Why Value-Based Care Programs Fail to Scale: Operational and Data Architecture Barriers

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Abstract
Value-based care (VBC) has been considered as a primary solution to manage the ever-unsustainable U.S. healthcare costs. Even then, most VBC programs have failed to achieve meaningful savings or clinical quality improvements at scale. This paper examines three systemic barriers to development and scalability of VBC: 1) patient attribution challenges, 2) fragmented risk adjustment data pipelines, and 3) operational execution failures. In this paper we are sharing our insights on the above-mentioned systemic barriers by leveraging CMS evaluations, industry surveys, and peer-reviewed research. Healthcare organizations manage an average of 18.3 distinct clinical systems, of which only 26.2% are effectively interoperable. Meanwhile, fewer than one in four CMMI models have produced net cost savings. VBC will remain aspirational until the industry resolves foundational data architecture and operational coordination problems. The paper concludes with strategic recommendations for bridging the gap between VBC promise and performance.

Keywords: Value-Based Care; Patient Attribution; Risk Adjustment; Hierarchical Condition Categories (HCC); Data Interoperability; Healthcare Data Architecture; Operational Scalability; Medicare Advantage; Accountable Care Organizations; Care Coordination

1. Introduction

It is widely proven that the United States spends more on healthcare than any other industrialized nation. Additionally, it also underperforms relative to its peer nations on key quality and outcome measures (Telesford et al., 2023). In 2025, total U.S. healthcare spending is projected to reach $5.6 trillion. This is expected to be approximately 25% of the GDP which is a staggering $1.4 trillion. This spend is attributed to defects in care delivery, care coordination, over treatment, pricing inefficiencies, fraud, and administrative complexity (United Health Group, 2025). Value-based care (VBC) emerged as the healthcare industry's primary strategic response to this crisis, offering a resolution that promises to realign incentives so that providers are rewarded for outcomes rather than volume.

Michael Porter provided a conceptual framework, that defined value as health outcomes per dollar spent (Porter, 2010). Since then, CMMI has implemented interventions across more than 50 models encompassing more than 192,000 providers and shared-risk participation reached 45.2% in 2023 (HFMA, 2025). The Health Care Payment Learning & Action Network (HCPLAN) reported that 28.5% of U.S. healthcare payments flowed through Alternate Payment Models (APM) contracts with downside financial risk in 2024, up from 24.5% in 2022 (HCPLAN, 2024). Despite these trends, the performance data tells a concerning story. Of CMMI's 50+ models, only twelve produced cost savings, and only four were expanded. The Congressional Budget Office (CBO) estimates that CMMI's activities actually increased net Medicare spending by $5.4

billion between 2011 and 2020 (CBO, 2020). This represents that VBC adoption is increasing, but performance is not improving proportionally.

Through the data science lens, the key barrier to scale VBC programs is not one of clinical or physician led. It is rather a data architectural and operational infrastructure problem. Specifically, three interconnected barriers prevent VBC programs from achieving their intended impact: (1) patient attribution methodologies that produce inaccurate and unstable provider-patient linkages, (2) risk adjustment data pipelines that are fragmented, latency-ridden, and susceptible to coding variability, and (3) operational execution failures rooted in administrative complexity and misaligned workflows between payers and providers.

Understanding these barriers is critical so that VBC can help transform the United States healthcare landscape. The AMA has also cautioned that if Congress fails to reauthorize Advanced APM incentive payments after the 2026 payment year, physician participation will shrink (AMA, 2025). A 2025 survey by Mathematica and Reveleer found that while 100% of providers and 97% of payers report aligned VBC goals, synchronized execution remains elusive. Addressing these structural barriers is essential for preserving the momentum behind the VBC movement.

2. Patient Attribution Challenges

Patient attribution— this is the process of assigning patients to specific provider for accountability and performance measurement. This is the foundational mechanism of all VBC financial arrangements. If attribution is inaccurate, the entire downstream chain of benchmarking, risk adjustment, quality measurement, and shared savings is compromised.

2.1 Attribution Methodologies and Their Limitations

The American Medical Association (AMA), America's Health Insurance Plans (AHIP), and accountable care organizations (ACO) have identified patient attribution as one of seven key payment domains requiring standardization for VBC to succeed (AMA, 2024). The current attribution methodologies fall into several categories: voluntary patient selection, claims-based, automatic new member attribution, geography-based alignment and clinician-type-based assignment. Each method comes with its own advantages and disadvantages.

The most commonly used methodology is Claims-based attribution. It is widely used in Medicare ACO programs. It relies on retrospective analysis of where patients have received majority of their primary care services. This introduces a temporal mismatch i.e. where providers are held accountable based on historical utilization patterns that may no longer reflect current care relationships. There are occasions where patients may select physicians who are no longer accepting patients or physicians may have retired without updating their directory information, or patients may fail to update their PCP designation after relocating seasonally (AMA, 2024). Some Medicare Advantage programs use Prospective attribution methodologies. Prospective attribution methodology provides greater planning certainty but can misalign accountability when patients seek care outside their attributed network. Research suggests attribution instability can affect 30–40% of assigned patient panels year over year in some ACO configurations.

Table 1. Comparison of Patient Attribution Methodologies

Methodology	Mechanism	Strengths	Key Limitations
Claims-Based (Retrospective)	Assigns patients based on previously submitted primary care claims	Reflects actual care-seeking behavior	Temporal lag; 30–40% panel instability year-over-year
Prospective	Assigns patients at start of performance period by estimating types of services needed on clinical and geographic conditions	Planning certainty; stable panels	Misaligned accountability when patients seek out-of-network care
Voluntary Patient Selection	Patient self-selects a in network primary care provider	Patient autonomy; direct engagement	Outdated selections; patients forget to update after relocation
Clinician-Type Based	Automatic assignment by provider role (PCP, specialist)	Scalable across large populations	Ignores patient preference; may not reflect care complexity
Geography based	When the patient is non attributable by any of the above methods	Ensures there is accountability for all patients	Outdated selections; patients forget to update after relocation

Source: Compiled from AMA (2024), HFMA (2025), and HCPLAN (2024) findings.

2.2 Downstream Consequences of Attribution Inaccuracy

Attribution errors cascade through each component of VBC program operations. When patients are misattributed, providers are evaluated against standard benchmarks that do not match the risk profile of their actual patient population. Such misalignment leads to the inflation or deflation of quality scores, distortion of shared savings calculations and erosion of provider confidence in VBC arrangements. According to the HFMA 2024 survey, only one in every four physician practice leaders reported expecting their participation in value-based models to increase in 2025 and difficulty achieving performance metrics was cited as a major deterring factor(HFMA, 2025).

Additionally, although this may pose some challenges to alignment across multiple payers—a priority identified by the AMA as critical for VBC sustainability—attribution inaccuracies further contribute. Payers use different attribution methods to determine their patient population, so a single provider practice may be managing several potentially contradictory patient panels with inconsistent performance benchmarks. This fragmentation multiplies the administrative burden and detracts from the clinical focus inherent in VBC programs.

3. Risk Adjustment Data Pipeline Barriers

Risk adjustment in healthcare is a process that accounts for differences in patient complexity when setting benchmarks and calculating performance. The CMS Hierarchical Condition Category (HCC) model is the dominant framework across Medicare Advantage, ACO programs, and commercial VBC contracts. However, the data pipelines feeding these models are plagued by fragmentation and latency.

3.1 The HCC Model Transition: V24 to V28

CMS has made extensive changes to its own risk adjustment model moving from V24 to version V28 over the 2024–2026 payment years. Risk scores in payment year 2025 are composed of 33% V24 model and 67% V28 model, with full transition to V28 occurring in payment year 2026 (CMS, 2024). The V28 model maps around 74,000 ICD-10-CM diagnosis codes to a total of 266 condition categories, and among these categories, 115 were included in the payment model (an increase from 86 payment categories in V24) (YES HIM Consulting,2024). At the same time, however, the model removes more than 2,000 ICD codes that were previously risk-adjustable.

This transition to a dual model introduces superlative complexity for healthcare organizations. Coding teams will need to stay proficient in both versions of the models running at the same time, cross-map diagnoses when they can capture under one framework and not another, and flag conditions that no longer have payment HCCs under V28. The greater specificity needs, such as explicitly linking diabetes to chronic kidney disease of the relevant type to even be considered for certain HCCs, are asking for a level of surgical clinical documentation that many provider organizations can't consistently provide (3Gen Consulting).

Figure 1. CMS-HCC Risk Adjustment Model Transition: V24 vs. V28

Dimension	V24 Model (Legacy)	V28 Model (2024–2026)
Total CMS-HCCs	204	266
Payment HCCs	86	115
ICD-10-CM Code Coverage	~9,800 risk-adjustable codes	~7,700 (~20% reduction)
Diagnosis Code Base	ICD-9 era mapping	Updated ICD-10-CM mapping
PY 2025 Blend Weight	33%	67%
PY 2026 Weight	0% (retired)	100% (full adoption)
Normalization Adj.	N/A	5.9% (coding intensity offset)

Source: CMS (2024), YES HIM Consulting (2024), 3Gen Consulting (2025).

3.2 Coding Intensity and Data Integrity Concerns

One of the weaknesses that plagues HCC-based risk adjustment is the vulnerability to manipulation for coded diagnoses. MedPAC has described differences in coding intensity between Medicare Advantage and traditional fee-for-service, with independent studies estimating effects of 10–20% (MedPAC, 2024). While the V28 model constrains HCCs with excessive discretionary coding variation, research by Carlin, Feldman and Jung (2024) in Health Services Research showed that the increased granularity of V28 creates new incentives for coding intensity by allowing more specific movement down to a more severe sub-category within an HCC. Health risk assessments and chart reviews transformed mean HCC scores of MA populations resulting in concerns that risk adjustment is creating a coding arms race diverting resources from clinical care to the documentation process.

3.3 Risk Adjustment Pipelines split by Data Fragmentation

Effective risk adjustment depends on receiving comprehensive, timely, and accurate clinical data. However, healthcare organizations manage an average of 18.3 distinct clinical systems, with only 26.2% demonstrating effective interoperability (European Journal of Biology and Medical Science Research, 2025). Clinicians spend approximately 33% of their workday navigating disconnected systems. For risk adjustment, this means diagnostic information critical for HCC capture may be siloed in specialty EHRs, lab systems, or external provider records not integrated into the pipeline. The Mathematica-Reveleer 2025 report confirmed that data quality and security remain top barriers to interoperability (Mathematica, 2025). Such under diagnosis results in risk scores that mischaracterise performance and misleadingly low benchmarks are making genuinely complex populations appear to be achieving sub-optimal care.

4. Operational Execution Failures

Even when attribution and risk adjustment function reasonably well, VBC programs frequently stall at operational execution. The 2025 Mathematica-Reveleer report identified this execution gap as the defining challenge: where payers and providers need to align on goals but critical execution gaps still stall progress (Mathematica, 2025).

4.1 The Payer-Provider Coordination Deficit

A clear finding from the 2025 report is that, even though 100% of providers and 97% of payers feel their VBC goals are well aligned, they are operating in silos rather than collaboratively (Reveleer, 2025). This manifests as excessive, duplicative data collection, different quality metrics across contracts that are often inconsistent with one another, incompatible platforms, and misaligned incentive timelines. When providers participate in multiple VBC contracts that use different attribution methods, quality metrics, and reporting timelines the administrative burden becomes significant. According to the AMA, many practices struggle to find APMs that match their specialties (HFMA, 2025).

4.2 Adoption of Technology Without Operational Integration

Technology adoption has outpaced operational integration. While 98% of healthcare leaders believe AI is essential to VBC and all surveyed leaders use AI to some degree, only 40% of payers and 38% of providers are fully committed to adoption (Mathematica, 2025). Main barriers for adoption that are observed in the industry include Regulatory concerns, system integration challenges, lack of staff expertise, and AI accuracy concerns. These barriers represent fundamental organizational and operational challenges, reflecting the difficulty of embedding new tools into legacy workflows without comprehensive governance and training frameworks.

4.3 Administrative Complexity as a Structural Barrier

Administrative complexity compounds these issues. In the hybrid payment environment continuous measurement against multiple, sometimes conflicting, frameworks is required (Health Catalyst, 2025). CMS's push for downside risk, combined with expiring Advanced APM incentives beyond 2026, has created financial uncertainty that reduces VBC investment capacity—particularly in rural areas (AMA, 2025).

5. The Industry Gap: Data Fragmentation and Administrative Complexity

These three barriers are interlocked in solving a healthcare data infrastructure that is fee-for-service oriented rather than being value-based care (VBC) oriented. Approximately 30% of all global data originates from medical sources (Availity, 2023), with large swathes remaining siloed. This is alarming especially within the Healthcare Data Interoperability Market, estimated at $4.2 billion in 2024 going up to $12.8 billion by 2034

(Emergen Research, 2025). According to a scoping review, data collection continues to be an impediment to the sustained adoption of VBC outside of pilot efforts (Khalil et al., 2025). Care delivery failures, coordination failures, overtreatment and administrative complexity account for an estimated $1.4 trillion in waste annually (United Health Group, 2025).

Table 2. Summary of Key Barriers to VBC Scalability

Barrier	Core Issue	Key Metric	Downstream Impact
Patient Attribution	Temporal mismatches; inconsistent payer methodologies	30–40% panel instability; only 25% of leaders expect VBC growth	Distorted benchmarks; eroded provider trust
Risk Adjustment Pipelines	V24→V28 dual-model transition; coding intensity incentives	2,000+ codes eliminated; 86→115 payment HCCs	Coding arms race; understated risk scores
Operational Execution	Parallel payer-provider workflows; tech without redesign	98% see AI as essential; <40% fully committed	Administrative burden; stalled technology ROI
Data Fragmentation	Siloed systems; low interoperability across platforms	18.3 avg systems; 26.2% interoperability rate	$1.4T annual waste; incomplete patient profiles

Source: Compiled from CMS (2024), Mathematica (2025), HFMA (2025), and United Health Group (2025).

6. Conclusion

6.1 Summary of Aims and Objectives

This paper aimed to explore why VBC programs consistently fail to achieve scalable impact even when there is growing adoption and widespread stakeholder alignment. Our analysis focused on three interconnected operational and data architecture barriers: patient attribution challenges, risk adjustment data pipeline deficiencies, and operational execution failures.

6.2 Main Findings and Their Significance

Our data indicates that VBC scalability failures are primarily structural rather than clinical. The evidence shows that: (a) attribution methodologies remain inconsistent across payers, with only 25% of physician leaders expecting increased VBC participation in 2025; (b) the V24-to-V28 risk adjustment transition has eliminated over 2,000 codes while expanding to 115 payment HCCs, creating new coding intensity incentives; (c) 98% of leaders believe AI is essential to VBC but fewer than 40% are fully committed to adoption; and (d) organizations manage an average of 18.3 clinical systems at interoperability rates, much below the accepted 27%. These findings reframe the VBC scalability challenge from a problem of clinical engagement to one of infrastructure engineering.

6.3 Future Implications and Applications

Looking forward, we can recommend four strategic priorities. First, CMS and private payers should pursue standardization of multi-payer attribution processes and rules. Second, interoperable data infrastructure must be treated as a prerequisite for VBC expansion and not as an afterthought. Third, technology deployment

should be accompanied by an operational redesign. Fourth, Congress should extend expiring Advanced APM incentive payments and modify participation thresholds so that VBC remains viable in rural and other underserved areas.

The interoperability market is projected to grow to $12.8 billion by 2034. But market growth alone won't be enough without coordinated standards adoption and regulatory enforcement. The promise of VBC is still compelling and delivering it at scale will require addressing the infrastructure challenges we have documented in the paper. The question is no longer whether VBC is the right path, but whether the health care system can lay the groundwork needed to arrive.

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