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Value-Based Health Care in Latin America: A Survey of 70 Healthcare Providers from Argentina, Brazil, Chile, Colombia and Mexico

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ABSTRACT

Objectives

Value-based Health Care (VBHC) is a health system reform gradually being implemented in health systems worldwide. A previous national-level survey has shown that Latin American countries were in the early stages of alignment with VBHC. Data at the healthcare providers level are lacking. This study aim was to investigate how healthcare providers in five Latin American countries are implementing the Value Agenda.

Design

Mixed-methods research was conducted using online questionnaire, semi-structured interviews (from December of 2018 to June of 2020), and analyses of aggregated data and documents. Statistical analysis was performed using Fisher's exact test. Univariate analysis was used to compare organizations in relation to the implementation of VBHC initiatives. P value ≤0.05 was considered significant.

Participants

Top and middle-level executives from 70 healthcare provider organizations from Argentina, Brazil, Chile, Colombia and Mexico.

Results

From a total of 172 initiatives referred by 55 participants, 58 referred by 33 participants were aligned with the value agenda and focused on care delivery organization (56.9%), outcomes measurement (22.4%), cost measurement (10.3%) and bundled payments (10.3%). Although fee-for-service predominated, one third of providers were experimenting with alternative payment models. Univariate analysis showed that specialty hospitals (p=0.05), a high level of alignment with care delivery organization (p<0,01) and outcomes measurement (p=0.01),

implementation of ICHOM standard sets (p<0.01), and participation in alternative payment models were associated with VBHC implementation (p=0.01).

Conclusions

A wide variation in the level of implementation of the value agenda existed across participating providers. A list of initiatives was produced that may provide insights for different stakeholders. Scalability of such initiatives will demand investments on education of stakeholders and on systematic measurement and use of outcomes and cost data. Further research is needed to identify successful implementation cases that may serve as regional benchmark for other Latin American providers advancing with VBHC.

Key words Organisation of health services; International health services; Qualitative research

Strengths and limitations of this study

- A previous national-level survey by the Economist Intelligence Unit on VBHC implementation, assessed the alignment with VBHC components. Our survey focused on addressing such alignment from the healthcare providers perspective and included five countries that represent Latin America's biggest economies (Argentina, Brazil, Chile, Colombia and Mexico).
- A mixed method approach was used to explore the adoption of the six elements of the Value Agenda and to map VBHC initiatives implemented in each provider.
- Experiences from participants from 70 healthcare providers were obtained to get insights on how VBHC is being implemented in the region
- An aggregate analysis is presented for the region without any direct comparison among countries as some countries, such as Chile and Mexico had a limited number of participants.

INTRODUCTION

Escalating costs and the substantial variation in the quality of health services threatens the sustainability of health systems globally. In several countries, a double-digit difference between general inflation and medical inflation has been reported[1], along with an evident failure of healthcare systems to address preventable diseases and to warrant universal and equitable access to care. Such challenges are even bigger for Latin American countries where increasing rates of chronic non-communicable diseases are combined with endemic and emerging diseases and, despite the positive effects of a series of health system reforms implemented in the last three decades aimed at achieving universal coverage and improving effectiveness of care, great disparities remain in terms of access to effective health services[2].

The Value-Based Health Care (VBHC) approach, proposed by Porter & Teisberg in 2006, has been seen as a strategy to transform the health care system through a redesign of the care-delivery processes around medical conditions or population segments, monitoring of outcomes and costs and a change in the financing model from paying for each service provided (*fee-for-service*) to paying for outcomes achieved (*fee-for-value*)[3]. This theory has been expressed in the Value Equation, where value is defined as health outcomes relative to the cost of achieving those outcomes and in a strategic Value Agenda comprised of six elements organizations should adopt in order to move into a high-value health care delivery system (organize into integrated practice units, measure outcomes and costs for every patient, move to bundled payments for care cycles, integrate care across separate facilities, expand excellent services across geography, and build an enabling information technology platform).[4]

Most reports on the value agenda adoption come from Europe and North America[5-6] and little is known about its adoption in Latin America. A report published in 2016, by The Economist Intelligence Unit (EIU), assessed the alignment with VBHC components in 25 countries, including Brazil, Colombia, Chile and Mexico. Assessment was organized around four domains (Enabling context, policies and institutions for value in healthcare; Measuring outcomes and costs; Integrated and patient-focused care and Outcome-based payment) and 17 qualitative indicators. Results showed considerable variations in the adoption of the four domains across countries. Sweden was considered the only country with a very high alignment and about half of participating countries emerged as having low alignment with VBHC. Latin American countries emerged with low alignment with VBHC, except for Colombia, with moderate alignment due to health systems reforms that sought to achieve universal coverage, redirect care delivery around patient needs and monitoring of costs for high-cost conditions. Chile scored second in the region due to the implementation of a bundle payment system in several areas and monitoring of treatment costs by major payers. Brazil and Mexico had the lowest scores, and Brazil was the only country in the region not to have a condition-based national registry[7].

The EIU study, however, focused on the macro-level evaluation of health systems. More recent reports from leading Latin American healthcare organizations have shown an emerging movement around the implementation of alternatives to fee-for-service payments, more integrated care models, monitoring of outcomes and costs using the International Consortium for Health Outcomes Measurement (ICHOM) standard sets and time-driven activity based costing[8-11]. These experiences by front-runner organizations may serve as a benchmark for other organizations in the region initiating similar endeavors.

Therefore, the aim of this study was to investigate how healthcare providers from the five biggest Latin American economies are advancing with Value Agenda and adapting it to their local contexts.

METHODS

Study design

Mixed-methods research combining both qualitative and quantitative techniques were used. Quantitative methods included an online questionnaire to assess the level of implementation of the value agenda components and to map VBHC initiatives, and analyses of aggregated data on the initiatives referred in the interview. Qualitative methods included semi-structured interviews and analysis of relevant documents, including meeting notes and published documents.

Sampling Strategy

Participants were selected using purposeful sampling. We started by selecting countries. Argentina, Brazil, Chile, Colombia and Mexico comprise the five biggest Latin American economies and 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 this list other providers were added based on a review of scientific and website publications and from interviews with stakeholders from organizations in the region aimed at identifying organizations working on VBHC enablers such as new care or payment models, outcomes and cost measurement, and value management office and IT infrastructure supporting VBHC.

Participants

From a total of 182 organizations considered to participate in the study, 71 signed the written consent. Two organizations requested to participate as a single organization, as they work as a single management and care provider, which resulted in a final sample of 70 participants. A flow diagram is presented in figure 1. Respondents of each organization were top or middle-level managers appointed by the CEO or President: Chief Medical Officer or Vice Medical Officer (43%), President, Chief Executive Officer or Vice Executive Officer (26%), Director of Quality and Patient Safety or Planning and Quality Advisor (19%), Director of Education and Research

(4%), Medical Manager (4%), Corporate Strategy Manager (3%) and Process Alignment Manager (1%).

Data collection

A structured questionnaire was developed, by the authors, in Portuguese and then translated into Spanish by a native speaker. It included questions on the organization and respondent profiles, the level of adoption of the main components of the value agenda (organization of care delivery, outcomes and cost measurement, implementation of alternative payment models and implementation of a VBHC enabling IT platform), availability of a value management office or similar structure and whether VBHC initiatives had been implemented in the organization (online supplemental appendix A).

Online surveys and interviews were applied between December of 2018 and June of 2020. Telephone and videoconferencing interviews used a semi-structured format where respondents were requested to comment and give examples of VBHC implementation according to the answers given in the online survey, and to describe the VBHC initiatives listed in the online survey, as well as invited to share documents. All interviews were digitally recorded, transcribed into Portuguese and analyzed by the authors.

Data Analysis

Quantitative and qualitative data were analyzed using descriptive statistics. Fisher's exact test was performed to compare organizations that had implemented VBHC initiatives with those that had not implemented. Univariate analysis was used to identify differences between the two groups in relation to VBHC implementation. To compare organizations regarding their level of alignment with the elements of the value agenda, answers to the online survey were transformed into binary variables, where ‘yes’ (high level of alignment) was considered if options ‘a or b’ had been selected, and ‘no’ (low level of alignment) for all other options (Table 2), in order to make groups more homogeneous and to reduce the degrees of freedom of the variables. Statistical analysis was performed using the R 64-bit version 4.1.1 (R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/). All tests were two tailed and statistical significance was considered for p values <0.05.

Patient and public involvement

The study presents analysis of a survey conducted with healthcare executives. There was no patient or public involvement.

Ethical considerations

All participants gave their written informed consent to participate in the study. The Study was approved by the Brazilian Research Ethics' Committee (CAAE: 85658117.7.0000.0071; SGPP approval number: 2.731.483).

RESULTS

Participants

A total of 70 healthcare providers completed the online survey. Of those, 56 (80%) also participated in a virtual interview to deepen the information provided in the questionnaire. Table 1 presents a descriptive analysis of the organization profiles.

Table 1. Descriptive analysis of the participating organization profiles

		Argentina		Brazil		Chile		Colombia		Mexico		Total	
		n	%	n	%	n	%	n	%	n	%	n	%
Number of participanting organizations		9	13%	39	56%	2	3%	15	21%	5	7%	70	100%
Number of beds	≤ 200	5	56%	15	38%	1	50%	6	40%	4	80%	31	44%
	> 200	4	44%	24	62%	1	50%	9	60%	1	20%	39	56%
Number of Practicing Phyicians	≤ 500	5	56%	9	23%	1	50%	11	73%	3	60%	29	41%
	>500	4	44%	30	77%	1	50%	4	27%	2	40%	41	59%
Number of hospital discharges (previous year)[1]	≤ 15,000	5	56%	22	56%	1	50%	9	60%	4	80%	40	58%
	> 15,000	4	44%	17	44%	1	50%	6	40%	1	20%	29	42%
Type of organization	Private	9	100%	34	87%	2	100%	13	87%	5	100%	63	90%
	Public	0	0%	5	13%	0	0%	2	13%	0	0%	7	10%
Teaching/University Hospital	yes	4	44%	5	13%	1	50%	8	53%	2	40%	20	29%
	no	5	56%	34	87%	1	50%	7	47%	3	60%	50	71%
Legal structure	For-profit	5	56%	15	38%	0	0%	3	20%	2	40%	25	36%
	Not for-profit	4	44%	24	62%	2	100%	12	80%	3	60%	45	64%
Specialization	General hospital	6	67%	34	87%	2	100%	11	73%	5	100%	58	83%
	Specialty hospital	3	33%	5	13%	0	0%	4	27%	0	0%	12	17%
JCI accreditation[2]	Yes	3	33%	17	44%	1	50%	3	20%	3	60%	27	39%
	No	6	67%	22	56%	1	50%	12	80%	2	40%	43	61%
AmericaEconomia ranking (2009-2019)[3]	Yes	2	22%	10	26%	1	50%	11	73%	3	60%	27	39%
	No	7	78%	29	74%	1	50%	4	27%	2	40%	43	61%

[1] Only 69 hospitals reported the number of hospital discharges in the previous year as one of them had not completed one year of operation at the time of its participation in the study.
[2] Joint Commission International's Hospital program or Academic Medical Center Hospital Program
[3] Participation in the annual ranking of best hospitals & clinics in Latin America, from 2009 to 2019, published by AméricaEconomía Intelligence. Available at: https://www.americaeconomia.com/negocios-industrias/conozca-los-resultados-del-ranking-de-clinicas-y-hospitales-2020

Implementation of the elements of the Value Agenda

The level of adoption of the value agenda elements are described in Table 2. In regard to care delivery organization, half of participants informed care delivery was organized around medical

conditions for full care cycles for at least one medical condition, although less than 3% informed this was the case for several medical conditions.

All organizations referred to measure Clinician-reported outcomes (CROMs), most frequently mortality and complications rates. Patient-reported outcomes (PROMs) were measured by 41.4% but in only 8.5% this information was used to give feedback to the care team, or in routine medical encounters with patients, or published on the internet. In 10 Brazilian organizations, which corresponds to 25,6% of participants from that country, PROMs were collected using ICHOM standard sets for heart failure, stroke and hip and knee osteoarthritis as part of a collaborative started in 2017 by the National Association of Private Hospitals (ANAHP).

In regard to cost measurement, 24,3% of organizations informed to measure cost at the medical condition level but only two (2.9%) measured costs of full care cycles. Most of them measured costs only at the service or department level (67,2%), although 28,7% referred that pilots were underway to measure costs at the condition level. Six (8,6%) participants did not have a cost system structure in place to measure costs on a routine basis. Only one organization was using the Time-Driven Activity Based Costing (TDABC) methodology, as part of a public-private partnership with the Ministry of Health focused on training a critical mass of healthcare professionals to measure TDABC and on coordinating multicenter TDABC initiatives in public hospitals.

None of the organizations had a payment model in place where payment was linked to outcome-based performance metrics, although 5 (7%) referred participation in contracts where providers bore the costs of treatment-related complications. Thirty percent reported to participate in pay-for-performance agreements based on process metrics and 21,4% referred agreements focused on improving the appropriateness of care and on cost reduction. The remaining were not participating in alternative payment modalities (Table 2). Fee-for-service (FFS) was the predominant payment model (91,4%) while global payment was present as the only modality in 6 public hospitals. Among organizations on FFS, 54,3% were on FFS only while the remainder (37.1%) were already experimenting a combination of FFS with other alternative payment models such as global payments (capitation and/or global budgets), bundled payments (defined as condition or episodic bundles that covered treatment-related complications for a pre-defined

period of time) or pay-for-performance agreements. (Figure 1). Additionally, three (4,3%) organizations referred to participate in risk-sharing agreements with payers and/or the medical device industry.

Regarding the information Technologies (IT) available, around 94% of organizations had an electronic medical record, but only 40% had a business intelligence system to integrate clinical, cost and outcomes data and 4% had implemented an interoperable digital platform that integrated both inpatient and outpatient data, and allowed interactions between patient and care team.

Table 2. Implementation of the core elements of the Value agenda among participants

Elements of the Value Agenda	n	%
Number of participanting organizations	70	100%
Organization of care delivery		
a. Care pathways that organize care delivery for the full cycle or episode of care are implemented for several medical conditions.	2	2,9%
b. Care pathways that organize care delivery for the full cycle or episode of care are implemented for at least one medical condition.	35	50,0%
c. Care pathways that organize care delivery but do not cover the full cycle or episode of care are implemented.	20	28,6%
d. Evidence-based clinical guidelines that guide clinical practice are implemented.	13	18,6%
e. Evidence-based clinical guidelines that guide clinical practice are not implemented.	0	0,0%
Health Outcomes Measurement		
a. Clinical outcomes, Patient-reported outcomes (PROs) and experience are measured for several medical conditions, and results are incorporated into the medical record, used during medical consultations, to give feedback to the care team and published in the internet.	1	1,4%
b. Clinical outcomes, PROs and experience are measured for several clinical conditions, and results are used to give feedback to the care team and published in the internet, however they are not routinely available to the medical team during consultations.	5	7,1%
c. Clinical outcomes, PROs and experience are measured for some clinical conditions, but are not available to give feedback to the care team or published in the internet.	23	32,9%
d. Only clinical outcomes are measured and pilot projects are underway to measure PROs and experience for some medical conditions.	23	32,9%
e. Only clinical outcomes are measured.	18	25,7%
Costs Measurement		
a. Costs are measured at the medical condition level for a full cycle or episode of care and data are used for decision making and to design value-based payment models.	1	1,4%
b. Costs are measured at the medical condition level but do not cover the full cycle or episode of care, although data are used for decision making and to design value-based payment models.	16	22,9%
c. Pilots are underway to measure costs at the medical condition level.	20	28,6%
d. Costs are measured at the level of services or departments.	27	38,6%
e. A structured system for cost measurement on a routine basis is not available.	6	8,6%
Alternative Payment Models		
a. Alternative payment models, including population-based contracting, with part of payment linked to outcomes, are implemented and contribute to revenue.	0	0,0%
b. Alternative payment models, including condition or episode-based contracting with part of payment linked to outcomes, are implemented and contribute to revenue.	0	0,0%
c. Alternative payment models for certain medical conditions, with part of payment linked to process metrics, are implemented and contribute to revenue.	21	30,0%
d. Alternative payment models for certain medical conditions, focused on the appropriateness of care and on reducing costs are implemented and contribute to revenue, but payment is not linked to performance.	15	21,4%

e. Alternative payment models are not implemented.	34	48,6%
Investments on Information Technology		
a. A digital platform is available that integrates inpatient and outpatient data and allows interactions with patients and supports care coordination.	3	4,3%
b. Electronic medical record in all care areas, diagnostic grouping system and a business intelligence (BI) system that integrates clinical, cost and outcomes data are available.	15	21,4%
c. Electronic medical record present in part of the care areas, diagnostic grouping system and a BI system that integrates clinical, cost and outcomes data are available.	10	14,3%
d. An electronic medical record is available but clinical, cost and outcomes data are not integrated into a BI system.	38	54,3%
e. An electronic medical record is not available.	4	5,7%

Implementation of a Value Management Office (VMO)

Thirty-one participants (44%) informed to have implemented a VMO. In the interviews, however, when asked to describe the VMO in terms of the definition proposed by Kaplan et al. as a "central office to oversee the creation of capabilities and information to implement VBHC initiatives such as outcomes and cost measurement and management, set priorities for continuous improvement projects, facilitate the creation of value-based payment models and ensure that new IT platforms are aligned with the value agenda", only 12 (17%) were aligned with this definition, although they differed in terms of size, governance and structure[12]. In the remaining, the structure was dedicated to patient quality and safety (47%), were decentralized corporate areas that collaborated in specific projects (21%), innovation (12%), patient experience (11%) and project management or continuous process improvement (10%).

Implementation of VBHC Initiatives

In total, 57 (81.4%) organizations referred 179 initiatives that they considered aligned with the value agenda. Seven initiatives (3.9%), referred by two organizations were excluded because they had not been implemented, leaving a total of 172 initiatives from 55 organizations to be analyzed. Overall, only one third of initiatives (n=58) were aligned with the value agenda and were related to organization of care delivery (n=33, 56.9%), outcomes measurement (n=13, 22.4%), cost measurement (n=6, 10.3%) and bundled payments (n=6, 10.3%). Initiatives not aligned with those elements were categorized as 'other initiatives' and were related to quality

and safety, operational efficiency and process improvement, alternative payment models other than bundles, patient experience, investment in new technologies, physician relationship programs, research projects, and marketing, among others. A flow diagram of initiatives and their distribution according to the elements of the value agenda are presented as radar charts (Figure 2). Most participants implemented VBHC initiatives related to organization of care delivery (n=24, 72.7%), followed by outcomes measurement (n=13, 39.4%), cost measurement (n=6, 18.2%) and bundled payments (n=6, 18.2%). Appendix B in Supplemental material presents the full list of initiatives.

Table 3 presents the results of the univariate analysis used to assess the factors related to the implementation of VBHC initiatives. Regarding organization profiles, specialty hospitals were associated with implementation of VBHC initiatives (p=0.05), while all other organization 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 related to VBHC implementation. Organizations that referred high level of alignment with organization of care delivery and outcomes measurement, in the online survey, were associated with the implementation of VBHC initiatives (p<0.01 and 0.01, respectively). Adoption of ICHOM's standard sets was also associated with VBHC implementation (p<0.01). Organizations that had implemented alternative payment models were also significantly associated with VBHC implementation (p=0.010).

Table 3. Univariate Analysis to Assess the Factors Related to the Implementation of VBHC Initiatives

Independent variables		Participants without VBHC initiatives (n =37)	Participants with VBHC initiatives (n =33)	Total	p value	OR [95%]
Type of organization	Public	2 (5%)	5 (15%)	7 (10%)	0,242	0,33 [0,03 - 2,17]
	Private	35 (95%)	28 (85%)	63 (90%)		
Teaching/University Hospital	No	27 (73%)	23 (70%)	50 (71%)	0,796	1,17 [0,36 - 3,77]
	Yes	10 (27%)	10 (30%)	20 (29%)		
For-profit organization	No	21 (57%)	24 (73%)	45 (64%)	0,214	0,5 [0,16 - 1,49]
	Yes	16 (43%)	9 (27%)	25 (36%)		
Specialty hospital	No	34(92%)	24(73%)	58(83%)	0,054	4,16 [0,91 - 26,4]
	Yes	3(8%)	9(27%)	12(17%)		
JCI accreditation	No	25 (68%)	18 (55%)	43 (61%)	0,328	1,72 [0,59 - 5,14]
	Yes	12 (32%)	15 (45%)	27 (39%)		
America Economia Ranking	No	22 (59%)	21 (64%)	43 (61%)	0,808	0,84 [0,28 - 2,45]
	Yes	15 (41%)	12 (36%)	27 (39%)		
Number of beds	> 200	20 (54%)	19 (58%)	39 (56%)	0,813	0,87 [0,3 - 2,47]
	≤ 200	17 (46%)	14 (42%)	31 (44%)		
Organization of care delivery	No	28 (76%)	8 (24%)	36 (51%)	< 0,01	6,31 [2,04 - 21,53]
	Yes	12 (32%)	25 (76%)	37 (53%)		
Outcomes measurement	No	37 (100%)	27 (82%)	64 (91%)	0,01	∞ [1,45 - ∞]
	Yes	0 (0%)	6 (18%)	6 (9%)		
ICHOM standard sets implemented	No	37 (100%)	23 (70%)	60 (86%)	< 0,01	∞ [3,16 - ∞]
	Yes	0 (0%)	10 (30%)	10 (14%)		
Cost measurement	No	30 (81%)	23 (70%)	53 (76%)	0,401	1,85 [0,54 - 6,68]
	Yes	7 (19%)	10 (30%)	17 (24%)		
Alternative payment models[1]	Não	29(78%)	15(45%)	44(63%)	0,01	4,25 [1,38 - 14,22]
	Sim	8(22%)	18(55%)	26(37%)		
VMO Implemented	No	33 (89%)	25 (76%)	58 (83%)	0,201	2,6 [0,61 - 13,2]
	Yes	4 (11%)	8 (24%)	12 (17%)		

[1]Defined as the adoption of payment modalities different from pure Fee-for-Service or Global Payment.
JCI = Joint Commisssion International
ICHOM = International Consortium for Health Outcomes Measurement
VMO = Value Management Office

DISCUSSION

To the best of our knowledge, this study is the first to assess how healthcare providers from Latin American countries are implementing value-based health care strategies. It differs from a previous study that assessed VBHC implementation in 25 countries, four Latin American countries among them, which focused on the macro-level evaluation of health systems[7]. Another difference is that Argentina was included in our study due to its relevance to the region, as Latin America's third-largest economy.

Our findings show a wide variation in the level of implementation across healthcare providers with most efforts directed to the organization of care delivery and outcomes measurement. Although a clear effort is underway in over 40% of providers to collect PROMs and to implement ICHOM standard sets, outcomes information in most organizations had not been integrated into routine clinical practice or used to improve quality and outcomes, thus limiting their potential for enhancing value in care.[13-14]

Costs were mostly measured at the service or department level with less than 3% of organizations reporting to measure costs at medical condition level for a full care cycle, as defined by the value equation[15].

Fee-for-service was the predominant payment modality in 91% of providers with 54% of them being reimbursed solely based on the FFS model, mostly private hospitals, and the remaining by means of global budgets, all public hospitals. Fee-for-service and global budgets may constitute barriers to VBHC implementation in the region as both payment models do not incentivize care coordination and do not hold providers accountable for healthcare outcomes. Studies have shown that the greater the fragmentation of care, the greater the unnecessary use of resources and the worse the quality and outcomes of care, contributing to enhancing health care costs.[16] Although 37% of organizations were participating in alternative payment models, none of those payment agreements linked payment to performance based on outcome metrics, which define value-based payment models[17].

Among participants, only 40% of providers had a business intelligence system and 4% had an interoperable digital platform in place. In this scenario, lack of an interoperable information and

communication technology (ICT) platform may function as a barrier to scalability of implemented initiatives and transition into outcome-based agreements as ITC reinforces all other elements of the value agenda[4].

When providers were compared in terms of implementation of VBHC initiatives, specialization, a high level of alignment with organization of care delivery and outcomes measurement, implementation of ICHOM standard sets and participation in alternative payment agreements were associated with implementation of VBHC initiatives. Among the 12 specialty hospitals participating in the study, nine had implemented VBHC initiatives (75%, p=0.05). This finding suggests that it may be simpler for specialty hospitals to adopt VBHC strategies aligned with the Value Agenda. This is not surprising considering that, at its core, VBHC is a specialization-oriented management framework, and most success cases have been reported in well-defined, narrow "focused factories".[18] Further research may address the potential adaptations needed for VBHC adoption to thrive in general hospitals, including in large, academic medical centers.

When participants were asked to inform VBHC initiatives implemented in their organizations, two thirds of such initiatives were not aligned with the elements of the value agenda. This finding shows that most respondents were not familiar with VBHC core concepts and is in accordance with previous studies that reported a lack of understanding about the original concepts of the value-based health care strategy. This highlights the need to educate different stakeholders on VBHC in order to advance with its implementation.[19-20]

Most initiatives reported by providers were focused on reorganizing care delivery and on measuring outcomes. Starting VBHC implementation with a focus on those two elements of the value agenda are key steps well in line with recommendations given by Elizabeth Teisberg, co-creator of the VBHC Strategy, based on data collected over more than a decade of research in organizations that achieved better health outcomes, that VBHC implementation begins with identifying unmet needs of patient segments and with designing solutions that meet those needs.[21]

Availability of a value management office, present in 17% of providers was not associated with the implementation of VBHC initiatives (p=0.201). Differences in size, governance

and structure and the relatively recent implementation of such offices may have contributed to a lack of association.

Strengths and weaknesses of the study

There is a paucity of data regarding VBHC implementation in Latin America. Therefore, the strength of this study is to bring new evidence on VBHC implementation from the perspective of leading health care providers in the region. It is a contribution to improve the understanding of how healthcare transformation is taking place in Latin America, in terms of the value agenda strategies that organizations have focused their efforts on and which initiatives have been implemented providing insights for future studies, follow-up and action.

A limitation of this research was the small number of participants for two of the selected countries. Chile and Mexico had a low acceptance response with only 2 and 5 participants, respectively. This fact did not allow us to make any meaningful comparison among participating countries. On the other hand, we believe that the aggregate information presented in our study is relevant as a starting point for discussions around the role of providers in care transformation. Additionally, we are not aware of any other study gathering data from 70 different providers from the region.

Another limitation is the predominance of private hospitals, which comprised 90% of participants. Although findings cannot be extrapolated to public organizations, leading public healthcare providers are represented in the study.

CONCLUSIONS

Value-Base health care implementation is challenging particularly in Latin American countries where access to care is still a major issue. Nonetheless, some healthcare providers, are advancing in terms of adapting and implementing the value agenda. This evaluation identified a list of implemented initiatives, mostly focused on the organization of care delivery and outcomes measurement, that may provide insights for other healthcare providers in the region. Scalability of VBHC initiatives will demand investments on education of different stakeholders and on systematic measurement and use of outcomes and cost data, which in turn demand more investments on information and communication

technology. Further research is needed to identify successful implementation cases that may serve as regional benchmark for the other Latin American providers advancing with VBHC.

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Author's Contributions

MM, PR and MK conceptualized the study and prepared submission for funding and led interviews with Brazilian participants. MM and LN led interviews with Spanish speaking participants. DM led the data analysis and provided insights for study design and discussion of findings. MM wrote the first draft of the manuscript and was responsible for revisions. All authors revised the drafts, provided insights for discussion and approved the final version.

Ethics approval

The Study was approved by the Brazilian Research Ethics' Committee (CAAE: 85658117.7.0000.0071; SGPP approval number: 2.731.483).

Competing interests

The authors declare that they have no competing interests, except for Marcelo Katz who declared having received consulting fees and speaker's fees from Servier do Brasil and Abbvie Brasil and speaker's fees from Eli Lilly do Brasil, Brace Pharma Brasil, EMS Brasil and Novo nordisk Brasil, although there is not a direct conflit of interest with the content of this article.

Patient consent for publication

Not required.

Data availability statement

Statistical code, and dataset "VBHC Latin America Providers Survey" available from the Dryad repository, DOI: [10.5061/dryad.83bk3j9sc]. Reviewer URL link:

https://datadryad.org/stash/share/cnGA2yzQ5XVL4uuwFptWluZWDcFD3PCPLTFMAbbJwSw

Supplemental material

Appendices A, B and C present a list of participating organizations, the survey questionnaire, and a list of VBHC initiatives informed by participants, respectively.

REFERENCES

1. 2020 Global Medical Trend Rates Report: Global Benefits. Available at: https://www.aon.com/2020-global-medical-trend-rates-rising-health-plan-costs-risk-factors/index.html [Accessed August 26, 2021]

2. OECD/The World Bank (2020), Health at a Glance: Latin America and the Caribbean 2020, OECD Publishing, Paris, https://doi.org/10.1787/6089164f-en.
3. Porter ME, Teisberg EO. Redefining Health Care: Creating Value-Based Competition on Results. Boston: Harvard Business School Press, 2006.
4. Porter ME, Lee TH. The Strategy That Will Fix Health Care. Harvard Business Review; 91(10):50-70.
5. EIT Health, Implementing Value-Based Health Care in Europe: Handbook for Pioneers (Director: Gregory Katz), 2020. Available at: https://eithealth.eu/wp-content/uploads/2020/05/Implementing-Value-Based-Healthcare-In-Europe_web-4.pdf [Accessed October 05, 2021]
6. Mjåset C, Ikram U, Nagra NS, Feeley TW. Value-Based Health Care in Four Different Health Care Systems. NEJM Catalyst (November 10, 2020). Available at: Available at: [Accessed October 05, 2021]. [Accessed October 05, 2021]
7. The Economist Intelligence Unit. Value-based healthcare: A global assessment. Available at: https://perspectives.eiu.com/sites/default/files/EIU_Medtronic_Findings-and-Methodology_1.pdf [Accessed August 26, 2021].
8. Makdisse M, Katz M, Ramos P, Pereira A, Shiramizo S, Neto MC, Klajner S. What Is a Value Management Office? An Implementation Experience in Latin America. Value Health Reg Issues. 2018 Dec;17:71-73.
9. Makdisse M, Ramos P, Malheiro D, et al. 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.
10. Cabral NL, Nagel V, Conforto AB, et al. Five-year survival, disability, and recurrence after first-ever stroke in a middle-income country: A population-based study in Joinvile, Brazil. Int J Stroke. 2018 Oct;13(7):725-733.

11. da Silva Etges APB, Cruz LN, Notti RK. et al. An 8-step framework for implementing time-driven activity-based costing in healthcare studies. Eur J Health Econ 2019; 20:1133–1145.

12. Kaplan RS, MacLean CH, Dresner A, Haas DA, Feeley TW. Health Care Providers Need a Value Management Office. Harvard Business Review (website) (December 2, 2015). (Part of the "Leading Change in Health Care" series, a collaboration of the editors of Harvard Business Review and NEJM Group.) Available at: https://www.hbs.edu/faculty/Pages/item.aspx?num=50264. Accessed January 20, 2021.

13. Øvretveit J, Zubkoff L, Nelson EC, Frampton S, Knudsen JL, Zimlichman E. Using patient-reported outcome measurement to improve patient care. International Journal for Quality in Health Care 2017;29(6):874–879.

14. Damman OC, Jani A, de Jong BA, et al. The use of PROMs and shared decision-making in medical encounters with patients: An opportunity to deliver value-based health care to patients. J Eval Clin Pract. 2020 Apr;26(2):524-540.

15. Porter ME. What is value in health care? N Engl J Med. 2010;363(26):2477-81.

16. Kaltenborn, Z., Paul, K., Kirsch, J. et al. Super fragmented: a nationally representative cross-sectional study exploring the fragmentation of inpatient care among super-utilizers. BMC Health Serv Res 2021;21:338-347.

17. Porter ME, Kaplan RS. How to Pay for Health Care. Harv Bus Rev. 2016;94(7-8):88-98, 100, 134.

18. Cook D, Thompson JE, Habermann EB, Visscher SL, Dearani JA, Roger VL, et al. From "Solution Shop" Model To "Focused Factory" In Hospital Surgery: Increasing Care Value And Predictability. Health Affairs [Internet]. 2014;33(5):746–55. Available at:

https://search.ebscohost.com/login.aspx?direct=true&db=bah&AN=95933326&site=ehost-live.

19. Andersson A, Bååthe F, Wikström E, Nilsson K. Understanding value-based healthcare – an interview study with project team members at a Swedish university hospital. Journal of Hospital Administration 2015;4:64-72.

20. Fredriksson JJ, Ebbevi D, Savage C. Pseudo-understanding: an analysis of the dilution of value in healthcare. BMJ Qual Saf. 2015 Jul;24(7):451-7.

21. Teisberg E, Wallace S, O'Hara S. Defining and Implementing Value-Based Health Care: A Strategic Framework, Academic Medicine. 2020; 95(5):682-685.

Figures legends

Figure 1. Flow Diagram of Selection of Participants

Figure 2. VBHC Initiatives referred by participating organizations

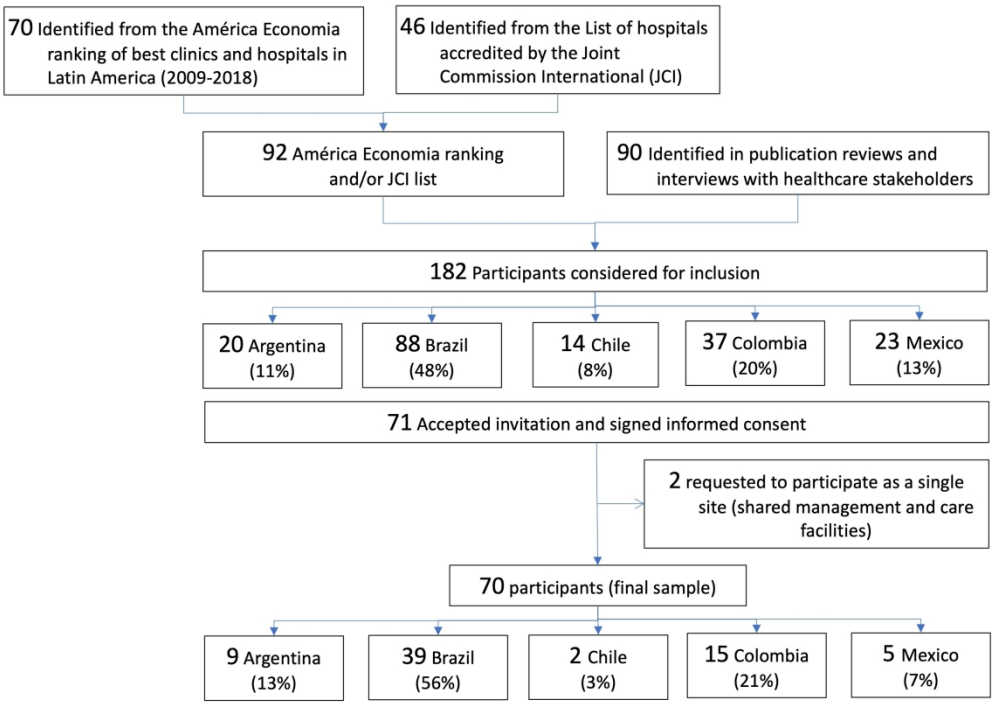

Figure 1. Flow Diagram of Selection of Participants

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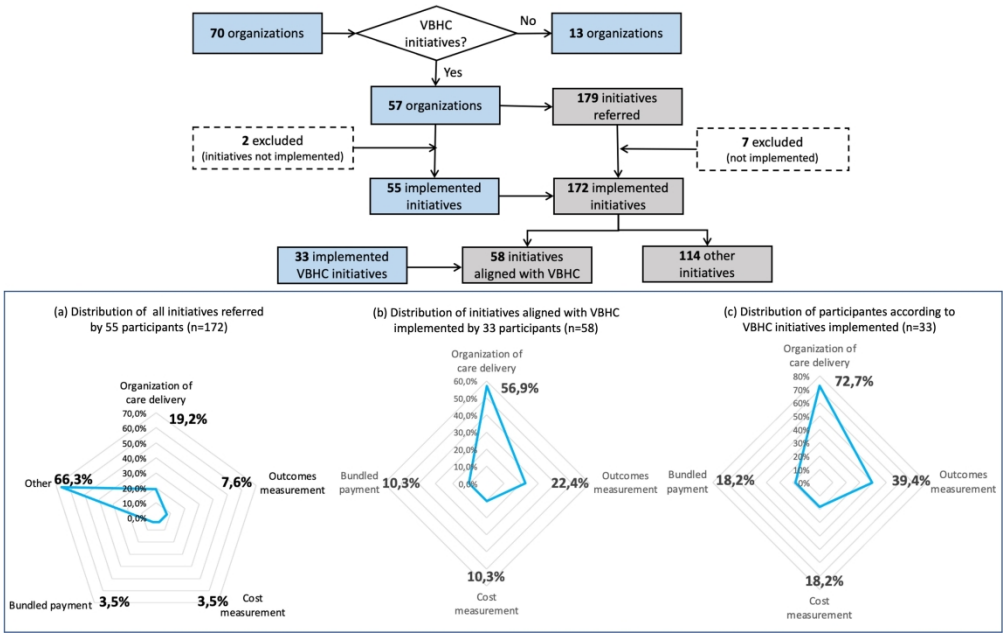

Figure 2. VBHC Initiatives referred by participating organizations

326x205mm (300 x 300 DPI)

Value-Based Health Care in Latin America: A Survey of 70 health care providers from Argentina, Brazil, Chile, Colombia and Mexico

Appendix A. List of Healthcare Organizations that participated in the study:

Argentina: Miguel Angel Silva, Willen Cabrera (Sanatorio Finochietto); Jorge Lantos (Sanatorio de los Arcos); Mariano Benzadón (Instituto Cardiovascular de Buenos Aires – ICBA); Hernán Michelángelo (Hospital Italiano de Buenos Aires); Pablo Alejandro Lemos (Hospital Privado Universitario de Córdoba); Jose Luis Puiggari (Hospital Universitario Austral); Silvio Javier Payaslian (Clínica Zabala - Swiss Medical Group); Javier Agustin Sala-Mercado (Instituto Modelo de Cardiologia Privado S.R.L.); Matias Fosco (Hospital Universitario Fundación Favaloro).

Brazil: Otavio Celso Eluf Gebara; Camila Succi (Hospital Santa Paula); Miguel Cendoroglo Neto (Hospital Israelita Albert Einstein); Camila Sardenberg (Hospital Santa Catarina); Fabiana Rolla (Hospital Municipal Dr. Moysés Deutsch e Hospital Municipal Dr. Gislon de Cassia Marques de Carvalho - Vila Santa Catarina); Eloisa Silva Dutra de Oliveira Bonfá, Michelle Ugolini, Ingrid Magatti (Hospital das Clínicas-Faculdade de Medicina da Universidade de São Paulo-HC-FMUSP); Fernando Colombari (Hospital Alvorada Moema); Ricardo Prates Periard (Hospital Samaritano Botafogo); Diogo Porto Dias (Hospital Porto Dias); Antonio Tonete Bafi (Hospital Sepaco); Osni Silvestri (Hospital Vita Curitiba); Ir. Monique Bourget (Casa de Saude Santa Marcelina); Paulo César Santos Dias (Complexo Hospitalar de Niterói); Humberto Bolognini Tridapalli (Hospital Santa Catarina de Blumenau); Fábio Araújo Motta (Hospital Pequeno Príncipe da Associação Hospitalar de Proteção à Infância Dr. Raul Carneiro); Daniela Falqueto (Alvim Hospital Santa Clara); Walter Amauchi, Cibele Quaranta (Beneficência Nipo Brasileira de São

Paulo); Fabio Katayama (Hospital Samaritano de São Paulo); Ary Costa Ribeiro, Sabrina Bernardez (Hospital do Coração-HCor); Luiz Eduardo Loureiro Bettarello (Hospital Beneficiência Portuguesa de São Paulo e Hospital BP Mirante); José Roberto Ferraro, Nelson Akamine (Hospital São Paulo - SPDM – Universidade Federal de São Paulo-Unifesp); Antonio da Silva Bastos Neto, Ícaro Boszczowski (Hospital Alemão Oswaldo Cruz); Gisele Nader (Hospital Moinhos de Vento); Erickson Blun, Fábio Gonçalves (Hospital Vera Cruz S/A); Monica Cypriano (GRAACC - Instituto de Oncologia Pediátrica- Universidade Federal de São Paulo-Unifesp); Adriana Blanco, Claudio Enrique Lubascher (Hospital Santa Cruz); Daniella Lins Neves (AACD-Associação de Assistência à Criança Deficiente); Eduardo Darzé (Hospital Cárdio Pulmonar); Guilherme Espírito Santo (Hospital Primavera); Felipe Salvador Ligório (Hospital Mater Dei Contorno-Rede Mater Dei de Saúde); Alfonso Migliore Neto, Ana Paula Mikulenas (Hospital Nove de Julho (Rede Impar Serviços Hospitalares S.A); Oswaldo Luis Balparda (Irmandade da Santa Casa de Misericórdia de Porto Alegre); Pedro Palocci, Fábio Gonçalves (Hospital Sao Lucas de Ribeirão Preto); Soraia Accioly (Santa Casa da Bahia / Hospital Santa Izabel); Rogerio Quintela Pirotto (Hospital alemão Oswaldo Cruz - Unidade Vergueiro); Pedro Silva Correa de Magalhães (Hospital Municipal São José – Joinville); Alexandre M. M. Ribeiro (Hospital Santa Isabel | Santa Casa de São Paulo); Ronaldo Fernandes Rosa (Santa Casa de São Paulo).

Chile: Bernd Oberpaur Wilkens, Paula Ithurbisquy (Clínica Alemana de Santiago); Alonso Rodriguez Rioseco (Clínica San Carlos de Apoquindo-Red de Salud UC-Christus).

Colombia: Victor Raul Castillo M. (Fundacion Cardiovascular de Colombia-HIC-ICV); Luis Antonio Mueses Coral (Hospital Universitario Departamental de Nariño); Luisa Fernanda Salgado Pilonieta (Hospital Universitario San Ignacio); Monica Patricia Arango Salas, Ana María Jaramillo Cardona (Inversiones Medicas de Antioquia S.A Clinica las Vegas); María Victoria Restrepo

Ceballos (Hospital Pablo Tobon Uribe); Jesús Eugenio Bustamante Cano, Katherine Madrid Restrepo (Empresa Social del Estado Hospital General de Medellín "Luz Castro de Gutierrez); Orlando Jaramillo (Corporación Hospitalaria Juan Ciudad – Méderi); Ana Maria de la Hoz Bradford (Instituto Roosevelt); Wilmar Alonso Alcaraz Otalvaro, Carlos Alberto Restrepo Molina (Clínica Universitaria Bolivariana); Juan Guillermo Ortiz, Hermencia Carolina Aponte Murcia (Clínica Universidad de La Sabana); Marcela Granados Sánchez (Fundación Valle del Lili); Diana Ximena Castañeda (Centro Médico Imbanaco S.A.); Lina María Lopez Barreto (Fundación Hospital Infantil Los Angeles); Paola Sanchez Zapata, Mauricio Tamayo Palacio (Clínica Cardio VID); Edwin Harvey Etayi Ruiz (Gesencro SAS / Clínica de Alta Complexidade Santa Bárbara SAS)

Mexico: Alejandro Alfonso Diaz, Reyna Yacamán Handal (Centro Médico ABC - The American British Cowdray Medical Center IAP); Eduardo Martiniano Loya Cortés, Georgina Herrera Martínez (Hospital Galenia); Cinthya Zahidaly Castro González (Hospital San José TecSalud); Javier Salvador Hernández Cruz (Hospital Zambrano Hellion TecSalud); Octavio González–Chon (Médica Sur S.A.B. de C.V.).

Appendix B. Online Questionnaire (translated English version)

(Q01) Country
●Argentina ●Brazil ●Chile ●Colombia ●Mexico

Organizational profile
(Q02) Name:
(Q03) Type: ●Public ●Private ●Public, teaching ●Private, teaching
(Q04) For-profit: ●Yes ●No

Respondent profile
(Q05) Name and surname:
(Q06) Position:
(Q07) E-mail:
(Q08) Telephone: ( )

Hospital in numbers
(Q09) Number of beds:
(Q10) Number of hospital discharges (previous year):
(Q11) Number of registered physicians:

About the implementation of the Value agenda core elements at your organization
(Q12) How is care delivery organized around medical conditions?
a. Care pathways that organize care delivery for the full cycle or episode of care are implemented for several medical conditions (including pre-hospital, admission, post-acute care, patient education, etc).
b. Care pathways that organize care delivery for the full cycle or episode of care are implemented for at least one medical condition (including pre-hospital, admission, post-acute care, patient education, etc).
c. Care pathways that organize care delivery but do not cover the full cycle or episode of care are implemented (inpatient care only)
d. Evidence-based clinical guidelines that guide clinical practice are implemented.
e. Evidence-based clinical guidelines that guide clinical practice are not implemented.

(Q13) How are outcomes measured and analyzed?
a. Clinical outcomes (eg, mortality, complications, readmissions), patient-reported outcomes (eg, quality of life, functional ability) and patient experience (eg, NPS, satisfaction) are measured for several medical conditions, and outcomes are incorporated into the electronic medical record, used during medical consultations, to give feedback to the care team and published in the internet.

b. Clinical outcomes (eg, mortality, complications, readmissions), patient-reported outcomes (eg, quality of life, functional ability) and patient experience (eg, NPS, satisfaction) are measured for several medical conditions, and outcomes are used to give feedback to the care team or published in the internet, however they are not routinely available to the medical team during consultations.
c. Clinical outcomes (eg, mortality, complications, readmissions), patient-reported outcomes (eg, quality of life, functional ability) and patient experience (eg, NPS, satisfaction) are measured for some medical conditions, but are not available to give feedback to the care team or published in the internet.
d. Only clinical outcomes (eg, mortality, complications, readmissions) are measured and pilot projects are underway to measure patient-reported outcomes and experience for some clinical conditions.
e. Only clinical outcomes (eg, mortality, complications, readmissions) are measured.

(Q14) How are costs measured and analyzed at the condition level?
a. Costs are measured at the medical condition level for a full cycle or episode of care and data are used for decision making and to design value-based payment models.
b. Costs are measured at the medical condition level but do not cover the full cycle or episode of care, although data are used for decision making and to design value-based payment models.
c. Pilots are underway to measure costs at the medical condition level.
d. Costs are measured at the level of services or departments.
e. A structured system for cost measurement on a routine basis is not available.

(Q15) How is the adoption of new payment models?
a. Alternative payment models, including population-based contracting, with part of payment linked to outcomes, are implemented, and contribute to revenue.
b. Alternative payment models, including condition or episode-based contracting, with part of payment linked to outcomes, are implemented, and contribute to revenue.
c. Alternative payment models for certain medical conditions, with part of payment linked to process metrics, are implemented, and contribute to revenue.
d. Alternative payment models for certain medical conditions, focused on the appropriateness of care and on reducing costs are implemented and contribute to revenue, but payment is not linked to outcomes or process metrics.
e. Alternative payment models are not implemented.

(Q16) What are the investments and technologies incorporated related to the value-based health care initiatives?
a. A digital platform, that integrates inpatient and outpatient data and allows interactions with patients and supports care coordination, is available.
b. Electronic medical record in all care areas, diagnostic grouping system and a business intelligence (BI) system that integrates clinical, cost and outcomes data are available.
c. Electronic medical record present in part of the care areas, diagnostic grouping system and a BI system that integrates clinical, cost and outcomes data are available.
d. An electronic medical record is available but clinical, cost and outcomes data are not integrated into a BI system.
e. An electronic medical record is not available.

(Q17) Is a Value Management Office (VMO) or similar structure, dedicated to design and implementation of VBHC initiatives, available?
●Yes ●No
(Q18) Has the organization implemented or is it implementing any VBHC initiatives?
●Yes – List initiatives:
●No

Appendix C. List of initiatives aligned with the Value Agenda referred by participants

Categories	Initiatives implemented by participants
Organization of care delivery	Implementation of an Atrial Fibrillation clinic with critical pathways and measurement of effectiveness, clinical outcomes and experience of care
Organization of care delivery	Organization in Medical condition centers: Heart Failure Center, LVAD Center and Acute Myocardial Infarction Center.
Organization of care delivery	Creation of an EPS ('Entidad Promotora de Salud', Health Promoting Entity) to offer integrated population health for full care cycles
Organization of care delivery	Maternity and birth care pathway
Organization of care delivery	Care model for Rheumatoid arthritis and other rheumatic conditions
Organization of care delivery	Care pathway for heart valve disease
Organization of care delivery	Transplant Program (Liver, kidney, pancreas, heart, etc)
Organization of care delivery	Breast cancer care pathway
Organization of care delivery	Breast cancer care pathway
Organization of care delivery	Scoliosis center of excellence
Organization of care delivery	Autism Spectrum Disorder (ASD) care pathway
Organization of care delivery	Comprehensive care model for patients with cerebral palsy
Organization of care delivery	Kidney Transplant program
Organization of care delivery	Urinary incontinence and pelvic floor disorders care pathway
Organization of care delivery	Optimization of adherence to therapy for pulmonary arterial hypertension using an interactive mobile device and care team approach
Organization of care delivery	Obesity and diabetes Center
Organization of care delivery	Breast Cancer Center
Organization of care delivery	Breast Cancer Functional Unit (certified)
Organization of care delivery	Heart failure and transplant functional unit
Organization of care delivery	Organization of care around different tumors using a multidisciplinary approach for full cycle of care and outcomes monitoring
Organization of care delivery	Hip disorders, low back pain and scoliosis care pathways

Organization of care delivery	Integrated heart failure program in partnership with a health plan to reduce costs
Organization of care delivery	Bone marrow transplantation care pathway
Organization of care delivery	Trauma care pathway
Organization of care delivery	Heart Failure clinic
Organization of care delivery	Implementation of knee arthroplasty care pathway
Organization of care delivery	Implementation of kidney transplant care pathway
Organization of care delivery	Breast cancer center
Organization of care delivery	Obesity center
Organization of care delivery	Partnership with a long-term care service to provide care coordination and safe discharge
Organization of care delivery	Community-based comprehensive stroke care model
Organization of care delivery	Comprehensive care program for chronic diseases
Organization of care delivery	Implementation of a Bio-Psycho-Social outpatient management program and a Physical conditioning program
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets and development of other local standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets and development of other local standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of clinical outcome and volume metrics
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	5-year outcomes measurement for stroke paients
Outcomes measurement	Measurement of validated clinical outcomes, Patient-reported outcomes and social determinants of health

Cost measurement	Costs and outcomes study
Cost measurement	Multicientric initiative to train and measure TDABC (Bone marrow transplant)
Cost measurement	Pilot to measure integrated cost of congenital heart disease interventional procedures
Cost measurement	Care pathways with cost measurement
Cost measurement	Cost of stroke for cycles of care
Cost measurement	Cost measurements at the patient and condition level for full cycles of care
Bundle payment	Implementation of a condition-based bundle payment for endometriosis
Bundle payment	Bundle payment for knee and hip replacements
Bundle payment	Fixed-price bundles for main procedures and Insurers
Bundle payment	Bundle payment for bariatric surgery
Bundle payment	Procedural episodic bundles covering inhospital complications
Bundle payment	Episodic bundles for surgical procedures including 30-days post-discharge complications
Other initiatives	Implementation of infection prevention and control quality metrics.
Other initiatives	Pilot project on infection prevention (hand wash, safe administration of iv medication and iv catheter monitoring)
Other initiatives	Lengh of stay reduction through data and process management
Other initiatives	Operating room efficiency and patient safety
Other initiatives	Implementation of an inhospital stroke care pathway
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Creation of a portfolio of products based on care pathways (pricing strategy)
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Implementation of a Physician compact agreement in partnership with IHI (institute for Healthcare Improvement)
Other initiatives	Implementation of an adjustable budget payment model
Other initiatives	Implementation of risk sharing models with a medical device company (Atrial fibrillation and TAVR) and with a health plan (CABG)
Other initiatives	Organization of the Medical practice department through the implementation of clinical managed protocols

Other initiatives	Participation in the Appropriate Birth Collaborative ('Parto Adequado')
Other initiatives	Integration between hospital and primary care
Other initiatives	Rational use of high-cost and antimicrobial drugs
Other initiatives	Implementation of a Patient experience unit
Other initiatives	Inhospital care pathways for stroke and acute kidney injury
Other initiatives	ERAS (Enhanced Recovery After Surgery) protocol for surgery procedures
Other initiatives	Homologation of medical supplies and medications based on value
Other initiatives	Filing system of medical supplies according to procedures
Other initiatives	Homologation of practices and procedures
Other initiatives	Launch of a support program for low-income patients in regard to spiritual, social, financing, lodging, food and transportation needs
Other initiatives	Healthy lifestyle incentive programs including a halh marathon with over 50,000 participants
Other initiatives	Knowledge transfer to improve community's quality of life through translational research projects focused on improvements in care delivery
Other initiatives	Comprehensive hospital nutritional care program
Other initiatives	Care pathway for cancer patients submitted to Radiotherapy pateient
Other initiatives	Research Project on the prevalence of gastric malignant precursor lesions and effect of Helicobacter Pylori eradication for primary prevention
Other initiatives	Promotion of a human milk bank network
Other initiatives	Opening of na outpatient specialties center including women's, trauma and heart centers
Other initiatives	Implementation of a dedicated anticoagulation clinic
Other initiatives	Sleep laboratory in a hotel
Other initiatives	Express Scheduled spontaneous demand
Other initiatives	Launch of a patient web portal
Other initiatives	A pilot to improve diagnosis in breast cancer
Other initiatives	ERAS (Enhanced Recovery After Surgery) protocol for colorectal, breast and gynecologic cancer
Other initiatives	Participation in the Appropriate Birth Collaborative ('Parto Adequado')

Other initiatives	Telemetry for ICU LOS reduction
Other initiatives	Optimization of flow and surgical volume
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Implementation of a stroke care pathway
Other initiatives	Managed surgical procedure packages
Other initiatives	Global daily rates with clinical management
Other initiatives	Emergency care packages including services/supplies
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Chronic disease inpatient ward
Other initiatives	Case management for breast, colon and prostate cancer
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Cost-effectiveness pilot study on community-acquired pneumonia
Other initiatives	Cost-effectiveness pilot study on left ventricular hypoplasia syndrome
Other initiatives	Cost-effectiveness pilot study on sepsis.
Other initiatives	Implementation of an adjustable budget payment model
Other initiatives	Lean methodology for reviewing and adjusting processes.
Other initiatives	Definition of productivity metrics
Other initiatives	Description of processes based on value flow maps
Other initiatives	Adjustments in care model to incorporate and comply with national policies
Other initiatives	Implementation of a global payment model for frail elderly patients with a health plan
Other initiatives	Development of physician feedback based on health outcomes
Other initiatives	Adoption and monitoring of care pathways
Other initiatives	Analysis of variability of most frequent procedures
Other initiatives	Creation of specialty committees to standardize and approve medical supplies and technology based on evidence
Other initiatives	Meetings with medical practice groups to review clinical outcomes and care variation

Other initiatives	A model to Integrate care facilities
Other initiatives	Build of an integrated care model
Other initiatives	Launch of a humanization policy
Other initiatives	DRG (Diagnosis Related Groups) implementation
Other initiatives	Center for pediatric specialized care
Other initiatives	Acute bronchiolitis care pathway
Other initiatives	Optimization of care in acute coronary syndromes program, accredited by the American College of Cardiology
Other initiatives	Optimization of care in hearth failure program, accredited by the American College of Cardiology
Other initiatives	Optimization of adherence in primary and secondary cardiovascular prevention and rehabilitation
Other initiatives	Analysis of 30-day readmission after abdominal oncologic surgeries
Other initiatives	Increase in the number of clinical and care management guidelines
Other initiatives	Cost management to improve performance (not at the condition level)
Other initiatives	DRG (Diagnosis Related Groups) implementation
Other initiatives	Spine appropriateness of care committees
Other initiatives	Pay-for-performance with one payer, including a joint coding effort between payer and provider and bonus based on process metrics
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Physician Management Program with a focus on technical leadership succession and on patient flows to reduce lenght of stay
Other initiatives	Pediatric Cancer Functional Unit
Other initiatives	Prospective Global Fixed Payments
Other initiatives	Implementation of the Quadruple Aim Model
Other initiatives	Pilot of a model to align performance metrics between hospital and health plan
Other initiatives	Alternative ambulatory care for low-complexity ED (emergency department) patients
Other initiatives	Service lines for cardiovascular medicine, neurology and digestive tract disorders
Other initiatives	A mobile device for early detection of heart failure clinical decompensation

Other initiatives	Outpatient care based on care pathways
Other initiatives	Evaluation of physician performance using clinical outcomes for periodic feedback
Other initiatives	ERAS (Enhanced Recovery After Surgery) protocol for surgery procedures
Other initiatives	Implementation of na electronic medical record
Other initiatives	Standardization of clinical processes for the entire hospital network
Other initiatives	Improvements in communication with patients throughout the care process (pre-, in- and posthospitalization)
Other initiatives	Training program on customer satisfaction for our employees combined with monthly measurement of results
Other initiatives	Local and organizational Quality Directory for the hospital network
Other initiatives	Single Electronic Medical Record Committee including outpatient and inpatient settings
Other initiatives	Management of ndividual clinical risk
Other initiatives	Optimization of the patient discharge process
Other initiatives	Piloting for DRG (Diagnosis Related Groups) implementation
Other initiatives	Strategy for strengthening clinical governance
Other initiatives	Anticoagulation program
Other initiatives	Payment agreement to care for patients with pulmonary hypertension covered by a specific health plan
Other initiatives	Iimplementation of clinical guidelines
Other initiatives	Improved care processes based on time and resource optimization
Other initiatives	DRG (Diagnosis Related Groups) implementation
Other initiatives	Acquisition of last generation medical equipments
Other initiatives	ModernizationHospital infrastructure
Other initiatives	DRG (Diagnosis Related Groups)-based payment model with one health plan
Other initiatives	Implementation of an outcomes unit
Other initiatives	Risk sharing agreement with a medical device company
Other initiatives	Building of key performance indicators dashboards
Other initiatives	Clinicians and employees performance evaluation

Other initiatives	Post-discharge and post-outpatient encounters satisfaction surveys using the net promoter score (NPS)
Other initiatives	Establishemnt of a Clinical governance structure.
Other initiatives	Short hospital stay care model (Lenght of stay <5 days)
Other initiatives	Prospective global payments for results achieved

Reporting checklist for cross sectional study.

Based on the STROBE cross sectional guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

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		Reporting Item	Page Number
Title and abstract			
Title	#1a	Indicate the study's design with a commonly used term in the title or the abstract	2
Abstract	#1b	Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background / rationale	#2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	#3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	#4	Present key elements of study design early in the paper	6

Setting	#5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Eligibility criteria	#6a	Give the eligibility criteria, and the sources and methods of selection of participants.	6
	#7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	n/a
Data sources / measurement	#8	For each variable of interest give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group. Give information separately for for exposed and unexposed groups if applicable.	7
Bias	#9	Describe any efforts to address potential sources of bias	7
Study size	#10	Explain how the study size was arrived at	6
Quantitative variables	#11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen, and why	7
Statistical methods	#12a	Describe all statistical methods, including those used to control for confounding	7
Statistical methods	#12b	Describe any methods used to examine subgroups and interactions	7
Statistical methods	#12c	Explain how missing data were addressed	n/a
Statistical methods	#12d	If applicable, describe analytical methods taking account of. sampling strategy	n/a
Statistical methods	#12e	Describe any sensitivity analyses	n/a
Results			
Participants	#13a	Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed. Give information separately for for exposed and unexposed groups if applicable.	6

Participants	#13b	Give reasons for non-participation at each stage	6
Participants	#13c	Consider use of a flow diagram	6
Descriptive data	#14a	Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders. Give information separately for exposed and unexposed groups if applicable.	9
Descriptive data	#14b	Indicate number of participants with missing data for each variable of interest	n/a
Outcome data	#15	Report numbers of outcome events or summary measures. Give information separately for exposed and unexposed groups if applicable.	n/a
Main results	#16a	Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
Main results	#16b	Report category boundaries when continuous variables were categorized	n/a
Main results	#16c	If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	#17	Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses	n/a
Discussion			
Key results	#18	Summarise key results with reference to study objectives	16
Limitations	#19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias.	18
Interpretation	#20	Give a cautious overall interpretation considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence.	18
Generalisability	#21	Discuss the generalisability (external validity) of the study results	18

Other Information			
Funding	#22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19

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Value-Based Health Care in Latin America: A Survey of 70 Healthcare Provider Organizations from Argentina, Brazil, Chile, Colombia and Mexico

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Figures and Tables 5

ABSTRACT

Objectives

Value-based Health Care (VBHC) is a health system reform gradually being implemented in health systems worldwide. A previous national-level survey has shown that Latin American countries were in the early stages of alignment with VBHC. Data at the healthcare provider organizations (HPOs) level are lacking. This study aim was to investigate how HPOs in five Latin American countries are implementing VBHC.

Design

Mixed-methods research was conducted using online questionnaire, semi-structured interviews based on selected elements of the value agenda (from December/2018 to June/2020), analyses of aggregated data and documents. Qualitative analysis was performed using NVivo QSR International, 1.6.1 (4830). Quantitative analysis used Fisher's exact test. Univariate analysis was used to compare organizations in relation to the implementation of VBHC initiatives. P value ≤0.05 was considered significant.

Participants

Top and middle-level executives from 70 HPOs from Argentina, Brazil, Chile, Colombia and Mexico.

Results

The definition of VBHC varied across participating organizations. Although the value equation had been cited by 24% of participants, its composition differed in most case from the original Equation. Most VBHC initiatives were related to care delivery organization (56.9%) and outcomes measurement (22.4%) but in most cases, IPU features had not been fully developed and outcome data was not used to guide improvement. Information, stakeholders buy-in,

compensation and fragmented care delivery were the most cited challenges to VBHC implementation. Fee-for-service predominated, although one third of organizations were experimenting with alternative payment models.

Conclusions

A wide variation in the definition and level of VBHC implementation existed across organizations. Our finding suggests investments in information systems and on education of key stakeholders will be key to foster VBHC implementation in the region. Further research is needed to identify successful implementation cases that may serve as regional benchmark for other Latin American organizations advancing with VBHC.

Key words Organisation of health services; International health services; Qualitative research

Strengths and limitations of this study

- A mixed method approach was used to explore the adoption of Value-Based Health Care by Healthcare provider organizations (HPOs) in 5 Latin-American countries
- Online survey, semi-structured interviews, and analyses of aggregated data and documents were used.
- An aggregate analysis is presented for the region without no direct comparison across countries due to the limited number of participating HPOs in some countries, such as Chile and Mexico.

INTRODUCTION

Escalating costs and substantial variation in the quality of health services threatens the sustainability of health systems globally. In several countries, a double-digit difference between general inflation and medical inflation has been reported[1], along with an evident failure of healthcare systems to address preventable diseases and to warrant universal and equitable access to care. Such challenges are even bigger for Latin American countries where increasing rates of chronic non-communicable diseases are combined with endemic and emerging diseases and, despite the positive effects of a series of health system reforms implemented in the last three decades, great disparities remain in terms of access to effective health services[2].

The Value-Based Health Care (VBHC) approach, proposed by Porter & Teisberg in 2006, has been seen as a strategy to transform the health care system through a redesign of the care-delivery processes around medical conditions or population segments, monitoring of outcomes and costs and a change in the financing model from paying for each service provided (*fee-for-service*) to paying for outcomes achieved (*fee-for-value*)[3]. This theory has been expressed in the Value Equation, where value is defined as health outcomes relative to the cost, and in the Value Agenda comprised of six elements (organize into integrated practice units, measure outcomes and costs for every patient, move to bundled payments for care cycles, integrate care across separate facilities, expand excellent services across geography, and build an enabling information technology platform).[4]

Most reports on the VBHC adoption come from Europe and North America[5-6] and little is known about its implementation in Latin America. A report published in 2016, by The Economist Intelligence Unit (EIU), assessed the alignment with VBHC components in 25 countries, including Brazil, Colombia, Chile and Mexico. Assessment was organized around four domains (Enabling context, policies and institutions for value in healthcare; Measuring outcomes and costs; Integrated and patient-focused care and Outcome-based payment) and 17 qualitative indicators. Results showed considerable variations in the adoption of such domains across countries. Sweden was the only country with a very high alignment and about half of participating countries emerged as having low alignment with VBHC, including Latin American countries, except for Colombia, which was considered to have a moderate alignment as a result

of the healthcare reforms aimed at achieving universal coverage, redirecting care delivery around patient needs and monitoring of costs for high-cost conditions. Chile scored second due to the implementation of a bundle payment system in several areas and monitoring of treatment costs by major payers. Brazil and Mexico had the lowest scores, and Brazil was the only country in the region not to have a condition-based national registry[7].

The EIU study, however, focused on the macro-level evaluation of health systems. More recent reports from leading Latin American healthcare organizations have shown an emerging movement around the implementation of alternatives to fee-for-service payments, more integrated care models, monitoring of outcomes and costs using the International Consortium for Health Outcomes Measurement (ICHOM) standard sets and time-driven activity based costing[8-11]. These experiences by front-runner organizations may serve as a benchmark for other organizations in the region initiating similar endeavors.

Therefore, the aim of this study was to investigate how HPOs from the five biggest Latin American economies were advancing with VBHC implementation in their local contexts.

METHODS

Study design

Mixed-methods research combining both qualitative and quantitative techniques were used. Quantitative methods included an online questionnaire to assess the level of implementation of the value agenda components and to map VBHC initiatives, and analyses of aggregated data on the initiatives referred in the interview. Qualitative methods included semi-structured interviews and analysis of relevant documents, including meeting notes and published documents.

Sampling Strategy

Participants were selected using purposeful sampling. We started by selecting countries. Argentina, Brazil, Chile, Colombia and Mexico comprise the five biggest Latin American economies and represent over 50% of the population living in the region. An initial list of HPOs 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 this list other HPOs were added based on a review of scientific and website publications and from interviews with stakeholders from organizations in the region aimed at identifying organizations working on VBHC enablers such as new care or payment models, outcomes and cost measurement, and value management office and IT infrastructure supporting VBHC implementation.

Participants

From a total of 182 organizations considered to participate in the study, 71 signed the written consent. Two organizations requested to participate as a single organization, as they work as a single management and care provider organization, which resulted in a final sample of 70 participants (Appendix A). A flow diagram is presented in Appendix B. Respondents of the online survey were top or middle-level managers appointed by the CEO or President: Chief Medical Officer or Vice Medical Officer (43%), President, Chief Executive Officer or Vice Executive Officer (26%), Director of Quality and Patient Safety or Planning and Quality Advisor (19%), Director of Education and Research (4%), Medical Manager (4%), Corporate Strategy Manager (3%) and Process Alignment Manager (1%). For the interviews, in 9 (15.5%) organizations one to three other executives, namely the CMO, the Director of Quality and/or the Director of Education and Research, joined in the interview.

Data collection

For the online survey, a structured questionnaire was developed, by the authors, in Portuguese and then translated into Spanish by a native speaker (LN). It included questions on the organization and respondent profiles, the level of adoption of the selected components of the value agenda, availability of a value management office or similar structure and on the implementation of VBHC initiatives (Appendix C). To build the questionnaire, multiple rounds were necessary during which investigators used the Value agenda as a guide to be adapted based on the investigators' knowledge, as experienced managers and investigators in the region, and on information gathered in the preparatory phase of the study that showed VBHC was in its early steps of adoption. A consensus was reached to focus the online survey on the elements that were

considered the main enablers of VBHC implementation: organization of care delivery, outcomes and cost measurement, implementation of alternative payment models and of a VBHC enabling IT platform. The other two elements (integration of care across separate facilities and expand excellent services across geography) would be explored during interviews. Interviews followed a semi-structured guide with open-ended questions including the meaning of VBHC in each organization and exploring the answers given on the online survey (Appendix D). An invitation was made for respondents to share documents. Both instruments were tested twice resulting in minor adjustments. Online surveys and telephone or videoconferencing interviews were conducted in Portuguese or Spanish, between December of 2018 and June of 2020, by four of the authors (MM, PR, MK and LN). All interviews were digitally recorded, transcribed into Portuguese and English, by two of the authors (MM e LN).

Data Analysis

Interview data were analyzed using a qualitative data analysis software (NVivo QSR International, 1.6.1 (4830). We used an inductive coding method (in vivo coding) which is a ground-up analytic strategy where codes emerge based on participants' own words. Quantitative data were analyzed using descriptive statistics. Fisher's exact test was used to compare organizations that had implemented VBHC initiatives with those that had not implemented. Univariate analysis was used to identify differences between the two groups in relation to VBHC implementation. To compare organizations regarding their level of alignment with the elements of the value agenda, answers to the online survey were transformed into binary variables, where 'yes' (high level of alignment) was considered if options 'a or b' had been selected, and 'no' (low level of alignment) for all other options, in order to make groups more homogeneous and to reduce the degrees of freedom of the variables. Statistical analysis was performed using the R 64-bit version 4.1.1 (R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/). All tests were two tailed and statistical significance was considered for p values <0.05. Data from interviews were used to capture the level of alignment, of the 33 initiatives categorized as 'organization of care delivery', with the Integrated Practice Units (IPU) features described by Porter & Lee[12]. Only 18 initiatives were analyzed as 15 were excluded based on the following reasons: non-participation in the interview (n=3), initiative was not focused on a defined medical condition/patient segment (n=6) and/or initiatives were restricted

to the implementation of a care pathway with no integrated multidisciplinary work (n=6). IPU features were considered implemented if they were fully developed and not part of a pilot project.

Patient and public involvement

The study presents analysis of a survey conducted with healthcare executives. There was no patient or public involvement.

Ethical considerations

All participants gave their written informed consent to participate in the study. The Study was approved by the Brazilian Research Ethics' Committee (CAAE: 85658117.7.0000.0071; SGPP approval number: 2.731.483).

STROBE checklist

The STROBE checklist has been completed online using https://www.goodreports.org/.

RESULTS

Participants

A total of 70 HPO representatives completed the online survey. Of those, 58 (83%) also participated in a virtual interview to deepen the information provided in the questionnaire. Table 1 presents a descriptive analysis of the organization profiles.

Table 1. Descriptive analysis of the participating provider organization profiles

		Argentina		Brazil		Chile		Colombia		Mexico		Total	
		n	%	n	%	n	%	n	%	n	%	n	%
Number of participanting organizations		9	13%	39	56%	2	3%	15	21%	5	7%	70	100%
Number of beds	≤ 200	5	56%	15	38%	1	50%	6	40%	4	80%	31	44%
	> 200	4	44%	24	62%	1	50%	9	60%	1	20%	39	56%
Number of Practicing Phyicians	≤ 500	5	56%	9	23%	1	50%	11	73%	3	60%	29	41%
	>500	4	44%	30	77%	1	50%	4	27%	2	40%	41	59%
Number of hospital discharges (previous year)[1]	≤ 15,000	5	56%	22	56%	1	50%	9	60%	4	80%	40	58%
	> 15,000	4	44%	17	44%	1	50%	6	40%	1	20%	29	42%
Type of organization	Private	9	100%	34	87%	2	100%	13	87%	5	100%	63	90%
	Public	0	0%	5	13%	0	0%	2	13%	0	0%	7	10%
Teaching/University Hospital	yes	4	44%	5	13%	1	50%	8	53%	2	40%	20	29%
	no	5	56%	34	87%	1	50%	7	47%	3	60%	50	71%
Legal structure	For-profit	5	56%	15	38%	0	0%	3	20%	2	40%	25	36%
	Not for-profit	4	44%	24	62%	2	100%	12	80%	3	60%	45	64%
Specialization	General hospital	6	67%	34	87%	2	100%	11	73%	5	100%	58	83%
	Specialty hospital	3	33%	5	13%	0	0%	4	27%	0	0%	12	17%
JCI accreditation[2]	Yes	3	33%	17	44%	1	50%	3	20%	3	60%	27	39%
	No	6	67%	22	56%	1	50%	12	80%	2	40%	43	61%
AmericaEconomia ranking (2009-2019)[3]	Yes	2	22%	10	26%	1	50%	11	73%	3	60%	27	39%
	No	7	78%	29	74%	1	50%	4	27%	2	40%	43	61%

[1] Only 69 hospitals reported the number of hospital discharges in the previous year as one of them had not completed one year of operation at the time of its participation in the study.
[2] Joint Commission International's Hospital program or Academic Medical Center Hospital Program
[3] Participation in the annual ranking of best hospitals & clinics in Latin America, from 2009 to 2019, published by AméricaEconomía Intelligence. Available at: https://www.americaeconomia.com/negocios-industrias/conozca-los-resultados-del-ranking-de-clinicas-y-hospitales-2020

The meaning of Value-Based Health Care

Figure 1 presents the distribution of the 14 codes compared by number and percentage of the 163 coding references derived from the qualitative analysis performed with NVivo on the meaning of VBHC given by each organization during the interviews. Outcomes and cost were the codes with the highest number of references, followed by compensation and patient

experience or perception of care. Examples of references, selected for the 14 different codes, is presented in Appendix E. The value equation was mentioned by 14 participants (24%), although only 5 mentioned 'outcomes/costs' as its components. The remaining defined the value equation as 'value/cost', 'best medicine/cost', 'individual value/cost', 'best care possible/cost', 'outcomes or patient experience/cost', 'quality of care perceived by the patient/cost', 'quality/cost' and 'outcomes/price'.

Implementation of the elements of the Value Agenda

The level of adoption of the value agenda elements are described in Table 2. In regard to care delivery organization, half of participants informed care delivery was organized around medical conditions for full care cycles for at least one medical condition, although less than 3% informed this was the case for several medical conditions.

All organizations referred to measure Clinician-Reported Outcomes (CROMs), most frequently mortality and complications rates. Patient-reported outcomes (PROMs) were measured by 41.4% but in only 8.5% this information was used to give feedback to the care team, or in routine medical encounters with patients, or published on the internet. In 10 Brazilian organizations, which corresponds to 25,6% of participants from that country, PROMs were collected using ICHOM standard sets for heart failure, stroke and hip and knee osteoarthritis as part of a collaborative started in 2017 by the National Association of Private Hospitals (ANAHP).

In regard to cost measurement, 24,3% of organizations informed to measure cost at the medical condition level but only two (2.9%) measured costs of full care cycles. Most of them measured costs only at the service or department level (67,2%), although 28,7% referred that pilots were underway to measure costs at the condition level. Six (8,6%) participants did not have a cost system structure in place to measure costs on a routine basis. Only one organization was using the Time-Driven Activity Based Costing (TDABC) methodology, as part of a public-private partnership with the Ministry of Health focused on training a critical mass of healthcare professionals to measure TDABC and on coordinating multicenter TDABC initiatives in public hospitals.

None of the organizations had a payment model in place where payment was linked to outcome-based performance metrics, although 5 (7%) referred participation in contracts where HPOs bore the costs of treatment-related complications. Thirty percent reported to participate in pay-for-performance agreements based on process metrics and 21,4% referred agreements focused on improving the appropriateness of care and on cost reduction. The remaining were not participating in alternative payment modalities. Fee-for-service (FFS) was the predominant payment model (91,4%) while global payment was present as the only modality in 6 public hospitals. Among organizations on FFS, 54,3% were on FFS only while the remainder (37.1%) were already experimenting a combination of FFS with other alternative payment models such as global payments (capitation and/or global budgets), bundled payments (defined as condition or episodic bundles that covered treatment-related complications for a pre-defined period of time) or pay-for-performance agreements. Additionally, three (4,3%) organizations referred to participate in risk-sharing agreements with payers and/or the medical device industry.

Regarding the information Technologies (IT) available, around 94% of organizations had an electronic medical record, but only 40% had a business intelligence system to integrate clinical, cost and outcomes data and 4% had implemented an interoperable digital platform that integrated both inpatient and outpatient data and allowed interactions between patient and care team.

Table 2. Implementation of the core elements of the Value agenda among participants

Elements of the Value Agenda	n	%
Number of participanting organizations	70	100%
Organization of care delivery		
a. Care pathways that organize care delivery for the full cycle or episode of care are implemented for several medical conditions.	2	2,9%
b. Care pathways that organize care delivery for the full cycle or episode of care are implemented for at least one medical condition.	35	50,0%
c. Care pathways that organize care delivery but do not cover the full cycle or episode of care are implemented.	20	28,6%
d. Evidence-based clinical guidelines that guide clinical practice are implemented.	13	18,6%
e. Evidence-based clinical guidelines that guide clinical practice are not implemented.	0	0,0%
Health Outcomes Measurement		
a. Clinical outcomes, Patient-reported outcomes (PROs) and experience are measured for several medical conditions, and results are incorporated into the medical record, used during medical consultations, to give feedback to the care team and published in the internet.	1	1,4%
b. Clinical outcomes, PROs and experience are measured for several clinical conditions, and results are used to give feedback to the care team and published in the internet, however they are not routinely available to the medical team during consultations.	5	7,1%
c. Clinical outcomes, PROs and experience are measured for some clinical conditions, but are not available to give feedback to the care team or published in the internet.	23	32,9%
d. Only clinical outcomes are measured and pilot projects are underway to measure PROs and experience for some medical conditions.	23	32,9%
e. Only clinical outcomes are measured.	18	25,7%
Costs Measurement		
a. Costs are measured at the medical condition level for a full cycle or episode of care and data are used for decision making and to design value-based payment models.	1	1,4%
b. Costs are measured at the medical condition level but do not cover the full cycle or episode of care, although data are used for decision making and to design value-based payment models.	16	22,9%
c. Pilots are underway to measure costs at the medical condition level.	20	28,6%
d. Costs are measured at the level of services or departments.	27	38,6%
e. A structured system for cost measurement on a routine basis is not available.	6	8,6%
Alternative Payment Models		
a. Alternative payment models, including population-based contracting, with part of payment linked to outcomes, are implemented and contribute to revenue.	0	0,0%
b. Alternative payment models, including condition or episode-based contracting with part of payment linked to outcomes, are implemented and contribute to revenue.	0	0,0%
c. Alternative payment models for certain medical conditions, with part of payment linked to process metrics, are implemented and contribute to revenue.	21	30,0%
d. Alternative payment models for certain medical conditions, focused on the appropriateness of care and on reducing costs are implemented and contribute to revenue, but payment is not linked to performance.	15	21,4%
e. Alternative payment models are not implemented.	34	48,6%
Investments on Information Technology		

a. A digital platform is available that integrates inpatient and outpatient data and allows interactions with patients and supports care coordination.	3	4,3%
b. Electronic medical record in all care areas, diagnostic grouping system and a business intelligence (BI) system that integrates clinical, cost and outcomes data are available.	15	21,4%
c. Electronic medical record present in part of the care areas, diagnostic grouping system and a BI system that integrates clinical, cost and outcomes data are available.	10	14,3%
d. An electronic medical record is available but clinical, cost and outcomes data are not integrated into a BI system.	38	54,3%
e. An electronic medical record is not available.	4	5,7%

Implementation of a Value Management Office (VMO)

Thirty-one participants (44%) informed to have implemented a VMO. In the interviews, however, when asked to describe the VMO in terms of the definition proposed by Kaplan et al. as a "central office to oversee the creation of capabilities and information to implement VBHC initiatives such as outcomes and cost measurement and management, set priorities for continuous improvement projects, facilitate the creation of value-based payment models and ensure that new IT platforms are aligned with the value agenda", only 12 (17%) were aligned with this definition, although they differed in terms of size, governance and structure[13]. In the remaining, the structure was dedicated to patient quality and safety (47%), were decentralized corporate areas that collaborated in specific projects (21%), innovation (12%), patient experience (11%) and project management or continuous process improvement (10%).

Implementation of VBHC Initiatives

In total, 57 (81.4%) organizations referred 179 initiatives that they considered aligned with the VBHC. Seven initiatives (3.9%), referred by two organizations were excluded because they had not been implemented, leaving a total of 172 initiatives from 55 organizations to be analyzed. Overall, only one third of initiatives (n=58) were aligned with VBHC and were related to organization of care delivery (n=33, 56.9%), outcomes measurement (n=13, 22.4%), cost measurement (n=6, 10.3%) and bundled payments (n=6, 10.3%). Initiatives not aligned with those elements were categorized as 'other initiatives' and were related to quality and safety, operational efficiency and process improvement, alternative payment models other than bundles,

patient experience, investment in new technologies, physician relationship programs, research projects, and marketing, among others. A flow diagram of initiatives and their distribution according to their alignment with VBHC is presented in the radar charts (Appendix F). Most participants implemented VBHC initiatives related to organization of care delivery (n=24, 72.7%), followed by outcomes measurement (n=13, 39.4%), cost measurement (n=6, 18.2%) and bundled payments (n=6, 18.2%). The full list of initiatives can be found in Appendix G.

A univariate analysis was used to assess the factors related to the implementation of VBHC initiatives (Appendix H). Regarding organization profiles, specialty hospitals were associated with implementation of VBHC initiatives (p=0.05), while all other organization 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 related to VBHC implementation. Organizations that referred high level of alignment with organization of care delivery and outcomes measurement, in the online survey, were associated with the implementation of VBHC initiatives (p<0.01 and 0.01, respectively). Adoption of ICHOM's standard sets (p<0.01) and implementation of alternative payment models (p=0.010) were also significantly associated with VBHC implementation.

Figure 2 presents the distribution of the initiatives categorized as 'organization of care delivery' according to the medical condition or population segment and to IPU features implemented. Eighteen initiatives were identified in which care was organized around 14 medical conditions or patient segments and delivered by a multidisciplinary team, although only 39% covered the full cycle of care of that condition. Heart failure and breast cancer were the most prevalent conditions. None of the initiatives had fully developed all IPU features.

Challenges to Value-Based Health Care implementation

Figure 3 presents 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 compensation (17%). Examples of references, selected for the 8 different codes, is presented in Appendix I.

DISCUSSION

To the best of our knowledge, this study is the first to assess how healthcare provider organizations from Latin American countries are implementing value-based health care strategies. It differs from a previous study that assessed VBHC implementation in 25 countries, four Latin American countries among them, which focused on the macro-level evaluation of health systems[7]. Another difference is that Argentina was included in our study due to its relevance to the region, as Latin America's third-largest economy.

Our findings show a wide variation in how VBHC is defined and on the level of implementation of VBHC initiatives across healthcare provider organizations. Although 'outcomes' and 'costs' were the referenced codes, it represented less that one quarter of total references and, in most cases, when the value equation was mentioned, most respondents used less specific terms such as 'value' or 'quality' instead of 'outcomes', which makes the concept less tangible. The same happened when participants were asked to inform VBHC initiatives implemented and two third of initiatives mentioned were not aligned with VBHC. This finding suggests there is an awareness on VBHC in the region but that there is a gap in relation to its core concepts. This is in accordance with previous studies that reported a dilution instead of a diffusion of the original concepts of the value-based health care strategy. This highlights the need to educate different stakeholders on VBHC in order to advance with its implementation.[14-15]

Most initiatives were directed at reorganizing care delivery and outcomes measurement but when the IPU features were assessed, most features had not been fully implemented specially in terms of taking responsibility for full cycles of care, having a team captain/care coordinator, measuring outcomes and costs, assuming responsibilities for the results and meeting regularly to promote continuous improvements. Although there is a clear effort underway in over 40% of HPOs to collect PROMs using ICHOM standard sets, such information has not been integrated so far into routine clinical practice or used to improve quality and outcomes, in most organizations, thus limiting their potential for enhancing value in care.[16-17] Reorganization of care delivery and outcomes measurement are key steps to start VBHC implementation in line with recommendations given by Elizabeth Teisberg, co-creator of the VBHC Strategy, based on data collected over more than a decade of research in organizations that achieved better health outcomes, that VBHC implementation begins with identifying unmet needs of patient segments and with designing solutions that meet those needs.[18]

Information, stakeholders buy-in, compensation and fragmented care delivery were the most cited challenges during the interviews. Information plays a key role in VBHC implementation, and the lack of an interoperable information and communication technology (ICT) platform may function as a barrier to implement, and even more, to scale-up initiatives and transition into outcome-based agreements as ITC reinforces all other elements of the value agenda[4]. Doctors and executives were the most referenced stakeholders in terms of the buy-in process. Doctors as 'team captains' have a key role in IPU implementation and as a member of the multidisciplinary care team[19], and quoting one of the interviewees (I_26) *"currently doctors are not educated on this and whoever is leading these processes of change is not involving physicians in such discussions."*

In regard to compensation, fee-for-service was the predominant payment modality in 91% of HPOs with 54% of them being reimbursed solely based on the FFS model, mostly private hospitals, and the remaining by means of global budgets, all public hospitals. Those two payment modalities do not incentivize care coordination and do not hold HPOs accountable for healthcare outcomes[20]. Studies have shown that the greater the fragmentation of care, the greater the unnecessary use of resources and the worse the quality and outcomes of care, contributing to enhancing health care costs.[21] Although 37% of organizations were participating in alternative payment models, none of those payment agreements linked payment to performance based on outcome metrics, which define value-based payment models[22].

When HPOs were compared in terms of implementation of VBHC initiatives, specialization, a high level of alignment with organization of care delivery and outcomes measurement, implementation of ICHOM standard sets and participation in alternative payment agreements were associated with implementation of VBHC initiatives. Among the 12 specialty hospitals participating in the study, nine had implemented VBHC initiatives (75%, p=0.05). This finding suggests that it may be simpler for specialty hospitals to adopt VBHC strategies aligned with the Value Agenda. This is not surprising considering that, at its core, VBHC is a specialization-oriented management framework, and most success cases have been reported in well-defined, narrow "focused factories".[23] Further research may address the potential adaptations needed for VBHC adoption to thrive in general hospitals, including in large, academic medical centers.

Strengths and weaknesses of the study

There is a paucity of data regarding VBHC implementation in Latin America. Therefore, the strength of this study is to bring new evidence on VBHC implementation from the perspective of leading HPOs in the region. It is a contribution to improve the understanding of how healthcare transformation is taking place in Latin America, in terms of the value agenda strategies that organizations have focused their efforts on and which initiatives have been implemented providing insights for future studies, follow-up and action.

A limitation of this research was the small number of participants for two of the selected countries. Chile and Mexico had a low acceptance response with only 2 and 5 participants, respectively. This fact did not allow us to make any meaningful comparison among participating countries. On the other hand, we believe that the aggregate information presented in our study is relevant as a starting point for discussions around the role of HPOs in care transformation. Additionally, we are not aware of any other study gathering data from 70 different HPOs from the region.

Another limitation is the predominance of private hospitals, which comprised 90% of participants. Although findings cannot be extrapolated to public organizations, leading public HPOs are represented in the study.

CONCLUSIONS

Value-Base health care implementation is challenging particularly in Latin American countries where access to care is still a major issue. A wide variation in the definition and level of VBHC implementation existed across organizations. Information, stakeholders buy-in, compensation and fragmented care delivery were the most cited challenges. Nonetheless, some organizations are advancing in terms of implementing VBHC initiatives, mostly focused on the organization of care delivery and outcomes measurement, that may provide insights for other HPOs in the region. Scalability of such initiatives will demand investments on education of different stakeholders and on systematic measurement and use of outcomes and cost data, which in turn demand more investments on information and communication technology. Further research is needed to identify successful

implementation cases that may serve as regional benchmark for the other Latin American HPOs advancing with VBHC.

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Author's Contributions

MM, PR and MK conceptualized the study and prepared submission for funding and led interviews with Brazilian participants. MM and LN led interviews with Spanish speaking participants. DM led the data analysis and provided insights for study design and discussion of findings. MM wrote the first draft of the manuscript. MM, PR, MK, LN, DM, MCN, JHG and SK contributed to subsequent drafts. All authors were involved in the final draft.

Ethics approval

The Study was approved by the Brazilian Research Ethics' Committee (CAAE: 85658117.7.0000.0071; SGPP approval number: 2.731.483).

Competing interests

The authors declare that they have no competing interests, except for Marcelo Katz who declared having received consulting fees and speaker's fees from Servier do Brasil and Abbvie Brasil and speaker's fees from Eli Lilly do Brasil, Brace Pharma Brasil, EMS Brasil and Novo nordisk Brasil, although there is not a direct conflit of interest with the content of this article.

Patient consent for publication

Not required.

Data availability statement

Extra data can be accessed via the Dryad data repository at http://datadryad.org/ with the doi: https://doi.org/10.5061/dryad.83bk3j9sc

Reviewer URL link:

https://datadryad.org/stash/share/cnGA2yzQ5XVL4uuwFptWluZWDcFD3PCPLTFMAbbJwSw

Supplemental material

Appendices A to I present aadditional material referred in the text.

REFERENCES

1. 2020 Global Medical Trend Rates Report: Global Benefits. Available at: https://www.aon.com/2020-global-medical-trend-rates-rising-health-plan-costs-risk-factors/index.html [Accessed August 26, 2021]

2. OECD/The World Bank (2020), Health at a Glance: Latin America and the Caribbean 2020, OECD Publishing, Paris, https://doi.org/10.1787/6089164f-en.
3. Porter ME, Teisberg EO. Redefining Health Care: Creating Value-Based Competition on Results. Boston: Harvard Business School Press, 2006.
4. Porter ME, Lee TH. The Strategy That Will Fix Health Care. Harvard Business Review; 91(10):50-70.
5. EIT Health, Implementing Value-Based Health Care in Europe: Handbook for Pioneers (Director: Gregory Katz), 2020. Available at: https://eithealth.eu/wp-content/uploads/2020/05/Implementing-Value-Based-Healthcare-In-Europe_web-4.pdf [Accessed October 05, 2021]
6. Mjåset C, Ikram U, Nagra NS, Feeley TW. Value-Based Health Care in Four Different Health Care Systems. NEJM Catalyst (November 10, 2020). Available at: Available at: [Accessed October 05, 2021]. [Accessed October 05, 2021]
7. The Economist Intelligence Unit. Value-based healthcare: A global assessment. Available at: https://perspectives.eiu.com/sites/default/files/EIU_Medtronic_Findings-and-Methodology_1.pdf [Accessed August 26, 2021].
8. Makdisse M, Katz M, Ramos P, Pereira A, Shiramizo S, Neto MC, Klajner S. What Is a Value Management Office? An Implementation Experience in Latin America. Value Health Reg Issues. 2018 Dec;17:71-73.
9. Makdisse M, Ramos P, Malheiro D, et al. 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.
10. Cabral NL, Nagel V, Conforto AB, et al. Five-year survival, disability, and recurrence after first-ever stroke in a middle-income country: A population-based study in Joinvile, Brazil. Int J Stroke. 2018 Oct;13(7):725-733.

11. da Silva Etges APB, Cruz LN, Notti RK. et al. An 8-step framework for implementing time-driven activity-based costing in healthcare studies. Eur J Health Econ 2019; 20:1133–1145.

12. Porter M, Lee T. Integrated Practice Units: A Playbook for Health Care Leaders. NEJM Catalyst Innovations in Care Delivery 2021; 2(1). DOI:https://doi.org/10.1056/CAT.20.0237

13. Kaplan RS, MacLean CH, Dresner A, Haas DA, Feeley TW. Health Care Providers Need a Value Management Office. Harvard Business Review (website) (December 2, 2015). (Part of the "Leading Change in Health Care" series, a collaboration of the editors of Harvard Business Review and NEJM Group.) Available at: https://www.hbs.edu/faculty/Pages/item.aspx?num=50264. Accessed January 20, 2021.

14. Andersson A, Bååthe F, Wikström E, Nilsson K. Understanding value-based healthcare – an interview study with project team members at a Swedish university hospital. Journal of Hospital Administration 2015;4:64-72.

15. Fredriksson JJ, Ebbevi D, Savage C. Pseudo-understanding: an analysis of the dilution of value in healthcare. BMJ Qual Saf. 2015 Jul;24(7):451-7.

16. Øvretveit J, Zubkoff L, Nelson EC, Frampton S, Knudsen JL, Zimlichman E. Using patient-reported outcome measurement to improve patient care. International Journal for Quality in Health Care 2017;29(6):874–879.

17. Damman OC, Jani A, de Jong BA, et al. The use of PROMs and shared decision-making in medical encounters with patients: An opportunity to deliver value-based health care to patients. J Eval Clin Pract. 2020 Apr;26(2):524-540.

18. Teisberg E, Wallace S, O'Hara S. Defining and Implementing Value-Based Health Care: A Strategic Framework, Academic Medicine. 2020; 95(5):682-685.

19. Ramos P, Savage C, Thor J, Atun R, Carlsson KS, Makdisse M, Neto MC, 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; 282:114145.
20. Porter ME. What is value in health care? N Engl J Med. 2010;363(26):2477-81.
21. Kaltenborn, Z., Paul, K., Kirsch, J. et al. Super fragmented: a nationally representative cross-sectional study exploring the fragmentation of inpatient care among super-utilizers. BMC Health Serv Res 2021;21:338-347.
22. Porter ME, Kaplan RS. How to Pay for Health Care. Harv Bus Rev. 2016;94(7-8):88-98, 100, 134.
23. Cook D, Thompson JE, Habermann EB, Visscher SL, Dearani JA, Roger VL, et al. From "Solution Shop" Model To "Focused Factory" In Hospital Surgery: Increasing Care Value And Predictability. Health Affairs [Internet]. 2014;33(5):746–55. Available at: https://search.ebscohost.com/login.aspx?direct=true&db=bah&AN=95933326&site=ehost-live.

Figures legends

Figure 1. The Meaning of Value-Based Health Care for participating Healthcare Provider Organizations. The figure displays the distribution of codes by number and percentage of coding references derived from the qualitative analysis.

Figure 2. Initiatives alignment with the Integrated Practice Unit (IPU) Features[12]

Figure 3. Challenges for a healthcare provider organization to implement Value-Based Health Care

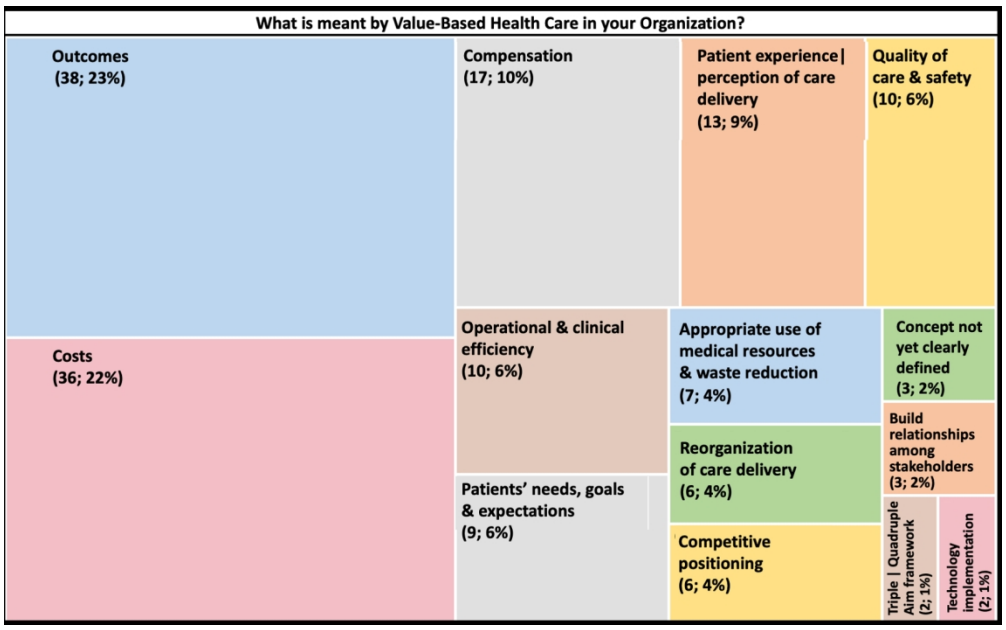

Figure 1. The Meaning of Value-Based Health Care for participating Healthcare Provider Organizations. The figure displays the distribution of codes by number and percentage of coding references derived from the qualitative analysis.

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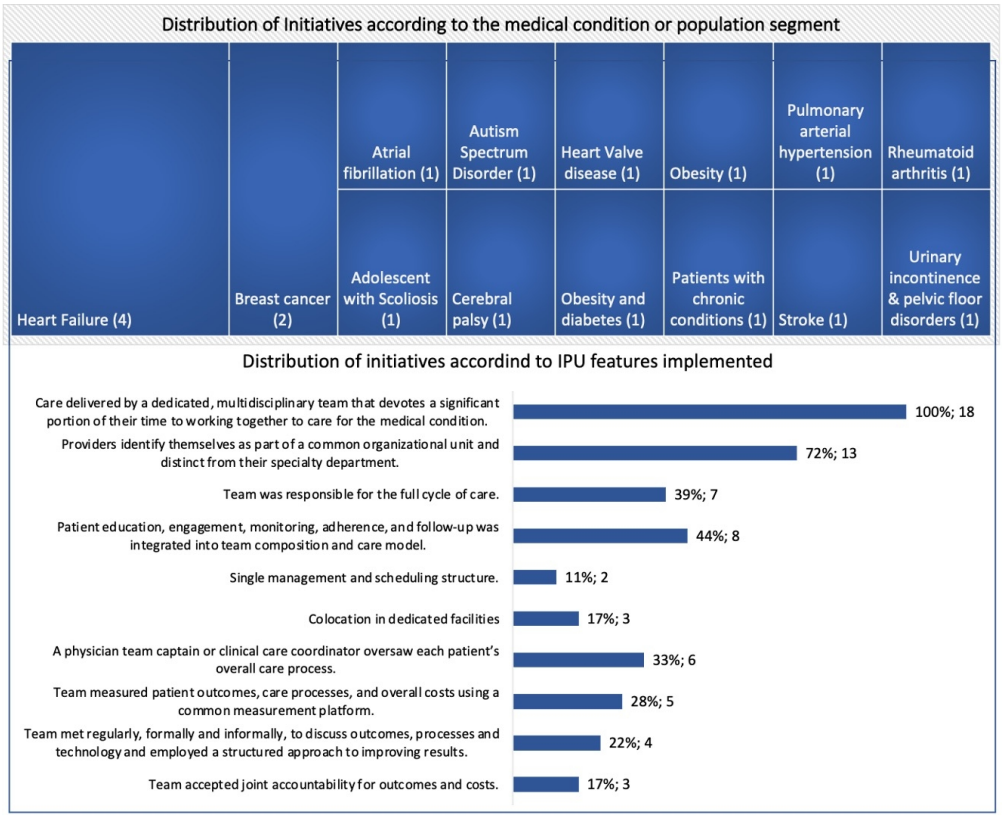


Figure 2. Initiatives alignment with the Integrated Practice Unit (IPU) Features12

233x190mm (144 x 144 DPI)

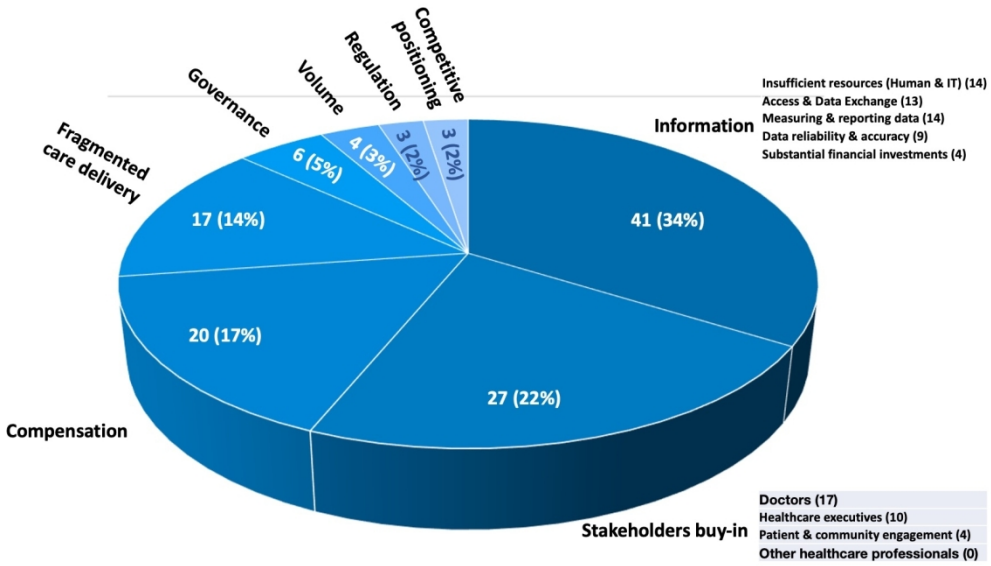


Figure 3. Challenges for a healthcare provider organization to implement Value-Based Health Care

311x186mm (144 x 144 DPI)

Value-Based Health Care in Latin America: A Survey of 70 Healthcare Provider Organizations from Argentina, Brazil, Chile, Colombia and Mexico

Appendix A. List of Healthcare Provider Organizations that participated in the study:

Argentina: Miguel Angel Silva, Willen Cabrera (Sanatorio Finochietto); Jorge Lantos (Sanatorio de los Arcos); Mariano Benzadón (Instituto Cardiovascular de Buenos Aires – ICBA); Hernán Michelángelo (Hospital Italiano de Buenos Aires); Pablo Alejandro Lemos (Hospital Privado Universitario de Córdoba); Jose Luis Puiggari (Hospital Universitario Austral); Silvio Javier Payaslian (Clínica Zabala - Swiss Medical Group); Javier Agustin Sala-Mercado (Instituto Modelo de Cardiologia Privado S.R.L.); Matias Fosco (Hospital Universitario Fundación Favaloro).

Brazil: Otavio Celso Eluf Gebara; Camila Succi (Hospital Santa Paula); Miguel Cendoroglo Neto (Hospital Israelita Albert Einstein); Camila Sardenberg (Hospital Santa Catarina); Fabiana Rolla (Hospital Municipal Dr. Moysés Deutsch e Hospital Municipal Dr. Gilson de Cassia Marques de Carvalho - Vila Santa Catarina); Eloisa Silva Dutra de Oliveira Bonfá, Michelle Ugolini, Ingrid Magatti (Hospital das Clínicas-Faculdade de Medicina da Universidade de São Paulo-HC-FMUSP); Fernando Colombari (Hospital Alvorada Moema); Ricardo Prates Periard (Hospital Samaritano Botafogo); Diogo Porto Dias (Hospital Porto Dias); Antonio Tonete Bafi (Hospital Sepaco); Osni Silvestri (Hospital Vita Curitiba); Ir. Monique Bourget (Casa de Saude Santa Marcelina); Paulo César

Santos Dias (Complexo Hospitalar de Niterói); Humberto Bolognini Tridapalli (Hospital Santa Catarina de Blumenau); Fábio Araújo Motta (Hospital Pequeno Príncipe da Associação Hospitalar de Proteção à Infância Dr. Raul Carneiro); Daniela Falqueto (Alvim Hospital Santa Clara); Walter Amauchi, Cibele Quaranta (Beneficência Nipo Brasileira de São Paulo); Fabio Katayama (Hospital Samaritano de São Paulo); Ary Costa Ribeiro, Sabrina Bernardez (Hospital do Coração-HCor); Luiz Eduardo Loureiro Bettarello (Hospital Beneficiência Portuguesa de São Paulo e Hospital BP Mirante); José Roberto Ferraro, Nelson Akamine (Hospital São Paulo - SPDM – Universidade Federal de São Paulo-Unifesp); Antonio da Silva Bastos Neto, Ícaro Boszczowski (Hospital Alemão Oswaldo Cruz); Gisele Nader (Hospital Moinhos de Vento); Erickson Blun, Fábio Gonçalves (Hospital Vera Cruz S/A); Monica Cypriano (GRAACC - Instituto de Oncologia Pediátrica- Universidade Federal de São Paulo-Unifesp); Adriana Blanco, Claudio Enrique Lubascher (Hospital Santa Cruz); Daniella Lins Neves (AACD-Associação de Assistência à Criança Deficiente); Eduardo Darzé (Hospital Cárdio Pulmonar); Guilherme Espírito Santo (Hospital Primavera); Felipe Salvador Ligório (Hospital Mater Dei Contorno-Rede Mater Dei de Saúde); Alfonso Migliore Neto, Ana Paula Mikulenas (Hospital Nove de Julho (Rede Impar Serviços Hospitalares S.A); Oswaldo Luis Balparda (Irmandade da Santa Casa de Misericórdia de Porto Alegre); Pedro Palocci, Fábio Gonçalves (Hospital Sao Lucas de Ribeirão Preto); Soraia Accioly (Santa Casa da Bahia / Hospital Santa Izabel); Rogerio Quintela Pirotto (Hospital alemão Oswaldo Cruz - Unidade Vergueiro); Pedro Silva Correa de Magalhães (Hospital Municipal São José –

Joinville); Alexandre M. M. Ribeiro (Hospital Santa Isabel | Santa Casa de São Paulo); Ronaldo Fernandes Rosa (Santa Casa de São Paulo).

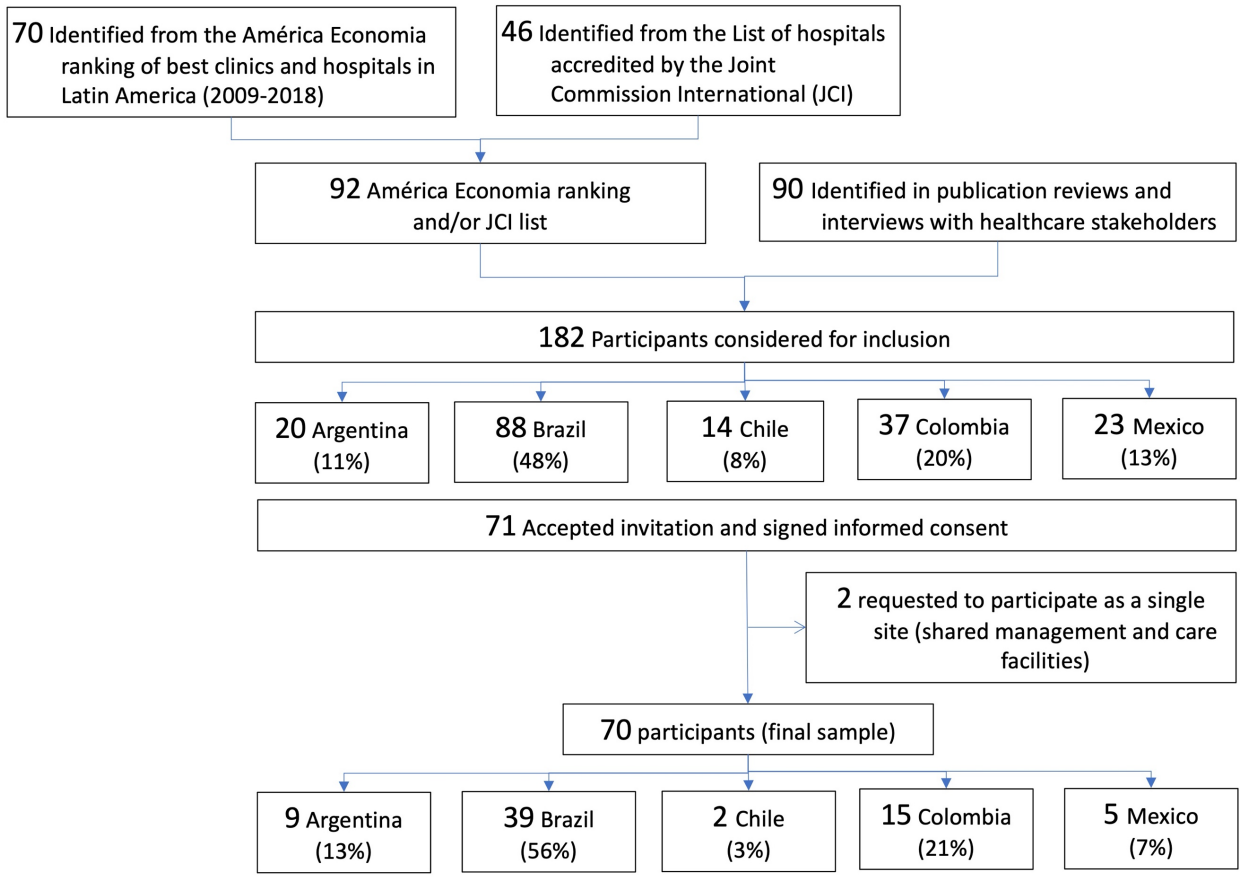
Chile: Bernd Oberpaur Wilkens, Paula Ithurbisquy (Clínica Alemana de Santiago); Alonso Rodriguez Rioseco (Clínica San Carlos de Apoquindo-Red de Salud UC-Christus).

Colombia: Victor Raul Castillo M. (Fundacion Cardiovascular de Colombia-HIC-ICV); Luis Antonio Mueses Coral (Hospital Universitario Departamental de Nariño); Luisa Fernanda Salgado Pilonieta (Hospital Universitario San Ignacio); Monica Patricia Arango Salas, Ana María Jaramillo Cardona (Inversiones Medicas de Antioquia S.A Clinica las Vegas); María Victoria Restrepo Ceballos (Hospital Pablo Tobon Uribe); Jesús Eugenio Bustamante Cano, Katherine Madrid Restrepo (Empresa Social del Estado Hospital General de Medellín "Luz Castro de Gutierrez); Orlando Jaramillo (Corporación Hospitalaria Juan Ciudad – Méderi); Ana Maria de la Hoz Bradford (Instituto Roosevelt); Wilmar Alonso Alcaraz Otalvaro, Carlos Alberto Restrepo Molina (Clínica Universitaria Bolivariana); Juan Guillermo Ortiz, Hermencia Carolina Aponte Murcia (Clínica Universidad de La Sabana); Marcela Granados Sánchez (Fundación Valle del Lili); Diana Ximena Castañeda (Centro Médico Imbanaco S.A.); Lina María Lopez Barreto (Fundación Hospital Infantil Los Angeles); Paola Sanchez Zapata, Mauricio Tamayo Palacio (Clínica Cardio VID); Edwin Harvey Etayi Ruiz (Gesencro SAS / Clínica de Alta Complexidade Santa Bárbara SAS)

Mexico: Alejandro Alfonso Diaz, Reyna Yacamán Handal (Centro Médico ABC - The American British Cowdray Medical Center IAP); Eduardo Martiniano Loya Cortés, Georgina Herrera Martínez (Hospital Galenia); Cinthya Zahidaly Castro González

(Hospital San José TecSalud); Javier Salvador Hernández Cruz (Hospital Zambrano Hellion TecSalud); Octavio González–Chon (Médica Sur S.A.B. de C.V.).

Appendix B. Flow Diagram of Participating Organizations Selection



Appendix C. Online Questionnaire (translated English version)

(Q01) Country
☐Argentina ☐Brazil ☐Chile ☐Colombia ☐Mexico

Organizational profile
(Q02) Name:
(Q03) Type: ☐Public ☐Private ☐Public, teaching ☐Private, teaching
(Q04) For-profit: ☐Yes ☐No

Respondent profile
(Q05) Name and surname:
(Q06) Position:
(Q07) E-mail:
(Q08) Telephone: ( )

Hospital in numbers
(Q09) Number of beds:
(Q10) Number of hospital discharges (previous year):
(Q11) Number of registered physicians:

About the implementation of the Value agenda core elements at your organization
(Q12) How is care delivery organized around medical conditions?
a. Care pathways that organize care delivery for the full cycle or episode of care are implemented for several medical conditions (including pre-hospital, admission, post-acute care, patient education, etc).
b. Care pathways that organize care delivery for the full cycle or episode of care are implemented for at least one medical condition (including pre-hospital, admission, post-acute care, patient education, etc).
c. Care pathways that organize care delivery but do not cover the full cycle or episode of care are implemented (inpatient care only)
d. Evidence-based clinical guidelines that guide clinical practice are implemented.
e. Evidence-based clinical guidelines that guide clinical practice are not implemented.

(Q13) How are outcomes measured and analyzed?
a. Clinical outcomes (eg, mortality, complications, readmissions), patient-reported outcomes (eg, quality of life, functional ability) and patient experience (eg, NPS, satisfaction) are measured for several medical conditions, and outcomes are incorporated into the electronic medical record, used during medical consultations, to give feedback to the care team and published in the internet.
b. Clinical outcomes (eg, mortality, complications, readmissions), patient-reported outcomes (eg, quality of life, functional ability) and patient experience (eg, NPS, satisfaction) are measured for several medical conditions, and outcomes are used to give feedback to the care team or published in the internet, however they are not routinely available to the medical team during consultations.

c. Clinical outcomes (eg, mortality, complications, readmissions), patient-reported outcomes (eg, quality of life, functional ability) and patient experience (eg, NPS, satisfaction) are measured for some medical conditions, but are not available to give feedback to the care team or published in the internet.
d. Only clinical outcomes (eg, mortality, complications, readmissions) are measured and pilot projects are underway to measure patient-reported outcomes and experience for some clinical conditions.
e. Only clinical outcomes (eg, mortality, complications, readmissions) are measured.

(Q14) How are costs measured and analyzed at the condition level?
a. Costs are measured at the medical condition level for a full cycle or episode of care and data are used for decision making and to design value-based payment models.
b. Costs are measured at the medical condition level but do not cover the full cycle or episode of care, although data are used for decision making and to design value-based payment models.
c. Pilots are underway to measure costs at the medical condition level.
d. Costs are measured at the level of services or departments.
e. A structured system for cost measurement on a routine basis is not available.

(Q15) How is the adoption of new payment models?
a. Alternative payment models, including population-based contracting, with part of payment linked to outcomes, are implemented, and contribute to revenue.
b. Alternative payment models, including condition or episode-based contracting, with part of payment linked to outcomes, are implemented, and contribute to revenue.
c. Alternative payment models for certain medical conditions, with part of payment linked to process metrics, are implemented, and contribute to revenue.
d. Alternative payment models for certain medical conditions, focused on the appropriateness of care and on reducing costs are implemented and contribute to revenue, but payment is not linked to outcomes or process metrics.
e. Alternative payment models are not implemented.

(Q16) What are the investments and technologies incorporated related to the value-based health care initiatives?
a. A digital platform, that integrates inpatient and outpatient data and allows interactions with patients and supports care coordination, is available.
b. Electronic medical record in all care areas, diagnostic grouping system and a business intelligence (BI) system that integrates clinical, cost and outcomes data are available.
c. Electronic medical record present in part of the care areas, diagnostic grouping system and a BI system that integrates clinical, cost and outcomes data are available.
d. An electronic medical record is available but clinical, cost and outcomes data are not integrated into a BI system.
e. An electronic medical record is not available.

(Q17) Is a Value Management Office (VMO) or similar structure, dedicated to design and implementation of VBHC initiatives, available?
☐Yes ☐No

(Q18) Has the organization implemented or is it implementing any VBHC initiatives?
☐Yes – List initiatives:
☐No

Appendix D. Semi-structured interview guide (translated English version)

The purpose of this interview is to deepen our understanding of the value-based healthcare initiatives implemented in your organization. The interview will be digitally recorded. I will also take notes during the interview to prevent data loss due to recording failures.

The interview will take 30 minutes. I will ask questions using an interview guide, focused on different areas. Everything that will be said during this interview will be handled carefully and will only be seen by the research group. Results will be presented anonymously and aggregated. Your participation is voluntary, and you may decide to discontinue your participation at any time.

1. Could you confirm your name and role in the organization?

2. What is meant by Value-Based Health Care in your Organization?

3. Regarding your answers to the online questionnaire, I would like to ask for tangible examples of implementation in your organization:

HOW IS CARE DELIVERY ORGANIZED AROUND MEDICAL CONDITIONS?

[Respondent answer to the online survey displayed here is read by the interviewer]

HOW ARE OUTCOMES MEASURED AND ANALYZED?

[Respondent answer to the online survey displayed here is read by the interviewer]

HOW ARE COSTS MEASURED AND ANALYZED AT THE CONDITION LEVEL?

[Respondent answer to the online survey displayed here is read by the interviewer]

HOW IS THE ADOPTION OF NEW PAYMENT MODELS?

[Respondent answer to the online survey displayed here is read by the interviewer]

WHAT ARE THE INVESTMENTS AND TECHNOLOGIES INCORPORATED RELATED TO THE VALUE-BASED HEALTH CARE INITIATIVES?

[Respondent answer to the online survey displayed here is read by the interviewer]

IS A VALUE MANAGEMENT OFFICE (VMO) OR SIMILAR STRUCTURE, DEDICATED TO DESIGN AND IMPLEMENTATION OF VBHC INITIATIVES, AVAILABLE?

[Respondent answer to the online survey displayed here is read by the interviewer]

HAS THE ORGANIZATION IMPLEMENTED OR IS IT IMPLEMENTING ANY VBHC INITIATIVES?

[Respondent answer to the online survey displayed here is read by the interviewer]

(In case initiatives were mentioned, list will be displayed here)

-

-

Please tell us more about the initiative(s) you have mentioned on the online questionnaire. You can also add other initiatives not mentioned previously.

(In case initiatives were not mentioned)

You have not mentioned any VBHC initiative on the online questionnaire. Are there any new initiatives in your organization? If so, could you please tell us more about it?

4. Is there anything else you would like to add?

5. In case your organization is selected, are you willing to authorize a field visit by our team of investigators? If so, in view of the initiatives mentioned, who would be the people with the greatest involvement and who could participate in the interviews during the field visit?

(Name, position, e-mail and/or phone)

We have reached the end of this interview. I would like to thank you for your time and look forward to answering any questions you may have.

Appendix E. Examples of Definition of Value-Based Health Care in the words of Representatives of the 58 Healthcare Provider Organizations

What is meant by Value-Based Health Care in your Organization?
Outcomes (38 references, 23%)
"It's monitoring the outcomes of care provided at the institution. How much value we added for the patient as an imminently surgical hospital, it is not only to monitor the immediate result of the surgery - but to assess complications and how the patient is up to 1 year after the surgery." (I_01) *"We seek to advance in the sense of not only providing patients with this specific context of the health outcome, but we also regard ourselves, in our own reality, as contributing to the patient, to the insurer company and to the social group to which the patient belongs. We try to insert VBHC as an additional contributing element, which outweighs specific clinical outcomes."(I_09)* *"It seeks to make the impact of good care on clinical outcomes visible, including the patient's perspective. And it is also an opportunity to improve outcomes and reduce health costs, which is very much in line with our mission here at the hospital, being a reference public hospital in our region". (I_23)* *"It's looking at the best outcome for the patient, looking at the most linear process at the lowest possible cost and within outcomes you look at everything from the process, practice and the outcome itself within a more accessible cost and with that we will be able to serve more people in need and serve them better." (I_28)* *"When we think of VBHC, we think of Michael Porter, so we think of everything we spend that can generate good clinical outcomes, all the economic effort we make to achieve better clinical outcomes." (I_33)* *"It's a concept to be practiced. I would say that a few years ago, at the time of our long-term strategic planning, the term came under consideration but due to lack of maturity, we focused only on starting isolated actions that were in line with the concept of improving outcomes at a lower cost. In essence, that's what happened. As this process is difficult to be practiced in a disciplined way as a set of action plans that are chained in a rational way over time, VBHC evolved into a series of small initiatives in different areas, that although aligned with its global concept, were not linked to a systems approach that would enable us to fully implement the VBHC concept." (I_43)*

Costs (36 references, 22%)
"Finding a way to provide a better benefit to cost ratio for our patients, not only to provide an optimal clinical outcome for the patient, but also for the payer, at a reasonable and appropriate cost for the service being provided." (I_04) *"All the actions that we are developing to improve patient outcomes, cost-effectively, and with very good financial results as well." (I_10)* "*VBHC seeks to translate health economics, to sell high-impact indicators and be able to seek effective strategies with a better benefit to cost ratio for a target group at risk. The exercise of VBHC consists of obtaining the best clinical outcomes in a safe way but at minimal costs. This is the component that differentiates it in part from Evidence-Based Medicine." (I_14)* *"It's what you deliver in the end to each patient and, of course, in balance with costs. Thinking about what we can do best at the lowest cost, whether in terms of clinical outcome or average length of stay, hospital infection, humanization, reception, patient experience, rational use of antibiotics, the complete care chain." (I_29)*
Compensation (17 references, 10%)
"VBHC is in part opposed to the medicine we have practiced until now, in which patient care, and the payment made by the payer of that care, is given by service provided. VBHC has to do with another concept where care provided is assessed in another way, not in terms of the benefit being granted or not, but in terms of value added to that patient's care chain. It's more about paying-for-results, paying-for-performance or paying-for-appropriate processes than about paying-for-service."(I_11) *"It is simply a care model in which compensation is based on clinical outcomes, in our view, some sustainable models in which all parts of the health chain benefit: patients, providers, suppliers, payers and society as a whole." (I_22)* *"The C-suite understands this VBHC movement, but the current focus is more on seeking, learning and testing new payment models and on knowing more about the concept as a whole. From the care delivery perspective, we are still evolving traditional protocols and advancing in the measurement of clinical outcomes." (I_32)* *"We understand that VBHC is a global movement, not just a national or local one, both to improve clinical outcomes for the patient and is linked to the compensation model for hospital admissions." (I_41)*

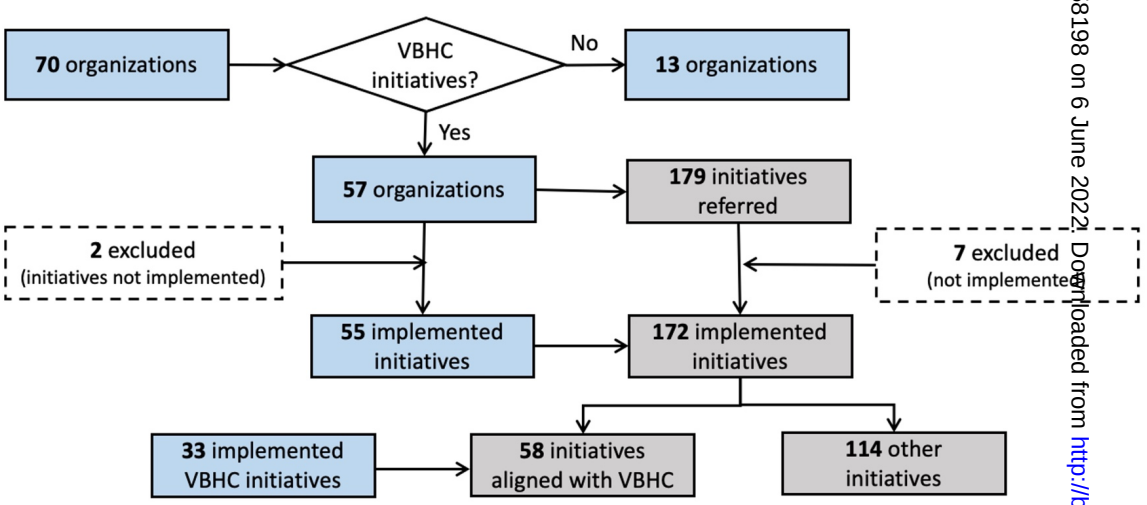
**Patient experience	perception of care (17 references, 10%)**
"The amount of well-being or satisfaction that the practice of medicine leaves in the patients, in their families, regardless of the result as such, this is what a science like medicine promises, but we know that it has been handled as a commitment to a specific result, achieved through specific activities." (I_07) *"VBHC is what the patient and family perceive in addition to medical care."(I_13)* *"I understand that it is what we deliver to the patient in terms of satisfaction, meaning his/her experience counts, so it is to provide resolutive and efficient care, with as few adverse events as possible and a good experience for the patient." (I_38* *"We don't see VBHC as just a specific protocol, for example, with ICHOM or another methodology, we understand that it is a series of actions that we have to carry out, such as a well-structured infection control service, thinking about patient-friendly enviroment settings, everything we can bring to improve patient's care, and his/her experience while in the hospital."(I_54)*
Quality of care & safety (10 references, 6%)
"We have been trying to advance with VBHC for many years and we have adopted the internationally widespread concept that defines value as the ratio between the quality of care we provide, perceived by the patient, adjusted by the costs for the health system to deliver such quality. We believe that we add value each time we manage to improve the quality of care perceived by the patient and we also believe that we add value each time we are more efficient in reducing the costs of the health system."(I_51) *"It is a structure that we are trying to build based on the analysis of outcomes and how we are committed to the quality and safety of care and basing a lot on effectiveness and the analysis and monitoring of clinical outcomes." (I_20, I_21*
Operational & Clinical efficiency (10 references, 6%)
"Our main purpose at this moment is to map all the important outcomes of fundamental care processes within the hospital and naturally correlating this with the linked cost. Important hospital areas such as the operating rooms, the surgical volume and the hospitalization of highly complex medical patients, in addition to the dehospitalization of chronic patients, all impact this equation. So this is how we are treating this concept of value within the hospital, understanding that it is essential to reach this

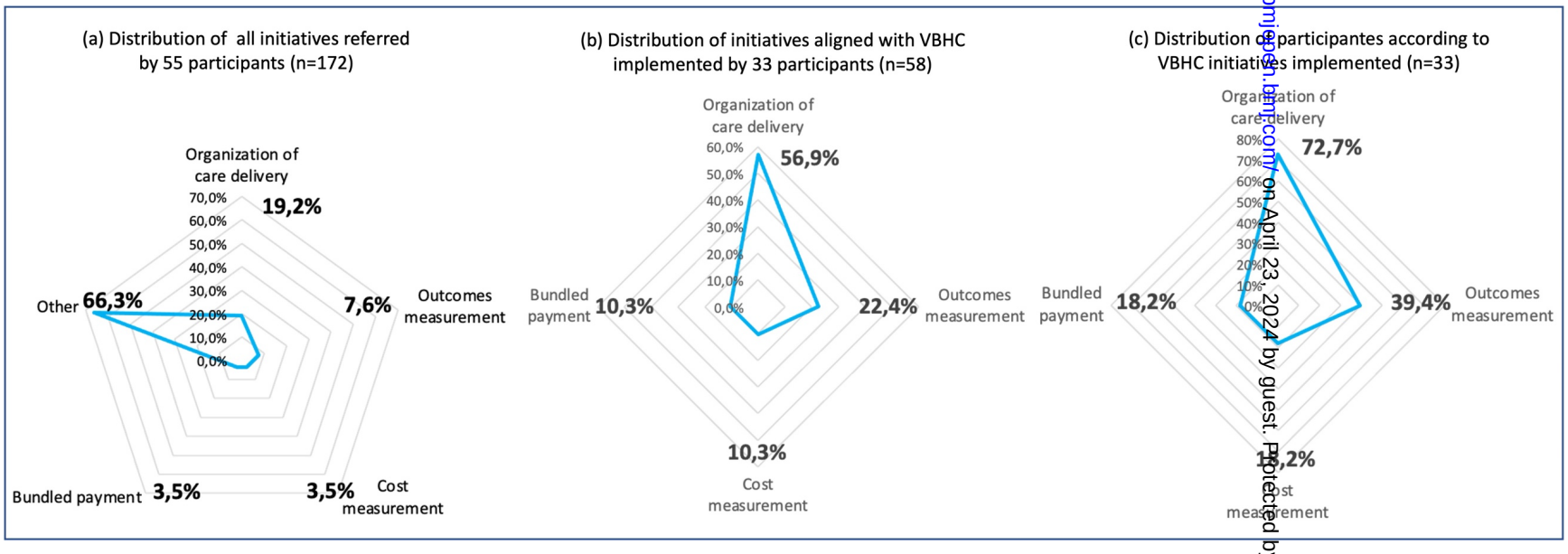
point, this result. We have well defined clinical outcomes of our care processes and naturally we correlate them with all the costs involved in hospital operation." (I_34) *"It's a relatively new topic and we believe it's associated with adding value to care delivery at each of the stages of the care delivery value chain." (I_45)*
Patients' needs, goals & expectations (9 references, 6%)
"The concept is related to the clinical care activities that we carry out, which puts patients and their families at the center of care, respecting their values and culture, as well as their spiritual and religious aspects." (I_05) *"It's directly linked to value for the patient. What the patient understands as a value. What he/she understands as the expected outcome for his/her case. The patient leaves the hospital with the outcome he/she feels as adequate, meaning that he/she comes to us in a situation of risk, problem or health event and finds a solution or a referral here, even when it is not the solution, which he/she deems appropriate for his/her case within the ethics of medical care. This for us is VBHC. If I can anticipate, value-based compensation for us is a second step." (I_53)*
Appropriate use of medical resources & waste reduction (7 references, 4%)
"We are committed to the proper use of resources, minimizing or eliminating waste and also at the same time seeking a better outcome for the patient. We are advancing in the search for outcomes so that we can increasingly observe outcomes that matter to the patient and not only from the perspective of the hospital." (I_19) *"It's about delivering what the patient needs, neither more nor less. It is doing the right thing at the right time for that health condition. It has a lot to do with reducing waste and improving value for the patient as well." (I_36)*
Reorganization of care delivery (6 references, 4%)
"We are starting to look at outcomes delivered by care pathways rather than by a specific procedure or disease. Because we deal with an open medical staff, it's easier for us to start working on this concept using a more direct approach focused on those care pathways where we have specific medical teams and doctors who have a closer relationship with our institution, making it easier for us to work with them. At this first moment, we started to work on the critical patient care pathway, where from admission in

the emergency department to discharge, outcomes are monitored to see how the patient evolved within this care pathway. Another step, taken two months ago, was to include a post-discharge visit so that we can measure the success of the hospitalization and if we have done everything we could during the hospital stay and if the patient was discharged in the best clinical condition possible." (I_39) *"It's moving away from a fragmented approach, to serve the patient in an integrated way including all relevant spheres of patient care." (I_57)*
Competitive positioning (6 references, 4%)
"The final objective of VBHC in our institution has a continuous improvement aspect that has a care focus and has a market positioning and competitiveness aspect."(I_24) *"It is increasingly clear that we will have to work within a model that creates more value for consumers, patients and families, and then, value in terms of delivery of clinical results, patient experience and a lower price... So it's that famous little equation and we always work on this concept of delivering value. It is also clearer that we have to work on this equation if we want to develop new products and more and more the market wants good products with this higher loss ratio faced by health plans, the difficulties in growing our business and all this scenario we live, including the loss of beneficiaries and the unsustainable cost that exist in this sector, the alternative is to develop new products around this value proposition. This is how we define VBHC." (I_35)*
Building relationships among stakeholders (3 references, 2%)
"It's a journey that aims at building relationships with all those involved based on the precept of delivering value to the patient. I want to emphasize the journey and involvement of various stakeholders in the process."(I_24) *"It's the ratio between the quality of care we provide and the outcomes on the most varied fronts, whether clinical care outcomes or the patient's own experience and how much this adds value to us and its relation to cost. This is what we try to practice here, still in the phase of implementing tools that allow us to better reference this but the concept is this: trying to make a good relationship between the 4 bridges that exist between health plans, patients, staff and cost this is our goal." (I_44)*
Concept not yet clearly defined (3 references, 2%)

"We still don't use this VBHC tool well. We have had a constant discussion about this, but we lack a well-defined process to implement it. We have care pathways and we have started with care pathways because we see that we can offer patients a beginning-to-end solution." (I_49) *"We are still in the initial phase of this process. We have not started much on this issue so that we can actually advance in the process of measuring Value. I think we've made a lot of progress on measuring costs, but we still haven't managed to analyze costs together with other indicators and across teams." (I_03)*
Triple I Quadruple Aim framework (2 references, 1%)
"We have adopted a vision of Value based on the Triple Aim concept that has been around for a while and that was fundamental to tread a new path and build our healthcare network, incorporating population health, primary care, and knowing that it is not enough to offer the best treatment for the patient in terms of quality, safety and experience and at an adequate cost if you have not done everything possible to preserve the patient's health and avoid the need of a procedure. Within this triple aim paradigm, we understand that in the dimension between the experience with care and the reduction of the per capita cost, there is a huge space for us to work with VBHC, and that includes new, more creative payment models that in fact deliver value. And I'm putting it that way because I think this is more complex than what is expressed by the Value Equation. Usually, when people discuss about it, they say it's 'result over cost', but the result must include the patient experience and it must include the appropriateness of care as a guide."(I_26)
Technology implementation (2 references, 1%)
"It's about incorporating healthcare achievements and advancements versus the costs incurred by the institution to obtain these results." (I_08)

Appendix F. VBHC Initiatives referred by participating organizations





Appendix G. List of initiatives aligned with the Value Agenda referred by participants

Categories	Initiatives implemented by participants
Organization of care delivery	Implementation of an Atrial Fibrillation clinic with critical pathways and measurement of effectiveness, clinical outcomes and experience of care
Organization of care delivery	Organization in Medical condition centers: Heart Failure, LVAD, AMI Centers
Organization of care delivery	Creation of an EPS to offer integrated population health for full care cycles
Organization of care delivery	Maternity and birth care pathway
Organization of care delivery	Care model for Rheumatoid arthritis and other rheumatic conditions
Organization of care delivery	Care pathway for heart valve disease
Organization of care delivery	Transplant Program (Liver, kidney, pancreas, heart, etc)
Organization of care delivery	Breast cancer care pathway
Organization of care delivery	Breast cancer care pathway
Organization of care delivery	Scoliosis center of excellence
Organization of care delivery	Autism Spectrum Disorder care pathway
Organization of care delivery	Comprehensive care model for patients with cerebral palsy
Organization of care delivery	Kidney Transplant program
Organization of care delivery	Urinary incontinence and pelvic floor disorders care pathway
Organization of care delivery	Optimization of adherence to therapy for pulmonary arterial hypertension using an interactive mobile device and care team approach
Organization of care delivery	Obesity and diabetes Center
Organization of care delivery	Breast Cancer Center
Organization of care delivery	Breast Cancer Functional Unit (certified)
Organization of care delivery	Heart failure and transplant functional unit
Organization of care delivery	Organization of care around different tumors using a multidisciplinary approach for full cycle of care and outcomes monitoring
Organization of care delivery	Hip disorders, low back pain and scoliosis care pathways

Organization of care delivery	Integrated heart failure program in partnership with a health plan to reduce costs
Organization of care delivery	Bone marrow transplantation care pathway
Organization of care delivery	Trauma care pathway
Organization of care delivery	Heart Failure clinic
Organization of care delivery	Implementation of knee arthroplasty care pathway
Organization of care delivery	Implementation of kidney transplant care pathway
Organization of care delivery	Breast cancer center
Organization of care delivery	Obesity center
Organization of care delivery	Partnership with a long-term care service to provide care coordination and safe discharge
Organization of care delivery	Community-based comprehensive stroke care model
Organization of care delivery	Comprehensive care program for chronic diseases
Organization of care delivery	Implementation of a Bio-Psycho-Social outpatient management program and a Physical conditioning program
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets and development of other local standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of ICHOM standard sets and development of other local standard sets
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	Implementation of clinical outcome and volume metrics
Outcomes measurement	Implementation of ICHOM standard sets
Outcomes measurement	5-year outcomes measurement for stroke paients
Outcomes measurement	Measurement of validated clinical outcomes, Patient-reported outcomes and social determinants of health

Cost measurement	Costs and outcomes study
Cost measurement	Multicientric initiative to train and measure TDABC (Bone marrow transplant)
Cost measurement	Pilot to measure integrated cost of congenital heart disease interventional procedures
Cost measurement	Care pathways with cost measurement
Cost measurement	Cost of stroke for cycles of care
Cost measurement	Cost measurements at the patient and condition level for full cycles of care
Bundle payment	Implementation of a condition-based bundle payment for endometriosis
Bundle payment	Bundle payment for knee and hip replacements
Bundle payment	Fixed-price bundles for main procedures and Insurers
Bundle payment	Bundle payment for bariatric surgery
Bundle payment	Procedural episodic bundles covering inhospital complications
Bundle payment	Episodic bundles for surgical procedures including 30-days post-discharge complications
Other initiatives	Implementation of infection prevention and control quality metrics.
Other initiatives	Pilot project on infection prevention (hand wash, safe administration of iv medication and iv catheter monitoring)
Other initiatives	Lengh of stay reduction through data and process management
Other initiatives	Operating room efficiency and patient safety
Other initiatives	Implementation of an inhospital stroke care pathway
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Creation of a portfolio of products based on care pathways (pricing strategy)
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Implementation of a Physician compact agreement in partnership with IHI (Institute for Healthcare Improvement)
Other initiatives	Implementation of an adjustable budget payment model
Other initiatives	Implementation of risk sharing models with a medical device company (Atrial fibrillation and TAVR) and with a health plan (CABG)

Other initiatives	Organization of the Medical practice department through the implementation of clinical managed protocols
Other initiatives	Participation in the Appropriate Birth Collaborative ('Parto Adequado')
Other initiatives	Integration between hospital and primary care
Other initiatives	Rational use of high-cost and antimicrobial drugs
Other initiatives	Implementation of a Patient experience unit
Other initiatives	Inhospital care pathways for stroke and acute kidney injury
Other initiatives	ERAS protocol for surgery procedures
Other initiatives	Homologation of medical supplies and medications based on value
Other initiatives	Filing system of medical supplies according to procedures
Other initiatives	Homologation of practices and procedures
Other initiatives	Launch of a support program for low-income patients in regard to spiritual, social, financing, lodging, food and transportation needs
Other initiatives	Healthy lifestyle incentive programs including a halh marathon with over 50.000 participants
Other initiatives	Knowledge transfer to improve community's quality of life through translational research projects focused on improvements in care delivery
Other initiatives	Comprehensive hospital nutritional care program
Other initiatives	Care pathway for cancer patients submitted to Radiotherapy pateient
Other initiatives	Research Project on the prevalence of gastric malignant precursor lesions and effect of Helicobacter Pylori eradication for primary prevention
Other initiatives	Promotion of a human milk bank network
Other initiatives	Opening of na outpatient specialties center including women's, trauma and heart centers
Other initiatives	Implementation of a dedicated anticoagulation clinic
Other initiatives	Sleep laboratory in a hotel
Other initiatives	Express Scheduled spontaneous demand
Other initiatives	Launch of a patient web portal
Other initiatives	A pilot to improve diagnosis in breast cancer

Other initiatives	ERAS protocol for colorectal, breast and gynecologic cancer
Other initiatives	Participation in the Appropriate Birth Collaborative ('Parto Adequado')
Other initiatives	Telemetry for ICU LOS reduction
Other initiatives	Optimization of flow and surgical volume
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Implementation of a stroke care pathway
Other initiatives	Managed surgical procedure packages
Other initiatives	Global daily rates with clinical management
Other initiatives	Emergency care packages including services/supplies
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Chronic disease inpatient ward
Other initiatives	Case management for breast, colon and prostate cancer
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Cost-effectiveness pilot study on community-acquired pneumonia
Other initiatives	Cost-effectiveness pilot study on left ventricular hypoplasia syndrome
Other initiatives	Cost-effectiveness pilot study on sepsis.
Other initiatives	Implementation of an adjustable budget payment model
Other initiatives	Lean methodology for reviewing and adjusting processes.
Other initiatives	Definition of productivity metrics
Other initiatives	Description of processes based on value flow maps
Other initiatives	Adjustments in care model to incorporate and comply with national policies
Other initiatives	Implementation of a global payment model for frail elderly patients with a health plan
Other initiatives	Development of physician feedback based on health outcomes
Other initiatives	Adoption and monitoring of care pathways
Other initiatives	Analysis of variability of most frequent procedures

Other initiatives	Creation of specialty committees to standardize and approve medical supplies and technology based on evidence
Other initiatives	Meetings with medical practice groups to review clinical outcomes and care variation
Other initiatives	A model to Integrate care facilities
Other initiatives	Build of an integrated care model
Other initiatives	Launch of a humanization policy
Other initiatives	DRG implementation
Other initiatives	Center for pediatric specialized care
Other initiatives	Acute bronchiolitis care pathway
Other initiatives	Optimization of care in acute coronary syndromes program, accredited by the ACC
Other initiatives	Optimization of care in hearth failure program, accredited by the ACC
Other initiatives	Optimization of adherence in primary and secondary cardiovascular prevention and rehabilitation
Other initiatives	Analysis of 30-day readmission after abdominal oncologic surgeries
Other initiatives	Increase in the number of clinical and care management guidelines
Other initiatives	Cost management to improve performance (not at the condition level)
Other initiatives	DRG implementation
Other initiatives	Spine appropriateness of care committees
Other initiatives	Pay-for-performance with one payer, including a joint coding effort between payer and provider and bonus based on process metrics
Other initiatives	Implementation of a Value Management Office (VMO)
Other initiatives	Physician Management Program with a focus on technical leadership succession and on patient flows to reduce lenght of stay
Other initiatives	Pediatric Cancer Functional Unit
Other initiatives	Prospective Global Fixed Payments
Other initiatives	Implementation of the Quadruple Aim Model
Other initiatives	Pilot of a model to align performance metrics between hospital and health plan

Other initiatives	Alternative ambulatory care for low-complexity ED (emergency department) patients
Other initiatives	Service lines for cardiovascular medicine, neurology and digestive tract disorders
Other initiatives	A mobile device for early detection of heart failure clinical decompensation
Other initiatives	Outpatient care based on care pathways
Other initiatives	Evaluation of physician performance using clinical outcomes for periodic feedbacks
Other initiatives	ERAS protocol for surgery procedures
Other initiatives	Implementation of na electronic medical record
Other initiatives	Standardization of clinical processes for the entire hospital network
Other initiatives	Improvements in communication with patients throughout the care process (pre-, in- and posthospitalization)
Other initiatives	Training program on customer satisfaction for our employees combined with monthly measurement of results
Other initiatives	Local and organizational Quality Directory for the hospital network
Other initiatives	Single Electronic Medical Record Committee including outpatient and inpatient settings
Other initiatives	Management of ndividual clinical risk
Other initiatives	Optimization of the patient discharge process
Other initiatives	Piloting for DRG implementation
Other initiatives	Strategy for strengthening clinical governance
Other initiatives	Anticoagulation program
Other initiatives	Payment agreement to care for patients with pulmonary hypertension covered by a specific health plan
Other initiatives	Iimplementation of clinical guidelines
Other initiatives	Improved care processes based on time and resource optimization
Other initiatives	DRG implementation
Other initiatives	Acquisition of last generation medical equipments
Other initiatives	Modernization of hospital infrastructure
Other initiatives	DRG-based payment model with one health plan

Other initiatives	Implementation of an outcomes unit
Other initiatives	Risk sharing agreement with a medical device company
Other initiatives	Building of key performance indicators dashboards
Other initiatives	Clinicians and employees performance evaluation
Other initiatives	Post-discharge and post-outpatient encounters satisfaction surveys using the net promoter score (NPS)
Other initiatives	Establishemnt of a Clinical governance structure.
Other initiatives	Short hospital stay care model (LOS <5 days)
Other initiatives	Prospective global payments for results achieved

LVAD=Left Ventricular Assist Device; AMI=Acute Myocardial infarction; EPS=Entidad Promotora de Salud, Health Promoting Entity; ICHOM=International Consortium for Health Outcomes Measurement; TDABC=Time-Driven Activity Based Costing; TAVR= Transcatheter aortic valve replacement; CABG= Coronary artery bypass graft; ERAS=Enhanced Recovery After Surgery; ICU LOS= Intensive care unit; LOS= Length of stay; ACC= American College of Cardiology; DRG=Diagnosis Related Groups

Appendix H. Univariate Analysis to Assess the Factors Related to the Implementation of VBHC Initiatives.

Independent variables		Participants without VBHC initiatives (n =37)	Participants with VBHC initiatives (n =33)	Total	p value	OR [95%]
Type of organization	Public	2 (5%)	5 (15%)	7 (10%)	0,242	0,33 [0,03 - 2,17]
	Private	35 (95%)	28 (85%)	63 (90%)		
Teaching/University Hospital	No	27 (73%)	23 (70%)	50 (71%)	0,796	1,17 [0,36 - 3,77]
	Yes	10 (27%)	10 (30%)	20 (29%)		
For-profit organization	No	21 (57%)	24 (73%)	45 (64%)	0,214	0,5 [0,16 - 1,49]
	Yes	16 (43%)	9 (27%)	25 (36%)		
Specialty hospital	No	34(92%)	24(73%)	58(83%)	0,054	4,16 [0,91 - 26,4]
	Yes	3(8%)	9(27%)	12(17%)		
JCI accreditation	No	25 (68%)	18 (55%)	43 (61%)	0,328	1,72 [0,59 - 5,14]
	Yes	12 (32%)	15 (45%)	27 (39%)		
America Economia Ranking	No	22 (59%)	21 (64%)	43 (61%)	0,808	0,84 [0,28 - 2,45]
	Yes	15 (41%)	12 (36%)	27 (39%)		
Number of beds	> 200	20 (54%)	19 (58%)	39 (56%)	0,813	0,87 [0,3 - 2,47]
	≤ 200	17 (46%)	14 (42%)	31 (44%)		
Organization of care delivery	No	28 (76%)	8 (24%)	36 (51%)	< 0,01	6,31 [2,04 - 21,53]
	Yes	12 (32%)	25 (76%)	37 (53%)		
Outcomes measurement	No	37 (100%)	27 (82%)	64 (91%)	0,01	∞ [1,45 - ∞]
	Yes	0 (0%)	6 (18%)	6 (9%)		
ICHOM standard sets implemented	No	37 (100%)	23 (70%)	60 (86%)	< 0,01	∞ [3,16 - ∞]
	Yes	0 (0%)	10 (30%)	10 (14%)		
Cost measurement	No	30 (81%)	23 (70%)	53 (76%)	0,401	1,85 [0,54 - 6,68]
	Yes	7 (19%)	10 (30%)	17 (24%)		
Alternative payment models[1]	Não	29(78%)	15(45%)	44(63%)	0,01	4,25 [1,38 - 14,22]
	Sim	8(22%)	18(55%)	26(37%)		
VMO Implemented	No	33 (89%)	25 (76%)	58 (83%)	0,201	2,6 [0,61 - 13,2]
	Yes	4 (11%)	8 (24%)	12 (17%)		

[1]Defined as the adoption of payment modalities different from pure Fee-for-Service or Global Payment.
JCI = Joint Commisssion International
ICHOM = International Consortium for Health Outcomes Measurement
VMO = Value Management Office

Appendix I. Challenges to VBHC implementation mentioned in the interviews

Information: Insufficient Resources (Human and IT) (14)
"We don't have an electronic medical record, it's a sad reality, we need to make a big investment, but it's still not working." (I_04)
"We have more setbacks than advances, because we had an electronic system that didn't really help much. Therefore, implementing the new software will take at least two years. Although there is an electronic medical record, it's implemented only in outpatient setting, not in the inpatient area. We still use paper."(I_08)
"During the rehabilitation process, the patient undergoes various types of assessments and interacts with interdisciplinary teams. The patient is seen by the therapeutic area and by the medical area, so the electronic medical record that we have does not cover the entire rehabilitation process that we offer."(I_09)
"Insert outcomes collection forms within our electronic medical record is something that we aspire to, it is possible to do, but I don't know if our IT team has the resources and the functionalities to do this."(I_26)
"Perhaps our biggest Achilles' heel is the manual collection of data, speaking of issues that limit and are indispensable for the office to be able to carry out analyzes in real time, we need an adequate and agile costing system, with quality, these are problems for anyone starting in the area."(I_30)
"Fee-for-service continues to predominate in our organization. Sometimes I have the impression that payers react as if there is a trap behind the proposal of alternative payment models and I also think that they believe that implementing such models can be very expensive because it requires a series of controls that they don't currently have. In addition, these new models are generally for very specific groups of patients and are likely to require a lot of work for an impact that is considered small, as the vast majority of patients do not fit into these groups. So they don't see it as a way to cut costs. If they had an adequate information system, it would be different." (I_51)
"For hospitalized patients, we do a very rigorous and manual data collection work in Excel spreadsheets. This is the unfortunate truth, and that's what we use every day during our nursing rounds."(I_52)

Information: Access & Data Exchange (13)
"The data are in our systems, but we have not been successful in extracting the information that translate the quality of care delivered. Another example is the quality satisfaction survey that we send out to patients twice a year, and they give us a score from 1 to 10 and we get a semi-annual evaluation of our results. So I have 8.5 in the first semester and 8.35 in the second semester and I don't know why the quality of our service has dropped. I only have isolated data and I can't relate it to the outcomes. We are in the process of improving data extraction and we believe that after analyzing this data we will be able to measure the value we create."(I_11) *"We're piloting this and we're trying to assess the doctor's experience of receiving outcomes information before the patient's appointment. At the same time, we know that no matter how successful this initiative may be, it will not be sustainable, due to the volume of patients, if data collection remains manual. The idea is to access information directly from the electronic medical record in real time. We've had a conversation in the past with our electronic medical record provider to bring the EROMs into the system but it hasn't moved forward. The alternative was to use Redcap-like databases to finally automate the collection of questionnaires and the medical record thing got a little stuck, but in the medium and long term I don't see a way out other than the total integration of data."(I_17)* *"The clinical team needs to request permission to the management team to access the quality indicators."(I_18)* *"The greatest difficulty in proposing stronger value-based care models is that our entire cost structure, and that of most hospitals, is linked to a very departmentalized and sectored vision of cost centers and business units. When in parallel we try to measure the cost of a patient with a heart attack and not the cost of a cardiac ICU, it is an incredible effort. We've been working on this for 2 years and we're getting very close to it because when the formula is developed within the system for one condition, then it becomes easier for another." (I_22)* *"Our greatest difficulty is to bring real-time outcome information to the physician."(I_54)*
Information: Measuring & Reporting Data (14)
"In regard to collecting outcomes, we face many difficulties including IT support, for example, and we are not able to collect the patient-reported outcomes because we lack the digital tools that could enable us to do it well. Therefore, we have collected data from the EMR and have used a Redcap database."(I_06)

"We still collect data manually in order to give feedback to physicians. We are facing this difficult phase of building a solution, but we think that this is the way to go, which is to try to automate this, to build a tool able to link the data throughout the care cycle. We have some estimate based on the frequency of the visits, but again, as the process is manual, it is very prone to errors."(I_17) *"We have not advanced with regard to the implementation of alternative payment models, especially because we lack a risk adjustment tool like the DRG, for example."(I_30)* *"Currently, we measure a lot of processes metrics. Some outcome metrics such as mortality have been studied, but what is implemented and what I have mapped at the moment is just process such as compliance with admission criteria and readmissions within 30 days."(I_35)* *"Our problem with cost is global in our organization. We have a division by 'cost center' in the institution but it's hard for you to know if that really corresponds to the real cost of each service. We hired a consultancy to do this work and should have some information available later this year. But it is a weakness of the institution itself. You get lost many times even in the database you use for the query. The cost collection is not even structured properly. I was having a conversation with our new billing coordinator who has been here for 48 hours and her concern was "we need to look at cost, because I saw that this is a problem and it is a problem for institutions in general". (I_40)* *"Measuring outcomes in a high-complexity hospital, like ours, brings with it a very different need for data collection in order to adjust the risk. For example, patients referred to us from other outpatient or hospital facilities outside of our network, usually arrive at our hospital in a very different clinical condition."(I_53)*
Information: Data reliability & accuracy (9)
"We need to make sure the data is reliable. This is difficult because the data entered by the doctors during the consultations is insufficient and that's why we made the decision, about a year and a half or 2 years ago, to hire people dedicated diagnostic coding, and this has helped us to code the DRGs, to find the differences and define what we can do about it. In regard to costs, I don't know the exact nominal value, I can compare existing deviations in relation to the large DRG database, in terms of weight and the estimated length of stay, because logically this will impact the costs of care, what I can't tell you is the exact cost. What we are measuring are the average costs of all cancers and their risk-sharing models, but please note that it is difficult to determine an exact figure as it varies by type of health plan. We compared the costs among three different health plans and the

average costs for a certain disease throughout its cycle of care is different between them, so the question to be answered is "am I responsible for these differences?" or is it more likely that the patient's clinical risk profile at the time of diagnosis is the factor? Or are differences in process agility causing a difference in costs? So, I hope one day I can say that for all patients, regardless of the health insurance they have, "the cost of caring for this patient was this". But this is not the case, it varies, what we have at the moment are the average costs of care." (I_13)
"The quality metrics used to adjust global budget shares range from quality and outcome to user's experience. For example, in myocardial infarction there is a modulation of what is the expected mortality. The trick part here is that there is no clinical risk adjustment. Patient opinion about the quality of care is also poor. It is collected in the emergency room, in the outpatient clinics, and in the ward, it is a large sample and we pay several people to do the survey."(I_43)
"It has become more difficult to measure the real costs due to the surgery packages and the fee-for-service payment model."(I_55)
Information: Substantial financial investments (4)
"The investment we have made in technology is huge, millions of dollars, we have a very large team working on information analysis, which is the medical informatics team, which also had a large investment in human resources.(I_17)
"I believe there is no way to implement any value-based compensation model if you don't have a strong information system. We made an initial investment of almost 12 million dollars and we will have to make investments on an ongoing basis. The size of the investment we are making in Information Technology is about half of what we are investing in medical equipment, that is, if I invest in medical equipment per year, 15 million dollars, surely in Information Systems and Technologies I am investing 7 or 7.5 million dollars." (I_13)
"Our dream is to integrate all data within a single platform and we are trying to make this financially viable." (I_29)
Stakeholders Buy-in: Doctors (17)
"In terms of publishing the outcomes of surgical and medical procedures, last year we published the names of the doctors who stood out the most and it was a bit chaotic. We first need to build a certain culture to move on with more personalized publications. But we have to move forward with it."(I_08)

"For the last year, we have fully controlled costs through the commitment of all physicians, in such a way that it has become a learning experience."(I_12) *"Currently doctors are not educated on this and whoever is leading these processes of change is not involving physicians in such discussions."(I_26)* *"We realized that just involving the executives, the executive leadership and even the clinical executive leadership of the hospital is not enough. So we started by identifying clinical leaders who really had a purpose. The cardiology team showed a strong commitment to collaborate with this new model and we started the project with them. The idea is to identify all medical leaders and then listen to their opinions and co-create the new model with them. This is the principle. Once the model is designed, we will then present it to the hospital leadership and the commercial area. A bottom-up movement. Don't start the conversation talking about financial issues, start with the purpose." (I_47)*
Stakeholders Buy-in: Healthcare Executives (10)
"I believe that the VBHC motto can influence organizational decision to create a system that allows measuring costs by specialty and by clinical condition." (I_23) *"I can say that the C-suite understands this VBHC movement but the current focus is more on seeking, learning and testing new payment models. My perception is that the C-suite still doesn't fully understand the concept of VBHC as a whole, such as the care delivery part of seeking better outcomes for the main medical conditions."(I_32)* *"We are looking for agreements with a better balance between outcome and cost and I think that from the moment we are able to identify more clearly, especially the issue of outcomes, we can evolve into a more symmetrical system where all these stakeholders will be able to find a common interest and naturally reach a result that we all wish aimed at reducing costs and improving the quality of care."(I_34)*
Stakeholders Buy-in: Patient & Community (4)
"The driver came from highly motivated healthcare professionals supported by the Patient advocacy association."(I_16)

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"Although we have started almost twelve months ago, patients adherence has been a challenge, and we are working to understand the causes behind this."(I_52)
Compensation (20)
"We are tied in some way to the agreements we have with the insurers, let's say that with new contracts, we may have the possibility of offering the full cycle of care."(I_46) *"The care pathway is very well established here, but often a barrier to access is the various forms of contracting with insurers."(I_57)* *"There is an asymmetry of interests among stakeholders such as healthcare professionals, payers, hospital and, of course, the end user and, unfortunately, the payment system that prevails in most countries generates these asymmetric interests."(I_34)* *"Global budget with a penalty-based pay-for-performance is our main payment model. Thirty-seven metrics are evaluated every 3 months to define if a penalty should be applied. It's like, 'If you meet these metrics in the best possible way, you qualify to earn the amount you were supposed to receive, but if you don't, you'll be paid less.' There is only downward adjustment, there is no upward adjustment. That's kind of discouraging, isn't it" (I_43)* *"For the last year, we have fully controlled costs through the commitment of all physicians, in such a way that it has become a learning experience. And we had to beg for the health plans to agree on a new compensation model because they preferred to continue to pay by activity.(I_12)*
Fragmented care delivery (17)
"There they are seen by our open clinical staff. The doctor makes use of his judgment of the case. There is not a single protocol at the outpatient clinic. In the hospital, the protocol is well defined."(I_02) *"It's very hard to integrate outpatient, emergency and in-hospital care. We advanced a bit with the inpatient. The integration we have with the primary care network is very broad, so we partnered with the public multidisciplinary home care team program and we are using referrals and counter-referrals but there is still a lot to do because this is very complex as we have more than 50 specialties. In some of them, such as cardiology and internal medicine, we are more advanced but in others we are not there yet.' (I_03)*

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"We do not have a primary care network linked to the hospital, pre- and post-discharge care is provided in the doctors' offices in the hospital's surroundings, and we do not have access to their medical records. Care is fragmented and so onces patients are discharged, we loose track of them." (I_38) *"While at the hospital, the person is fully connected, but as of today and this is one of our challenges, we do not follow the patients more effectively before they get sick, much less after discharge." (I_53)* *"There is an important issue I need to clarify regarding post-acute care, this is not our strongest point, because we are a highly complex hospital and we serve all insurers. In our context, insurers are responsible for patient follow-up, meaning our role is limited to preparing and educating patients for discharge. After discharge we have no contact with them, they return to their insurer's low-complexity network, as we only serve medium and high complexity cases". (I_58)*
Competitive positioning (3)
"It is also clearer that we have to work on this equation if we want to develop new products and more and more the market wants good products with this higher loss ratio faced by health plans, the difficulties in growing our business and all this scenario we live, including the loss of beneficiaries and the unsustainable cost that exist in this sector, the alternative is to develop new products around this value proposition."(I_35) *"We understand that current payment and care delivery models we offer to the market today are not ideal. And we understand that the patient increasingly demands more of it, requests more that we deliver value on top of what is being paid to us, and we understand that the study regarding the delivery of value to the patient is a something that is going on, it is something difficult to do, difficult to find the solution for this, but we understand that this is the delivery of value to the patient."(I_37)*
Governance (6)
"Hospital governance is split between executives and professors that serve as department heads and there is a dispute that makes it difficult to align the two parts. Interestingly, hospital executives are pushing for change while department heads are actually slowing down the process, contrary to what one would expect."(I_43)
"The executive board, even though it is composed of physicians, is still guided by the logic of volume and financial results instead of being guided by the logic of care reengineering to reach that financial result. It's a dilema."(I_47)
"I believe that the VBHC motto can influence organizational decision to create a system that allows measuring costs by specialty and by clinical condition."(I_23)

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Regulation (3)
"The way healthcare regulation is structured in my country, which implies that each patient, after an outpatient or inpatient care, must receive a detailed bill with a list of all their expenses such as supplies, medications, consultations, diagnostic tests, etc. it has turned the regulation itself in an obstacle to moving forward with other payment models linked to longer and more integrated care cycles. We all need to move forward together, providers, payers and regulators.(I_06) *"Our current report with the local government is all based on the costs of services provided and that will have to continue being measured."(I_23)*
Volume (4)
"What we did was, based on these costs, reach a consensus with the health plan and ensure that the clinic has a volume of patients."(I_09) *"Some care pathways are well organized such as the cardiac surgery pathway but our volume is very low to date. In total hip and knee arthroplasty and breast cancer, care pathways are designed both for public projects and to extend to private health plans but the problem is that we also don't have a very significant volume of patients at this moment."(I_18)* *"They, for example, are not mobilized around myocardial infarction, but perhaps they would be around heart failure that involves a higher volume of patients." (I_51)*

Reporting checklist for cross sectional study.

Based on the STROBE cross sectional guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the STROBE cross sectionalreporting guidelines, and cite them as:

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		Reporting Item	Page Number
Title and abstract			
Title	#1a	Indicate the study's design with a commonly used term in the title or the abstract	2
Abstract	#1b	Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background / rationale	#2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	#3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	#4	Present key elements of study design early in the paper	6

Setting	#5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Eligibility criteria	#6a	Give the eligibility criteria, and the sources and methods of selection of participants.	6
	#7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	n/a
Data sources / measurement	#8	For each variable of interest give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group. Give information separately for for exposed and unexposed groups if applicable.	7
Bias	#9	Describe any efforts to address potential sources of bias	7
Study size	#10	Explain how the study size was arrived at	6
Quantitative variables	#11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen, and why	7
Statistical methods	#12a	Describe all statistical methods, including those used to control for confounding	7
Statistical methods	#12b	Describe any methods used to examine subgroups and interactions	7
Statistical methods	#12c	Explain how missing data were addressed	n/a
Statistical methods	#12d	If applicable, describe analytical methods taking account of. sampling strategy	n/a
Statistical methods	#12e	Describe any sensitivity analyses	n/a
Results			
Participants	#13a	Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed. Give information separately for for exposed and unexposed groups if applicable.	6

Participants	#13b	Give reasons for non-participation at each stage	6
Participants	#13c	Consider use of a flow diagram	6
Descriptive data	#14a	Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders. Give information separately for exposed and unexposed groups if applicable.	9
Descriptive data	#14b	Indicate number of participants with missing data for each variable of interest	n/a
Outcome data	#15	Report numbers of outcome events or summary measures. Give information separately for exposed and unexposed groups if applicable.	n/a
Main results	#16a	Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
Main results	#16b	Report category boundaries when continuous variables were categorized	n/a
Main results	#16c	If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	#17	Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses	n/a
Discussion			
Key results	#18	Summarise key results with reference to study objectives	16
Limitations	#19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias.	18
Interpretation	#20	Give a cautious overall interpretation considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence.	18
Generalisability	#21	Discuss the generalisability (external validity) of the study results	18

Other Information			
Funding	#22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19