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HealthPartners Technical Documentation

Total Cost of Care and Total Resource Use Validity Analysis

Using Optum Symmetry Episode Risk Groups (ERG)

Purpose

To evaluate the validity of the Total Cost of Care and Resource Use measures using the Optum Symmetry Episode Risk Groups (ERG). The analysis compares provider group Pearson correlations between actual cost and resource use to their corresponding risk score and risk adjusted cost and resource use.

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Overview of Analysis

The Total Cost of Care and Resource Use are measures of a provider's risk adjusted cost and resource use effectiveness at managing their primary care attributed population across the care continuum. The Total Cost of Care and Resource Use measures were applied to HealthPartners primary care providers as per the specifications of the measures. The total cost index (TCI) and total resource use index (RUI) relative provider positions are compared to the ERG risk score and non risk adjusted cost and resource use relative positions to determine the correctness of conclusions. Since price is the natural by-product of TCI less RUI, we should expect that price will show a moderate correlation to actual PMPM, but low correlation to ERG score.

Expected Conclusions/Hypothesis

- The risk score should be highly correlated to resource use as patients with higher risk profiles require higher levels of care.

- The provider group relative risk adjusted cost and resource use positions should have a low correlation to the risk score. In other words, the risk score should not determine the relative cost or resource use position of a provider group.

- The provider group's non risk adjusted resource use position should have a moderate correlation to the actual PMPM since a provider's resource use management and illness burden of their population impacts their relative position.

  o Once risk adjustment is applied, the provider group's risk adjusted resource use position should have a lower correlation to the actual PMPM than the unadjusted resource use position. This is because when illness burden is removed, only the provider's resource use management remains.

- The provider's actual resource use (Total Care Relative Resource Values – TCRRV) PMPM and their actual price positions should have a moderate to high correlation to the actual PMPM position. In other words a provider's resource use rate and price both contribute to their overall cost position.

Summary of Findings

- There is a high correlation between ERG score and the unadjusted resource use (0.85) indicating that that ERG is a good measure of patient illness burden and resource consumption.

- There is a low correlation between ERG score and the risk adjusted TCI (-0.03), Price (0.06), and RUI (0.07) indicating that patient risk does not determine relative cost position.

- The correlation between the unadjusted resource use and the actual PMPM is 0.57 which indicates a moderate correlation, as expected.

  o The risk adjusted resource use correlation to actual PMPM is 0.37 which is a lower correlation than the unadjusted resource use because the illness burden of the patient is removed, but the providers' resource use management remains.

- The provider's actual PMPM correlation to their TCRRV PMPM and price is 0.57 and 0.80, respectively.

Pearson Correlation Coefficients

The Pearson Correlation Coefficients are calculated at the network level between provider groups. In general, the correlation coefficient is an indicator of the level of connection or influence two measures have on each another.

- The correlation coefficient scores range from negative one to positive one, with the closer to either value indicating the more influence or connection and the close to zero indicating no influence.
- When the correlation is positive both values move in the same direction and when the correlation is negative the values move in the opposite direction.

Interpretation of Correlations (absolute value)

Weak/none:	0.0 - 0.4
Moderate:	0.4 - 0.6
Strong Correlation:	0.6 - 1.0

Methodology

The Total Cost of Care and Resource Use measures should differentiate between providers based on the cost per member and/or consumption of resources per member given all other factors are equal. The ERG adjustment controls for variations in the illness burden of the patients and the peer grouping controls for various provider types and types of product.

Analysis Overview

The Pearson Correlation Coefficients are calculated at the health plan network level between provider groups.

- Network Overview Non Risk Adjusted metrics
  - Correlations between the ERG score and the non-ERG adjusted cost PMPM and TCRRV PMPM.
- Network Overview Risk Adjusted Metrics
  - Correlations between the ERG score and the Total Cost Index and Resource Use Index.

Member Population

- Members age 1 – 64 included (babies < 1 and members age 65+ are excluded).
- Members are included if they are enrolled for a minimum of 9 months during the 12 month claims window.
- Commercial products only.
- Attributed members only (guideline per HealthPartners' Total Cost of Care and Total Resource Use NQF-endorsed specifications).
- A member is assigned to the provider group that provides the largest percentage of the primary care office visits.
- In the event of a tie, the provider group with the most recent visit is attributed the member.
- Members that do not have a primary care office visit are excluded from attribution and TCOC.
- Metro and Regional Primary Care Providers with more than 600 members that meet the above criteria.

Primary Care Network Analysis Overview

- HealthPartners primary care metro and regional network consists of 53 individual provider groups with more than 600 members, per the TCOC specification.

- The total membership of the primary care attributed network is ~ 600,000 members.

- The range between provider groups within the following metrics:

    o ERG score variation – 0.33 points (min 0.74 and max 1.08)

    o Total Cost Index variation – 1.05 points (min 0.82 and max 1.87)

    o Resource Use variation – 0.39 points (min 0.83 and max 1.23)

    o Provider group sizes vary from 652 to 83,962 members.

Metrics

- Total Cost Index – TCI: A provider's ERG Adjusted total cost per member per month divided by the peer group average ERG Adjusted total cost per member per month.

- Total Care Relative Resource Use Value Index – RUI: A provider's ERG Adjusted total resource use per member per month divided by the peer group average ERG Adjusted total resource use per member per month.

- Price Index – PI: The byproduct of the TCI and RUI. By definition, the only variance between the TCI and RUI is price.

- Actual PMPM – The actual spend divided by the member months of the population. These are non risk adjusted numbers.

- ERG Score – Is the sum of a (member's assigned ERG weight x their member months divided by the total member months).

- TCRRV – Total Care Relative Resource Value – Is a price neutral value that is relative within and across all places of service and types of treatment.

    o *The Total Care Relative Resource Use Values (TCRRVs) place a relative value unit on all health care services and are the basis of the resource use index (see TCRRV documentation on www.healthpartners.com/tcoc).*

- TCRRV PMPM – The actual TCRRVs divided by the member months of the population. These are non risk adjusted numbers.

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Correlations and Conclusions

Correlations Between ERG Score, Actual PMPMs, Actual TCRRVs, Risk Adj TCI, and Risk Adj RUI

Since ERG is a common industry risk adjuster that measures resource use, there should be strong correlations between it and the Actual PMPMs and Actual TCRRVs. The Actual PMPM and TCRRV correlations should be similar to the ERG score; however the TCRRV's correlation should be stronger because the Actual PMPMs are not a true unbiased measure of resources, since they are impacted by the unit cost of each of the providers within the analysis.

Non-Risk Adjusted	Correlation Coefficient	
Metric	ERG	Actual PMPMs
Actual TCRRVs	0.85	0.57
Price Index	-0.06	0.80

Risk Adjusted	Correlation Coefficient	
Metric	ERG	Actual PMPMs
ERG Adjusted TCI	-0.03	0.90
ERG Adjusted RUI	0.07	0.37

- There is a high correlation between ERG and the unadjusted TCRRVs (0.85) which indicates that the ERG score and the Actual TCRRVs are a good measure illness burden.

- There is a low correlation between ERG score and the risk adjusted TCI, Price, and RUI, -0.03, -0.06 and 0.07, respectively.
    - This indicates that a provider can have a high or low ERG score and still have a high or low risk adjusted TCI.

- There is a lower correlation between the risk adjusted RUI and Actual PMPMs (0.37) than the risk adjusted TCI and Actual PMPMs (0.90) because the risk adjusted RUIs are not impacted by the cost per unit (price).

- Risk adjusted TCIs and price have a high correlation with the actual PMPM, as expected (0.90 and 0.80, respectively). Risk adjusting resource use lowers its correlation with actual PMPM from 0.57 to 0.37, demonstrating that the ERG adjuster reduces the impact on utilization caused by increased risk.

Table 1

Analysis Group	Average ERG Score			TCI			Price Index			Resource Use Index		
	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011
Provider 2	0.96	0.92	0.92	0.93	0.89	0.82	0.93	0.91	0.92	1.00	0.98	0.89
Provider 36	0.92	0.94	0.93	0.82	0.86	0.83	0.89	0.87	0.85	0.93	0.99	0.98
Provider 50	~	0.81	0.80	~	0.92	0.87	~	0.93	0.89	~	0.99	0.97
Provider 32	1.00	0.95	0.95	0.88	0.90	0.87	0.93	0.91	0.92	0.95	1.00	0.95
Provider 21	0.94	0.89	0.99	0.90	0.88	0.88	0.87	0.88	0.86	1.03	0.99	1.02
Provider 49	0.89	0.87	0.89	0.93	0.90	0.90	0.89	0.87	0.87	1.04	1.03	1.03
Provider 16	0.99	0.94	0.91	0.93	0.99	0.90	0.89	0.90	0.89	1.05	1.10	1.01
Provider 13	1.03	1.06	1.06	0.91	0.94	0.91	0.91	0.91	0.90	1.01	1.03	1.02
Provider 26	0.79	0.80	0.78	0.94	0.94	0.91	0.92	0.92	0.94	1.02	1.02	0.98
Provider 25	1.05	1.08	1.07	0.89	0.93	0.91	0.91	0.94	0.94	0.97	0.98	0.98
Provider 45	0.76	0.77	0.74	0.95	0.88	0.92	0.88	0.87	0.86	1.07	1.01	1.07
Provider 33	1.02	1.05	1.08	0.91	0.90	0.92	0.87	0.87	0.87	1.05	1.04	1.06
Provider 34	1.02	1.02	1.03	0.93	0.93	0.92	0.89	0.89	0.88	1.05	1.04	1.05
Provider 20	1.03	1.02	1.02	0.92	0.92	0.93	0.96	0.95	0.95	0.96	0.97	0.98
Provider 10	0.94	0.90	0.97	0.96	0.88	0.93	0.93	0.91	0.91	1.03	0.97	1.02
Provider 12	1.01	1.00	1.04	1.00	0.95	0.94	0.97	0.91	0.91	1.03	1.04	1.02
Provider 47	0.85	0.88	0.91	0.95	1.03	0.94	1.02	1.01	1.00	0.93	1.02	0.94
Provider 6	0.99	1.01	1.01	0.95	0.97	0.94	0.93	0.93	0.93	1.02	1.04	1.01
Provider 11	0.94	0.96	0.88	0.98	0.98	0.95	0.92	0.93	0.92	1.06	1.06	1.03
Provider 19	1.03	1.03	1.07	0.98	0.95	0.96	0.94	0.94	0.94	1.05	1.01	1.03
Provider 23	~	0.89	0.77	~	0.96	0.97	~	1.03	0.97	~	0.92	1.01
Provider 14	0.98	1.00	1.01	0.97	0.99	0.97	0.97	0.97	0.96	1.00	1.02	1.01
Provider 9	0.74	0.76	0.77	0.99	1.03	0.98	0.93	0.93	0.94	1.07	1.11	1.04
Provider 42	0.91	0.93	0.92	0.98	0.93	0.98	1.00	1.03	1.03	0.97	0.90	0.95
Provider 40	0.96	0.96	0.96	0.99	0.98	0.99	0.99	0.97	0.98	1.00	1.01	1.01
Provider 41	0.92	0.91	0.95	0.97	0.91	0.99	0.94	0.92	0.92	1.03	0.99	1.08
Provider 3	1.00	1.02	1.01	1.02	1.00	1.00	1.00	1.01	1.01	1.01	0.99	0.99
Provider 5	1.00	0.96	0.98	0.98	1.03	1.00	1.11	1.08	1.09	0.89	0.95	0.92
Provider 51	0.85	0.88	0.88	1.06	1.04	1.01	1.02	1.01	1.02	1.03	1.04	0.99
Provider 46	0.89	0.86	0.98	1.08	1.09	1.01	1.04	1.03	1.02	1.04	1.06	0.99
Provider 39	0.85	0.91	0.84	1.07	1.10	1.06	1.09	1.11	1.07	0.98	0.99	0.99
Provider 31	0.82	0.81	0.87	1.08	1.10	1.06	1.07	1.10	1.11	1.01	1.00	0.96
Provider 4	0.84	0.86	0.84	1.21	1.19	1.08	1.24	1.21	1.14	0.98	0.99	0.95
Provider 17	0.86	0.88	0.92	1.06	1.06	1.08	1.04	1.03	1.07	1.02	1.03	1.02
Provider 15	0.96	0.94	0.90	1.25	1.20	1.09	1.25	1.22	1.20	1.00	0.99	0.91
Provider 8	0.96	0.97	1.01	1.08	0.95	1.09	1.04	1.06	1.09	1.04	0.89	1.00
Provider 1	0.82	0.77	0.84	1.10	1.16	1.13	1.14	1.18	1.17	0.96	0.99	0.97
Provider 22	0.76	0.85	0.79	1.14	1.18	1.13	1.07	1.08	1.07	1.07	1.09	1.06
Provider 24	1.02	0.99	0.93	1.11	1.20	1.16	1.18	1.21	1.15	0.95	0.99	1.01
Provider 35	0.82	0.77	0.78	1.13	1.06	1.18	1.09	1.07	1.10	1.03	0.99	1.08
Provider 28	0.84	0.80	0.81	1.26	1.25	1.19	1.18	1.20	1.17	1.06	1.04	1.02
Provider 48	1.06	1.01	1.02	1.20	1.14	1.21	1.14	1.12	1.12	1.05	1.02	1.08
Provider 52	0.73	0.77	0.86	1.22	1.33	1.29	1.36	1.38	1.34	0.90	0.97	0.96
Provider 43	0.89	0.90	0.90	1.22	1.25	1.30	1.24	1.30	1.28	0.99	0.96	1.02
Provider 7	0.92	0.90	0.91	1.33	1.34	1.31	1.24	1.32	1.30	1.07	1.02	1.00
Provider 44	0.97	1.00	1.00	1.32	1.30	1.31	1.24	1.26	1.24	1.06	1.03	1.06
Provider 27	1.07	0.91	0.94	1.32	1.24	1.32	1.33	1.32	1.38	1.00	0.94	0.96
Provider 18	0.98	1.00	1.04	1.40	1.47	1.32	1.60	1.55	1.59	0.88	0.95	0.83
Provider 30	0.88	0.92	0.93	1.36	1.40	1.35	1.33	1.34	1.34	1.02	1.05	1.00
Provider 38	0.78	0.76	0.80	1.30	1.37	1.37	1.44	1.46	1.51	0.90	0.93	0.91
Provider 29	0.90	1.02	0.99	1.48	1.49	1.71	1.46	1.47	1.49	1.01	1.01	1.15
Provider 37	~	1.11	0.96	~	1.48	1.87	~	1.40	1.52	~	1.06	1.23
Grand Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00