

Data Warehousing Improves Care, Demonstrates Return on Investment

Save to myBoK

by Michele Mercer, RN, MS, HSA

Without an enterprise data warehouse, we were flying blind," says Robert Robison, MD, chief medical officer of Horizon Mercy in Trenton, NJ.

Horizon/Mercy, one of the largest managed care organizations in the nation, administers and manages Medicaid's Horizon HMO. Some HMOs are abandoning service for the publicly insured, citing rising costs and inadequate reimbursement. Horizon Mercy is succeeding in this market, because it has the business intelligence required to care for a Medicaid patient population with complex healthcare needs-and thin financial margins.

Necessary Change

Like most health plans, Horizon Mercy found that its claims transaction system could not provide the information that management needed. Patient data was "locked" in a number of different databases, including emergency and outpatient visits, lab, radiology, pharmacy, and inpatient stays. Management wanted an enterprise-wide solution, which would provide enterprise-level business intelligence.

The Horizon Mercy team decided that a drill-down capability would be essential. A simple reporting system could highlight business metrics that were out of range, but would not provide a way to look at the data underneath.

The databases within a data warehouse contain raw data that has been cleaned, meaning duplicates are removed and indexes are attached for quick retrieval. Data mining uses the data to answer questions or report on issues and trends. Once a data warehouse is established, data mining is accomplished by reviewing production reports and using the data to drill down to prepare specific reports on issues not addressed in the production reports.

Horizon Mercy needed easy access to key business metrics such as unit cost, marginal costs, and return on investment (ROI) that can be calculated and used to analyze costs associated with health management programs to see where problems were beginning to grow. Because health plans have information on total costs of care and can record outcomes as well as costs, business metrics are used to assess value, defined as the incremental cost of quality or quality divided by cost (the value equation). The best solutions frequently come from an understanding of the cause of a care or cost problem. But this understanding often requires the ability to quickly dig into patient-level data.

Seeking a Solution

Horizon Mercy didn't have the time or resources needed to build a homegrown data warehouse system. It couldn't afford the high failure rate of do-it-yourself projects, but its Medicaid service needs were specialized and critical to survival in the market. With the limited resources of a small IS department, Horizon Mercy realized it would be cheaper and faster to outsource its data warehouse project.

Three years ago, Horizon Mercy's data warehouse was used for clinical information only, with a monthly dump from its claims system. Later, pharmacy data was added. The next step was a redesign of its warehouse data blueprint with the addition of six new data sources. This was a big project and well worth the cost, according to Robison.

When assessing products, Horizon Mercy considered that its users were not technically sophisticated: they needed an easy-to-use tool to manage risk, understand patient needs, form financial strategies, and drill down quickly to more detailed information. A Windows and Web-compatible front end offers an easy-to-use control panel with key business metrics for the Horizon

Mercy network. Managers can quickly gauge the performance of outpatient services, inpatient, and ER-and drill down to see the detailed data under the summaries.

All of Horizon Mercy's solutions are Web-ready for easy deployment across the enterprise. This browser-based, thin-client approach is much easier to manage and support, and sharply reduces the total cost of ownership. (A thin-client approach allows users to run the application on their computer without having to install software-in this case, the software is accessed via an intranet at Horizon Mercy.)

The system collects raw data from Horizon Mercy's existing information systems, transforms the data, and loads it into a new business-oriented data warehouse. Applications automatically organize the information for quick queries and drill-down analysis.

More than ROI

Horizon Mercy uses the data warehouse to manage patient care costs, improve care delivery, profile physicians, and develop new products and programs. For example, the data was used to reduced the risk of entering a new market: Horizon Mercy analyzed the population served by a competing healthcare plan and projected the costs and benefits associated with an acquisition. Based on the results of this study, Horizon Mercy launched a successful acquisition.

Horizon Mercy has also enjoyed direct cost reduction. Participants in New Jersey Care for Pregnant Women, a Medicaid program that includes pre-natal and post-natal services for indigent women and their newborns, have been assigned to Horizon Mercy. Coverage continues for mother and baby for 60 days following delivery. The facility suspected that the actual cost of care for this high-risk population exceeded the reimbursement received from the state, with a significant impact on Horizon's medical cost ratio. Using the data warehousing system, the Horizon Mercy team analyzed cost data and found that the New Jersey Care for Pregnant Women population represented only 2.3 percent of the membership in their plan, but accounted for 28 percent of total bed days and 35 percent of all inpatient admissions. An overwhelming 189 percent medical loss ratio was documented.

This led to two successful cost reduction efforts:

- a new early risk-assessment program was launched to identify key factors, including homelessness, smoking, or drug addiction, and target preventive health interventions through state and private services. As a result, the medical cost ratio was quickly reduced by 26 percent
- armed with clear evidence of excessive costs, Horizon Mercy sent a request to the state, which led to a positive change in payment methodology

The data warehouse also reduces variations in physician practice patterns. Using information from the system, Horizon Mercy profiles primary care physicians in the plan, identifies differences in practice patterns, and improves service. Physicians are motivated to follow improved care plans because they understand and respect the data delivered by the system. This has resulted in more effective patient care with many dollars saved.

Better patient care is the most significant return on investment for Horizon Mercy. In one example, Horizon Mercy was able to solve a critical problem for one family, improve the quality of care, and reduce overall costs of care. Using the system, managers were reviewing care costs, which are always higher in the winter. Drilling down to patient-level detail, they found that one young boy was being rushed to the emergency room three or four times a month during the winter with acute asthma. He was often admitted to the hospital. This was traumatic for the child and his family. Managers found that the boy's family could not afford enough heating oil, and the cold temperatures in their home aggravated the child's asthma. Horizon Mercy's social work department arranged delivery of additional heating oil through a local community agency.

"With data warehousing, we can benefit from this wealth of data. Data mining lets us get at it, look at it, and act on it," says Robison. "We're seeing where we can intervene and educate, and where we should adjust. Without this tool, we wouldn't know."

Benefits at Work

Horizon Mercy has a variety of award-winning case management and disease management programs with excellent and proven return on investment. It calculated savings of \$6 per member, per month, in a recent study on their maternity program and have reduced asthma admissions per thousand by 23 percent with an asthma management program.

Data analysis is the first step in developing successful programs. According to Robison, in addition to the data warehouse, Horizon Mercy has excellent physicians and nurses and state-of-the-art case management software to assist in data analysis.

Ultimately, the system helps Horizon Mercy uphold the ethic of service to the public-providing quality patient care without financial loss. Data warehousing has uncovered answers to create strategic benefits, reduce direct costs, reduce variations in physician practice patterns, create new markets with reduced risk, and most important-provide better patient care.

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