The Forest Through the Trees: Maximizing Value in an Evolving Healthcare System

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EXECUTIVE SUMMARY

New payment models are helping to shift the U.S. healthcare care system from one that rewards volume to one that rewards value. The Avalere Center for Payment & Delivery Innovation™, in collaboration with the Robert Wood Johnson Foundation, conducted a structured literature review and a series of expert interviews to answer the question: What innovations contribute the most value to health and healthcare?

From our research, Avalere identified five salient lessons in maximizing value in the evolving healthcare system:

- **Lesson 1:** Payment models that achieve the greatest value share three fundamental characteristics:
    - Hold providers broadly accountable for population health against a global budget
    - Empower providers by giving resources and supports necessary for long-term success
    - Grant autonomy to providers in defining the "how" of delivering value in healthcare
- **Lesson 2:** Successful care delivery changes consider both the clinical and non-clinical needs of a population, employing non-traditional providers and workflows to meet population needs throughout the care continuum
- **Lesson 3:** Consumers are most engaged with their health and healthcare when payers and providers engage with and value their individual needs, and innovations are most impactful when targeting high-risk, high-need individuals
- **Lesson 4:** Data and technological infrastructure are essential for both measuring and achieving value in population health management, but the need for additional research on how best to leverage these resources is equally essential
- **Lesson 5:** Payment and delivery models must take into account the unique circumstances of individual markets in order to maximize value, instead of pursuing rigid models across disparate settings

INTRODUCTION

Although the 20th century witnessed dramatic clinical advances, the country remains remarkably far from a healthcare system that promotes a culture of health. This systemic failure derives in part from a lack of focus on maximizing value for our healthcare investments. The U.S. spends substantially more on healthcare than any other nation, yet achieves comparatively mediocre outcomes.[1]

Among many reasons for the U.S. healthcare system's shortcomings is a set of financial incentives that pays for **how much** care providers deliver rather than the **quality** of that care. The healthcare system is now in transition, moving from one that rewards volume to one that rewards value. Throughout this transition, stakeholders are navigating through external market-level changes, while also implementing internal organizational changes that will position them to succeed in this new focus on population health (See Appendix A).

In their efforts to contribute value to health and healthcare, industry stakeholders are testing and implementing a variety of interventions to achieve the greatest value for the healthcare dollar. In collaboration with the Robert Wood Johnson Foundation, the Avalere Center for Payment & Delivery Innovation™ sought to gain a comprehensive understanding of current healthcare system innovations in terms of the value—quality relative to cost—they offer to the health of the U.S. population. Ultimately, Avalere found that the most effective way of guiding this investigation was by systematically answering a series of questions:

1. When considering how to maximize value in terms of population health, how should "value" in healthcare be defined?
2. What does all available scientific evidence suggest about current payment and delivery innovations and the value they add to health and healthcare?
3. What innovations not yet captured in academic literature show promise in contributing value to healthcare and how could they drive health system change?

This report serves as a high-level overview of Avalere's foundational research, analysis, and findings in its continued efforts to answer these fundamental questions about value in the healthcare system.

METHODS

In collaboration with the Robert Wood Johnson Foundation, Avalere executed a two-pronged research strategy when reviewing interventions that add "value" to healthcare, which it defined through the following equation based partially on the Triple Aim:[2]

$$\text{Value} = \frac{\text{Quality}}{\text{Cost}} \propto \frac{\text{Clinical Quality + Patient Experience + Population Health}}{\text{Cost of Care / Cost of Intervention}}$$

In its search for value, Avalere conducted a comprehensive structured review of academic peer-reviewed (PubMed, Google Scholar, Cochrane Collaboration Library) and notable grey literature investigating different payment and delivery system interventions spanning 8 major topics and 50 sub-topics. The major topics of focus were Value and Accountability-Based Payment Models; Care Delivery and Organization Redesign; Data and Technology Infrastructure Investments; Quality Measurement and Improvement; Consumerism and Consumer Engagement; Public Health Systems and Investments; Overuse and Over-consumption, or Waste; and Price and Quality Transparency Initiatives.

Reviewing only the evidence that addressed an intervention's contribution to value within the last five years, Avalere identified 3,102 relevant white and grey literature studies, of which approximately 1,115 merited in-depth review. Please see Appendix B for an overview of the quantity and quality of evidence reviewed by individual topic area. The quality of evidence was rated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) scale, and all references to an article's evidence quality throughout this paper are based upon the GRADE system.[3]

Cognizant of the fact that the academic literature could not offer a complete view of health system innovations focused on contributions to value, and that certain promising interventions may not yet have a significant presence in the traditional evidence base, Avalere conducted a series of interviews with 17 healthcare industry leaders. Avalere chose each interviewee for innovative leadership in emerging payment and delivery models, improved consumer engagement, and/or reduced overuse in healthcare. Avalere's interviewees included public and private payers, accountable care organizations (ACOs), patient-engagement experts, delivery system leaders, health data entrepreneurs, quality improvement organizations, and academic and practicing physicians. All interviews focused on the theory, design, testing, implementation, and scaling opportunities and challenges of notable innovations that add value to healthcare for consumers.

KEY LESSONS

After reviewing the available evidence and gaining insights from thought leaders spanning the industry, Avalere discerned the following lessons that can serve to guide the healthcare industry as it transitions to a value-based system:

Lesson 1: Payment models that achieve the greatest value share three fundamental characteristics:

- **Hold providers broadly accountable for population health against a global budget**
- **Empower providers by giving resources and supports necessary for long-term success**
- **Grant autonomy to providers in defining the "how" of delivering value in healthcare**

Hold providers broadly accountable for population health against a global budget

At the center of the discussion of value-based care is the question of how different payment mechanisms can best encourage providers to reorient clinical workflows to support proactive population health management. Despite widespread conversations around alternative payment models (APMs), such as shared savings through ACOs, bundled payments, pay-for-performance, and global budgets, Avalere found that empirical evidence directly addressing the value of different APMs is relatively scarce. However, of the available evidence, global budget programs emerged as the alternative payment model with the most promising long-term results, particularly the Alternative Quality Contract (AQC) led by Blue Cross Blue Shield of Massachusetts. Providers participating in the AQC were able to limit growth in medical spending over a four-year period far more effectively than their control counterparts, generating a comparative savings of $62.21 per enrollee per quarter.[4]

Savings came predominantly from reduced prices and utilization in outpatient facility care settings, imaging, and laboratory tests and procedures. While each year of the program generated gross savings, incentive payments to physicians exceeded cost savings in the first three years of the program, leading to the AQC only first yielding a **net** savings after its fourth year.[4] The AQC serves as a case study for global budgets as an effective APM design. Participating providers are rewarded for their performance in reducing the total cost of care of their beneficiaries, as well as for improving quality of care on core structural, procedural, and patient-level outcome metrics. When evaluating the comparative value of the AQC relative to similar models, such as Medicare ACOs, it is important to note the

timeframe of each intervention. Results from both programs indicate that time is an essential resource for delivery systems to adequately develop population health infrastructure and workflows. First year financial performance of Medicare Shared Savings Program (MSSP) and Pioneer ACOs, for instance, was modest and variable. Though nearly half of all organizations saved money relative to their calculated benchmarks, only 58 of 220 Shared Savings Program ACOs and 11 of 23 Pioneer ACOs reached the savings threshold required to receive a shared savings payment.[5] Jeff Butler, CEO and Chairman of Privia Health, which operates an MSSP ACO, explained that in the first year, an ACO is mostly focused on investing in key infrastructure changes, such as HIT platforms, and helping providers work together to build high-value networks. Butler expressed that expecting "to see significant results within the first 12 months while you're building the network is not super realistic."

The literature draws a significant contrast between broad payment reforms like the AQC, and those that are narrower in scope, such as pay-for-performance. One systematic review of the Quality and Outcomes Framework (QOF), a United Kingdom-based upside-only financial incentive program, found that the QOF initially improved health outcomes for a limited number of conditions, but over time fell to pre-intervention levels. Another systematic review of the QOF found that it was unclear if initial quality improvements had any impact on costs or patient experience—key contributors to value in healthcare.[6, 7]

Additionally, current evidence on bundled payment models is promising but inconclusive. One systematic review of largely low-quality evidence found that bundled payments are effective cost-containment mechanisms that can also improve quality of care.[8] The most impressive results attributed to a bundled payments initiative came from two articles with very low evidence quality that describe Geisinger's ProvenCare® model, indicating that the program reduced operative mortality by 67% and length of stay by 1.3 days, yielding 4.8% savings per coronary artery bypass graft (CABG) case.[9, 10] In addition, individual bundled payment initiatives have other limitations in producing healthcare value because accountability to costs and quality begins and ends in a small window of episodic care.

Empower providers by giving resources and supports necessary for long-term success

While broad accountability to cost and quality is a key contributor to driving value, accountability alone is insufficient when implementing APMs. Jon Blum, Executive Vice President at CareFirst Blue Cross Blue Shield emphasized the central importance of primary care providers (PCPs) in improving care when explaining the CareFirst Patient-Centered Medical Home and Total Care and Cost Improvement (PCMH/TCCI) program. Consequently, Blum added that it's essential for payers to engage with providers and

support them with tools to ensure success. In describing the PCMH/TCCI program, Blum said:

> "The tools and the supports, and the capabilities that a practice needs to manage complex patients is far greater than what society should ask a primary care practice to bear. What CareFirst brings is the behavioral health resources, complex pharmacy management resources, staff to manage the care planning and care coordination process, and the resources and data infrastructure necessary to enable the PCP to take a greater role."

Grant autonomy to providers in defining the "how" of delivering value in healthcare

In addition to the provision of essential resources and infrastructure, special attention must be paid to how payers communicate major operations changes to providers. David Share of Blue Cross Blue Shield of Michigan, home to the largest PCMH program in the U.S., stressed that payment incentives are "a tool" to drive health system change toward value-based care, but "not the solution." Instead, he maintained that a shared sense of purpose among providers coupled with autonomy in its execution gives providers a more powerful intrinsic motivation to improve clinical workflows than payment incentives alone. With a shared sense of purpose in place, systemwide change is best furthered by strong internal governance structures. Twila Burdick of Banner Health, a Pioneer ACO that has generated nearly $35 million in gross savings in its first two years, stressed that strong internal collaboration on system wide decisions is essential for large delivery systems making the rapid and enduring changes necessary to succeed in population health improvement.

Lesson 2: Successful care delivery changes consider both the clinical and non-clinical needs of a population, employing non-traditional providers and workflows to meet population needs throughout the care continuum.

As payment models increasingly hold providers accountable for the total cost of care of a population, healthcare stakeholders are exploring new strategies for managing population health inside and outside traditional provider settings. Acknowledging that health management and improvement is a continuous effort, providers are working to develop their capabilities around addressing both clinical and non-clinical population health needs. According to Val Overton of Fairview Health, which operates Pioneer and commercial ACOs:

> "I think we have discovered this gap between clinically managing diverse patients and complex medical issues. The gap is really how you activate the patient and then how you translate that to activate the team in the most cost-effective manner."

Evidence suggests that one of the most effective means of bridging that gap is through investing in and deploying community health workers (CHWs) or health coaches. Three separate randomized controlled trials (RCTs) and one non-randomized controlled trial found that CHW interventions for low-income and minority diabetic patients reduce HbA1c compared to control groups.[11-14] Additional evidence suggests that CHW interventions can be effective in weight loss programs, reducing HIV viral loads, combatting depression among Medicaid-eligible pregnant women, and improving mammography screening rates.[15-18] Though promising, the evidence base around health coaches and CHW interventions is still nascent, and additional research will be needed to further define the potential for these types of health workers, the value they add to health and healthcare, and how they can best be incorporated into new care delivery models.

In addition to introducing new types of clinicians, some provider groups are reconsidering how to best utilize their existing workforce. Matt Handley explained that Group Health has explored how non-traditional deployment of medical specialists can maximize value in diabetes care and related outcomes. In their model, a diabetologist mentors PCPs during and after shared visits with some diabetes patients. Through the enhanced capabilities learned by co-managing the care of diabetes patients with a specialist, PCPs are then able to provide advanced diabetes care to their entire patient panel. Dr. Handley said that after Group Health's PCPs treated two diabetes patients with a diabetologist, health outcomes for all diabetes patients improved. The literature supports this notion, indicating that Group Health's diabetes care delivery model improves rates of retinal eye screening, foot examinations, microalbuminuria and HbA1c testing, as well as patient satisfaction.[19, 20]

Mobile health technology and virtual care are also emerging as a key to influencing care delivery across traditional and non-traditional settings. Twila Burdick identified early adoption of emerging technologies, such as electronic medical records (EMRs) and telehealth technology, as one of three organizational traits that has helped it to succeed in population health. Growing technology infrastructure and capabilities are reshaping daily operations in clinical practices. Dr. Handley of Group Health explained that 70-75% of interactions with patients at his clinic are virtual, either via phone or secure messaging. This practice enables providers to maximize the number of patients engaged each day as well as maximize in-person time spent with patients who need to be seen most frequently in person. Balancing virtual and in-person care across the health system will require effective and ethical payment mechanisms and triaging algorithms, but if successful it can improve both patient and provider engagement across the care continuum.

Lesson 3: Consumers are most engaged with their health and healthcare when payers and providers engage with and value their individual needs, and innovations are most impactful when targeting high-risk, high-need individuals.

Consumers are most engaged with their health and healthcare when payers and providers engage with and value their needs

The most effective emerging payment and delivery models are those that tailor healthcare delivery to patients' unique needs and preferences, and view patients as equal partners in health and healthcare. A foundational step in engaging patients is through including them in their healthcare decisions, particularly those that are sensitive to their individual values. High-quality RCTs have found that shared decision-making interventions, when effectively implemented, can improve patient knowledge and satisfaction with their care and medical decisions,[21] statistically significantly lower health costs from preference-sensitive surgeries and admissions,[22] and more effectively activate patients to manage their health.[23]

Michael Barry, President of the Informed Medical Decisions Foundation and Chief Science Officer of Healthwise, stressed that shared decision-making requires that delivery systems pursue two key avenues if they hope to scale this intervention. First, clinicians need a formalized training process. According to Barry, "shared decision-making is really not about decision aids, but new ways of clinicians and patients relating and sharing decisions. We've come to realize that clinician training in how to share decisions is important; we've invested quite a bit in developing a clinician skills course in shared decision-making." In addition to training, Dr. Barry maintains that scaling shared decision-making requires a robust incentive structure, which current fee-for-service payment models do not possess.

Jeff Greene at MedEncentive is working toward establishing that incentive structure. MedEncentive is a program that rewards both patients and providers for improving health literacy and engagement through information therapy. In the program, patients who are prescribed information therapy read articles about their condition and disease management, and then complete a brief quiz testing the knowledge gained through the intervention. Greene explained that by providing an incentive as small as $15 for providers and patients, MedEncentive is able to improve member satisfaction, overall health status, and medication adherence. Though a low-quality observational case study, a University of Kansas analysis of MedEncentive indicated that Greene's claims hold promise, as participants in the program found that the intervention improved health literacy, found the information provided helpful, and experienced high satisfaction with care and medication adherence.[24]

An additional method of ensuring true patient engagement is by holding providers accountable for patient-reported outcome measures (PROMs). Dr. Claire Snyder, co-principal investigator with Albert Wu, MD, MPH, for Johns Hopkins University's PROM pilot project, PatientViewpoint (www.PatientViewpoint.org), said: "The primary focus for using it [PROMs] is to improve patient centeredness and quality, making sure that the patient's functioning and well-being is considered with laboratory tests, imaging studies, and other clinical markers." The evidence suggests that succeeding in improving patient engagement, as measured through PROMs, is directly related to improved patient performance on traditional quality metrics. One review of evidence evaluating a particular PROM, the Patient Activation Measure (PAM), found that increasing patient activation improves health-related quality of life, clinical indicators such as blood pressure and adherence to treatment, and utilization measures such as hospital readmissions and emergency room visits.[25]

In addition to fostering accountability to patients when delivering care, patient-reported outcomes add a wealth of information that stakeholders can use to tailor services to individual patient needs and more effectively manage daily workflows. Snyder explained that "in a capitated or an ACO environment where it's more about value and quality… you can use the PRO data to determine who needs to be seen, who needs to be using what resources, and when."

Consumer engagement initiatives are most impactful when targeting high-risk, high-need individuals

Outside of the provider space, some payers are using value-based insurance designs (VBID), which reduce patient copayments for medications that provide high benefits relative to costs, as a means of engaging patients and more effectively stewarding resources.[26] While the concept is not new, VBID models are still developing and, as a result, the evidence base is as well. However, several studies have found that VBID models that reduce copayments for prescription drugs improve medication adherence in beneficiaries.[26, 27] One low-quality observational study examined a VBID program sponsored by a large employer, which reduced cost sharing for prescription drugs for asthma, hypertension, and diabetes for employees with chronic conditions. After three years of implementation, adherence to cardiovascular medications was 9.4% higher, and the program was deemed cost neutral to the employer.[26] A separate observational study of a large employer with a similar VBID program found that improved medication adherence due to decreased copays resulted in significant reductions in non-drug spending.[28]

Still, healthcare stakeholders should view the promise of VBID with caution. VBID models may not necessarily add value for all populations, but rather for high-need populations that struggle with the cost of particular services. Matthew Maciejewski of Duke University, a national expert on VBID models, said:

> "VBID is assumed to be effective under the assumption that cost is the primary barrier to people taking their medications. That is not necessarily the case for a lot of patients in the commercially insured population. If they [patients] are healthy enough to work full time and have employer-based coverage, it may not be that price is the biggest barrier, it may be forgetfulness, or side effects, cumulative burden of all medications that they have to take, complexity of regimen. Or if they have a very chaotic life, it may be difficult for them to take medications with a routine schedule, or a lack of medication adherence queues."

Maciejewski's thoughts do not detract from VBID's usefulness to improve value in healthcare, but rather reinforce the notion that any intervention in healthcare must meet the particular needs and concerns of individual patients if it aims for patient engagement.

Lesson 4: Data and technological infrastructure are essential for both measuring and achieving value in population health management, but the need for additional research on how best to leverage these resources is equally essential.

Avalere found that healthcare stakeholders are making investments to incorporate technology and healthcare data into population health management. Improvements to infrastructure can take many forms, whether by implementing mobile technology solutions that strengthen the link between patient and provider, or harnessing the potential of multiple data sources to inform best practices. However, the extent of current data and technology infrastructure, data's role in daily workflows, and research focused on understanding how to leverage health data is still limited. Technological innovations are being used to improve population health across the care continuum. The use of mobile technology, for instance, is addressing the needs of patients once they have left the provider facility and are managing their own health. The evidence is strongest in the area of health behavior related to medication adherence, lifestyle changes, and patient self-management. Mobile health technology interventions featuring SMS text message reminders have been shown to statistically significantly improve weight loss program outcomes,[29] reduce saturated fat intake, increase fruit and vegetable intake, increase daily exercise,[30] increase adherence to medications and insulin therapy,[31, 32] and reduce HbA1c levels.[33-38]

Healthcare innovators are also developing new technologies centered on using different sources and types of data. The Camden Care Coalition, for example, uses claims data to identify high-cost, high-utilization patients in need of advanced primary care services.[39]

Medicare ACOs, the AQC, and other accountability-based models are also regularly providing claims-based cost reports to inform providers of their overall performance. CareFirst's PCMH/TCCI program even makes available to PCPs the spending and utilization patterns of individual specialists so that PCPs can create high-value referral networks.

In addition to administrative claims, healthcare stakeholders will need to navigate the growing volume of electronic healthcare data containing biometric, clinical, and patient-reported outcomes to improve workflows and population health.[40-42] Amy Harris-Overby of Fairview Health Services explained, "I think the ability to take in and make as much of real-time data as you can is absolutely essential in giving you a full view of care, as opposed to just looking at claims history. The combination of claims and clinical data, retrospective and real-time, is the ideal. Fairview has not yet reached this place, but it's one of those necessary investments. There's just a tremendous amount of wisdom and learning that can come from having those pieces of information available to you." Current evidence evaluating the potential of certain data infrastructure investments, such as all payers claim databases, data transparency, and advanced data analytics and modeling, are limited in quantity and quality. However, the most developed evidence base supports the promise of robust health information exchange (HIE). There is substantial evidence that providing access to otherwise unavailable data through HIE yields significant savings by reducing redundancies in diagnostic imaging, consultations, and laboratory tests, particularly in emergency departments.[43-47]

Though support for use of health data is growing, the available evidence has yet to identify how best to maximize their use. Most studies evaluating the use and role of health data are executed in real-world settings, making it difficult to produce evidence that is traditionally considered high quality.[48-52] Additionally, several stakeholders continue to experience challenges in acquiring the data necessary to inform and improve care practices. Dr. Jane Brock of Telligen, the Medicare quality improvement organization (QIO) for Colorado, explained the struggles of local health agencies in obtaining data necessary for advancing the health of their constituents:

> "County human services folks are really trying to integrate all of these medical and social programs, and yet don't have enough funding for a full analytic staff. There's no uniform data source for them that can tie the benefits of their programs to medical utilization and outcomes. One woman we were working with said, 'You know, I just want access to Medicare claims data.'"

As data become increasingly available to stakeholders, the final challenge lies in presenting it in a meaningful and understandable way. Despite the unique insights data might provide, it is useless if payers, public health officials, providers, and patients can't extract

the meaning behind the data. In describing this challenge of communicating data, Snyder said, "It's very basic things like what do the numbers mean and what's a good number, what's a bad number? For some measures, higher scores are better and on others higher scores are worse. This inconsistency is really challenging to both patients and providers. The fact that they're not accustomed to seeing this data on a routine basis, this lack of familiarity makes it all the more important that the data are presented in an intuitive and understandable way." Dr. Snyder and co-principal investigator Michael Brundage, MD, MSc, have funding from the Patient-Centered Outcomes Research Institute to investigate best practices for presenting PRO data to promote understanding and use.

Lesson 5: Payment and delivery models must take into account the unique circumstances of individual markets in order to maximize value, instead of pursuing rigid models across disparate settings.

A common concept in conversations around new payment and delivery models is the possibility of universally applicable solutions that add value to the health and healthcare of all populations. Certainly, national demonstrations have an inherent value through their ability to scale, but Avalere found that their rigid and uniform structures limit opportunities to add value for individual markets and specific subpopulations.

The Hospital Readmissions Reductions Program (HRRP), for instance, has demonstrated success on a macro level, but has had potentially adverse effects for providers treating vulnerable populations. The Centers for Medicare & Medicaid Services (CMS) reports that between 2007 and 2011, the 30-day all-cause readmission rate for Medicare fee-for-service beneficiaries remained relatively constant at approximately 19%.[53] By 2013, according to CMS estimates, that rate has fallen to below 18%, coinciding with the introduction of the program. This equates to 130,000 fewer readmissions.[54] However, an observational study found that given the relative risk of the populations they treat, major teaching hospitals were more likely to be highly penalized than non-teaching hospitals (44% vs 30%), and safety net hospitals were more likely to be penalized than non-safety net hospitals (44% vs 30%).[55] While the HRRP undoubtedly has value, its rigid structure makes it possible to unintentionally penalize providers that historically treat patients with the greatest need.

In contrast, CMS's Partnership for Patients found success in improving patient safety and reducing hospital-acquired conditions (HACs) by embracing the intricacies of individual markets. Partnership for Patients was a program with voluntary participation and the nationally prescriptive goal of improving patient safety—as defined by its two concrete complementary aims of reducing HACs by 40% and all-cause readmissions by 20% between the years 2010 and 2013. Providing $1 billion in funding and supports,

the Partnership for Patients allowed over 3,700 participating hospitals to determine the "how" of reaching those goals. John O'Brien and Ashley Ridlon, the former field directors of the program, stressed the importance of convening all relevant health stakeholders, identifying conflicts and shared opportunities, and allowing local markets to test innovations themselves instead of adhering to a nationally mandated approach to achieving value. O'Brien and Ridlon emphasized that their goal was to "unleash" the quality improvement work of healthcare stakeholders in the field, rather than control it. O'Brien said, "Regarding quality measures and improvement methods, we were tight about the what, such as conditions and measures to improve, but loose about the how of driving improvement within organizations."

O'Brien and Ridlon added that local stakeholders are uniquely positioned to learn from and influence their healthcare environments. Complementing the local focus of the initiative, participants were able to also benefit from the national learning collaboratives hosted by the initiative, which identify the best practices of positive outliers throughout the country and discuss how they can be adopted in different markets.

It is difficult to evaluate the impact of the program as an isolated variable, as the Partnership for Patients was implemented in conjunction with other initiatives focused on patient safety. However, available indicators attest to significant progress made toward achieving the Partnership for Patient's goals during its three-year term. The Agency for Healthcare Research and Quality (AHRQ) estimates that there was a 17% decline in HACs between 2010 and 2013 relative to what there would have been if 2010 rates remained steady, representing 50,000 lives and $12 billion saved.[56]

The idea that the most valuable healthcare innovations are locally sourced is influencing commercial markets as well as public. Jon Blum, when describing the governing principles of CareFirst's PCMH/TCCI program, said, "These models get designed not by a point of perfection, but by a point of context. I think it would be very difficult for federal policy to impose one model. To me these models evolve and get started within the context, history, and offerings of the localized delivery system." David Share, of Blue Cross Blue Shield of Michigan shared this sentiment, stressing that if any health stakeholder, including CMS, aims to be a regional catalyst in payment and delivery, it should build upon innovations that are organically occurring in individual markets.

A key component of succeeding in individual markets lies in understanding the corresponding populations. Amy Harris-Overby from Fairview Health Services said, "What we've learned is that the things you can do to perform in a commercial population may not be enough to perform in a Medicare population. From a population management perspective,

Medicare is actually a whole bunch of subpopulations that have very different needs, and different utilization patterns. When you get in there and you really see the variation in the subpopulation, it really gives you an appreciation for what it would take to perform with those populations."

One pioneer on this front is the Camden Coalition of Healthcare Providers, led by Jeffrey Brenner. Adopting the foundational principles of the Chronic Care Model, the Camden Coalition focuses on using health and utilization data to identify the highest need, most complex populations, or "super-utilizers," and proactively addresses their individual clinical and non-clinical needs. Early evidence from these efforts is of very low quality, but shows that the innovation has significant promise. Studying a cohort of 16 patients treated through this alternative model, the Camden Coalition found a 47.5% reduction in hospital admissions six months post-intervention in comparison to the six months studied pre-intervention. In a separate cohort of nine super-utilizers, the study found a 90% reduction in hospital admissions.[38] The Camden Coalition is currently conducting an RCT to evaluate its efforts and their value to health and healthcare, which is expected to reach completion in 2016.

CONCLUSION

Through its investigation, Avalere hoped to empirically assess the comparative value of different payment and delivery models being pursued throughout the healthcare system. Instead, Avalere found that health stakeholders hoping to contribute value to healthcare are best served by a set of governing principles. These five principles, as outlined in the paper, will position current and future innovations for success in the rapidly changing healthcare landscape. Healthcare interventions focused on contributing value will continue to evolve, and the suite of specific innovations being pursued today may or may not exist in their current form in the future. However, the models that most reflect the principles in this paper have the greatest potential to endure and the stakeholders adopting them could emerge as leaders in population health management.

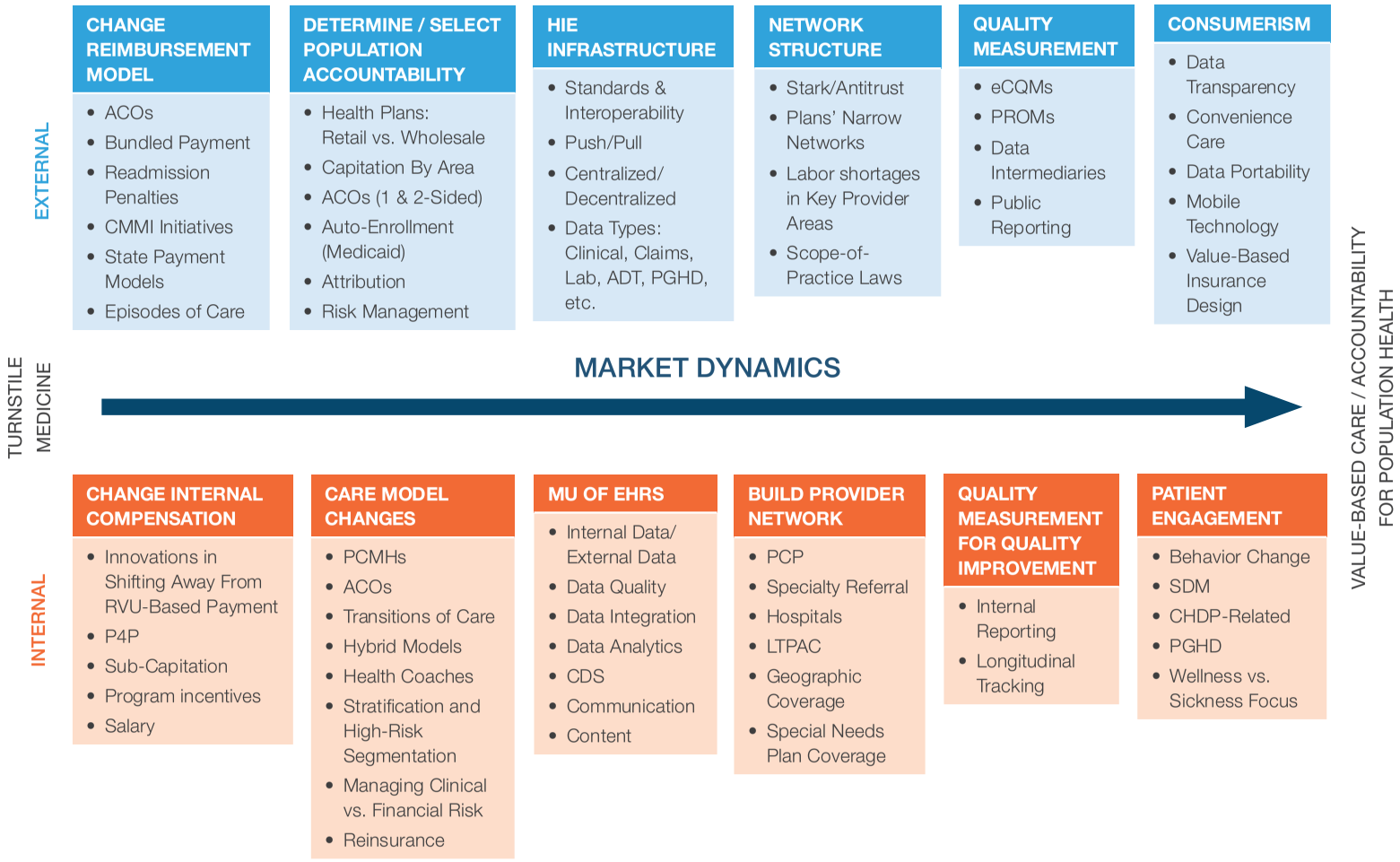
In addition to this report, Avalere Health assembled in-depth memos investigating the value of health system payment and delivery innovations across its 8 major topic and 50 minor subtopic areas. Each memo details the findings of Avalere's structured evidence review.

LIMITATIONS

Avalere's analysis and findings have certain limitations worth mentioning. First, payment and delivery innovations in the healthcare system are still relatively new. As a result, even though the research team conducted an in-depth structured review of the literature, Avalere found that much of the evidence informing health system change is of low or moderate quality. Though the research team considered the conclusions of studies in the context of their scientific rigor, the comparative scarcity of high-quality RCTs and systematic reviews of high-quality studies made it difficult for Avalere to make authoritative recommendations on the value of any individual intervention. Second, the breadth and quantity of evidence reviewed by the research team gave Avalere a unique and comprehensive perspective of innovations occurring throughout the healthcare system. While this is undoubtedly one of the great strengths of this investigation, it also limited Avalere's ability to conduct any rigorous quantitative meta-analyses of individual interventions. Lastly, there is no shortage of insights and lessons that Avalere learned throughout this investigation. Avalere determined that the five governing principles highlighted in this paper best capture the wealth of information reviewed in the literature and discussed during interviews. It is quite possible that different reviewers would choose to highlight a different set of key lessons. Unfortunately, Avalere could not include all the information gathered from this research. Additional information regarding any of the 8 major and 50 minor areas of inquiry may be furnished upon request.

Appendix A: External and Internal Changes in Payment and Delivery Innovation

Avalere Center for Payment and Delivery Innovations



ACO: Accountable Care Organization; CDS: Clinical decision support; CHDP: Child Health and Disability Prevention; CMMI: Center for Medicare and Medicaid Innovation; CQM: Clinical Quality Measure; LTPAC: Long-term post-acute care; P4P: Pay-for-performance; PCMH: Patient-centered medical home; PCP: Primary care provider; PGHD: Patient-generated health data; PROM: Patient-reported outcome measure; RVU: Relative Value Unit; SDM: Shared decision-making; SGR: Sustainable growth rate

Appendix B: Overview of Evidence in Structured Literature Review

MAJOR TOPIC AREA	NUMBER OF STUDIES INCLUDED/ NUMBER OF STUDIES IDENTIFIED	HIGH QUALITY	MODERATE QUALITY	LOW/ VERY LOW QUALITY	GREY LITERATURE
Value/ Accountability-Based Payment Models	140/440	8	25	74	33
Care Delivery and Organization Redesign	178/561	15	58	89	16
Data and Technology Infrastructure Investments	253/415	37	45	137	31
Quality Measurement and Improvement	86/200	4	8	58	16
Consumerism and Consumer Engagement	170/440	29	57	39	45
Public Health Systems and Investments	171/492	17	42	96	16
Overuse and Overconsumption	91/499	11	43	26	11
Price and Quality Transparency Initiatives	26.55	1	10	9	6

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