# How Predictive Modeling is helping employers gain control of health care costs

*By Janice Stanger, Ross Winkelman, Dana Liedel, and Mickelle Shults*

The Affordable Care Act (ACA) has impacted employer health program strategy, planning, and operations since it was signed into law March 23, 2010. Health care costs have been soaring faster than inflation for decades, with ACA as the most recent cost accelerator. Employers will feel the full brunt of ACA in 2015, when the most far-reaching provisions of this legislation are effective.

To manage rapidly growing health care costs, many employers are turning to increasingly sophisticated cost simulation and modeling tools for employer health plans. These tools proactively address ACA impacts, as well as the growing prevalence of chronic illness, demographic changes, and other drivers of the United States health care trend. These predictive modeling tools, most often designed and used by actuaries, are integral to an organization's optimal ACA compliance strategy and overall cost management of benefit programs. Used effectively, these tools can provide a significant advantage.

In mitigating rising health care costs, this makes actuaries a critical ally for employers. Actuaries use mathematics, statistics, and financial tools to identify and analyze plan risk. They model an uncertain future, designing strategies to lessen the probability and reduce the consequences of adverse events. In group health plans, this means maximizing the ability to understand the impact of factors such as plan design, six-figure claims, demographics, make costs and cash flow as predictable as possible, and anticipate how to respond to legislative mandates.

## ACA Primer

Some background will provide a basis to grasp the far-reaching impact of ACA, so that the critical role of predictive modeling is better understood. This legislation aims to provide health care insurance to all Americans through a range of options:

- Medicaid (including expanded eligibility in states that adopt this option) and Medicare
- Public exchanges, with subsidies that will be available for those who have incomes between the level that qualifies for Medicaid and 400 percent of the federal poverty level. The exchanges will offer a variety of plans available to all eligible applicants with no pre-existing condition limitation.
- Employers, with penalties for large employers that do not offer health coverage that meets minimum plan design and affordability standards, as well as revised options for small employers through small group exchange and new regulations for the small group market
- Other public or private insurance programs the individual may have access to

Employers face several sources of higher benefits costs under ACA including:

- New taxes and fees on benefit plans, drugs, and medical devices
- Restrictions on the ability to limit plan benefits maximums and minimum coverage requirements to avoid penalties
- Expanded benefit eligibility to employees who work 30 hours a week
- Unknown effect of employees moving back and forth from public exchanges to employer plans, including potential penalties
- Underwriting rules for small group plans

Employers with a lower-paid workforce, a high proportion of variable hour employees, and current low benefit levels will more strongly experience ACA's impact.

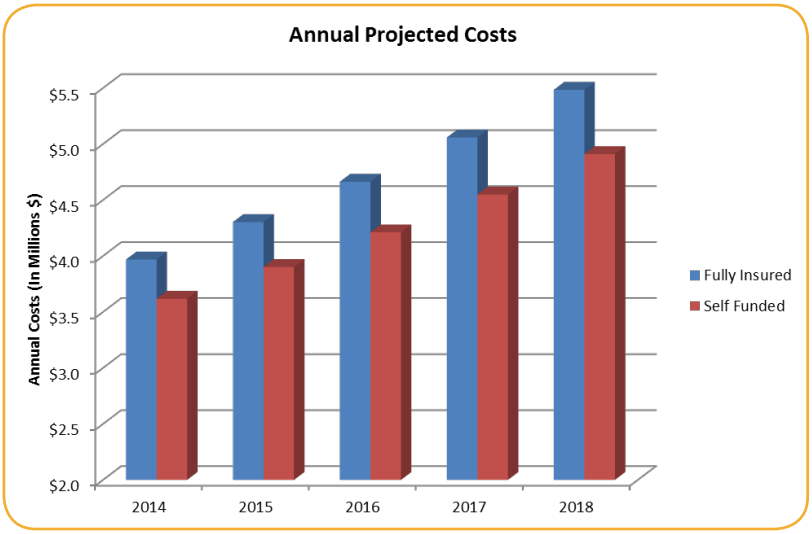
## Optimizing Employer ACA Strategies

As health care costs continue to consume an ever-growing portion of organizational budgets, employers are seeking and implementing diverse methods to slow cost acceleration. Self-funding health benefits is a key strategy being considered.

Employers of all sizes (including those with less than 100 employees, traditionally considered too small to self-fund) are looking at this funding method for both increased flexibility in plan design and ability to save on insurance costs. Upon moving to a self-funded arrangements, groups can potentially realize savings as a result of not needing to comply with state insurance mandates, avoiding state premium taxes, no explicit charge for profit from health carriers and the ability for the employer to hire best-practice vendors for each plan function (such as stop loss vendors).

For example, **Figure 1** shows that for a group of 350 employees, within the first year of moving to a self-funded arrangement an employer could potentially see savings of almost 9 percent, which can grow to a spread of over 10.5 percent within five years.

**FIGURE 1**




In addition to these long-standing considerations, ACA drives a move to self-funding for two main reasons.

- The employer avoids any share of the nondeductible health insurer fee that will be spread over most insured plans. The total targeted for collection is $8 billion in 2014, accelerating annually and reaching $14.3 billion in 2018. This tax is projected to increase group premiums by 1 percent to 3 percent.
- Smaller employers will be able to sidestep underwriting and plan design changes mandated for small group plans. Depending on the state, this could save from a few percent up to 30 percent or more on plan costs.

Being self-funded, does however, mean the employer takes on more risk and cash flow uncertainty. Stop-loss coverage for claims that exceed budget is an employer's primary method of risk management.

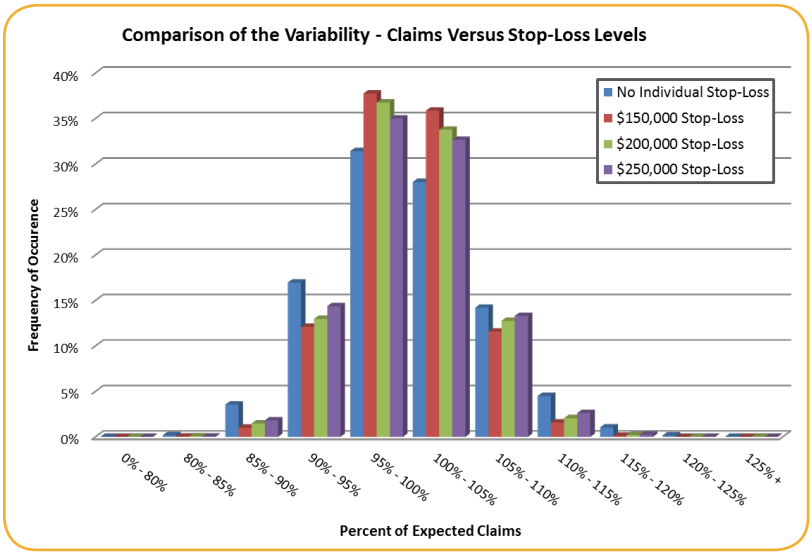
Individual claims over $500,000 are a growing risk for self-funded employers. A Munich Health analysis of industry data shows expanding risk from such mega-claims, which are often attributable to treatment of cardiovascular disease, cancer, premature infants, organ transplants, severe trauma cases, and use of specialty drugs.

- The proportion of claims reaching $500,000 almost doubled from 2004 to 2008, and then roughly doubled again in the few years from 2008 to 2011. At the $1 million level, the proportion of claims increased only slightly less quickly.
- In 2011, on average, claims over $500,000 comprised 3.4 percent of total costs and those over $1 million made up 1 percent of average total claims.

The higher the claim level, the more difficult it is to reliably predict the probability of an occurrence for a specific employer group. The smaller the group, the harder the large claim risk is to quantify and protect against at any level.

Accurate predictive modeling is a key factor determining the success of self-funding. Even employers that already have self-funded plans will be able to better protect against risk using sophisticated modeling tools.

**FIGURE 2**




Monte Carlo simulation is an optimal way for self-funded employers to better understand their potential for large claims and overall claims fluctuation. This method takes the group's own claims data and demographics and runs this information through a tool that simulates 10,000 policy years or more.

This method, which should be employed by an experienced actuary, takes the output from the 10,000 or more modeling runs and aggregates it into charts and tables showing the probability of large claims at various claims levels. **Figure 2** is a graphical representation of the output of a Monte Carlo simulation for a group of 1,000 employees; Table 1 is a summary of Figure 2. Figure 2 shows how the various stop loss levels interact with total anticipated claim volatility. This Table and Figure highlights the increase in variability as attachment points increase for specific stop loss coverage.

For example, **Table 1** shows that if the employer were to have no stop loss coverage, the probability of exceeding 105 percent of expected claims is almost 20 percent. By adding stop loss coverage of $150,000 this will drop the probability of exceeding the same level of claims to 13 percent. Based on the modeling for this employer and summarized in Table 1, it is highly unlikely that total actual claims will exceed total expected claims by more than 20 percent.

**Table 1: Likelihood of Claims Exceeding "X"% of Expected Claims**

| Specific Stop-Loss Attachment Point | Probability of Exceeding 105% of Expected Claims | Probability of Exceeding 120% of Expected Claims |
|---|---|---|
| $150,000 | 13.3% | 0.0% |
| $200,000 (current) | 15.0% | 0.0% |
| $250,000 | 16.1% | 0.0% |
| No Stop Loss Coverage | 19.9% | 0.2% |

This knowledge can then be used by the employer to make an informed decision on whether to self-fund and, if so, at what level to purchase stop-loss protection. Each employer's decision will be guided by the organization's risk tolerance, experience with self-funding, cash flow, financial metrics, and similar considerations.

## Additional Modeling for Self-Funded Plans and Exchanges

Sponsors of self-funded plans need to establish premium equivalents (also called accrual rates) that are reasonable estimates of the costs expected, on a per capita basis, for all health plan claims and administrative costs. Usually these rates are set by coverage tier (such as employee only, employee plus spouse, and so on). The premium equivalents are used to budget costs, track how actual claims are matching projections, and for billing COBRA participants.

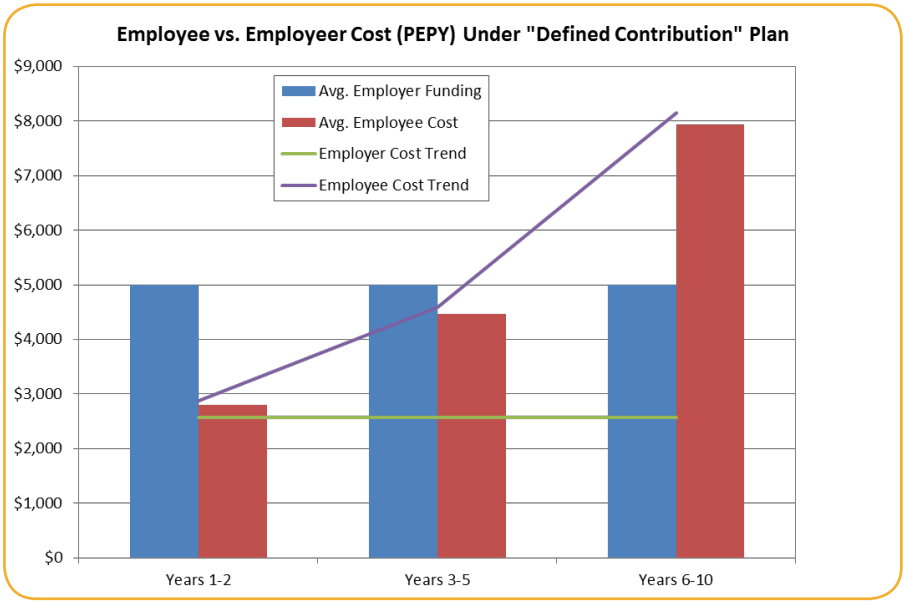
Plan contributions are often based on a percentage of the premium equivalents to be paid by employees who elect different coverage tiers. For employers that offer a choice of more than one plan, it is crucial to price each plan correctly relative to the others. This guards against the phenomenon of adverse selection, in which specific plans are over- or under-priced, and hence draw a skewed risk profile from the employee pool. Predictive and demographic modeling is helpful in setting contribution rates that stabilize enrollment by plan to meet budget and other employer goals.

Sponsors of self-funded plans need to set up reserves to cover claims that will be outstanding if the plan is ever terminated. The technical name for this is "Incurred But Not Reported" claims (IBNR). Having an accurate gauge of IBNR is critical to making effective ongoing decisions and budgeting for this liability.

Another approach employers are considering to deal with relentless health care costs is to go into a private exchange using a defined contribution approach. This means the employer sets a fixed contribution to budget for each employee who goes onto the private exchange and chooses from a wide range of plans, which may be either insured or self-funded.

By holding the employer contribution constant, rising costs year after year would be absorbed by employees. The issue with this approach is that, if the amount the employer puts toward coverage is not increased by at least the average rise in premium costs, employee costs soar over time and quickly become unaffordable. As **Figure 3** shows, if cost sharing is set in year 1 based on employee contributions of 33 percent of premium, within five years the employee contribution increases to 55 percent and within 10 years increases to 67 percent of the total premium. Before moving to a private exchange option, employers should develop a long-term plan to deal with the impact of cost trends and model the impact on their budget and employees.

**FIGURE 3**




## Employee Engagement and Predictive Modeling

Employees need to understand that, in a self-funded plan, each dollar spent on health care claims comes directly from the employer's pocket. Clear communication is essential. When employees get the message that controlling health costs ultimately impacts their pay as well as their employer's financial state, they will be more receptive to playing an active role as a consumer of health care.

Insights from predictive modeling and detailed data analysis can lead to benefits communications that can drive specific employee behavior. For example, if the group is utilizing the emergency room at twice the national average, this cost can be quantified and used as part of a strategy to show employees how to make wiser use of an emergency room benefit. Seeing the specific dollar amount coming out of their pockets for poor health care choices is motivational, helping employees to understand the importance of making better health care decisions.

Many employers are using tools to project the impact of ACA employer penalties. Questions may include the

most fundamental: “Does it make sense to maintain employer sponsored health care coverage, or instead to discontinue and send all employees to the public exchanges?” While the answer stems partly from rather straightforward calculations, a major part of the insight is related to the employee decision-making process. This is because, if an employer sponsored health plan is offered, specific employee choices will determine if lower-income employees, who may be eligible for a subsidy, will select the exchange or an employer plan.

This employee choice, in turn, is related to the respective plan designs and costs of the options as well as employer communications. Modeling these variables is complex and challenging. Actuarial models of the short-term and long-term financial impact of employee choices among employer and exchange plans are generally the most sophisticated.

These models provide robust insight into the financial consequences of various employer choices and are especially useful for employers with complex plan designs, employees waiving coverage or not currently eligible for coverage, or a lower-paid workforce.

Actuaries have the technical tools and financial rigor to be as accurate as possible in their modeling, whether for ACA purposes or general cost and plan management. Specific services include setting premium equivalents, recommending and modeling contribution scenarios, determining IBNR, and showing the long-term impact of private exchanges, public exchanges, or a defined contribution approach. In addition, these professionals work closely with other consultants and the employer to negotiate with plan vendors, present alternative plan designs and the changes in cost expected from each, and sign off that a customized plan design meets ACA’s minimum value criteria to avoid employer penalties.

Many employers are already using bits and pieces of cost and risk modeling. Sophisticated modeling plus powerful employee communications are two essential elements for a successful health plan in a ACA-governed health system.

### *Case Study 1*

A financial services company in the Southwest had 350 employees enrolled in an insured PPO plan that had been hit with a 20% renewal increase, after the prior year’s 18% increase. The group was also aware of two large claims. Actuarial predictive modeling determined that self-funding would lower plan costs by 5.2% first year. Sources of savings were lower administration fees, lower pooling charges, and premium tax savings. The analysis took network savings into account.

The employer kept their plan design unchanged, implementing self-funded strategy with a stop loss level of $150,000 on individual claims. Rates were budgeted with the modeled 5% savings.

### *Case Study 2*

A gaming industry company in the West with 1,500 employees offered two insured plans, one PPO and one HMO, with two different carriers. The group faced a 15% renewal increase, following 18% the year before. Actuarial predictive modeling determined that, assuming comparable network savings, that self-funding would save 2.5% first year on costs due to lower administration fees and premium tax savings.

The employer retained only the PPO, which was the plan with the larger enrollment, in adopting a self-funded strategy. The actuarially-determined rates were used for budgeting.

### *Case Study Conclusion*

In both cases, savings will play out over several years as the groups save on administrative fees and premium and ACA taxes. The groups will also have detailed, actionable data to use to determine plan changes, best-in-class vendors, and wellness programs that will have the largest impact on ongoing costs.

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