Creating an analytics ecosystem to support risk-based contracting

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Abstract Payers are increasingly pressing hospitals and health systems to assume more financial risk through risk-based contracts. However, very few healthcare organisations have the information they need to identify the medical spend on care delivered to patients and to tie the cost of care to clinical outcomes, capabilities that are important to managing financial risk. To successfully manage risk-based contracts, organisations must develop systems that enable insightful decision-making about risk and value. That requires a shift in basic data strategy. Most healthcare organisations today focus on maintaining *information systems* to manage multiple silos of clinical, operational and financial data. To succeed under value-based care, an organisation must start building an *analytics ecosystem* for managing patient populations. A healthcare analytics ecosystem is an interconnected set of clinical, financial and operational data sources and analytic capabilities that enable provider organisations to plan, negotiate and manage risk-based contracts. To build an analytics ecosystem, healthcare leaders must translate data into actionable information, leverage that information to create clinical programmes that generate new knowledge, and use analytical tools to turn knowledge into insights that drive strategic decision-making and action.

KEYWORDS: risk-based contracting, cost of care, care management, utilisation analysis

INTRODUCTION

For several years, government and private payers have been pushing healthcare organisations to become more accountable for the care they provide to patients. A decade ago, the main tools of healthcare accountability were penalties for low quality and incentives in the form of shared savings. Today, however, payers are increasingly pressing organisations to assume more financial risk. As one example, the new Pathways to Success programme for Medicare accountable care organisations (ACOs) will expose participating organisations to downside risk much sooner than many expected.[1]

This trend has been a source of concern to healthcare finance executives. One of the

important disciplines of risk-based contracting is to manage the medical spend of the care delivered to patients, otherwise known as the 'cost of care'. Very few healthcare finance leaders, however, have the information they need to identify the cost of care and tie it to clinical outcomes. Without the ability to manage the cost of care, a healthcare organisation has no way to manage financial risk.

The problem is not the availability of data but lack of actionable information and insights. Finance and clinical leaders have access to an enormous amount of clinical, financial and operational data, but most are dissatisfied with their ability to use data to navigate value-based care. According to a recent survey, an overwhelming 96 per cent of chief financial officers say their hospitals or health systems need to improve their ability to leverage financial and operational data to inform decisions about organisational strategy.[2]

To assume risk under value-based contracts, healthcare organisations must develop systems that enable insightful decision-making about risk and value. Of importance here is to shift the basic data strategy: most hospital organisations today focus on maintaining *information systems* to manage multiple silos of clinical, utilisation and financial data. To succeed under value-based care, however, an organisation must start building an *analytics ecosystem* for managing patient populations.

For the purpose of this discussion, a healthcare analytics ecosystem is an interconnected set of clinical, financial and operational data sources and analytic capabilities that enable provider organisations to plan, negotiate and manage risk-based contracts. A few high-performing organisations have made substantial progress towards the goal of creating an analytics ecosystem for value-based care. These organisations are following a challenging yet focused path: (1) translate data into actionable information, (2) leverage that information to create clinical programmes that generate new knowledge and trackable results and (3) use analytical tools to turn knowledge into insights that drive strategic decision-making and action.

FROM DATA TO INFORMATION: HOW TO BUILD THE ANALYTICS PLATFORM

The first step in building an analytics ecosystem is to establish a solid foundation of clinical, financial and operational data. This foundation will serve as a platform for building advanced care models, position the healthcare organisation to succeed under risk contracts and ultimately enable advanced analytics.

The main challenge is tying together clinical data and cost data. As noted previously, most healthcare organisations do not have detailed information about costs. They therefore find it very difficult to accurately identify the cost of care, especially at the level of episodes of care. When these organisations start preparing for value-based care, they tend to focus on clinical quality and utilisation management. Quality and utilisation are important issues, but without the ability to track outcomes on a service and episode basis, it is difficult to identify the total medical spend as well as understand specific cost drivers. It is also difficult to gain insights into the patient's travels through the full continuum of care.

The solution to this challenge is to use claims data to create a cost model. Begin by obtaining payer claims files for the previous two to three years. Files should include all patient medical claims and pharmaceutical spending, including claims for services received in various care settings and from various providers (ambulatory, acute, post-acute, etc.) both inside and outside the organisation's network. In addition to medical claims, files should also include demographic information and important diagnoses. Ideally, all information will be provided as monthly breakdowns, but quarterly data are acceptable.

This comprehensive claims data will enable the organisation to quantify the total medical spend for a defined population. Divide this total spend by the number of attributed lives in the population to create the basic cost model, expressed as a *per member, per month* (PMPM) cost.

The next step in developing the data platform is to begin applying attribution formulas to the population. This is a critical capability for risk-based contracting, because both the provider organisation and the payer need to understand precisely which patients are covered by any agreement. The primary decision is whether to use a visit-based or a geography-based attribution methodology.[3]

Visit-based (also known as volume-based) formulas have intuitive appeal — patients should be attributed to the organisation and associated provider from which they receive most of their care. Within that basic idea, there is a lot of leeway to craft specific attribution formulas. For example, a formula might give priority to primary care physicians as the main attribution trigger but specify that patients with chronic diseases are attributed to the specialist who manages their condition. Historically, Medicare has used a volume-based attribution model for its ACO programmes; the model attributes patients to practices (based on tax identification number (TIN)) and the primary care providers within a practice.

Geography-based formulas are easier to manage administratively but can be financially challenging because the population under contract will include many patients that the organisation has little ability to impact. Large health systems with significant market presence will typically be in the best position to commit to managing a geographically defined patient population. In exchange for administrative simplicity, a provider organisation may be able to negotiate more favourable rates.

Once the cost model has been established and the patient population has been defined through attribution, complete the platform by layering on clinical data. Obtaining these data is relatively easy if the clinical providers are on a single electronic health record (EHR); most organisations have access to inpatient and outpatient EHR, pharmacy and clinical lab data. The main hurdle is aggregating and normalising patient data from different sources. The solution is to implement a master patient identifier that connects patient data inputs from across the care continuum and allows staff to link to the claims data.

The goal is to create a mix of clinical and cost data that begin to provide useful information about patients and the care they receive. The data platform should be rich enough to construct matched patient cohorts and compare similar episodes of care. Because the platform is based on historical claims data, it will enable a healthcare organisation to manage a total population, not just the subset of care that a subset of patients received directly from the organisation's providers.

Theoretically, a healthcare organisation could use claims data from *all* its payers to build a comprehensive data platform at one fell swoop. However, it is recommended to pursue this process one payer (and one value-based contract) at a time. Once an organisation has successfully established a basic cost model and contract with one payer, it can repeat the process with its other major payer partners.

One potential mistake is to delay the launch of a data platform while finance leaders try to create the perfect cost model or the ideal attribution formula. The better approach is to start with a workable model and adjust it as the organisation develops expertise in managing populations under risk-based contracts. This will involve gradually incorporating additional financial, operational and demographic data into the platform. Important data acquisition targets include information from billing systems and referral systems, as well as data on the

social determinants of health (SDoH)[4] — the economic, educational and community factors that can significantly affect patient outcomes.

The overall aim is to lay the groundwork for more advanced analytics that create insight. Leaders should concentrate on developing four primary categories of indicators to manage a population:

- *Financial indicators derived from claims and billing data*, which answer the question 'what services are being provided within the population?'
- *Quality indicators derived from EHR data and clinical technology systems*, which provide insights on 'what conditions and diseases are affecting the population?'
- *Performance indicators derived from claims data and referral systems*, which answer the question 'where are services being provided and by whom?'
- *Social determinant indicators derived from demographic data and other public information*, which create insights into the question 'what factors are influencing patient outcomes?'

FROM INFORMATION TO KNOWLEDGE: HOW TO USE THE PLATFORM TO BUILD ADVANCED CARE MODELS

Once the basic data platform has been established, the next step is to use it to develop clinical programmes and care protocols for effectively managing populations. The focus here is using information about population risk stratification to organise patients in different cohorts, understand the drivers of medical spend, and design care programmes to proactively manage the population with the goal of improving patient outcomes while reducing costs. A first step is to understand the high-risk population and provide efficient care across the continuum to those patients who need it. However, the most significant opportunity is to identify the rising-risk population and incorporate care management programmes to provide proactive care for these patients.

Traditionally, care management programmes have been based partly on science and partly on intuition. The clinical evidence for specific interventions might be in place, but no one really knew how a fully realised programme would impact the health of the patient population or the financial performance of a complex healthcare organisation. As healthcare transitions to risk-based contracts and fee-for-value payment, organisations must be more deliberate about stratifying populations by risk level and medical condition and incorporating interventions that drive real results for the patient and provider organisation.

Using the organisation's data platform to analyse the patient population is an important means of exploring opportunities to improve the total value of care. Three analyses can be very effective:

- *Analysing PMPM cost cohorts for manageable risk factors.* For example, what are the most common diagnoses among the highest-medical-spend population segments?
- *Analysing clinical outcome groups for value-based opportunities.* For instance, among patients with unplanned admissions or readmissions, are there clinical patterns (such as presence of congestive heart failure) that suggest potential targets for intervention?
- *Analysing the total population for network leakage.* Which patients are going out of network for services? Do they share any commonalities of diagnosis or demographics that can be addressed through a focused care management initiative and be redirected to the domestic network?

Once the organisation has identified strong opportunities for improvement, the next step is to design and implement appropriate care management programmes. One familiar approach is to target high-risk patients

— the sickest 5 to 10 per cent of a patient population who represent the greatest costs. For this population, even relatively simple initiatives that create efficiencies or reduce redundant care can make a big impact. The cost of the average hospital readmission in 2016 was US$14,400, so every readmission that a care management programme prevents represents significant savings.[5]

While care management for high-risk patients is important, targeted management of the rising-risk population is what positions organisations to achieve success under a risk-based contract. This group often contains chronic illness patients with multiple conditions or poorly controlled disease — for instance, chronic obstructive pulmonary disease (COPD) patients who do not consistently attend regular appointments or lack coordinated care. It is often more difficult to impact outcomes for these patients, unless the organisation is proactively managing care before patients present for services. However, rising-risk patients represent a much larger part of the population. In fact, more than 25 per cent of the US population has two or more chronic conditions.[6] Targeting the rising-risk population creates a much larger opportunity for system-wide clinical performance management and cost control.

Many healthcare organisations have begun to develop clinical 'service line' models for managing high- and moderate-risk patients. The focus is on tracking patient care activities across the entire care continuum and the full spectrum of providers, services and care settings, from acute hospitalisation to post-acute care to ambulatory services, and even in the home. The most successful service line programmes, which include cancer, cardiac, neuroscience and orthopaedic initiatives, incorporate technology, enhanced data tools, clinical pathways, patient engagement strategies and a focus on provider engagement.

For example, a healthcare organisation might determine that it has high readmissions among congestive heart failure (CHF) patients owing to an inability to anticipate the health failure potential of these patients on initial discharge. Building insightful information that combines clinical, performance and financial data would allow administrators to understand readmission contributors by medical condition, provider interventions, SDoH, and other factors. In response, clinicians could work with administrative and finance leaders to develop a comprehensive care management programme for CHF patients and specific high-risk conditions for proactive management. Important elements might include:

- Creation of an analytic profile of CHF high-risk patients with a strong probability of readmission
- Use of a CHF disease registry to identify high-risk patients and potential clinical service gaps
- Deployment of care managers to schedule services proactively and conduct patient education
- Creation of an interdisciplinary protocol for hospitalised CHF patients
- An evidence-based transitions-of-care programme focused on patients discharged home
- Patient use of validated mobile apps to monitor symptoms and enhance self-care
- Physician compensation incentives linked to blood pressure control, annual labs, etc.
- A medical home model deployed in primary care to enhance care coordination

This approach to care management design can be applied to many rising-risk populations, including cohorts with diabetes, depression, respiratory disease and renal disease.[7] As the cohorts by medical condition are defined with analytic models, care managers and patient navigators will be able to use tools such as direct access, telemedicine and home health interventions to get ahead of probable readmission patients before they present to the emergency department (ED).

FROM KNOWLEDGE TO INSIGHT: HOW TO USE ANALYTICS TO CREATE A VALUE MODEL

At this point in the process, the healthcare organisation has established a strong platform of clinical, financial and operational data. It has also developed care management programmes that are informed by data and generate data. The final step is to use advanced analytics to create a value model to help guide growth and development of appropriate value-based capabilities. The value model serves as a decision-making tool to measure outcomes, predict risk, evaluate return on investment (ROI), guide new investment and proactively influence provider performance. It also allows leaders to evaluate the pace of change required to move into value-based care as well as ensure that current profitability is not compromised during the transition.

A healthcare value model is not a single formula but an integrated set of analytics applied to the complex challenge of optimising value in healthcare. Broadly speaking, the value model has two components: a *statistical cost-of-care model* and an *economic model*.

The statistical cost-of-care model is a microeconomic look at care management programmes that uses regression analysis to determine the marginal cost impact of various interventions. For example, many care management programmes include social workers, but how does the addition of a social worker affect the medical spend? To find out, use analytics to quantify the link between social worker employment costs and changes in PMPM cost at the population, segment and patient level. In this case, the finding might be that one full-time equivalent (FTE) social worker generates US$275,000 in savings across the managed population. Regression analysis could then be used to determine the marginal productivity curve and identify the point of diminishing return. For instance, the conclusion might be that after three FTEs, social workers no longer generate commensurate cost savings.

The economic model uses the estimates generated by the statistical cost-of-care model to determine the enterprise-wide impact of care management initiatives. An effective economic model encompasses three distinct capabilities:

- *ROI calculator*: Analytical tools for using cost impact estimates and programme expenditure data to determine net programme savings and programme ROI. Statistical analysis can be used to identify dependent and independent variables affecting programme outcomes. For example, an organisation could use this capability to predict the revenue implications of a certain preventive care intervention. This sensitivity analysis would allow leaders to make investment decisions.
- *Utilisation analyser*: Analyses to determine how a care management initiative impacts utilisation at various service sites. Using this capability, an organisation would be able to determine how a programme leads to decreases in 'bad utilisation', such as ED visits, hospitalisations and other high-cost episodes. At the same time, the analysis would quantify offsets created by increases in 'good utilisation', including primary care visits, medication adherence (increased pharmacy costs), home health services and mental health services.
- *Predictive modeller*: Techniques for using cost, ROI and utilisation data to predict patient outcomes. For instance, an organisation may determine that specific programme inputs will lead to specific health improvements, utilisation reductions and cost reductions for a targeted population. The ability to predict risk enables the organisation to negotiate favourable risk-based contracts and optimise performance under these agreements.

One benefit of the value model is that it can help organisations maintain their existing

margin while the industry transitions from fee-for-service (FFS) payment to risk-based contracts. Specifically, the model can show how value-based care programmes can create new FFS revenue streams or enhance FFS revenue while the organisation builds value-based care capabilities and prepares for risk-based contracts. For example, say a hospital enters a risk-based contract for geriatric surgery patients. The hospital hires a nurse navigator to manage patient flow, which succeeds in improving operating room (OR) throughput for these patients and optimising performance under the contract. At the same time, the initiative might also improve throughput for *all* surgery patients, which would enable the hospital to increase FFS volumes. The value model allows the organisation to quantify the overall utilisation impact and leverage it to maintain revenue even as payment models shift dramatically.

The value model as a whole is an essential element of a robust analytics ecosystem. Firstly, it enables organisations to evaluate potential ROI under value-based payment models, which is very different from ROI in the FFS world. Second, the value model enables organisations to understand and manage challenging utilisation shifts. Third, it facilitates a quantitative approach to risk, which is essential to managing the transition from FFS payment to shared savings contracts and eventually to full-risk capitation. At the same time, the value model helps leaders maintain and grow an organisation's FFS population while it is transitioning to risk-based contracts. As healthcare shifts to value-based reimbursement, value models allow financial leaders to understand the new economic drivers associated with value-based reimbursement.

CONCLUSION

The push to offload financial risk to healthcare organisations is creating a new demand for data-driven management tools. To develop these tools, healthcare leaders need to look beyond information systems and focus on building an analytics ecosystem that ties together clinical, operational and financial data. An effective healthcare analytic ecosystem uses data to create knowledge and insight about patient populations and care interventions. Healthcare leaders can use these insights to manage the cost of care and execute risk-based contracts while providing better healthcare value to patients and communities.

References

1. Centers for Medicare & Medicaid Services. (2019) 'CMS finalizes "pathways to success," an overhaul of Medicare's national ACO program', CMS.gov, available at: https://www.cms.gov/newsroom/press-releases/cms-finalizes-pathways-success-overhaul-medicares-national-aco-program (accessed 14th March, 2019).
2. Spence, J., Sussman, J. (2019) '2019 CFO outlook: Performance management trends and priorities in healthcare', Kaufman Hall, available at: https://www.kaufmanhall.com/sites/default/files/documents/2019-01/2019-cfo-outlook-healthcare.pdf (accessed 14th March, 2019).
3. Harker, M., Olson, A. (2018) 'Patient attribution: The basis for all value-based care', Society of Actuaries, available at: https://www.soa.org/Files/resources/research-report/2018/patient-attribution.pdf (accessed 14th March, 2019).
4. U.S. Department of Health & Human Services, Office of Disease Prevention and Health Promotion. (2019) 'Social determinants of health', Healthy People 2020, available at: https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health (accessed 14th March 2019).
5. Bailey, M., Weiss, A., Barrett, M., Jiang, H. (2019) 'Characteristics of 30-day all-cause hospital readmissions, 2010–2016', Statistical Brief #248, AHRQ Healthcare Cost And Utilization Project, available at: https://www.hcup-us.ahrq.gov/reports/statbriefs/sb248-Hospital-Readmissions-2010-2016.pdf (accessed 14th March, 2019).
6. U.S. Department of Health & Human Services. (2010) 'Multiple chronic conditions: A strategic framework optimum health and quality of life for individuals with multiple chronic conditions', available at: https://www.hhs.gov/sites/default/files/ash/initiatives/mcc/mcc_framework.pdf (accessed 14th March 2019).
7. Davy, C., Bleasel, J., Liu, H., Tchan, M., Ponniah, S., Brown, A. (2015) 'Effectiveness of chronic care models: Opportunities for improving healthcare practice and health outcomes: A systematic review', *BMC Health Services Research*, Vol. 15, No. 1, available at: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-015-0854-8 (accessed 13th November 2019).