Total Cost of Care: Is Health Care Resource Use and Price Influenced by Primary Care Clinic Affiliation with a Health Care Delivery System?

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Introduction

Experience with the COVID-19 pandemic has sharpened our recognition that health care delivery in the United States is often fragmented and inefficient. The associated economic downturn makes it abundantly clear that we must find better ways to reduce health care costs while maintaining quality, and we must do it **now**. Large health care delivery systems with their economies of scale, vertical and horizontal opportunities for integration and coordination of care, streamlined processes for implementing evidence-based practices and current technologies have emerged as frontrunners in the nation's quest for lowering costs and increasing quality of care. Over the last decade, the predominant trend has been toward consolidation of independent practices and facilities, often including multiple acute care hospitals and outpatient diagnostic centers, with the expectation of greater coordination of patient care and improved efficiency. Yet national health care costs continue to rise, and Americans continue to "suffer from underuse, overuse, and misuse" of care.[i]

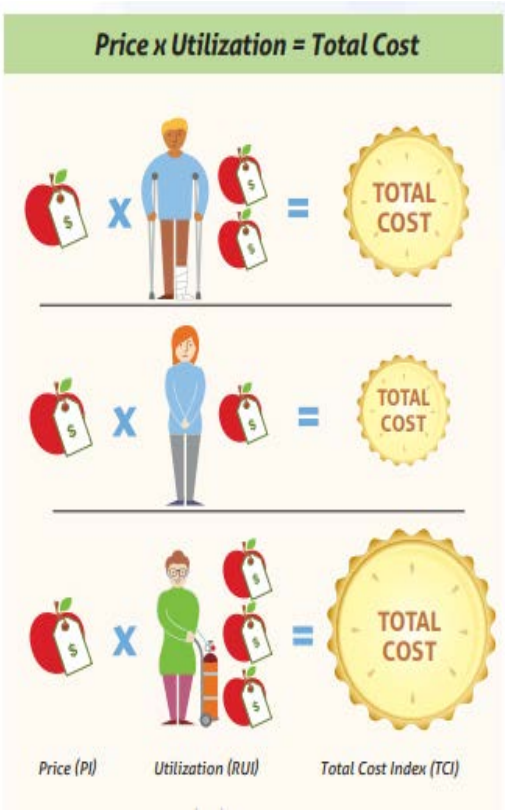
Solutions to our health care woes will require careful policy impact review and implementation of evidence-based recommendations to medical business models and standards of care. In turn, informed decisions about which policies, business models and practices are most likely to succeed require accurate and timely information about the complex relationships between cost, resource use and quality outcomes.

To this end, access to multi-payer health care cost and resource use data along with reliable analytic methods has emerged as a national priority. State-based all-payer claims databases (APCDs) are an important source of this information, which can be aggregated by health care delivery variables including geography, practice type, practice size and patient population represented, as well as practice organizational structure and affiliation. This approach often relies on the variability visible across these aggregations as a means for identifying opportunities for improvement. Characteristics of efficient practices and organizations can be emulated, and characteristics associated with rising costs and inefficient health care delivery can be avoided or improved.

Comagine Health's experienced data analysts and project coordination experts have leveraged the organization's access to all-payer claims data, partnerships with local and regional stakeholders, and national funding opportunities to provide important insights on these issues. Over the last five years, Comagine Health has participated in national Total Cost of Care (TCOC) and Healthcare Affordability[ii] research and benchmark reporting.[iii] This report summarizes Comagine Health's work over the last five years to examine the impact of health system affiliation on TCOC indices.

Comagine Health's Total Cost of Care Work (2014–2020)

Comagine Health's TCOC program was supported by the Robert Wood Johnson Foundation and was part of the Network for Regional Healthcare Improvement (NRHI) Getting to Affordability initiative. The Oregon and Utah TCOC programs initially focused on reporting the Total Cost, Resource Use, and Price Indexes developed by HealthPartners® and endorsed by the National Quality Forum. These measures were chosen because of their integrity and utility; they serve as the foundation of reports to primary care clinics that can be used to improve the quality and affordability of care, as evidenced by the fact that these measures have been used for over 10 years in over 40 states.[iv]



Source: Healthcare Affordability: Data is the Spark, Collaboration is the Fuel.

The TCOC measures can be reported for four service line categories: professional, outpatient facility, inpatient facility and pharmacy.

Comagine Health's work with the TCOC measures highlights variability in health care cost and resource use in primary care clinics within and across states amongst the commercially insured population. Drivers of variability in costs include population density and geography, use of the emergency department, outpatient facility, and medical specialists, inpatient treatment policies, and pricing of services. For example, we consistently find that per member per month health care costs ($PMPM) are highest in less populated areas and lowest in larger metropolitan areas.

Other drivers of variability differ within and across states. Over the last five years, we have produced primary care clinic-level TCOC reports in Oregon that include not only TCOC results but also quality measures results. The reports benchmark clinics against the state average and help providers and clinic managers maximize practices and use patterns that reduce costs and improve the quality of care. In addition, both states have publicly reported these clinic-level measures.

Another Way to Look at TCOC Variation: Clinic Affiliation/Ownership by System

Adaptation of Comagine Health's clinic-level TCOC work for systems analysis is part of our participation in a five-year Agency for Healthcare Research and Quality (AHRQ)-funded grant (Award No. U19HS024072-03). AHRQ awarded grants to three Centers of Excellence (the National Bureau of Economic Research [NBER], Dartmouth and the RAND Corporation) as part of the Comparative Health Systems Performance Initiative aimed at studying how health care delivery systems promote evidence-based practices in delivering care.

As one of the funded centers, NBER has a portfolio of five projects called *Measuring Clinical and Economic Outcomes Associated with Delivery Systems*. Comagine Health participated in Project Two of this portfolio, which focuses on examining the structure and outcomes of health systems in four states: Colorado, Massachusetts, Oregon and Utah.

By studying delivery system characteristics and outcomes in diverse state settings, we sought to identify which delivery system features are associated with cost-efficient diffusion of evidence-based care and dissemination and use of best practices.

Development of the Health Systems and Provider Database

In support of this systems research, NBER developed a database cataloguing affiliation of individual providers with health care delivery systems. The 2016 Health Systems and Provider Database (HSPD) classification system[v] is based on the health system definition adopted by AHRQ (see definition below). The HSPD describes affiliation of Medical Doctor

(MD) and Doctor of Osteopathy (DO) providers with health care delivery systems. It does not include auxiliary providers such as Nurse Practitioners (NPs) and Physician Assistants (PAs).

The research highlighted in this white paper focuses on 2016 claims year data to align with the most recent version of NBER's HSPD. The use of the term "health system" throughout this white paper refers to the AHRQ definition: **"An organization that includes at least both a hospital and a physician group, and where there is an ownership relationship between the hospital and physician group, or between these and a corporate entity."**[vi]

Comagine Health maintains a primary care provider directory in Oregon and Utah that was also used to support these analyses.

TCOC: Physician-Level Systems Analysis

Our initial approach to a systems-based analysis of TCOC consisted of calculating the Total Cost, Resource Use, and Price indices at the physician-level (as opposed to clinic-level aggregation). Claims data were subjected to standard HealthPartners TCOC methodology, then patient cost and resource use were aggregated for individual primary care providers included in the HSPD. Next, cost and resource use data were aggregated for all national provider identifiers (NPIs) identified as practicing within a health system and compared to the aggregated results of NPIs not known to be part of a health system per the HSPD. Included NPIs had a minimum attributed patient threshold of 30 or more commercially insured patients with medical benefits and 20 or more patients with pharmacy benefits.

Table 1 illustrates the number of NPIs included in the analysis for each state.

Table 1: Count of Physicians (NPIs) Included in Analyses and % in System.

	Total NPI Included	% in System
Oregon	1,832	54%
Utah	743	63%

Results of this comparison are summarized in Table 2. The "greater than" symbol (>) denotes the affiliation type (in system versus not in system) that has a significantly higher index within each service line (professional, outpatient facility, inpatient facility and pharmacy). **Overall, in both Oregon and Utah, the Total Price Index is higher for NPIs practicing within a system, driven by higher professional prices. Outpatient costs are also higher for NPIs practicing within a system, driven by higher in-system resource use.**

Table 2. Physician-Level (NPI) Systems Analysis.

Physician-Level TCOC indices	Within Oregon	Within Utah
Overall: Total Cost Index	NS	NS
Total Resource Use Index	Not in System > System	No difference
Total Price Index	System > Not in System	System > Not in System
Inpatient: Total Cost Index	NS	NS
Inpatient Resource Use Index	NS	NS
Inpatient Price Index	NS	NS
Outpatient: Total Cost Index	System > Not in System	System > Not in System
Outpatient Resource Use Index	System > Not in System	System > Not in System
Outpatient Price Index	Not in System > System	NS
Professional: Total Cost Index	Not in System > System	NS
Professional Resource Use Index	Not in System > System	NS
Professional Price Index	System > Not in System	System > Not in System

Physician-Level TCOC indices	Within Oregon	Within Utah
Pharmacy: Total Cost Index	System > Not in System	NS
Pharmacy Resource Use Index	System > Not in System	NS
Pharmacy Price Index	NS	NS

NS = difference is not statistically significant.

***>** means greater than. In this table, it denotes the affiliation type (system versus not in system) that has a significantly higher index within each service line (professional, outpatient facility, inpatient facility and pharmacy).*

Working with Stakeholders to Refine the Research Question

The physician-level results offered interesting insight into cost variability in Oregon and Utah, but left Comagine Health and our stakeholders with more questions than answers. Health care delivery system organization is complex and varies widely in each of these states. Three themes emerged from our conversations with our stakeholders in Oregon and Utah:

1. The HSPD system designation does not include contributions of non-MD/DO primary care providers (e.g. NPs and PAs) who bill independently and deliver a significant portion of primary care services (both within and outside of health systems) and are included in the clinic-level attributions of earlier TCOC work.
2. HealthPartners TCOC indices were developed for clinic-level comparisons and both states have been producing TCOC reports for primary care clinics over the last five years. Widespread dissemination of TCOC indices at the provider-level may confuse or obscure existing understandings of the work.
3. The AHRQ definition of a health system requires a contractual relationship between hospital, clinics and providers; however, in both states, other forms of provider organizations exist and blur the distinction between in-system and not-in-system practices.

Recognizing these limitations and feedback, we continued to customize our analyses for application to Oregon and Utah health care delivery systems.

TCOC: Clinic-Level Systems Analysis

Based on the feedback outlined above, Comagine Health decided to re-run TCOC analyses at the clinic-level. The first step for clinic-level systems analysis was to compare Total Cost, Resource Use, and Price for all primary care clinics known to be affiliated with a system to all clinics not known to be affiliated with a system, using the AHRQ system definition, local knowledge and internet research. Using this approach, claims year 2016 TCOC indices were re-aggregated and expanded to include indices for smaller clinics per HealthPartners guidelines. Included clinics had a minimum attributed patient threshold of 150 commercially insured patients.

For Oregon, this process identified 139 in-system and 209 not-in-system clinics. In Utah, 95 in-system clinics and 108 not-in-system clinics were identified. Results are shown in Table 3. The “greater than” symbol (>) denotes the affiliation type (in system versus not in system) that has a significantly higher index within each service line (professional, outpatient facility, inpatient facility and pharmacy).

Overall, higher total costs tend to be associated with in-system clinics, primarily driven by higher professional prices and trends toward higher outpatient costs. In both states, the higher professional prices for in-system clinics are offset by lower professional resource use.

Table 3. Clinic-Level Systems Analysis.

Clinic-Level TCOC Indices	Within Oregon	Within Utah
Overall: Total Cost Index	System > Not in System	NS
Total Resource Use Index	NS	NS
Total Price Index	System > Not in System	System > Not in System

Clinic-Level TCOC Indices	Within Oregon	Within Utah
Inpatient: Total Cost Index	NS	NS
Inpatient Resource Use Index	System > Not in System	NS
Inpatient Price Index	NS	NS
Outpatient: Total Cost Index	System > Not in System	NS
Outpatient Resource Use Index	System > Not in System	System > Not in System
Outpatient Price Index	NS	NS
Professional: Total Cost Index	Not in System > System	NS
Professional Resource Use Index	Not in System > System	Not in System > System
Professional Price Index	NS	System > Not in System
Pharmacy Total Cost Index	NS	NS
Pharmacy Resource Use Index	System > Not in System	NS
Pharmacy Price Index	NS	NS

NS = difference is not statistically significant.

> means greater than. In this table, it denotes the affiliation type (system versus not in system) that has a significantly higher index within each service line (professional, outpatient facility, inpatient facility and pharmacy).

Identification and Analysis of Not-In-System Clinics Affiliated with Other Types of Provider Organizations

For the next level of Comagine Health's state-customized systems analysis, not-in-system clinics were further distinguished according to other types of provider organizations or management structures that might be expected to provide core elements of health care delivery systems (e.g. cohesion, scale and infrastructure support), but not meet the AHRQ definition's hospital, clinic and size requirements. Independent, large multispecialty group clinics and large primary care group clinics were identified in both states (Table 4). Only one Utah clinic fell within the "large primary care group" definition and was excluded from the analysis. The remaining not-in-system clinics were classified as "independent."

Table 4. Clinic Category Definitions and Counts by State.

Clinic Categories	Oregon	Utah
Independent (single office, single specialty)	149 (42.9%)	67 (34.2%)
Large Primary Care Group (multiple offices, single specialty)	29 (8.4%)	1 (0.5%)
Multispecialty Group (single or multiple offices, multiple specialties including primary care)	30 (8.6%)	33 (16.8%)
In-System (clinics owned or operated by a health care system, as defined by the AHRQ definition of a health system)	139 (40.1%)	95 (48.5%)
Total	**347**	**196**

Figure 1 illustrates results across all clinic categories for both Oregon and Utah. Each dot represents a clinic included in the analysis. We found wide variation across all clinic types in both states. While there are few statistically significant differences between groups related to inpatient resource use, the amount of variation is notable in both Oregon and Utah.

Figure 1: TCOC Indices Across All Clinic Types, Oregon and Utah.

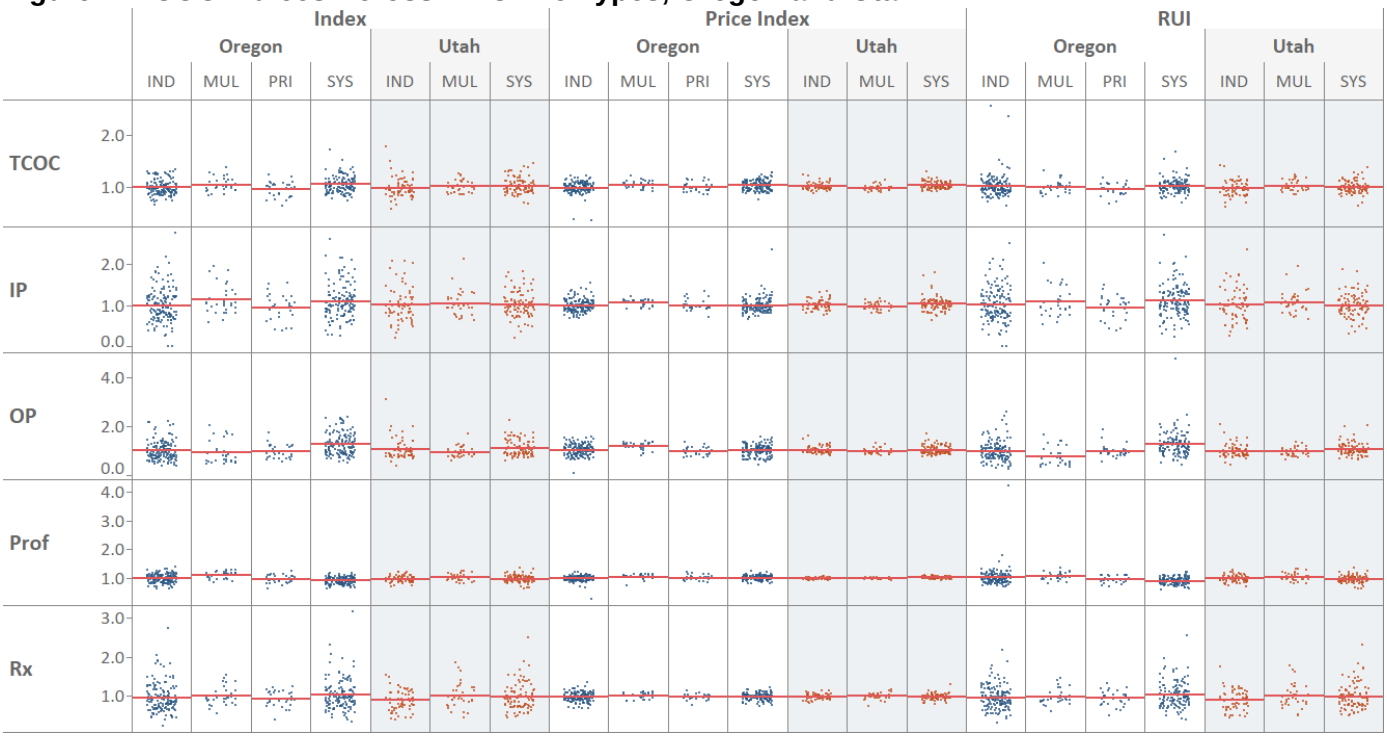


Figure 1 shows Total Cost Index (Index), Price Index, and Resource Use Index (RUI) for the following clinic categories: Independent (IND), Multispecialty Group (MUL), Large Primary Care Group (PRI) and In-System (SYS) across the following service lines: Total Cost of Care (TCOC), Inpatient (IP), Outpatient (OP), Professional (Prof), and Pharmacy (Rx).

Based on results of the physician- and clinic-level system affiliation analyses, it appears that being affiliated with a health care delivery system means higher health care costs: In general, total price indexes are higher, and outpatient resource use is higher at both the physician and clinic level. Professional price index is also higher for physicians affiliated with a system whereas professional resource use tends to be lower for physicians and clinics affiliated with a system. In Oregon, multispecialty group clinics have total cost of care and total price indices more like clinics affiliated with a system than to independent and primary care group clinics. Independent clinics tend to have lower costs, resource use and price indices than clinics affiliated with systems or other provider organizations in both states.

In Oregon, patients who receive their primary care at clinics that are part of a multispecialty group have higher-than-average prices across all four service categories. In-system clinics in Oregon have higher outpatient resource use than other clinic types, but much lower professional resource use. In contrast, multispecialty groups have lower outpatient resource use and costs coupled with higher professional resource use and costs.

In Utah, patients who receive their primary care at in-system clinics have lower professional resource use, but higher professional prices, which results in an overall higher total cost of professional care compared to patients who receive their primary care at multispecialty group or independent clinics. In-system clinics also have higher overall outpatient costs than multispecialty group (but not independent) clinics. The higher in-system outpatient costs appear to be driven by higher outpatient resource use. Patients who receive their primary care at multispecialty group clinics have the lowest outpatient costs.

Local Stakeholder Engagement and Feedback

Given the complexities of health care delivery system organization within each state, we sought to bolster our analyses with input from local stakeholders to help elucidate the nuanced factors driving variation between the four identified clinic categories. Comagine Health is grateful for the guidance and feedback from state stakeholders who helped us interpret and contextualize the results of these analyses.

In both Oregon and Utah, we presented our findings to several multi-stakeholder groups and facilitated discussions to elicit their feedback. Utah stakeholder groups included the Utah Partnership for Value-Driven Healthcare, as well as the Utah Department of Health's Payer Task Force and Transparency Advisory Group. Oregon stakeholder groups included the Oregon Data Collaborative's Leadership Advisory Committee and Analytic Advisory Committee. These committees comprise representation from health plans, providers, policymakers, and consumers. We also conducted interviews with subject-matter experts who possess on-the-ground experience working within the clinic categories used for this analysis and could offer more nuanced feedback on results.

In both states, stakeholders suggested the following points about the results:

- **The observed variation in outpatient facility and professional costs in system-owned clinics could be explained by differences in billing practices.**
- **Clinics that are part of systems or multispecialty groups may have higher prices because of stronger negotiating power than independent clinics with payer organizations.**
- **Referral patterns and the ease of referrals could also explain the increased resource use among primary care clinics who are part of multispecialty groups.**
- **Infrastructure like electronic health record platforms and physical co-location could increase the use of specialty referrals within a multispecialty group environment.**

Discussion

The results indicate that overall, health care costs are higher for physicians and clinics that are part of a health care system. This is a perplexing result given that large health care delivery systems have led the nation's efforts to reduce costs yet are still presenting higher costs than physicians and clinics that are not part of a system. Our findings also highlighted another key point: health care delivery systems look and function differently in each state. This variation complicates national efforts to reduce the cost of care because the levers to do so in each state may be different.

One illustration of this variation can be seen in the clinic classifications between Oregon and Utah. For example, Utah had a greater proportion of clinics that were part of a health system (48.5%) than Oregon (40.1%). Similarly, there were few comparable results between the two states, meaning the TCOC indices for a given clinic type in one state don't perform the same in the other state, pointing to factors outside of this analysis that could be impacting TCOC variation.

In Oregon and Utah, clinics that are part of a health system have higher outpatient resource use. However, each state has different results by clinic categorization. In Oregon, clinics that are part of a multispecialty group have higher prices across all service categories than other clinic types. However, in Utah, clinics that are part of a multispecialty group have the lowest outpatient costs compared to other clinic types. These findings suggest that success of omnibus policy or regulatory solutions for addressing health care affordability will vary state-to-state and benefit from local considerations and adaptations.

In Oregon, clinics that were part of a large primary care group had slightly lower-than-average total costs across all four service categories. There may be some efficiencies that these clinics have achieved that could be worth further exploration. Based on stakeholder feedback and our understanding of these clinics, it seems that their size provides them the opportunity for increased health IT infrastructure including analytic staff that can help the practices understand their cost, quality and utilization and, therefore, address it appropriately. Similarly, these clinics may be engaged in various primary care transformation initiatives that would support changes to care delivery and help keep total costs below average. Transformation initiatives could include chronic disease management, care coordination and increased patient access.

Limitations

This analysis relied on data from 2016. Given the rapidly shifting and consolidating health care delivery landscape, we suspect this analysis would look different if repeated with more recent data.

Providers and clinics that did not meet the minimum attributed patient threshold are not included in these analyses. Therefore, results are only generalizable to clinics and providers like those included.

Claims data has inherent limitations that could impact the results of these analyses. Any payments made outside of a claim would not be captured in this analysis, meaning any payments practices might receive from participation in an alternative payment model would not be reflected here. Similarly, some stakeholders suggested that a clinic's participation in alternative payment models and their contractual relationships with payer organizations may have a greater influence on TCOC indices than system affiliation. As contractual details are not captured in claims, we were unable to account for this possibility in our analysis.

Differences in providers' and clinics' coding practices and coding intensity could also impact the TCOC results, but an examination of those differences was outside the scope of this analysis.

Due to data limitations, Comagine Health could only include quality measures in the Oregon Total Cost of Care clinic reports but could not include any quality measures in any other analyses. Many stakeholders pointed out this missing data point when reviewing the results, and we agree. Resource use and price are two important points to consider when supporting a high-value health care system, but it is incomplete without considering quality.

Next Steps

While the results gave us some directional information, further investigation is needed into the drivers of variation. With appropriate funding, Comagine Health will further the work begun here to examine the variance in cost, quality and utilization within and between systems. We will also examine influence of system size, health system ownership status (profit versus not-for-profit), urban/rural distributions and payer mixes on this variance. Another goal would be to expand this work to other states beyond Oregon and Utah.

The COVID-19 pandemic has not only illuminated the fragmented nature of care in the United States, but also the inadequacies of fee-for-service payment for health care services. Rapid and extreme shifts in utilization patterns have left primary care practices in precarious financial positions as they feel the impacts of reduced office visits.[vii]

We do not yet know how the health care delivery landscape has been changed by the pandemic, but it is reasonable to think there will be changes in primary care clinic ownership arrangements as offices work to stay open and continue serving their communities. Many primary care offices have expanded access via telehealth visits; this change has also brought about a new level of reimbursement and sustainability challenges.

While telehealth technology has existed for many years, it was not used to its full potential before the pandemic, largely due to disparities in reimbursement. Temporary changes in federal and state policies have resulted in widespread adoption of telehealth during the pandemic. To support sustained telehealth policy changes, Comagine Health is prepared to use the TCOC methodology to track the impacts of telehealth utilization on the total cost of care.

Alongside the pandemic, the state policy environment is rapidly evolving related to costs. The State of Oregon is currently working on establishing a health care cost growth target that will "serve as a target for the annual per capita rate of growth of total health care spending in the state."[viii] While the details of the cost growth target are still being determined, it is known that health care organizations will be held accountable for monitoring and controlling their costs in ways they have not been before. Methodology like Total Cost of Care will become more valuable and useful as delivery organizations work to understand their costs so that they can take action to contain cost growth. Comagine Health is equipped to drill into results by service line categories to further inform organizations who are looking to address cost and help organizations develop strategies to improve their total cost results. Our experienced analytic team will expand these results to define and quantify other drivers of variation.

Comagine Health is prepared to help providers in Oregon and across the country who are ready to understand and address their costs.

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