

## Managing Information for the Delivery of Quality Health Care

Greg Rogers, SAS Institute Inc., Cary, N.C.

Sarah Luker, Intermountain Health Care, Inc., Salt Lake City, UT

Glen McBride, Intermountain Health Care, Inc., Salt Lake City, UT

Glen Buckner, LDS Church, Salt Lake City, UT

Carey Boldenow, HealthPartners, Minneapolis, MN

### Abstract:

The one-trillion-dollar health care industry is the latest major US industry to experience dramatic changes in the way business is run. The reinventing of health care brings a great many challenges for controlling the costs, and improving quality of the delivery of care. At the heart of this change is the health care organization's ability to successfully implement information technology as the key enabler. Organizations are discovering the importance of managing a successful information technology strategy in a complex, changing health care environment. In this paper, we explore the major trends in the health care industry today and the role of information and technology. Next, we discuss how the SAS® System provides information delivery solutions, concentrating on specific application areas. Finally, you will see how two companies, Intermountain Health Care and HealthPartners, utilize the SAS System's unique capabilities for empowering their health care leaders and professionals with the tools necessary to better compete in today's marketplace.

### Health Care in the 90's

The once strong national legislation reform movement has created a firestorm within the industry. It has put health care into the hearts and minds of the public. Contrary to popular belief, the national health reforms effort didn't create this change in the industry; it has only served to speed up the process. The industry is reforming itself with or without national legislation. Reform efforts have grown out of the industry's need to control spiralling costs and inefficiencies. Today, real reform manifests itself in the form of market pressures. In other words, the industry is changing itself; no more of the status quo. The traditional, not-for-profit health care industry is now learning how to run healthcare like a business. Over the last two decades, most American industries have had to learn the value of cost control and higher quality through pressures created by foreign competition and investment. The health care industry is now being forced to learn the same lessons.

In addition to market pressures reform, many states are in the process of enacting their own health care legislation, involving everything from legislation that supports the growth of managed care, to the shifting of Medicaid reform to the state level. States have now gained federal approval to put their billion-dollar Medicaid programs into the hands of HMOs. Many feel this could be problematic. A lack of a national coherent regulatory framework could lead to what Dr. David Lawrence, CEO and chairman of the board for Kaiser Foundation Health Plan called a "rapid non-linear discontinuous change" in the industry. Some agree that this lack of a coherent framework is a model for failure and potential collapse, while others in the industry would wholeheartedly disagree. Within this complex set of circumstances, the great challenge is how to lower the cost of health care while also improving the

quality and accessibility of that care.

The current model of health care in this country is evolving from a traditional fee-for-service, indemnity payer system to a capitated, fully integrated delivery system. The various segments that make up the market were once easily separated with very little crossover. Today, that line is blurring. Partnerships between the providers, payers, suppliers, and regulators are changing the way health care is delivered. This change is often referred to as a move to *managed care*. Most health care organizations are moving to some form of managed care. There are a number of different types of managed care organizations from HMOs and PPOs, to Point of Service plans and IPA models. Managed care evolved out of the need to control cost. Cost control measures are typically occurring through some form of *capitation*. Capitation is a method of reimbursement based upon pre-determined dollar amounts per person per timeframe. Historically, medical costs have been fee-for-service, that is, when a patient receives care, the cost of that care is determined by the type of care received. In a managed care system, the payment for care is often capitated. As managed care grows, capitation will dramatically change health care in this country, shifting the burden of risk from the payers to the providers.

A common strategy for dealing with the demands of change in the industry is for health care organizations to combine forces to achieve a competitive advantage. Therefore, there is a constant upheaval in the market with a seemingly unending number of acquisitions, mergers and cooperative agreements taking place. The December 19, 1994 issue of *Modern Healthcare* states, "More than 650 of the nation's hospitals were involved in mergers or acquisitions in 1994."

Along with these changes come new pressures from the regulators and consumers of health care services. Not-for-profit organizations like the National Committee for Quality Assurance (NCQA) and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) are affecting how hospitals, health systems, HMOs and health insurance companies do business through accreditation and report card standards. Better customer awareness has created an environment that is becoming increasingly competitive. Large corporations and organizations who contract for healthcare services are demanding comparisons between providers and payers to get the highest-quality, lowest-cost health care for their money. Is the competition healthy for the industry? Many feel health care organizations should be fighting disease, not each other. The health care industry needs to come to grips with its changing identity. Unregulated competition will be healthy for the industry. After the shakeout, there may only be a handful of managed care organizations left to compete. Those that make it will be the ones that learned the lessons of cost containment and high-quality-patient-focused care.

In conclusion, we are seeing a *reengineering* of the delivery of care in this country. Within the health care industry, reengineering is more often referred to as process improvement, benchmarking, best practices, health systems reform, patient focus, systems integration, or the re-inventing of health care. It's all about the changes that are rapidly occurring. The next section will explore the role of information technology in the reinventing of health care systems.

#### **Information and Technology in Health Care**

In a 1994 HIMSS survey of over 1000 health care professionals, the question was asked, "What is the most important force driving increased computerization in health care?" The number one answer given was the movement to managed care. Managed care brings about the pressing need for integration of systems across the continuum of care. Information access from any location and user-friendly interfaces are major barriers that need to be overcome. There were a number of other interesting items in the survey as well. It was stated that the most frustrating information systems (IS) problems revolve around (1) the lack of a strategic IS plan and (2) complaints from clinicians about ease of use. This suggests a lack of proper hardware and software tool sets and a potential lack of upper management support for change. The industry is experiencing growing pains, looking to streamline the way technology is leveraged to meet organizational business needs.

Information technology (IT) will play an important role

during this process of change. The health care industry is moving from a typical IS, mainframe-based environment to one where the users are empowered with technology and information they need to lower cost and improve the quality of care provided. Many organizations are exploring the use of workstations. Downsizing or right-sizing are the hot topics. Specific tools vary greatly. There is growth in computerized patient records systems, often referred to as clinical data repositories. Data warehousing is fast being accepted as an improvement for querying information. Many are interested in client/server technology and how it empowers users with information? How can it save money? Does it make information gathering easier?

The industry is inundated with all types of non-integrated turnkey systems or specialty tools. Applications vary from claims processing, accounting and financial functions, to clinical systems for patient records, provider profiling, utilization reviews and outcomes management. End user computing and the empowerment of the clinician, especially at the point of care, is of growing concern and is where many health care organizations are focusing their efforts.

As the industry matures, quality of care and associated technology is becoming a top priority. The Institute of Medicine defines the quality of care as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge." Total Quality Management (TQM), is called CQI, or Continuous Quality Improvement within health care. This is also sometimes referred to as patient-focused care. Often the two terms are mistakenly used interchangeably, with health care organizations implementing one or the other, when in fact they are different in scope. According to a 1993 article in *Healthcare Information Management*, "CQI can serve as the broad philosophical framework to support the organization's vision. Patient-focused care will enhance CQI by addressing the fundamental structural problems in our delivery systems that can not be fixed with incremental improvements." Health care organizations that are aware of the differences, that can harness the power of technology to implement a successful strategy, will gain the competitive advantage.

Typical CQI programs have been geared towards areas such as customer focus, human resource training, improved teamwork, and utilization improvements. Missing from most quality programs within the industry is the lack of statistical process control (SPC) techniques and tools. To date, they have yet to gain widespread use or success. One of the biggest growth areas within quality for health care at this time is in the study of outcomes.

Everyone is talking about outcomes, yet no one can agree upon a definition. Most CQI programs are measuring whether an event or episode of care occurred, versus whether the outcome of that care was successful. The question should be, what is happening within an episode of care and how can that outcome be improved? Many health care organizations have yet to implement the proper tools or applications to measure, analyze and report on outcomes. There is much confusion and conflict over how to measure and define outcomes. Outcomes often include many different areas such as patient responses to treatments, lab results, appropriateness of care, service quality, length of patient care and clinical effectiveness. One of the fast-growing areas within outcomes is in the area of patient satisfaction surveys. Hospitals, clinics and HMOs want to learn more about the care and services they provide from the patient's point of view. Outcomes should be a continuation of the many steps for improving quality. Information technology solutions supporting outcomes data will be very important for their effective implementation. End user, business intelligence software solutions that include SPC, decision support and EIS systems for measuring quality and improving outcomes will be the focal point of empowerment for the future. Although CQI activities are increasing, there is doubt in the industry about their real value. To date, there are many who have not seen and do not expect to see the positive results they've been promised. This may be a telling sign of the industry's lack of experience in managing health care like a business. Quality improvement programs, techniques and ideas are generally long-term in their effect. At this time, only the larger or more progressive health systems, HMOs and hospitals are making the transition successfully.

There is currently a lack of technology standards within health care. A nationwide system for the standardization and sharing of computerized patient records is at best in the rumor stage. Data Integration through community health information networks (CHINs) are being discussed by many, but cooperation between competing organizations, a lack of any real standards, the high potential costs and the ownership and control issues are obstacles standing in the way. The information superhighway is a concept that is still in its infancy and many are either not familiar enough with its concepts or don't think it's very feasible for health care. Imaging technology is still young but holds future promise.

There is growth in all areas of technology, but health care is at least 10 to 15 years behind other industries in the effective implementation of IT. The industry is struggling with growing beyond its current definition. Managers are learning to think "*outside the box.*" The emphasis is on re-

inventing health care, no more of the status quo. Business process reengineering ideas permeate the industry. Health care organizations are looking for enterprise-wide technology solutions to enable this change. In a published interview, Merck's former CEO, Roy Vagelos, said, "Information lies at the heart of what the company does. Our ability to leverage information will set us apart...the company that best controls the information flow from doctor to patient to pharmacist to plan sponsor has the best chance of succeeding in this industry." Enterprise-wide information technology solutions and the companies that can deliver these solutions will be the enablers for the change.

#### **The SAS System for Health Care**

The challenge for health care organizations is to be able to effectively integrate people, technology and processes. The purpose of IT is to help streamline the process, resulting in higher productivity and lower cost. The SAS System helps in this process by allowing an organization to turn its data assets into usable information, and deliver that information into the hands of the right people in a timely fashion, empowering them with the tools and necessary knowledge to make better more informed decisions.

SAS software already enjoys a significant presence in health care. It is being used for a variety of different applications in over 1000 health care organizations in the U.S.. Health care professionals across the country rely on the SAS System to provide a variety of custom applications in areas such as data warehousing, decision support and EIS systems, client/server processing, TQM and/or CQI applications, enabling reengineering efforts, data access, management and analysis of clinical processes, HEDIS reporting, utilization management, provider profiling, outcomes analysis, patient records, end-user computing, and patient satisfaction analysis and surveys.

Many of the strengths of the SAS System parallel the needs of health care. The constant state of flux caused by the many industry mergers and acquisitions have created an environment of diverse data sources and hardware platforms. The SAS System is well suited to delivering answers for these problem barriers because of its ability to make data a generalized resource no matter what the data structure. Another strength of the SAS system is in its ability to meet the computing needs of a variety of different users. Comfort levels of the clinician may be totally different from that of the business analyst or IT professional. Through a variety of customized user interfaces, the SAS System can provide a computing solution that all can understand and use effectively.

There are a number of specific information technology needs for health care that the SAS system excels in:

- health data repositories
- HEDIS reporting
- case management
- quality improvement (SPC and outcomes).

#### **The SAS System for Health Data Repositories**

Data warehouses, data repositories or information databases are all hot topics within the industry. Health care organizations have matured beyond the question of How will it help us? The question now is, what are the proper tools for implementing our data repositories or computerized patient records system? How are successful strategies implemented? According to Randy Betancourt, SAS Institute's program manager for Enterprise Computing, there are a number of strategies that need to be considered when building an information database. Access to operational data, the ability to apply logic to the data, the location and architecture of decision support data, and the end-user tool set to be used for desktop deployment are all critical components. The SAS System's data engine technology, and client server capabilities coupled with the strength and flexibility of industry leading data management tools, and support of the many industry standards such as SQL, TCP/IP, APPC and ODBC, empowers organizations such as Group Health Cooperative and Abbott Northwestern Hospital to successfully implement health care information data repositories. In addition, the MultiVendor Architecture™ (MVA™) design of the SAS System makes it possible for the successful deployment of your health data repository and associated decision support functions on all major workstation platforms.

#### **The SAS System for HEDIS reporting**

The rise of managed care has led to the growth of report cards within health care. One of the fastest growing is NCQA's Health Plan Employer Data and Information Set, or better known as HEDIS. HEDIS 2.0 is a standardized set of calculations and reports on quality measures and performance indicators. Items such as mammography rates and immunization rates are examples. HEDIS has evolved because large employer groups are now demanding comparisons among plans across regions. One of the biggest problems with HEDIS is in the collection, auditing and reporting of the data. Because there is a lack of standards in the areas of data specifications, audit requirements, and benchmarking within the industry, a number of managed care organizations are having great difficulty in participating fully with the HEDIS requirements. Many like Athena of North America and Group Health Cooperative are turning to the SAS System because it allows for the collection, linking and combining of diverse data sources and file structures required when

implementing a HEDIS strategy. The SAS System's strengths in data access and management and its world renowned analytical tools provide solutions for organizations looking for HEDIS answers.

#### **The SAS System for Case Management**

Important steps for improving the quality and reducing the cost of health care include systems for provider profiling and utilization management and analysis. The competitive nature of today's health care environment makes it imperative to provide the health care professional with accurate information on the trends in health care spending. Reducing costs through case management requires organizations to track and analyze a number of areas such as the ability to:

- reduce the likelihood of an adverse or preventable patient care error
- analyze cases based upon pharmacy costs
- investigate rehabilitation requirements
- better understand the cost of an episode of care
- calculate provider costs
- reduce unnecessary care.

Organizations such as Harris Methodist Health Plan and HealthPartners are using the SAS System for just such applications. Harris Methodist Health Plan is utilizing the SAS System for its Pharmacy Services Reporting System. According to Mary Rose Jones, project leader, "It's a comprehensive case management system...we can look at the same piece of information at least a dozen different ways. Harris Methodist is now beginning to see positive results in controlling cost." She concludes, "Using the SAS System allows us to deliver accurate and timely information in a better format...this type of information delivery helps physicians manage their care better."

#### **The SAS System for Quality (SPC and Outcomes)**

Many in health care have expressed concerns that the issues in the industry are too complex for SPC and the study of variability. For example, some feel that SPC methods are ineffective on issues regarding infection control and other epidemiological studies. SPC has traditionally been considered a tool for manufacturing systems. There is a misconception that manufacturing systems are just too different from service industries such as health care for SPC techniques to apply. SPC techniques have in fact been used extensively for both clinical and non-clinical applications in a number of health care organizations. According to Deming, the quintessential expert on quality, "...the concepts and principles of quality control can be successfully applied to service industries..."

For years, the quality improvement tools found within the SAS System have been used by companies representing both the manufacturing and service industries for

improving the quality of their goods and services. The SAS System is ideally suited with the analytical quality tools, data access tools, interfaces versatility tools, and the graphical representation capabilities to meet the diverse user needs required for a successful implementation of a data-driven SPC/TQM/CQI program. For example, the SAS System for quality allows health care organizations to measure variability using control charts, perform distribution analysis, and create cause-and-effect diagrams for process planning purposes. Control charts can be used for a number of different clinical and nonclinical studies such as to monitor hypertension levels, prescription error rates, mammography rates by provider, number of admits per 1000, or to track variability in the number of days between infections.

The SAS System is currently being utilized by many organizations such as Intermountain Health Care for customer satisfaction surveys. Customer satisfaction is a key indicator of true quality in service industries, ranging from hotels to hospitals. The patient's perception of quality is an increasingly important area of outcomes measurement for health care. SPC techniques can be utilized to measure patient perceptions of quality in areas such as the quality of nursing and physician care to billing and housekeeping services. Each of these areas can be broken down and analyzed by detailed categories.

The following case studies further demonstrate how the SAS System is making a difference in effectively empowering organizations to stay competitive in the evolving health care industry.

### Case Study # 1

#### **Intermountain Health Care, Inc.**

Sarah Luker  
Research Associate  
Glen McBride  
Manager, Research & Planning  
Glen Buckner  
Programmer Analyst

#### **Background**

Intermountain Health Care (IHC) is a fully-integrated health care system including a hospital division, a health insurance division, and a physician division. IHC's twenty-four hospitals are located in Utah, Wyoming and Idaho. There were 100,000 inpatient discharges from IHC facilities in 1994 and over 1,000,000 outpatient encounters. IHC Health Plans provides health coverage to 500,000 subscribers and dependents.

Monitoring outcomes. IHC is committed to providing the highest quality of care and services to patients and

subscribers. This commitment is a challenge in the evolving and increasingly competitive health care environment. In response, IHC has focused attention on three areas: 1) financial outcomes; 2) clinical processes and outcomes; and 3) patient perceptions of quality (satisfaction). Because quality improvement efforts in one area may affect outcomes in other areas, outcomes in all three areas are monitored continuously. For example, it is essential to know whether efforts to make the care process more efficient negatively affect patients' perceptions of quality. It is believed that managing patient perceptions of quality will be the new arena of competition: differences between health plan options and prices will level off, leaving service quality as the basis of competition.

A centralized approach. IHC monitors patient perceptions of quality through a centralized monitoring system. A centralized data collection and reporting system eliminates duplication of effort at the hospital and department level and reduces costs through economies of scale. In addition, it reduces the impact on patients who might otherwise be asked by several different departments to complete a satisfaction survey. Finally, a centralized monitoring system allows for valuable system-wide analyses. For example, it allows for comparing similar departments across hospitals and monitoring perceptions of quality within service lines across hospitals.

Maintaining flexibility. Hospital managers were concerned that a centralized system would not be responsive to their needs for timely and department-specific feedback. The challenge was to develop a flexible reporting system that would provide timely and audience-specific feedback to administrators, department managers, and front-line employees. Monthly reports for department managers require much more specific information than the summary reports provided to administrators. IHC also requires flexibility in responding quickly to ad hoc requests for reports from all levels of the organization.

Other reporting needs. Aside from flexibility, there are specific graphical needs for the reports. All information is reported using statistical process control (SPC) charts. This allows all users of the information to easily and quickly determine if there are areas reflecting significant changes in patient perceptions of quality. Other reporting criteria include:

- Multiple charts per page
- Multiple types of charts (x-bar-chart, p-chart, stacked bar chart)
- Highlighting of positive trends or runs
- Selective inclusion of charts which indicate statistically significant changes or trends in perceived quality

- Readability
- Automated report generation.

### **The SAS Solution**

The SAS System provides the tools needed to manage patient perceptions of quality reporting for the entire IHC system. It provides the built-in statistical procedures in SAS/QC® software, tremendous graphics flexibility in SAS/GRAPH® software, and the SAS/AF® software frame technology that allows for a user-friendly interface in a single application.

SAS/GRAPH software produces highly customized and complex graphical output. Each page of the report displays up to nine different types of charts, with varying scales, means, and sample sizes. The ability to identify and report only the questionnaire items which indicate significant changes or trends adds to the user-friendliness of the reports. Flexible placement of titles and other information enhances the readability of each report.

The frame technology of SAS/AF software permits the creation of unique reports without altering the code. Report generation is fully automated and user-friendly. Significant run-time options are available. Finally, at the questionnaire item, item-group and report levels, customized selection menus in the application permit highly individualized reports. The application also allows for processing of data from many different questionnaires.

### **Conclusion**

The SAS System ably met the initial criteria for a centralized, automated report generating system. IHC has seen the benefits of monitoring patient perceptions of quality at the system level in many ways. The reports have facilitated widespread use of patient feedback. First, having a centralized database of quality information helps improve the care process. For example, analyses are being done to pinpoint the optimal length of stay from the hospitals' and patients' perspectives based on various patient types.

Second, the reports allow IHC to monitor how cost containment efforts affect patient perceptions of quality. In general, IHC patients consistently report high levels of satisfaction. However, in one hospital a downward trend in patient perceptions of quality was identified that seemed to correspond with several changes in hospital operations. The reports allowed for quick evaluation of the issues contributing to the downward trend and directed secondary analyses.

Third, the reporting system enables IHC to meet the changing information needs of users at all levels by being able to create department/hospital comparison reports and

reports based on patient types, specific questionnaire items, or groups of items. This flexibility is essential in the changing health care environment.

Fourth, the flexibility of the application allows for future development. Currently, this system monitors satisfaction levels of hospital patients. However, there are plans to extend the monitoring system to subscribers of IHC Health Plans.

With this reporting system in place, IHC is able to meet the needs for patient feedback at all levels of the organization. The SAS System has proven to be an effective tool for reporting patient feedback. This information is essential in IHC's efforts to provide the highest quality of care and services to patients.

### **Case Study # 2**

#### **HealthPartners**

Carey Boldenow  
Manager, Employer Reporting

#### **Background and Business Problem**

HealthPartners is the parent company of a family of health care organizations that includes a staff model HMO, a group model HMO, a major critical care, trauma, and regional burn facility, and a 200-member multi-specialty physician group practice. HealthPartners provides health care services and coverage to more than 650,000 members through both fully insured and self-insured products.

MedSource is a reporting tool that was developed because of the intensely competitive nature of the health care industry in the Minneapolis-St. Paul marketplace. Any competitive advantage that can be gained will make a difference in retaining the company's current book of business and in the adding of new accounts. The ability to provide timely, accurate and pertinent data is the greatest advantage a health care organization can have today. The marketplace has become sophisticated. Many of the employer groups in the Minneapolis-St. Paul market have individuals working in their benefit departments who have years of managed care or other medical experience. They understand medical data, and more importantly, they know how to use this medical data to better serve their company's interests, both from a financial and quality of care perspective. The health care organizations that can most effectively and efficiently meet the data needs of these organizations will be the winners.

As important as it was for HealthPartners to have a state-of-the-art reporting tool for its customers, it was probably more important for it to have a similar reporting tool for its own internal decision-making processes. Therefore,

MedSource was designed with two components. The first is an employer-specific application that is being distributed to many of HealthPartners largest employer groups. Once MedSource is installed, monthly updates of their data are sent to the site. The second component is a management application that is used internally at HealthPartners to monitor different lines of business.

Regardless of the user, MedSource was designed to answer three basic questions. The first: what is happening within the company's different lines of business, or from the employer perspective, where are we spending our health care dollars? It is important to know what areas are experiencing abnormal trends, both favorable and unfavorable. Once the areas of focus have been identified, the second question is: what is causing these trends? MedSource was designed with a wide variety of reports for determining if the trends are due to provider contracting issues, demographic trends, plan design arrangements, high cost catastrophic cases, or changes in the way health care professionals are administering care. With this information, top management can formulate strategies that hopefully, will reverse the unfavorable trends and reaffirm the positive ones. Once these strategies are implemented, the third question is: are the new strategies working? MedSource was designed with complete flexibility, so that a user can continually monitor trends, both before and after implementation of specific programs, contracting and plan design arrangements, or changes in product mix.

#### **The SAS System's role**

There are many reasons why HealthPartners chose the SAS System as its applications building tool. HealthPartners has always used the SAS System on its MVS mainframe environment; therefore, it was a natural progression to use SAS software on the PC. The SAS System's object-oriented programming makes it very easy to build and incorporate drilldown capabilities into an application. Some of the new SAS/EIS® software features, such as the expander object, are perfect tools for displaying and analyzing medical data. In addition, SAS/ETS® software was used to build a very sophisticated forecasting model. The model forecasts both cost and utilization data. It is very flexible, allowing for the introduction of seasonality trends or inflation trends for medical costs into the model. In addition, custom frame entries and objects are very easy to build and add to applications using the SAS System's Screen Control Language (SCL). It is this feature that really brings out the power and flexibility in MedSource. MedSource was started from scratch last May, and was completed six months later. The quick development time is not so much an indication of the SAS expertise within HealthPartners, but an indication of how easy it is to build EIS

applications with the SAS System.

#### **Conclusion**

HealthPartners has realized substantial benefits since implementing MedSource, from a cost and revenue perspective. MedSource has made internal reporting processes much more efficient. With the reporting process more centralized, a great deal of redundant reporting has been eliminated, thereby freeing up analysts' time to focus their energies on the more pressing issues. In addition, there is now consistent reporting throughout the organization. It is very important that a report generated in underwriting will automatically link to a report generated in provider contracting, guaranteeing data integrity and consistency. The most important benefit from a revenue standpoint that has been realized from MedSource is the long-term partnerships forged with our customers. Those organizations who purchase healthcare have always mistrusted to some degree the data provided by healthcare insurers. However, now that many of those organizations have access to their own medical data, they know exactly what is going on with their medical experience, and more importantly, HealthPartners can work with them to understand the data, and lower their total medical costs. Many of these customers are multi-million dollar accounts, so it is imperative that HealthPartners do all it can to keep them as customers. MedSource has helped us land new business as well. Many of the consultants in the marketplace, who are contracting with some of the larger employer groups, know of MedSource. This has been a big selling point because they can get access to their clients' data, and hopefully help those clients meet their specific needs. Lastly, because users throughout our organization have real-time access to data, questions can be answered in a timely manner, and results can be formulated and implemented when their impact will be the greatest.

#### **Summary**

The effective use of information and technology is crucial for health care organizations to stay competitive in today's complex changing environment. Those that can best integrate their systems across the continuum of care will be the ones who can deliver the highest-quality, lowest-costing health care. The SAS System's flexibility in handling diverse data sources, diverse user needs, and diverse applications are the reasons why over 1000 health care organizations look to SAS Institute for solutions. This paper is an attempt to make users aware of the wide range of capabilities and applications that the SAS System can deliver to the industry. The Information Delivery System from SAS Institute can be your foundation for raising the efficiency and lowering the cost of health care.

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