



Measuring employer cost savings from network changes: Implementation results

Commissioned by Imagine Health

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Introduction

Risk adjustment is an important component of accurately measuring healthcare costs. As large employers continue to seek cost-saving initiatives for their health and welfare plans, risk adjustment offers them a tool that allows for the normalization of the health of underlying employee populations. This allows for more accurate measurements of costs or savings attributable to the implementation of various healthcare initiatives.

A common healthcare initiative undertaken by large employers seeking savings for their health benefit offerings is the use of customized network options. These programs are marketed as a way to help the employer capture savings without compromising quality of service.

Narrow or specialized network options provide one opportunity for large employers to leverage their size to reduce the total cost of care while maintaining high-quality outcomes. Care must be taken with the implementation of narrow networks, however, given that their use can restrict the healthcare provider options available to the enrollee.

This paper offers a follow-up to the May 2016 paper entitled "Measuring employer cost saving from network changes," authored by Shyam Kolli, Hans Leida, and Troy Pritchett. It focuses on the use of risk adjustment as a key component in measuring the costs or savings associated with the implementation of three narrow network options.

Because risk adjustment allows for normalization of a population's health status, a risk-adjusted measurement can help account for selection bias and significant population changes.

In what follows, we present case studies of risk-adjusted measurements of narrow network options offered by Imagine Health to three employers across four geographical areas. The details for each employer are outlined in the discussion below.

Summary of findings

Risk adjustment helps to more accurately measure the cost or savings of a network change. Narrow network options market their networks as possible sources of significant savings to employers. Risk-adjusted cost measurements help to verify whether the plan sponsors are actually realizing the savings.

In this paper, we measure the costs/(savings) that three Imagine Health narrow network options generated, on a risk-adjusted allowed claim cost basis over a period of two to three years for three separate employers. This analysis considered costs and risk scores for medical claims only, excluding prescription drug claims. These options were implemented in four markets with varying plan designs and product features with customizations.

The total estimated average annual savings for these clients ranged from (2.6%) to (24.8%).

All savings calculations were based on risk-adjusted allowed claim costs, measured against risk-adjusted allowed baseline costs.

The trends used in this analysis varied by client, as agreed upon between Imagine Health and its clients. Trends were used to move the baseline and experience periods to a common year of measurement.

The following describes the approach used in the measurement of these savings, specific assumptions, details in the savings, and other information deemed relevant to the analysis.

Narrow network implementation

Imagine Health implemented narrow network options for three large employers. Each employer has a national presence and the narrow network options were implemented regionally, according to the clients' needs. This analysis is restricted to these three groups as they were all of the groups for which Imagine Health had full post-adjudicated claims.

In what follows, we will analyze the results of the narrow network option on a risk-adjusted basis. The employer participation by market is shown in Figure 1.

Figure 1: Market Summary for Employer Groups, Years of Narrow Network Implementation by Market

Market Summary for Employer Groups				
Years of Narrow Network Implementation by Market				
	Market 1	Market 2	Market 3	Market 4
Employer A	2 years	2 years	2 years	2 years
Employer B	1 year	1 year		
Employer C				2 years

Each employer sought network options that could minimize employee medical service disruption while capturing significant savings in some of their largest markets.

The employers engaged in contracts with a health network where the parties agreed to measure allowed cost savings on a risk-adjusted basis.

These contracts stipulated the trend that would be used in the measurement of savings and in one case Imagine Health offered a performance guarantee.

This paper focuses on the cost or savings attributable to the network implementation on a risk-adjusted basis.

Risk adjustment puts allowed costs on an equal basis for direct comparison

From "Measuring employer cost savings from network changes":¹

If individuals across two different provider networks A and B were homogenous, with the same demographics, medical conditions (diagnosis codes), and receiving the same treatment using the same medical procedures and prescription drugs, then comparing total allowed costs of patients over a period of time would likely be sufficient to identify efficient provider networks. However, this is rarely the case. Risk adjusting allowed costs accounts (at least partially) for differences in intrinsic patient characteristics.

Risk-adjuster models are not perfect. Other factors (described in more detail later in this report), such as random effects, data accuracy, and provider coding, may also impact the results of the comparison. However, a risk-adjusted comparison is significantly better than comparing costs across providers without making any attempt to account for differences in the populations treated (which providers may have no control over). For example, even the best interventions, care management, and provider efficiency are generally not able to overcome the biological fact that an

older and less healthy patient panel will need to utilize more services relative to a younger and healthier panel.

Milliman Advanced Risk Adjusters (MARA)

The risk adjustment analysis used in this paper relied on the Milliman Advanced Risk Adjusters™ (MARA™). MARA is one of many risk score models that could be used for such analysis.² Other tools may result in different risk score assignments that could impact the estimated cost or savings of this analysis.

Methodology of measurement

Two different baseline sets are used in the measurements that follow. For *Employer B*, the baseline data is based only on participants who were enrolled with the new network in the measurement period. This approach allowed for an evaluation that removed selection bias.

Employers A and C used baseline data that include the entire employment population. While selection is captured in this approach, the risk adjustment technique used allows these factors to be normalized. Selection bias, with healthier participants selecting the narrow network option, generally makes it more difficult to measure savings. These considerations are expanded upon in the detailed analysis below.

¹ Kolli, S., Leida, H., & Pritchett, T. (May 25, 2017). Measuring Employer Cost Savings From Network Changes, p. 4. Milliman Client Report. Retrieved January 18, 2019, from <http://www.milliman.com/insight/2016/Measuring-employer-cost-savings-from-network-changes/>.

² The Society of Actuaries' "Accuracy of Claims-Based Risk Scoring Models" report, finalized in October 2016, is available at <https://www.soa.org/research-reports/2016/2016-accuracy-claims-based-risk-scoring-models/>.

In each of the three studies, the baseline period claims and demographic information were run through MARA to determine baseline risk scores. The measurement periods for each group were also evaluated using MARA to determine the measurement period risk scores.

The allowed per member per month (PMPM) claim costs for the baseline and measurement periods were calculated.

These amounts were risk-adjusted by dividing the allowed PMPM figure by the respective member month-weighted average risk score. The risk scores used were based on medical diagnoses on a concurrent basis.

The risk-adjusted baseline PMPM was then trended to be able to compare across the years of implementation. For the case studies below, we trend both the baseline and measurement period to 2017 in order to measure savings from a common year. We included member experience for any members enrolled at any point during the year.

The actual risk-adjusted PMPM for the measurement period was then compared to the trended baseline risk-adjusted PMPM (expected risk-adjusted PMPM) to determine the risk-adjusted savings that were captured by the program.

Why allowed cost?³

Focusing the analysis on allowed claim costs minimizes the impact of differences in cost sharing or plan design, assuming that the populations being compared have

essentially the same covered benefits and that cost-sharing levels do not vary materially. This contrasts with the paid amounts (net of member cost sharing), which are directly affected by benefit design.

To the extent the benefit designs do vary considerably among the networks, additional consideration must be given to the impact of increased utilization on overall cost. If induced demand increases significantly under a very generous benefit offering, then the increased utilization could offset the lower unit cost differences in the narrow network.

Analysis: Employer A

Year One analysis

For Employers A and C, we have put all expected costs on a 2017 basis to measure savings from a common year.

The exhibit in Figure 2 captures the first-year savings (on a 2017 basis).

³ Kolli, S. et al., op cit.

Figure 2: Risk-Adjusted Savings Summary, Employer A: 2016 vs. 2015 on a 2017 Basis

Risk-Adjusted Savings Summary Employer A - 2015 vs. 2016 on a 2017 Basis	
Item	Total
2015 Allowed PMPM	\$322.35
2015 Risk Score	1.138
2015 Risk Adj Allowed PMPM	\$283.38
Mutually Agreed Annual Medical Trend	3.00%
Expected 2017 Risk Adj Allowed PMPM	\$300.64
2016 Allowed PMPM	\$110.30
2016 Risk Score	0.491
Actual 2016 Risk Adj Allowed PMPM	\$224.51
Mutually Agreed Annual Medical Trend	3.00%
Actual 2016 PMPM Trended to 2017	\$231.25
Cost/(Savings) PMPM at 1.00 Risk Score	(\$69.39)
% Cost/(Savings)	(23.1%)

The calculation shown in Figure 2 is normalized to a 1.00 risk score on a 2017 basis. The details of the calculation are as follows:

For this comparison, we have placed both 2015 and 2016 on a 2017 basis. The actual experienced 2015 allowed PMPM of \$322.35 is divided by the 2015 risk score and trended to 2017, as follows:

$$\frac{\$322.35}{1.138} * 1.03^2 = \$300.64$$

The estimated savings for a 1.00 risk score is the risk score-adjusted 2016 allowed PMPM trended to 2017 minus the adjusted expected 2015 amount:

$$\frac{\$110.30}{0.491} * 1.03 - \$300.64 = (\$69.39)$$

It should be noted that these savings are adjusted for the risk score and the measurement population, and represent the

expected savings for a hypothetical population with a risk score of 1.00. The actual dollar savings occur at the risk score of the measurement population (and before being trended to 2017 levels), but the percentage savings is independent of the choice of what risk level or trend year used to illustrate the savings.

The advantage of stating these values on a 1.00 risk score basis and trending to a common year is to facilitate the combination of multiple measurement years in subsequent calculations, which can be useful to increase the credibility of the results.

Year Two analysis

Figure 3: Risk-Adjusted Savings Summary, Employer A: 2015 vs. 2017

Risk-Adjusted Savings Summary Employer A - 2015 vs. 2017	
Item	Total
2015 Allowed PMPM	\$322.35
2015 Risk Score	1.138
2015 Risk Adj Allowed PMPM	\$283.38
Mutually Agreed Annual Medical Trend	3.00%
Expected 2017 Risk Adj Allowed PMPM	\$300.64
2017 Allowed PMPM	\$136.35
2017 Risk Score	0.616
Actual 2017 Risk Adj Allowed PMPM	\$221.17
Cost/(Savings) PMPM at 1.00 Risk Score	(\$79.47)
% Cost/(Savings)	(26.4%)

Similarly, 2017 is compared to the expected 2015 amount on a 2017 basis, by first calculating the new adjusted expected amount and comparing to 2017:

$$\frac{\$136.35}{0.616} - \$300.64 = (\$79.47)$$

The second year of implementation resulted in a savings to Employer A of (26.4%).

The exhibit in Figure 4 outlines the total savings on a 2017 basis.

Figure 4: Risk-Adjusted Savings Summary, Employer A: 2015 and 2016 Net Cost/(Savings) on a 2017 Basis

Risk-Adjusted Savings Summary Employer A 2015 & 2016 Net Cost/(Savings) on a 2017 Basis	
Item	Total
2015 Risk Adj Allowed PMPM	\$283.38
Mutually Agreed Annual Medical Trend	3.00%
Expected 2017 Risk Adj Allowed PMPM	\$300.64
Actual 2016 Risk Adj Allowed PMPM	\$224.51
Mutually Agreed Annual Medical Trend	3.00%
Actual 2016 Risk Adj PMPM Trended to 2017	\$231.25
2016 Cost/(Savings) on 2017 Basis	(\$69.39)
Actual 2017 Risk Adj Allowed PMPM	\$221.17
2017 Cost/(Savings) at 1.00 Risk Score	(\$79.47)
Total Net Cost/(Savings) PMPM on 2017 Basis	(\$148.86)
Average Annual % Cost/(Savings)	(24.8%)

Trend

Employer A and the network agreed upon a trend of 3.0% from the baseline period to the measurement periods. The employer group and the network determined the trend. Milliman was not involved in the development of the trend assumptions.

Analysis: Employer B

Figure 5: Risk-Adjusted Savings Summary, Employer B: 2016 vs. 2017

Risk-Adjusted Savings Summary Employer B - 2016 vs. 2017	
Item	Total
2016 Allowed PMPM	\$376.74
2016 Risk Score	1.019
2016 Risk Adj Allowed PMPM	\$369.82
Mutually Agreed Annual Medical Trend	6.00%
Expected 2017 Risk Adj Allowed PMPM	\$392.01
2017 Allowed PMPM	\$358.13
2017 Risk Score	1.088
Actual 2017 Risk Adj Allowed PMPM	\$329.10
Cost/(Savings) PMPM at 1.00 Risk Score	(\$62.91)
% Cost/(Savings)	(16.0%)

As can be seen in Figure 5, the ultimate savings, after accounting for trend, was (16%).

Trend

Employer B and the network agreed upon a trend of 6.0% from the baseline period to the measurement period. Again, the employer group and the network developed the trend assumptions.

Market segmentation

While the details of the contract were based on an aggregated group, the calculations were also performed at a market level.

Market 1

The exhibit in Figure 6 outlines the calculation in Market 1.

Figure 6: Market 1: Risk-Adjusted Savings Summary, 2016 vs. 2017

Market 1 - Risk-Adjusted Savings Summary 2016 vs. 2017	
Item	Total
2016 Allowed PMPM	\$372.00
2016 Risk Score	1.024
2016 Risk Adj Allowed PMPM	\$363.33
Mutually Agreed Annual Medical Trend	6.00%
Expected 2017 Risk Adj Allowed PMPM	\$385.13
2017 Allowed PMPM	\$351.44
2017 Risk Score	1.051
Actual 2017 Risk Adj Allowed PMPM	\$334.25
Cost/(Savings) PMPM at 1.00 Risk Score	(\$50.88)
% Cost/(Savings)	(13.2%)

Market 2

Similarly for Market 2, as shown in Figure 7.

Figure 7: Market 2: Savings Summary, 2016 vs. 2017

Market 2 - Savings Summary 2016 vs. 2017	
Item	Total
2016 Allowed PMPM	\$380.99
2016 Risk Score	1.014
2016 Risk Adj Allowed PMPM	\$375.71
Mutually Agreed Annual Medical Trend	6.00%
Expected 2017 Risk Adj Allowed PMPM	\$398.25
2017 Allowed PMPM	\$364.09
2017 Risk Score	1.121
Actual 2017 Risk Adj Allowed PMPM	\$324.79
Cost/(Savings) PMPM at 1.00 Risk Score	(\$73.45)
% Cost/(Savings)	(18.4%)

Analysis: Employer C

Year One analysis

Similar to our approach with Employer A, both years of experience for Employer C were measured on a 2017 basis.

Figure 8 details the first-year savings.

Figure 8: Risk-Adjusted Savings Summary, Employer C: 2015 vs. 2016 on a 2017 Basis

Risk-Adjusted Savings Summary Employer C - 2015 vs. 2016 on a 2017 Basis	
Item	Total
2015 Allowed PMPM	\$343.75
2015 Risk Score	1.313
2015 Risk Adj Allowed PMPM	\$261.81
Mutually Agreed Annual Medical Trend	6.00%
Expected 2017 Risk Adj Allowed PMPM	\$294.17
2016 Allowed PMPM	\$193.41
2016 Risk Score	0.868
Actual 2016 Risk Adj Allowed PMPM	\$222.88
Mutually Agreed Annual Medical Trend	6.00%
Actual 2016 PMPM Trended to 2017	\$236.26
Cost/(Savings) PMPM at 1.00 Risk Score	(\$57.91)
% Cost/(Savings)	(19.7%)

Year Two analysis

Figure 9: Risk-Adjusted Savings Summary, Employer C: 2015 vs. 2017

Risk-Adjusted Savings Summary Employer C - 2015 vs. 2017	
Item	Total
2015 Allowed PMPM	\$343.75
2015 Risk Score	1.313
2015 Risk Adj Allowed PMPM	\$261.81
Mutually Agreed Annual Medical Trend	6.00%
Expected 2017 Risk Adj Allowed PMPM	\$294.17
2017 Allowed PMPM	\$328.85
2017 Risk Score	0.977
Actual 2017 Risk Adj Allowed PMPM	\$336.73
Cost/(Savings) PMPM at 1.00 Risk Score	\$42.56
% Cost/(Savings)	14.5%

Year Two resulted in a cost to Employer C of 14.5%.

The exhibit in Figure 10 outlines the total savings on a 2017 basis.

Figure 10: Risk-Adjusted Savings Summary, Employer C: 2015 and 2016 Net Cost/(Savings) on a 2017 Basis

Risk-Adjusted Savings Summary Employer C 2015 & 2016 Net Cost/(Savings) on a 2017 Basis	
Item	Total
2015 Risk Adj Allowed PMPM	\$261.81
Mutually Agreed Annual Medical Trend	6.00%
Expected 2017 Risk Adj Allowed PMPM	\$294.17
Actual 2016 Risk Adj Allowed PMPM	\$222.88
Mutually Agreed Annual Medical Trend	6.00%
Actual 2016 Risk Adj PMPM Trended to 2017	\$236.26
2016 Cost/(Savings) on 2017 Basis	(\$57.91)
Actual 2017 Risk Adj Allowed PMPM	\$336.73
2017 Cost/(Savings) at 1.00 Risk Score	\$42.56
Total Net Cost/(Savings) PMPM on 2017 Basis	(\$15.35)
Average Annual % Cost/(Savings)	(2.6%)

Trend

Employer C and the network agreed upon a trend of 6.0% from the baseline period to the measurement period. As with Employers A and B, the trend assumptions were determined by the employer group and the network.

Other considerations

Selection bias

Concerns over plan selection for participating in the narrow network plans were considered at all aspects of this evaluation. Where employees are offered a choice of coverage, they may select a network based on their health status. Risk adjustment is a method to estimate the effects of selection. Risk adjustment may not fully account for the differences in health status, particularly if the selection effect is extreme.

Credibility⁴

Credibility is used here in the sense defined by the Actuarial Standards Board as a measure of the predictive value in a given application that the actuary attaches to a particular set of data (predictive is used here in the statistical sense and not in the sense of predicting the future).⁵

The size of the patient population for any given provider will impact the credibility of the measured claims and risk scores for the population associated with that provider. If multiple years of data are available, the threshold (number of members) to assign full credibility will generally be lower when compared with the threshold required when a single year of data is available.

In general, risk-adjusted costs should be more credible at a given number of members than claim costs prior to risk adjustment. This is because the risk adjustment process removes a portion of the variability of claim costs. The increase in credibility will depend on the statistical power of the risk adjustment model used.

In our experience, it is sometimes tempting for stakeholders to apply the threshold of 2,000 members (or 24,000 member months) to the commercial market. That is the threshold published by the Centers for Medicare and Medicaid Services (CMS) for experience in the Medicare Advantage market. However, the commercial market is different from the Medicare Advantage market in that there are a lot more chronic members within the Medicare population compared to the commercial population and

thus more of the Medicare member costs are relatively stable from year to year. The threshold for member months for full credibility in the commercial market could therefore be higher than Medicare.

There are many considerations that must be weighed to determine the credibility level to use. These considerations include but are not limited to: a) turnover rate, b) desired confidence levels, c) inclusion or exclusion of pharmacy claims in the data, and d) whether pooling levels are applied to limit impact of large claims. Based on research in the Milliman Commercial Health Cost Guidelines™, a range of 4,000 to 5,000 members for one year of data that is not risk-adjusted can be considered fully credible. The threshold on a risk-adjusted basis or for multiple years of data would be somewhat lower and dependent on the specific circumstance.

The employers in this study had member sizes ranging from roughly 1,300 members electing the narrow network, to well in excess of the suggested credibility threshold.

Narrow network considerations

It should be noted that there are trade-offs that must be considered when selecting a narrow network. By definition, these networks provide enrollees access to fewer providers and hospitals in a rating area than traditional networks. This restricted access could lead to enrollees needing to seek access outside of the network. Out-of-network benefits are limited and could place

⁴ Kolli, S. et al., op cit.

⁵ Actuarial Standard of Practice No. 25 Credibility Procedures.

a heavy cost burden on enrollees who need these services.

In addition, implementation of narrow networks can disrupt employee/provider relationships if an employee's current provider is not in the narrow network. Organizations considering narrow networks must take care to ensure this disruption is managed to minimize employee dissatisfaction and avoid continuity of care issues.

With regard to the savings estimate, as mentioned above, the dollar savings shown in the exhibits reflect amounts that have been normalized to a 1.00 risk score and trended to a common measurement year rather than PMPM savings for the actual risk enrolled in each year. However, the percentage savings are independent of the normalization.

Contact and acknowledgments

This report was commissioned by Imagine Health, which builds custom provider networks for employers with large concentrations of employees in single geographic areas. The methodology and analysis in this white paper reflect the research and opinion of the authors; Milliman does not intend to endorse any product or organization. As with any economic or actuarial analysis, it is not possible to capture all factors that may be significant. Different data sets, time periods, and methodologies will produce different results. The findings in this white paper should be interpreted carefully before they are applied to any particular situation. If this report is reproduced, we ask that it be

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If you have any questions or comments on this document, please contact the authors. The opinions in this white paper represent those of the authors and not Milliman as a whole. Troy and Les are members of the American Academy of Actuaries and meet the qualification standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

The authors would like to acknowledge the peer review of Hans Leida, who is a principal and consulting actuary in the Minneapolis office of Milliman.

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