Chapter 6
Information Value and Quality for the Health Sector: A Case Study of Search Strategies for Optimal Information Retrieval

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ABSTRACT
The approaches of information value and quality can be discussed in any area of activity. The health sector is one of them, and the scientific literature has always been seen as a valuable tool in patient care. A number of studies highlight the impact of scientific literature on clinical decision-making and patient care costs. An important part of the literature in question is a result of online literature searching. The PubMed database contains over 22 million citations for biomedical literature and is widely used. The author, therefore, present its main features and review the leading studies developed to evaluate the retrieved information and to find optimal search strategies. Finally, she presents a study in the specific area of critical care, describing the strategies used by a group of doctors and the retrieval results achieved on two different occasions.

INTRODUCTION
Information value and quality, their definitions, criteria and possible metrics, have been under discussion in many areas of activity. In this chapter, we will approach the topic of health information value and quality, with the main focus being on information retrieval evaluation. Eppler (2006) collected the information quality frameworks developed by various authors, and issues like cost-saving, relevance, precision, indexing and vocabulary control are directly associated with the discussion of these concepts. Eppler considers that information value is “information quality (or alternatively: benefit) in relation to the acquisition
and processing costs of information; potential of information to improve decisions by reducing uncertainty.” This author believes that information quality means “fitness for use of information; information that meets the requirements of its authors, users, and administrators.” Eppler’s approach is a very simple and pragmatic view of the subject, but goes directly to the major aspects of value and quality of information in context.

In the specific area of health care, information value and quality can be seen in its effect on clinical decision making and reducing patient care costs. The literature on this subject underlines the evidence.

In studies conducted to assess the impact of information obtained with searches performed using MEDLINE, physicians reported fewer hospitalizations, shorter length of stay in hospital, fewer nosocomial infections and lower mortality (McKibbon & Walker-Dilks, 1995).

The major problem raised by clinicians concerns the time required to conduct each search. From problem formulation, until the recovery of the full text, each search takes about 24 minutes or more, depending on the complexity of the subject (Haynes et al., 1990).

A study on the use of MEDLINE, conducted in an American university hospital, found that 64% of the searches were carried out to solve patients problems. It was also found that, within that percentage, the information obtained in 47% of searches led either to some modification of the decision already taken or a new clinical decision (Haynes et al., 1990).

In another study conducted by interviewing the users registered in libraries affiliated to the National Library of Medicine (NLM), the researchers concluded that MEDLINE searches resulted in choosing the most appropriate means of diagnosis, in the recognition of clinical problems, in developing an appropriate treatment plan and changing the habits of patients. In the same study, the users were asked about the use of this source and not others and clinicians reported that textbooks could not be as up-to-date or as specific as this database when it comes to answering questions about rare diseases, rare combinations of common diseases or recent developments in diagnosis and therapy. Other clinicians have noted that although the information needed was in easily accessible journals, MEDLINE searching was important to effectively locate the relevant articles. Any ineffectiveness of some searches was related to the lack of understanding about how to use the indexing vocabulary used in MEDLINE: Medical Subject Headings (Lindberg et al, 1993).

The change in advice given to patients and changes in treatment and diagnostic tests were the main conclusions of a study about the importance of information conducted with a group of doctors from 15 hospitals in the region of Rochester, NY, (Marshall, 1992). These same conclusions were drawn from another study carried out in the central hospital of the state of Connecticut (Veenstra, 1992).

In a study involving three hospitals in the Detroit metropolitan area, based on a set of cases in the same Diagnosis-Related Group and designed to evaluate the effect of searching MEDLINE for the time and cost of hospitalizing patients, the authors concluded that the sooner searches are performed (first half of hospitalization), the greater the reduction in costs and length of hospitalization (Klein et al., 1994).

Aiming of know the sources of information preferred by the 347 physicians undergoing postgraduate training in three hospitals in Oxford, a group of researchers concluded that, despite having a more rapid obsolescence, printed sources had high preferences. Regarding the use of electronic sources, the most mentioned was the MEDLINE database, regardless of the available interface (Forrest, Robb, 2000).

As we can see, information is crucial to the success of patient care and to the control of costs associated with health care. As far as databases...
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