One of the primary goals of any health care plan should be to help its employees improve their health. Although this may sound altruistic, especially in difficult times, healthier employees lead to lower costs, making this a situation in which both the employer and the employees (and their families) stand to gain. While there are many actions that organizations can take to help employees improve their health, one that many plan sponsors still overlook is data mining: the process of indentifying data patterns and turning them into useful information. (See the sidebar, “How Data Mining Works.”) Now, with so much attention being paid to health care reform, plan sponsors risk forgetting about such proven strategies as data mining.

The Potential of Data Mining

Data mining uses predictive modeling to:

- **Determine what diseases and conditions are driving trends.** This entails reviewing an organization’s medical and prescription drug claims data to verify which health issues are most prevalent among employees and their families. Using this information, the sponsor can then tailor the health care plan to help employees adopt healthier behaviors and reduce costs.

- **Target intervention to high-risk segments of the population and those who need the most care.** Reviewing the severity of employees’ diseases and conditions will identify those who have complex needs and require significant care management. The goals of targeted intervention include reducing the rate of hospital readmission and directing care to high-quality, low-cost network providers.

- **Identify gaps in medical treatment and direct employees to the proper care.** Gaps can be discovered by comparing employees’ data to Healthcare Effectiveness Data and Information Set (HEDIS) benchmarks. Where possible, skilled health care analysts can use data mining to help plan sponsors uncover problems and focus on areas for improvement.

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1 HEDIS is a tool used by more than 90 percent of America’s health plans to measure performance on various dimensions of care and service. For more information, visit the National Committee for Quality Assurance Web site.
employees and their primary-care physicians should be encouraged to reduce or eliminate those gaps.

- **Identify the best, most cost-effective network providers and guide employees to use them.** Data mining can, for example, pinpoint high-performance, high-quality providers, especially for elective procedures that drive a large percentage of plan costs. It can also identify providers that offer access to appropriate care that follows evidence-based guidelines. Plan sponsors can then promote the use of these doctors to participants who need care.

- **Improve health habits through wellness, health promotion, education and care-management programs that increase awareness and engage employees in their own care.** Using data mining, a plan sponsor can determine if its benefit design is effective in promoting wellness and prevention. A multi-faceted, incentive-based plan that includes design, vendor performance, communications and incentives will help manage costs.

- **Measure the performance of vendors and administrators and hold them accountable for quality, cost-effective treatment by comparing their results to national benchmarks.** Plan sponsors should implement performance guarantees for the plan’s financial, clinical, operational and utilization components. For example, utilization performance guarantees can help manage emergency room visits for chronic conditions, such as asthma.

- **Determine what level of cost-sharing improves employee health and cuts costs.** One organization that had an upfront deductible and a co-payment for office visits decided to try eliminating both. The next year, virtually every employee visited his or her primary care physician and specialists, which doubled the plan’s physician and specialist visit rates per 1,000 employees. This improved employee health and reduced long-term costs. The key is to be sure that cost-sharing encourages appropriate usage. For example, in a recent study of patients who self-referred, 61 percent visited the wrong specialist. If cost-sharing is structured to encourage patients to visit a primary care physician first, he or she will select an appropriate specialist, which will cut costs and improve results.

### Two Examples of How Data Mining Improved Health and Cut Costs

In a recent application of data mining, Sibson Consulting found that employees with diabetes generated 13 percent of the costs in one employer’s health plan. The exercise also discovered that clinical compliance among these employees was significantly below HEDIS benchmarks:

- **Compliance with A1c hemoglobin testing** was 31 percent compared to the HEDIS guideline for accredited plans – 88 percent. This is significant because every percentage point drop in A1c results can reduce the risk of eye, kidney and nerve disease complications by 40 percent.

- **Compliance with kidney disease monitoring** was 21 percent compared to an 83 percent HEDIS guideline. According to a study by the American Diabetes Association, kidney disease occurs in 20 to 30 percent of diabetics, and early detection can delay or, in some cases, prevent it.

- **Compliance with lipid testing** was 49 percent for diabetics compared to an 85 percent HEDIS guideline. Improved control of low-density lipoprotein (LDL) cholesterol can reduce cardiovascular complications for diabetics by 20 to 50 percent.

The employer used these findings to develop a care coordination program that was designed to increase the involvement of its diabetic employees and hold its vendors more accountable for improving employees’ health and behavior. This involved implementing a multifaceted plan that

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2 The A1c hemoglobin test is used as a standard tool to determine blood sugar control for patients with diabetes.
The Benefits of Digging Deeper:
Using Data Mining to Improve Employee Health and Reduce Employer Costs

included design change, vendor performance guarantees, communications and incentives to encourage employees to make better health decisions. As a result, the employer was able to reduce its health care cost trend from 10.4 percent to 5.4 percent.

In addition to helping organizations implement programs that improve disease outcome by increasing medication compliance, data mining is essential to measuring such a program’s effectiveness. Through Sibson’s data analytic studies, it was determined that 22 percent of one organization’s employees who had congestive heart failure (CHF) were not compliant in using their beta-blocker medication, a treatment recommended by the American College of Cardiology and the American Heart Association. Beta-blocker therapy can reduce hospitalizations due to worsening CHF by 30 percent.3

Increased compliance can lead directly to savings. In 2007, the nationwide cost of inpatient hospital treatment for CHF was roughly $10,200 per patient while the annual cost of beta-blocker medication for a fully compliant patient was roughly $430 per patient. Based on the prevalence of CHF in commercially insured populations, employers could save $2,630 annually per non-compliant CHF patient.4

Conclusion

To determine where to focus their efforts, employers need to know where their population falls on the health scale against benchmarks and with regard to compliance with recommended care guidelines. Organizations that choose to ignore their employees’ health indicators will not be able to address what is affecting their employees’ health and, inevitably, their plan costs.

By conducting a data mining review of claims information, plan sponsors can gain insight into what is driving their plan’s costs and make effective changes. This is a critical step to preserve the long-term viability of the plan and the health of its employees.

About the authors:

Mary Kirby is a vice president and senior health consultant in the New York office of Sibson Consulting where she leads the Heath Actuarial Unit. She can be reached at 212.251.5489 or mkirby@sibson.com.

Matthew Kersting is a health care consultant in the New York office of Sibson Consulting. An expert in data mining and predictive modeling analysis, he can be reached at 212.251.5987 or mkersting@sibson.com.

Eileen Flick is a vice president and consultant for the National Health Practice of The Segal Company, the parent of Sibson Consulting. She leads the firm’s Health Technical Service work and manages projects that use data mining. She can be reached at 212.251.5120 or eflick@segalco.com.

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4 A $430-a year beta-blocker can reduce $10,200 hospital visits by a third, generating annual per-patient savings of $2,630: [(10,200 x .3) = $3,060] - $430 = $2,630. Source: Sibson’s Health Management Consultant, Sadhna Paralkar, MD, MPH, MBA, who is an expert in health care analytics and contributed significantly to this article.
The Benefits of Digging Deeper:  
Using Data Mining to Improve Employee Health and Reduce Employer Costs

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