

## Chapter 7.12

# Reliability and Evaluation of Health Information Online

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### ABSTRACT

This chapter discusses the problem of how to evaluate online health information. The quality and accuracy of online health information is an area of increasing concern for healthcare professionals and the general public. We define relevant concepts including quality, accuracy, utility, and popularity. Most users access online health information via general-purpose search engines, therefore we briefly review Web search-engine fundamentals. We discuss desirable characteristics for quality-assessment tools and the available evidence regarding their effectiveness and usability. We conclude with advice for healthcare consumers as they search for health information online.

### INTRODUCTION

The healthy, the newly diagnosed, and the chronically ill turn to the Internet for health information. In spite of some controversy regarding the number of individuals that are accessing online health information at any given time, most experts agree that the numbers are enormous. Indeed, some have estimated that on any given day, more people consult the Internet for health information than see a physician (Fox & Rainie, 2002). Furthermore, there is evidence that patients are making treatment decisions based on the information that they encounter online (Helft, Hlubocky, Gordon, Ratain, & Daugherty, 2000). Therefore, researchers, clinicians, and the general public are increasingly concerned about

the reliability of health information online that is directed toward consumers of healthcare. In this chapter, we consider the problem of how to enable healthcare consumers to evaluate online health information.

### **DEFINITIONS: INFORMATION QUALITY VS. INFORMATION ACCURACY**

One of the major impediments to research into online information quality is the lack of clear, consistent, and generally accepted definitions. In this section, we define relevant terms to provide a vocabulary for discussion.

The factual correctness (accuracy) of health information online may be difficult to assess. Indeed, even experts often disagree regarding accuracy. Therefore, review of information content by a panel of experts is considered to be the gold standard of accuracy.

Most Internet users are not healthcare experts. Therefore, they cannot judge the accuracy of online health information. Since consumers cannot assess accuracy, surrogate measures that they can assess are appealing. We refer to these surrogate measures as measures of quality and collections of these measures as quality-assessment tools. Measures of information quality are useful to the extent that they (a) can be effectively assessed by healthcare consumers and (b) correlate with outcomes of interest such as whether the information is factually incorrect or whether the information has the potential to harm health (i.e., if the advice were followed).

An example of an information quality measure is authorship (i.e., is an author identified?). The JAMA benchmarks (Silberg, Lundberg, & Musacchio, 1997) are a commonly cited quality-assessment tool. The JAMA benchmarks consist of four quality measures: authorship, attribution, disclosure, and currency. These generally came to be known as the “clarity in publishing” criteria and

are similar in spirit to the type of questions one might ask about a textbook or scientific paper.

Preferably, measures of quality should be based on meaning rather than presentation of information. In contrast, some studies tested superficial characteristics such as the claim of copyright (Fallis & Fricke, 2002). In this study, Web pages that claimed copyright were more likely to be accurate than pages that did not claim copyright. The authors point out, however, that it is simple to claim copyright. Even if such superficial measures correlate with accuracy, they are easy to manipulate. Web-site developers could simply claim copyright without modifying the information displayed on the Web site. Therefore, as superficial measures become more widely used, they will become less useful.

Unfortunately, quality measures are difficult to put into practice. A systematic review of studies assessing the quality of online health information determined that although 70% of the studies found quality to be a problem, there were wide differences in the quality measures used, their operational definitions,<sup>1</sup> and methods in which the analyses were carried out (Eysenbach, Powell, Kuss, & Sa, 2002).

Some have argued that a high-quality Web site should display information that is accurate, easy to understand, specifically tailored to the intended audience, and pleasing to the eye. However, in order to enable communication, more precise definitions are useful. Eysenbach et al.’s (2002) review of the literature distinguished the following: (a) technical quality criteria, defined as “general, domain-independent criteria, i.e., criteria referring to how the information was presented or what metadata<sup>2</sup> was provided,” (b) design, which “includes visual aspects of the site such as the colors used or layout,” (c) readability, meaning whether the language is easy to read and is understandable, (d) accuracy, or the “degree of concordance with the best evidence or with generally accepted medical practice,” and (e) completeness, which refers to the portion of

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