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2019 COLORADO ALL PAYER CLAIMS DATABASE ANNUAL REPORT



CENTER FOR IMPROVING
VALUE IN HEALTH CARE
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Introduction

Data in the Colorado All Payer Claims Database (CO APCD) is more credible, comprehensive, and actionable than it has been since its launch seven years ago. Over the past year, Center for Improving Value in Health Care (CIVHC), administrator of the CO APCD, has worked steadily and conscientiously to strengthen the quality and completeness of the CO APCD while at the same time providing meaningful analytics to Change Agents across Colorado and the nation.

A requirement of [Colorado Statute 25.5-1-204](#), this report details the administration of the CO APCD between July 1, 2018 and June 30, 2019.

Who is CIVHC?

CIVHC is an objective, not-for-profit organization. Through services, health data, and analytics, we partner with Change Agents to drive towards the Triple Aim of better health, better care and lower health care costs for all Coloradans. We believe that together we can alter the trajectory of health care and we are privileged to serve those striving toward a better health system for us all.

What is the CO APCD?

In 2010, the Executive Director of the Colorado Department of Health Care Policy and Financing (HCPF) appointed CIVHC the administrator of the CO APCD. The CO APCD is a state-legislated, secure health care claims database compliant with all federal privacy laws. The complexity and scale of the database continually grows with over 4.3 million claims submitted by payers each month. It is the only claims repository in the state that represents the majority of insured lives in Colorado, with more than ten years of data from commercial health insurance payers, Medicaid and Medicare. These claims provide valuable insights about the health of Coloradans, how Colorado is paying for and using health care, and the quality of the care being delivered. CIVHC makes this information available publicly and via the data request process to consumers, researchers, state agencies, advocacy organizations, nonprofits, and others working to improve health care and lower costs for Colorado residents.

Contents of the CO APCD

The CO APCD contains over 865 million claims for over 70% of the covered lives in Colorado, with claims from 41 commercial health insurance plans, including Medicare Advantage as well as mandated non ERISA and voluntarily submitted ERISA self-insured employer plans, Medicaid, and Medicare Fee-for-Service (FFS) claims. The CO APCD does not contain claims for people covered by Federal health insurance programs such as the Veterans Administration, TRICARE federal employees, or Indian Health Services, and does not include information for uninsured Coloradans. Please see [Appendix A](#) for a breakdown of the number of lives and claims the CO APCD contains by payer type.

Due to a 2016 ruling by the United States Supreme Court, states cannot mandate submission of claims data from self-insured Employee Retirement Income Security Act (ERISA) plans to APCDs. Self-insured claims are estimated to represent half of the total commercially insured lives in Colorado and CIVHC estimates that the CO APCD currently contains approximately a quarter of those lives.

Getting Claims into the CO APCD

When a Coloradan who has health insurance receives a health care service, the provider typically submits a claim for reimbursement to their health insurance company. Once the claim has been paid, the health insurance company submits the information for collection in the CO APCD.

Claims Life-Cycle Through the CO APCD



How the CO APCD is Used

CIVHC releases CO APCD data in two ways: non-public custom releases, licensed by Change Agents working on specific projects to improve care for Coloradans; and public information on civhc.org designed to foster decision-making at all levels of the health care system, from consumers to state agencies.

Public Data Releases

Increasing access to transparent health care data for all stakeholders is foundational to the original legislative vision of the CO APCD, CIVHC's mission, and to Colorado's ability to make informed decisions that will have lasting benefit to the state. Public analyses and interactive tools, available on civhc.org is one of the methods CIVHC employs to bring transparency to the health care marketplace.

Non-Public Data Releases

In addition to making public information available, CIVHC provides custom data sets and reports to organizations and researchers seeking to advance the Triple Aim. Every release of data must benefit Colorado, as mandated by CO APCD regulations.

HCPF CO APCD Scholarship

The Colorado General Assembly established the HCPF CO APCD Scholarship Fund in 2014, allocating funds to offset the cost of data for requestors with limited resources. The Colorado Department of Health Care Policy and Financing administers the funds and requestors must meet specific criteria in order to be considered for the scholarship.

Administering the CO APCD in 2019

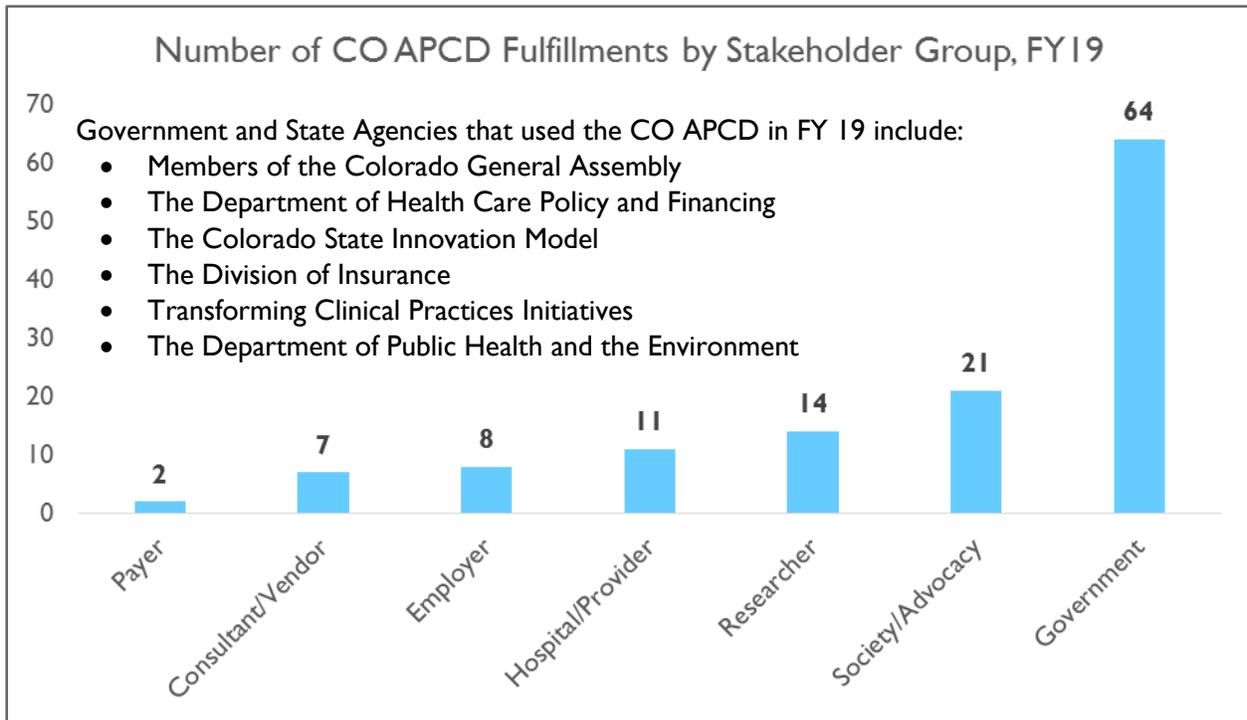
The CO APCD of today bears little resemblance to that of three years ago, much less to the one that launched in 2012. When passing legislation (HB 10-1330) enabling the database in 2010, Colorado policymakers looked far into the state’s future and when the CO APCD was unveiled two years later, it was one of seven functioning statutory APCDs in the nation.

There were big expectations across multiple stakeholder groups for what the CO APCD could and should be able to do. However, soon after launch we learned that collecting, processing, and then analyzing large amounts of claims data was not as straightforward as previously thought. The next several years were a period of “building the plane as we flew.” We switched to data vendors better suited to executing effective use of the CO APCD and made changes to our data intake and quality assurance processes. The results of these efforts were clear in 2019 and result in a database with more credible and timely data than ever before, stronger and more efficient processes surrounding data quality, and enhanced analytic capabilities, which provide increasingly detailed insight into health care in Colorado.

Successes

Non-Public Data for Change Agents

In FY19 (July 2018-June 2019), CIVHC provided 127 fulfillments of non-public CO APCD data to 44 different stakeholder organizations, 14 of which received funding from the HCPF CO APCD Scholarship. The majority of scholarship funding went to Government agencies followed by society and advocacy organizations and researchers. It is also worth noting that larger projects like the Colorado State Innovation Model (SIM) required multiple fulfillments throughout the year, thus increasing the number of non-public data releases while keeping the number of requesting organizations stable. Please see [Appendix B](#) for a list of all non-public data releases in FY19.



FY19 Recipients of the CO APCD/HCPF Scholarship	
CIVHC	Colorado Division of Insurance
Colorado Children's Healthcare Access Program	Colorado State Legislature
Colorado Community Managed Care Network	Lanig Family Fund - A Donor Advised Fund of Rose Community Foundation
Colorado Consumer Health Initiative	Northwest Colorado Community Health Partnership
Colorado Dental Association	University of California Los Angeles
Colorado Medical Society	University of Colorado Denver Cancer Center
Colorado School of Public Health	University of Colorado Denver School of Medicine

Shop for Care and Public Analyses

In addition to the non-public data releases, CIVHC published several public reports featuring CO APCD data to inform the needs of stakeholders across the state. July 2018 saw the publication of cost and quality information on a named facility level for imaging services on the Shop for Care page on civhc.org for the first time. The following January, we published cost and quality information for 12 common procedures, also on a named facility level, using episode of care analytics. CIVHC also published a Spot Analysis investigating prescribing trends of three powerful opioids and analyses exploring price variation for imaging services and common procedures. Please see [Appendix D](#) for static CO APCD publications released during FY19; all interactive reports released are available on civhc.org

Public CO APCD Data Releases in FY 19			
Interactive Reports, Infographics, and Downloadable Data	Spot Analyses and White Papers	Data Bytes	Educational Content
Shop for Care: Imaging	Medicare Reference Based Price Analysis	In/Out of Network Costs	Plaintalk Blogs
Shop for Care: Episodes of Care for 12 Common Procedures	Scorecards for Payment Reform with Catalyst for Payment Reform	Legislative District Medical and Pharmacy Total Spend	Change Agent Profiles
Medicare Reference Based Price Comparison	Spot Analysis: Prescribing Opioids in Colorado		CIVHC Status Blogs
	Total Cost of Care Update with the Network for Regional Healthcare Improvement		Change Agent Chats

Improving the Completeness of the CO APCD

As part of our ongoing efforts to improve the comprehensiveness of the CO APCD and its ability to provide information crucial to transforming health care, CIVHC works with HCPF and the payers to modify or add new data elements via the HCPF Executive Director rule change process. During FY19, we worked toward promulgation of a rule change that required submission of alternative payment model and drug rebate information into the CO APCD beginning September 30, 2019. Addition of these

elements enables new analyses regarding health care spending in Colorado for important drivers like pharmacy and primary care.

Supporting State and Community Innovation

The past year has been a watershed for innovation and collaboration among stakeholders in Colorado working to lower health care costs. Coalitions of employers have formed across the state to reduce health care costs and improve care for their employees and many of them are working with CIVHC to obtain CO APCD data to further their efforts. CIVHC is also partnering with employer advocates to increase voluntary submission of ERISA self-funded employer claims and developing reports to demonstrate the value of having their data included in the CO APCD.

Another way CIVHC is supporting community is by providing rural hospitals and employer coalitions with outmigration reports designed to show where patients are going outside of the community for care. This information allows for assessment of the frequency and reasons patients are leaving the area and helps address gaps in services, thus improving access to care for people living in rural Colorado. There are now 13 rural hospitals and multiple employer groups using CIVHC's outmigration reports to assess gaps and opportunities for increasing services within their communities.

Governor Polis and his administration's focus on health care has provided CIVHC and the CO APCD with new opportunities to inform change in Colorado as the database was written into two pieces of legislation during the 2019 session (Out of Network Billing [HB 19-1174](#), Primary Care Investment [HB 19-1233](#)) as well as the Polis/Primavera Health Care Affordability Roadmap. HCPF worked with CIVHC to include operational funding for the CO APCD for the first time in the state FY20 budget, indicating their belief in the value of the database and their desire to ensure the longevity, quality and expansion of this important resource for Colorado.

Increasing Data Transparency and Literacy

CIVHC Connect: Dollars and Sense

In November 2018, CIVHC brought together Change Agents from across the nation to transform the health care improvement conversation from anecdotal to data-driven. CIVHC Connect: Dollars and Sense was a day-long event, funded, in part, by the Network for Regional Healthcare Improvement (NRHI) and the Robert Wood Johnson Foundation, featuring new data and analysis from local and national leaders in health care transparency and cost containment. Presentations included information on the Total Cost of Care project from NRHI, Medicare Reference-based Pricing from CIVHC and the Colorado Business Group on Health, and the launch of the Colorado Scorecards on Payment Reform from the California-based Catalyst for Payment Reform. The day concluded with a panel of Colorado's health care leaders and a lively discussion about concrete ways stakeholders across the state are working to improve care and lower costs.

Over 160 people attended the event and the level of audience engagement was high. It was evident that there are knowledgeable and passionate individuals ready to understand the data and take the necessary steps to affect change. Attendees asked insightful questions of the presenters – and each other – with the clear objective of solving the problems, not continuing to admire them.

Accessible County Profile Template

During the spring of 2019, we developed a user-friendly template to show public health stakeholders how to create county-level health profiles using multiple data sources. The profile template included measures ranging from chronic condition prevalence and cost of care to insurance coverage and socio-

economic factors. Aligning these important elements can allow public health agencies to get a more complete picture of the health of a county and what is driving its current trajectory. Once these drivers are identified, decision makers in the county can design targeted interventions to improve the health of residents.

Our goal when developing the profile template was to create something to empower stakeholders to harness existing public data for themselves and discover the available insights on their own. We made a deliberate decision to use a “low-tech” Excel template because we wanted the tool to be accessible to everyone and to demonstrate that advanced analytics knowledge is not a requirement for gleaning insight. We presented the profiles at workshop at the Public Health in the Rockies conference in August 2019.

Please see [Appendix C](#) for the example County Health Profile for Morgan County.

Advancing Alternative Payment Models

Innovation in how care is paid for is one of the biggest drivers of change in the health care industry right now. In FY19, CIVHC helped engage payers and provided additional staff support for Colorado’s participation in Catalyst for Payment Reform’s (CPR) Payment Reform Scorecard. CPR found that in the commercial market, payments tied to value were equally prevalent in primary care and specialists (68%), with hospital payments tied to value trailing slightly at 64% of total dollars. They also learned that in the Medicaid market, 100% of payments to hospitals were tied to value, with quality performance incentive payments making up 7% of total dollars paid to hospitals in 2016.

CIVHC also worked to provide new information regarding different ways to consider paying for health care. Collaborating with the Colorado Business Group on Health, the RAND Corporation, and employer groups across the state, we produced reference based pricing analyses showing the percentage of Medicare that commercial insurers were paying for common inpatient and outpatient procedures. In many cases, it was well over 300% of Medicare rates, unlocking information to be used as a starting point for negotiations.

CIVHC is also using the PROMETHEUS analytic tool to publish episode of care cost and quality information on a named facility level publicly, and to provide payers and providers with data to create episode-based payments. Episode of care cost information can be used to inform the creation of bundled payments where facilities or providers are paid a single sum for the entirety of the services included in an “episode,” e.g., a knee replacement includes pre-op, the procedure itself, and any post-op care such as physical therapy. These bundled payments give incentives for the facility or the provider to treat patients with the highest level of quality so there are no complications, as they will receive the same amount of money no matter how much care is required.

Opportunities

Maintaining Balance

The months between July 2018 and June 2019 saw many shifts in alignment at CIVHC. Changes in priorities and focus became necessary as we worked with HCPF to ensure the sustainability and continuation of the CO ACPD by pursuing State operating funds. In the past, CIVHC and the CO ACPD received no ongoing state funding and were largely funded by private operations grants, intended to be time-limited until additional revenue sources could be identified. In the journey towards sustainability, it became apparent to CIVHC that sustaining the CO ACPD on licensing revenue alone is insufficient to cover the growing expenses of this invaluable state resource. The decision to seek state funding was

crucial not only to the survival of the CO APCD in general but also to support the need to continually improve the quality of the data and analytics necessary to inform state and stakeholder initiatives. As a result, it was vital to direct as many resources as possible toward the acquisition of new state funding.

This tension is not new to CIVHC. Sustainability of the CO APCD has been a constant challenge. Every day, we learn more about claims data and how to make it actionable and credible for a wide variety of stakeholders; yet this education has been costly. We are continually working to find the balance between meeting our financial needs for ongoing operations and ensuring that data requesters receive the highest quality and most meaningful product possible.

Problem-Solving

The CO APCD now has nearly a billion claims spanning almost 10 years. With a data set of this magnitude, the different combinations in which someone could choose to slice, dice, and analyze the data are myriad, as are the research questions they could then pose. The data is also frequently being updated and improved through regular refreshes that include not only the addition of new data but also the application of fixes and refinements to the processing systems designed to improve overall quality and completeness. As we work with this constantly evolving data set, we are always learning, adapting, and gaining a deeper knowledge and appreciation of the complexity of the CO APCD.

However, while this breadth and complexity are at the heart of the CO APCD's unique value to Colorado, they can also be the reason we sometimes have to do a bit of problem solving to ensure that requestors receive information that will help them answer their questions. We learn things about the database with every request. A good example of this is when there are unexpected gaps caused by data elements that have never been requested before, or when the data in those fields isn't what it should be (i.e., a number in a text field). Sometimes we can go to the submitters and request that they update and resend the information. Other times we can find comparable information in the claims and use that instead. On occasion, it becomes a larger data quality concern that we investigate, possibly requiring changes to how data is submitted or processed in the future.

Communication of Complexities

Over the last five years and continuing today, CIVHC has worked to distill the basics of claims data collection and analysis into meaningful language and accessible across the spectrum of stakeholders. We use a public platform, civhc.org, to educate about what the CO APCD can do, illuminate cost and utilization insights, and amplify the exciting work that Change Agents are doing to improve health care. However, we have been less successful in our communication regarding the complex challenges we encounter as we strive to provide credible and actionable data. We have historically been laser-focused on solving the problem and haven't always done a good job being able to describe and disseminate the findings in a timely manner to impacted stakeholders. This has resulted in a lack of understanding across the stakeholder community related to the complexities of claims data management and analysis. Moving into 2020, we are implementing new avenues of engagement with our partners and increasing the frequency of our communications related to a host of items including data discovery, quality, and new analytic development.

Cost to Administer the CO APCD

In the beginning, the CO APCD received no direct, ongoing operational State funding. The enabling legislation specifies that all funds must be raised by the administrator. Generous capacity-building grants from HCPF, The Colorado Trust, and the Colorado Health Foundation enabled CIVHC to develop, implement, and grow the CO APCD, contingent on its becoming a self-sustainable resource. From 2012

on, CIVHC worked to bolster grant funding with income from licensing CO APCD data to requestors with projects meeting the criteria set forth by the [CO APCD Rule](#) and through additional avenues of funding.

CIVHC began the process to receive matching funds from the Centers for Medicare & Medicaid Services (CMS) for the Medicaid operations portion of the CO APCD in 2018. In order to be eligible for this 50/50 opportunity, CIVHC was required to obtain half of the requested dollars in State funding. As the State budget process was well underway at the time of the application’s planned submission, for fiscal year 2018 (July 2017 – June 2018), the Colorado Health Foundation generously granted dollars to be administered to CIVHC via HCPF, meeting the requirement for State funds for that fiscal year.

In order to obtain ongoing matching funds, it was necessary for CIVHC to request and secure continued support from the State. To this end, CIVHC worked with HCPF, the Joint Budget Committee, and legislators to pass House Bill 18-1327, which provides annual State funding for contractual Medicaid-only operations of the CO APCD and development and implementation of data literacy initiatives. These dollars are matched each year by CMS. Additionally, the bill formalized the grant/scholarship fund to offset data licensing fees for qualifying entities.

The funding provided by the CMS 50/50 is a significant step toward full sustainability for the CO APCD, though it only covers the Medicaid operations portion of the database Administration. The approved cost allocation plan includes a calculation for the percentage of Medicaid covered lives in the database, which is then applied to total operating expenses. Therefore, the current Medicaid match funding does not cover the remainder (Commercial and Medicare portions) of the cost.

To make up the remainder of the funding, CIVHC undertook a multipronged approach, 1) licensing CO APCD data to requestors who meet criteria outlined in statute, legislation, and regulation; 2) applying for local and national grants; and 3) working with HCPF to secure operational funds from the State. In April 2019, the CO APCD was included in the SFY 2019-20 Long Bill Budget signed by Governor Polis, providing funding for core operating expenses and additional analytics services for state agencies in FY20.

2018-2019 CO APCD Budget and Expenses

Payers submit claims for everyone they provide coverage to during the previous period, resulting in over four and a half million claims collected in the CO APCD monthly. Ongoing infrastructure and data management costs account for over three quarters of all CO APCD annual expenses. Over time, the CO APCD annual budget has increased due to a number of factors including an increase in data storage costs, data intake and management costs related to more submitters, and an increase in volume of public and custom analytics being produced to support the Triple Aim.

FY19	
Income	
Grants Total	\$550,000
Earned Revenue Total	\$3,765,453
Expenses	
CO APCD Program	\$4,414,297

CO APCD Data Licensing Fees

CIVHC works to increase access to data sets and standard/custom reports from the CO APCD to advance the Triple Aim. In order to do that, we use a data licensing fee formula that enables us to cover our costs while providing high value, competitively priced data and other information products.

General Data Access Fee Information:

Standard Reports: *Start at \$500
 Custom Reports: *Start at \$1,500
 Data Sets: *Start at \$10,000

**Please note that this information represents baseline pricing and that final fees are calculated based on a number of factors including those listed below.*

Factors that go into data access fees	
Indirect costs (including legal fees)	Number of unique and specific data elements
Labor costs/time required	Output type (Tableau, Excel, etc.)
Any additional professional services/consultation requested	

Looking Ahead

The CIVHC that is moving into 2020 is very different from the one that launched the CO APCD in 2012 and is different still from the team three years ago. We've grown and developed, our expertise has expanded and diversified, and just as the CO APCD has improved with each passing year, so have we. As we have gained mastery over the difficulties inherent in claims data submission, processing and analysis, we have become better prepared for the unexpected and better able to present solutions. We are confident in the data and our ability to work with it.

This hard-won experience coupled with the new sustainability created by the generous state funding affords CIVHC the opportunity to expand focus in two areas: innovation and customer service. In addition to our emphasis on releasing credible, timely, and actionable data, new analytic methodology development is already underway and we are designing new programs to further support users of the CO APCD as they work to change the trajectory of the health care system.

Grounded firmly in the foundation we've built over the last six years, CIVHC is excited about the information that new analytics will bring and the fresh ways that Change Agents will be able to apply the insights in Colorado and across the nation. We are also excited about cultivating stronger relationships with our partners and working together to improve health care for us all.

New Analytics

Over the next year, CIVHC will be developing reports based on new analytic methodologies and information including:

- additional PROMETHEUS episodes of care for procedures;
- alternative payment models;
- drug rebate information;
- out of network billing;
- primary care spending;
- Medicare reference-based pricing; and
- the Milliman MedInsight Waste Calculator (low value care), which uses the [Choosing Wisely](#) guidelines for care that is evidence-based, not duplicative, free from harm, and truly necessary.

Data Mart

Over the past few years, CIVHC has been taking an incremental approach to developing a secure, online portal – also known as the “Data Mart.” As part of this process, we enlisted partners to help design and create standard reports in the analytic tool Tableau. This was an intensive process as CIVHC and our partners worked, through discovery and trial and error, to determine the appropriate use of the data, most actionable data to display and the most meaningful visualizations.

The period of research and iteration has served CIVHC in good stead as we prepare to begin building the full Data Mart in the coming months. The first iteration of the Data Mart will be a tool that will allow users to build a custom visualization using a de-identified CO APCD data set. Based on the question(s) they wish to answer, users will be able to choose from a menu of data elements, decide on the type of data aggregation (sum, median, average, etc.), and select the type of visualization (bubble chart, scatter plot, heat map, etc.).

CO APCD User Group

Data recipients and researchers from the University of Colorado formed a CO APCD User Group with the aim to pool knowledge of working with the data and sharing lessons learned. CIVHC and the CO APCD data warehouse vendor, Human Services Research Institute (HSRI) provide presentations to the group about aspects of administering the CO APCD, including Data Quality Processes, Data Discovery, and Member Composite Identifiers. The group meets every other month and has responded very well to each of these presentations, appreciating and understanding the level of detail and complexity required to effectively and efficiently maintain a database the size of the CO APCD.

These presentations were the first time CIVHC has delved that far into the nuts and bolts of data management and processing with data users outside of our staff, the warehouse vendors, and other organizations administering APCDs. Moving forward, we are making plans to record and refine the presentations to the Data Users Group and make them available on civhc.org.

CO APCD Data Brief

We believe that data moves at the speed of trust and not only do we have to be good stewards of the data, but we must also continually cultivate and build trust in our work with the partners and stakeholders we support. Our bi-weekly Data Brief email blast is designed to foster trust in CIVHC and the capabilities of the CO APCD by providing updates on timelines for new analytics, describing any new data discoveries we've uncovered, and sharing updates on our process to continually improve the overall quality of the data.

Appendix A: CO APCD Snapshot - Size and Population Coverage

As of the November 2019 CO APCD Data Refresh

Claims by Payer

Paid Date Range: 1/1/2012 – 8/31/2019*

Total	Commercial	Medicaid	Medicare Advantage	Medicare FFS	Missing/Undefined
667,681,921	175,370,156	214,954,888	93,923,023	182,015,773	1,418,081
100%	26.3%	32.2%	14.1%	27.3%	0.2%
Totals by Claim Type					
Medical	91,039,608	127,390,861	45,866,297	117,401,594	1,003,674
Pharmacy	70,370,170	79,657,526	48,048,645	64,613,752	361,708
Dental	13,960,378	7,906,501	8,081	427	52,699

* 2009 – 2011 CO APCD data archived in July – 201,093,345 claims

Insured Lives by Payer Type

Based on member eligibility data as of the November 2019 data refresh; including member eligibility data as of September 2019 for one major payer accounting for less than 10% of unique insured lives.*

Total	Commercial	Medicaid	Medicare Advantage	Medicare FFS	Unclassified
4,281,126	2,021,584	1,261,363	616,220	333,784	48,175
100%	47.2%	29.5%	14.4%	7.8%	1.1%

* See note below for explanation of methodology.

Commercial Market Coverage*

Coverage Percent	Commercial Lives Covered**	Insurable Population
43.1%	1,419,360	3,293,500

* Based on 2018 population data – most recent population data available from Kaiser Family Foundation

** Adjusted to include Medical membership only (previous reports also included pharmacy, dental, and behavioral health membership)

Submitters

Commercial* (Monthly)	Medicare FFS (Quarterly)	Medicaid FFS (Monthly)
41 Commercial Payers	CMS	HCPF

* includes all payers outside of Medicaid/Medicare FFS

Change in Methodology

As noted above, data for a major payer were not available for this snapshot report due to a comprehensive initiative for a major payer to resubmit claims. In order to account for this inconsistency, this payer's submission numbers from the September 2019 data refresh are included in the Insured Lives by Payer Type for this reporting period.

Appendix B: CO APCD FY 19 Data Requests

Stakeholder Category	Scholarship Recipient	Project Summary	Product Type
Employer		This analysis provided information on spending for health care services for the employer's covered members.	Standard Report
Employer		This analysis provided information on spending for health care services for this employer's covered members.	Standard Report
Government / State Agency		This agency used CO APCD data to report pharmacy expenditures for Medicaid and commercially insured members for brand and generic drugs with the highest costs and highest utilization.	Custom Report
Government / State Agency		The Prometheus analytics tool was used to create episodes of care for Medicaid and commercially insured members using data from the CO APCD.	Custom Report
Government / State Agency		This project included outputs generated with CO APCD data from the MedInsight Waste Calculator analytic tool developed by Milliman, using the Choosing Wisely guidelines for high value care.	Custom Report
Government / State Agency		This agency used CO APCD data and analytics to understand variation in the average amounts hospitals are paid for inpatient procedures and possibly help reveal any biases to over-code Medicaid inpatient stays in order to maximize payment.	Custom Report
Government / State Agency		This report featured a Tableau dashboard exploring different measures related to access to care in Colorado.	Custom Report
Government / State Agency		Using Medicare a reference point, this project explored pricing for commercial payers for inpatient and outpatient procedures.	Custom Report
Government / State Agency		Price and resource utilization are two drivers of the overall cost of total care for providers. This project explored these two elements for adult Medicaid and for adult commercially insured members for the state and for DOI and Regional Care Collaborative Organization (RCCO) regions.	Custom Report
Government / State Agency		This project was working to find common solutions to workforce data needs and to form effective collaborations for the collection, management, sharing, and distribution of health professional workforce data.	Custom Report
Government / State Agency	Yes	This agency used CO APCD data to determine the potential savings and costs associated with a reinsurance program.	Limited Data Set
Government / State Agency		CO APCD data informed an analysis of spending and utilization rates for select procedures on a named provider and payer basis based on DOI geographic rating regions.	Custom Report
Government / State Agency	Yes	A Colorado State Legislator used CO APCD data to inform legislation about out-of-network billing.	Custom Report

Stakeholder Category	Scholarship Recipient	Project Summary	Product Type
Government / State Agency		This agency used aggregated employer, county, and state level CO APCD data to compare their inpatient and outpatient costs to what Medicare would pay for the same services.	Standard Report
Government / State Agency		CO APCD data helped this agency examine patterns of care around knee arthroscopy and knee replacement/revision compared to other regions in Colorado as well as the referral patterns that lead to these procedures.	Custom Report
Government / State Agency		This initiative used CO APCD data to analyze, evaluate, and model claims data to support a statewide health care transformation project, focusing on the integration of behavioral health care services with physical health care services in primary care settings.	Custom Report
Government / State Agency		The initiative used CO APCD data and analytics to support evidence-based changes that helped providers improve outcomes for their patients while lowering costs.	Custom Report
Government / State Agency		Given the high health insurance premiums in their county, this agency used CO APCD data to understand how the number of self-funded lives in their area impacts costs, identify cost drivers, and compare their costs to a community on the Front Range.	Limited Data Set
Government / State Agency		This agency is undertaking a collaborative effort to reduce health care cost, improve access to services, and understand cost drivers in their county. They used the Outmigration and CPT4 reports to understand what services county residents leave the area to receive and to investigate the general volume of services in the county compared to statewide and Front Range.	Standard Report
Health System		This health system is using CO APCD data to understand reimbursement amounts and volume for specific procedures in the Denver area to ensure that their pricing model aligns with the region.	Custom Report
Health System		Though this health system has a robust stream of internal administrative data, it is not comprehensive. This subscription to CO APCD data enabled a broad range of improvements designed to impact patients, providers, payers and employers.	De-Identified Data Set
Hospital		The outmigration report helped this hospital to understand where patients were going for care and what services they were seeking.	Standard Report
Non-Profit & Others	Yes	This data was for use with the Milliman Low Value Care Calculator.	Limited Data Set
Non-Profit & Others	Yes	This study is investigating the cost of care at end of life and the opportunities to improve outcomes while lowering costs.	Limited Data Set
Non-Profit & Others		This nonprofit used CO APCD data combined with the Milliman MedInsight Low Value Care analytic tool to identify medical tests, treatments, and procedures considered to be of low value in northern Colorado and comparing the results to other parts of the state.	Custom Report

Stakeholder Category	Scholarship Recipient	Project Summary	Product Type
Non-Profit & Others	Yes	This nonprofit organization used CO APCD data to evaluate a plan to reduce the number of children on Medicaid that go to the emergency department or urgent care for treatment better provided in a medical home setting.	Fully-Identifiable Data Set
Non-Profit & Others	Yes	With this report, the nonprofit intended to determine the prescription drugs make up the larger share of expenditures, examine possible trends, and identify potential areas of opportunity to control costs that might inform policy advocacy and consumers.	Custom Report
Non-Profit & Others		This nonprofit used CO APCD data to determine if the dental benefit inclusion for Health First Colorado has reduced ED utilization for dental pain.	Custom Report
Non-Profit & Others	Yes	This nonprofit received a sample data set to help their members understand what CO APCD contains, how it is delivered and how it can be used to best suit the needs of their project.	De-Identified Data Set
Non-Profit & Others	Yes	CO APCD data helped this nonprofit gain a better understanding of charging patterns for professional services in Colorado as they relate to out-of-network and variations in pricing.	Custom Report
Non-Profit & Others		The outmigration reports allowed individual hospitals the opportunity to understand what services their local residents leave the area to receive. Patterns of outmigration could inform hospital leadership and the community about services that are needed or issues related to over / under-utilization, etc.	Standard Report
Non-Profit & Others		This nonprofit used CO APCD data in a tool to help customers quickly and anonymously estimate annual costs and preview plans.	De-Identified Data Set
Non-Profit & Others	Yes	This project used CO APCD data to understand the prevalence, costs, payer type, and services used by those with spinal cord injuries (SCI). This was the first step in understanding how individuals with SCI interact with the health care system.	Custom Report
Non-Profit & Others		This national nonprofit and state partners across the nation used CO APCD data to determine how the total cost of care and use of health care services at the practice level varies across different regions of the U.S. and Colorado to help physicians identify ways to improve quality and lower costs.	Custom Report
Non-Profit & Others		CO APCD data helped this nonprofit examine emergency department usage in their region in order to understand where there is significant variation in utilization and cost and how this compares to other areas in the state.	Custom Report
Non-Profit & Others	Yes	CO APCD data allowed this nonprofit to look at ED visits and potentially avoidable costs in northwest Colorado, Grand, Jackson, Moffat, Rio Blanco, and Routt Counties.	Custom Report
Non-Profit & Others		CPT code 99497 was established in 2016 to allow reimbursement for advanced care directive discussions with a health care provider. This nonprofit used CO APCD data to determine whether the volume of advanced care directive billing changed in Colorado as well as Weld and Larimer counties between January 1, 2016 and December 31, 2018, where patients were having the discussions, and which payer was being reimbursed.	Custom Report

2019 COLORADO ALL PAYER CLAIMS DATABASE ANNUAL REPORT

Stakeholder Category	Scholarship Recipient	Project Summary	Product Type
Payer		This payer validated their internal premium-setting actuarial analytics against aggregated analyses of risk-adjusted CO APCD data.	Custom Report
Payer		This payer used de-identified CO APCD data to understand how their hospital and physician discounts compare to other de-identified payers in the Colorado market.	Custom Report
Payer		This payer was part of a multi-payer initiative fostering collaboration between public and private health care payers to strengthen primary care.	Fully-Identifiable Data Set
Payer		This payer used the CO APCD to understand the fair market value for specific treatment codes and ensure patients received fairly negotiated rates.	Custom Report
Provider		The goal of this provider's project was to understand volume trends and costs across the state CPT codes related to specific procedures. By understanding these volumes, spend amounts, and trends, for in and out of network payments they could have more informed conversations regarding current legislative initiatives and their potential impact.	Custom Report
Provider		This provider was using CO APCD data to investigate costs of primary care and specialty services for their members.	Custom Report
Provider	Yes	The overall objective of this project was to integrate data from the CO All Payer Claims Database to with Electronic Health Records data. The integrated dataset would allow the provider to produce utilization, cost and quality indicator reports to support safety net population health improvements with its members.	Fully-Identifiable Data Set
Provider		This provider used CO APCD data to evaluate the cost of care, total reimbursement, and service utilization for an integrated health home for children and families in Colorado.	Limited Data Set
Provider		These providers used CO APCD data to understand reimbursement trends related to anesthesia services.	De-Identified Data Set
Provider		This provider used CO APCD data to answer physician questions related to the 2019 Surprise Hospital Bill legislation about how it might impact their industry	Custom Report
Researcher		By using social network analysis methods and CO APCD data, these researchers hoped to characterize variation in the networks of providers who care for adults with serious mental illness and determine whether this variation is associated with the quality of care for physical health conditions that these patients receive.	Limited Data Set
Researcher		These researchers used CO APCD data to determine whether the legalization of recreational cannabis impacted opioid utilization and harm resulting from opioid use.	Limited Data Set
Researcher		In a nationwide study incorporating CO APCD data, these researchers analyzed payments made by commercial insurers for inpatient and outpatient procedures at acute care hospitals compared to what Medicare pays for the same services.	De-Identified Data Set

2019 COLORADO ALL PAYER CLAIMS DATABASE ANNUAL REPORT

Stakeholder Category	Scholarship Recipient	Project Summary	Product Type
Researcher	Yes	Researchers used CO APCD to investigate the effects of the long-term physiological health effects of prescribed psychotropic drugs (stimulants, antidepressants, antipsychotics, anxiolytics, and mood stabilizers).	Limited Data Set
Researcher		Researchers used CO APCD data to investigate how transitions between Health First Colorado (Medicaid), Medicare and private insurance plans are associated with access and continuity of care and health care spending.	Limited Data Set
Researcher	Yes	Researchers used CO APCD data to investigate whether there is a correlation between hospitalization for lower respiratory infections prior to age two and the development of asthma after age five.	Limited Data Set
Researcher	Yes	Researchers used CO APCD data in conjunction with clinical data for Latino patients with advanced medical illness in both rural and urban areas to investigate whether an intervention with a patient navigator improved access to and utilization of palliative care while lowering costs for this underserved population.	Fully-Identifiable Data Set
Researcher		CO APCD data helped researchers estimate the proportion of the vaccine-eligible population that received the human papillomavirus (HPV) vaccine and determine the distance traveled for the service.	Limited Data Set
Researcher		Researchers used CO APCD data to link specific patients with the existing health data warehouse that includes information for individuals treated at specific facilities in Colorado. Incorporating CO APCD information into their data warehouse will allow them to provide a more complete dataset on their patients.	Limited Data Set
Researcher	Yes	The researchers used CO APCD data to measure how often certain cardiac stress tests that provide no benefit to patients, and can sometimes lead to patient harm, are occurring in Colorado. By determining why these cardiac stress tests are performed in poor-performing hospitals and identifying the best practices that minimize their use in top-performing hospitals, researchers hoped to discover the most effective ways of reducing use of the tests in Colorado.	Limited Data Set
Researcher		A researcher is using CO APCD data to assess the short and long term health effects associated with unconventional natural gas development (UNGD), including hydraulic fracturing (fracking) and horizontal drilling.	Fully-Identifiable Data Set
Researcher	Yes	Risk evaluation and mitigation strategies (REMS) are restrictions the FDA places on high-risk drugs that would otherwise be removed from the market. The goal of this project was to eventually be able to evaluate REMS adoption and implementation.	Limited Data Set & Custom Report
Vendor		This vendor is building a tool designed to help consumers and their providers navigate the health care pricing landscape. They used CO APCD data to determine median facility reimbursements and provider quality information.	De-Identified Data Set

2019 COLORADO ALL PAYER CLAIMS DATABASE ANNUAL REPORT

Stakeholder Category	Scholarship Recipient	Project Summary	Product Type
Vendor		This vendor used CO APCD data to help determine the cost savings of a wearable technology intervention as well as integrate with the intervention interface.	De-Identified Data Set
Vendor		This vendor helps providers to develop and operate episode of care payment programs to improve clinical outcomes, lower costs and increase patient satisfaction. They hoped to integrated CO APCD data into their Colorado-based initiatives to refine provider-level cost and quality metrics for episodes of care and establish benchmarks for comparison.	Limited Data Set

Appendix C: Example County Level Profile – Morgan County

Indicator	Morgan County	State	Comparison to State	Notes
Insurance Coverage				
Uninsured	8.00%	9.40%	-15%	County Health Rankings, varies (www.countyhealthrankings.org)*
Access, General, Mental & Oral Health				
General Health				
Primary Care Physician ratio	1,770:1	1,230:1	44%	County Health Rankings, varies (www.countyhealthrankings.org)
Adults 18+ with one or more regular providers	77.30%	76.30%	1%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Has a usual source of care	87.9%	84.2%	4%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Days of Poor Physical Health (out of past 30)	3.6	3.4	6%	Colorado Health Access Survey, 2017 (https://www.coloradohealthinstitute.org/data)*
Low Birth Weight	9.0%	8.9%	1%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Premature Death	8300	5900	41%	County Health Rankings, varies (www.countyhealthrankings.org)
Mental Health and Depression				
Mental health provider ratio	470:1	300:1	57%	County Health Rankings, varies (www.countyhealthrankings.org)
Needed mental health in past 12 mo but didn't get	9.3%	11.8%	-21%	Colorado Health Access Survey, 2017 (https://www.coloradohealthinstitute.org/data)*
Days of Poor Mental Health (out of past 30)	3.5	3.3	6%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Suicide (10th leading cause of death/100,000)	16.3	19.1	-15%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Depression	6.39	5.1	25%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Oral Health				
Dentist ratio	1,280:1	1,260:1	2%	County Health Rankings, varies (www.countyhealthrankings.org)
Adult Tooth Loss	43.4%	37.0%	17%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Child Poor Oral Health	n/a	5.7%	n/a	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Socio-economic Factors and Health Behaviors				
Access to Healthy Foods (Rate per 10,000)	1.4	1.2	17%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Violent Crime (/100,000)	203	326	-38%	County Health Rankings, varies (www.countyhealthrankings.org)
Children in Poverty	15%	12%	25%	County Health Rankings, varies (www.countyhealthrankings.org)

Indicator	Morgan County	State	Comparison to State	Notes
Teen births (/1000)	39	22	77%	County Health Rankings, varies (www.countyhealthrankings.org)
Chronic Condition, Quality and Prevention				
Arthritis				
Adult Arthritis	18.3%	22.6%	-19%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Asthma				
Asthma Prevalence (Rate/1000)	3.3	3.62	-9%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Appropriate Medication for Asthma	89.8%	88.5%	1%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/quality-measures/)
Diabetes				
Diabetes Type I	0.38	0.39	-3%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Diabetes Type II	4.71	4.78	-1%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Diabetes A1c Test	78.0%	75.4%	3%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/quality-measures/)
Heart-Related Conditions				
Adults who ever had a heart attack	3.4%	3.1%	10%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Heart Disease (1st leading cause of death/100,000)	134.5	126.3	6%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Congestive Heart Failure	0.75	0.92	-18%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Elevated Blood Cholesterol	31.1%	33.6%	-7%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Elevated Blood Pressure	26.4%	25.8%	2%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Hypertension	10.09	11.85	-15%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Respiratory Conditions/Influenza				
Chronic lower respiratory	60.4	46.5	30%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Chronic lower respiratory disease (3rd leading cause of death)	53.2	46.5	14%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
COPD	2.04	2.05	0%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Influenza and pneumonia (6th leading cause of death)	24.3	12.4	96%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Adults 18+ with Flu shot in past 12 mo	47.10%	44.50%	6%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)

Indicator	Morgan County	State	Comparison to State	Notes
Adults 65+ with Pneumonia shot in past 12 mo	74.20%	75.40%	-2%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Obesity				
Adult Obesity	26.1%	20.9%	25%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Child Obesity	10.2%	10.1%	1%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
Cancer Prevalence & Screening				
Breast Cancer	0.3	0.79	-62%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Breast Cancer Screening	42.4%	57.1%	-26%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/quality-measures/)
Cervical Cancer	n/a	0.21	n/a	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Cervical Cancer Screening	49.4%	57.6%	-14%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/quality-measures/)
Colorectal Cancer	n/a	0.14	n/a	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Colorectal Cancer Screening	21.5%	28.4%	-24%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/quality-measures/)
Lung Cancer	n/a	0.09	n/a	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/condition-prevalence/)
Cost and Utilization of Health Care Services				
Total Health Care Cost (Per Person Per Year, PPPY)	\$3,600	\$3,925	-8%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Health Plan Only Cost	\$3,387	\$3,565	-5%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Patient Only Cost	\$218	\$361	-40%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Inpatient Cost & Utilization				
Inpatient Cost (PPPY)	\$820	\$840	-2%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Health Plan Only Cost	\$802	\$809	-1%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Patient Only Cost	\$20	\$31	-35%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Inpatient Utilization				
Unplanned Hospitalizations (Rate/1000)	43	43	0%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/utilization/)
Heart Disease Hospitalizations (/100,000)	2571.2	2156.9	19%	CO Health Indicators, 2015 (https://www.colorado.gov/pacific/cdphe/colorado-health-indicators)
30-Day Readmissions (Rate/1000)	6	7	-14%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/utilization/)
Observation Stays (Rate/1000)	24	21	14%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/utilization/)

Indicator	Morgan County	State	Comparison to State	Notes
Outpatient Cost & Utilization				
Outpatient Cost (PPPY)	\$1,040	\$880	18%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Health Plan Only Cost	\$968	\$803	21%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Patient Only Cost	\$73	\$76	-4%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Outpatient Utilization				
Outpatient Services (Rate/1000)	1760	1200	47%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/utilization/)
Emergency Room Visits (Rate/1000)	510	360	42%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/utilization/)
Professional Cost				
Professional Cost (PPPY)	\$980	\$1,400	-30%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Health Plan Only Cost	\$904	\$1,239	-27%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Patient Only Cost	\$78	\$162	-52%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Pharmacy Cost & Utilization				
Pharmacy Cost (PPPY)	\$990	\$910	9%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Health Plan Only Cost	\$934	\$807	16%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Patient Only Cost	\$61	\$103	-41%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/cost-of-care/)
Pharmacy Utilization				
Pharmacy Scripts, All (Rate/1000)	11460	10,760	7%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/utilization/)
Pharmacy Scripts, Generic Only (Rate/1000)	9320	8,680	7%	CO APCD, 2015 (www.civhc.org/get-data/public-data/interactive-data/utilization/)

Legend

-  Indicates a negative comparison by at least five percent
-  Indicates a positive comparison by at least five percent

*Note, this is for HSR I and includes multiple counties (CHAS Survey Data)

Appendix D: CO APCD Public Reports Released During FY 19

Data Bytes

In/Out of Network Costs

Legislative District Medical and Pharmacy Total Spend

Interactive Reports, Infographics, and Downloadable Data

Shop for Care: Imaging

Shop for Care: Episodes of Care for 12 Common Procedures

Medicare Reference Based Price Comparison

Spot Analyses and White Papers

Medicare Reference Based Price Analysis (replaced by interactive report)

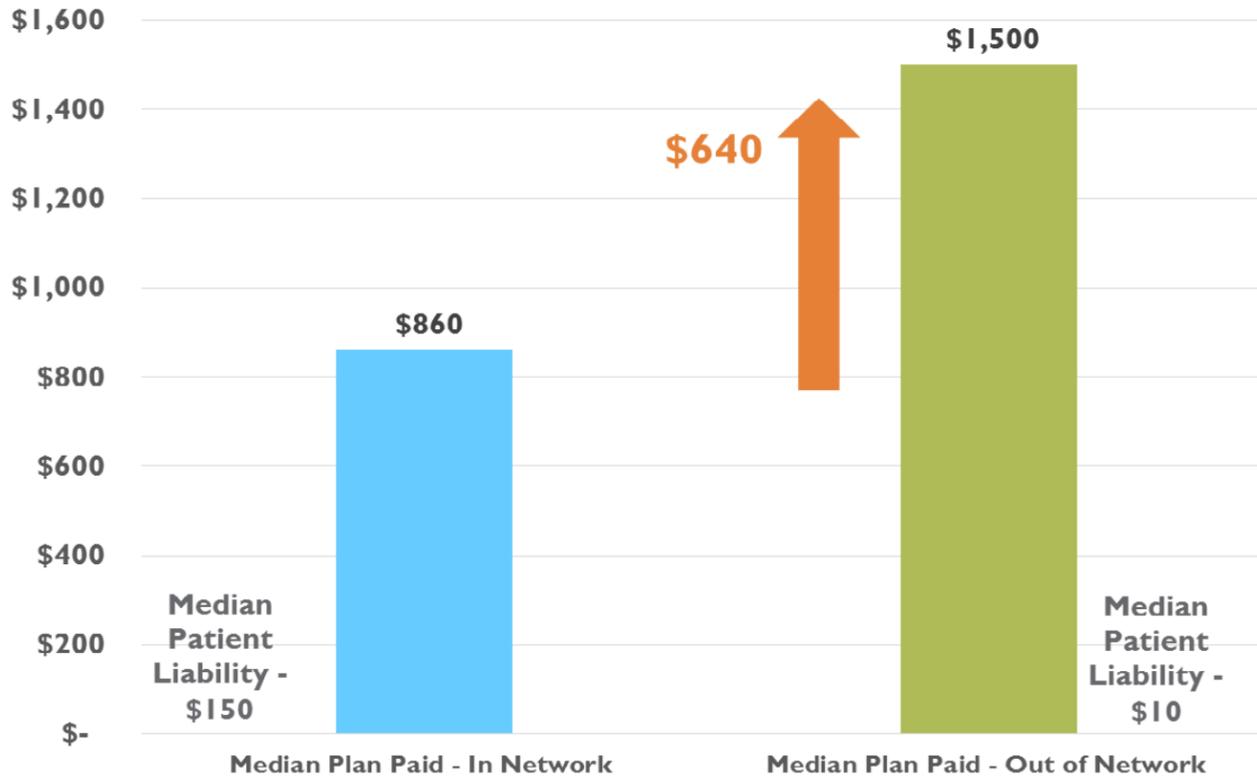
Commercial and Medicaid Scorecards for Payment Reform with Catalyst for Payment Reform

Spot Analysis: Prescribing Opioids in Colorado

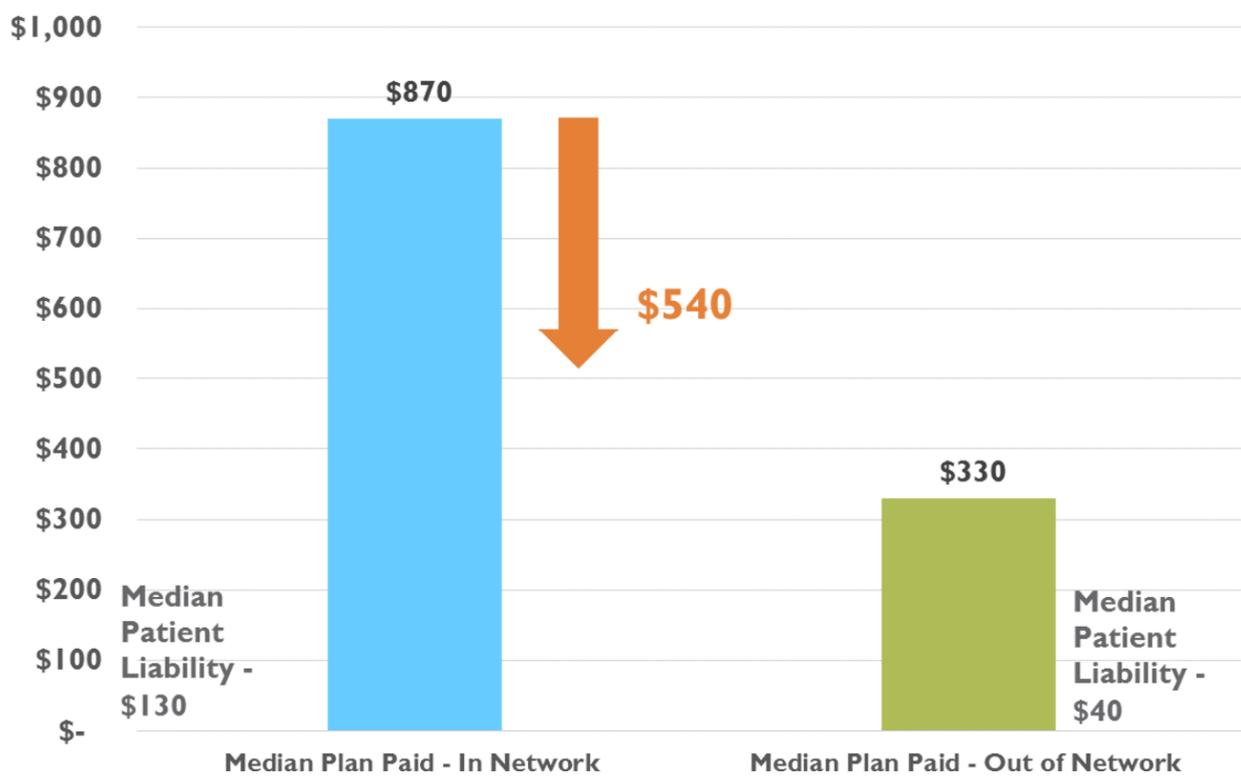
Total Cost of Care Update with the Network for Regional Healthcare Improvement



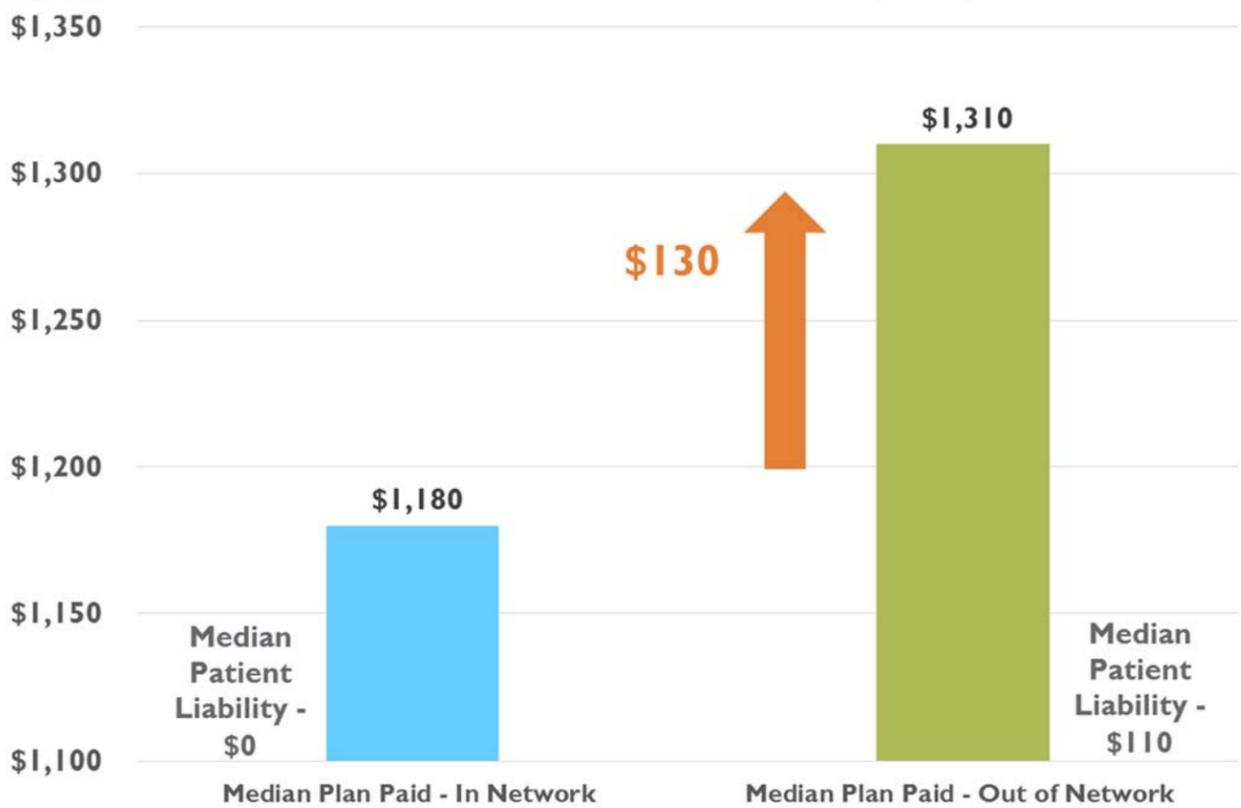
Laparoscopic Appendectomy (CPT Code 44970), Median In and Out of Network Commercial Professional Fee Paid Amounts, 2017, CO APCD



Laparoscopic Cholecystectomy (CPT Code 47562), Median In and Out of Network Commercial Professional Fee Paid Amounts, 2017, CO APCD



Small Intestine Resection (CPT Code 47562), Median In and Out of Network Commercial Professional Fee Paid Amounts, 2017, CO APCD



Dollar amounts represent actual payments paid to health care providers using the Current Procedural Terminology (CPT) code indicated and do not include facility fees. In and out of network is determined based on the Provider Network Indicator field submitted by insurance companies to the Colorado All Payer Claims Database. For commercial health insurance claims, approximately 44% of claims submitted are not attributed as in or out of network and therefore were eliminated from this analysis. Patient liability is the amount payers expect that a patient will pay out of pocket; the CO APCD does not collect any actual payments or additional payments made directly to providers.



CENTER FOR IMPROVING
VALUE IN HEALTH CARE

Colorado Legislative District Medical and Pharmacy Total Spend Analysis

December 2018

Report Overview

This analysis provides allowed amounts (paid amounts) for pharmacy and medical care by Colorado legislative district. The data is based on 2017 claims submitted to the Colorado All Payer Claims Database (CO APCD) by Commercial payers, Medicare Advantage and Medicaid. The dollar amounts **do not include** Medicare fee-for-service claims, Medicaid supplemental payments, or other federal programs such as the VA, Indian Health Services or Tricare. Self-insured ERISA employer plans are voluntary and as a result, approximately 25% of all self-insured claims are represented in this analysis.

Methodology

Total Allowed Amounts (plan paid and member paid amounts) were calculated by Legislative District using zip code location of the member, regardless of where care was accessed. If zip codes were part of multiple districts, they were counted for each district, therefore statewide total allowed amounts will not equal the sum of all districts. Unique Persons Count for each district represents individuals with eligibility coverage as submitted to the CO APCD in 2017.



CENTER FOR IMPROVING
VALUE IN HEALTH CARE

Colorado Legislative District Medical and Pharmacy Total

Spend Analysis, Colorado All Payer Claims Database (CO APCD), 2017,
Medicaid, Medicare Advantage and Commercial Payers

Legislative District	Total Medical Allowed Amount	Total Pharmacy Allowed Amount	Total Allowed Amount	Member Count
COLORADO Total	\$ 13,293,100,064	\$ 2,967,422,317	\$ 16,260,522,381	2,695,679
HOUSE DISTRICT 1	\$ 715,062,464	\$ 154,831,837	\$ 869,894,300	148,980
HOUSE DISTRICT 2	\$ 422,600,888	\$ 109,795,747	\$ 532,396,635	90,037
HOUSE DISTRICT 3	\$ 603,123,197	\$ 140,055,290	\$ 743,178,487	109,851
HOUSE DISTRICT 4	\$ 694,100,243	\$ 144,403,074	\$ 838,503,317	144,916
HOUSE DISTRICT 5	\$ 686,812,017	\$ 159,887,336	\$ 846,699,353	160,494
HOUSE DISTRICT 6	\$ 727,119,140	\$ 178,777,637	\$ 905,896,776	147,259
HOUSE DISTRICT 7	\$ 317,071,625	\$ 59,633,374	\$ 376,704,999	73,526
HOUSE DISTRICT 8	\$ 464,653,740	\$ 117,076,623	\$ 581,730,362	101,753
HOUSE DISTRICT 9	\$ 444,630,449	\$ 92,937,478	\$ 537,567,928	74,628
HOUSE DISTRICT 10	\$ 268,556,109	\$ 64,940,422	\$ 333,496,530	58,480
HOUSE DISTRICT 11	\$ 357,979,635	\$ 81,281,446	\$ 439,261,081	75,325
HOUSE DISTRICT 12	\$ 648,203,856	\$ 146,516,119	\$ 794,719,975	136,857
HOUSE DISTRICT 13	\$ 406,036,573	\$ 96,306,668	\$ 502,343,241	88,891
HOUSE DISTRICT 14	\$ 271,852,468	\$ 65,041,892	\$ 336,894,360	59,774
HOUSE DISTRICT 15	\$ 386,832,383	\$ 90,980,175	\$ 477,812,558	88,420
HOUSE DISTRICT 16	\$ 356,623,689	\$ 96,323,644	\$ 452,947,333	77,085
HOUSE DISTRICT 17	\$ 437,753,966	\$ 105,742,637	\$ 543,496,604	96,148
HOUSE DISTRICT 18	\$ 464,692,101	\$ 123,547,568	\$ 588,239,670	97,278
HOUSE DISTRICT 19	\$ 278,601,088	\$ 68,467,452	\$ 347,068,540	59,760
HOUSE DISTRICT 20	\$ 375,241,551	\$ 101,985,209	\$ 477,226,760	78,123
HOUSE DISTRICT 21	\$ 240,410,270	\$ 59,826,034	\$ 300,236,304	51,543
HOUSE DISTRICT 22	\$ 319,486,524	\$ 74,314,304	\$ 393,800,828	62,153
HOUSE DISTRICT 23	\$ 602,879,706	\$ 134,648,734	\$ 737,528,440	112,808
HOUSE DISTRICT 24	\$ 643,843,207	\$ 138,593,652	\$ 782,436,858	113,312
HOUSE DISTRICT 25	\$ 417,352,971	\$ 98,139,300	\$ 515,492,271	83,257
HOUSE DISTRICT 26	\$ 215,345,354	\$ 35,625,517	\$ 250,970,871	39,860
HOUSE DISTRICT 27	\$ 518,776,682	\$ 119,441,216	\$ 638,217,897	97,911
HOUSE DISTRICT 28	\$ 791,190,989	\$ 177,317,046	\$ 968,508,035	148,102
HOUSE DISTRICT 29	\$ 538,452,806	\$ 127,916,152	\$ 666,368,958	111,260
HOUSE DISTRICT 30	\$ 893,353,325	\$ 192,424,270	\$ 1,085,777,595	193,126
HOUSE DISTRICT 31	\$ 438,526,695	\$ 94,398,009	\$ 532,924,704	93,805
HOUSE DISTRICT 32	\$ 711,992,501	\$ 159,170,344	\$ 871,162,844	153,887
HOUSE DISTRICT 33	\$ 500,206,708	\$ 113,042,874	\$ 613,249,582	106,431
HOUSE DISTRICT 34	\$ 568,895,373	\$ 128,935,473	\$ 697,830,847	124,365
HOUSE DISTRICT 35	\$ 526,034,597	\$ 122,812,550	\$ 648,847,147	114,579
HOUSE DISTRICT 36	\$ 696,963,372	\$ 145,952,474	\$ 842,915,846	145,117
HOUSE DISTRICT 37	\$ 421,596,519	\$ 86,619,542	\$ 508,216,061	84,061
HOUSE DISTRICT 38	\$ 528,439,397	\$ 119,194,065	\$ 647,633,462	96,010
HOUSE DISTRICT 39	\$ 828,689,582	\$ 185,504,042	\$ 1,014,193,624	167,331
HOUSE DISTRICT 40	\$ 575,898,012	\$ 118,460,814	\$ 694,358,826	112,363
HOUSE DISTRICT 41	\$ 659,644,491	\$ 139,405,004	\$ 799,049,495	125,191
HOUSE DISTRICT 42	\$ 528,608,946	\$ 116,232,955	\$ 644,841,901	111,494
HOUSE DISTRICT 43	\$ 307,097,389	\$ 72,242,170	\$ 379,339,559	62,908
HOUSE DISTRICT 44	\$ 337,685,136	\$ 70,071,964	\$ 407,757,100	66,003
HOUSE DISTRICT 45	\$ 341,616,402	\$ 76,378,083	\$ 417,994,485	68,271
HOUSE DISTRICT 46	\$ 345,425,793	\$ 85,766,411	\$ 431,192,204	63,755



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VALUE IN HEALTH CARE

Colorado Legislative District Medical and Pharmacy Total

Spend Analysis, Colorado All Payer Claims Database (CO APCD), 2017,

Medicaid, Medicare Advantage and Commercial Payers

Legislative District	Total Medical Allowed Amount	Total Pharmacy Allowed Amount	Total Allowed Amount	Member Count
HOUSE DISTRICT 47	\$ 500,752,091	\$ 118,030,448	\$ 618,782,539	93,739
HOUSE DISTRICT 48	\$ 558,743,368	\$ 120,462,130	\$ 679,205,497	117,120
HOUSE DISTRICT 49	\$ 1,106,714,800	\$ 239,649,706	\$ 1,346,364,507	238,221
HOUSE DISTRICT 50	\$ 318,809,069	\$ 73,445,516	\$ 392,254,585	70,425
HOUSE DISTRICT 51	\$ 453,000,170	\$ 95,826,089	\$ 548,826,258	94,543
HOUSE DISTRICT 52	\$ 281,469,695	\$ 62,803,377	\$ 344,273,071	61,978
HOUSE DISTRICT 53	\$ 331,561,746	\$ 74,660,164	\$ 406,221,910	73,520
HOUSE DISTRICT 54	\$ 472,999,371	\$ 112,149,725	\$ 585,149,095	85,304
HOUSE DISTRICT 55	\$ 355,718,534	\$ 81,263,483	\$ 436,982,017	61,302
HOUSE DISTRICT 56	\$ 489,119,956	\$ 110,689,274	\$ 599,809,230	102,667
HOUSE DISTRICT 57	\$ 221,769,271	\$ 35,129,160	\$ 256,898,431	38,255
HOUSE DISTRICT 58	\$ 208,126,127	\$ 44,854,273	\$ 252,980,399	44,874
HOUSE DISTRICT 59	\$ 220,453,528	\$ 39,958,108	\$ 260,411,637	43,850
HOUSE DISTRICT 60	\$ 219,729,978	\$ 46,532,697	\$ 266,262,675	40,684
HOUSE DISTRICT 61	\$ 258,545,329	\$ 45,162,936	\$ 303,708,265	50,109
HOUSE DISTRICT 62	\$ 485,959,146	\$ 109,861,642	\$ 595,820,788	93,659
HOUSE DISTRICT 63	\$ 525,081,198	\$ 120,558,530	\$ 645,639,728	117,381
HOUSE DISTRICT 64	\$ 426,791,654	\$ 90,587,154	\$ 517,378,809	80,894
HOUSE DISTRICT 65	\$ 208,224,714	\$ 39,720,259	\$ 247,944,973	35,630
SENATE DISTRICT 1	\$ 815,100,847	\$ 178,090,246	\$ 993,191,093	163,258
SENATE DISTRICT 2	\$ 669,142,542	\$ 164,901,251	\$ 834,043,793	137,526
SENATE DISTRICT 3	\$ 500,309,489	\$ 124,833,644	\$ 625,143,133	94,061
SENATE DISTRICT 4	\$ 654,975,460	\$ 140,374,386	\$ 795,349,846	127,303
SENATE DISTRICT 5	\$ 369,422,730	\$ 63,235,876	\$ 432,658,606	69,398
SENATE DISTRICT 6	\$ 368,545,457	\$ 72,841,889	\$ 441,387,346	76,596
SENATE DISTRICT 7	\$ 431,915,283	\$ 103,674,058	\$ 535,589,340	75,942
SENATE DISTRICT 8	\$ 348,201,756	\$ 57,978,227	\$ 406,179,983	64,806
SENATE DISTRICT 9	\$ 464,444,963	\$ 117,183,414	\$ 581,628,377	97,379
SENATE DISTRICT 10	\$ 463,685,601	\$ 119,304,510	\$ 582,990,111	100,904
SENATE DISTRICT 11	\$ 579,768,043	\$ 150,609,201	\$ 730,377,244	126,504
SENATE DISTRICT 12	\$ 624,826,571	\$ 157,819,737	\$ 782,646,308	139,426
SENATE DISTRICT 13	\$ 493,993,014	\$ 113,414,976	\$ 607,407,990	106,721
SENATE DISTRICT 14	\$ 367,543,362	\$ 81,820,849	\$ 449,364,211	82,235
SENATE DISTRICT 15	\$ 879,106,698	\$ 191,056,738	\$ 1,070,163,436	187,931
SENATE DISTRICT 16	\$ 1,014,129,482	\$ 234,120,079	\$ 1,248,249,562	203,785
SENATE DISTRICT 17	\$ 719,601,177	\$ 164,127,750	\$ 883,728,928	152,536
SENATE DISTRICT 18	\$ 622,375,168	\$ 144,702,209	\$ 767,077,377	137,793
SENATE DISTRICT 19	\$ 752,782,900	\$ 173,191,061	\$ 925,973,961	146,633
SENATE DISTRICT 20	\$ 1,225,147,120	\$ 274,690,683	\$ 1,499,837,803	229,327
SENATE DISTRICT 21	\$ 1,121,006,148	\$ 253,179,285	\$ 1,374,185,432	244,485
SENATE DISTRICT 22	\$ 760,265,127	\$ 167,869,109	\$ 928,134,236	141,095
SENATE DISTRICT 23	\$ 1,334,501,309	\$ 292,497,312	\$ 1,626,998,621	282,090
SENATE DISTRICT 24	\$ 691,721,023	\$ 155,642,187	\$ 847,363,209	149,888
SENATE DISTRICT 25	\$ 1,131,266,927	\$ 249,150,990	\$ 1,380,417,916	248,305
SENATE DISTRICT 26	\$ 1,541,549,200	\$ 336,164,175	\$ 1,877,713,375	287,519
SENATE DISTRICT 27	\$ 562,959,834	\$ 118,957,309	\$ 681,917,143	108,825
SENATE DISTRICT 28	\$ 733,956,980	\$ 150,968,931	\$ 884,925,910	145,362



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Colorado Legislative District Medical and Pharmacy Total Spend Analysis

Colorado All Payer Claims Database (CO APCD), 2017,
Medicaid, Medicare Advantage and Commercial Payers

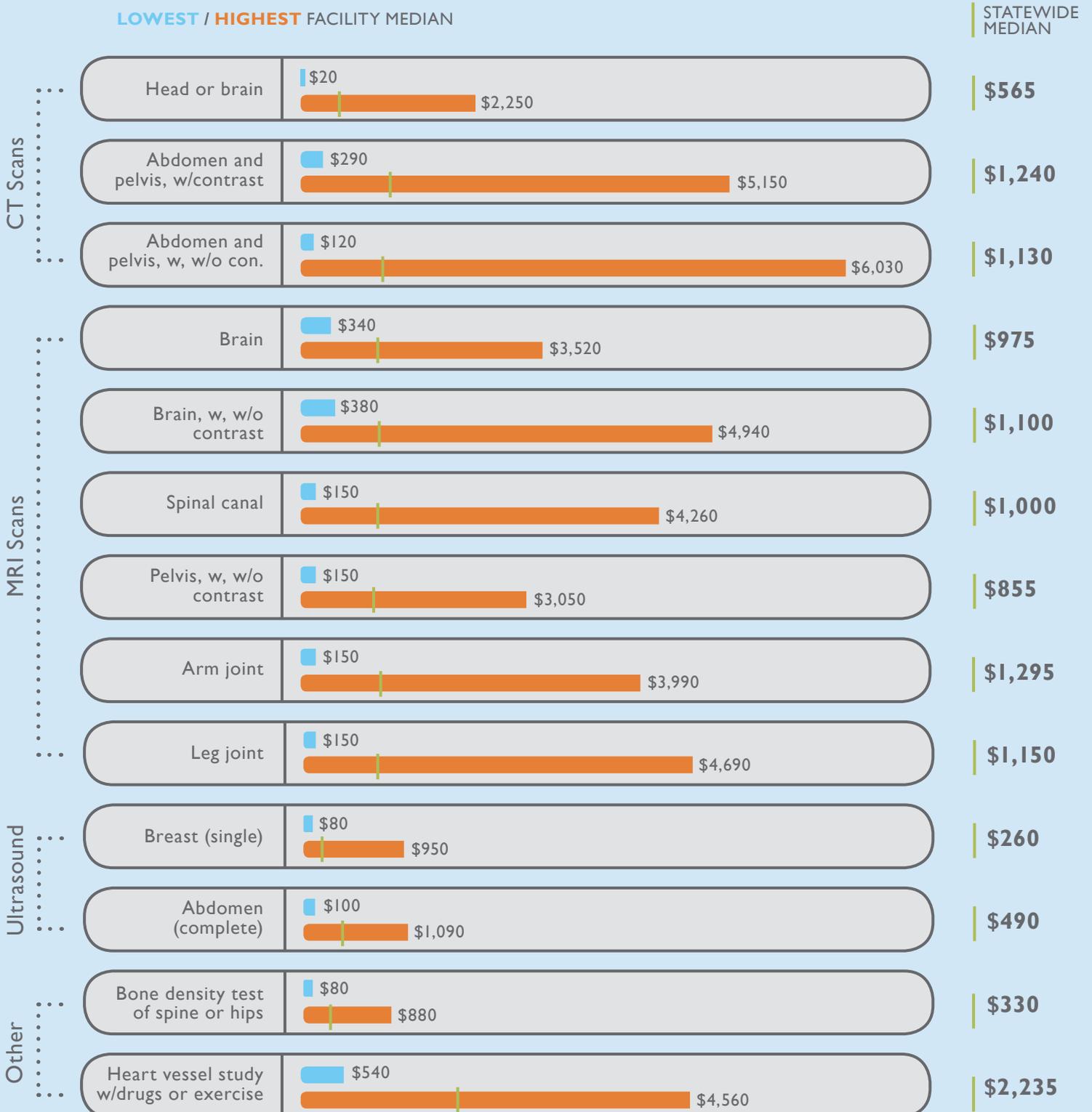
Legislative District	Total Medical Allowed Amount	Total Pharmacy Allowed Amount	Total Allowed Amount	Member Count
SENATE DISTRICT 29	\$ 795,486,986	\$ 175,308,899	\$ 970,795,885	166,941
SENATE DISTRICT 30	\$ 640,786,945	\$ 144,753,269	\$ 785,540,214	129,404
SENATE DISTRICT 31	\$ 905,265,439	\$ 216,302,925	\$ 1,121,568,364	171,049
SENATE DISTRICT 32	\$ 985,707,168	\$ 237,505,090	\$ 1,223,212,258	210,258
SENATE DISTRICT 33	\$ 604,237,019	\$ 137,219,561	\$ 741,456,580	136,011
SENATE DISTRICT 34	\$ 983,887,398	\$ 224,513,167	\$ 1,208,400,565	213,458
SENATE DISTRICT 35	\$ 745,188,746	\$ 168,749,709	\$ 913,938,455	145,408



Variation in Prices for Imaging Services, 2017

Colorado All Payer Claims Database

Visit www.civhc.org/shop-for-care for named facility comparisons for these imaging services along with episode-based procedure pricing.



LOWEST / HIGHEST FACILITY MEDIAN

STATEWIDE MEDIAN

X-Rays



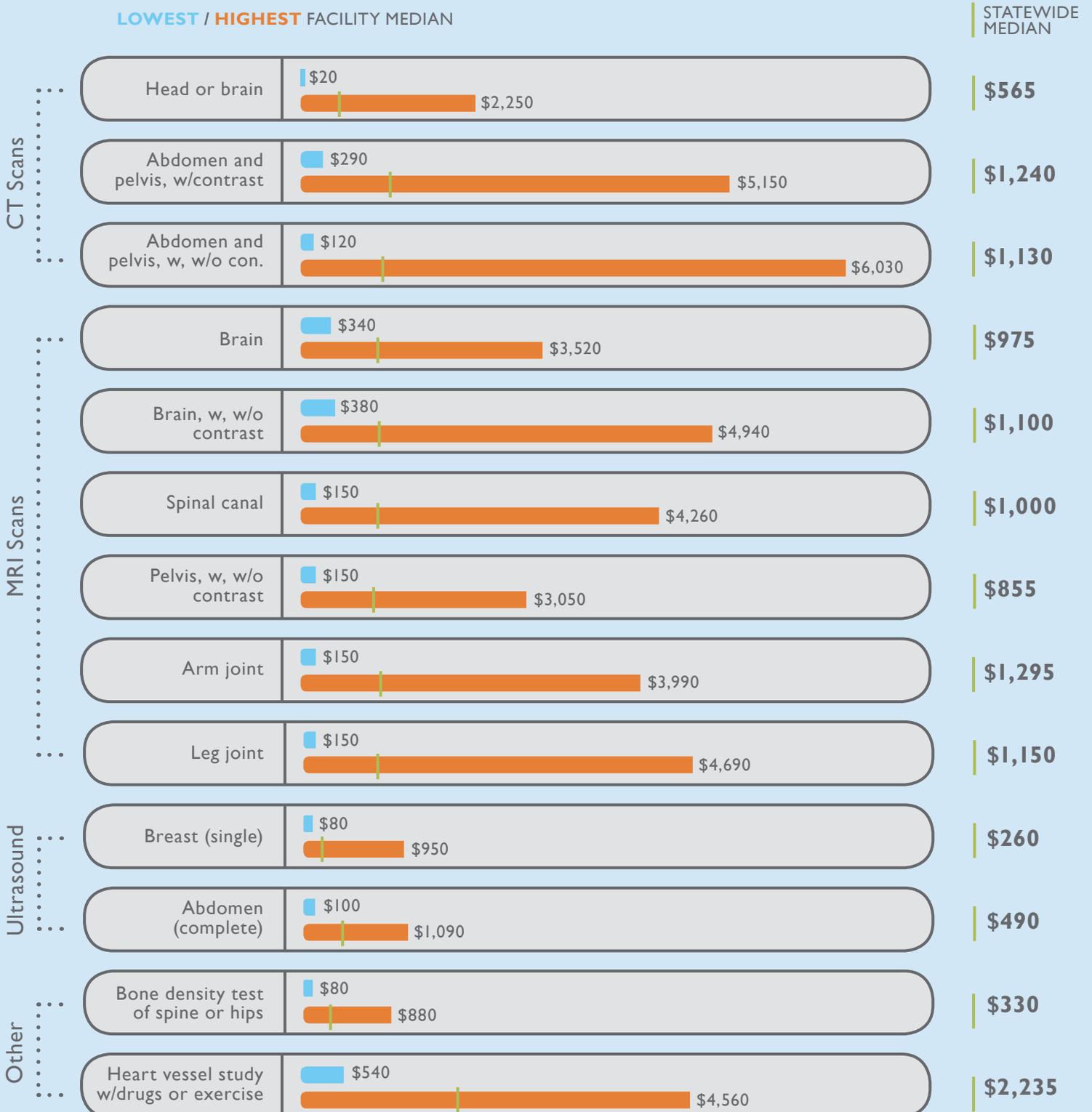
Data is based on 2017 claims submitted by commercial health insurance payers to the Colorado All Payer Claims Database. Dollar amounts reflect median facility payments only and do not include any professional or ancillary fees that may be associated with the service.



Variation in Prices for Imaging Services, 2017

Colorado All Payer Claims Database

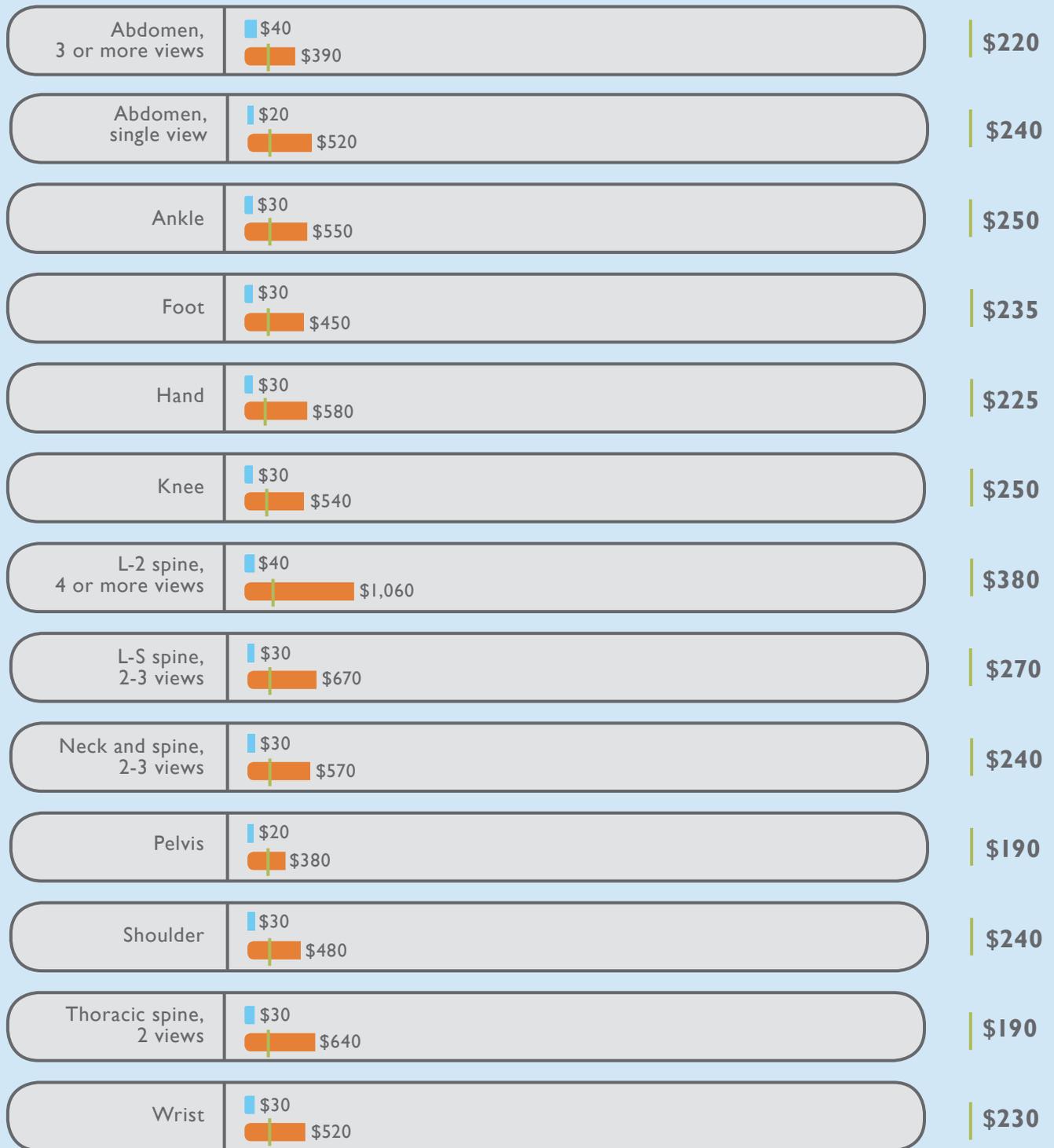
Visit www.civhc.org/shop-for-care for named facility comparisons for these imaging services along with episode-based procedure pricing.



LOWEST / HIGHEST FACILITY MEDIAN

STATEWIDE MEDIAN

X-Rays



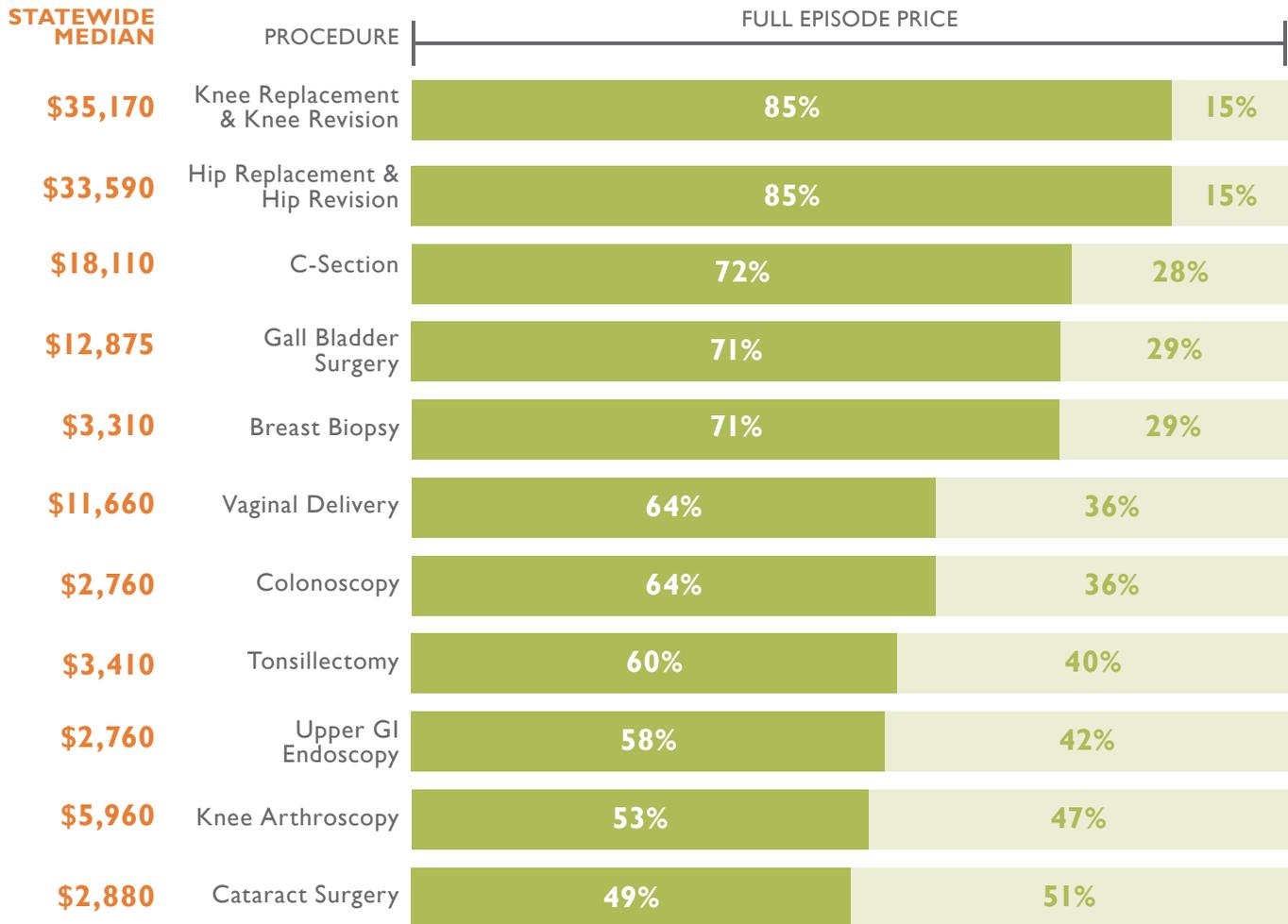
Data is based on 2017 claims submitted by commercial health insurance payers to the Colorado All Payer Claims Database. Dollar amounts reflect median facility payments only and do not include any professional or ancillary fees that may be associated with the service.

SHOP FOR CARE EPISODE PRICE BREAKDOWN

Colorado All Payer Claims Database (CO APCD)

Facility price and quality information available at www.civhc.org/shop-for-care/ provides total price information for high cost, high volume procedures. The total price is determined based on the full “episode” of care which includes everything that happens before, during and after a procedure. This infographic shows what percentage of the price is typically paid to the facility where the procedure takes place. For more information about what is included, visit the Shop for Care page and click on the FAQs in the resources section.

■ FACILITY PAYMENT
■ ALL OTHER PAYMENTS



.....

FULL EPISODE PRICE (includes all bills related to the procedure)



Facility bills: facility fees including equipment, surgical suite, medications, etc.

Provider bills: pre-, during, and post-doctor visits, anesthesiologist fee for the procedure, post-procedure physical therapy, etc.

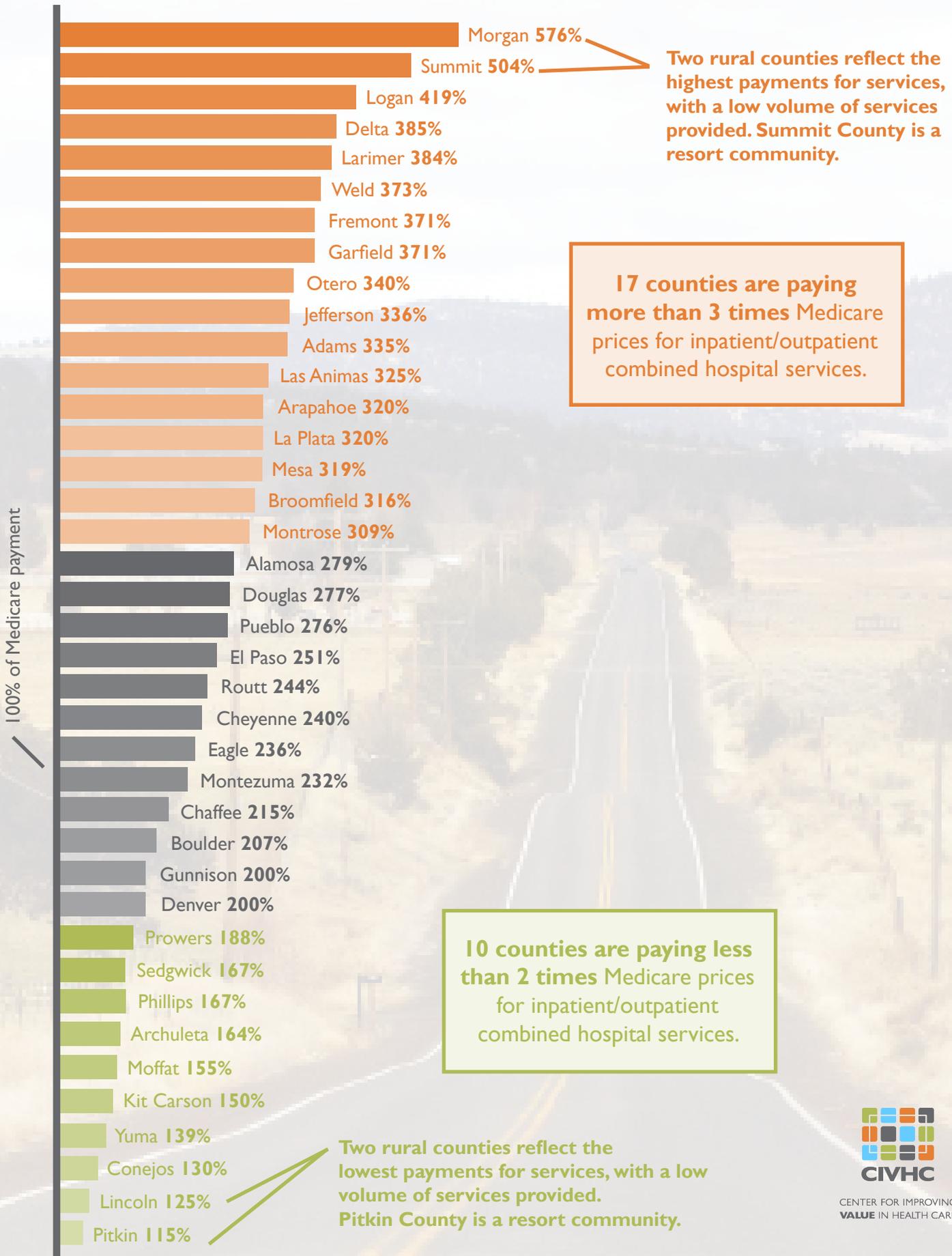
Labs/test bills: CT scans, MRIs, x-rays, labs, etc.

Pharmacy bills: pre- or post-procedure prescriptions (e.g. antibiotics, pain medication)



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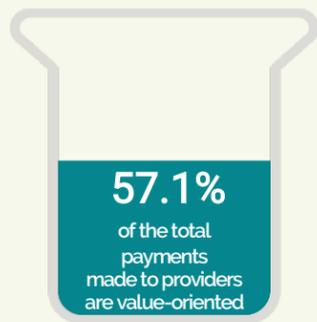
Medicare Reference-Based Commercial Price Variation By County for Inpatient/Outpatient Combined Hospital Services, 2015-2017



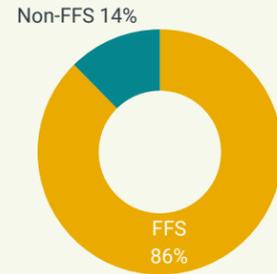
This information is based on data from the RAND Corporation analysis (https://www.rand.org/pubs/research_reports/RR3033.html) of commercial health insurance payments in the Colorado All Payer Claims Database (CO APCD) from 2015-2017. Percentage of Medicare represents the total commercial payment divided by the Medicare payment for those services where Medicare is the baseline at 100%. Visit www.civhc.org for the interactive and downloadable dataset. Not all counties are available due to low volume.



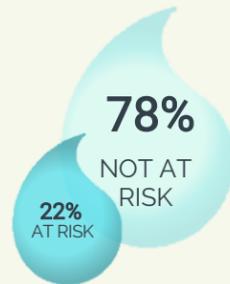
CENTER FOR IMPROVING
VALUE IN HEALTH CARE



The results of the Colorado Scorecard on Commercial Payment Reform are in, and 57% of all commercial payments are value-oriented—either tied to performance or designed to cut waste. Status-quo payments make up the remaining 43%. These data are from calendar year 2016 or the most recent 12 months available.



Fee-for-Service (FFS) remains the dominant base method of payments to providers, even when the payment is value-oriented. Of all the value-oriented commercial payments health plans made in Colorado in 2016, 86% are still based on FFS and 14% are based on a non-FFS payment method. Value-oriented payment methods categorized as non-FFS include: bundled payment, full capitation, partial or condition-specific capitation, and payment for non-visit functions, while pay-for-performance, shared savings, and shared risk rely on FFS.



Less than a quarter of value-oriented payments put providers at risk. About 78% of value-oriented payments offer providers a financial upside only, with no downside financial risk.

ACKNOWLEDGMENTS

The Colorado Scorecard on Commercial Payment Reform 2.0 was made possible by the Laura and John Arnold Foundation and the Robert Wood Johnson Foundation, as well as the leadership of the Center for Improving Value in Health Care (CIVHC). CPR thanks CIVHC staff Cari Frank, VP of Communication and Marketing, Jonathan Mathieu, VP of Data and Delivery, and Maria de Jesus Diaz-Perez, Director of Public Reporting; CPR project leads Andréa Caballero and Alejandra Vargas-Johnson; CPR staff Lea Tessitore and Roslyn Murray; as well as the health plans that provided data for the Scorecard, for their significant contributions to this project.

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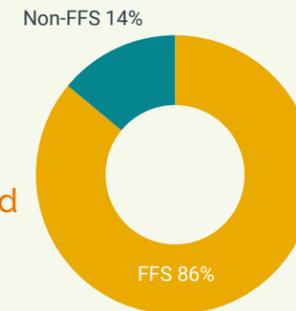


©2018 Catalyst for Payment Reform



2018 COLORADO SCORECARD ON Commercial Payment Reform

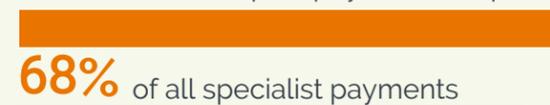
Use of Fee-For-Service in Value-Oriented Payments in Colorado



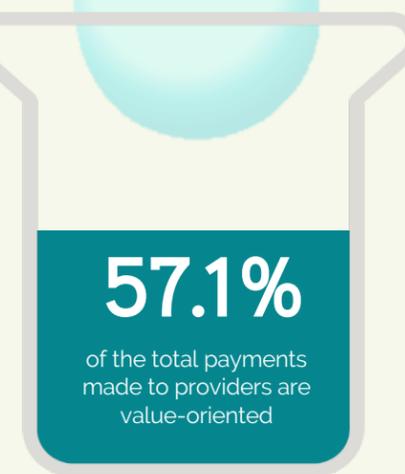
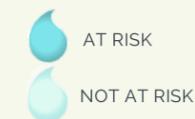
Share of Value-Oriented Payments that Put Providers at Financial Risk



Provider Participation in Value-Oriented Payments

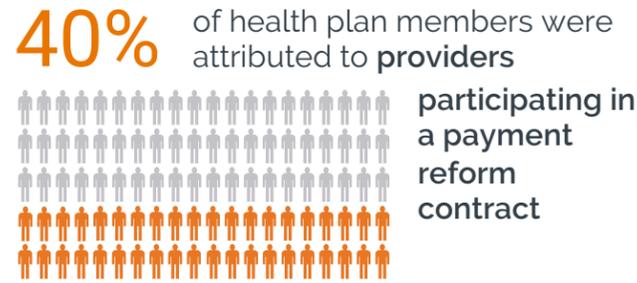


Share of Total Dollars Paid to Primary Care Providers and Specialists

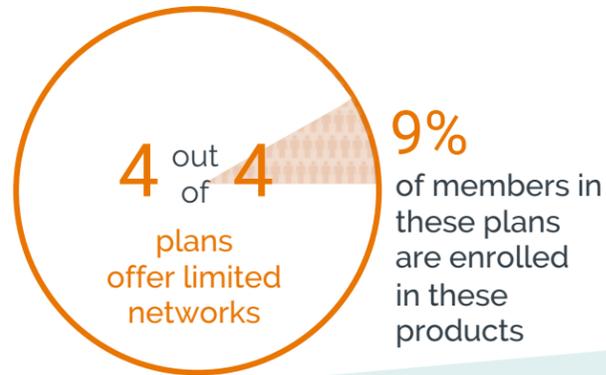


Economic Signals

ATTRIBUTED MEMBERS



LIMITED NETWORKS

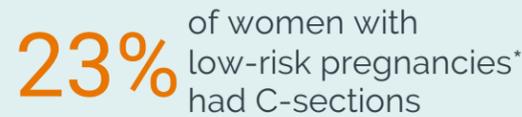


Payment Reform's Impact at a Macro-Level: Leading Indicators to Watch

Together, these metrics shed light on the impact of payment reform on the health care system in Colorado.

System Transformation

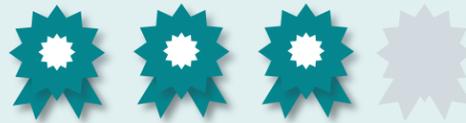
CESAREAN SECTIONS



*NTSV measure.
Source: Analysis by CIVHC.

OF HEALTH PLANS OFFERING ONLINE MEMBER SUPPORT TOOLS

3 of 4 offer quality information



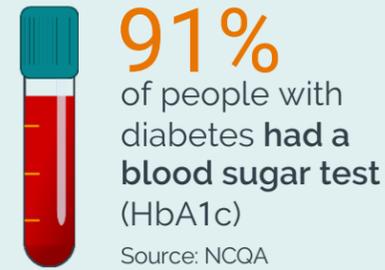
4 of 4 offer price information



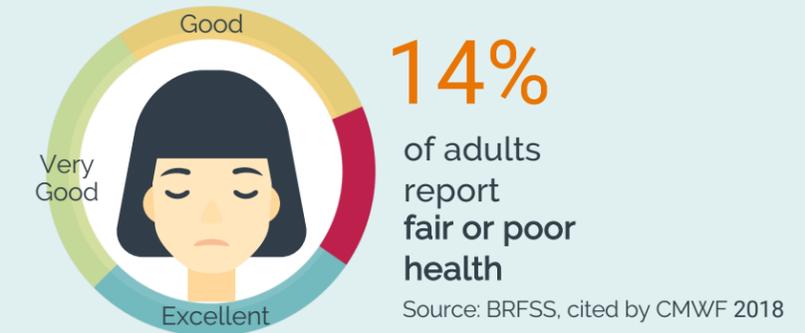
3 of 4 offer treatment decision information



HBA1C TESTING



HEALTH-RELATED QUALITY OF LIFE



UNMET CARE DUE TO COST

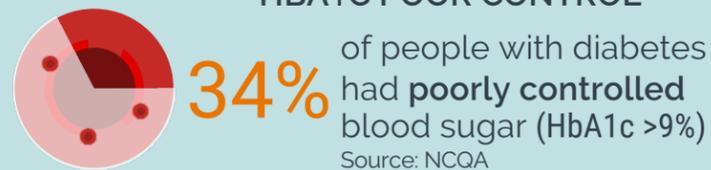


SHARED RISK CONTRACTS



Outcomes

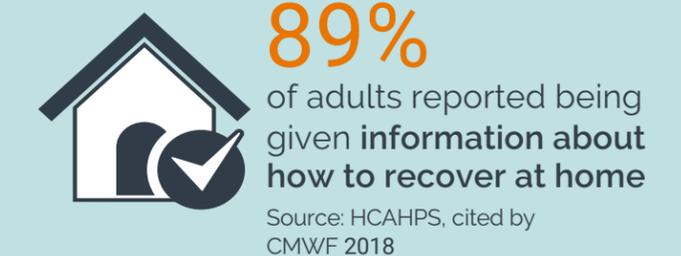
HBA1C POOR CONTROL



CHILDHOOD IMMUNIZATIONS



HOME RECOVERY INSTRUCTIONS

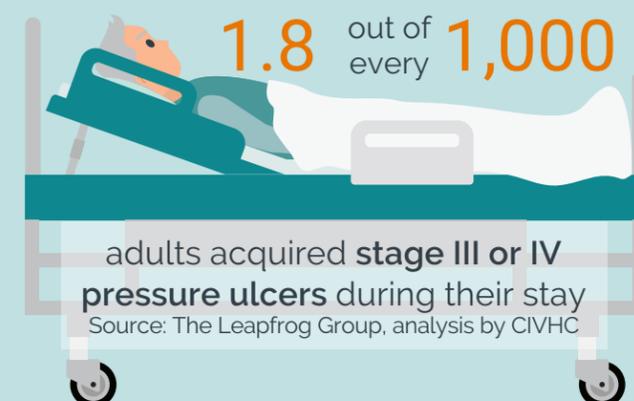


ALL-CAUSE READMISSIONS

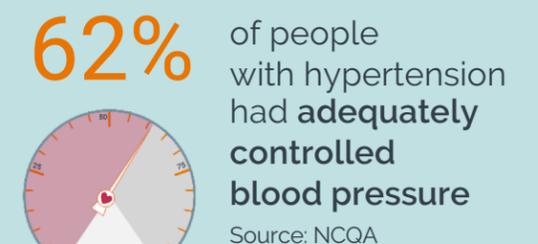


Source: NCQA. *Based on CO's case mix. See Methodology for details.

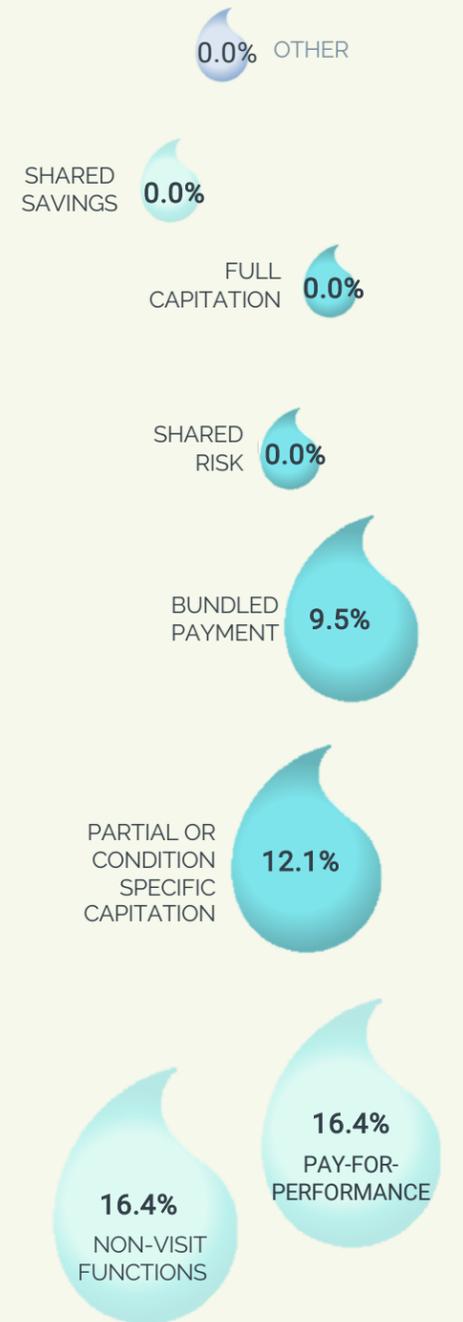
HOSPITAL-ACQUIRED PRESSURE ULCERS



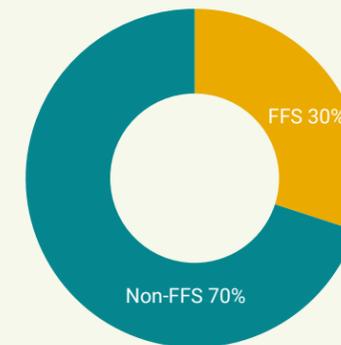
CONTROLLING HIGH BLOOD PRESSURE



2018 COLORADO SCORECARD ON Medicaid Payment Reform



Use of Fee-For-Service in Value-Oriented Payments in Colorado



Share of Value-Oriented Payments that Put Providers at Financial Risk



Provider Participation in Value-Oriented Payments



100% of all hospital payments (in-patient) are value-oriented*

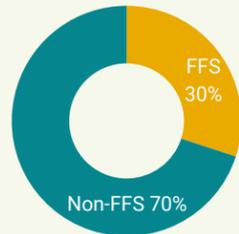
*Quality performance incentive payments made up 7% of total dollars paid to hospitals in 2016.



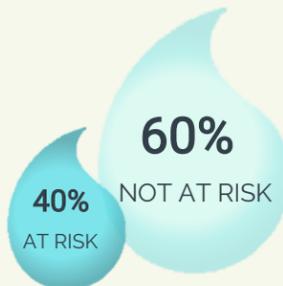
54.4%

of the total payments made to providers are value-oriented

The results of the Colorado Scorecard on Medicaid Payment Reform are in, and 54% of all Medicaid payments are value-oriented—either tied to performance or designed to cut waste. Status-quo payments make up the remaining 46%. These data are from calendar year 2016 or the most recent 12 months available.



Of all the value-oriented Medicaid payments made in Colorado in 2016, 70% are not based on FFS and 30% are FFS-based. Value-oriented payment methods categorized as non-FFS include: bundled payment, full capitation, partial or condition-specific capitation, and payment for non-visit functions, while pay-for-performance, shared savings, and shared risk rely on FFS.



Forty percent of value-oriented payments in the Medicaid market put providers at risk. Just over half of value-oriented payments in place in 2016 offered providers a financial upside only, with no downside financial risk.

ACKNOWLEDGMENTS

The Colorado Scorecard on Medicaid Payment Reform 2.0 was made possible by the Laura and John Arnold Foundation and the Robert Wood Johnson Foundation, as well as the leadership of the Center for Improving Value in Health Care and the collaboration of the Colorado Department of Health Care Policy and Financing (HCPF). CPR thanks CIVHC staff Cari Frank, VP of Communication and Marketing, Jonathan Mathieu, VP of Data and Delivery, and Maria de Jesus Diaz-Perez, Director of Public Reporting; CPR project leads Andréa Caballero and Alejandra Vargas-Johnson; CPR staff Lea Tessitore and Roslyn Murray; as well as the health plans that provided data for the Scorecard, for their significant contributions to this project.

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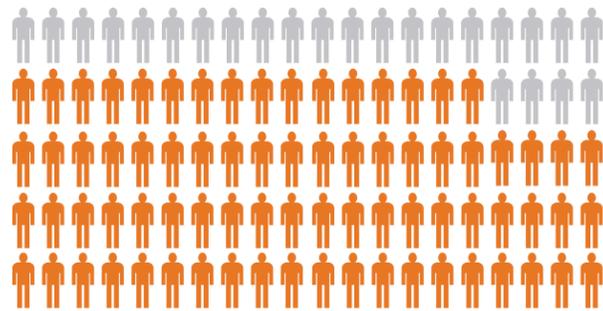
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Economic Signals



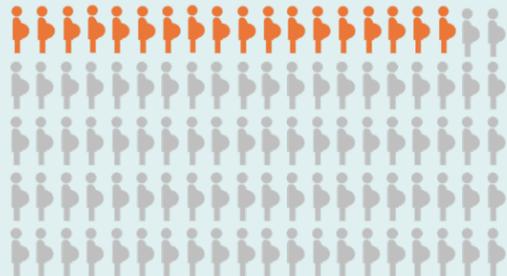
ATTRIBUTED MEMBERS

76%

of members in Colorado's Medicaid program were attributed to **providers participating in a payment reform contract**

System Transformation

CESAREAN SECTIONS



18%

of women with low-risk pregnancies* in Colorado's Medicaid program had C-sections

*NTSV measure. Source: Analysis by CIVHC.

SHARED RISK CONTRACTS



Zero shared risk contracts reported*
This metric does not include other types of at risk contracts.

UNMET CARE DUE TO COST



Source: BRFSS, cited by CMWF 2018
*From general population

12% of adults* went without care due to cost

HEALTH-RELATED QUALITY OF LIFE



14%

of adults* report **fair or poor health**

Source: BRFSS, cited by CMWF 2018
*Ages 18-64 years

HBA1C TESTING



79%

of Medicaid members with diabetes had a **blood sugar test (HbA1c)**

Source: HSAG for HCPF 2017
*Colorado reports this using claims data only.

Outcomes

CHILDHOOD IMMUNIZATIONS

76% of children ages 1.5 - 3 years old received **all recommended doses** of seven key vaccines

Source: NIS, cited by CMWF 2018

HBA1C POOR CONTROL



94%

of Medicaid members with diabetes had **poorly controlled** blood sugar (HbA1c >9%)*

Source: HSAG for HCPF 2017
*Colorado reports this using claims data only.

HOSPITAL-ACQUIRED PRESSURE ULCERS

0.8 out of every 1,000



Medicaid members acquired **stage III or IV pressure ulcers** during their stay

Source: 2017 Leapfrog Hospital Survey, analysis by CIVHC

HOME RECOVERY INSTRUCTIONS



89%

of adults reported being given **information about how to recover at home**

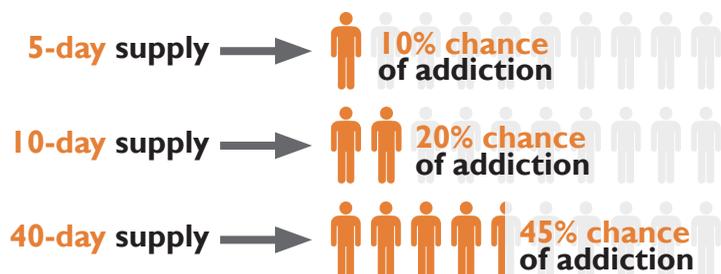
Source: HCAHPS, cited by CMWF 2018

Prescribing Opioids in Colorado

Oxycodone, Percocet, and Vicodin

Opioid use disorders impact us all, not only patients. Working from within the health care system and across communities, together we can make a positive impact.

One critical approach to minimizing opioid use disorders is reducing the number of pills given to people with temporary, acute pain. Centers for Disease Control (CDC) research shows that people receiving a five-day supply of opioids the first time they are prescribed have a 10 percent chance of becoming addicted and using opioids long term (one year or more). The likelihood of using an opioid for over a year doubles to 20 percent for people receiving a 10-day supply and jumps up to 45 percent for patients receiving an initial 40-day supply.ⁱ



To help reduce long-term use and dependency when treating acute pain, the CDC suggests that providers offer alternative treatment options to opioids, and when necessary, prescribe the lowest effective dose for the shortest duration, typically three to seven days.ⁱⁱ

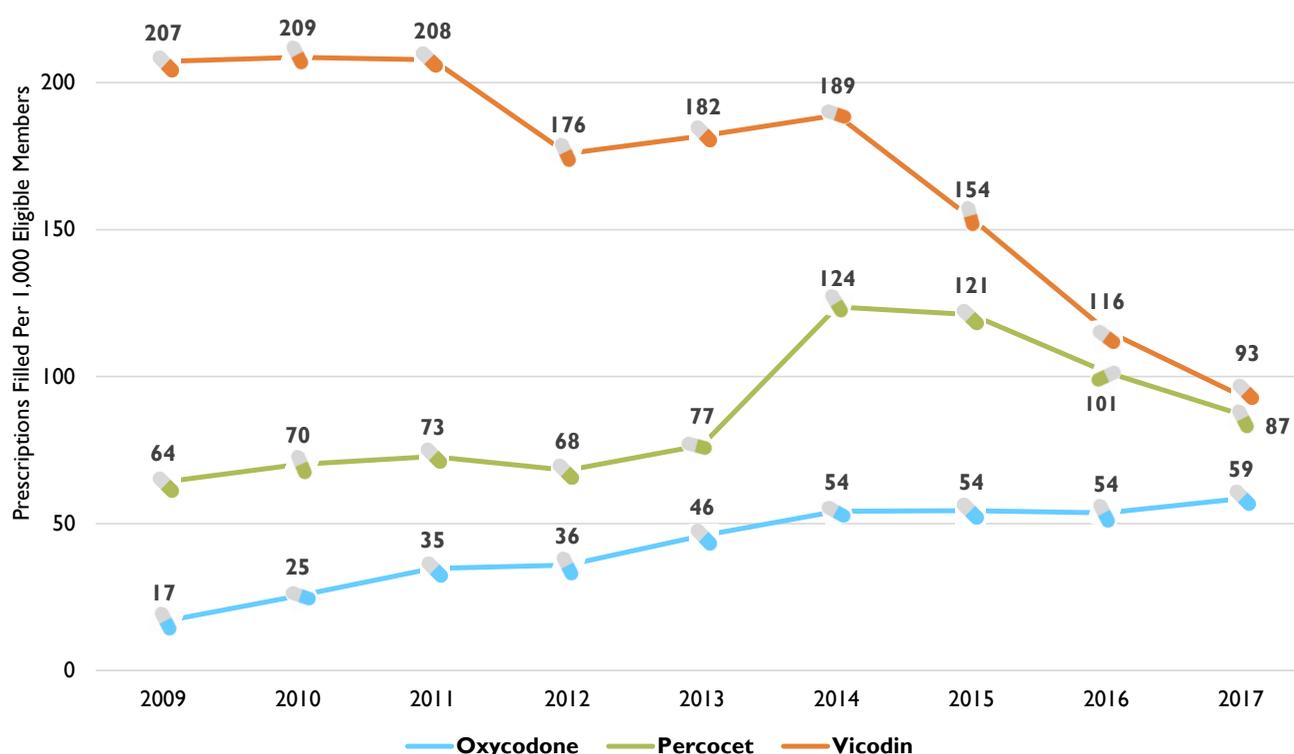
Opioid Prescribing Patterns in Colorado

To understand patterns in opioid days supply being prescribed and filled in Colorado, the Center for Improving Value in Health Care (CIVHC) used data from the Colorado All Payer Claims Database (CO APCD) to evaluate trends for short-acting versions of three commonly prescribed opioids: Oxycodone, Percocet, and Vicodin.

According to CO APCD data, between 2009 and 2017, Coloradans with Commercial, Medicaid and Medicare Advantage health insurance filled nearly 7 million prescriptions for the short-acting versions of Oxycodone, Vicodin and Percocet.

Oxycodone, Percocet, and Vicodin Prescription Trends in Colorado, 2009-2017

Commercial, Medicaid, and Medicare Advantage, CO APCD

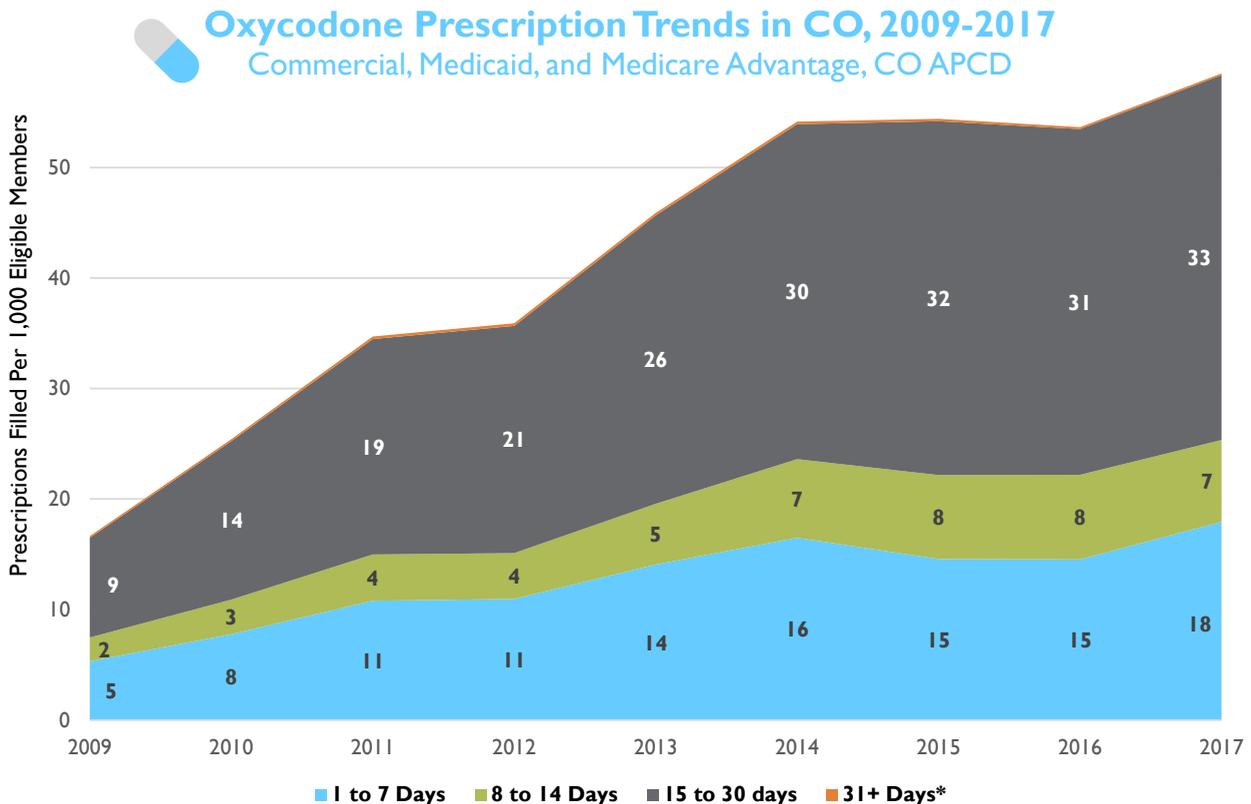
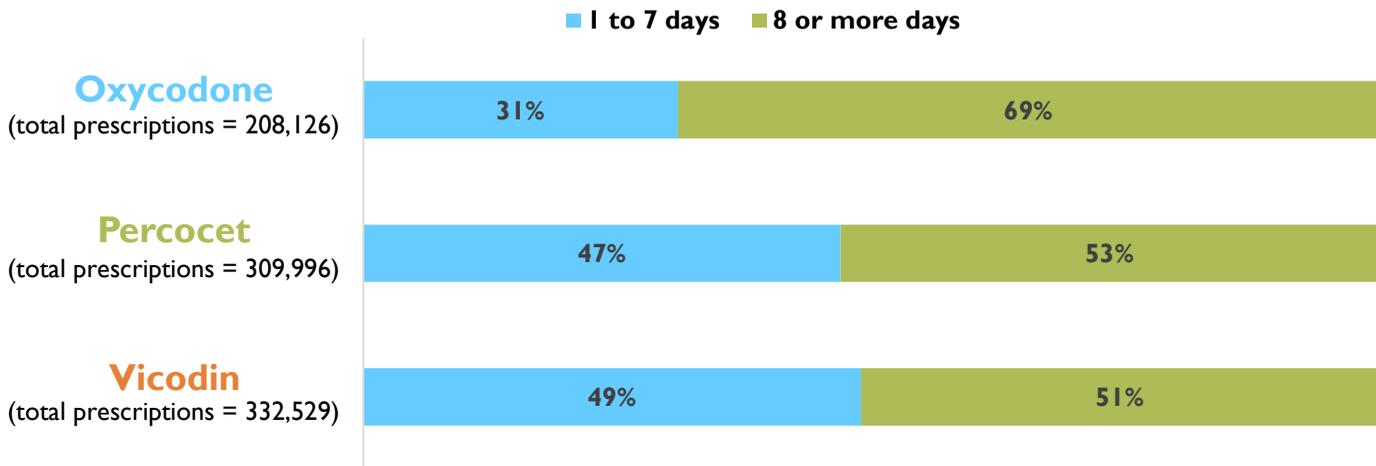


Evaluation of prescribing trends since 2009 indicate that:

- Although it is the least prescribed of the three opioids, rates of Oxycodone prescriptions increased 247 percent between 2009 and 2017.
- Rates of Percocet and Vicodin fills have steadily declined since reaching a peak in 2014 (30 percent and 51 percent reduction respectively).
- Vicodin prescription fills fell sharply in 2015, which could be a result of the Drug Enforcement Administration (DEA) changing the Vicodin drug schedule from a Schedule III to a Schedule II (higher potential for abuse and considered dangerousⁱⁱⁱ) in 2014. This change may also be related to the increase in Percocet and Oxycodone fills beginning in 2014 as an alternative to Vicodin.

Although the opioid fill rate has fallen for two of the three opioids analyzed, for all three drugs across all payers, more than half of all prescriptions filled were for eight days or more. Oxycodone in particular has higher rates of 15-30 days supply compared to 1-7 days or 8-14 days, and 69 percent of all fills for Oxycodone were for eight or more days.

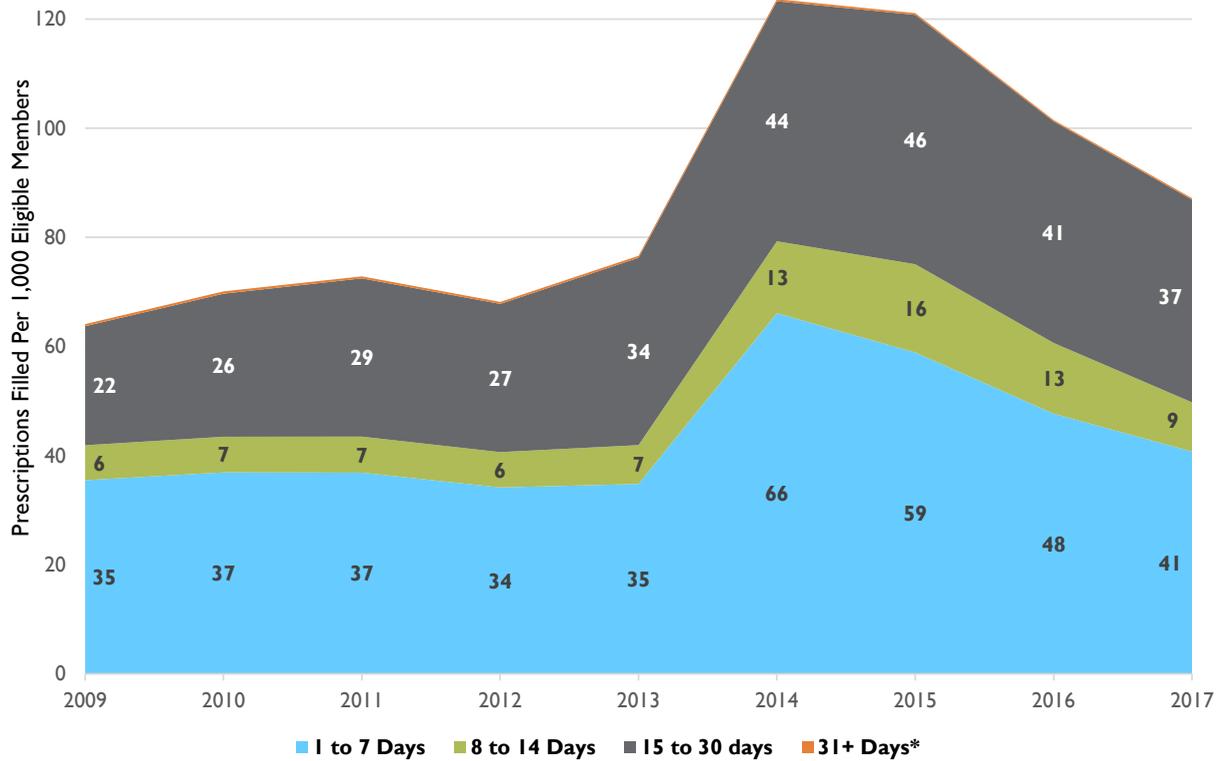
Opioids Days Supply Pattern, 2017 Commercial, Medicaid, and Medicare Advantage, CO APCD





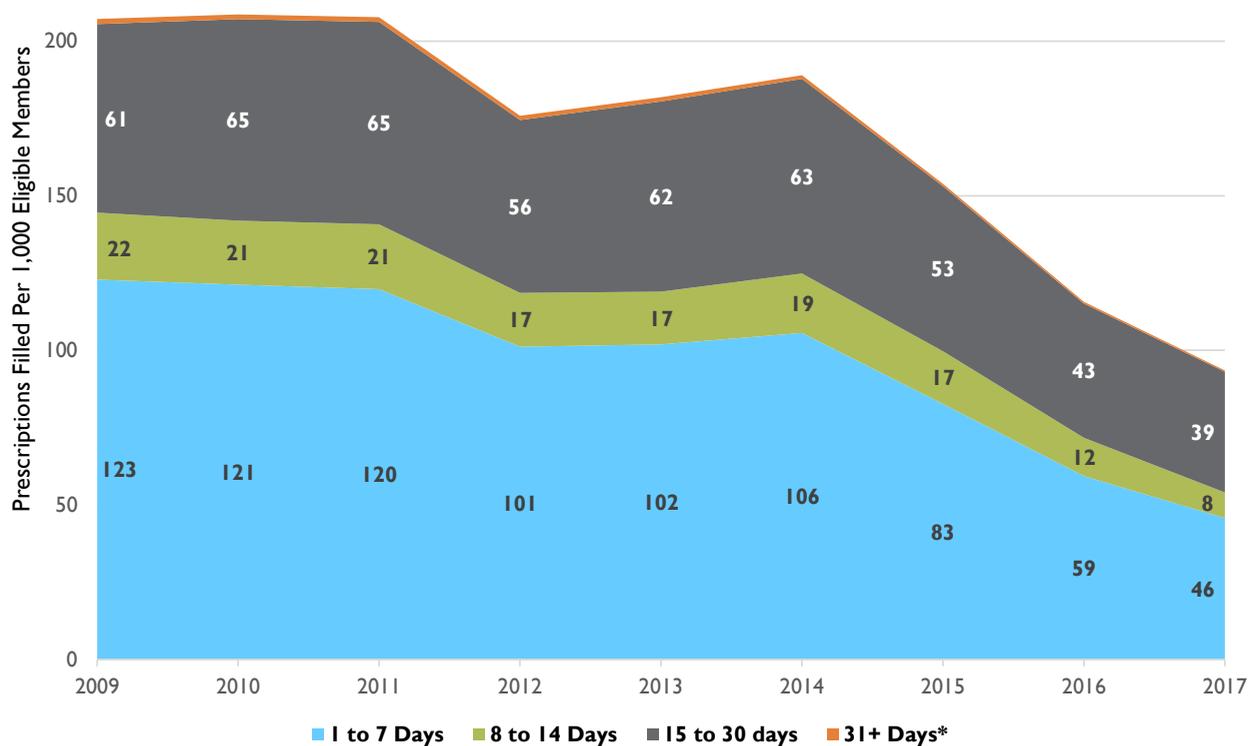
Percocet Prescription Trends in CO, 2009-2017

Commercial, Medicaid, and Medicare Advantage, CO APCD



Vicodin Prescription Trends in CO, 2009-2017

Commercial, Medicaid, and Medicare Advantage, CO APCD



*31+ Days supply results ranged from 1/1000 to >1/1000 for Oxycodone, Percocet, and Vicodin from 2009-2017.

Opportunities

According to this analysis, in general, Colorado is seeing positive movement toward reducing the total number of prescriptions being filled across these three common opioids, and reducing the number of long duration prescriptions in some instances. However, more can be done to reduce the hundreds of thousands of prescriptions for opioids that get filled every year, and the percentage of longer duration fills. There is no easy solution for addressing opioid use disorder in Colorado and the U.S. and it is likely going to require a concerted, multi-pronged approach including:

- Provider education on recommended prescribing practices
- Patient education on the addictive properties of opioids
- More research and widespread acceptance of alternative pain management choices

The Colorado General Assembly has considered numerous opioid bills and encouraging steps have already been taken to reduce the number of individuals living with use disorders to prescription opioids including, but not limited to:

- Health First Colorado, the state's Medicaid program, issued new opioid prescription restrictions in 2017, limiting the duration of treatment and adding pain management consultation requirements to future refills.^{iv}
- Colorado Hospital Association launched the Colorado Opioid Safety Pilot, designed to help educate Emergency Room provider to use alternatives to opioids as a first-line treatment for pain.^v
- The Colorado Consortium for Prescription Drug Abuse Prevention works with the Colorado Department of Public Health and Environment and many other stakeholder groups including policy makers, providers, consumers and others to improve education, public outreach, research, safe disposal, and treatment. Their Take Meds Seriously and Take Meds Back public awareness campaigns are just two examples of their work.^{vi}



Methodology

This analysis used claims submitted by health insurance payers (31 commercial, Medicaid and Medicare Advantage) from 2009-2017 to the Colorado All Payer Claims Database. Extended release (long-acting) versions of Oxycodone, Vicodin and Percocet were removed from the analysis to isolate short-acting opioids. These three drugs were chosen because they are among the top 20 highest volume prescription fills of all drugs in CO APCD. The drugs included brand and generic versions of the following:

Oxycodone

Oxycodone HCL 10mg tab
Oxycodone HCL 15mg tab
Oxycodone HCL 5mg tab

Percocet

Oxycodone HCL 10mg tab/Acetaminophen 325mg tab
Oxycodone HCL 15mg tab/Acetaminophen 325mg tab
Oxycodone HCL 5mg tab/Acetaminophen 325mg tab

Vicodin

Hydrocodone 10mg tab/Acetaminophen 300mg tab
Hydrocodone 10mg tab/Acetaminophen 325mg tab
Hydrocodone 10mg tab/Acetaminophen 400mg tab
Hydrocodone 10mg tab/Acetaminophen 500mg tab
Hydrocodone 10mg tab/Acetaminophen 650mg tab
Hydrocodone 10mg tab/Acetaminophen 660mg tab
Hydrocodone 10mg tab/Acetaminophen 750mg tab

Hydrocodone 2.5mg tab/Acetaminophen 325mg tab
Hydrocodone 2.5mg tab/Acetaminophen 500mg tab
Hydrocodone 5mg tab/Acetaminophen 300mg tab
Hydrocodone 5mg tab/Acetaminophen 325mg tab
Hydrocodone 5mg tab/Acetaminophen 400mg tab
Hydrocodone 5mg tab/Acetaminophen 500mg tab
Hydrocodone 5mg tab/Acetaminophen 500mg tab, UD

Hydrocodone 7.5mg tab/Acetaminophen 300mg tab
Hydrocodone 7.5mg tab/Acetaminophen 325mg tab
Hydrocodone 7.5mg tab/Acetaminophen 400mg tab
Hydrocodone 7.5mg tab/Acetaminophen 500mg tab
Hydrocodone 7.5mg tab/Acetaminophen 650mg tab
Hydrocodone 7.5mg tab/Acetaminophen 750mg tab

For more information regarding this analysis, please contact ColoradoAPCD@civhc.org. Special thanks to the CO APCD Advisory Committee and members of the Colorado Consortium for Prescription Drug Abuse Prevention for their input into this publication, and to the Colorado Health Foundation for their support of CO APCD public reporting.

ⁱ Shah, A., Hayes PharmD, C. J., & Martin, PharmD, PhD, B. C. (2017). Morbidity and Mortality Weekly Report: Characteristics of Initial Prescription Episodes and Likelihood of Long-Term Opioid Use — United States, 2006–2015. Centers for Disease Control and Prevention. Retrieved February 2018, from https://www.cdc.gov/mmwr/volumes/66/wr/mm6610a1.htm#F1_up

ⁱⁱ Dowell, MD, D., Haegerich, PhD, T. M., & Chou, MD, R. (2016). Morbidity and Mortality Weekly Report: CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016. Centers for Disease Control and Prevention. Retrieved February 2018, from <https://www.cdc.gov/mmwr/volumes/65/rr/rr6501e1.htm>

ⁱⁱⁱ United States Drug Enforcement Administration. Drug Scheduling. Retrieved October 2018 from <https://www.dea.gov/drug-scheduling>

^{iv} Williams, M. (2017, July). Colorado Medicaid to Tighten Opioid Usage Policy. Retrieved February 2018, from Colorado Department of Health Care Policy and Financing: <https://www.colorado.gov/pacific/hcpf/news/colorado-medicaid-tighten-opioid-usage-policy>

^v Center for Improving Value in Health Care. (2017, August). Change Agent Profile: Colorado Hospital Association - The Colorado Opioid Safety Pilot. Retrieved February 2018, from civhc.org: <http://www.civhc.org/change-agent-gallery/colorado-hospital-association-and-the-colorado-opioid-safety-pilot/>

^{vi} The Colorado Consortium for Prescription Drug Abuse Prevention. (2017). About the Consortium. Retrieved February 2018, from The Colorado Consortium for Prescription Drug Abuse Prevention: <http://www.corxconsortium.org/about-the-consortium/>



Network for
Regional Healthcare
Improvement

Getting to Affordability

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

Section I: Benchmark Overview

Section II: Benchmarking Methodology

November 8, 2018

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The views expressed here do not necessarily reflect the views of the Foundation.

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THE FOLLOWING ORGANIZATIONS CONTRIBUTED DATA AND ANALYSIS FOR THIS PROJECT.

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HealthInsight Oregon | Oregon
HealthInsight Utah | Utah
Maine Health Management Coalition | Maine *

Maryland Health Care Commission | Maryland
Midwest Health Initiative | St. Louis, Missouri
Minnesota Community Measurement | Minnesota

THE FOLLOWING ORGANIZATIONS PARTICIPATED AS DEVELOPMENT SITES.

Greater Detroit Area Health Council | Michigan
HealthInsight Nevada | Nevada
HealthInsight New Mexico | New Mexico
Health Care Improvement Foundation | Philadelphia
Integrated Healthcare Association | California
Massachusetts Health Quality Partners | Massachusetts

The Health Collaborative | Ohio
The University of Texas Health Sciences
Centers at Houston | Texas
Virginia Health Information | Virginia
Washington Health Alliance | Washington
Wisconsin Health Information Organization | Wisconsin

ABOUT THE NETWORK FOR REGIONAL HEALTHCARE IMPROVEMENT (NRHI)

The Network for Regional Healthcare Improvement (NRHI) is a national organization representing more than 30 member regional health improvement collaboratives (RHICs) and state/regional affiliated partners. These multi-stakeholder organizations are working in their regions and collaborating across regions to transform the healthcare delivery system. They share the goal of improving the patient experience of care, including quality and satisfaction; improving the health of populations; and reducing the per-capita cost of healthcare. The RHICs are accomplishing this transformation by working directly with physicians and other healthcare providers, provider organizations, commercial and government payers, employers, consumers, and other healthcare-related organizations. Both NRHI and its members are non-profit, non-governmental organizations. For more information about NRHI, visit www.nrhi.org.

ABOUT THE ROBERT WOOD JOHNSON FOUNDATION

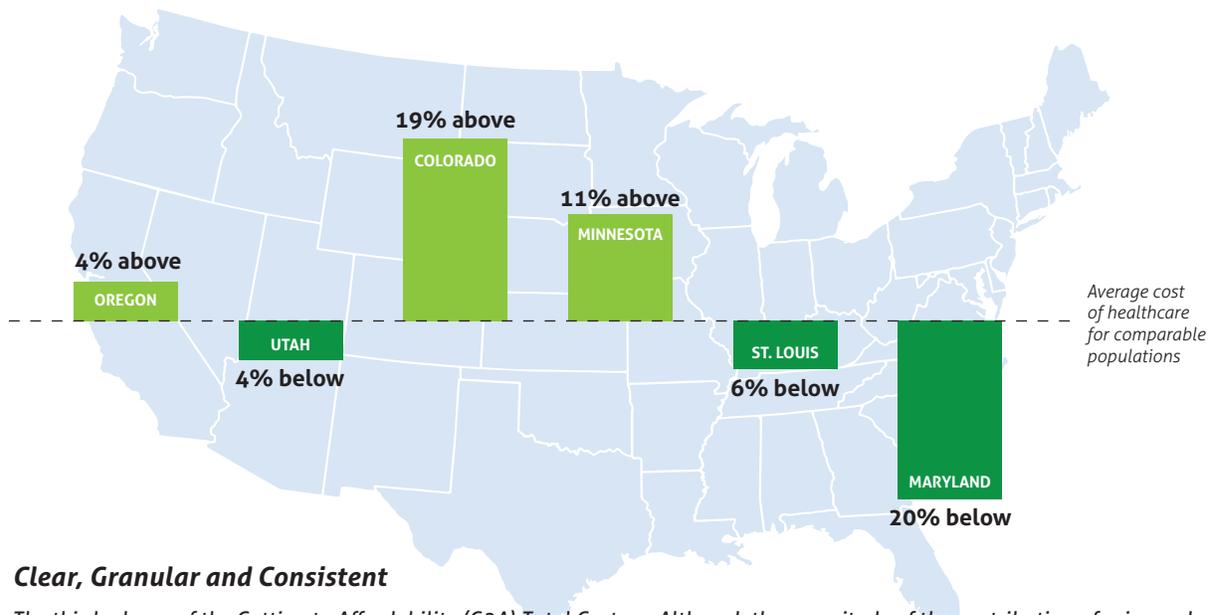
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or on Facebook at [www.rwjf.org/facebook](https://www.facebook.com/rwjf).

The Getting to Affordability team dedicates this report to Linda Bartnyska, Director of Analysis and Information Services at the Maryland Health Care Commission. Linda's contributions went far beyond her knowledge of, and dedication to, healthcare cost measurement. Linda's quiet leadership and steady presence were appreciated by every member of the team. She is greatly missed.



* Maine Health Management Coalition participated in Phases I and II and is now known as the Healthcare Purchaser Alliance of Maine



Clear, Granular and Consistent

The third release of the Getting to Affordability (G2A) Total Cost of Care (TCOC) benchmarks continues to highlight variation in the underlying drivers of healthcare costs across regions. Once again, it finds that although price is the driver of both higher and lower healthcare costs in some geographies, utilization makes the difference in others.

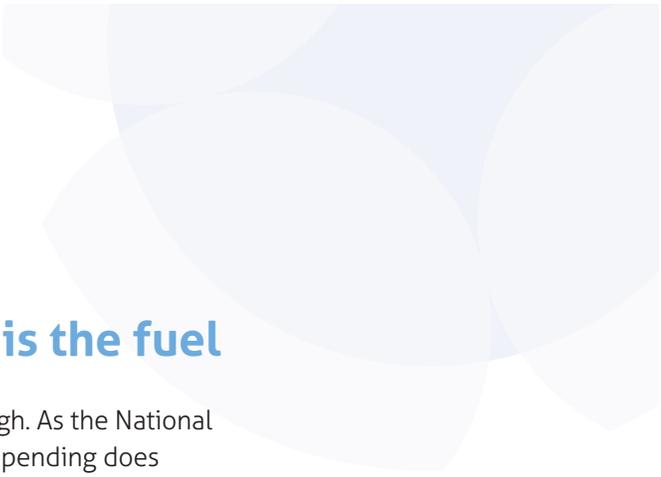
Although the magnitude of the contribution of price and usage varies year to year, the relativity has remained constant. This consistency reinforces the stability of this measure and its utility in informing changes in policy and care delivery.

Rising healthcare costs, and the underlying causes and attempts to rein them in is at the forefront of the news. This unsustainable trend is causing emotional distress and financial harm to individuals, communities and our country.

The Network for Regional Healthcare Improvement (NRHI) recognizes that credible, digestible information that quantifies and compares overall healthcare costs at the depth and granularity necessary for providers, policymakers, payers, purchasers and patients to act is essential. Through the Getting to Affordability (G2A) initiative NRHI and its members have taken on this challenge. They have leveraged the power of the nationally-standardized HealthPartners Total Cost of Care (TCOC) measure set to deliver this critical information to stakeholders in six regions across the country and have spread promise of cost transparency to an additional twelve regions.

A contagion of curiosity has spread across the country during the five-year G2A initiative. A dozen additional regions now benefit from the strong foundation built. The promise of measuring and reporting TCOC with a standardized approach that provides valuable information to various stakeholders has spread, carrying the proof that cost transparency can be achieved.

However, the data alone is not sufficient to guide new models of care delivery and payment. RHICs' multi-stakeholder forums leverage collaboration, healthy tension and intelligence from local healthcare leaders who understand the markets they serve. The result is greater confidence in the accuracy of the data and that the information gained will be used for good purposes.



Data is the spark, collaboration is the fuel

In healthcare, there's little question that the costs are too high. As the National Academy of Medicine has long reported, a third or more of spending does nothing to improve health. Because of these and many other factors, we simply do not receive the healthcare we deserve for the dollars we spend.

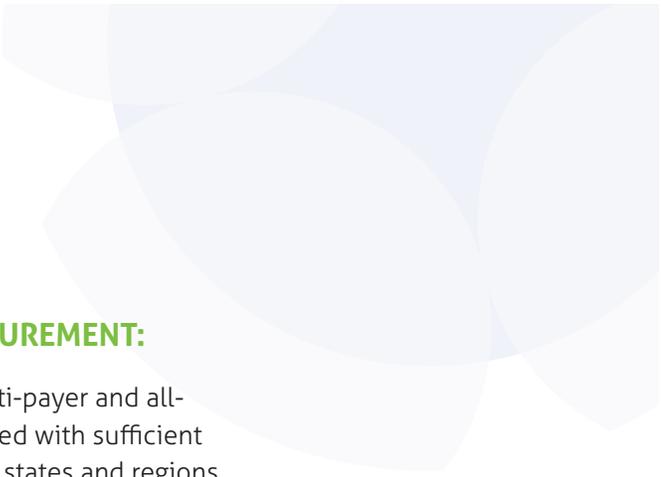
A barrier to overcoming these realities has been the lack of a credible approach for quantifying overall healthcare cost, utilization and price that could simultaneously empower national understanding, inspire state and regional policy change, paying for what matters and promote care delivery transformation. There are accepted methods to measure some elements of cost and utilization. However, they lack the breadth, depth and granularity necessary to be actionable to providers, policymakers, payers, purchasers and patients.

Overcoming these barriers requires three inputs. 1) Reliable, standardized measures of cost, price and resource use that could be applied across different populations such as states, regions, provider practices, health plan memberships, and employer workforces. 2) High-quality data sets with transparent cost information including the amount paid for services. 3) A detailed and well-documented process to ensure consistency in data processing and analysis and in turn, results.

NRHI is a national membership organization of more than 30 RHICs and state partners across the United States. These multi-stakeholder organizations are working in their regions and collaborating across regions to transform the healthcare delivery system to improve health, reduce price and eliminate waste.

NRHI and its members long recognized the need for high-quality, comparative data on healthcare spending. Working collaboratively and with the support of the Robert Wood Johnson Foundation, they began to produce it. Beginning in 2013, NRHI intensified its focus on making healthcare more affordable through an initiative now known as Getting to Affordability or G2A. Supporting six of its members in measuring and reporting on differences in total cost of care and the impact of price and resource use has been a core part of this work.

"The way we receive healthcare in the United States is broken, and as a result Americans are paying too much and are less healthy than other developed nations," said NRHI Executive Director, Healthcare Affordability Ellen Gagnon. "There are ways we can work together to change the system, but we need trusted data to focus our collective efforts and measure our shared success."



FIVE YEARS OF NRHI TOTAL COST OF CARE MEASUREMENT:

- **Goal:** Explore whether data from multiple states, multi-payer and all-payer claims datasets could be processed and analyzed with sufficient standardization to achieve comparable results across states and regions.
- **Outcome:** Over the last five years, RHICs and state partners participating in total cost of care measurement have collaborated to produce three reports comparing their performance against one another and developed state, regional and local results to inform policy and practice. Consistency across the three measurement periods suggest the project's extensive efforts to standardize data collection, measurement, and analysis processes has produced reliable, comparable results across the regions.
- **Goal:** Utilize this data to share information on differences in total cost and its components—utilization and price—to inspire a national discussion of cost drivers and remedies.
- **Outcome:** Featured in publications such as [Health Affairs](#), [Modern Healthcare](#) and [Forbes](#) and at leading conferences including AcademyHealth's Datapalooza, ACG System International Conference and the National Association of Health Data Organizations' annual meeting, NRHI's work in total cost of care measurement is providing meaningful contributions to the national dialogue on affordability.
- **Goal:** Produce local, actionable results that could be shared in different ways with providers, health plans, employers and the public to inform conversations about the local drivers impacting cost and how they could be addressed.
- **Outcome:** It's estimated that, for each year of the benchmark, healthcare cost information on over 5 million patients attributed to approximately 20,000 individual physicians has been calculated and shared. NRHI members are providing comparative cost data to state legislatures and state agency leaders, physician practices, health plans, leading national employers and in some regions, consumers. The information is used to inform strategy, shape policy and support interventions.

RHICs' ability to access, understand and utilize claims data for the purposes of cost measurement and their experience bringing together diverse stakeholders to act on the results, made them an ideal home for the first national project to develop a total cost of care benchmark across the participating regions.

Before the project began, it was clear previous attempts to reduce costs often had a balloon effect. Market pressure squeezed the balloon to save in one part of the system, such as emergency department use or imaging, but the balloon expanded elsewhere, resulting in the same high healthcare costs. Deflating the balloon would require an understanding of what's behind the total cost of care and monitoring to ensure overall costs are reduced. Through Getting to Affordability's multi-region analysis of total cost of care and its drivers, NRHI found striking variation between regions. While some national studies find that pricing is the biggest driver of healthcare cost increases, that is not true everywhere. More granular analyses make it possible to identify differences by market.

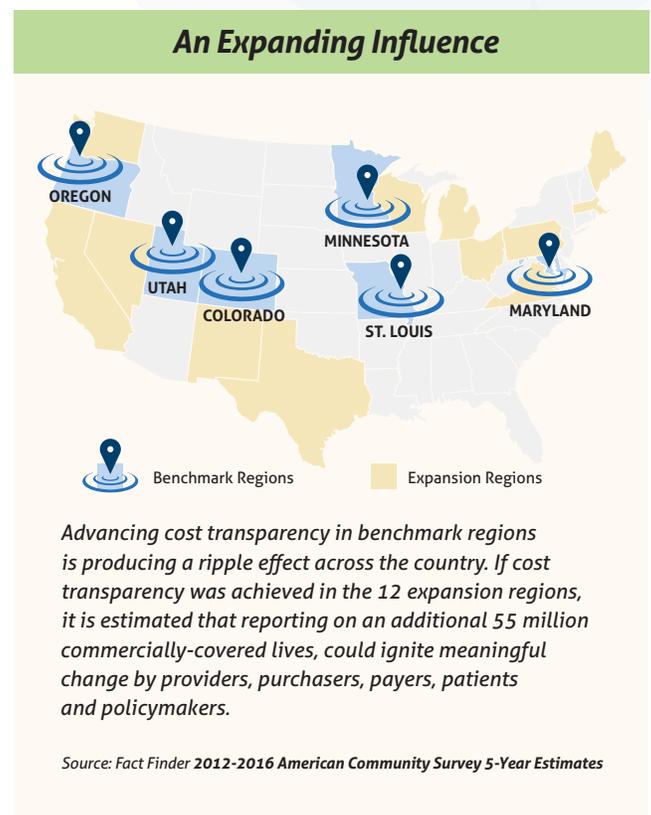
Achieving affordability will require the data and collaborations necessary to address all components of cost. Despite intensive work by providers to ensure appropriate utilization of resources, total cost of care may remain high as prices increase to make up for decreased utilization.

GATHERING, ANALYZING THE DATA

The regions base the analysis on data collected via the claims databases they steward. To produce comparable results, extensive standardization is critical. This work utilizes the Total Cost of Care (TCOC) and Total Care Relative Resource Value™ measures developed by HealthPartners which were first endorsed by the National Quality Forum in 2012 and again in October 2017. NRHI members work closely with each other and a technical advisor to standardize the application of these measures, including the risk adjustment methodology, and analyze the reasonableness of results.

"At the end of the day I think it's fairly remarkable," said Norman Thurston, Director of the Office of Health Care Statistics, which partners with HealthInsight Utah on the project. "One reason that it was successful was that so many people spent so much time worrying about the minutiae of the process."

Of course, none of this work would be possible without high-quality claims data and either supportive regulatory environments or highly engaged health plans



and self-insured employers that allow this data to be used in ways that illuminate opportunities to drive improvements in cost, quality, and utilization. Statewide all payer claims databases are typically created by a state mandate. They systematically collect healthcare claims data, such as medical, pharmacy, eligibility, and provider data, from a variety of payer sources. Three of the six RHICs participating in this project use data provided voluntarily by health plans.

Minnesota Community Measurement (MNCM) partners with leading Minnesota health plans to provide a unique data set. In this model, each payer applies the HealthPartners methodology to its own data. Then, MNCM aggregates all of the plans' data and analyzes. Then the data is sent to NRHI for the national benchmark. MNCM also produces extensive public information for the community, including patients, providers and payers. Medical group data enables local comparisons and gives consumers information on cost differences.

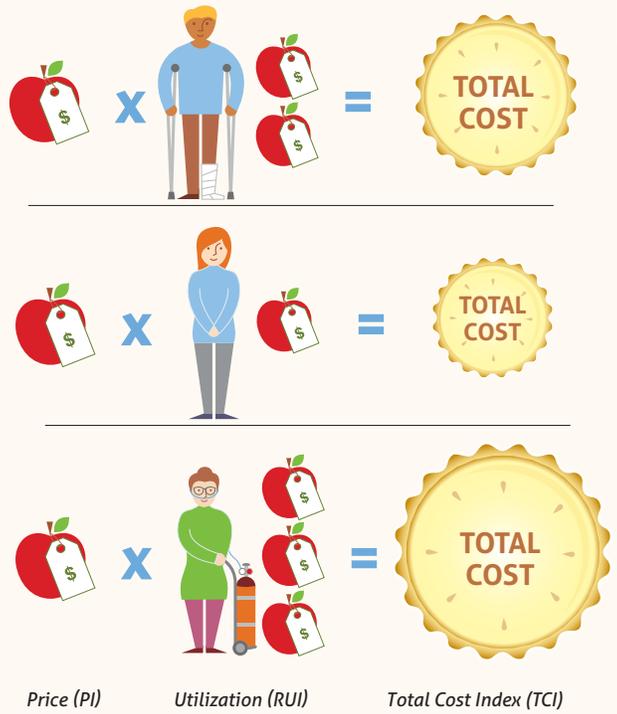
"The data shuts down anecdotal conversations and opens peoples' eyes," says Jonathan Mathieu, Vice President of Data and Delivery at the Center for Improving Value in Health Care (CIVHC), the RHIC serving the state of Colorado.

COSTS VARY, CONSISTENTLY

With three national total cost of care benchmark reports complete, some trends have begun to emerge.

- In each of the three benchmarks, Maryland was the lowest cost of the regions. In the most recent year, the total cost index varied from 20 percent below the benchmark for Maryland, to 19 percent above the benchmark for Colorado, the highest cost region. As shown in [Table 1](#), similar differences for these same states were observed in previous reporting periods. Further, the ordering of the four RHICs participating in all three of the total cost of care benchmark periods has remained consistent.

Price x Utilization = Total Cost



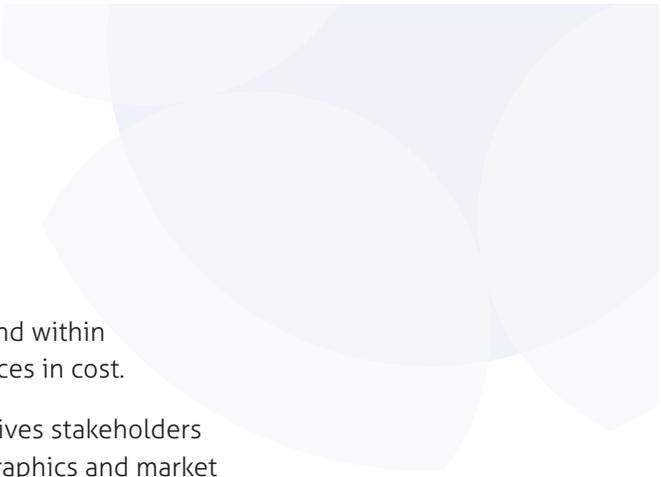
The Total Cost Index (TCI) can be separated into two components, the Resource Use Index (RUI) and the Price Index (PI). By breaking TCI into these component parts, we're able to ascertain whether observed cost differentials are a result of above (or below) average resource use, prices paid for services, or a combination thereof. And when standardized, high-quality data is available in multiple regions, it's possible to make meaningful cost comparisons at the state, local and national levels, identify outliers, and better understand where to look for the underlying causes of those differentials.

Risk Adjusted Total Cost and Resource Use Compared to the Average:

Commercial Population 2016
Combined Attributed and Unattributed

Measure	Colorado	Maryland	Minnesota	Oregon	St. Louis, MO	Utah
Risk Score	-7%	15%	-1%	-2%	4%	-9%
TCI	19%	-20%	11%	4%	-6%	-4%
RUI	5%	-7%	7%	-10%	10%	-5%
Price Index	13%	-14%	4%	16%	-15%	1%

Note: This is the midpoint of the ranges created from the sensitivity analysis and represents the percent above or below the risk adjusted average across all regions. View the full range of results in [Table 1 on page 21](#).

- 
- Prices and care delivery patterns vary across states and within states across markets. Those variations drive differences in cost.
 - Showing differences in price, cost and resource use gives stakeholders a framework to consider the roles of policies, demographics and market factors in steering healthcare costs.
 - Consistency in year-over-year total cost of care results, despite some differences in the underlying populations, reflect the regional norms in care delivery and pricing.
 - Most regions tend to have the same higher price and/or higher utilization service lines year over year.
 - Pharmacy pricing showed the least variability, which is largely a result of the influence of a few, large pharmacy benefit managers and pharmaceutical manufacturers' national pricing policies. It's also important to note that many of the new and expensive specialty medicines are being administered and represented in the medical expense so they may not be reflected in the pharmacy service line results.

Ben Steffen, Executive Director of the Maryland Health Care Commission (MHCC), said the results showing Maryland as the lowest cost are not surprising. For more than 35 years, Maryland has operated the nation's only all-payer hospital rate regulation program. In 2014, this program was expanded. Under the new model, the state agreed to limit all-payer per capita hospital growth, including inpatient and outpatient care, to 3.58 percent. In addition, Maryland agreed to limit annual Medicare per capita hospital cost growth to a rate lower than the national annual per capita growth rate per year for 2015-2018. This year, the program was expanded to physicians and nursing homes and extended until 2023. Steffen said the total cost of care methodology is different from the methodology used by the Centers for Medicare and Medicaid Services. However, he said, the results from this project may point to the all-payer model having a positive impact for the commercially-insured as well.

STAKEHOLDER ENGAGEMENT DEEPENS UNDERSTANDING OF THE DATA

NRHI members' standardized process, granular data and strong connections to stakeholders allow them to dig into the "why" and reveal how variations in care delivery and local prices contribute to the significant cost differences. The process also highlights differences in underlying populations and how risk adjustment impacts the numbers. This knowledge enables stakeholders to take steps to address the specific issues facing their states and regions.

In four of the six regions, some service lines reported higher prices or resource use than the benchmark and other service lines reported lower prices or resource use than the benchmark. Colorado reported a higher price than the benchmark for all service lines and Oregon reported lower resource use than the benchmark for all service lines.

In all three sets of results, Oregon prices, outside of pharmacy costs, have consistently been higher than the benchmark while resource use has been lower. In contrast, in St. Louis, prices have consistently been shown to be lower than other regions. However, resource use in St. Louis has consistently been higher.

The relatively lower prices shown in this data is consistent with previous years' benchmark reports and other information about the St. Louis healthcare market that its RHIC, the Midwest Health Initiative, (MHI) has reviewed over time, said Louise Probst, MHI Executive Director.

"The cost of living here is so much more reasonable than a lot of places so you wouldn't expect our costs to be as high," Probst said. "But the other side of cost is utilization. In St. Louis, we tend to have a slightly older population and higher rates of utilization than other markets".

The HealthPartners Total Cost of Care measure set allows regions to analyze the total cost of inpatient care, outpatient care, professional services and pharmacy, compare themselves to others, and better understand the price and utilization factors driving those costs.

The Oregon and St. Louis divergence described above was most dramatic in outpatient care where St. Louis' use of outpatient care was 53 percentage points higher than Oregon but its prices were 54 percentage points lower. Similarly, for inpatient care, prices were 48 percentage points lower in

Comparing Participants in All Three Years

Year to Year Comparison of Total Cost of Care
Compared to Average
Commercial Population 2014 – 2016
Combined Attributed and Unattributed

Only Participants With Data For All Three Years

Measure	Maryland	Minnesota	Oregon	Utah
Total Cost				
2014	-16%	11%	7%	0%
2015	-12%	11%	4%	0%
2016	-17%	14%	7%	-1%
Rank				
2014	1	4	3	2
2015	1	4	3	2
2016	1	4	3	2

Note: This table will differ from the values in other tables, which reflect the six participants used in 2016. The 2015 and 2016 values represent the midpoint of the ranges created from the sensitivity analysis.

Rank Order: 1 = Lowest; 4 = Highest

All Participants For All Three Years

Measure	Colorado	Maryland	Minnesota	Oregon	St. Louis, MO	Utah
Total Cost						
2014	—	-14%	14%	10%	-10%	2%
2015	17%	-16%	7%	0%	—	-4%
2016	19%	-20%	11%	4%	-6%	-4%
Rank						
2014	—	1	5	4	2	3
2015	5	1	4	3	—	2
2016	6	1	5	4	2	3

Note: Differences in Total Cost are due to the changes in the average caused by differing participants. The 2015 and 2016 values represent the midpoint of the ranges created from the sensitivity analysis.

Rank Order: 1 = Lowest; 6 = Highest

St. Louis than Oregon but resource use was 29 percentage points higher. All of the results are provided on a risk-adjusted basis.

Across states, inpatient care had the greatest variation in price in all three of the benchmark periods. Colorado’s hospital prices were 31 percent higher than the average, compared to 23 percent below average in St. Louis, in the most recent period. During the most recent period, the same differential was reported for outpatient care as well across the two regions.

Outpatient care also showed the greatest differences in resource use, with Maryland coming in 26 percent below average and St. Louis coming in 29 percent above average. Professional services had the least variation in resource use across the regions.

INFORMING HEALTHCARE COST POLICY

HealthInsight Oregon, one of the original RHICs participating in the project, has been sharing the information with providers, payers and policymakers for several years. Legislators have convened several workgroups addressing various components related to cost. HealthInsight Oregon is frequently called in to present the total cost of care data to help inform policy.

“We’re often called upon as having local expertise and a true and tried methodology,” said Meredith Roberts Tomasi, Associate Executive Director for HealthInsight Oregon. “Legislators see this data as an important source of information as they consider how to create a higher-value healthcare system for our state.”

She said Oregon has consistently shown higher prices and lower resource use. This year, the trend was most prominent in outpatient care. Last year, it was more evident in inpatient and professional. She thinks the legislature may focus on prices in light of this year’s results, and a recent recommendation from a legislative taskforce to take a multi-stakeholder statewide approach to total cost of care across service areas.

Detailed Analysis—Deeper Insights

Total Cost of Care by Service Category

Commercial Population 2016

Combined Attributed and Unattributed

Measure	Colorado	Maryland	Minnesota	Oregon	St. Louis, MO	Utah
Total Cost						
Overall	19%	-20%	11%	4%	-6%	-4%
Inpatient	21%	-27%	12%	5%	-13%	8%
Outpatient	34%	-34%	3%	0%	1%	5%
Professional	2%	-16%	30%	18%	-22%	-9%
Pharmacy	28%	-3%	-10%	-16%	15%	-14%
Resource Use						
Overall	5%	-7%	7%	-10%	10%	-5%
Inpatient	-8%	-10%	9%	-16%	13%	13%
Outpatient	17%	-26%	6%	-24%	29%	3%
Professional	-4%	2%	17%	-3%	-5%	-8%
Pharmacy	22%	-4%	-16%	-7%	21%	-17%
Price						
Overall	13%	-14%	4%	16%	-15%	1%
Inpatient	31%	-19%	3%	25%	-23%	-4%
Outpatient	15%	-11%	-3%	32%	-22%	3%
Professional	7%	-18%	11%	22%	-17%	-1%
Pharmacy	5%	1%	7%	-10%	-5%	4%

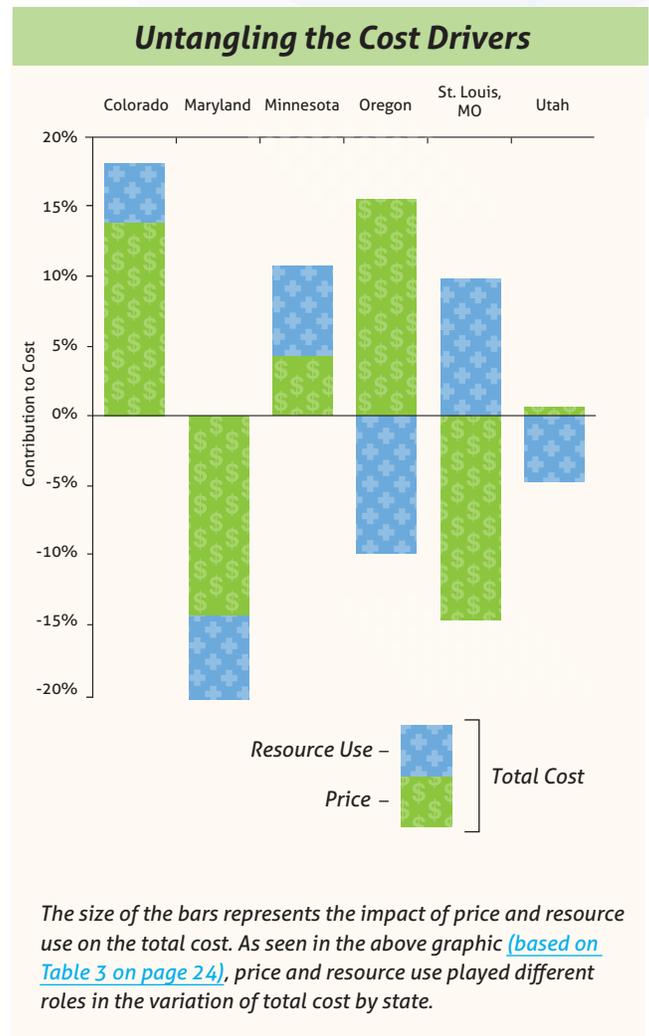
Note: This is the midpoint of the ranges created from the sensitivity analysis and represents the percent about or below the risk adjusted average across all regions.

[View the entire Table 2 on page 23](#)

Data from the project has been persuasive to the Colorado legislature as well. CIVHC, the RHIC which participates in the NRHI project on behalf of Colorado, looked at regional variation across the state and triangulated the data against other publicly available sources. CIVHC consistently found the state's high use of outpatient services and the high prices of those services have the greatest impact on its total cost. To highlight their findings, CIVHC developed and distributed a white paper to the Colorado legislature and other stakeholders so policymakers, providers and purchasers could better understand how the cost of care in Colorado compares to other states and consider policy changes to impact those costs. In response to strong interest, CIVHC staff presented to legislators, legislative staff and interns, and a conversation began to emerge. They started to move past discussing what the problem is and began talking about how to fix it.

“Now we have a problem in outpatient cost,” said Cari Frank, Vice President of Communications and Marketing at CIVHC. “So, what are we going to do about it? It takes out the guesswork and people start to focus on the solution.”

With its unrestricted funding sources, CIVHC worked with legislators to help inform the development of several bills aimed at increasing healthcare transparency in the state. A key piece of legislation passed. It requires every freestanding outpatient facility—freestanding emergency departments, urgent care centers, imaging centers and others—to bill using its own unique national provider identifier. This change will give CIVHC the ability to identify these various facilities in its dataset rather than have the care provided by those facilities look as though it were provided by a hospital or another facility. The additional data will allow CIVHC to conduct valuable analyses on the care, and the cost of care, delivered by these facilities.



SHARING INFORMATION WITH LOCAL PROVIDERS AND PURCHASERS

Variation across states gains the attention of policymakers. However many local stakeholders, particularly those who provide and pay for healthcare, are more interested in local comparisons of medical groups and practice sites. Five of the six regions share detailed total cost of care data with providers. Increasing interest in population health management and value-based contracting have generated increasing interest in the reports over the years.

At MHI in St. Louis, employers were invited to join representatives of the region's leading provider groups for a joint discussion. At the event, MHI shared how each of the groups performed on the total cost of care, utilization and quality measures compared to each other and a regional benchmark.

"We thought the providers would appreciate having the purchaser voice in the room to better understand the need to manage total cost of care," said Patti Wahl, Senior Director of Value-Based Purchasing, who leads the project for MHI. "Everybody can learn together."

Probst added, "Only by all stakeholders coming together to discuss trusted information can we deliver on the promise of higher-value, safer, and more affordable healthcare in our community."

HealthInsight Utah also is working with an employer workgroup to think about the cost information that would be most meaningful to employers and other purchasers and how it should be reported. Another HealthInsight Utah workgroup is focused on developing a consumer-focused website on affordability and a third workgroup is coordinating related data on social determinants of health from sources such as the United Way.

DEMAND FOR COST TRANSPARENCY ON THE RISE

Over the course of the project, with suggestions from local providers and others, several of the RHICs added new metrics and more sophisticated data visualizations to their provider reports. In some cases, they trimmed back information providers found less useful. For example, in Oregon, they have added a quality composite versus total cost index graph. They've also begun



Data in Action Policymakers

Provides meaningful information to inform policy targeted at the actual drivers of healthcare costs.



Data in Action Purchasers

Identification of high-value providers and health plans informs purchaser's benefit network design.

to share trending information, so providers can see how the cost and resource use compares to their peers over time. Utah shares quality data and year-over-year variability at the clinic level.

“We now have people calling us wanting to know where their reports are. That’s quite a change,” Roberts Tomasi said. “People are paying attention. We’ve tried to get the word out that public reporting is coming so providers want to understand how they are performing in comparison to other providers.”

Utah has also seen an uptick in interest for the total cost of care information, especially from providers and clinic managers who oversee several clinics and can recognize unexplained variability. In addition, these same providers are becoming more willing to share information to improve the accuracy of Utah’s master provider list for attribution.

Gunnar Nelson, who has led Total Cost of Care reporting for MNMCM since before the NRHI project began, said he’s been inspired by the look and content of the HealthInsight Oregon reports, which were originally inspired by reports provided to primary care practices by the Maine Health Management Coalition. Now, MNMCM is redesigning its reports to mimic elements of the Oregon report.

A graphic with a green header and a light yellow body. On the left is a blue circular icon containing a white medical cross and a stylized white 'E' shape. To the right of the icon, the text 'Data in Action Payers' is written in a bold, dark font. Below the icon and text, a quote is written in a smaller, italicized font: 'Provides aggregated cost information they wouldn't otherwise have access to and can drive improvement in the market.'

Data in Action Payers

Provides aggregated cost information they wouldn't otherwise have access to and can drive improvement in the market.

Minnesota and Oregon also report data back to their contributing payers, and Colorado is moving in this direction. All said it’s a way to provide value back to the payers who spend time and resources sharing the data and who will benefit from a greater understanding of overall market performance .

For the first time this year, the regions added the utilization metrics component of the HealthPartners measure set. The utilization metrics, which include measures of emergency department use, high-cost imaging and length of hospitalizations to name a few, can help providers focus more succinctly on one or two patterns that might be contributing to higher than necessary cost. Utah plans to incorporate the data into its next round of physician reports and tailor each report to the physician group with an emphasis on the utilization metrics of greatest interest. Tables comparing utilization metrics across regions can be found beginning on [page 27](#) of this report.

“We attribute the uptick in TCOC interest in Utah to our efforts to customize summaries for the clinics, highlighting variability in service lines versus last year,” said Rita Hanover, a senior analyst at HealthInsight Utah. “We think that taking time to highlight the more detailed utilization variability is well worth the effort and will further increase the ability of the clinics to take action.”

Here's one example of how this type of data might be useful. If the HealthPartners measure set finds high outpatient utilization, the next question for a practice is, "What type of outpatient utilization?" The utilization breakdown can help the practices identify areas for further investigation. In this case, the data might suggest high rates of MRIs or emergency department visits. Then, the question moves from, "Where do I look?" to "How do I fix it?"



Data in Action Providers

Multi-payer reporting enables providers to validate, challenge, and change practice patterns, select high-value specialists, and monitor the impact of change over time.

SPREADING COST TRANSPARENCY TO NEW REGIONS

In addition to the six sites currently contributing to the benchmark, another dozen sites have participated in the project in other ways, including exploring various barriers to reporting on cost such as data availability and stakeholder readiness. These regions have the opportunity to learn from the sites that have gone before them, offer their stakeholders tangible examples of success and offer their own contributions to the collective knowledge base. For many of these sites, the result is the ability to break down technical barriers to reporting. For others, the focus is on engaging stakeholders to assess or broaden support for total cost of care reporting. Across a wide array of market structures, political environments and data infrastructures, RHICs have worked with their regional partners to find solutions to make progress in achieving cost transparency.

Virginia Health Information (VHI), an APCD and RHIC, had Data Submission and Use Agreements between itself and participating health insurance plans that restricted the use of actual allowed amounts submitted. As part of its work to revise these agreements to add TCOC reporting as an approved use, VHI hosted a series of professionally-facilitated meetings that included hearing about project successes and lessons learned from HealthInsight Oregon. With this intensive stakeholder engagement as an underpinning, VHI and its legal counsel determined that VHI could move forward with using actual allowed amounts within the TCOC calculation if authorized through an official vote of its APCD Advisory Committee. This appeared to be both a faster and less costly approach to resolving the barrier as opposed to amending health plan APCD agreements.

Both the Greater Detroit Area Health Council (GDAHC) and HealthInsight New Mexico hosted regional events where members of the Getting to Affordability project team provided an overview of the measure and what their region has gained through measuring and reporting total cost of care. Stakeholders in both regions now have a greater sense of urgency and are meeting to discuss their

regional strategy for healthcare cost transparency. While each region faces different barriers, both were able to advance healthcare affordability by leveraging and sharing the work done by members of the project team.

At the University of Texas, physicians and researchers came together over many months, even on a Saturday, to think through how the state might begin aggregating medical claims data. The result is Health of Texas, a soon to be launched website providing state and regional comparisons of cost and utilization trends by payer type using a multi-payer claims data set representing an estimated 80 percent of the state's claims data.

In other markets with more capitated payment contracts, regional health improvement collaboratives, including the Wisconsin Health Information Organization, the Washington Health Alliance and the Integrated Healthcare Association, are exploring options on how to value capitated payments in the TCOC measure.

While the nudge of a national project can often help local stakeholders realize the benefits of cost reporting, in other instances strong market dynamics can continue to limit the collection and broad use of this data. In Philadelphia, at the Health Care Improvement Foundation (HCIF), an assessment of stakeholders' readiness for sharing cost-related data found health plans worried it would put their plan at a competitive disadvantage and decrease their overall leverage during provider negotiations. With this knowledge, HCIF is considering other ways to increase cost transparency and partner on other opportunities to address cost drivers.

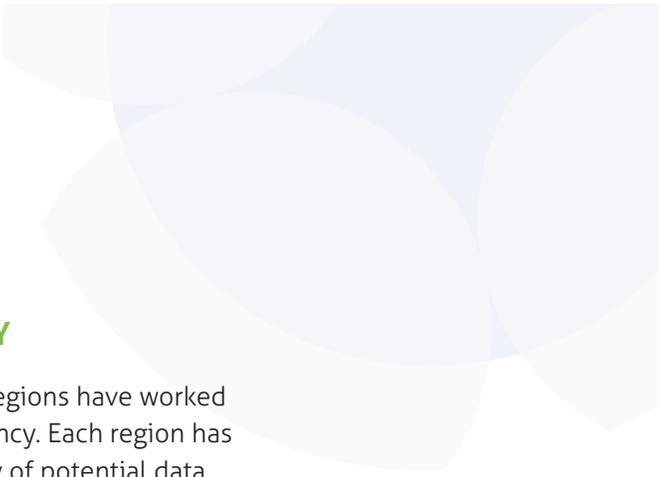
HealthInsight Nevada is working to align Medicare Advantage payers to engage and understand the interest for a common definition of TCOC. By focusing on Medicare Advantage plans, HealthInsight Nevada wanted to learn what barriers exist for obtaining health plan costs for non-Medicare populations in the future.

The Getting to Affordability project provided an excellent opportunity for The Health Collaborative in Cincinnati, OH to develop a standardized method of measuring and improving how the community pays for care. Ultimately, this will support the region in ensuring better care, smarter spending and healthier people. As trends in healthcare progress towards payment for value, transparency and uniform measurement across the region will assist in accelerating improvement for all stakeholders.



Data in Action Patients

Public reporting raises patient awareness of the variation that exists and informs selection of higher quality, more cost-efficient providers.



CONTINUING TO ADVANCE COST TRANSPARENCY

Over the last five years, multi-stakeholder partners in 18 regions have worked together to better understand the power of cost transparency. Each region has grown in its ability to understand the availability or quality of potential data and the appetite of stakeholders for measurement and reporting. Throughout the project, participants also have seen continued and growing interest across stakeholders for information related to affordability. Much of this stems from increasing concern regarding the high cost of care and a desire to buy care differently through value-based contracts. With CMS' recent announcement that it will be looking for health systems to take on increasing risk for total cost of care, this interest likely will only grow.

For several of the regions, reporting on Medicare and making more data public will be the next frontiers in the work. All will continue to work collaboratively across stakeholder groups to better understand affordability of care in their regions, the factors driving price and resource use, and opportunities to reduce waste.

Network for Regional Healthcare Improvement (NRHI) recently launched **Affordable Care Together**, a national campaign that strives to achieve affordable healthcare by focusing on three major drivers: health, price, and waste. A key component of this work is developing a better understanding of the specific relationships across health, price, and waste, in each region and supporting local stakeholders in developing and implementing tailored strategies to increase likelihood of more affordable healthcare.

Affordable Care Together builds on NRHI's Getting to Affordability work. As part of this national campaign, NRHI is inviting national organizations and healthcare advocates interested in taking community action to address healthcare affordability in collaboration with other like minded change agents across the country.

Join the movement—we can achieve Affordable Care Together by improving health, reducing price, and eliminating waste. Stay up to date on the work NRHI and its members are doing to make our healthcare system higher quality and more affordable for everyone by signing up for our email list (<http://affordablecaretogether.com/>) and following us on Twitter (www.twitter.com/reghealthimp).



Network for
Regional Healthcare
Improvement

Getting to Affordability

Section II: Benchmarking Methodology

Purpose

The Network for Regional Healthcare Improvement (NRHI) has previously published two national annual reports¹ comparing the total cost of care among commercially insured populations. This report, covering healthcare delivered in 2016, is the third installment of these reports. The Benchmarking Methodology Section summarizes the process and results of the second year of NRHI's Total Cost of Care (TCOC): Phase III project (Phase III Year Two)². This installment, similar to the previous reports, used the National Quality Forum (NQF) endorsed HealthPartners TCOC Measure Set³ to compare commercial data across several regions in the United States. This section provides an in-depth review of the participants, process, and results.

Summary

Phase III Year Two saw several advancements from the previous years. These included increasing the number of participating regions from five to six, adding a review of utilization statistics to the report, and an increase in the number of commercial plans meeting the data quality requirements for inclusion in the report.

Phase III Year Two of the Total Cost of Care project continued to advance healthcare transparency in several ways:

- Regions with different healthcare markets and population demographics were compared;
- Participants produced TCOC measure benchmarks after a careful and thorough data quality review;
- Regions learned more about the contents of their data and improved data quality to refine current and future submission streams;
- Several potential cost drivers were examined for impact;
- Results compared to prior years showed stability, increasing confidence in the TCOC measure set's ability to produce meaningful results despite limitations of the data.

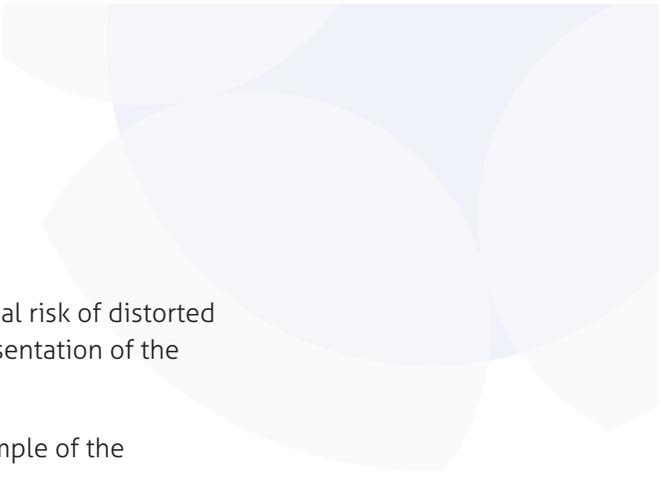
Previously identified data limitations and considerations persisted in Phase III Year Two. These were thoroughly examined and an issue brief was published⁴

1 http://www.nrhi.org/uploads/benchmark_report_final_web.pdf
<http://www.nrhi.org/uploads/g2a-benchmark-report-final-web-1.pdf>

2 http://www.nrhi.org/uploads/g2a_onepager_r17.pdf

3 <https://www.healthpartners.com/hp/about/tcoc/index.html>

4 http://www.nrhi.org/uploads/futureconsiderationsforreportingtcc_r10.pdf



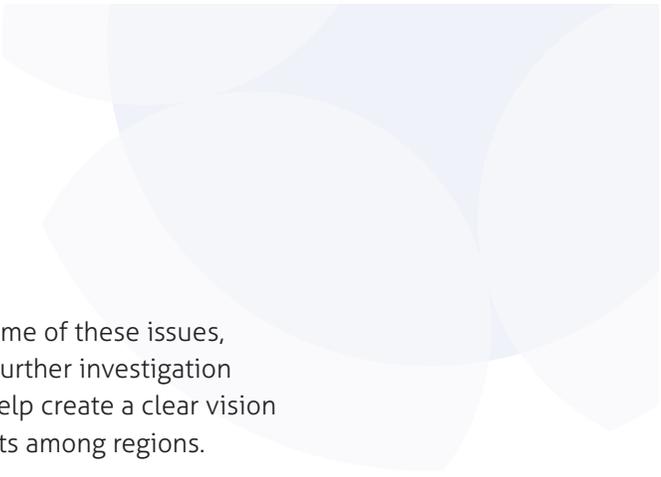
to help navigate them. However, they still pose the potential risk of distorted benchmarks and should be included as caveats in any presentation of the benchmark results.

- Data used to produce measures are not a random sample of the commercial market in each region.
- Claims paid by pharmacy and behavioral health benefit managers may not be included.
- Following HealthPartners TCOC methodology, patient-level costs were truncated at \$100,000.
- Substance abuse and other behavioral claims are sometimes excluded from data submissions or aggregated data stores for privacy reasons.
- Variation in provider coding patterns potentially affects risk scores.
- Non-claims payments (e.g. capitation, pay for performance payments) are not in the data stores.
- Data store structure limited data quality control or attempts to correct issues identified during that process for some regions.

Further information about these issues is available in previous publications of the benchmark.

This publication continues to aid in understanding healthcare cost variation among different areas of the country. Cost drivers can be identified by deconstructing per member cost into its individual components. Conceptual cost drivers might include:

- Health status—measured and adjusted for in the TCOC methodology through risk adjustment;
- Differences in services covered by the health benefit plan (e.g., mandated differences by state);
- Patient cost-sharing levels in the benefit plan;
- Utilization rates of health services—measured by the Resource Use Index (RUI);
- Provider reimbursement methods;
- Provider price levels (including influences of cost shifting from other payers and uncompensated care and from market power)—measured by the price index;
- Narrowness of provider networks;
- Wage levels and general cost of living;
- Urbanization and access to healthcare facilities.



While the HealthPartners TCOC methodology addresses some of these issues, there are some that are outside the scope of this project. Further investigation and analysis of cost drivers and their relative impact will help create a clear vision of how these cost drivers are impacting the healthcare costs among regions.

Participants and Process

PARTICIPANTS

The TCOC project, under the leadership of NRHI and through funding from the Robert Wood Johnson Foundation (RWJF), began with five pilot sites in November of 2013. These sites are NRHI member Regional Health Improvement Collaboratives (RHICs) and included:

- Center for Improving Value in Health Care (CIVHC)
- Maine Health Management Coalition (MHMC)⁵
- Midwest Health Initiative (MHI)
- Minnesota Community Measurement (MNCM)
- HealthInsight Oregon

Since 2013 NRHI has expanded to include several other RHICs. These regions can be classified as either Standardized Regions or Developmental Sites. The Standardized Regions contribute data in the creation of the National Benchmark, while Developmental Sites seek to address specific barriers to price transparency. For Phase III Year Two the Standardized Regions included:

- Center for Improving Value in Health Care (CIVHC)
- Midwest Health Initiative (MHI)
- Minnesota Community Measurement (MNCM)
- HealthInsight Oregon
- HealthInsight Utah in partnership with the Utah Department of Health, Office of Health Care Statistics
- Maryland Health Care Commission (MHCC) in partnership with Social and Scientific Systems

The Developmental Sites that participated were:

- Greater Detroit Area Health Council
- HealthInsight Nevada

⁵ MHMC participated in Phase I benchmarks only and is now known as Healthcare Purchaser Alliance of Maine

- 
- HealthInsight New Mexico
 - Health Care Improvement Foundation
 - Integrated Healthcare Association
 - Massachusetts Health Quality Partners
 - The Health Collaborative
 - The University of Texas Health Science Center at Houston
 - Virginia Health Information
 - Washington Health Alliance
 - Wisconsin Health Information Organization

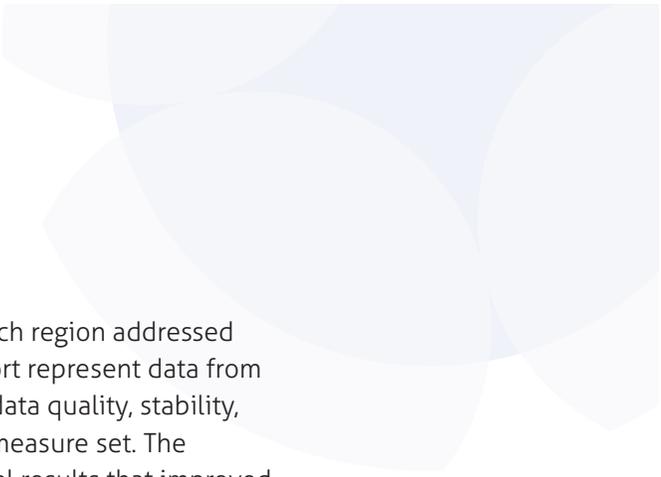
Work done by the Developmental Sites expands the TCOC measurement by exploring the use of capitated claims, Medicaid data, and Medicare advantage data, as well as collaborating with stakeholders to achieve greater price transparency. More information and publications on these topics can be accessed through the NRHI Getting to Affordability website⁶.

GENERAL PROCESS

Regions participating as Standardized Regions in the Phase III TCOC Year Two benchmarking performed robust data quality assurance and data quality control processes using their data store to determine fitness for TCOC analysis. Improvements in data quality from previous years led to a combined increase of over 600,000 unique members for three of the regions. Data quality tables examining the following characteristics were produced and compared across contributors' data stores as well as across data sources within them:

- Member counts and claim dollars by month
- Members and claims indicating primary insurance
- Payment deduplication
- Procedure code integrity and coverage
- Diagnosis code fields
- Surgical procedure code fields
- Professional place of service
- Inpatient Diagnosis-Related Group
- High cost pharmacy
- Consistency of member ID across claims and eligibility

⁶ See G2A Case Studies at <http://www.nrhi.org/work/multi-region-innovation-pilots/tcoc/>



An iterative process between the Technical Advisor and each region addressed most data quality issues. The results presented in this report represent data from each participating Standardized Region that met rigorous data quality, stability, and completeness requirements for supporting the TCOC measure set. The intensive process used to improve data quality yielded final results that improved on Phase I and Phase II. However, limitations remain and provide an important opportunity for future refinement. These limitations can be further examined in the aforementioned prior reports and issue brief.

Results

The analytical results produced by the project include the TCOC measures including the recently added utilization statistics, as well as additional analysis drilling further into the cost drivers underlying the aggregate measures. These results represent multi-payer commercial data for 2016.

TCOC RESULTS

[Table 1](#) shows the Total Cost Index (TCI), the Resource Use Index (RUI), and the Price Index for the six participating Standardized Regions using the commercial population (ages 1–64). The TCI compares total per member per month spending and the RUI focuses on differences in intensity of utilization. Both the TCI and RUI are adjusted for differences in the populations' underlying health status using the Johns Hopkins Adjusted Clinical Groups® System (ACG® System)⁷. The RUI measure and the Price Index allow separate analysis of intensity of utilization and price.

[Table 1](#) and [Table 2](#) display these TCOC measures as ranges. The cost, utilization, and price shown in the first section of this report are derived from the midpoint of the ranges in these tables and displayed as a percentage above or below one. The risk score ranges were determined by conducting a sensitivity analysis on the risk scores and then indexing the results. This analysis considered variation in claim detail across data contributors. After consulting with subject matter experts about the potential effect of variation in claim detail, maximum potential variation was applied to affected risk scores. Some regions experienced higher variation in risk score due to the variation in claim level detail. The risk scores were indexed so that their unweighted average was equal to one. This was done by dividing each region's risk score by the overall unweighted risk score.

⁷ For more detailed information on the TCOC measure set, including TCI and RUI, see the HealthPartners White Paper: https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/dev_057649.pdf

The range of indexed risk scores produces ranges in TCI and RUI because these indexes are both risk score adjusted. However, since the Price Index is calculated directly from the TCI and RUI, their risk score adjustments cancel each other out. Hence the Price Index does not vary with the risk score. A region's index is above the risk-adjusted average if the range is greater than one, approximately average if the range spans one, and below average if the range is less than one.

**TABLE 1: TOTAL COST INDEX AND RESOURCE USE INDEX:
COMMERCIAL POPULATION 2016**

	Colorado	Maryland	Minnesota	Oregon	St. Louis, MO	Utah
<i>Indexed Risk Score</i>	0.90 – 0.97	1.11 – 1.19	0.98 – 1.01	0.96 – 0.99	1.02 – 1.05	0.89 – 0.92
TCI	1.15 – 1.23	0.78 – 0.83	1.10 – 1.13	1.03 – 1.06	0.92 – 0.95	0.95 – 0.97
RUI	1.01 – 1.09	0.90 – 0.97	1.05 – 1.09	0.89 – 0.91	1.08 – 1.12	0.94 – 0.97
Price Index	1.13	0.86	1.04	1.16	0.85	1.01

HealthPartners' TCOC measure set is designed to produce results at the primary care practice level. In this scenario, results consist only of those patients who can be attributed to a primary care practice. However, this report compares regions rather than practices. The measures shown here reflect the entire available population regardless of whether individuals visited a primary care provider. Using the entire available population provides the largest possible sample and avoids potential impact on results caused by differences in attribution methodologies across regions. Analysis showed that the regional results based on primary care practice populations did not vary substantially from the TCI, RUI, and Price Index of the entire available population.

It is important to note that the measures are indexed to the non-weighted average of the participating regions. Using the non-weighted averages avoids letting larger regions dominate the average. Furthermore, the indexes are directly impacted by the regions participating in the benchmark. Phase III Year Two added St. Louis, MO (MHI) into the benchmark. Other region's indexes were impacted due to St. Louis' relatively high healthcare resource use and low price. Application of the results should be interpreted with the relative nature of indexes in mind, as well as close attention to the technical data issues and to the insight into interpreting benchmark data as will be discussed.

COST DRIVER EXPLORATION

Measuring and reporting costs of healthcare support providers and policymakers in their efforts to pursue the Triple Aim: higher quality healthcare, with more

satisfied patients, at a lower cost. Once response to the question, “What is the difference in the cost of healthcare in various regions?” have been established, then attention can turn to “Why does it differ?” Answers to this last question will lead to specific strategies that can be employed to reduce cost.

Factors that drive the cost of healthcare can be divided into two main components: those that affect the unit price of services and those that affect the intensity of services used (utilization).

Factors Affecting Commercial Unit Price:	Factors Affecting Utilization:
Provider market power	Health status (morbidity)
Health Plan market power	Physician practice patterns
Cost-shifting	Patient cost-sharing level
Regional cost of living	State mandates
Location of service	Providers in network

Each factor that contributes to differences in cost can be used both as an adjustment in order to isolate the other factors contributing to cost and as an important stand-alone measure for further exploration of potential strategies to reduce healthcare costs. For example, risk scores are used to adjust for basic health status in the regional groups to make costs more comparable. At the same time, an examination of the regional risk scores themselves may be conducted to explore ways for cost reduction through improved health status (lower morbidity) and potentially through policies to improve underlying causes. Similarly, the RUI measure controls for provider prices, allowing a focus on the reduction of certain types of utilization as a way to lower overall cost. Another aspect for additional research and examination is to discover why unit prices vary, including consideration of wage levels, cost of living, urbanization, healthcare access, or provider and payer market power. Improving the collective understanding of the differing cost drivers and contributing factors may provide the most useful results for finding strategies that will reduce costs.

The TCOC results presented in [Table 1](#) begin to break cost into components by showing average indexed risk score, the cost measure adjusted for risk score, and the effect of eliminating unit cost differences through the Total Care Relative Resource Value (TCRRV™) and RUI. The TCOC measure set offers some additional insight into service categories which are displayed in [Table 2](#). As stated above, the results are indexed according to the participants and thus, if year-to-year comparisons are made it should be done with reference to a consistent set of participants.

Table 2 breaks down the components of medical cost by region. As an example of how to interpret this table, notice that St. Louis has a lower than average overall TCI (0.92–0.95). However, their pharmacy TCI is much higher than average (1.13–1.17), which appears to be driven by higher than average utilization (1.19–1.23). This result suggests that while St. Louis seems to be keeping medical costs fairly low, pharmacy utilization can be examined for its relationship to quality of care.

**TABLE 2: COMPONENTS OF MEDICAL COST:
COMMERCIAL POPULATION 2016**

	Colorado	Maryland	Minnesota	Oregon	St. Louis, MO	Utah
TCI						
Overall	1.15 – 1.23	0.78 – 0.83	1.10 – 1.13	1.03 – 1.06	0.92 – 0.95	0.94 – 0.97
Inpatient	1.17 – 1.26	0.70 – 0.75	1.10 – 1.14	1.04 – 1.07	0.86 – 0.89	1.07 – 1.10
Outpatient	1.29 – 1.39	0.64 – 0.68	1.01 – 1.04	0.99 – 1.02	0.99 – 1.02	1.04 – 1.07
Professional	0.98 – 1.06	0.81 – 0.87	1.28 – 1.32	1.17 – 1.20	0.77 – 0.80	0.90 – 0.92
Pharmacy	1.23 – 1.33	0.94 – 1.00	0.89 – 0.92	0.83 – 0.85	1.13 – 1.17	0.85 – 0.87
RUI						
Overall	1.01 – 1.09	0.90 – 0.97	1.05 – 1.09	0.89 – 0.91	1.08 – 1.12	0.94 – 0.97
Inpatient	0.89 – 0.96	0.87 – 0.93	1.07 – 1.10	0.83 – 0.86	1.11 – 1.15	1.12 – 1.15
Outpatient	1.13 – 1.21	0.71 – 0.76	1.04 – 1.08	0.75 – 0.77	1.27 – 1.31	1.01 – 1.04
Professional	0.92 – 0.99	0.99 – 1.06	1.16 – 1.19	0.95 – 0.98	0.93 – 0.97	0.91 – 0.93
Pharmacy	1.18 – 1.27	0.92 – 0.99	0.83 – 0.86	0.92 – 0.95	1.19 – 1.23	0.82 – 0.84
PRICE INDEX						
Overall	1.13	0.86	1.04	1.16	0.85	1.01
Inpatient	1.31	0.81	1.03	1.25	0.77	0.96
Outpatient	1.15	0.89	0.97	1.32	0.78	1.03
Professional	1.07	0.82	1.11	1.22	0.83	0.99
Pharmacy	1.05	1.01	1.07	0.90	0.95	1.04
PROPORTION OF HEALTHCARE BY PLACE OF SERVICE						
Inpatient	14%	13%	14%	14%	13%	16%
Outpatient	30%	22%	24%	26%	28%	29%
Professional	32%	39%	44%	42%	31%	35%
Pharmacy	24%	27%	18%	18%	27%	20%
Overall	100%	100%	100%	100%	100%	100%

The Overall Healthcare Cost Percentages in the above table shows that there is variation in where healthcare dollars are being spent. This variation is impacted by several different local and regional factors. Continuing the example above, one contribution to St. Louis' high pharmacy usage may be related to the billing practices for specialty medications. In some regions, medication that is administered in a clinical setting is usually procured and billed under the medical benefit. However, there is a growing trend in some regions among self-insured employer and union plans to move specialty medicines out of the medical benefit, whenever the situation allows, and into the pharmacy, where the patient and plan cost is lower. This example serves as a reminder that underlying regional practices can and do have an influence on where and how healthcare dollars are spent.

Table 3, below, explores the cost drivers by breaking the TCI into the RUI and Price Index components⁸. The indexes in the table represent the midpoint of the ranges presented in Table 2. The percentages indicate the contribution to total cost each of the components made. A positive percentage indicates utilization or price is driving cost higher compared to the benchmark, and a negative percentage indicates utilization or price is driving cost lower compared to the benchmark. In some cases, the RUI and the Price Index are working in opposite directions. In those cases, the component that contributes most determines if the cost is above or below average.

TABLE 3. PRICE AND UTILIZATION CONTRIBUTIONS TO TOTAL COST

	Colorado	Maryland	Minnesota	Oregon	St. Louis, MO	Utah
TCI	1.19	0.80	1.11	1.04	0.94	0.96
RUI	1.05	0.93	1.07	0.90	1.10	0.95
Contribution to TCI	27%	-32%	64%	-39%	40%	-85%
Price Index	1.13	0.86	1.04	1.16	0.85	1.01
Contribution to TCI	73%	-68%	36%	61%	-60%	15%

In order to get a more comprehensive picture when comparing healthcare costs, overall cost of living should be examined. In this report, the Missouri Department of Economic Development's Economic Research and Information Center (MERIC) was used to help provide this perspective. Table 4 shows MERIC's 2016 Health Cost of Living Index⁹ along with the TCI, RUI, and Price Index. As in previous publications a high correlation exists between the Health Cost of Living Index and TCI (correlation coefficient = 0.82) and with the Price Index (correlation coefficient = 0.65).

⁸ TCI equals Price Index multiplied by RUI. The contribution to TCI calculation takes this relationship into consideration

⁹ Cities across the nation participate in the Council for Community & Economic Research (C2ER) survey on a volunteer basis. Price information in the survey is governed by C2ER collection guidelines (<http://coli.org/wp-content/uploads/2017/12/2018-COLI-Manual.pdf>). Weights assigned to relative costs are based on government survey data on expenditure patterns for professional and executive households. MERIC derives the cost of living index for each state by averaging the indices of participating cities and metropolitan areas in that state.

TABLE 4: COMPARING HEALTH COST OF LIVING INDEX TO TCI, RUI AND PRICE INDEX

	Colorado	Maryland	Minnesota	Oregon	St. Louis, MO	Utah
<i>Health Cost of Living Index 2016</i>	1.06	0.92	1.09	1.05	0.97	0.90
TCI	1.19	0.80	1.11	1.04	0.94	0.96
RUI	1.05	0.93	1.07	0.90	1.10	0.95
Price Index	1.13	0.86	1.04	1.16	0.85	1.01

These results highlight the complexity of healthcare costs and how cost of living is one factor that plays a role in the healthcare landscape. There are many factors that influence healthcare costs. Some of these other factors include richness of the benefit plan, provider-payer reimbursement relationships, market share of public payers, and the rate of uninsured individuals—all contribute to commercial healthcare costs. Of particular note is research performed on how uncompensated care, Medicare rates, and Medicaid rates caused shifts in costs from regulated reimbursed payer populations to the commercial population. For those who may be interested in learning more on this topic, please reference Frakt’s publication¹⁰.

Utilization Metrics

INTRODUCTION

The TCRRV™ (RUI) measures intensity of healthcare resource utilization. To determine whether variation in Relative Resource Use is due to differences in the level of a service used (e.g., an MRI instead of an X-ray) or the number of times a provider orders a particular service (x-rays on more patients), the expanded TCRRV™ software offers a look at counts of specific services ordered, such as admissions, office visits, Emergency Room (ER) services, and pharmacy prescriptions. These utilization metrics are produced using the same patients and claims as the TCOC and TCRRV™ measure sets.

The utilization metrics include:

- Inpatient Admissions
- Inpatient Days

¹⁰ Frakt, Austin B. "How Much Do Hospitals Cost Shift? A Review of the Evidence." *The Milbank Quarterly* 89.1 (2011): 90–130. PMC. Web. 11 Jan. 2018.

- Surgery Admissions
- Surgery Admission Days
- Medical Admissions
- Medical Admission Days
- Emergency Room Visits
- Outpatient Surgery
- Primary Care Office Visits
- Specialty Office Visits
- Lab and Pathology Tests
- High Tech Radiology Use
- Standard Radiology Use
- Pharmacy Use
- Generic Pharmacy Use Ratio

RISK ADJUSTMENT FOR UTILIZATION METRICS

The risk score used for the Total Cost Index is designed to adjust for expected dollars spent for a particular configuration of conditions. Different conditions can have similar costs per year with distinctly different utilization patterns (see Table 5 below). This makes it necessary to use a different risk adjustment method for Utilization Metrics.

TABLE 5. RISK SCORE AND UTILIZATION DIFFERENCES

ACG	1721	4830
Description	Pregnancy, 2–3 ADG, Delivered	6–9 ADG with complications, Female 18–34, 2 major ADGs
Risk Score	3.32	3.41
UTILIZATION PER 1000 PATIENTS PER YEAR		
Office Visits	2,040	8,825
Inpatient Admissions	987	197
Emergency Room Use	79	565
Pharmacy Scripts Filled	4,665	24,209

Utilization also varies by age and sex:

TABLE 6. EMERGENCY ROOM VISITS PER 1000 PATIENTS PER YEAR

	Female	Male
Age 1–17	136	150
Age 18–39	197	131
Age 40–64	157	132

To enable comparison across regions, the utilization pattern by age/sex/ACG cell within a region is measured. These utilization rates are then applied to a standard distribution of patients by age/sex/ACG cell. This method calculates the regional utilization as if all regions were presented with the same set of patients. The differences in these risk-adjusted rates are then due to differences in the way providers in each region treat patients, rather than differences in the patients they are treating.¹¹

UTILIZATION RESULTS

The tables below display selected utilization metrics for the participating regions. The metrics are adjusted for risk as described above. As with the TCI and RUI, all measures are calculated on 2016 dates of service. The RUI is shown alongside the risk-adjusted utilization rates because the interaction of the indexed utilization and the RUI highlight the difference between raw utilization and intensity.

TABLE 7. RISK ADJUSTED UTILIZATION AND RESOURCE USE INDEX

Region	Office Visits						RUI
	Count per 1,000 Patients			Index to Average			Professional
	PCP	Specialist	Total	PCP	Specialist	Total	
Colorado	2,068	1,245	3,313	1.07	0.75	0.92	0.96
Maryland	2,006	2,281	4,287	1.04	1.37	1.19	1.02
Minnesota	1,920	1,542	3,462	0.99	0.93	0.96	1.17
Oregon	1,786	1,673	3,459	0.93	1.01	0.96	0.97
St. Louis, MO	1,993	1,625	3,618	1.03	0.98	1.01	0.95
Utah	1,808	1,585	3,393	0.94	0.96	0.95	0.92
Average	1,930	1,659	3,589	1.00	1.00	1.00	1.00

¹¹ For more information on the method of direct standardization, see <https://www.healthknowledge.org.uk/e-learning/epidemiology/specialists/standardisation>

	Inpatient						RUI
	per 1,000 Patients			Index to Average			Inpatient
Region	Admissions	Days	Average Length of Stay	Admissions	Days	Average Length of Stay	
Colorado	41.1	146	3.55	1.00	0.92	0.93	0.92
Maryland	43.6	174	3.99	1.06	1.10	1.04	0.90
Minnesota	45.1	174	3.86	1.09	1.10	1.01	1.09
Oregon	35.4	122	3.45	0.86	0.77	0.90	0.84
St. Louis, MO	40.5	191	4.72	0.98	1.21	1.23	1.13
Utah	41.4	139	3.36	1.00	0.88	0.88	1.13
Average	41.2	158	3.83	1.00	1.00	1.00	1.00
	Emergency Room Visits						RUI
	per 1,000 Patients			Index to Average			Inpatient
Region	Count			Count			
Colorado	168			1.11			1.17
Maryland	178			1.18			0.74
Minnesota	144			0.95			1.06
Oregon	139			0.92			0.76
St. Louis, MO	148			0.98			1.29
Utah	132			0.87			1.03
Average	151			1.00			1.00
	Pharmacy Prescriptions Filled						RUI
	per 1,000 Patients			Index to Average			Pharmacy
Region	Count			Count			
Colorado	11,847			0.97			1.22
Maryland	11,860			0.98			0.96
Minnesota	11,865			0.98			0.84
Oregon	11,428			0.94			0.93
St. Louis, MO	13,391			1.10			1.21
Utah	12,555			1.03			0.83
Average	12,158			1.00			1.00

*Note: Emergency Room visits that result in direct admission to the hospital are excluded.

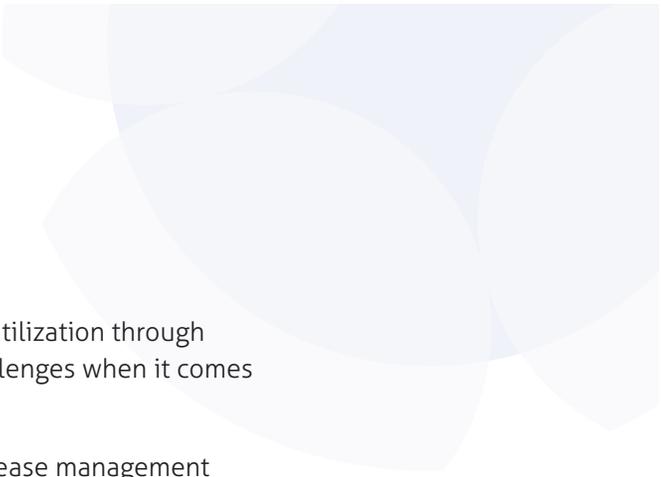
	Laboratory/Radiology						RUI
	per 1,000 Patients			Index to Average			Not Applicable
Region	Lab/ Pathology	High Tech Radiology	Standard Radiology	Lab/ Pathology	High Tech Radiology	Standard Radiology	
Colorado	5,387	189	596	0.97	1.02	0.91	
Maryland	6,620	186	704	1.20	1.01	1.08	
Minnesota	5,334	202	589	0.96	1.09	0.90	
Oregon	5,086	151	626	0.92	0.82	0.96	
St. Louis, MO	5,823	201	757	1.05	1.09	1.16	
Utah	4,921	178	640	0.89	0.96	0.98	
Average	5,529	185	652	1.00	1.00	1.00	

DISCUSSION

The first table above compares the regional rates of office visits to Primary Care Providers and Specialists, an important component of the Professional RUI. While the PCP visit rate varies somewhat across the regions, with Colorado at 7% above the average and Oregon 7% below, the rate of Specialist visits shows more dramatic differences. Maryland makes heavy use of specialists while Colorado is 25% below the average. Minnesota, despite its high Professional RUI, is about average in terms of office visits to both PCPs and specialists. This highlights the value of the utilization metrics as a way of understanding and addressing the RUI results, by giving users some insight into what is or is not driving them.

The Inpatient utilization metrics relate directly to the Inpatient RUI. Minnesota's 1.09 RUI and 1.09 indexed admission rate indicate that the intensity of admissions is about average. In contrast, Maryland's 0.90 inpatient RUI compared to its 1.06 indexed admission rate suggests that the average intensity is low. They are using below average resources on inpatient admissions, but more people are spending time in the hospital. Utah and St. Louis (MHI) show the opposite situation, with average admission rates but high resource utilization.

Emergency Room visits are only one component of Outpatient RUI, but they are often a focus of efforts to curtail inappropriate utilization. Colorado and Maryland have higher than average rates of ER utilization, but they have very different measures of outpatient resource consumption. These utilization metrics suggest



that both of these regions have an opportunity to reduce utilization through programs directed at ER visits, but they have different challenges when it comes to overall Outpatient utilization.

Pharmacy utilization is a complex issue. In some cases, disease management programs encourage greater use of appropriate medications to control chronic conditions. In other cases, such as antibiotic use, providers and patients should be focused on using prescriptions only in situations that warrant them. Comparing 30-day prescription counts with pharmacy RUI for each of the regions shows that Colorado uses particularly high-intensity medications, while Utah uses more prescriptions with a lower average intensity.

A review of the Laboratory/Radiology metrics shows that Oregon is consistently below the average for Laboratory tests and both types of Radiology. In contrast, St. Louis makes heavier than average use of all three types of testing. Along with St. Louis, Minnesota uses High Tech Radiology 9% more than the average and 33% more than Oregon, who has the lowest rate of High Tech Radiology.

DATA CONSIDERATIONS FOR UTILIZATION METRICS

The utilization methodology in the TCRRV™ software does not test thresholds or outliers. It counts all the activity within the category, unlike the TCI calculation which limits the costs per patient to a preset limit (in this case \$100,000 per member per year). The TCRRV™ values are limited to specific ranges so a missing or mistaken value does not drastically impact the result. The lack of outlier threshold should be noted in any analysis of the data but not adjusted within the data.

This difference in methods puts a greater importance on data review. For example, on the initial data run, one region had five inpatient admission claims with no admission date. This created inpatient admissions with apparent lengths of stay of over 20,000 days each. After a review, these data points were corrected, and the lengths of stay recalculated.

Billing and practice patterns impact results. For example, the HealthPartners TCRRV™ Utilization metric for Outpatient Surgery counts only surgeries billed on the UB04 hospital claim form. Ambulatory surgical centers, which use the HCFA 1500 claim form, are not included. This phenomenon is apparent in the differences seen among regions in the Outpatient Surgery utilization metric, shown below:

TABLE 8: RISK ADJUSTED OUTPATIENT UTILIZATION

Region	Outpatient Surgery per 1000 Patients Per Year
COLORADO	133.3
MARYLAND	84.8
MINNESOTA	109.2
OREGON	59.3
ST. LOUIS, MO	132.1
UTAH	124.1

Use of Ambulatory Surgical Centers in Maryland and Oregon could be a possible explanation of outpatient surgery 21% and 45% lower than the other regions.

UTILIZATION CONCLUSION

The Utilization Metrics included in the expanded TCRRV™ software offer some insight into factors underlying differences in RUI by region. Because there is no truncation or testing for reasonability in the methodology, more attention to data cleaning and preparation is required. Utilization metrics drill down into specific services and are therefore more sensitive to differences in provider coding and billing patterns. These may be more alike within a state, creating more reliable comparisons among practices within a state, than among states. As with all statistics, one should interpret them with an understanding of their source (claims data) and context (the changing healthcare landscape).

Year-to-Year Comparisons

In Phase III Year Two, six regions contributed to the TCOC benchmark results. Four of those regions participated in all three years of the TCOC comparison: Maryland, Minnesota, Oregon, and Utah. These four regions provide an opportunity to assess the stability of the measure over time and across regions. One of the complexities of making comparisons between years is the variation of available commercially insured members in each region. Through the years, there have been some substantial changes in the amount of available data for some of the regions. Notably, in 2016 the Supreme Court's decision in *Gobeille vs Liberty Mutual*¹² severely impacted the availability of self-funded Employee Retirement Income Security Act (ERISA) data contributions. Other factors that impacted data availability include timeliness and quality of the data submitted to each region.

¹² For more information about *Gobeille vs Liberty Mutual* and the impact on APCDs, please see the APCD Council's statement: <https://www.apcdouncil.org/news/2016/03/apcd-council-statement-scotus-decision-gobeille-v-liberty-mutual-case>

In spite of these changes in the amount of data available, Table 9 demonstrates the consistency in the TCOC measures. Of particular note, Minnesota was the only region whose data store did not change significantly from year to year.

TABLE 9: COMPARING TCOC MEASURES FROM 2014 TO 2016 WITH COMMON PARTICIPANTS IN ALL THREE YEARS

	Maryland	Minnesota	Oregon	Utah
2014 TCI	0.84	1.11	1.07	1.00
2015 TCI	0.88	1.11	1.04	1.00
2016 TCI	0.83	1.14	1.07	0.99
2014 RUI	0.91	1.08	0.94	1.10
2015 RUI	0.99	1.08	0.94	0.99
2016 RUI	0.97	1.11	0.93	0.99
2014 Price Index	0.93	1.03	1.14	0.91
2015 Price Index	0.88	1.03	1.11	1.00
2016 Price Index	0.85	1.03	1.14	1.00

Maryland’s sample fundamentally changed from 2014 to 2016. Maryland no longer includes any data from self-funded employers with ERISA health plans, and changes in the individual market (ACA-compliant and non-compliant plans) introduced more high risk patients. Utah had changes in its data store from 2014 to 2015 that increased accuracy in the detailed data on inpatient claims and improved the precision of the TCRRV. This change in the data store and TCRRV output specifically drove down the RUI in 2015 which also impacts the Price Index.

[Table 10](#) shows all participants for all three years of the project. It should be remembered that the HealthPartners measures are relative only to those regions that participate. Comparing Table 9 and [Table 10](#) demonstrates how including different regions in the benchmark can impact the measures; this is due to the fact that any measure based on a small number of contributors can be influenced by the inclusion or exclusion of just a single participant. The indexes fluctuate between 0.01 and 0.04 depending on whether all regions are used or only the four regions with data for all three years are used.

TABLE 10: COMPARING TCOC MEASURES FROM 2014 TO 2016 WITH ALL PARTICIPANTS

	Colorado	Maryland	Minnesota	Oregon	St. Louis, MO	Utah
2014 TCI	–	0.86	1.14	1.10	0.90	1.02
2015 TCI	1.17	0.84	1.07	1.00	–	0.96
2016 TCI	1.19	0.80	1.11	1.04	0.94	0.96
2014 RUI	–	0.88	1.05	0.93	1.08	1.07
2015 RUI	1.11	0.97	1.05	0.92	–	0.97
2016 RUI	1.05	0.93	1.07	0.90	1.10	0.95
2014 Price Index	–	0.98	1.09	1.18	0.83	0.96
2015 Price Index	1.06	0.87	1.01	1.09	–	0.99
2016 Price Index	1.13	0.86	1.04	1.16	0.85	1.01

CONCLUSION

Phase III Year Two of the RWJF Total Cost of Care project advances healthcare cost and utilization transparency in several important ways. First, a greater understanding of how cost and utilization vary between regions is achieved. Cost was analyzed by price and utilization to identify cost drivers in different regions. The utilization metrics then build upon this by showing regional differences in healthcare practices and use. Finally, the project highlights that although there may be changes in payer mix and data availability for a region, the differences among regions are, at a high level, more consequential than the potential differences caused by these data changes. These findings advance the national conversation regarding healthcare cost and utilization in the search for a solution to the healthcare cost crisis.