Data analytics and predictive modeling can help plan sponsors avoid wasted spending in their health and welfare plans. This article is from a chapter in the International Foundation book *Self-Funding Health Benefit Plans*, edited by John C. Garner, CEBS, and available this fall.
Studies have shown that one-third to nearly one-half of U.S. health care expenditures are wasted—driven by duplicative services and testing, variations in service costs, treatment in the “wrong” setting and inefficiency in vendor contracting and management. To make the most of health care plan dollars, plan sponsors must continue to seek strategies that reduce waste, mitigate cost increases and improve the overall health and well-being of their participants.

Plan sponsors that use data analytics and predictive modeling can gain control over the true drivers of costs and generate substantial savings. Sponsors with data-driven plans are able to make more informed decisions and are better positioned to assess the investments needed for more efficient and effective care. Moreover, the insights generated by data-assessment tools can spur effective changes without simply shifting costs to participants.

What Is Data Analytics?

Data analytics is the process of inspecting, cleaning, transforming, interpreting and modeling data to discover trends, patterns and other information that can support benefit plan decisions and changes. The ultimate goal of this work is to (1) reduce costs and (2) improve clinical outcomes and/or the participant experience.

Data analytics begins with a detailed review of a plan’s experience. The types of data used to predict health plan performance include historical membership, medical claims experience, prescription drug experience, biometric screenings, laboratory results, health risk assessments, disease management program participation and wellness program participation.

What Is Predictive Modeling?

Predictive modeling is a statistical technique commonly used to forecast future behavior. It involves analyzing historical and current data to generate a model to forecast future outcomes. Predictive modeling can be used to quantify risk and costs for individuals and groups of individuals enrolled in a health plan. The modeling can be leveraged to:

- Review a plan’s disease burden (health status) and how this burden will change over time.
- Stratify a plan’s population by risk level to identify at-risk and catastrophic claimants for
targeting disease management and case management, respectively.

- Identify risk factors likely to generate future plan costs that should be targeted with more intensive outreach, including finding “at-risk” individuals who—although they may be low-cost today—may generate significant costs in the future.

- Compare relative resource consumption by groups for budgeting and underwriting forecasts. Consumption refers to how intensively plans use physician visits, hospital stays and other resources to care for members.

- Compare providers fairly—adjusting for differences in health risk among patient populations. Such comparisons can be used to profile providers for utilization review and quality of care.

- Analyze a medical management program to see what the true savings are, as opposed to those that are regression to the mean. Regression to the mean involves outcomes that are at least partly due to chance. It refers to the phenomenon of “averaging out” in statistics.

Predictive modeling can help identify areas of need and provide direction. It can also offer a sense of the cost and outcome changes that likely will be required to address participants’ health needs more effectively.

How Can Health Plan Sponsors Use Data Analytics and Predictive Modeling?

Plan sponsors can use data analytics and predictive modeling to identify claims trends, target high-risk users, identify gaps in care, steer patients to the best providers, measure vendor performance, uncover cost-sharing strategies, engage participants in their own care and investigate waste, abuse and fraud.

Identify Claims Trends

There are many possible explanations when a health plan’s total paid claims increase. The cost of specific goods and services may have risen. Utilization may have increased because of an aging population or plan design changes. Another explanation may be something as simple as an increase in the plan’s total membership. The answer usually is a combination of factors. By using data analytics, plan sponsors can understand what is driving trends and predict what will happen in the next plan year.

After identifying the trend drivers, a plan sponsor should take a closer look at those that are most significant. For example, if a plan’s total paid claims rose 9% and the bulk of the increase is attributable to prescription drug costs, prioritizing the data analysis of drug claims probably is appropriate. Plan sponsors might find through the analysis that drug utilization was flat, but specialty drug costs increased substantially.

A closer look at the data might reveal a handful of very expensive claims for drugs showing great promise for curing hepatitis C, shortening the duration of treatment and/or increasing cure rates. If the plan sponsor then mines the plan’s historical medical data for current participants who have had a claim with a hepatitis diagnosis, it may determine the demand for these drugs will continue to rise in the future. On the other hand, it may conclude that the claims spike was a one-time event that is unlikely to reoccur; once the course of treatment is completed, the patient usually is cured.

Predictive modeling can play a role in treatment customization, leading to improved adherence to therapy and better patient outcomes. For example, hepatitis C is a chronic disease that progresses slowly. As a result, patients can postpone the start of a medication regimen. Some physicians promote this approach as they consider the availability of treatment options with...
improved cure rates, fewer side effects and shorter treatment durations.

In another scenario, a plan’s medical claims may have increased only 3% from the previous year. On the surface, this may look like a good result, but if a plan sponsor discovers the number of participants with diabetes increased 10% from the prior year, it can expect medical claims to rise significantly in the coming years.

**Target High-Risk Users**

Predictive modeling can identify high-risk and/or high-cost users within a population by looking at historical patterns of utilization and key demographic indicators. These users include participants who currently drive a high percentage of costs as well as those projected to drive costs in the future. Early detection of a disease with treatment that is less invasive and with less costly treatment options is one strategy to cut costs and improve care. Another is targeted, clinical intervention to reduce hospital readmissions for the same illness. Reviewing the severity of participant diseases and conditions can identify those who have complex needs and require significant care management.

**Identify Gaps in Care**

Gaps in care can be found by comparing participant data to Healthcare Effectiveness Data and Information Set (HEDIS) benchmarks—measures used by more than 90% of U.S. health plans to assess performance on various dimensions of care and service. Performance standards should be implemented using HEDIS benchmarks for top clinical indicators (although target compliance with standards of care ideally should be 100%). Clinical indicators assess particular health conditions and outcomes. They create the basis for quality improvement and prioritization within a population.

Consider, for example, a HEDIS benchmark that shows more than 85% of all diabetic participants receive a hemoglobin A1c test in a plan year. The hemoglobin A1c test is essential for managing blood sugar levels. Studies have shown that every percentage point drop in A1c cuts a patient’s risk of eye, kidney or nerve-related complications by 40%. If data analysis finds only 25% of a plan’s diabetics received the hemoglobin A1c test in the past year, there is a significant actionable gap in care. Where possible, participants and their primary care physicians should be encouraged to increase compliance and reduce or eliminate gaps in care. Implementing performance guarantees with vendors also helps.

**Steer Patients to the Best Providers**

Many plan sponsors are reviewing the feasibility of implementing tiered networks with incentives for participants to use high-quality/high-performance networks. The purpose of a tiered network is to steer patients away from overpriced hospitals, physicians and drugs for specific procedures and conditions that don’t have justification in the form of better outcomes. Data analytics can pinpoint high-quality/high-performance providers—especially for elective procedures that drive a large percentage of plan costs. Plans can promote the use of these providers to participants who need care and realize plan savings without compromising patient care.

**Measure Vendor Performance**

Plan sponsors can implement performance guarantees for their plan’s financial, clinical, operational and utilization results to hold vendor partners more accountable in working toward and achieving the goals they state they can reach. An example of a utilization performance guarantee might include reductions in emergency room (ER) visits per 1,000 patients with chronic conditions (e.g., asthma) and hospital readmissions for patients with acute myocardial infarction. Plan sponsors can compare the plan utilization of participants with chronic conditions against benchmarks and determine whether participants who have an ER or hospital event are in compliance with their medication. Plans with data analytics capabilities can better hold their vendors and administrators accountable for meaningful performance.

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The level of cost sharing influences plan utilization and overall costs. If a plan is too “rich,” participants tend to overuse health care services. Conversely, if coverage is too “poor,” they begin to forgo or delay care. Data analytics can be used to determine whether a plan’s benefit design (e.g., copayments and other cost-sharing features) steers participants to cost-effective therapies, treatments and medical providers. Data analytics are particularly important in light of the Affordable Care Act’s excise tax on high-cost health plans (popularly known as the Cadillac tax), which will be implemented in 2018. Plans that exceed certain specified thresholds will face a 40% tax on the amount of the excess benefit. This makes it critically important to understand and control plan costs.

Consider how copayment differences for lower cost settings (e.g., telemedicine, walk-in clinics and urgent care) can reduce ER visits for minor illnesses. Data analytics can identify if the plan copays are getting proper participation rates in each setting. Alternatively, are the copays discouraging proper preventive and diagnostic treatments through cost-sharing levels that exceed participants’ ability to pay?

Data analytics also can help plan sponsors find ways to increase adherence to testing, improve drug therapy compliance, slow overutilization of services and encourage appropriate utilization. For example, a plan with a significant percentage of congestive heart failure (CHF) in its population could lower its copayments on therapeutic drugs for this condition to improve medication adherence. According to several major studies used to guide beta blocker usage, beta blocker therapy can reduce hospitalizations for CHF by up to 30%. The relative relationship between copayments for different treatment options and settings is a critical element for creating a highly efficient plan design.

Engage Participants in Their Own Care

The amount of excess health care spending attributable to preventable behaviors and lifestyle is well-documented. Smoking, obesity, stress, lack of physical activity and poor eating habits contribute to a significant percentage of national health spending. Some studies suggest 30% to 50% of health care spending is the result of modifiable behaviors. According to a meta data study that synthesizes research results using various statistical methods to retrieve, select and combine results from previous separate but related studies, medical plan costs fall about $3.27 for every $1 spent on wellness programs. This does not factor in improvements in attendance and productivity.

Using data analytics, a plan sponsor can dissect a plan’s claims history to determine where to focus its wellness efforts and determine if its benefits design promotes wellness and prevention. Plans that use a multifaceted design encouraging and supporting a proper wellness program experience meaningful levels of member participation. They also see long-term reductions in hospitalization, advanced complications of disease and rates of expansion of chronic disease.

Successful Communication

One plan developed a communications strategy that included creating a “brand”—a logo, tagline and “look and feel” for the plan benefits communication—that was aggressively promoted via participant outreach that included a game and integrating content with social channels. The communications encouraged wellness, condition and behavior interactions.

This plan also established and promoted incentives to encourage participation. One strategy was rewards for a reduction in body mass index (BMI) sustained for at least six months.

The results? Over a three-year period, the plan’s medical trend dropped from 10% to less than 3%.

Investigate Waste, Abuse and Fraud

Data analytics also can help plan sponsors discover potential waste, abuse and even fraudulent claim activity. The complexity of administering medical benefits increases the chances for mistakes, errors, overpayments, etc. Many plans pay claims they should not, such as claims for recalled drugs and devices, ineligible dependents and excessive or unnecessary prescriptions. Using data analytics, one plan uncovered a patient who was prescribed a controlled prescription drug by more than 20 distinct physicians. While the annual drug expense was low, the medical plan costs exceeded $150,000 due to numerous ER visits as well as frequent office visits to obtain prescriptions.

Large plans should routinely investigate claim coordination and subrogation opportunities. Subrogation occurs when a payer seeks reimbursement from the responsible party for a claim it has already paid. Plan sponsors can
reduce costs by as much as 5% per year by applying rigorous audit and recovery protocols.

How Should Plan Sponsors Implement These Data Tools?

To launch a data-analytics and predictive-modeling initiative, plan sponsors should take the following five steps:

1. Determine who will perform the data analytics. Only the very largest plans have the capabilities to handle data analytics on their own. Most need to decide if the analytics offered by their existing health care vendors are sufficient or whether they should outsource their data analytics.

2. Use data analytics and predictive modeling to identify and map the most prevalent clinical risk characteristics and associated costs in the plan population. Plan sponsors should then evaluate the programs in place to address these risks.

3. Establish a three-year health-management strategy. This strategy should have a budget, goals and performance targets that increase over time (e.g., improving wellness program participation from 10% in year one to 50% in year two and 75% in year three).

4. Develop a formal participant communications strategy. While data analytics can reveal the cost outliers to plan sponsors, effective communications can have an immediate, direct and positive impact. Participants’ understanding can directly affect both individual behavior and the financial impact of their actions on the plan. Here are some examples: When participants do not understand the cost implications of using generic drugs versus brand-name medications, when they go to the ER for nonemergency issues instead of using urgent care or their primary care physician or when they inadvertently receive care from an out-of-network provider, they contribute to unnecessary, excessive costs. Educating participants through a well-planned communications strategy leads them to a better understanding of how health care benefits work and awareness of the financial impact of their individual actions on a self-funded plan. (See the sidebar, “Successful Communication.”)

5. Identify how the plan’s participants will react to change. It is important to remember that any changes a plan sponsor implements affect people directly. A prime example is a plan that inadvertently created an adversarial relationship by implementing a $100 surcharge for participants who failed to participate in a screening portion of a wellness initiative.

Conclusion

Using data analytics and predictive modeling to help develop and support health plan strategies will greatly improve the likelihood that actions taken will have the intended impact. High-level dashboard numbers (e.g., overall trend) do not tell the full story. They are simply clues as to where to start analyzing drivers of cost. Plan sponsors should then use data analytics and predictive modeling to make more-informed decisions.

Endnotes


Eileen M. Flick is a vice president and benefits consultant in the National Health Services Practice of The Segal Group, of which Segal Consulting is a member. She specializes in developing health care cost-containment strategies, with an emphasis on pricing and plan design. Flick holds a bachelor’s degree from the State University of New York at Stony Brook. She can be reached at eflick@segalco.com.

David Searles is a vice president and consultant with The Segal Group, of which Segal Consulting is a member. He serves as the project leader for Segal’s data analytics and pricing tools. Searles holds a B.A. degree in business administration from Rutgers, the State University of New Jersey–New Brunswick. He can be reached at dsearles@segalco.com.