nrhi
Network for
Regional Healthcare
Improvement

Getting to
Affordability

APCD COUNCIL All-Payer Claims Database

Technical Resource for Measurement of Total Cost of Care Using Multi-Payer Data Sets

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A collaborative effort of:

Network for Regional Healthcare Improvement
APCD Council

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Contents

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Executive Summary/Introduction

In the pursuit of advancing payment reform, the Network for Regional Healthcare Improvement (NRHI) is leading a multi-regional innovation initiative focused on the production, sharing and use of information about the total cost of care. With funding from the Robert Wood Johnson Foundation, five pioneering regional health improvement collaboratives (RHICs) who participated in the pilot phase of the initiative are now joined by six additional regions in a unique approach to standardizing how they report cost information. Balancing local customization with alignment to national efforts makes the information consistent, relevant, and actionable. This initiative is known as NRHI Getting to Affordability and this Technical Resource is a major component of this effort.

One of the key objectives of this work is national spread. All-Payer Claims Databases (APCDs), which already exist or are planned in many states, represent a golden opportunity to enable that expansion (to build upon, coordinate and ultimately establish a national standard model). NRHI partnered with the APCD Council to understand the strategy for using APCDs for this purpose. Together, these entities worked to translate the standardized technical specifications and lessons learned from the pilot regions into a more formal how-to guide for measuring and reporting total cost of care. This effort uses the HealthPartners National Quality Forum endorsed Total Cost of Care and Resource Use framework (TCOC).

The purpose of this Technical Resource is to give other users of APCDs the benefit of experience gained by project participants in creating TCOC on multi-payer commercial claim data. It addresses data preparation, quality assessment, and suggestions for getting the best results from the HealthPartners Standard Analytic Package.[1] It offers guidance/best practices on:

- Initial data quality checks
- Preparing the data
- Minimum data requirements
- Selection of members and claims data
- Evaluating the quality of the data to be analyzed
- Assigning risk scores
- Assessing the output of the HealthPartners software

This Technical Resource is intended to provide step-by-step instructions, along with tips drawn from the experiences of the pilot project participants, to provide entities wanting to report TCOC using a multi-contributor data source with a smoother path while increasing measurement standardization and alignment nationally.

To continue conversations, share best practices and get peer support around measurement of Total Cost of Care using multi-payer data sets, we encourage you to join the Getting To Affordability Community, an NRHI-led social learning platform designed to connect peers and stakeholders across the healthcare spectrum with the larger community. To learn more and to register, email: gettingtoaffordability@nrhi.org.

For questions for the APCD Council or to join the APCD Council Learning Network, please contact info@apcdcouncil.org.

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[1] See https://www.healthpartners.com/hp/about/tcoc/toolkit/index.html for more information.

ABOUT THE NETWORK FOR REGIONAL HEALTHCARE IMPROVEMENT (NRHI)

The Network for Regional Healthcare Improvement is a national organization representing over 35 regional multi-stakeholder groups working toward achieving the Triple Aim of better health, better care, and reduced cost through continuous improvement. NRHI and all of its members are non-profit organizations, separate from state government, working directly with physicians, hospitals, health plans, and patients using data to improve healthcare.

NRHI is a neutral, non-partisan national connector who works closely with national policymakers, including the Center for Medicare and Medicaid Services (CMS), state policymakers and a wide-range of partners to inform and engage our member organizations in the work of everyday implementation, and to give voice in the form of direct feedback from our members to policymakers on how regulations impact various stakeholders, consumers and communities. For more information about NRHI, visit www.nrhi.org.

ABOUT THE APCD COUNCIL

In 2007, the Regional All-Payer Healthcare Information Council (RAPHIC) began as a convening organization to bring together several Northeast states that had, or were developing, APCD systems.

The vision for RAPHIC was to support cross-state data harmonization and analytic activities. RAPHIC quickly expanded to include participation from states across the country to a broader set of learning network activities. In 2010, RAPHIC changed its name to the APCD Council to reflect the expanded reach. The APCD Council is a learning collaborative of government, private, non-profit, and academic organizations focused on improving the development and deployment of state-based APCDs. The APCD Council is convened and coordinated by the Institute for Health Policy and Practice (IHPP) at the University of New Hampshire (UNH) and the National Association of Health Data Organizations (NAHDO).

Since 2007, the APCD Council has helped states across the country with a variety of activities related to APCD development, including:

- Stakeholder meetings;
- Legislation review;
- Rule development;
- Vendor selection;
- Analytics support;
- Linking states to one another to find common solutions;
- Leveraging state resources to achieve common objectives.

The APCD Council maintains a map of state progress on APCD development. As of 2016, there are 12 states with existing APCDs, five in implementation, three existing voluntary efforts, and many other states with interest in developing an APCD. For more information about the APCD Council, visit www.apcdcouncil.org.

ABOUT THE MEASURE DEVELOPER: HEALTHPARTNERS

HealthPartners is the largest consumer-governed, non-profit health care organization in the nation with over 22,000 team members. HealthPartners is an integrated health care organization that provides both health care services and health plan financing and administration.

HealthPartners envisions health as it could be, affordability as it must be, through relationships built on trust. As an integrated organization, HealthPartners had the advantage of having both robust clinical data and administrative claims data. In 1995, they started measuring affordability consistently across their organization. HealthPartners has contributed the Total Cost of Care Framework measures to the public domain, free of charge, because they are a mission-driven, consumer-governed organization and they believe this offering will lead to improved healthcare affordability across the country. For more information about HealthPartners work on Total Cost of Care, visit https://www.healthpartners.com/hp/about/tcoc/toolkit/index.html.

ABOUT DST HEALTH SOLUTIONS, LLC

DST Health Solutions, LLC delivers contemporary healthcare technology and service solutions that enable its clients to thrive in a complex, rapidly evolving healthcare market. Supporting commercial, individual, and government sponsored health plans, health insurance marketplaces, and healthcare providers, DST Health Solutions' services including enterprise payer platforms, population health management analytics, care management, and business process outsourcing solutions, each designed to assist a company to manage the process, information, and products that directly impact quality outcomes. DST Health Solutions is a wholly-owned subsidiary of DST Systems, Inc. For more information on DST Health Solutions, visit www.dsthealthsolutions.com.

ABOUT THE ROBERT WOOD JOHNSON FOUNDATION

For more than 40 years the Robert Wood Johnson Foundation has worked to improve health and health care. We are working with others to build a national Culture of Health enabling everyone in America to live longer, healthier lives. For more information, visit www.rwjf.org. Follow the Foundation on Twitter at www.rwjf.org/twitter or on Facebook at www.rwjf.org/facebook.

NRHI's Total Cost of Care Pilot Background

In November 2013, with funding from the Robert Wood Johnson Foundation (RWJF), NRHI launched the Total Cost of Care Pilot project (The Pilot). The goal of The Pilot was to develop and produce information to enable communities to reduce the total cost of care in multiple regions with replicable, multi-stakeholder driven strategies.

The Total Cost of Care and Resource Use (TCOC) framework developed by HealthPartners was selected as the common measure set for the purpose of The Pilot. The HealthPartners TCOC measure was determined to be the most appropriate option based on the goals of The Pilot, the broad use of the measure, and the NQF endorsement following rigorous reliability and validity testing. TCOC is an analytical tool that is designed to "support affordability initiatives, to identify instances of overuse and inefficiency, and to highlight cost-saving opportunities"[2] . HealthPartners TCOC framework was endorsed by the National Quality Forum (NQF) in January of 2012, the first endorsement of a full-population total cost of care measurement approach. More information can be found on the HealthPartners website, including white papers on the methodology. The Informatics Team at HealthPartners, led by Sue Knudson, Senior Vice President, Health Informatics, served as technical advisors during The Pilot and offered invaluable guidance and support. Regular updates and discussions regarding technical questions and issues were instrumental to achieving project goals. The Maine Health Management Coalition (MHMC) also served as a technical advisor for the project given their recent experience measuring and reporting total cost of care in Maine.

Five pilot sites participated in the initial phase of the project to report TCOC measures in their regions, and develop a benchmark approach to compare results across regions. These sites are NRHI member regional health improvement collaborative (RHICs) and included: the Center for Improving Value in

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[2] healthpartners.com/hp/about/TCOC/

Health Care (CIVHC), the Maine Health Management Coalition (MHMC), the Midwest Health Initiative (MHI), Minnesota Community Measurement (MNCM) and the Oregon Health Care Quality Corporation (Q Corp). All four pilot goals were achieved in the pilot phase, which ended in April 2015. The achieved goals are:

- Standardized the approach to measuring total cost of care and resource use across five regions;
- Created and tested a process for benchmarking multi-payer commercial healthcare costs;
- Each RHIC produced and distributed attributed practice level reports in their communities;
- Identified physician champions in each of the 5 RHICs and provided them with support to lead change on both the local and national levels with a reporting framework, strategy and approach to affect change.

In May 2015, The Pilot was extended by RWJF through October 2016. In this new phase of work, two additional regions were brought on board, HealthInsight Utah (an NRHI member RHIC) and the Maryland Health Care Commission (MHCC, not currently an NRHI member, testing the spread of this work beyond RHICs). Four additional regions joined as Development Sites to address specific barriers they faced to test potential solutions. Development Sites included the following: The Health Collaborative (Ohio) ,The University of Texas Health Science Center at Houston (Texas), Washington Health Alliance (Washington), and Wisconsin Health Information Organization (Wisconsin). Compass Health Analytics was retained as the Technical Advisor. Phase II goals include the continuation and refinement of The Pilot project goals, and an expansion that includes:

- Improving data collection and analysis process;
- Advising on the inclusion of Medicare and Medicaid populations in TCOC reporting;
- Deepening stakeholder engagement;
- Demonstrating that the TCOC has national applicability, by expanding into additional regions (MHCC and HealthInsight Utah);
- Developing an instructional technical guide for APCDs and other data organizations.

The last of these expanded goals is the basis of this Technical Resource.

Technical Resource Overview

The purpose of this Technical Resource is to give other users of APCDs the benefit of experience gained by project participants in creating TCOC on multi-payer commercial claim data. It addresses data preparation, quality assessment, and suggestions for getting the best results from the HealthPartners Standard Analytic Package.[3] Specifically it covers: standard quality checks, preparing the data, minimum data requirements, selection of members and claims data, evaluating the quality of the data to be analyzed, assigning risk scores, and assessing the output of the HealthPartners software.

The Technical Resource describes the process as three major phases:

1. Data preparation and validation;
2. Assignment of risk scores;
3. Use of HealthPartners software to produce TCOC measures.

In general, analytic steps leading to TCOC calculation from an APCD are:

1. Assess data at the contributor level;
2. Subset data based on quality criteria;
3. Select data based on TCOC requirements;

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[3] See https://www.healthpartners.com/hp/about/tcoc/toolkit/index.html for more information.

4. Assign risk score to patients;
5. Attribute patients to primary care practices;
6. Assign HealthPartners' Total Cost Relative Resource Value (TCRRV™) at the claim level;
7. Calculate TCOC measure set.

NOTE: This Technical Resource does not address the process of creating reports for various audiences displaying the results of the TCOC calculations. Rather, it provides guidance for the data requirements, validation, and preparation phases leading up to the production of the reports. The production of reports requires local decision making and should reflect the needs of the local audience. Examples of regional reports are included in Appendix A.

Multiple routes can be taken to accomplish these steps, and no one way is right or wrong. Each section below details, when possible, a "Voices from the Field" example describing how different pilot project participants addressed specific pieces of this process. For an illustration of how different regions have used different routes to produce TCOC reports, see Appendix B.

Common Terms

Throughout the Technical Resource, terms are used that can have more than one meaning depending on the reader's perspective or due to local terminology variations. In some cases, these differences can have a significant impact on the data validation and preparation process. See Appendix C for definitions of terms used within this document, specifically for the purpose of the TCOC measurement process.

Requirements

This document is addressed to entities who want to calculate TCOC measures from a data source containing commercial health insurance claims and eligibility information from multiple carriers and plans. This can be a state or regional APCD or an aggregation collected under other auspices.

Calculating the TCOC measure set has the following high-level requirements. A list of specific fields required in the claim data is shown in Appendix D.

Base SAS® Software[4] to run the HealthPartners Standard Analytic Package is recommended. HealthPartners produces documentation that would enable a user to develop a non-SAS application to assign TCRRV™ and calculate the TCOC measure set, but those who have tried it suggest that using the SAS package is preferred.

1. Information about every plan member who was eligible to receive medical benefits, in sufficient detail to determine the number of months the member was eligible during the year.
2. Information about every plan member's eligibility to receive pharmacy benefits. This information must be tied to the ability to match the pharmacy claims in the data source to the medical plan member ID.
3. Medical claim data for one year with sufficient runout (at least 3 months) to have a complete picture of that year.

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[4] http://www.sas.com/en_us/software/base-sas.html.

4. Pharmacy claim data for the same period with similar runout as #3 above.
5. Medical claim data for professional and facility outpatient claims at the healthcare service level (procedure code) with the ability to combine services to the visit level. Inpatient claim records require Medicare Severity - Diagnosis Related Group (MS-DRG) and length of stay.
6. Pharmacy claim data at the prescription level.
7. Provider identifiers on medical claims that are common across all data contributors and at a level that corresponds to the user's intention for creating reports. For example, if the user wants to create reports at the practice level, the claim data must contain either practice identifiers or individual provider identifiers that the user can combine to create practices.
8. Allowed amount (plan paid amount plus member responsibility amount) on all medical and pharmacy claims. This must be at the line (procedure code) level on medical claims, both professional and facility outpatient. For inpatient claims, it is sufficient to have it at the claim level.
9. Fully adjusted claim data (net claims).
10. A method for assigning a risk score to each member for the time period being measured.
    a. If using the Johns Hopkins Adjusted Clinical Group (ACG)® System:
        i. A license for the population to be scored;
        ii. Sufficient memory and disk space for data storage and installation (requirements outlined in Appendix E) OR
        iii. The capacity to create a file to send to DST for overlay scoring and the ability to read the return file.
    b. If using another risk methodology, a file with a risk score for each member. Note that the 2012 NQF endorsement of the TCOC measure set is based on the use of ACGs.

Voices From The Field:

Maintaining Provider Directories

Regions have unique, market specific approaches to maintaining their provider database in order to tie a provider back to their practice and/or practice group levels. Maintaining a provider database is a key step in properly attributing patients to a practice for TCOC reporting. Below are a few examples of how the project team regions manage their provider databases.

Oregon: *The Oregon Healthcare Quality Corporation (Q Corp) works with medical groups to maintain a comprehensive primary care provider directory. Semi-annually , Q Corp asks medical groups to review and update their clinic and provider information through a secure on-line web portal. In addition, Q Corp conducts periodic outreach to medical groups and clinics to audit provider information in the provider directory. This provider directory links practicing primary care providers with the clinics and medical groups where they work.*

The information is then used to attribute patients identified in claims data to the appropriate primary care provider, clinic, and medical group. Q Corp defines primary care providers as family medicine, internal medicine, general practice, and pediatric physicians (MDs/DOs/NDs), nurse practitioners (NPs), and physician assistants (PAs).

Maine: *At the Maine Health Management Coalition (MHMC), the provider directory is considered a dynamic resource. In order to maintain accuracy the following resources are used to manually update information: data feeds from the NCQA Recognition Data Exchange, MaineCare (Medicaid), and the Maine Health Data Organization are run against the existing database through SAS for discrepancies; updated listings are received from the Pathways to Excellence program, Accountable Care Organizations, and major practices and groups; announcements from practice websites and newsletters, and a news clipping service help identify changes; and sources including the NPI listings and Maine Licensing Board are used to verify provider location.*

11. A method for attributing patients to primary care providers. An example attribution method is available from HealthPartners.[5] This topic is often sufficiently sensitive that stakeholders want input into the methodology to be used in their region.
12. A method to link provider information on claims to the practices for which the user intends to report TCOC measures. This is often the most challenging and time-consuming step because the relationships between individual providers and practices are quite dynamic and multi-faceted. Claim data from different contributors often have inconsistent ways of identifying providers.
13. A method for deciding which groups to report on. Since the nature of the TCOC is to provide comparisons, it is important that the groups included in reporting are comparable. If you are reporting on primary care practices, for example, how do you define a primary care practice? Is that any practice that provides primary care services, or any practice that has primary care as its main goal? The former might include, for example, OB/GYN practices who provide primary care for many of their patients, but are different enough from a typical primary care practice that including them in the comparison may create a skewed picture. It is possible to include groups in reporting but exclude them from the benchmark (see section on Benchmark Definition on page 16).

    NOTE: It is important to be aware of any exclusions that may have been applied to your data source. For example, some sources exclude claims with diagnosis or procedure codes indicating treatment for Substance Abuse Disorder or other conditions deemed to be particularly sensitive. If it is reasonable to assume the exclusions affect all report subjects (practices) equally, or your intention is to calculate the measures without those excluded items, TCOC measures will still be useful.

Data Validation and Preparation Phases

DATA VALIDATION

APCDs present some challenges in calculating TCOC measures that accurately and fairly reflect differences among practices in the use of health care resources. Only plans with complete medical coverage should be included in the population used for calculating the measures. Those that provide limited benefits (e.g. supplement plans, catastrophic health plans, limited liability plans, behavioral health or vision carve-outs) must be excluded. Even after that selection is done, inconsistencies among data contributors in any aspect of claims, such as provider identification, number of diagnoses included per claim, or population of the HCPCS modifier field, can lead to non-comparable results.

Plans that do not reimburse providers on a fee for service basis (e.g., Kaiser-type plans where the plan is offered by a provider organization) pose particular challenges to calculating TCOC. These plans frequently do not have individual service records with allowed amounts for each healthcare service delivered. One could argue that the "cost of care" in these situations is the premium rather than the sum of the individual claims. These plans are not suitable for inclusion in TCOC calculations.

During The Pilot, great efforts were made to develop an efficient and effective way to uncover inconsistencies in the data source and help users define the appropriate population for TCOC.

STABILITY

Within each data contributor, the allowed amount per member per month (PMPM) across the 12 months of the performance period should be fairly stable. The amount may fluctuate up or down each month but

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[5] https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/dev_057425.pdf and https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/cntrb_031064.pdf

there should not be a major shift at a point in the year (allowing for seasonality and random variation). One factor that affects the PMPM for a given month is the number of workdays. February will generally have the lowest PMPM, and October will be much higher. Beyond that, the degree of fluctuation depends on the number of members. Small populations (< 500 people) can have peaks that are twice or more the average if a particular patient had an expensive inpatient event in that month. Every monthly allowed amount per member should be within 10-15% of the average for population counts in the tens of thousands or higher. Plans with high deductibles can show increased usage over the course of the year as members opt to schedule more healthcare once their deductible is satisfied.

CONSISTENCY

Total allowed amount per member per month at the payer level should be consistent with other commercially insured populations of a similar age distribution within the region. If the average PMPM for a payer is more than 25% above or below the average for other payers with the same average age, that payer's data should be investigated for problems, such as duplicate or orphan claims, or errors in populating the amount fields. Other considerations include the type of plan being offered (supplemental, partial year, limited liability, etc.) and the timing of the plan offering on the market (new this year, or closing after this year). Usually an explanation is found in one of these. If the data cannot be corrected and resubmitted to bring the plan PMPM within at least 25% of the average, or it is discovered that the plan has some features that make it non-comparable to other plans, the plan's data should be omitted from the population.

DISTRIBUTION BY TYPE OF SERVICE

Distribution of Outpatient and Professional claims by first character of HCPCS/CPT code should be generally consistent for all contributors. A few things to look at are:

- No contributor is missing any first characters that are present on other payers.
- Same first characters are the largest proportion of the total for each contributor.
- Percent of total represented by each character is within 5-10 percentage points of other contributors.
- If the proportion of claims with one first character is markedly lower (less than half of others), it could be an indication that a specific set of claims are largely missing (e.g., lab claims or Evaluation & Management (E&M) encounters). The proportion of Outpatient and Professional claims with no HCPCS/CPT code must be very low (less than 10% missing).

Voices From The Field:

Data Validation and Assessment

The project team regions had varying levels of experience when it came to producing, using and sharing information on total cost of care. Some regions relied on health plans to process their own data and submit the results for aggregation. Other regions had a process in place and needed to make changes to align their methods for a standardized approach. Still others were new to cost reporting and worked with multiple vendors to pull together the resources required in the process. Here are few thoughts from some of the team members on data validation and quality assessment:

CIVHC *– You need to have a high degree of confidence in the completeness and quality of your data. It can be difficult to anticipate issues, particularly when you are aggregating data across multiple sources and utilizing multiple vendors in the process. When you're working with multiple sources and vendors, your data may need to move or change hands multiple times, which can impact completeness and accuracy. Being able to compare your results with what other regions are seeing can help you identify issues early. Don't underestimate the level of time and effort this work takes; at the end of the day it is worth it given what you will learn about your data.*

MHMC *- You need complete claims data. Complete has at least two dimensions, it needs to be representative of the population and it needs to be complete in terms of fields. Additionally, you need to have the ability to correctly handle data, put it in a structured warehouse to be able to use it for productive purposes. An APCD acts as a repository for information, and what is submitted to an APCD has varying levels of completeness and consistency. To produce these reports you need to have access to the granular, field and record level data, and have a powerful tool such as SAS to parse out the usable and required information for accurate reports.*

ORPHAN CLAIMS

The proportion of claims that fail to match to an eligible member in the month in which the claim was incurred (i.e., orphans) should be less than 2%.

DRGS

DRGs on inpatient claims must be validated as MS-DRGs from CMS. Several different DRG systems are in use; the same code can mean different things depending on which system is being used. Because this field is not used or supplied consistently across commercial payers, data sources with multiple contributors will likely need to have this field added through an MS-DRG assignment application.

DIAGNOSIS CODES

The primary diagnosis code should be populated on 100% of medical claims. A contributor who does not meet this standard should be omitted from the TCOC population and encouraged to resubmit historical data to the APCD. In addition, the analytic team should determine the number of diagnosis code fields reliably populated by all contributors. For consistency within the population, only the number of codes populated by all contributors should be used in calculating risk scores.

DATA PREPARATION

After going through the quality assessment steps above, the analytic team will make decisions about which data contributors to include in the population. The HealthPartners TCOC methodology places additional restrictions on members and claims. The information in this document is intended to supplement, not replace, the documentation and instructions in the HealthPartners Standard Analytic Package (see https://www.healthpartners.com/hp/about/tcoc/toolkit/). Please refer to that documentation throughout this Technical Resource.

Voices From The Field:

Data Validation and Assessment (cont.)

MHI *– It's important to ensure that every data element is squeaky clean. Data is never perfect and there are always opportunities to make it better, particularly when you have the opportunity to talk and share ideas with others who are working toward the same goal. When we first looked at our results we were uncertain if it was correctly reflecting reality or if there may be some data issues impacting the results. We used outside sources to verify what we were seeing, for example we looked at the Health Care Cost Institute for comparative pricing on procedures, and we looked at our utilization rates to see if they were in line with what we see elsewhere. Additional resources included health plan partners, national employer partners and the brokers and consultants they trust, and even insurance filings – all to get a better sense of how our results stacked up against surrounding areas.*

MNCM *- Using a decentralized model , each payer submits TCOC data for aggregation which requires comparable processes run in multiple health plans. This means that you don't just have to talk to your programmer, you need to talk to all the programmers involved at each of the payers who are submitting data. You need to talk with them early in the process so that you are all running the data in exactly the same way. The advantage of the distributed model is by using the expertise of the health plan analysts and programmers, you can account for the unique aspects that exist in each health plan data warehouse.*

Q Corp *- Working together and being able to share and discuss issues that others were having with their data, and to be able to create a checklist with our technical advisor to review our data for quality, was invaluable. It moved us along much more quickly.*

STEP 1A. SELECTION OF DATA CONTRIBUTORS

The first requirement for including data from a contributor in the TCOC population is that inclusion of the data will improve the accurate representation of the healthcare occurring in the commercial market. It must not distort the picture or artificially under- or over-state per population delivery or cost of services.

The analytic team might also consider how well the mix of included contributors reflects aspects of the market such as fully-insured compared to self-insured; metal levels of exchange plans; HMO, PPO, POS and other network configurations; high-deductible plans; etc.

TCOC measures increase in reliability with larger populations, so the team should aim to include as many contributors as possible within the considerations above.

Voices From The Field:

Distributed Data Model

Minnesota Community Measurement employed a distributed data model where each individual health plan followed the same technical specifications and submitted aggregated files to the RHIC for data quality checks and final aggregation. The steps in this guide are written assuming multi- payer data at the claim level is housed in a single location.

STEP 1B. SELECTION OF MEMBERS

HealthPartners TCOC specification[6] requires that the population be limited to members with certain characteristics. In addition, for an APCD it is important to exclude members whose claims in the data source do not fairly represent the total cost of their healthcare.

Voices From The Field:

Dental Claims

One region found that the data source contained dental claims, which did not have diagnosis information. This caused the contributor to fail the test of 100% population of primary diagnosis. Eliminating these claims brought the contributor up to the standard. Dental claims can be identified either by an indicator in the data source (preferable) or a HCPCS code starting with the letter "D" (for example, D1110).

SELECT MEASUREMENT PERIOD

1. TCOC is measured on a 12-month period of incurred claims with at least 3 months of runout in the data source (all claims with dates of service in the measurement period and paid through the 3rd month after the end of the measurement period).
2. The population should include all plan members eligible for at least 9 months during the measurement period, whether or not they had claims.
3. All claims incurred during the measurement period that have a net allowed amount greater than zero should be included.

SELECT MEMBERS BASED ON MEMBER DEMOGRAPHICS

1. If developing the measure for a particular geographic area of interest (e.g., state), exclude members that have a zip code (or other geographic indicator if zip code is not available) outside of the geographic area of interest.
2. Exclude members whose age in the measurement period is unknown.
3. Exclude members whose sex is unknown.
4. Exclude members who have not passed their first birthday by the end of the measurement period.
5. Exclude members who have passed their 65th birthday at the end of the measurement period.

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[6] https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/dev_057425.pdf

SELECT MEMBER WITH SUFFICIENT COVERAGE

1. Calculate medical and pharmacy eligibility in number of months during the measurement period.
    a. If you have specific dates of eligibility on each member, determine eligibility during the month on a consistent day of the month (e.g., must be eligible on the 15th of the month to be considered eligible during the month).
    b. If you only have monthly indicators, use those.
2. Select members who have 9 or more months of medical coverage during the measurement period.
3. Further exclude members who can be identified as having dual eligibility between a commercial plan and either Medicare or Medicaid. If a member is eligible for more than one commercial plan:
    a. Exclude duplicate eligibility so the member is counted only once.
    b. **NOTE:** Include all claims for that member where the payer on the claim is primary. As noted in #3 below, do not include claims from secondary payers or where the Coordination of Benefit (COB) amount is not zero.
4. Identify all members who do not have a pharmacy benefit for their entire medical enrollment period. Exclude the pharmacy eligibility and pharmacy claims for these members. In other words, if a member has any months in the measurement period with medical eligibility but no Rx benefit coverage, the member is treated as if s/he had no pharmacy benefit at all and no pharmacy claims for the measurement period.
5. Also exclude any pharmacy eligibility outside of the medical eligibility period; that is, exclude pharmacy eligibility and claims in months during which the member has no medical eligibility. If a member has no medical eligibility at all, exclude that member as indicated above.
6. Exclude any members known to have capitated lab or any other capitated service where the claims for that service would not appear in the data or would not have appropriate allowed amounts.

STEP 1C. SELECTION OF CLAIMS

Select claims for the analytic data set using the following criteria.

SELECT CLAIMS DATA

1. Include only the claims associated with the members selected above and incurred in the measurement period.
2. Exclude denied claims and any claims with zero total allowed amount at the encounter/visit/inpatient event level. Do not exclude individual service lines with zero allowed amount if the total encounter/visit had a positive allowed amount.
3. Exclude claims with any amount other than zero in the COB field or an indication that this claim record is being submitted by a secondary payer. These are assumed to be from a secondary payer and would consequently duplicate payment information from the primary payer.

ASSIGNMENT OF RISK SCORES

The TCOC measures are adjusted for the morbidity of the patients in each panel. Morbidity is measured by the risk score, a number representing the expected cost of each patient, given that patient's acute and chronic conditions as evidenced in claims, compared to the average. Several methods are available for assigning a risk score to patients based on claims and demographics. The TCOC measure set is NQF-endorsed only when the Johns Hopkins Adjusted Clinical Groups® risk adjuster is used[7] but the HealthPartners Standard Analytic Package accepts other risk scores. Details for assigning ACG categories follow.

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[7] http://acg.jhsph.org/

STEP 1A. ASSIGNING ACG CATEGORY

ACG categories can be assigned to a set of patients in one of two ways: 1) installing and running the ACG® System on measurement period claims and eligibility information; 2) preparing data extracts and sending them to an outside vendor (for example, DST Health Solutions). Appendix E outlines the steps for acquiring and installing the software, as well as the instructions for preparing and loading the file to be used with the ACG® System.

Consider the following when preparing the data for the ACG® System:

1. Only the number of diagnosis fields determined to be available from all included contributors should be used.
2. Exclude from ACG® System scoring any claim with zero total allowed amount. Note that following the instructions above these claims have already been removed.

NOTE: The ACG® System is set up to exclude claims with certain CPT codes because diagnoses associated with these procedures can be "rule out" or potential diagnoses rather than actual diagnoses. This requires that the procedure code be supplied along with the diagnosis codes.

NOTE: The Johns Hopkins ACG® System Supporting Documentation/User's Guide in Appendix E addresses how to choose the model calculation options for a commercial population.

STEP 1B. EVALUATING ACG ASSIGNMENT

The process of assigning ACG categories, whether through software or vendor service, will produce a Summary Statistics page that reflects the results of running the ACG® System on your data. Appendix E shows a sample report.

The following may be helpful in reviewing the Summary Statistics report of the ACG® System:

a. The combined proportion of the population assigned the ACGs 5110 and 5200 should be between 12% and 19%
b. There should be an immaterial number (e.g., <10) members assigned the ACG 9900
c. Number of diagnosis fields found on medical services file should be the same as intended
d. Number of diagnosis fields with data on medical services file should be the same as intended
e. These measures should be between 5 and 10:
    i. Average number of unique diagnoses per patient
    ii. Of those with a diagnosis, the average number of unique diagnoses per patient
f. These measures should be < 1% of the population:
    i. Unknown diagnoses encountered
    ii. Patients with unknown diagnoses encountered
g. These measures should be zero:
    i. Patients with unsupported diagnosis code sets encountered
    ii. Patients with unsupported procedure code sets encountered
    iii. Patients with unsupported revenue code sets encountered

If the report suggests problems with the data, the user should examine the reasons and resolve the issues before proceeding. It may take several attempts at data preparation to get the file in the exact format required by the software. If issues with extract preparation are ruled out, and the problem is found to be in the data source itself, it may be necessary to ask for resubmissions or eliminate data contributors whose information is inadequate to support ACG assignment.

Note that ACG assignment works independently for each patient. If the analytic team decides to exclude some patients from the population, it is not necessary to rerun the ACG assignment.

STEP 1C. ASSIGNING RISK SCORES

When you have a file identifying the ACG category for each patient in the population, the actual risk score for each patient can be determined in one of two ways:

1. Use the national risk weight for each category. These weights are calibrated on a very large national sample and are available from the ACG software or from the vendor service.
2. Calculate the relative cost of each ACG cell in the population being used to calculate TCoC measures.

The choice between the two depends on the goals and priorities of the stakeholders in the TCoC process. National weights are based on a large population, probably much larger than in any one APCD, so are likely more stable and reliable. Local weights reflect the actual period being measured and can therefore more accurately pick up the cost impact of emerging therapies. Local weights can also be calculated separately by service category. For example, the relative Inpatient cost of an ACG cell might be different from the relative Professional cost of that cell. If you choose to calculate local weights, simply divide the average cost of the members in each ACG cell by the overall average cost. All the patients in a single ACG cell receive the same risk score.

Voices From The Field:

Data Assessment Tips

Through collaboration - asking questions, sharing ideas, trouble shooting, and establishing quality checks with the technical advisors – the project team has gained a number of insights as to what sort of data issues may drive results that fall outside of the guidelines above. Some of their insights are shared below.

- *Do not assume that corrections to previous rounds of data have been carried forward to current data submissions, double check that all past corrections have been maintained.*
- *It is helpful to compare your data to 'typical' sample results to see where there is variation – some differences are appropriate and explainable, others are curious and need further exploration, and still others indicate an obvious submission or data processing error that requires follow up.*
- *Having some knowledge about the plan submitting the data can be helpful in identifying issues – some may have more variation than others and appear to be an outlier when in fact it may be a managed Medicaid or Medicare Advantage plan that was not identified as non-commercial.*
- *If the volume of claims or the PMPM value trails off toward the end of the 12 month period, there may be an issue with claims run-out.*

RUNNING THE HEALTHPARTNERS STANDARD ANALYTIC PACKAGE[8]

At the time of this publication, HealthPartners offers five analytic packages for implementing Total Cost of Care and Resources Use free of charge.[9] This Technical Resource refers to the Standard Analytic Package, which consists of SAS software and data tables as well as documentation on how to run the steps. The documentation can be accessed online prior to acquiring the package.[10]

This Technical Resource is intended to supplement, not replace, the HealthPartners Standard Analytic Package documentation.

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[8] https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/cntrb_039627.pdf

[9] https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/cntrb_042113.pdf

[10] https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/dev_057642.pdf (or Google "HealthPartners Standard Analytic Package"

STEP 1A. ASSIGNING TCRRV™

Year: The Standard Analytic Package contains 3 years of TCRRV™ lookup tables. Select the year that corresponds to the intended measurement period. If the measurement period contains portions of 2 calendar years, claims files can be separated into two pieces and run through the TCRRV™ process separately, specifying the appropriate year of TCRRV™ for each piece.

Billed Amount: The HealthPartners methodology makes use of the billed amount on each claim to judge whether the TCRRV™ is appropriate. If you do not have billed amount in your data, you can calculate a billed amount from the allowed amount and a general sense of the discount rate for each service type (IP, OP, Professional and Rx) in the market represented by the population.

Claim structure: The TCRRV™ methodology expects the data to be organized into claims (encounters) with each service on a separate line. All services in the same encounter have the same encounter ID, with a separate line field to differentiate the services within an encounter. If the software detects duplicate line numbers within the same Encounter ID, it will stop running and generate an error message to that effect.

Paid amount: When the HealthPartners documentation refers to paid amount they are referring to what is termed 'allowed amount' in the Technical Resource.

Software updates: HealthPartners updates TCRRV™ values yearly and methodology as needed. Check their website[11] for the latest information.

STEP 1B. EVALUATING TCRRV™ ASSIGNMENT

The TCRRV™ SAS code will assign a TCRRV™ value to each claim line in the submitted file. One output of the system is a report showing the count of claims found to be NORMAL (that is, the billed amount was within the range expected based on the identifying information such as DRG, procedure code, or NDC, along with LOS, unit count or quantity and considering place of service, and type of claim) and the count of claims falling into several non-normal categories (HIGH, meaning the billed amount was much higher than expected; LOW, meaning the billed amount was much lower than expected; NO MATCH, meaning the software could not find a match in its tables for the procedure code on the claim; etc.) About 95% of the claims within each service category should have a NORMAL flag. If the proportion of NORMAL is significantly lower, some adjustment may be needed to the input data.

TCRRV™ is run separately for IP, OP, Professional and Rx claims. When all 4 service categories are complete, it may be helpful to run the following comparison of actual allowed with assigned TCRRV™: Calculate the sum of the TCRRV™ and allowed amount by IP, OP, Prof and Rx. See sample tables in Appendix F.

Overall, the total TCRRV™ is expected to be about the same as the total allowed amount. Differences from 1.0 in the Ratio are supposed to reflect relative pricing in the region to which TCOC is being applied. If the results of the above comparison show something substantially different from 1.0 that is not explained by common knowledge about prices in the region, there may be a problem occurring in the assignment process due to a discrepancy between the software expectation and the data being supplied.

STEP 1C. ATTRIBUTION

HealthPartners Standard Analytic Package produces cost and resource utilization scores for groups indexed to the average for all groups. The package accepts any grouping the user wishes to compare, but the original intent and most common application is provider groups (practices, practice locations, hospital systems, etc.).

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[11] https://www.healthpartners.com/hp/about/tcoc/toolkit/

The scores for each group are based on the set of patients who belong to that group. The process of determining which provider group each patient belongs to is called attribution.

The Standard Analytic Package includes code that will perform attribution. See HealthPartners documentation[12] for a description of the methodology.

Most regions participating in the The Pilot had previously worked with stakeholders in their respective communities to agree on a methodology for attributing patients to primary care practices. The option to change to a consistent methodology across regions to enable comparison of cost measures was evaluated. It was determined that the value offered by consistency did not outweigh the challenge associated with standardizing the method across regions. Users may find strong opinions about attribution in other regions, affecting whether they can use the version found in the HealthPartners code or have to find another way of creating the grouping file.

Voices From The Field:
Selecting Benchmark Population

Each region needs to decide locally on which patients and clinics to include in the benchmark comparison. Q Corp in Oregon included all patients attributed to clinics that were eligible to receive a report, and excluded two types of clinics that have very different patient profiles: women's health clinics and immediate care clinics.

Maine Health Management Coalition separated practices for whom reports are generated from those who are included in the benchmark for the calculation of TCI. This allows for keeping the benchmark to just those practices who are likely practicing in similar ways, and which therefore provide a valid comparison against which the cost data is indexed. At the same time, those practices who are curious to see how they compare to a standard primary care practice can be engaged through reporting, without impacting the benchmark

Regardless of the methodology used, the process should result in a file that will identify the single set within a grouping to which each member belongs. The software accepts up to 3 groupings per patient, but these must be distinct groupings (e.g., age and zip code) not two sets within the same group (e.g., Practice 1 and Practice 2).

STEP 1D. CREATE TCOC MEASURE FILE

The last step in the process brings together the member and claims information, the TCRRV™ results, attribution (or other grouping), and risk scores. The HealthPartners documentation describes how to run the SAS programs to produce the final file which creates measures at the grouping level compared to the population of all groups.

BENCHMARK DEFINITION

The group scores in the output of the TCOC measure process are indexes, meaning that each group's result is a number that reflects the group's performance relative to a benchmark. That benchmark by default is the performance of all groups combined. For example, the TCI (Total Cost Index) is the ratio of the risk-adjusted cost per member month for each group to the cost per member month of all the panels combined. A TCI of .95 means that the group cost 5% less than average (the benchmark); a TCI of 1.08 means that the group cost 8% more than average.

It is possible to define the benchmark differently. If you choose to do this, you will have to make changes to the HealthPartners SAS programs.

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[12] https://www.healthpartners.com/ucm/groups/public/@hp/@public/documents/documents/dev_057642.pdf

Note that the output of the process is a file with the group level results. Creating publications that convey the information appropriately to various audiences is the responsibility of the user.

Pilot project participants used a variety of reports and websites to present TCOC information.

Summary

This Technical Resource contains information that may be helpful to those trying to calculate the HealthPartners TCOC measure set on an All-Payer Claim Database (APCD). A multi-contributor data source presents particular challenges to a process that relies on consistent and complete information to produce comparable results. Building a provider linkage file from the identifiers on claims to the groups the user wants to report on also requires significant investment of time and money and is a critical step to ensure accurate attribution.

APCDs offer a robust source of information that can enable reporting about how providers practice, and how the decisions they make affect the cost of healthcare. This feedback is invaluable to both providers and the community they serve. This Technical Resource is offered to help smooth the path and make it easier to produce that information.

To continue conversations, share best practices and get peer support around measurement of Total Cost of Care using multi-payer data sets, we encourage you to join the Getting To Affordability Community, an NRHI-led social learning platform designed to connect peers and stakeholders across the healthcare spectrum with the larger community. To learn more and to register, email gettingtoaffordability@nrhi.org.

For questions for the APCD Council or to join the APCD Council Learning Network, please contact info@apcdcouncil.org.

Questions and feedback may be directed to:

Ellen Gagnon
Executive Director TCOC and Project Management Collaboration
Network for Regional Healthcare Improvement
gettingtoaffordability@nrhi.org

APPENDIX A: PRIVATE REPORTING SAMPLES

All regions who participated in The Pilot reported TCOC information privately, and some also reported results publicly. Reporting styles and methods vary and must meet local needs. The project team agreed that consistency for multi-region comparisons must be balanced with customizations which maximize local impact. Common reporting elements include patient demographics, risk score, TCI and RUI by service setting, and a Regional Practice Comparison Scatter Plot.

Sample image is an excerpt from Q Corp's practice reporting package:

Some key findings from ABC Clinic's report:

Risk Score

The Clinic Risk Score represents the morbidity burden of a subset of patients in your clinic. Q Corp uses the Johns Hopkins Adjusted Clinical Groups (ACG) System which measures morbidity burden based on disease patterns, age and gender using diagnoses found in claims data.

Summary by Service Category

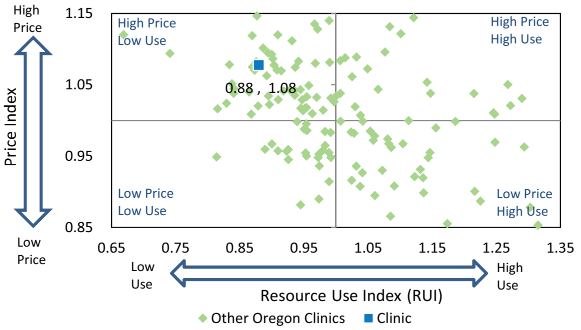
	TCI	=	RUI	x Price Index
Professional	1.07		0.97	1.10
Outpatient Facility	0.71		0.72	1.00
Inpatient Facility	1.10		0.93	1.19
Pharmacy	0.88		0.87	1.01
Overall	0.95		0.88	1.08

A Total Cost Index, Price Index or Resource Use Index value greater than 1.00 means the clinic's score is higher than the Oregon average score for the measure.

For more information see the Total Cost of Care Definitions page.

Price vs. Resource Use Comparison

This chart shows your clinic's price and resource use compared to other clinics across Oregon. Clinics that are lower in price and resource use appear in the lower left quadrant.

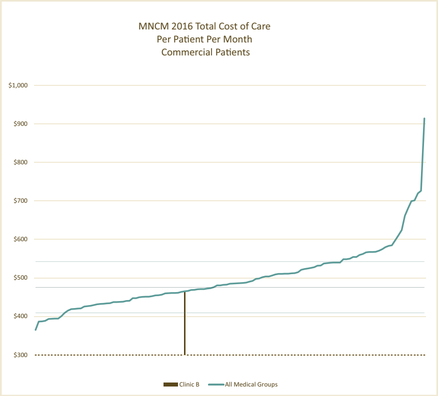


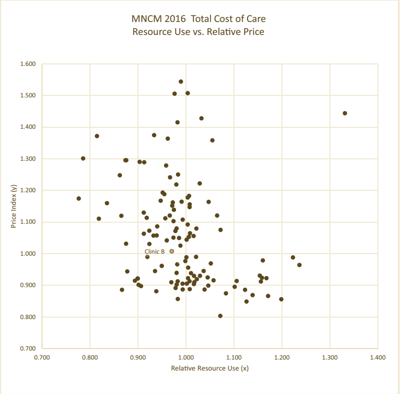
Sample image is an excerpt from MNCM's practice reporting package; MNCM also provides public reporting via their website, visit www.MNHealthScores.org for more:

MN Community Measurement: 2016 Commercial Cost and Utilization Report Suite

Clinic B
Group No:
Tax ID Number(s):
Date of Service Range: 1/1/15 - 12/31/15

	Adult	Pediatric	Total	Definition
Risk adjusted pmpm	$542	$241	$465	Cost per patient per month, adjusted for patient risk.
Market Average cost per patient	$558	$238	$476	Market average for all medical groups in measure.
Total Cost Index (TCI)	0.972	1.014	0.978	Relative Cost of medical group compared to market. 1.0 = average
Rank	39 out of 112	47 out of 73	51 out of 125	Rank from lowest Total Cost Index to highest Total Cost Index.
Total Cost of Care Health Score	Average	Average	Average	Rating to be displayed on MNHealthscores.org
TCRRV^{TM} Resource Use Index	1.008	0.964	0.970	Amount of resources used per patient, relative to medical groups in the market, adjusted for patient severity. 1.0 = Average
Price Index	1.008	1.006	1.008	Relative pricing compared to market (1.0 = Average). Calculation = TCI/TCRRV^{TM} Index

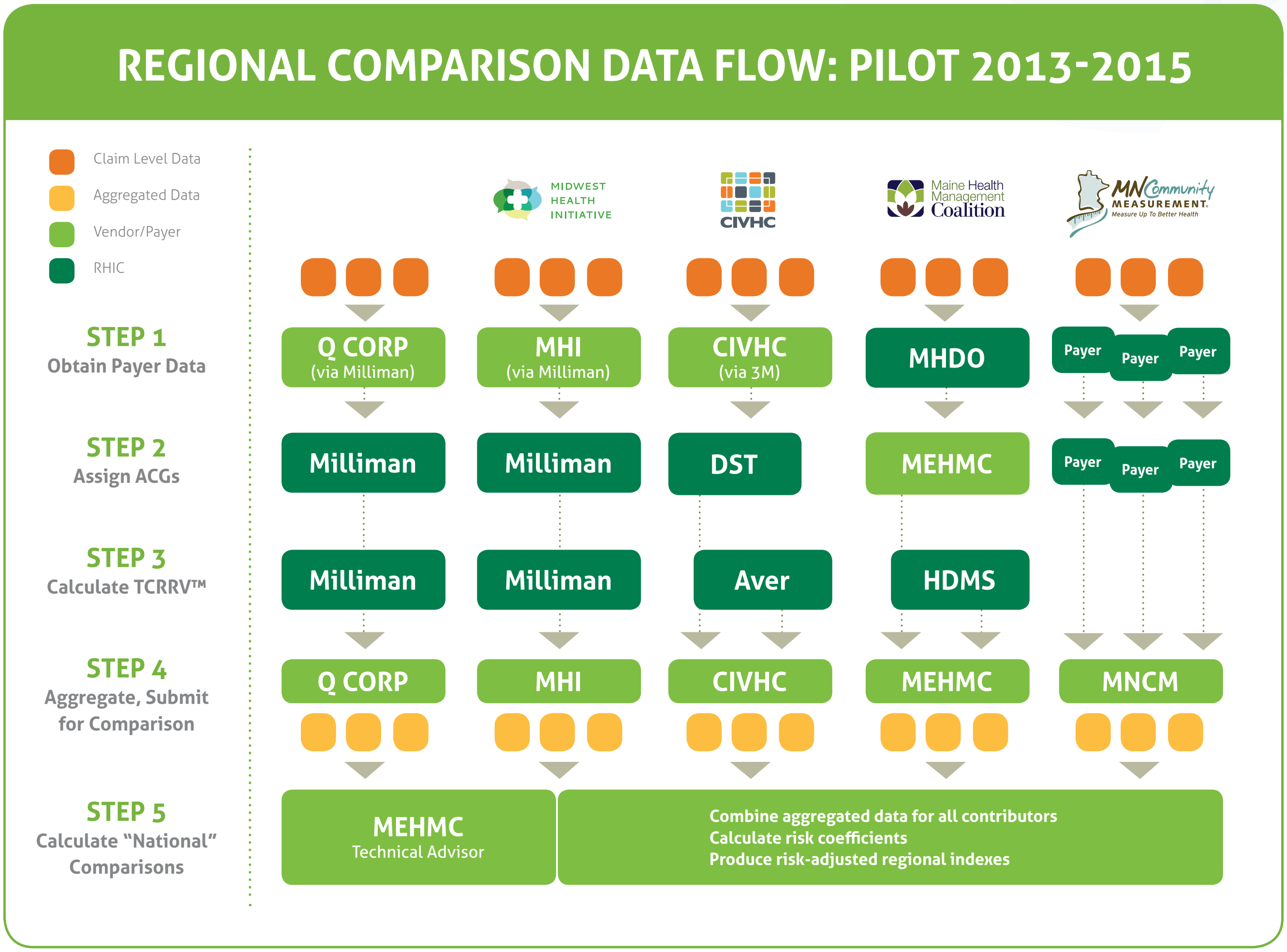

MNCM 2016 Total Cost of Care
Per Patient Per Month
Commercial Patients


MNCM 2016 Total Cost of Care
Resource Use vs. Relative Price

Clinic B	
Relative Resouce (x)	0.970
Price Index (y)	1.008

APPENDIX B: BENCHMARK DATA FLOW FROM TCOC PILOT

As part of The Pilot, participants took the additional step of creating regional comparisons. This diagram illustrates the multiple pathways taken during the initial pilot to calculating the aggregated data for regional comparison.



REGIONAL COMPARISON DATA FLOW: PILOT 2013-2015

🟧 Claim Level Data
🟨 Aggregated Data
🟩 Vendor/Payer
■ RHIC

		MIDWEST HEALTH INITIATIVE	CIVHC	Maine Health Management Coalition	MN Community MEASUREMENT. Measure Up To Better Health
STEP 1 Obtain Payer Data	Q CORP (via Milliman)	MHI (via Milliman)	CIVHC (via 3M)	MHDO	Payer Payer Payer
STEP 2 Assign ACGs	Milliman	Milliman	DST	MEHMC	Payer Payer Payer
STEP 3 Calculate TCRRV™	Milliman	Milliman	Aver	HDMS	
STEP 4 Aggregate, Submit for Comparison	Q CORP	MHI	CIVHC	MEHMC	MNCM

STEP 5 Calculate "National" Comparisons

MEHMC
Technical Advisor

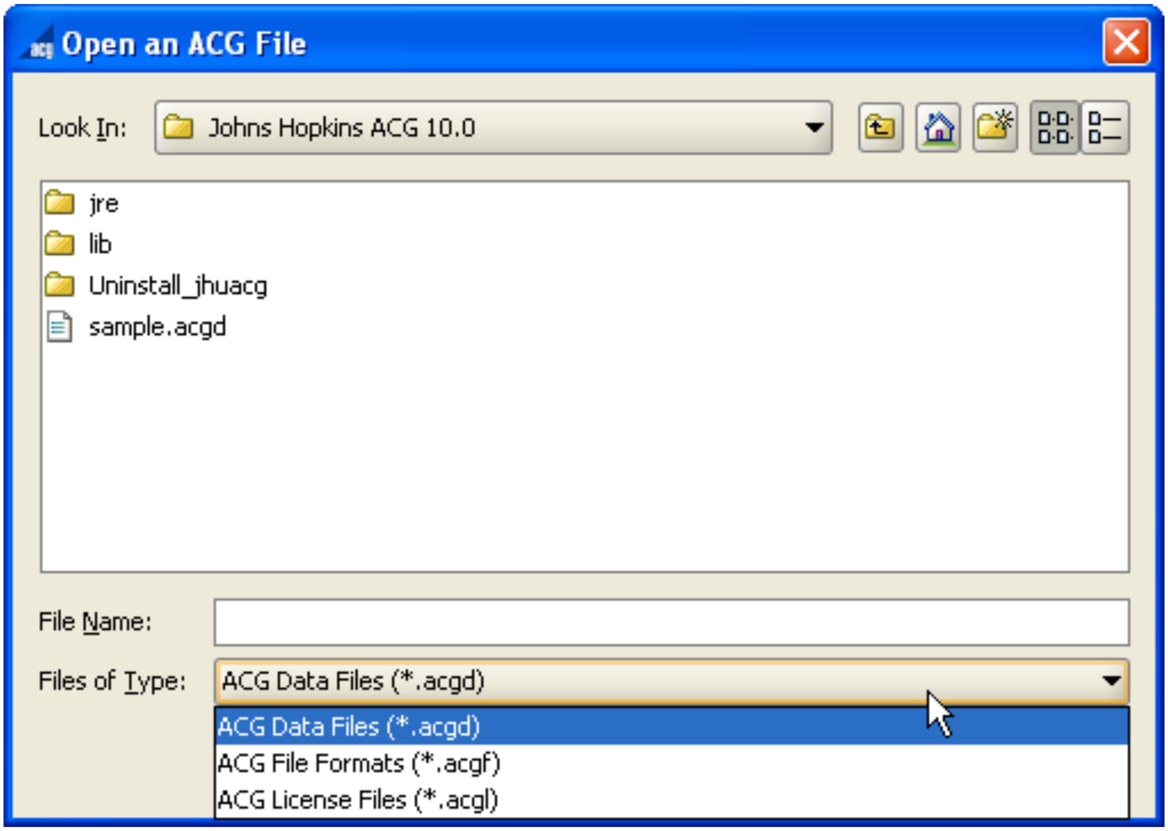
Combine aggregated data for all contributors
Calculate risk coefficients
Produce risk-adjusted regional indexes

FILE MENU

The File menu is for opening / saving ACG data files. These are files created by the ACG for Windows software and are appended with the .acgd extension. These files are working databases containing summary information on each member processed through the software. **Note:** It is not necessary to re-run your claims data each time you open the software; rather, ACG assignments can be stored in the *.acgd file for later use. For your convenience, the last five files opened will be shown from the File menu.

To open an ACG data file, select from the toolbar or select **File, Open** from the menu. At the top of the screen, the user can navigate the file system as shown in **Figure 2: Open an ACG® System File**.

FIGURE 2: OPEN AN ACG® SYSTEM FILE



Look In: Johns Hopkins ACG 10.0

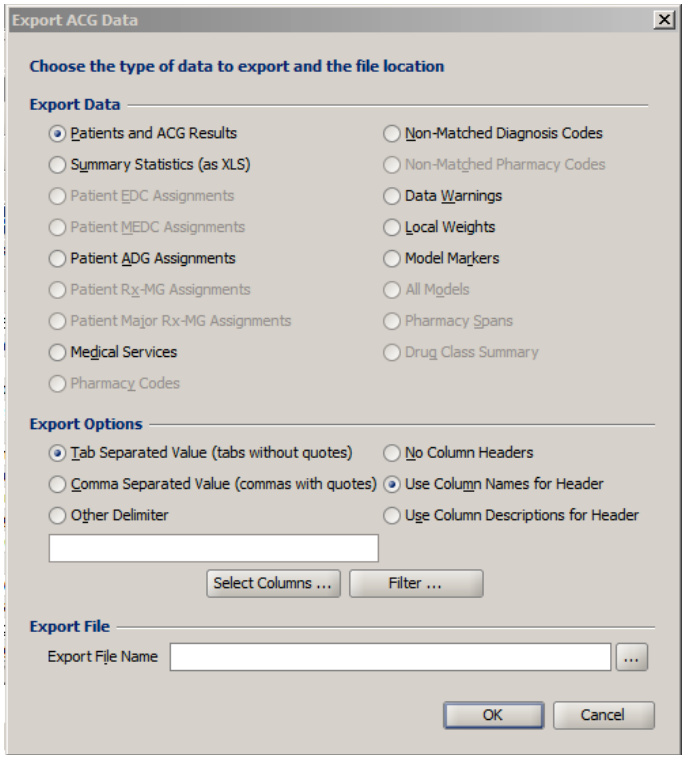
Files of Type: ACG Data Files (*.acgd)

EXPORT DATA FILES

From an active data file tab it is possible to export the entire data file to another application. The Export ACG Data option will create a tab-delimited text file from your ACG data. This data format is directly supported by Microsoft Excel, Microsoft Access, and many other mainstream databases and statistical applications.

Using the **Tools -Export** or menu button, simply click the **File Selection** button (...) and choose a filename in which to save the exported data. Click **OK** on the Export ACG Data window to begin the export.

FIGURE 10: EXPORT DATA FILES



Export ACG Data

Choose the type of data to export and the file location

Export Data

● Patients and ACG Results
○ Summary Statistics (as XLS)
○ Patient EDC Assignments
○ Patient MEDC Assignments
○ Patient ADG Assignments
○ Patient Rx-MG Assignments
○ Patient Major Rx-MG Assignments
○ Medical Services
○ Pharmacy Codes
○ Non-Matched Diagnosis Codes
○ Non-Matched Pharmacy Codes
○ Data Warnings
○ Local Weights
○ Model Markers
○ All Models
○ Pharmacy Spans
○ Drug Class Summary

Export Options

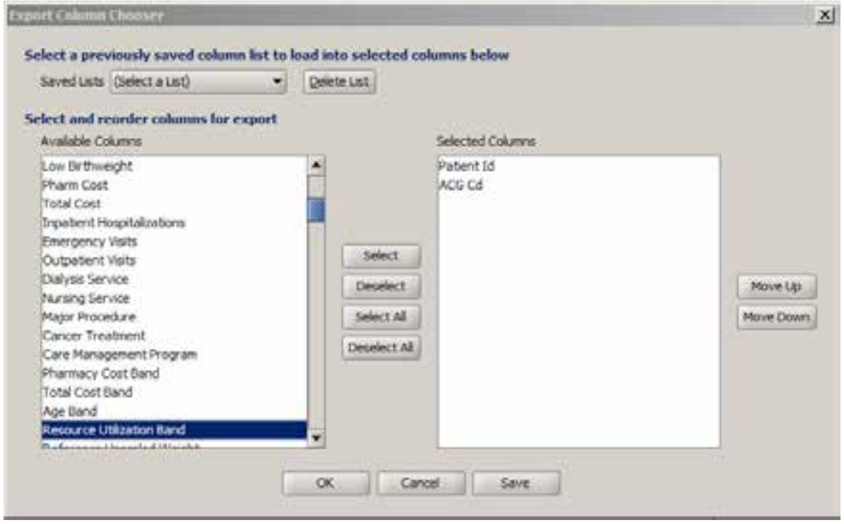
● Tab Separated Value (tabs without quotes)
○ Comma Separated Value (commas with quotes)
○ Other Delimiter
○ No Column Headers
● Use Column Names for Header
○ Use Column Descriptions for Header

Export File

Export File Name

All of the underlying ACG data elements that are used throughout the ACG® System are exportable through this option. When the Export ACG Data options are displayed, you must choose one of the data sets to export. For this project, the relevant data is stored in **Patients and ACG Results**. By default, this data file contains all of the data elements from your original patient import file, with any missing default columns added as blanks, and all of the ACG calculated fields. The columns in this export file are the same columns (in the same order) as shown in the Patient Sample section of the ACG Data File. The output file can be customized by selecting the "Select Columns…" button on the Export ACG Data screen. For purposes of this project, the Patient ID and corresponding ACG Code are the only fields necessary to support the analysis.

FIGURE 11: SELECT COLUMNS



Export Column Chooser

Select a previously saved column list to load into selected columns below

Saved Lists: (Select a List)

Select and reorder columns for export

Available Columns

Low Birthweight
Pharm Cost
Total Cost
Inpatient Hospitalizations
Emergency Visits
Outpatient Visits
Dialysis Service
Nursing Service
Major Procedure
Cancer Treatment
Care Management Program
Pharmacy Cost Band
Total Cost Band
Age Band
Resource Utilization Band

Selected Columns

Patient Id
ACG Cd

APPENDIX E: JOHNS HOPKINS ACG® SYSTEM SUPPORTING DOCUMENTATION

ACG SUMMARY STATISTICS

Description	Value
Patients processed	1,234,576
Patients processed 65 years and older	0
Diagnosis fields found on medical services file	5
Diagnosis fields with data on medical services file	5
Diagnoses processed	8,876,601
Medical services excluded per user-defined observation period	0
First Medical Service Date	
First Medical Service Date	
Unique diagnoses encountered	12,345
Average number of unique diagnoses per patient	7.19
Of those with a diagnosis, average number of unique diagnoses per patient	8.66
Unique unknown diagnoses encountered	596
Percentage of diagnoses that were unknown	0.1
Unknown diagnoses encountered	12,345
Patients with unknown diagnoses encountered	12,345
Percent of unique diagnoses used	99.9
Unique matched diagnosis code sets encountered	1
Percentage of procedure codes that were unknown	0.0
Percentage of revenue codes that were unknown	0.0
Percentage of ICD procedure codes that were unknown	0.0
Percentage of DRG codes that were unknown	
Unique matched procedure code sets encountered	0
Unique matched revenue code sets encountered	0
Unique matched ICD procedure code sets encountered	0
Unique matched DRG code sets encountered	
Unique unknown diagnosis code sets encountered	0
Unique unknown procedure code sets encountered	0
Unique unknown revenue code sets encountered	0
Unique unknown ICD procedure code sets encountered	0
Unique unknown DRG code sets encountered	
Patients with unsupported diagnosis code sets encountered	0
Patients with unsupported procedure code sets encountered	0

APPENDIX E: JOHNS HOPKINS ACG® SYSTEM SUPPORTING DOCUMENTATION

ACG SUMMARY STATISTICS (CONT.)

Description	Value
Patients with unsupported revenue code sets encountered	0
Patients with unsupported ICD procedure code sets encountered	
Patients with unsupported DRG code sets encountered	
Diagnosis code sets used	9
Procedure code sets used	
Revenue code sets used	
ICD Procedure code sets used	
DRG code sets used	
Pharmacy codes processed	0
Pharmacy services excluded per user-defined observation period	0
First Pharmacy Fill Date	
Last Pharmacy Fill Date	
Unique pharmacy codes encountered	0
Unique unknown pharmacy codes encountered	0
Percentage of pharmacy codes that were unknown	0.0
Unknown pharmacy codes encountered	0
Patients with unknown pharmacy codes encountered	0
Unique matched pharmacy code sets encountered	0
Unique unknown pharmacy code sets encountered	0
Patients with unsupported pharmacy code sets encountered	0
Pharmacy code sets used	
Number of EDCs assigned	12,345,678
Number of MEDCs assigned	1,234,567
Number of ADGs assigned	2,345,578
Number of Rx-MGs assigned	0
Population average CSA	
Population average MPR	
Percentage of patients with total cost > $100 and no diagnoses	0.0
Percentage of patients with pharmacy cost > $100 and no pharmacy codes	0.0
Number of patients with diagnosis information and no pharmacy codes	
Number of patients with pharmacy codes and no diagnoses	0
Number of data warnings	3617

APPENDIX E: JOHNS HOPKINS ACG® SYSTEM SUPPORTING DOCUMENTATION

ACG SUMMARY STATISTICS (CONT.)

Description	Value
Number of patients with data warnings	3346
Total cost on medical services file	$0
Total cost on pharmacy services file	
Minutes To load data	22
Predicted total cost model selected	Dx-PM - lenient dx -> total cost
Predicted pharmacy cost model selected	Dx-PM - lenient dx -> rx cost
Total concurrent cost model selected	Dx-PM - lenient dx -> total conc cost
Hospitalization model selected	
Date loaded	2016-05-25
Created with ACG version	11.0.1
Created with Risk Assessment Variables	US Non-Elderly
Created with ACG mapping version	11.0 2nd Quarter 2016 Release
Created with ACG mapping release date	2016-03-31
Prior Total Cost Present	NO
Prior Pharmacy Cost Present	NO
Date of Birth Present	NO
Pregnant Present	NO
Delivered Present	NO
Low Birthweight Present	NO
Dialysis Service Present	NO
Nursing Service Present	NO
Major Procedure Present	NO
Cancer Treatment Present	NO
Psychotherapy Service Present	NO
Mechanical Ventilation Present	NO
CAL SSA Present	NO
Emergency Visits Present	NO
Outpatient Visits Present	NO
Inpatient Hospitalizations Present	NO
Inpatient Days Present	NO
All Cause Inpatient Hospitalizations Present	NO

APPENDIX E: JOHNS HOPKINS ACG® SYSTEM SUPPORTING DOCUMENTATION

ACG SUMMARY STATISTICS (CONT.)

Description	Value
Unplanned Readmissions 30 day Present	NO
Readmissions 30 day Present	NO
Unplanned Readmissions 30 day Present	NO
Place of Service Present	NO
Service From Date Present	NO
Service Thru Date Present	NO
Procedure Code Present	NO
Pharmacy Medical Procedure Code Present	NO
Revenue Code Present	NO
ICD Procedure Code Present	NO
DRG Code Present	NO
Inpatient Service Present	NO
Provider ID Present	NO
Provider Specialty Present	NO
Provider Standard Specialty Present	NO
Type of Bill Code Present	NO
Medical Service Cost Present	NO
Fill Date Present	NO
Days Supply Present	NO
Pharmacy Service Cost Present	NO

APPENDIX F: VERIFICATION OF TCRRV™ ASSIGNMENT

Building on documentation from HealthPartners, the pilot work expanded these guidelines to include some parameters around data quality issues. For each service type, do a frequency count on the TCRRV™ flag. The results should look something like the following tables:

A. IP

Flag Value	Desired % of records	Possible problems
Normal	> 95%	
No LOS/No Billed	< 1%	Missing data from supplier
No Match	< 2%	Problem with DRG assignment
Low or High (combined)	< 5%	Problem with paid amounts

B. OP

Flag Value	Desired % of records	Possible problems
Normal	> 95%	
Incidental	< 2%	Missing CPT codes
No Billed/No Units	< 1%	Problem with units field from supplier
No Match	< 2%	Problem with CPT codes
Low or High (combined)	< 5%	Problem with paid amounts

C. Prof

Flag Value	Desired % of records	Possible problems
Normal	> 95%	
No Code	< 2%	Missing CPT codes
No Billed/No Units	< 1%	Problem with units field from supplier
No Match	< 2%	Problem with CPT codes
Low or High (combined)	< 5%	Problem with paid amounts

D. Rx

Flag Value	Desired % of records	Possible problems
Normal	> 95%	
No Days	< 1%	Missing data from supplier
No Match	< 1%	Bad NDC
Low or High (combined)	< 5%	Problem with paid amounts

APPENDIX F: VERIFICATION OF TCRRV™ ASSIGNMENT (CONT.)

E. Sum the TCRRV™ and allowed amount for measurement year by IP, OP, Prof and Rx

Type of Claim	Sum of Allowed Amount	Sum of TCRRV™	Ratio
IP			
OP			
Prof			
Rx			

F. The ratio of TCRRV™ to allowed amount should be approximately 1.0. HealthPartners is recalibrating the TCRRV™ to match allowed amount

APPENDIX G: DATA QUALITY ASSESSMENT: POPULATION ALLOWED PMPM

		ALL MEDICAL							ALL PHARMACY					
POPULATION	MONTH	NUMBER OF MEMBERS W MED ELIG	AVERAGE AGE	MEDICAL CLAIM COUNT	MEDICAL CLAIM ALLOWED AMOUNT $	MEDICAL CLAIM ALLOWED AMOUNT $/ ELIG MEMBERS	% MEMBERS W/ NO MEDICAL CLAIMS IN THE MONTH	MEDICAL CLAIM ALLOWED AMOUNT $/MEDICAL CLAIM COUNT	NUMBER OF MEMBERS W RX ELIG	RX CLAIM COUNT	RX CLAIM ALLOWED AMOUNT $	RX ALLOWED AMOUNT $/ ELIG MEMBERS	% MEMBERS W/ NO RX CLAIMS IN THE MONTH	P RX CLAIMS ALLOWED AMOUNT $/RX CLAIM COUNT
Plan A HMO	201301													
Plan A HMO	201302													
Plan A HMO	201303													
Plan A HMO														
Plan A HMO	201411													
Plan A HMO	201412													
PLAN B PPO	201201													
PLAN B PPO	201202													
PLAN B PPO	201203													
PLAN B PPO														
PLAN B PPO	201411													
PLAN B PPO	201412													

Calculate eligibility counts by month and claims by incurred month separately for each data contributor.

Show 3 years of history if available to get context for measurement year numbers.

PMPM $ shown in the yellow highlighted columns.

Look for a plan or submitter with $ PMPM distinctly different from the others not explained by a difference in age Look for a dramatic change in PMPM $ from one month to the next within a population.

Look for a large portion of members with no claims in a population or month.

APPENDIX G: DATA QUALITY ASSESSMENT: POPULATION PLAN PAID PMPM

POPULATION	MONTH	NUMBER OF MEMBERS W MED ELIG	MEDICAL CLAIM COUNT	MEDICAL CLAIM PLAN PAID AMOUNT $	MEDICAL CLAIM PLAN PAID AMOUNT $/ELIG MEMBERS	% MEDICAL CLAIMS WITH $0 PLAN PAID	NUMBER OF MEMBERS W RX ELIG	RX CLAIM COUNT	RX CLAIM PLAN PAID AMOUNT $	RX PLAN PAID AMOUNT $/ ELIG MEMBERS	% RX CLAIMS WITH $0 PLAN PAID
Plan A HMO	201201										
Plan A HMO	201202										
Plan A HMO	201203										
Plan A HMO											
Plan A HMO	201411										
Plan A HMO	201412										
PLAN B PPO	201201										
PLAN B PPO	201202										
PLAN B PPO	201203										
PLAN B PPO											
PLAN B PPO	201411										
PLAN B PPO	201412										

Calculate eligibility counts by month and claims by incurred month separately for each data contributor.

Show 3 years of history if available to get context for measurement year numbers.

Look for a plan or submitter with $ PMPM distinctly different from the others not explained by a difference in age.

Look for a dramatic change in PMPM $ from one month to the next within a population.

Look for a large portion of claims with $0 plan paid. % might decrease from Jan to Dec in a year as members hit their deductibles.

APPENDIX G: DATA QUALITY ASSESSMENT: POPULATION BEHAVIORAL HEALTH PMPM

			MENTAL HEALTH[1]			SUD[2]			MENTAL HEALTH $ PMPM			SUD $ PMPM		
POPULATION	MONTH	NUMBER OF MEMBERS W MED ELIG	IP ALLOWED AMOUNT $	OP ALLOWED AMOUNT $	PROF ALLOWED AMOUNT $	IP ALLOWED AMOUNT $	OP ALLOWED AMOUNT $	PROF ALLOWED AMOUNT $	IP ALLOWED AMOUNT $/ NUMBER OF MEMBERS W MED ELIG	OP ALLOWED AMOUNT $/ NUMBER OF MEMBERS W MED ELIG	PROF ALLOWED AMOUNT $/NUMBER OF MEMBERS W MED ELIG	IP ALLOWED AMOUNT $/ NUMBER OF MEMBERS W MED ELIG	OP ALLOWED AMOUNT $/ NUMBER OF MEMBERS W MED ELIG	PROF ALLOWED AMOUNT $/NUMBER OF MEMBERS W MED ELIG
Plan A HMO	201301													
Plan A HMO	201302													
Plan A HMO	201303													
Plan A HMO														
Plan A HMO	201411													
Plan A HMO	201412													
PLAN B PPO	201201													
PLAN B PPO	201202													
PLAN B PPO	201203													
PLAN B PPO														
PLAN B PPO	201411													
PLAN B PPO	201412													

Calculate eligibility counts by month and claims by incurred month separately for each data contributor.

Show 3 years of history if available to get context for measurement year numbers.

PMPM $ shown in the last 6 columns.

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[1] Codes to define mental health claims in document mental_health_claims_for_qc.docx

[2] Codes to define SUD (Substance Use Disorder) claims in document Substance Abuse Claims Filtering.docx

APPENDIX G: DATA QUALITY ASSESSMENT: ORPHANS

POPULATION	MONTH	TOTAL MED CLAIM COUNT	TOTAL MED CLAIM ALLOWED AMOUNT $	# ORPHAN[1] MED CLAIMS	% MED CLAIMS ORPHANED	ALLOWED AMOUNT $ OF ORPHAN MED CLAIMS	% TOTAL MEDICAL ALLOWED AMOUNT $ ORPHANED	TOTAL RX CLAIM COUNT	TOTAL RX CLAIM ALLOWED AMOUNT $	# ORPHAN[1] RX CLAIMS	% RX CLAIMS ORPHANED	ALLOWED AMOUNT $ ORPHAN RX CLAIMS	% TOTAL RX ALLOWED AMOUNT $ ORPHANED
Plan A HMO	201201												
Plan A HMO	201202												
Plan A HMO	201203												
Plan A HMO													
Plan A HMO	201411												
Plan A HMO	201412												
PLAN B PPO	201201												
PLAN B PPO	201202												
PLAN B PPO	201203												
PLAN B PPO													
PLAN B PPO	201411												
PLAN B PPO	201412												

Calculate claim counts and allowed amounts by incurred month of claim separately for each data contributor.

Orphan Claims are claims where there is no matching eligibility record for the member in the month when the claim was incurred.

Look for rate of orphan claims > 1%.

APPENDIX G: DATA QUALITY ASSESSMENT: CPT GROUP

POPULATION	YEAR	HCPCS/CPT CODE 1ST CHARACTER/ DIGIT	CLAIM COUNT	% TOTAL CLAIMS	CLAIM ALLOWED AMOUNT $	% CLAIMS WITH $0 OR $NULL ALLOWED	$/CLAIM
Plan A HMO	2012	1					
Plan A HMO	2012	2					
Plan A HMO	2012	3					
Plan A HMO							
Plan A HMO	2013	1					
Plan A HMO	2013	2					
Plan A HMO	2013	3					
Plan A HMO							
Plan A HMO	2014	1					
Plan A HMO	2014	2					
Plan A HMO	2014	3					
Plan A HMO							
Plan B PPO	2012	1					
Plan B PPO	2012	2					
Plan B PPO	2012	3					
Plan B PPO							
Plan B PPO	2013	1					
Plan B PPO	2013	2					
Plan B PPO	2013	3					
Plan B PPO							
Plan B PPO	2014	1					
Plan B PPO	2014	2					
Plan B PPO	2014	3					
Plan B PPO							

Look for a CPT code group with very different $/claims in one population.

Look for a CPT code group with too few claims in one population.

Look for a CPT code group with too many $0 (or null value) claims.

Look at increase over time in codes starting with D due to oral health inclusion in Essential Health Benefits.

APPENDIX G: DATA QUALITY ASSESSMENT: IP OP PROF RX

POPULATION	YEAR	CLAIM TYPE	CLAIM COUNT	% TOTAL CLAIMS	CLAIM ALLOWED AMOUNT $	% CLAIMS WITH $0 OR $NULL ALLOWED	ALLOWED AMOUNT $/CLAIM
Plan A HMO	2012	IP					
Plan A HMO	2012	OP					
Plan A HMO	2012	Prof					
Plan A HMO	2012	Rx					
Plan A HMO	2013	IP					
Plan A HMO	2013	OP					
Plan A HMO	2013	Prof					
Plan A HMO	2013	Rx					
Plan A HMO	2014	IP					
Plan A HMO	2014	OP					
Plan A HMO	2014	Prof					
Plan A HMO	2014	Rx					
Plan B PPO	2012	IP					
Plan B PPO	2012	OP					
Plan B PPO	2012	Prof					
Plan B PPO	2012	Rx					
Plan B PPO	2013	IP					
Plan B PPO	2013	OP					
Plan B PPO	2013	Prof					
Plan B PPO	2013	Rx					
Plan B PPO	2014	IP					
Plan B PPO	2014	OP					
Plan B PPO	2014	Prof					
Plan B PPO	2014	Rx					

APPENDIX G: DATA QUALITY ASSESSMENT: DIAGNOSIS CODES

		% NON-MISSING VALUES			
POPULATION	**YEAR**	**Dx1**	**Dx2**	**Dx3**	**Dx4**
Plan A HMO	2012				
Plan A HMO	2013				
Plan A HMO	2014				
Plan B PPO	2012				
Plan B PPO	2013				
Plan B PPO	2014				

Likely to show	98-100%	80-90%	45-55%	25-35%

Verify that some portion of Dx4 is populated.

APPENDIX G: DATA QUALITY ASSESSMENT: SURGICAL PROCEDURE CODES

		% NON-MISSING VALUES		
POPULATION	**YEAR**	**ICD 9 SURGICAL PROCEDURE 1**	**ICD 9 SURGICAL PROCEDURE 2**	**ICD 9 SURGICAL PROCEDURE 3**
Plan A HMO	2012			
Plan A HMO	2013			
Plan A HMO	2014			
Plan B PPO	2012			
Plan B PPO	2013			
Plan B PPO	2014			

APPENDIX G: DATA QUALITY ASSESSMENT: PROF POS

POPULATION	YEAR	POS	CLAIM COUNT
Plan A HMO	2014	01	
Plan A HMO	2014	02	
Plan A HMO	2014	03	
Plan A HMO			
Plan A HMO	2014	99	
Plan B PPO	2014	01	
Plan B PPO	2014	02	
Plan B PPO	2014	03	
Plan B PPO			
Plan B PPO	2014	99	

APPENDIX G: DATA QUALITY ASSESSMENT: IP MS-DRG

POPULATION	YEAR	MS-DRG	ADMISSION COUNT
Plan A HMO	2014	001	
Plan A HMO	2014	002	
Plan A HMO	2014	003	
Plan A HMO			
Plan A HMO	2014	999	
Plan B PPO	2014	001	
Plan B PPO	2014	002	
Plan B PPO	2014	003	
Plan B PPO			
Plan B PPO	2014	999	

Compare distribution of admissions by MS-DRG among data contributors. The same MS-DRG values should be prominent in all contributors. If one contributor looks very different, they may be using a different DRG system.

APPENDIX H: HEALTHPARTNERS DOCUMENTATION

TCOC TOOLKIT

The Total Cost of Care and Resource Use (TCOC) framework provides a robust, scalable measurement system for both cost and resource use. The TCOC analytical reporting suite supports multiple levels of analysis—which easily and systematically pinpoints savings opportunities at the population, provider, and condition levels. This versatility is what allows TCOC to identify problem areas and to produce actionable results. HealthPartners offers two licensing agreements to external users implementing TCOC in their organizations for SAS users and non-SAS users.

ANALYTIC PACKAGES

To access the HealthPartners packages, go to http://www.healthpartners.com/public/TCOC/toolkit/.