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# Time to Update Your Trend Process?

By Joan C. Barrett

**M**ost health plans have sophisticated systems in place to project and monitor trends. Given the volatility of the health care business today, however, it may be time to perform an intense review of these models to make sure they are up to date and provide as much actionable information as possible. The question is, what kind of changes should we be anticipating and reviewing?

## THE INITIAL RECOMMENDATION

In most health plans, the trend projection process starts with separate projections of each component of trend. For example, most health plans already have a sophisticated econometric model in place to project core utilization, the utilization associated with economic and clinical changes that apply across the board to all health plans and populations. Historically, this has been one of the most variable components of trend. Right now, the economy is stable, so these types of models are probably pretty accurate. Even so, a sudden turn in the economy may have a significant impact on the accuracy of these estimates.

Similarly, it may be time to pay more attention to the projection of core unit cost trends, the trends associated with price increases assuming no change in the mix of business. Historically, unit cost increases have been a major driver of overall trend. Luckily, this component has been relatively easy to predict for health plans that closely track contracting changes. We can, however, expect more volatility for this component with the rise of value-based reimbursement arrangements. Under these agreements, the cost of a specific service may be lower than for a comparable standard contract, since the provider will have the ability to earn a bonus. This underlying shift in contracting may skew historical patterns of unit costs. In addition, trend projections will have to reflect the fact that bonus payouts may be highly variable.

Most trend systems account for known changes to the book of business, like the introduction of a new program designed to identify gaps in care and to encourage members and providers to close these gaps. These types of programs have been around for several years. Most health plans have an extensive set of cost-saving programs available, and the specifics for each program

are well defined and documented. For example, suppose a health plan has a program for reminding patients to take a specific medication. In all likelihood, supporting documentation is available offline describing the clinical reason for the program, the criteria used to determine when a reminder is sent, the expected savings and a standard generic message to be delivered. In addition, the system records information on participants receiving the message and, of course, a claims history. This degree of specificity makes it relatively easy to measure the expected savings associated with the program.

More and more, however, health plans are relying on machine learning and artificial intelligence instead of a collection of defined programs. Under this construct, a computer program determines which members to contact and the messages to be sent. Since this is a relatively new development, it is unclear to what extent clinical and savings factors will be incorporated into the process. Also, unlike current programs, this is a dynamic process. The machine is continually “learning” how to improve the process, so the types of documentation we rely on now may or may not be available in the future. Clearly, new techniques will be needed to gauge the best way to incorporate these changes into our overall trend and cost projections.

Consumer behavior will also play an increasingly important role in projecting costs. Take price elasticity, for example. This is a simple economic principle that posits people will buy more when the price is low and buy less when the price is high. This may work at the grocery store, but health care is much more complex. Will a person really pay attention to the price of a procedure if he or she is close to reaching the out-of-pocket maximum? Also, what impact will price elasticity have on one’s health? Can a person really determine if a procedure or test will be cost effective in the long run? Our ability to answer these questions and so many others will be key to the accuracy of our projections going forward.

Finally, health plans participating in the exchange marketplace have already spent a lot of time and energy developing techniques for estimating the effect of the changing risk pool on costs. In the next few years, we can expect health plans to adapt the lessons from these efforts to more stable blocks of business.

## FINAL NUMBERS

Once the initial recommendation has been made, there is usually a meeting with representatives from underwriting, sales and finance along with other stakeholders to determine the final numbers to be published. This can be a challenging conversation, especially if the discussion is about manual rates, where the conversation centers around finding the right balance between competitive rates and mitigating risk. A health plan may have a good idea of whether they are competitive now, but there is no



real window into the rates a competitor will be charging during the rating period. Mitigating risk also poses a problem. If the health plan adds too much margin, the company may lose too many members to support the infrastructure. The final decision is usually a consensus based on business needs, past profit and losses and confidence in the current rates.

With all the turbulence in the current marketplace, we can only expect that stakeholders will be demanding analytics that are less intuitive and more quantitative. Some of the questions we can expect include the following:

- If we add a 1 percent margin to our best estimate, what are the chances we will lose money anyway?
- If we cut rates by 2 percent in order to be competitive, how many new members do we need to break even?
- How comfortable are you really with your best estimate?
- What are the chances we will lose more than \$1 million?

To answer these questions, we really need to think of risk in two components: a pricing risk and a random variation risk. The

random variation risk is the risk associated with fluctuations if the overall pricing assumptions were exactly right. Historically, we have used fluctuations in high-cost claims as a proxy for the random variation risk. Although this has worked well so far, the issue is more complicated than that and we are going to need better quantitative techniques in order to have accurate data. Regression analysis and other predictive analytics will be useful in this endeavor, since the underlying logic automatically separates out variation into a “best estimate” and random variation. Suppose, for example, that an insurer uses a simple linear regression to determine that its best estimate of claims costs was \$300 per member per month (PMPM) with a standard deviation of \$15, roughly 5 percent. Under this scenario if the health plan uses \$300 to determine the final premium, then there is a 50-50 chance the health plan will lose money. If, however, the final premium is \$315, then there is only a 16 percent chance of losing money.

The pricing risk is the risk, or opportunity, that happens if the overall claims are missed either intentionally or unintentionally. Again, this is not a new concept. We have often used scenario testing as a proxy for this type of analysis and, again, it has worked well so far. The problem is, there is seldom a systematic way of assigning probabilities to each scenario. If a simple linear regression model is used, we can calculate the risk associated with each scenario using the variance associated with the slope estimator.

The calculations just described are pretty straightforward when a simple linear regression model is used. Of course, as the projection models get more complicated, then so do the associated risk calculations—a major challenge, but one that can be dealt with using techniques like boot-strapping and Monte Carlo techniques.

## MONITORING EXPERIENCE

As noted earlier, monitoring experience is an integral part of pricing, reserving and similar functions. The process usually includes comparing actual experience to projected outcomes, where the actual experience is adjusted for large claims and other factors that have impacted results. If the results are significantly different than expected, then the key stakeholders must decide whether to revise estimates and/or business plans. As in the case of making the final decision, this is usually done based largely on intuition and experience.

Regardless of how intensive the underlying analytics are, the stakeholders are faced with a dilemma whenever there is a significant miss on a projection. If they wait for confirmation, they may suffer financial losses in the interim. If they move too soon, then there is a risk that later data will show that the original projection was right all along.

The good news is that if a risk analysis was done at the time of the original projection, that information can be used to assess the current situation. In the preceding example, the original best estimate was \$300 and the standard deviation was \$15. So, if the actual experience came in at, say, \$315, then we know that there is only a 16 percent chance that the actual result would be \$315 if the original projection was correct. That's a useful piece of information.

### BEYOND TREND PROJECTIONS

A few health plans have already adopted some of these techniques. Surprisingly, they have mostly been used to measure the risk associated with financial guarantees on the self-insured business. Under these guarantees, a health plan agrees to pay a penalty if a financial measure, such as a group's trend, exceeds a specified threshold. The threshold is usually based on book trend with adjustments for group-specific factors like changes in benefit plans. These guarantees tend to be one-sided, so a health plan faces the possible loss of millions of dollars with little or

no financial upside. Clearly, in this situation extensive analysis of the risk is extremely important and subject to much scrutiny.

As more actuaries become aware of these techniques, we can expect them to be applied in other situations, such as value-based reimbursement agreements and market-level decisions for insured business.

Each of my examples were based on simple linear regression projections in order to make them easy to understand. Determining how to apply these principles for more complex analytics will require considerably more work. I look forward to hearing about the efforts of others in this regard. ■



Joan C. Barrett, FSA, MAAA, is a consulting actuary with Axene Health Partners LLC in Hartford, Connecticut. She can be reached at [joan.barrett@axenehp.com](mailto:joan.barrett@axenehp.com).



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