

The Power of Raw Data



Reduce Costs & Improve Health with Data Mining

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.

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Although there are many actions employers can take to help manage costs and help employees and their families improve their health, one that many employers overlook is data mining — the process of identifying data patterns and turning them into useful information. With so much attention focused on health-care reform, it is critical to remember this highly effective and well-proven strategy.

This article covers what data mining can accomplish and highlights examples of how data mining has helped companies improve employee health and cut business costs.



The Potential of Data Mining

Data mining uses predictive modeling to:

- **Determine which 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. Using this information, the employer can tailor its health-care plan to help employees adopt healthier behaviors and reduce costs. A recent application of Sibson Consulting's medical data mining analytics found that 14 percent of the costs in one employer's health plan were due to diabetes. The employer installed programs to increase the involvement of employees with diabetes treatments, and implemented performance guarantees that held its vendors accountable for improving the health status and behavior of employees, with the overall goal of reducing costs related to time lost, short-term and long-term disability claims and talent loss.
- **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. Through predictive modeling, high-risk and/or high-cost users within a population can be identified in advance by looking at historical patterns of utilization and key demographic indicators. These include employees who currently are driving a high percentage of cost as well as those projected to drive these costs in the future: people who will benefit from targeted, clinical intervention. 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. 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. Performance standards should be implemented using HEDIS benchmarks for top clinical indicators. For example, the data analysis noted previously also found that only 15 percent of people with diabetes who participate in the employer's health plan had received a hemoglobin A1c test in the past year, compared to the national average of 80 percent for commercial preferred provider organization (PPO) plans. The test measures average blood sugar levels during a three-month period and is very helpful 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 percent. Where possible, employees and their primary care physicians should be encouraged to reduce or eliminate those gaps. Implementing performance guarantees with vendors will help.

- **Identify the best, most cost-effective network providers and guide employees to use them.** Data mining can pinpoint high-performance, high-quality providers, especially for elective procedures that drive a large percentage of plan costs. Employers can promote the use of these providers to employees who need care. For example, an analysis of cardiac catheterization at nine hospitals in a major metropolitan area showed that the cost at three high-quality hospitals was more than 15 percent lower than the average of the other six. The quality measurement included a complication index, where a low score indicated few complications and a high score indicated high complications. This data was used to create a tiered network to drive utilization to the most efficient high-quality providers and facilities.
- **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, an employer can determine if its benefits design is effective in promoting wellness and prevention. A multifaceted, incentive-based plan that includes design, vendor performance, communications and incentives will help manage costs.

How Data Mining Works

Data mining uses analytical software to examine a health-care plan's raw data, which can include medical, prescription drug, mental health and substance abuse, health reimbursement account and lab data.

Medical data management companies collect this information from health insurers, third-party administrators, health maintenance organizations and pharmacy benefit managers and organize it into highly useful clinical utilization and financial data sets. Sophisticated software allows analysts to sort, combine and contrast key data elements to help decisionmakers and clinical managers take effective corrective actions. Skilled health-care analysts can use data mining to help employers uncover problems and focus on areas for improvement.

Characteristics of these programs often include the use of a health-risk assessment to serve as the initial intervention/requirement for employees in wellness programs. Currently, health-risk assessments are used by 66 percent to 80 percent of employers in general and are the most common starting point for wellness and disease-management programs, according to a 2010 story in *Health Affairs*. Assessments are commonly used in conjunction with clinical risk factors, including lower blood pressure, improved body mass index and decreased blood cholesterol levels. Lower co-pays are also among the most preferred incentives for wellness programs. Program goals should be established whereby vendor performance guarantees are tied to patient outcomes.

- **Measure the performance of vendors and administrators and hold them accountable for quality, cost-effective treatment by comparing their results to national benchmarks (e.g., HEDIS).** Employers can implement performance guarantees for the plan's financial, clinical, operational and utilization components. An example of a utilization performance guarantee may include reduction in emergency room (ER) visits per 1,000 patients with chronic conditions, such as asthma. Through the data, employers can compare plan utilization of members with chronic conditions against benchmarks and determine if those who have an ER event are in compliance with their medication.
- **Determine what level of cost-sharing improves employee health and cuts costs.** Does the plan's benefits design (co-pays and cost sharing) steer employees to cost-effective therapies, treatments and medical providers? Does the plan discourage proper preventive and diagnostic treatments

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as a result of patient cost-sharing levels that exceed participants' ability to pay? Data mining can help employers find ways to increase adherence to testing, improve drug therapy compliance, slow overutilization of services and encourage appropriate utilization. For example, the employer noted previously with a significant portion of diabetics in its population lowered the co-pays on therapeutic drugs associated with this condition and covered diabetic supplies with no cost sharing.

Examples of How Data Mining Improved Health and Cut Costs

In a recent application of data mining, Sibson discovered that clinical compliance among one company's employees

was significantly below HEDIS benchmarks. In addition to the A1c testing example noted previously:

- Compliance with kidney disease monitoring was 21 percent compared to an 83 percent HEDIS guideline. This statistic is troubling given that according to a study by the American Diabetes Association, kidney disease occurs in 20 percent to 30 percent of people with diabetes, and early detection can delay or, in some cases, prevent it.
- Compliance with lipid testing was 49 percent for people with diabetes compared to an 85 percent HEDIS guideline. This finding highlights a problem in that improved control of low-density lipoprotein cholesterol can reduce cardiovascular complications for people with diabetes by 20 percent to 50 percent.

The employer used these findings to develop a care coordination program that was designed to increase the involvement of its employees with diabetes and hold its vendors more accountable for improving employees' health and behavior. This involved implementing a multifaceted plan that included design change, vendor performance guarantees, communication 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.

Once such a program has been established, data mining is essential to measuring its 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 taking their beta-blocker medication, a treatment recommended by the American College of Cardiology and the American Heart Association. This finding is significant given that

beta-blocker therapy can reduce hospitalizations due to worsening CHF by 30 percent, according to several major studies that were conducted in the late 1990s and are still used to guide beta-blocker usage. Furthermore, 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 patient who is fully compliant was roughly \$430 per patient.

Based on the prevalence of CHF in commercially insured populations, employers could save \$2,630 annually per noncompliant CHF patient, according to Dr. Sadhna Paralkar, a health management consultant with the authors' company who is an expert in health-care analytics.

From Theory to Practice: Making Data Mining Work

Companies that want to launch a data mining initiative will first need to determine who should perform the actual data mining. The organization needs to review what analytics tools are available to address its entire population. Only the very largest companies will have the capabilities to handle data mining on their own. Most will need to decide if the data analytics offered by their existing health-care vendors are sufficient or if they should outsource their data mining effort to a specialty data analytic firm.

The next step is to use data mining to identify and map the conditions that are most prevalent in the organization's population and evaluate the current programs in place to address them. Once that has been accomplished, the company should establish a three-year health management strategy that has a budget, goals and specific performance targets that increase over time. One example would

Reach out to employees to encourage them to use the plan that has resulted from the data mining effort.


be improving wellness program participation from 10 percent in year one to 50 percent in year two and 75 percent in year three.

The final step is to develop a formal communications program to reach out to the organization's population to encourage employees to use the plan that has resulted from the data mining effort. Sibson recently partnered with one organization to create a communications program that included creating a brand and logo for the plan, which was then promoted via announcement letters, employee outreach notices, a postcard series and newsletter articles. Sibson also helped the organization design incentives to encourage participation. One strategy included instituting higher primary care physician and specialty co-pays for employees who elected not to participate. Over a three-year period, the employer's medical trend dropped from 10 percent to less than 3 percent.

Conclusion

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, companies can gain insight into what is driving these costs and make effective changes. This can include tailoring their health-care plan to:

- Help employees adopt healthier behaviors
- Encourage employees who need care with information about high-performance, high-quality providers that follow evidence-based guidelines
- Remove barriers to necessary care inadvertently created by aspects of plan design
- Reduce employer costs.

Instituting a data mining program is a critical step to preserving the long-term viability of the plan and the health of its employees. 

ABOUT THE AUTHORS

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