

## Data Mining-Driven ROI: Health Care Cost Management

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*Plan sponsors can reduce or avoid future health care costs by at least 5% or 10% annually through the use of evidence-based data mining technology. Data mining is emerging as the new health care cost-management gold standard, since most employers have exhausted traditional savings opportunities by modifying plan design, shifting costs and making health plan vendor changes. The ability to morph disparate data into actionable information through the integration of census, enrollment, COBRA, medical claims, mental health claims, prescription drug claims and, to the extent desired, performance and workers' compensation claims data is becoming increasingly resource-effective with the application of relational technology.*

Data mining-enabled health care cost management is a financially fertile frontier that can provide material short-term and even longer term savings. The actionable information gleaned from data mining provides new, fact-based solutions that when implemented, become cost-effective, bottom-line management tools. The math makes this clear: With the annual subscriber costs averaging \$7,000, a 5% prospective savings rate equals \$350 per subscriber, which multiplies to a significant figure at any size plan. For example, a plan with 10,000 subscribers could save \$3.5 million annually. For a business operating on a 5% profit margin, that translates into \$70 million in revenue. Figure 1 illustrates annual data mining-enabled savings. Several examples of evidence-based data mining observations are included in this paper.

Utilizing health care cost-management data mining techniques requires trained skills similar to those of a detective. The process begins with a significant amount of research or fact finding. The review of all the data points leads to identification of a group of ideas, from which

the true opportunities emerge. As health care grows more complex due to the nature of medical conditions, as well as advances in medical and pharmaceutical treatments, the ability to identify impact areas has grown equally challenging.

### Understanding the Health Care Business Model

Professionals do not dispute significant claim dollars can be saved because of the many different entities involved in the health care benefits supply chain including, but not limited to:

- Plan sponsors
- Benefits outsourcers
- Providers
- Pharmacies
- Health plan insurance companies
- Disease management firms
- Wellness vendors.

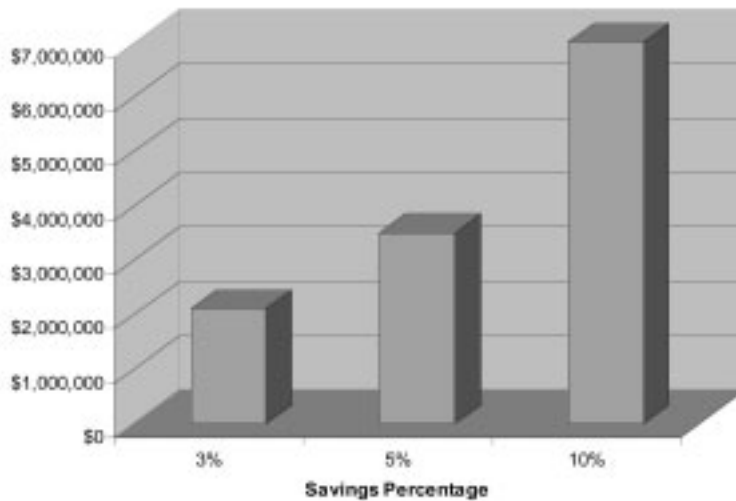
Each of these entities has a voluminous amount of data that, for the most part, resides in silos. When this silo-based data gets integrated and analyzed, plan sponsors can mine this data for pragmatic evidence-based cost-containment opportunities.

These distinct entities have a clear role in the health care process and ownership of specific information. Plan sponsors hold census and other indicative data on the employee as well as business unit, department, job title and performance information. Benefit outsourcers maintain eligibility, dependent and COBRA data. Providers hold records of diagnosis, treatments and corresponding costs. Pharmacies and pharmacy benefit managers have prescription, cost and prescriber information. Health plan insurance companies have records of claims filed and processed and, to the extent available, case management and utilization review information. Disease management firms have member-specific clinical and, to the extent available, outcomes data. Lastly, wellness vendors maintain health risk assessment and on-site wellness program data, such as weight loss information.

Data management is common to all of these entities. Behind the scenes, within a "black box," huge volumes of information are exchanged between systems and health care transactions are completed. While the overall flow of data is certainly more effective and efficient than in the

Figure 1

### Annual Data Mining-Enabled Savings



past, the integration of data is virtually nonexistent because the data resides in silos. Figure 2 illustrates the conceptual model for health care data mining.

Depending on the size of the plan as well as the business goals, data should be loaded monthly, quarterly or annually. Once the underlying technology footprint has been defined and tested, the effort to load the data is minimal.

### Practical Applications

Let's face it—Health care benefits are viewed as a great way to attract and retain employees. While hiring and keeping employees supports ongoing business operations, management must take into account that employees have become great health care consumers because of the accessibility and availability of products and services. As a result, health care costs have skyrocketed and have become a material line item in all budgets. While health care is an important component of the attraction and retention equation, plan sponsors still have the right to spend health care dollars in a prudent way and be sensitive to cash flow and overall profitability.

Given the sheer magnitude of data and the tools available to mine the data, the ability to discover financially fertile areas is now possible. Today, the human resources (HR) and benefits department cannot only give precise answers to difficult, if not impossible, questions previously asked by fi-

nance and senior management, but HR and benefits can now be proactive and approach health care cost management from a business perspective. To that end, health care data mining can help recapture overpayments made to health plan vendors and contain future costs.

HR and benefits can now confidently ask and answer the following specific questions:

- Do we have ineligible dependents enrolled in the health plan?
- How much does Type 2 Diabetes cost the plan?
- Will health incentives save money?
- Should copayments be waived for disease management enrollees?
- Which business units or departments have lower health care costs?
- Are workers' compensation claims being subrogated properly?
- Is it more cost-effective to raise base pay and reduce health benefits?
- How can we optimize our enrollment in consumer-driven health plans?
- To what extent do obesity-related diseases impact the budget?
- How much money will be saved by implementing a smoker surcharge?
- Which doctors are writing prescriptions for costly medications when less costly alternatives are available?
- What impact do medical conditions have on absenteeism and productivity?
- Are terminated employees receiving benefits even though they're not enrolled in COBRA?

More importantly, plan sponsors can now implement evidence-based cost-containment programs, such as wellness programs, and also make plan design changes to encourage desired plan utilization. Practical examples of health care data mining follow.

### Dependent Eligibility

Claim leakage due to ineligible dependents remains one of the most elusive areas to control. Neither employers nor health plan vendors make managing dependent eligibility a high priority. It is widely accepted that at any given point in time, as much as 10% of enrolled spouses and dependent children are ineligible for their coverage. Identification of records with multiple spouses, dependents over the limiting age and ineligible dependents are typical audit observations.

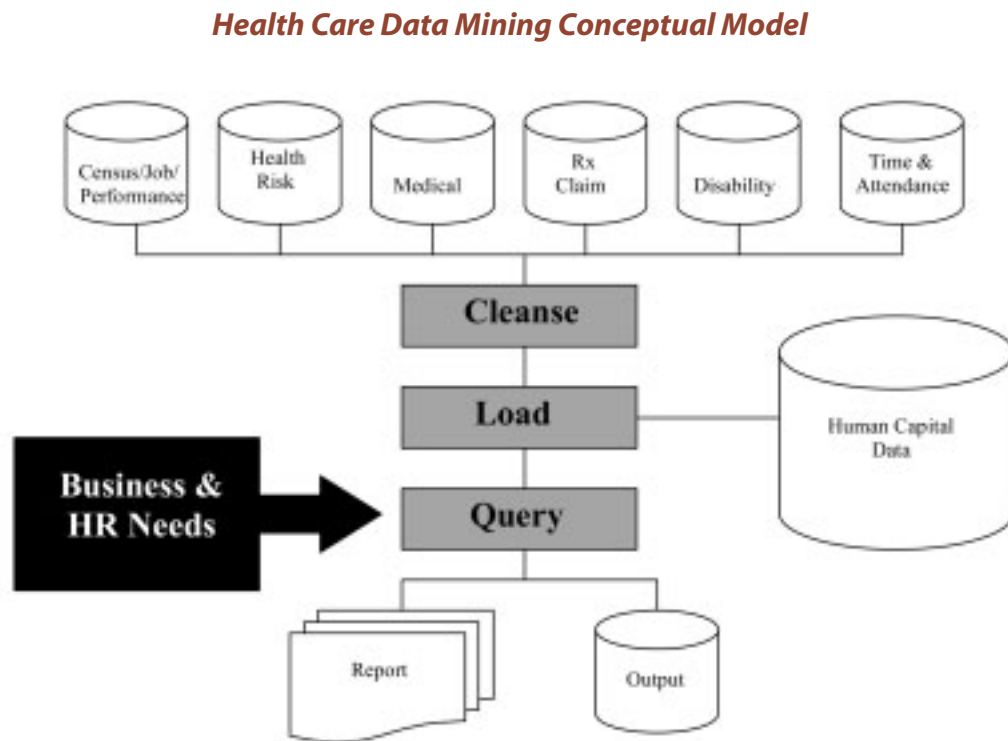
In a population with 5,000 employees and 11,500 total members, a dependent eligibility audit should identify up to 650 ineligible spouses and/or dependent children. Using a \$2,000 per member per year cost, the removal of 650 ineligible members translates into \$1.3 million in annual savings. For a business operating on a 5% profit margin, nearly \$26 million in sales would have to be generated to pay for these ineligible members.

### Type 2 Diabetes

While most employers know that Type 2 Diabetes is relevant to most plans, plan sponsors generally do not know how many members have it, nor do they know what this condition costs the plan.

Data mining can easily identify these metrics by first, identifying members that are taking Type 2 Diabetes medications, such as Metformin® or Actos®. From this list, a distinct set of plan members can be identified. Additionally, queries can be written to aggregate and quantify all relevant prescription drug claims. Subsequently, the total medication cost can be quantified by also including related prescription drug costs for type 2 diabetics with comorbidities, such as heart disease. Then, the medical costs can be quantified for these same members. Once the total costs are aggregated, management can then evaluate potential cost-containment options, such as disease management, from a return-on-investment (ROI) perspective.

Figure 2



### Health Incentives

Providing health incentives to members is emerging as a cost-containment best practice. Given the wide success of “frequent flyer club” programs, plan members have adopted this consumer mindset to health care. As a result, members are now being rewarded for positive, healthy behaviors. Providing health incentives is particularly relevant for plan sponsors that have low turnover, since there is a higher likelihood health care costs for these members will be paid for by the plan for many years.

By reviewing medical and prescription drug claims, plan sponsors can now reward the following behaviors tied to specific conditions, such as:

- Type 2 Diabetes—periodic visits to the eye and foot doctor, blood testing, weight management and exercise program participation
- Maternity—high-risk pregnancy case management compliance
- Heart disease—maintenance medication compliance and lifestyle management
- Maintenance medications—best purchase price
- Weight management—weight loss program participation and results

- Smoking—cessation program participation and results

Without advanced health care data mining methods, these programs would not be available. Moreover the ROI derived from these programs would be elusive.

### Waiving Prescription Drug Copayments

Many plan sponsors have shifted costs to members by increasing copayments. While a \$10 or \$20 copayment increase sounds insignificant, this increase often has a material impact on the family budget. The increase becomes even more relevant when a member is taking many maintenance medications. For example, a member that has high cholesterol, high blood pressure and is a type 2 diabetic will in all likelihood be taking many medications. Hence, the \$10 copayment increase could become \$50 or \$100 per month. For a family with a \$40,000 household income, this increase becomes a major health decision. In some cases, it becomes a decision of whether to turn on the heat or put dinner on the table. As a result, the member may opt not to take his or her maintenance medication.

This decision often leads to higher medical costs and lower productivity.

which not only have a negative impact on the health care budget, but also have an impact on the bottom line. Plan sponsors are beginning to realize that it is less expensive to actually make prescription drug copayments in the short term which, in turn, will reduce future medical costs. Again, these analyses can only be achieved through the implementation of advanced data mining concepts.

### Departmental Health Care Costs

Most health plan sponsors are literally starved for information. While health plan vendors provide financial utilization data to the plan sponsor, the information is often limited at best. Data mining enables plan sponsors to understand how the plan is being consumed across divisions, departments, titles, compensation bands and geographic regions. These dimensional views of health care costs provide management with the ability to make evidence-based plan changes and implement local programs. In some cases, this information is used as input to the local attraction and retention department which, in turn, can then make regional changes to compensation and health care benefit programs.

## Workers' Compensation Subrogation

The combination of third-party liability claims, also known as subrogation, and workers' compensation claims has always been and remains invisible to plan sponsors. The only way to identify workers' compensation claims that are subrogatable is through advanced data mining techniques. Given that subrogation is generally perceived to represent approximately 2% to 3% of the health care claim dollars, the subrogation opportunity is in itself material. With workers' compensation claims at equally high levels, the workers' compensation subrogation opportunity is very real and when monetized, can represent a material recovery or future savings impact.

Unlike other examples provided in this paper, the data warehouse would need to include additional data files including subrogation suspects (these are generally provided from the health plan vendor) and workers' compensation claims (these are generally provided by the workers' compensation third-party administrator). To the extent desired, disability claims could also be integrated to help eliminate workers' compensation suspects.

## Consumer-Driven Health Plan Optimization

Consumer-driven health plans have become increasingly popular for numerous compelling reasons. One such reason is because of the expected savings for plan sponsors. According to industry publications, plan sponsors can expect to save approximately \$1,000 annually for every subscriber that enrolls in a consumer-driven health plan. Moving 1,000 subscribers into a consumer-driven health plan can save a plan \$1 million every year.

Data mining can help optimize consumer-driven health plan enrollment by identifying subscribers currently enrolled in traditional health plans that have a high potential of switching into a consumer-driven health plan. This can be done by analyzing census, enrollment and claim data in addition to lifestyle and psychographic data (these are self-reported and are commercially available). Members that have profiles similar to consumer-driven health plan participants can be targeted for conversion. In

all likelihood, many of the participants enrolled in the traditional plans will convert to consumer-driven health plans. In this context, it is the powerful combination of health care data mining and predictive modeling that can achieve these results.

## Eligibility Leakage

In spite of timely and accurate interfaces to health plan vendors, ineligible employees routinely receive benefits. One of the biggest challenges facing health plan vendors is their back-office technology environments and their abilities to get eligibility correct at the point of care. Even though good business processes are in place, they are not always complied with, especially at companies that have large turnover as well as multiple locations.

In companies with high turnover operating in decentralized environments (such as retail or food services), employee terminations are not generally communicated to the health plan vendor, nor are they entered into the vendor's eligibility system on a timely basis. Employee eligibility is also impacted by reductions in work hours—The employee may still work for Company ABC, but not in a benefits-eligible capacity. Or in other cases, an employee has resumed working for another company that offers the same coverage as the previous employer, and claim payments are charged against the wrong company's experience.

Given that eligibility-based claim errors often account for a minimum of 1% to 2% of a health care budget, it is becoming easier to get management's attention to fix these historically elusive profit leaks. With the annual employee premium averaging \$7,000, a 2% premium error rate equals \$140 per employee, which multiplies to a significant figure in any plan.

## Case Studies

### Dependent Eligibility Audits

In an attempt to control health care costs, one company recently completed a dependent eligibility audit. The initiative was comprised of two phases. The first phase consisted of a letter-of-notice campaign, and an amnesty program where employees could correct their eligible dependent record without question. The second phase consisted of a minimally

invasive, more intelligent, technology-based audit.

A critical process driver in the audit was the access to census, medical claims and prescription drug claims data. In essence, the data was used to identify members with demographic anomalies or members that were actively consuming health care dollars. Examples of demographic anomalies include, but are not limited to, spouses aged 20-plus years apart, children with overlapping birthdays, dependents living in different places, families with more than seven children and overage dependents (that were not disabled according to the clinical information on their medical claims).

Medical claims and prescription drug claims data was also used to identify members that were actively using the plan. The management team felt this was important since the overall goal was to save money (i.e., terminating inactive members would not save the plan any money since their respective contributions do not vary based on the number of dependents, nor is the administrative-services-only (ASO) fee driven by the number of dependents).

Upon completion of the dependent audit, hundreds of dependents were removed from the company's eligibility rosters. Management computed its ROI for the project to be nearly 700%. Needless to say, the dependent eligibility audit exceeded management's expectations.

### Departmental Health Care Cost Measurement

The management team of a large health care company sensed its dependent health care costs were high, but did not have the requisite tools to identify costs on either a business unit or geographic level. In order to clarify local costs, census data and medical as well as prescription drug costs were integrated into the data warehouse.

Claim costs were quantified by the state in which each member resides. Not surprisingly, claim costs varied significantly by state as well as by claimant type (for example, employee, spouse and dependent child). Claim costs for spouses ranged from \$11,000 to \$15,000 in the highest claim states. Claim costs for dependent children ranged from \$12,000 to \$17,000 in completely different states. Management perceived these metrics as

problematic and sought to understand more. After a thorough analysis was completed, management learned that adverse selection was happening in several local markets. In essence, reputations were established by the local community and the workforce was ostensibly taking advantage of the plan. Additionally, it was further learned that part of the reason for higher-than-expected spousal costs was an expensive medical procedure being abused by plan members.

### Prescription Eligibility Audits

The management team of a domestic manufacturer could not understand their significant increase in prescription drug costs. While management did not have any proof that ineligible claimants were receiving benefits, they sensed this was the problem. As a result, 100% of the drug claims were audited for eligibility.

In order to meet the business objectives, the audit team integrated 100% of the census, enrollment, COBRA and drug claim data. The eligibility business rules were then applied to the data. As a result, nearly 4% of the claims were paid erroneously due to eligibility. While ten different eligibility tests were executed, most of the errors were made on behalf of “members” that were not included on the employer’s HR system. Not only did the plan get a refund, but the employer and the pharmacy benefits manager (PBM) fixed the respective process to ensure eligibility-based audits occurred in the future.

### Summary—Be Proactive, Take Action

Lack of actionable information is a big part of the problem; advanced data mining is a critical part of the solution. Plan sponsors, consultants and brokers have the opportunity to remedy the situation and foster an environment of data and financial integrity. HR and finance can continue to demonstrate value add to the C-suite and

to shareholders by mining health care data, implementing cost-effective programs and bolstering the bottom line. **B&C**

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