

Implementing value-based health care at the provider level: An operations management view

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Abstract

This paper operationalizes the concept of value-based health care (VBHC) from a service operations management (SOM) view. We present preliminary findings based on two steps: First, we theoretically derive seven operational constructs with the help of the service strategy triad and explain their underlying mechanisms with SOM theory. Secondly, we empirically validate the operational constructs based on case research at Karolinska University Hospital and develop operational measures through iteration between theory and empirical data. Operations managers and researchers can make use of the operational measures as an instrument to assess changes towards implementing VBHC at the service provider level.

Keywords: value-based health care, case research, theory elaboration

Introduction

Today's healthcare systems face numerous problems regarding quality issues and rising cost of healthcare delivery, resulting from constraints in resources, increasing demand and advances in clinical procedures (Boyer and Pronovost, 2010; Asch et al., 2014; Huckman and Raman, 2015). The management concept of value-based health care (VBHC) introduced by Porter and Teisberg (2006) aims to address those challenges by transforming healthcare systems with the imperative of "*value-based competition on results*". Its goal is to increase value for patients, where value is defined as health outcomes in relation to patient costs (Kaplan and Porter, 2011; Porter, 2010). As a complement to the current emphasis on reimbursement issues (Intelligence Unit, 2015),

we argue in this paper for insight into what kind of operational changes will occur through the adoption of VBHC principles, especially involving the stakeholders at the core of our healthcare systems, the healthcare providers. The quest to achieve higher value for patients will lead to a change of operational practices. However, as of today we know little about these changes to actual practice, neither from the researcher nor the practitioner perspective. Therefore, the purpose of this paper is to operationalize the VBHC concept from a service operations management (SOM) view and to develop an instrument to assess changes to practices at the provider level.

In the theory section we operationalize and explain the mechanisms of the VBHC concept from an SOM point of view. We develop a framework, in which we derive operational constructs by juxtaposing Porter and Teisberg’s (2006) VBHC concept with the service strategy triad developed by Roth and Menor (2003). As part of the methodology chapter we present the design of our single case-study approach and introduce the empirical setting underlying our findings. The preliminary results include 39 operational practices, derived through iteration between theory and empirical data. We conclude by discussing how the developed instrument will benefit research and practitioners.

Operationalizing VBHC

We operationalize the VBHC concept from a healthcare provider’s point of view by applying an SOM perspective. In so doing, we relate to a four-level conceptual hierarchy that Shah and Ward (2007) use in developing measures for lean production. The four levels consist of (1) the main concept, VBHC; (2) underlying constructs, the elements of the service strategy triad by Roth and Menor (2003); (3) operational constructs derived theoretically, validated empirically and explained through OM theory; and (4) operational measures, which rely on empirical findings and literature. The developed theoretical framework including underlying and operational constructs is summarized in Table 1.

Table 1 – Theoretical Framework

Underlying constructs	Operational constructs	OM theory explaining the mechanisms
Target markets	1. Medical condition focus Select specific medical conditions that the provider organization will cater to.	<u>Focus & specialization</u> <ul style="list-style-type: none"> • Skinner (1974) • Heskett (1986) • Davidow and Uttal (1989) <u>Complementarities</u> <ul style="list-style-type: none"> • Clark and Huckmann (2012)
	2. Service provision focus Select specific activities within the full care cycle that the provider organization will perform.	<u>Focus decisions</u> <ul style="list-style-type: none"> • Peltokorpi et al. (2016) • McLaughlin et al. (1995)
Service concept	3. High value care All core and peripheral elements of the service are designed with maximum value to the patient over the total care cycle.	<u>Integrating the patient</u> <ul style="list-style-type: none"> • Lillrank (2012) • Berry and Bendapudi (2007)
Service delivery chain	4. Structural specialization Ensure structural aspects of the delivery system enable efficient and high-quality care	<u>Theory of swift & even flow</u>

Underlying constructs	Operational constructs	OM theory explaining the mechanisms
	delivery within selected target markets and activities.	<ul style="list-style-type: none"> • Schmenner and Swink (1998)
	5. Patient-centered infrastructure Establish a coherent operating system that is structured around the medical condition and corresponding patient flows.	<u>Integrating the patient</u> <ul style="list-style-type: none"> • Lillrank (2012) <u>Theory of swift & even flow</u> <ul style="list-style-type: none"> • Schmenner and Swink (1998)
	6. Integrated care delivery Establish linkages and strategic fit among all external and internal entities involved in the full care cycle of targeted medical conditions.	<u>Integrating the patient</u> <ul style="list-style-type: none"> • Lillrank (2012)
	7. Systematic learning Establish formal mechanisms that ensure continuous innovation and improvement work.	<u>Continuous improvement as a capability</u> <ul style="list-style-type: none"> • Bessant et al. (2001)

The underlying constructs

Applying the service strategy triad (Roth and Menor 2003) as the underlying SOM framework allows us to segment the VBHC concept into several elements, which supports the operationalization of the VBHC concept from a SOM perspective. The triad includes the elements of target market, service concept, and service delivery chain. The service delivery chain is further differentiated by structural, infrastructural, and integrative strategic design choices.

The operational constructs

We theoretically derived operational constructs by juxtaposing the elements of the service strategy triad with the core elements of the VBHC concept (Kaplan and Porter, 2011; Kim et al., 2013; Porter, 2010; Porter and Lee, 2013; Porter and Olmsted Teisberg, 2006). In the following we briefly present the seven suggested operational constructs with reference to the service strategy triad elements and the VBHC concept. We also introduce relevant OM theories to explain likely mechanisms for the operational constructs (cf. Table 1).

Medical condition focus

Choosing the target market(s) concerns the question of who is the right customer, which in health care can be translated to a segment of patients. From the overall hospital perspective, focus therefore implies a strategic decision about which medical conditions to cater to and what kind of specialization a hospital aims for (e.g. highly specialized, standard, acute, or generic). In following VBHC practices “*institutions are expected to narrow the range of medical conditions served, or at least the types of cases they seek to address*” (Porter and Olmsted Teisberg, 2006, p. 160).

The use of focus, as a mechanism for quality improvement and cost reduction has been introduced by several researchers, which presumes differentiation and selection of market segments. Skinner (1969; 1974) presented the concept of the focused factory for the manufacturing industry, which was extended by other researchers to the service industry (Heskett, 1986) as well as to the healthcare industry in specific (Davidow and Uttal, 1989). Clark and Huckmann (2012) broadened the focus concept within the hospital

industry by introducing the notion of complementarities, taking advantage of multiple professions at the same site.

Service provision focus

The target market is also addressed within decision making that defines the scope of services (activities) that providers offer. *“In each medical condition, providers must decide what roles they will play in the care cycle, and what services to offer”* (Porter and Olmsted Teisberg, 2006, p. 159).

Focus decision-making in professional services has been introduced through a framework relying on micro-focusing decisions regarding value-chain activities (McLaughlin et al. 1995). Peltokorpi et al. (2016) introduce service provision focus as part of a healthcare provider specific focus concept.

High value care

The service concept is concerned with the elements that matter to the target customer and hence address the expectations of the specific target market (Roth and Menor, 2003). The delivery of high value care is of particular interest for the patient. Integrating the patient perspective as introduced within VBHC will require the service concept to cater to patient's needs. For example, *“outcomes should include the health circumstances most relevant to patients”* (Porter, 2010).

Lillrank (2012) suggests that the dominant element of integrated care is patient-centric care, with the aim of integrating patient experiences and addressing *“whole-person needs”* (Berry and Bendapudi, 2007).

Structural specialization

The first set of design choices in the service delivery system relates to the physical structure. VBHC emphasizes that staff in each integrated practice unit (IPU) should work in dedicated facilities (e.g., operating rooms, wards, and intensive care units), to allow for tailoring to the medical condition. Tailored facilities and patient-centric management practices supposedly lead to *“faster treatments, better outcomes, lower costs...”* (Porter and Lee, 2013).

According to OM theory, tailored facilities can increase productivity if they remove waste, bottlenecks, and variability (Schmenner and Swink, 1997).

Patient-centered infrastructure

The second set are infrastructural design choices, which focus on policies, management systems, and leadership. A common performance management system centered on measuring patient value is critical to VBHC. The introduction of IPUs, organized around medical conditions with multidisciplinary teams, is another key tenet (Porter and Lee, 2013). These new operating practices will also require different skills from those required by medical line managers, such as how to effectively lead a multiprofessional team across the full care delivery chain (Porter and Olmsted Teisberg, 2006).

Introducing an IPU as part of patient-centric infrastructure enables a more swift and even flow of the patient through the system (Schmenner and Swink, 1997). Coordinating the arrangement of roles and tasks within the IPU into an organized whole will be key to successfully manage the system (Lillrank, 2012).

Integrated care delivery

The final group of design choices in the service delivery system relates to external and internal integration. Integrating service delivery across providers is another salient point

in VBHC. IPU are expected to consist of all involved providers, and teams take responsibility for the full cycle of care (Porter and Lee, 2013). Being patient-centric and results driven, the individuals in the IPU should work together to achieve excellence (Porter and Olmsted Teisberg, 2006).

An increase in focus and specialization tends to fragment the delivery system, with individual entities sub-optimizing at the expense of the whole. Integration, when each unit sacrifices some specialization benefits to optimize the performance of the system, is suggested as a management response (Lillrank, 2012).

Systematic Learning

Finally, building the capability to improve and innovate requires developing corresponding routines and abilities (e.g., problem-solving skills, active participation, and diffusing learning across an organization) is especially highlighted within the VBHC concept. Porter and Olmsted Teisberg (2006) claim that systematic knowledge development “*is the only way that an organisation can truly learn and enable continuous improvements in care delivery*”(ibid p. 216).

Extensive and widely distributed learning behavior, with embedded routines for both improvement and innovation, would be the final and most advanced stage in building the capability (Bessant et al., 2001).

Research Methodology

Research Design

The change assessment instrument is being developed in an iterative process between theoretical and empirical process, as shown in Figure 1, following an abductive approach. This process also helped identify the relevant theories that we draw upon to theoretically explain the mechanisms (Ketokivi and Choi, 2014).

The starting point for developing the instrument was an early version of the seven theoretically derived operational constructs. We identified an initial list of 15 measures for assessing implementation from the existing literature on VBHC.

We adopted a case study design to empirically develop and validate the instrument, because our research aims to holistically explore the operational impact of a VBHC implementation at the provider level (Yin, 2009). The implementation of VBHC at the provider level is the chosen unit of analysis. Also, we researched the implementation further at the patient group level, which is the embedded subunit of analysis.

Our selected case is the ongoing program at Karolinska University Hospital, which started with 18 medical conditions (patient groups) and aims for hospital-wide implementation. The comprehensive scope of the case, in combination with a newly introduced organizational structure, offers a research environment that is unique in the world, justifying our single case selection (Yin, 2009). By engaging intensely with our empirical setting, we were able to access rich data based on interviews and observations.

Data collection

We have collected data from a majority of the patient groups where VBHC has been implemented so far. To improve our understanding and increase case validity (Yin, 2009), multiple sources were used, including interviews, data from meeting observation, and archival resources. The authors performed 33 semi-structured interviews at three organizational levels: the strategy function, business developers, and implementation leaders of the new patient groups. The respondents represent a total of 15 different patient groups, which covers a wide range of medical specialties, types of health care delivery

(acute, chronic and elective) and patient demographics (adults, children). All interviews (44 hours' worth) were recorded and summarized, as well as complemented by field notes and supporting documentation from the respondents.

Analysis and Validation

Compared with the reviewed literature, the interviews in the case study highlighted learning more strongly. With these insights from data collection, we revisited the literature before coding, expanding the initial list to further emphasize continuous improvement and innovation. Two researchers then coded the interview summaries independently, followed by developing partially ordered meta-matrices for pattern analysis (Miles et al., 2014). The current preliminary version of the instrument comprises 39 measures that can be mapped to the seven theoretically derived operational constructs.

Going forward we plan to further refine and validate the instrument by testing it empirically. A workshop is planned with a group of expert practitioners, as a pretest of the measurements. Finally, we plan to use the instrument for assessing the changes taking place during a period of VBHC adoption. For this purpose we will focus on a limited number of the patient groups as they adopt VBHC over the next months.

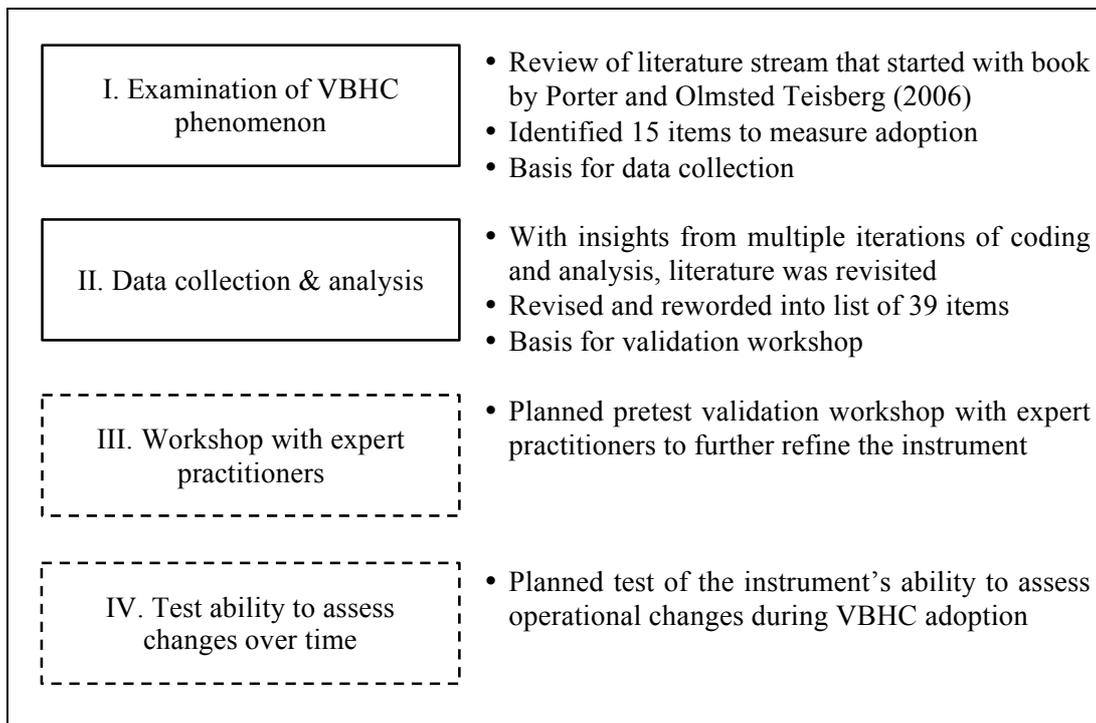


Figure 1 – Instrument development and validation process

Introducing the Karolinska University Hospital case

In Sweden, health care is primarily publicly financed and the responsibility of 20 county councils. Our selected case, Karolinska University Hospital, is located in Stockholm, which is the largest county with a population of 2.2 million. Karolinska is one of the largest university hospitals in Europe, with 1.5 million patient visits per year, 1700 beds and 16,000 employees. In collaboration with Karolinska Institutet the hospital also hosts 2000 researchers; 2540 scientific articles were published in 2014.

To meet the healthcare needs of a growing population, Stockholm County Council (SLL) is currently investing heavily in the county's healthcare system. The ambition is not only to increase capacity but also to ensure that healthcare providers collaborate in patient-

centered networks. As a part of this restructuring, the Karolinska University Hospital has been assigned to focus on tertiary (highly specialized) care. The hospital will also move into new hospital facilities at one of the two major sites during the coming years. In parallel, Karolinska has an ongoing program to implement value-based health care as a core strategy to meet the future of academic medicine. Implementation elements include a new organization structure centered around medical conditions, a new performance system measuring health outcomes and cost, interdisciplinary teams collaborating along the patient pathway, and involvement of external parties (patient representatives, other providers in the network and med-tech companies) in systematic learning activities.

Results

Our preliminary measurement model consists of 39 identified practices (see Table 2), to represent the operational consequences of value-based health care at the provider level.

Table 2 – Preliminary results, VBHC practices

Operational construct	VBHC practices
<p>1. Medical condition focus Select specific medical conditions that the provider organization will cater to.</p>	<ul style="list-style-type: none"> • Patients are segmented based on medical conditions. • It is formally stated that certain medical conditions are treated and not others. • Targeted medical conditions are classified into broader themes with similar needs for care. • Patients with medical conditions outside the provider’s focus are normally directed to other healthcare providers. • Ambition is to have high volumes for all medical conditions catered to.
<p>2. Service provision focus Select specific activities within the full care cycle that the provider organization will perform.</p>	<ul style="list-style-type: none"> • It is formally stated that certain types of activities are performed and not others. • For each selected medical condition, activities that will be performed in the full care cycle are specified. • Activities outside focus are provided by other healthcare providers in the network patients belong to. • Ambition is to have high volumes for all services provided.
<p>3. High value care All core and peripheral elements of the service are designed with maximum value to the patient over the total care cycle.</p>	<ul style="list-style-type: none"> • Ambition is to have patients interact with the same staff over time. • The patient has a single point of contact. • Scheduling of care encounters is coordinated. • Patient is continuously informed about the next step in the care process. • Medical records and other patient information is shared, avoiding duplicating data capture. • A variety of interaction alternatives is offered to cater for the patients’ needs and preferences. • Patients are involved in all decisions regarding treatment.
<p>4. Structural specialization Ensure structural aspects of the delivery system enable efficient and high-quality care</p>	<ul style="list-style-type: none"> • Facilities enable interdisciplinary, team-based delivery of care, through co-location of all relevant professions and specialities. • Layout and physical design of the facilities enable a swift physical flow of patients. • Patient groups with similar needs for care are located physically close and share specialized technology and equipment.

Operational construct	VBHC practices
delivery within selected target markets and activities.	<ul style="list-style-type: none"> • Structural capacity choices and the detailed production plans reflect the requirements of the target markets
<p>5. Patient-centered infrastructure Establish a coherent operating system that is structured around the medical condition and corresponding patient flows.</p>	<ul style="list-style-type: none"> • Top management emphasises value for patients in all communication. • Leaders have strong skills in building interdisciplinary teams, driving improvement work, and establishing collaborations with related internal and external entities. • The accounting system captures the cost per patient for the full care cycle and provides transparency into major cost drivers. • The performance system covers a mix of long- and short-term health outcomes, as well as key process metrics and cost. • Staff is organized into inter-disciplinary teams per medical condition, which include all relevant professions. • Each interdisciplinary team has a lead with a mandate to manage day-to-day operations and/or organize systematic learning. • Each interdisciplinary team has a shared understanding of the activities during a typical week, as well as the roles and responsibilities of everyone involved.
<p>6. Integrated care delivery Establish linkages and strategic fit among all external and internal entities involved in the full care cycle of targeted medical conditions.</p>	<ul style="list-style-type: none"> • Accounting standards and definitions are shared in common across the full care cycle, to understand the full cost of a patient. • All the major entities involved in the full cycle of care share the same set of long- and short-term health outcomes. • Tools (e.g., scheduling system, quality register) and methodologies are shared across the full care cycle, to coordinate care delivery. • There are formal relationships among all major entities involved in the full cycle of care, with a clear division of roles and responsibilities. • There is an integrated technology platform with common data definitions that allow sharing information across all entities involved in the full care cycle.
<p>7. Systematic learning Establish formal mechanisms that ensure continuous innovation and improvement work.</p>	<ul style="list-style-type: none"> • Performance, in terms of health outcomes, process metrics, and cost per patient, is systematically measured. • Results are regularly reviewed and compared with other similar providers. • External knowledge and innovations are regularly introduced from research results, collaboration with medical technology suppliers, and patient representatives. • Patient journeys, described in process maps that cover all variations and all activities across the full care cycle, are regularly reviewed. • Representatives from all professions and all entities involved in the full cycle of care regularly take part in joint problem-solving activities. • Team members, representing all specialties involved, share and integrate formal and tacit knowledge to develop new treatments. • Formal and systematic experimentation with new ways of delivering care that aim to increase patient value, takes place.

Discussion

We supplement the current reimbursement emphasis of the VBHC concept with operational consequences at the healthcare provider level. Applying an SOM perspective to our study facilitates the development of a wide range of individual but interrelated VBHC practices, which serve as an instrument for assessing changes towards VBHC. Hereby, we offer new insights about operational implications of the VBHC concept to both researchers and managers.

To arrive at our findings, we operationalize the VBHC concept through juxtaposing the service strategy triad with the VBHC concept, thereby theoretically deriving seven operational constructs of the VBHC concept. We empirically validate the operational constructs and develop a wide-ranging list of VBHC practices through iteration between theory and practice.

Contribution to knowledge

This paper adds to the available literature around VBHC from a healthcare provider viewpoint in describing VBHC practices based on theoretical constructs.

Implications for research

Researchers interested in assessing the performance of VBHC practices or studying possible enablers and barriers under VBHC adoption can build on the operational constructs and make use of the instrument assessing VBHC practices.

Implications for practice

When adopting the VBHC concept at the healthcare provider level, managers are typically confronted with the challenge of many and simultaneous changes to all aspects of their operations. Our operationalizing of the VBHC concept and the outlined list of practices support managers in their planning and evaluation of the implementation progress.

Limitations

So far our findings are based on a single case study in one country, which in addition is very specific regarding its implementation progress. Whereas this specificity yields special insights into a unique large-scale implementation of the VBHC concept, it also limits generalizability. As part of our ongoing research we will validate our findings through workshops with experts within and outside our case-study setting.

Conclusion

The extensive list of 39 individual and interrelated VBHC practices that belong to seven overriding operational constructs demonstrates the complexity and thoroughness of the changes a healthcare provider faces when implementing the VBHC concept. Researchers and managers can develop a better understanding of the operational consequences by relying on our operationalization of the VBHC concept.

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Names of the two first authors appear in alphabetical order, as both authors contributed equally. The financial support from Stockholm County Council is greatly acknowledged.

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