

**A Comparison of Data Presentation in Health Care:
An Attempt to Measure Performance
through Cost and Clinical Outcome Benchmarking**

Kevin J. Leonard, Ph.D., CMA
Associate Professor
Wilfrid Laurier University
School of Business and Economics
75 University Avenue West
Waterloo, Ontario
N2L 3C5

April, 1996

Introduction

Although health care industry benchmarking is a feasible and worthwhile objective, the lack of consistent and accessible data makes it extremely difficult to do any reasonable comparisons. This paper concentrates on the first phase of research pertaining to the identification of data measures and information requirements solely. In addition, the paper demonstrates varying methods of graphical data presentation. Our results suggest that insightful visual display of information is a necessary condition to begin benchmarking in the health industry.

Hypothesis of TQM in Health Care

In the health care industry, the main premise of Total Quality Management initiatives is that increased effectiveness in information systems would streamline costs and increase efficiencies of delivery of service. In the health care application, the specific IS goals are to:

- increase overall performance
- create a functionality that establishes a measure of efficiencies and of the ability of health care providers to achieve strategic objectives.

This then raises a number of relevant questions:

- how do we measure information system effectiveness?
- how do we measure increased efficiencies in health care?
- how do we measure impact of
 - ⇒ - cost reduction?
 - ⇒ - improved patient care?
 - ⇒ - overall outcomes pertaining to population health?
- what data are useful?
- what data are required?
- what data are necessary to develop useful information and decision support?

The literature is currently flooded with research and commentary regarding the need to revise the information systems in health care [1,3,5,11,12,13,14,15,17]. The call for applying new technology is heard throughout the industry.

This then questions the very structure of the current state of Health IS. Consequently, as a first step in a long term research program, the majority of the emphasis here - due to the state of IS development in health - deals with IS Design. By concentrating continuous improvement efforts on database and system design, a foundation will be properly created to establish long term overall system performance improvement.

Information Systems in Health Care: Current Issues

Health care providers need to be able to measure what resources they are using to provide quality health care, at what cost, and to what end—how effective is that care [4,17]? Within a hospital, for example, there are many

different levels of detail required for many different audiences; the kind of information required by a department manager differs considerably from the kind of information required by the Board of Trustees. In addition, the focus of the information could be varied: from a technical point of view when assessing the value of a treatment, to the customer's point of view when assessing the value of that same treatment. As well, the scope of information may range from a department level, functional focus, to a hospital-wide process focus.

Secondly, with regard to data availability, technology will have a profound impact on data collection. Advances in such technologies as hand writing and voice recognition will facilitate data capture for physicians and other care givers. Researchers have indicated that a continuous, lifetime, personal medical record would allow better assessment of the cost-effectiveness of many preventative, diagnostic, and therapeutic activities [3,5,6,12,18]. Such a record would also benefit the patient by ensuring consistent, integrated care, and ease of transition between health care institutions and providers - a need that definitely exists [10,12,13].

Thirdly, hospital administrators have been very frustrated in the past with *performance comparisons* that were made based solely on any numbers collected. Further, it is becoming widely accepted that the measures outlined by "current criteria" do *not* capture all of the information that a health manager may want [1,16]. Standardized comparisons of significant criteria, however, can provide important insights for a hospital's quality improvement efforts. It may not necessarily be true, however, that *all* information must be standardized *across* institutions. A manager could benchmark a department's current performance against past performance. In such a case the concern should be that the measure is appropriate, that it is important and indicative of quality of service provided.

Finally, if a goal of the health care system of the future is to encourage more community involvement, then a mechanism for sharing information throughout the community is required. However, important barriers exist which hinder the achievement of open collaboration and information dissemination. Hospitals have historically been protective of their programs, and current efforts to regionalize services have pushed some hospitals to become even more guarded and protective of their programs for fear of losing them. Widespread understanding and acceptance of the gains to be realized through collaboration will go a long way toward breaking down these barriers [11,13,15].

Healthcare Benchmarking

On-going management and monitoring must take place. This requires the development of reports and presentation materials that will quickly communicate pertinent ideas and information.

Often this can be the most critical step as it identifies areas within the organization where:

- training is needed most
- there are opportunities for continuous improvement and benchmarking.

Training and education play a significant role in the development of management reports and summary documents. This education and support initiative is the key as it intersects directly with the perceptions and expectations of all the constituents regarding communication of new ideas and the ability to affect change in the organization. The constituents contain all internal and external groups. For example, one significant hurdle to overcome is to convince patients and health care providers to allow for electronic transfer of 'their' medical and patient information. The client is then well served and consequently receives services that are effective and efficiently affordable.

The philosophy of total quality brings the whole model together, where benchmarking allows the framework for continuous improvement. Whether the comparison audience is the same group (on a historical basis), a different department within the same firm or an organization within a different industry, the objectives are the same - determine the placing relative to the "best of breed". This gives targets for improvement and feeling of achievement as minor goals are accomplished. Benchmarking can be effective throughout the systems development - from setting the goals through design, development, and implementation right up to on-going management and tracking.

Preliminary Results

Project investigations began with three local hospitals in the Kitchener-Waterloo (Ontario) area, and finally focused on the recently formed Grand River Hospital. During the twelve month period ending May 1996, MBA students from Wilfrid Laurier University began work in thirteen different departments within the Grand River Hospital to help program directors and functional managers determine their information needs and wants. Prior to establishing meaningful benchmarks for the programs and departments, the directors first need to ascertain what information they currently collect, what information they would like to collect, and how to address the gaps between the two. Indicators to measure continuous improvement within the department can then be developed. The search for relevant information extends beyond that suggested by the Ministry of Health through the MIS

Guidelines to include indicators that will help directors to determine the effectiveness of what they are doing. Efforts in this area will also help to prepare the hospital for its next accreditation process in 1997.

The priorities and information requirements of the directors and managers are quite varied, however they all share a desire to improve current management information. In many cases students worked with the directors to determine what information would assist them in improving the efficiency and effectiveness of what they do. The types of questions asked included:

- What type of data is currently available?
- What quality measurements are currently being examined?
- What reports are currently being produced?
- What types of reports would you like to see?
- In what ways can the current information system be improved?

The two exhibits ^{that} follow present a preliminary perspective of benchmarking performance material. The graphical presentation and the remaining data elements will be presented and discussed in detail at the Interface Conference.

BIBLIOGRAPHY

1. W. Boyle and L. Reinbold. Survey: emerging trends in information technology. *Healthcare Computing and Communications Canada*, 9 (4), 56-58 (1995).
2. J. Clemmer. Process re-engineering and process improvement: not an either/or choice. *CMA Magazine*, June, 36-39 (1988).
3. M.A. Cross. CIOs tell CEOs how to make the most of their information systems. *Healthcare Executive*, 11 (2), 6-10 (1996).
4. D.L. Goodhue. Understanding user evaluations of information systems. *Management Science*, 41 (12), 1827-1844 (1995).
5. D. Jursch. Patient-focused care: the systemic implications of change. *Healthcare Management Forum*, 6 (4), 27-32 (1993).
6. K.J. Leonard, C. Newell Kelly, J. LeBlanc, and J. Van Deursen. A proposal for a centralized patient record database: the need to identify patient data elements to measure costs, clinical outcomes and benchmarking. *Under Review* (1996).

7. K.J. Leonard. A discussion on the relationship between information systems and total quality management in the credit scoring industry. *Credit Research Digest*, Oct, 1-4 (1994).

8. K.J. Leonard. The development of credit scoring quality measures for credit applications. *International Journal of Quality and Reliability Management*, 12 (4), 79-85 (1995).

9. K.J. Leonard. Information systems and benchmarking in the credit scoring industry. *International Journal of Benchmarking for Quality Management and Technology*, 3 (1), 36-42 (1996).

10. K. Mercer, G. Roach, and K.J. Leonard. The missing piece of the long term care reform puzzle - the community health information network. *Journal for the Canadian Institute of Law and Medicine*, forthcoming (1996).

11. B.F. Minard. Protecting patient confidentiality. *Healthcare Executive*, 11 (2), 12-16 (1996).

12. A. Poljak. Role of a computer-based patient record in outcomes research. *1995 Conference on Health Policy Research*. Boston, Massachusetts, December 2-3 (1995).

13. D. Robinson. Ownership of health data: principles for health information networks (part 2). *Healthcare Computing and Communications Canada*, 9 (3) 63-66 (1995).

14. D. Samuelson. Diagnosing the real health care villain. *GRAS Today*, February, 26 (1995).

15. B. Scaon. Health information: overcoming our insecurities. *Healthcare Computing and Communications Canada*, 9 (3), 53-55 (1995).

16. J. Skelton-Green. The MIS guidelines: a critical analysis of their strengths and limitations (part II). *Healthcare Computing and Communications Canada*, 9 (4), 70-74 (1995).

17. P.R. Sulkers. The high performance team: healthcare's powershift - part VII. *Healthcare Computing and Communications Canada*, 9 (4), 12-15 (1995).

18. R.W. Sutherland and M.J. Fulton. *Health care in Canada: A description and analysis of Canadian health services*. Ottawa: Health Group (1988).