

Data Warehouses and the Dental Consultant

By: Michael del Aguila, MS, PhD

Data warehouses in the dental insurance industry are a well-recognized reality. However, the misperceptions surrounding them both exaggerate their misuse and underestimate their potential. Understanding the composition and requirements for appropriate use of these tools can dispel some of the mistrust, and open dialogue on the best uses of these tools. Without question, the appropriate use of a data warehouse can contribute substantively to the construction, deployment and evaluation of the next generation of dental benefits products. Getting to that point is not easy because it requires constant reexamination and refinement of basic assumptions and analyses.

So what is a data warehouse? In the strictest definition, a data warehouse contains literally all the information held by a company used to conduct its business. For dental insurance companies, this relates to the revenue through premiums, employee eligibility lists, treatment information, claims processing and adjudication, dentist information, and benefit plan design. Data warehouses relate all the pieces of data to each other. Building them requires a deep understanding from a business and clinical point of view of all the data elements, so that the created relationships in the database make sense. As a hypothetical example, when a dentist office submits a claim on Mary Johnson, that information is stored so that future queries can be run to indicate that Mary Johnson was in fact the primary subscriber as an employee of Safemart Construction who has had indemnity dental coverage with United Delta Cross dental insurance for the past 8 years. Those disparate pieces of information related to the patient subscriber status, the company, benefit plan and treatment are all held separately in the claims management system, and related only to adjudicate the claim. A data warehouse stores that information longitudinally.

Mercifully for most of us, the extensive and laborious work to construct a data warehouse happens in a manner that we don't see. When all the programming and processing work has been done, there are any number of select computer servers that store the information to permit querying and analysis. The result is one or more tremendous sources of information that can inform on best practices from claims adjudication to benefits design and dentist network management. Practically speaking, harnessing all this information into one relational database often proves to be overwhelming and inefficient for business purposes. Companies will therefore create subsets ("data marts") that have relevant information for their specific analytic purposes.

The potential for misuse has large implications as well. In light of cost-cutting measures and attempts to streamline operations, there is a tendency to view anything that smacks of automation with skepticism or mistrust. More specifically, data warehouses, with longitudinal stores of information can be easily perceived to represent a poor imitation of the knowledge base of dental consultants. This scenario envisions the stripping of important clinical information so that only a few standardized rules will be applied in claims adjudication or processing.

“...dental consultants should be prime users of data warehouses to help insurance companies create dental benefits products that incorporate the latest in technological advances.”

However, the successful deployment of a data warehouse relies on human knowledge to know what questions to ask, and how to interpret the findings. In fact, dental consultants should be prime users of data warehouses to help insurance companies create dental benefits products that incorporate the latest in technological advances. They can track changes in patient preferences, and identify clinical and scientifically objective outcomes measures. Following the creation and implementation of new products, consultants can continue to use data warehouses to evaluate and track their impact over time.

Dental consultants occupy a critical role in the dental insurance organization by applying their clinical experience to evaluate treatment experience in individual circumstances. Changing technologies and patient preferences often outpace changes in benefit coverage options. The consultant is tasked with balancing the changes in practice patterns and against policies that may not be the most up-to-date with respect to science or patient preference. Yet their work allows the dental insurance company to provide their purchasing customers with information that is current, and design dental benefits products to meet the expressed value propositions of those customers.

Quite simply, dental experts know which questions to ask on the basis of what they've seen during claims review. For example, does a given dentist, compared to his peers, perform significantly more crown buildups in relation to the total number of crowns? Is he more likely to place crown than a large amalgam or composite restoration? Are teeth in quadrants with periodontal surgery more likely to fracture? Will changes in the ADA procedure codes result in lower or higher utilization of certain procedures?

On the other hand, the scope of data in a warehouse augments the individual clinical experience of each consultant. Detailed examination may falsely obscure details that would be visible only at a higher level across many other procedures or dentists. The systematic storage of data in a warehouse allows appropriate queries and analyses to be conducted to illuminate the germane health or cost issue, and the treatment outcomes of care. The questions above can be easily tracked to understand their treatment and cost outcomes by using a data warehouse. What of the teeth treated by the dentist who places more crowns than large restorations compared to peers? Perhaps they experience fewer insults or extractions later. The standardized longitudinal database provides more definitive answers to questions. Ultimately, it allows for a transformative shift in the type of questions being asked. Long-held assumptions can be questioned, challenged, and possibly substantiated. The marriage of clinical and database population inputs should work together to increase the corporate knowledge base to improve the design of dental benefits.

The dental profession should therefore look at data warehouses as a necessary tool to help them accomplish their work in a more efficient and knowledgeable manner. Dental consultants can assess the areas where their clinical review is most cost effective and

emphasize those areas that have the greatest impact. If certain claims with defined treatments or characteristics are ultimately paid after initial denial, this highlights an area where review policies should be reconsidered. Similarly, practicing dentists now have access to a broader source of treatment patterns that could inform their own clinical judgment and guide their own practices.

It is critical to recognize that the information contained in a data warehouse must be converted into a knowledge that guides action. There will be instances when long-held traditions or beliefs are not substantiated by the data. Alternatively, new ideas will come to mind based on questions triggered from experience and through interpreting the data. A data warehouse can increase the knowledge base of the dental profession, and contribute to the oral health of the population through better-designed dental benefits products.

Dr. Michael del Aguila is a member of the AADC and president and CEO of Delta Dental Data and Analysis Center.