples of situations where this worked very well?
2. What is the problem you are trying to solve?
3. How do you think VBHC may help address this problem? Who will benefit and how?

   Patients? Clinical staff? Management? Students and Residents? Politicians?

<u>The Innovation</u>

1. How do you define VBHC in your hospital?
2. How do you think VBHC will impact research and education in your hospital?

<u>The Adoption System</u>

1. Where have you applied ? How are your working with VBHC in practice? Which areas have you started working and why ?
2. Who have been the stakeholders who have played an important role and what has been?

Managers ? Consultants? Patient representatives? Clinicians? Politicians?

3. And your role?

4. What are the challenges for implementing VBHC?

5. How has your approach changed in response to these early experiences?

6. How is the hospital developing competencies (knowledge, skills, attitudes) for embracing VBHC implementation efforts?

Health system characteristics & Context

1. Are there any factors in the health system that have influenced your efforts in VBHC?
   Organization / Financing (provider payment)/ Resources (HR also) / Need for new service delivery models

2. Do you think the broad context favors the introduction of VBHC?
   Changing epidemiology (e.g. ageing population); Technology innovations (AI, ML, …)

3. How have the relationships your hospital has with stakeholders changed as a result of VBHC?

   (payers?, suppliers? other hospitals?)

## Concluding Questions

1. Is there anything that you would like to add regarding?

2. Is there anyone else you think we should talk to ?

We have reached the end of this interview. I would like to thank you for your time and I am happy to answer any questions that you may have for me.

## 10.5 Appendix V – Interview Guide (Study IV)

### Interview Guide (English) – Patient Flow

### Introduction

The purpose of this interview is to try to explain how different patient flows adopted the same value-creating innovations and how these influenced improvement efforts and performance in outcomes and costs over time at the patient flow level.

The interview will take one hour. It will be divided in two parts: the first, where I will ask questions using an interview guide, focused on the different value-creating innovations adopted at Karolinska University Hospital; the second, where we will explore together quantitative data presented on the steering card, with the goal of identifying patterns and understanding improvement efforts over time.

The interview will be digitally recorded. I will also take notes during the interview in case the recording malfunctions. Everything that will be said during the interview will be treated with care and will only be viewed by the research group. The results will be presented anonymously and aggregated at the group level. A preliminary analysis will be presented for you and your team. Your participation is voluntary, and you may decide to discontinue your participation at any time.

If this is ok with you, perhaps we can start?

### Opening Question

2. Could you briefly describe your role(s) and your tasks in the organization?

### Main Questions

Now we will talk about the new organizational model and the value-creating innovations regarding three components: The patient flow organization, the oval table, and the steering cards.

<u>The Patient flow organization</u>

1. How did your PF implement the new organizational model?
2. How did the new organizational model influence the way you work?
3. What worked well? What has been hardest to implement with the new model (mandate problem? Economy? Staff responsibility? Who owns the resources?). Can you please give concrete examples?
4. How did the cooperation with other flows and themes work?
5. Could you conduct the same improvement work with the previous organization?
    a. If not, why not?

<u>The Oval Table</u>

1. How is your patient flow working with the oval tables?
    a. Can you give me examples of how a typical oval table meeting is run?
2. How did the oval table meetings influence the way you work?
3. What advantages and disadvantages have you experienced?

a. Can you give me examples of situations when it worked well and/or was difficult

4. Who is present at the table and what are their practical roles and actions during the meeting? Do you have all the roles present that are supposed to comprise an oval table?
    a. Managers? Patient Reps? Nurses? Comptroller? Teachers and Researchers? Patient representatives? Those who are not present, reasons why?

5. How does the cooperation between the people work during the oval table meetings?

6. How did it feel to lead a leading group (ledningsgrupp) where you are not the boss of everyone in that group?

The Steering Card

1. How are you using the data in the steering cards in practical terms?
    a. Can you give me examples of utilizations that generated tangible benefits for your flow

2. How did the steering cards influence the way you work?

3. What advantages and disadvantages have you experienced?
    a. Can you give me examples of situations when it worked well and/or was difficult?

4. Do the steering cards measure relevant outcomes? (In heart failure flow for instance several specific drugs are measured, it this relevant?)

5. Have you continued using steering cards (since there has been a new re-organization)? How has been possible to control without a steering card?

## Concluding Questions

1. What are the main results you have observed from implementing these innovations? Do you feel that they led to taking the patient focus perspective into a higher consideration in your daily work?

2. How have these different innovations evolve over time? Which adjustment have been made?

3. Is there anything that you would like to add regarding the topics that we have discussed?

4. Is there anyone else you think we should talk to ?

We have reached the end of this interview.

# 11 Popular science summary of the thesis

Value-Based Health Care (VBHC) promises better care at lower costs, but its adoption journey is complex. Studies at Karolinska University Hospital in Sweden and Hospital Israelita Albert Einstein in Brazil revealed key insights:

1. Rising healthcare costs drove VBHC discussions, and awareness over VBHC among clinical staff was low.
2. Latin American healthcare organizations struggled to define and integrate VBHC effectively.
3. Context shaped VBHC adoption: Karolinska prioritized outcomes, while Einstein focused on costs, facing unique challenges.
4. VBHC's dynamic nature led to gradual phase-out in VBHC practices.

Adoption was influenced by contextual factors, leading to selective implementation. Addressing data infrastructure, aligning business models, and considering contextual factors are crucial steps towards successful adoption. To unlock value, a balanced focus on outcomes and costs is key.