

Total Cost of Care and Total Resource Use User Guide

Purpose

To provide guidance on implementing the National Quality Forum (NQF) endorsed Total Cost of Care (TCOC) and Total Resource Use Technical Guidelines. The TCOC and total resource use is a standardized measurement approach that allows for cost and resource use comparisons between providers, insurers, and regions over time.

Methodology Overview

The total cost of care is a measure of the total cost of treating a population in a given time period expressed as a risk adjusted per member per month (PMPM). The measure includes all services associated with treating a patient including inpatient, outpatient, professional pharmacy and ancillary services and depending on the application can include members of a population that have not incurred any medical care expense (per capita). Using appropriate and comprehensive risk adjustment tools/methods allows for fair comparisons between providers, insurers, and regions over time.

The total resource use measure is very similar to the total cost of care measure with the only difference being that costs are replaced with a value that measures resource consumption. In short, resource consumption is measured by using standardize pricing to value all medical services. The Total Care Relative Resource Use Values (TCRRV™) assesses the frequency and intensity of all services and is relative across the entire health care continuum.

Final Metrics

The final Total Cost of Care and Resource Use Measures are expressed as a risk adjusted total cost or resource use per member per month:

$$\text{Risk Adjusted Total Allowed Amount PMPM} = (\text{Total Allowed Amount} / \text{population membership}) / (\text{relative risk score})$$

$$\text{Risk Adjusted Total Resource Use PMPM} = (\text{Total TCRRVs}^{\text{TM}} / \text{population membership}) / (\text{relative risk score})$$

Both the TCOC and Resource Use measures are typically compared to a peer group or benchmark, which generates an index relative to the peer group or benchmark.

$$\text{Total Cost Index (TCI)} = \text{Risk Adjusted Total Allowed Amount PMPM} / \text{Peer Group Risk Adjusted Total Allowed Amount PMPM}$$

$$\text{Total Resource Use Index (RUI)} = \text{Risk Adjusted Total Resource Use PMPM} / \text{Peer Group Risk Adjusted Total Allowed Amount PMPM}$$

The TCOC measure developed by HealthPartners contains 3 distinct components: **membership**, **claims**, and **risk adjustment**. The resource use measure contains one additional step contained in the claims component where the TCRRVs™ are applied. It is also recommended that an initial **data quality evaluation** be performed on the input data to ensure the results are reliably comparable.

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Guidelines for Comparability

Before any populations are compared, the supporting data should be evaluated to ensure that the comparisons are fair and that variations are understood. The following are a series of data quality checks that should be performed prior to the implementation of the Total Cost of Care and Resource Use measures to ensure the data is comparable.

An acceptable level of completeness should be evaluated by the user of the measure, balancing the risk associated to the use of the results versus the benefit of the information. For example, more data consistency and completeness is needed for consumer transparency or financial arrangements versus improvement opportunity assessments. The more complete the data, the higher the reliability of the results produced by the measure.

Data Quality for both TCOC and Total Resource Use

- All service categories are available and appropriately represented (i.e. inpatient, pharmacy, outpatient, and professional).
- Membership records available for each member.
- Risk adjustment inputs need to be evaluated for consistency, accuracy, and completeness.
 - For example, diagnosis codes from inpatient, outpatient, and professional for the ACG Risk Grouper should be accurate, complete, and consistent between the desired levels of analysis (this is just an example as there are other inputs values needed for the ACG grouper).
- Allowed amount—this is the amount paid to the providers (typically insurer payment + member copay/deductible/coinsurance).
- Membership data can identify members that have an Rx carve out benefit if applicable.
 - If a behavioral health carve out is required, membership and claims data will need to be identified consistently across the levels of analysis.

Additional Data Quality Specific for Total Resource Use

- Facility revenue codes and bill type codes (CMS Standard Codes)
- Inpatient claims contain MS-DRG codes
- Professional and outpatient CPT codes and modifiers
- Professional place of service code (CMS Standard Code i.e. POS = 11 – Office)
- Pharmacy NDC codes
- Utilization fields
 - Inpatient days
 - Units for outpatient and professional
 - Days supplied for pharmacy
- Billed Amount – the amount of charges billed on the service line (i.e.: provider charge master)

Membership Population

The total cost of care and resource use measures are designed to compare populations to identify variations in total cost of treating the population, the number of resources consumed by the population and the price per resource associated to the services delivered. Since the basis of the comparison is the overall peer group, the population needs to be limited to control for known variances, such as a commercial population.

Population

- Commercial products only.
- Members are identified if they are enrolled for a minimum of 9 months during the 12 month analysis period.
 - Only members with a minimum of 9 months of enrollment are included in the measures.
- Number of eligible medical member months during the measurement period.
- Number of eligible pharmacy member months during the measurement period.
- ***Number of eligible behavioral health member months during the measurement period, if applicable.***
- Member Age – Determine the age based on the last day of the measurement period (December 31 of the measurement year).
- Include members aged 1 to 64.
- Analytical Level – The level of analysis where the risk adjusted PMPMs will be compared. Examples include:
 - Hospital Service Areas or any geographic area defined by a member’s residence zip code
 - Health Plans
 - Employer Groups
 - Provider groups or physicians
 - Attributed
 - Assigned

Membership Output

Each person’s enrollment months are summed to person level. This will include a sum of the medical member months and a sum of the pharmacy member months. Having two fields, one for medical and one for pharmacy support the final TCOC and resource use calculations.

Administrative Claims and Resource Use

Claims data are extracted for the measurement period based on first date of service, including three months of paid claims run out. Claims include all member and plan paid dollars (allowed amount). Delete all encounters/visits that have zero allowed amounts.

Additional Resource Use Only Step

TCRRVs[™] can be treated like any other monetary payment field, with the only difference being it represents resource consumption.

SAS code is provided that will apply the TCRRVs[™]. The user will need to copy the TCRRV[™] files and programs to a central location and input the necessary parameters (i.e. input field names, input dataset name, output data set name). The SAS code will output datasets that will include the TCRRV[™] and the unique claim/encounter numbers for the user to join back onto their original data. No modifications should be necessary other than supplying the input parameters and input data.

The TCRRVs[™] are applied at the claim line level (see the [TCRRV[™] Methodology](#) document for more information).

Non SAS codes users will need to follow the TCRRV[™] application overview guide (see the [TCRRV[™] Non-SAS User Application](#) document).

Claims and Resource Use Processing

- The allowed amount and TCRRVs[™] are summed to the person level to apply the person level claims truncation process.
 - A member's combined medical and pharmacy allowed amount is truncated at \$100,000.
 - A member's total medical and total pharmacy claims are reduced in the same proportion as the rate to which their total claims are above \$100,000, i.e. if a member's claims total \$125,000, the factor would be 0.80 (\$100,000 / \$125,000).
 - If the user is applying TCRRVs[™], they are truncated by the same factor as described above.
- It is most actionable if the member truncation factor is applied to the claim line level, then drill down reporting can be developed to explain the final measure result. This will create two new fields:
 - Truncated Allowed Amount = Allowed x Person Level Truncation Factor
 - Truncated TCRRV[™] = TCRRV[™] x Person Level Truncation Factor (if applicable)
- Utilize the newly created truncated payment fields to develop Medical and Pharmacy truncated medical allowed amount and truncated pharmacy allowed amount.
 - If applicable, truncated medical TCRRV[™] and truncated pharmacy TCRRV[™].
 - Creating additional allowed amount fields for the other components of care aids in drill down reporting.

Additional Resource Use Information

- TCRRV[™] application will create major components of care.
 - Inpatient – Acute
 - Inpatient – Non Acute
 - Outpatient
 - Outpatient – Professional
 - Professional
 - Pharmacy

- Truncated and not truncated allowed amount and TCRRV™ fields are output for each of the components of care and in total to support drillable reporting.
 - Total allowed amount truncated at \$100,000
 - Total allowed amount not truncated
 - Total TCRRVs™ truncated
 - Total TCRRVs™ not truncated

Claims Output

Each person’s claims data is summed to person level.

- The medical and pharmacy allowed amounts are necessary to support the TCOC measure.
- The medical and pharmacy TCRRVS™ are necessary to support the total resource use measure.
- Any additional allowed amount and TCRRV™ fields are only necessary for drill down reporting.

Risk Adjustment

The TCOC and resource use of a population are impacted significantly by the underlying population’s risk profile. The higher a population’s risk score the higher the expected TCOC and resource use. The standard risk adjustment tools are designed to quantify the morbidity variation in cost in direct relation to the morbidity variation in risk. For example, a population with a 1% higher risk score is expected to have 1% higher TCOC and total resource use.

There are many risk adjustment tools on the market that (are equally as effective) perform similarly as shown in the Society of Actuaries Comparative Analysis of Claims-Based tools for Health Risk Assessment (2007). The endorsed TCOC and Resource use measures used the Johns Hopkins ACG Grouper; however, any of the risk groupers listed in the SOA report should produce similar results. The risk adjustment tool used must be consistent across the population measured.

<http://www.soa.org/Research/Research-Projects/Health/hlth-risk-assement.aspx>

Johns Hopkins ACG	DxCG RxGroups	Ingenix ERG
Kronick / UCSD CDPS	Ingenix PRG	ACG w/Prior Cost
3M Clinical Risk Groups (CRG)	Gilmer / UCSD Medicaid Rx	DxCG UW Model
DxCG DCG	Ingenix Impact Pro	MEDai

Risk Score Output

Each person’s risk score is output at the person level.

Combination of Components

The following operations are performed to produce the final risk adjusted PMPMs. For ease of use, the following documentation includes the calculations to produce both the TCOC and resource use measures, even though they are independent measures.

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The membership, claims and risk adjustment components are combined based on the person. The combination of components will produce a person level file with: medical member months, pharmacy member months, truncated medical allowed amount, truncated pharmacy allowed amount, truncated medical TCRRV[™] and truncated pharmacy TCRRV[™] and risk score.

For all members that have a pharmacy benefit carve out, zero out the pharmacy allowed amount, pharmacy TCRRVs[™] and pharmacy membership for the entire measurement period.

Risk Score Calculation

Each risk adjustment tool will have a slight variation on how to calculate an average risk score. In all cases, one relative average risk score will need to be developed for each of the units within the analysis (i.e. In a geographic analysis, each region will have an average risk score that is relative to the total geographic average risk score).

For example: ACGs relative risk score calculation is as follows:

- Each member's ACG score is multiplied by member months, which creates a Total ACG Weight.
- The Total ACG Weights and member months are summed to the unit of analysis and an **average ACG weight** is calculated (i.e. $\frac{\sum \text{Total ACG Weights}}{\sum \text{member months}}$).
 - The same calculation is performed at the population level (i.e. all members).
- The relative ACG Risk Score is calculated for each level of analysis by dividing their average ACG weight by the total population average ACG weight.

The Final TCOC and Resource Use Calculation

Review the final TCOC formula:

$$\text{Risk Adjusted Total Cost PMPM} = (\text{Total Allowed Amount} / \text{population membership}) / (\text{relative risk score})$$

The (total allowed amount / population membership) component of the formula is broken down by medical and pharmacy. This produces the following:

$$\text{Total PMPM} = (\text{medical allowed amount} / \text{medical member months}) + (\text{pharmacy allowed amount} / \text{pharmacy member months})$$

Now divide the Total PMPM by the relative risk score:

$$\text{Risk Adjusted Allowed Amount PMPM} = \text{Total Allowed Amount PMPM} / \text{relative risk score}$$

The Risk Adjusted Allowed Amount PMPMs are the final TCOC values that are compared to the other entities in the analysis. Typically, each entity's Risk Adjusted PMPM is compared to the average of all members to create an index (Total Cost Index or TCI). In essence, this is an actual to expected value.

The same calculations are performed to produce the resource use measure with the exception that TCRRVs[™] are used in the place of the allowed amount.

$$\text{Risk Adjusted Resource Use PMPM} = \text{Total TCRRVs}^{\text{™}} \text{ PMPM} / \text{relative risk score}$$

According to the license agreement signed to download the TCRRV[™] code and tables, please credit HealthPartners as follows:

*This work is based on the patented algorithm of **HealthPartners, Inc. (Bloomington, MN)** and is used with their permission.*

Optional Guidelines

Level of Analysis

Since this is a patient centric method, a member needs to belong to a specific unit of measure. When this is not clearly defined, a form of attribution will be necessary. There are a variety of attribution methods that exist to meet varying needs across the country. The method used must be consistent across the population measured.

The following is an example of an attribution approach that has been used in an open access market that is primary care provider group based.

Attribution Algorithm

- Utilize the same professional data within the TCOC and resource use measurement period.
- Exclude all services that are not office based (place of service code not equal to 11).
- Exclude physicians that are not a MD, physician assistant or nurse practitioner.
- Assign each service line a specialty based on the servicing physician's practicing specialty or credentialed specialty if practicing specialty is not available.
- Include only the following specialties:
 - Family Medicine
 - Internal Medicine
 - Pediatrics
 - Geriatrics
 - OB/GYN
- Assign each service line a specialty based on the servicing physician's practicing specialty or credentialed specialty if practicing specialty is not available.
- The member is attributed to the provider that has seen the patient most frequently during the measurement period.
 - If there is a tie, the provider with the most recent visit is selected.
- Members who do not have a primary care office visit during the measurement time period are not attributed to a primary care provider and are not included in the measures.

Additional Physician Attribution

- Once a provider group has been attributed a member, a second level of attribution can be performed in the same manner to Attribute the patient to a physician within the group.
- The member is attributed to the physician that has seen the patient the most frequent within the attributed provider group.
- The "competition" for the member remains within the original attributed provider group.

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