# Health websites and reliability components

**Dr Wayne Usher** and **Dr James Skinner** Griffith University, School of Educational and Professional Studies, Gold Coast campus

One of the factors that have contributed to the explosive popularity of the World Wide Web (WWW) is the ease with which almost anyone can become a web publisher. It has been estimated that 30 million new websites are created every day on the WWW, with a vast majority of these being health related. It is further asserted that there is a healthy dose of cynicism when it comes to the quality and reliability of information pertaining to online health information. Consequently, a user's lack of trust still constitutes a major psychological barrier to the adoption of new forms of online services and health information. Hence, a critical challenge facing the health profession is how to develop an online presence that is not only compelling to the user, but also establishes trust. Furthermore, active health information seekers evaluate the trustworthiness of a web provider when they first interact with the website's interface. From such concerns, this paper will present specific criteria that can be used to determine the level of reliability presented throughout a health website. A thorough search of the WWW, presented 29 published rating tools and 100 journal articles that identified explicit criteria for evaluating the reliability of health websites. From such a collective approach, this paper presents the common eight reliability criteria as being, 1) Authority, 2) Accuracy, 3) Objectivity, 4) Currency, 5) Intended Audience, 6) Coverage, 7) Confidentiality, and 8) Justifiability. Throughout this paper, specific screen captures and elaborations will be directed towards demonstrating an illustrative presentation of these reliability components to current health websites

#### Introduction

This paper aims to provide online health information seekers with a method that will assist them in evaluating health websites and to allow users the resources for making their own judgments about whether the information is a reliable source and consequently, is suitable for their individual health needs. Due to information already known about users and the evaluation of health websites, there is evidence that health consumers and information seekers, use arbitrary search strategies, often use sites unknown to them, have low awareness of specific health or medical sources (Warner & Procaccino, 2004), have difficulty managing the amount of online health information available (Gray, Lein, Cantrill & Noyce, 2002), neglect authority (Eysenbach & Jadad, 2001) and depending on their expertise, rarely verify web-based information (Fox & Raine, 2000). Furthermore, individuals assess the credibility of a health website by determining the sites primary look, professional design, scientific or official touch, language and ease of use (Eysenbach & Jadad, 2001). Current research identifies that the most frequently cited criteria, associated with determining a reliable (credible) website, are those dealing with content, design and aesthetics of site (Deering & Eng, 1999).

Other important criteria include disclosure of authors, sponsors, or developers, currency of information, authority of source and ease of use (Deering & Eng, 1999). It is further indicated that the five most common criteria for the

evaluation of health websites are accuracy, authority, bias, currency and coverage (Eysenbach, Yihune, Lampe, Cross & Brickley, 2000). From such a review of the literature, the most common qualities surrounding reliability criteria are presented in Figure 1. Consequently, this paper, through the presentation of specific screen captures, will illustrate each criterion and give attention to outlining their practical application to evaluating the reliability of health websites. Such an approach to health website evaluation is aimed at empowering and educating both the health consumer and web author in relation to various tools and techniques that can be used as resources and a possible reference point for evaluating the reliability of health information found online

# Eight reliability components Component # 1 - Authority

Authority can be defined as the extent to which material is the creation of a person or organization that is recognized as having definitive knowledge of a given subject area (Eysenbach, Yihune, Lampe, Cross & Brickley, 2000). In relation to a health website, authority is understood as coming from recognized health professionals (physicians, academics or accredited individuals) or institutions (hospitals, universities or accredited health centres) that publish health related material that is based on sound, scientific evidence rather than hearsay.

Components	Defining qualities
Reliability	The quality and level of trustworthiness of information / material found on the website.
1.Authority	1. The extent to which material is the creation of a person or organization that is recognized as having definitive knowledge of a given subject area.
2.Accuracy	2. The extent to which information is reliable and free from errors.
3.Objectivity	3. The extent to which material expresses facts or information without distortion by personal feelings or other biases (sponsorship).
4.Currency	4. The extent to which material can be identified as up to date.
5.Coverage	5. The range of topics included in a work and the depth to which those topics are addressed.
6.Intended Audience	6. The group of people for whom material was created.
7.Confidentiality	7. Confidentiality of data relating to individual patients and visitors to a health website, including their identity, is respected by this website.
8.Justifiability	8. Any claims relating to the benefits/performance of a specific treatment, commercial product or service will be supported by appropriate, balanced evidence.

Figure 1: Eight reliability components

On the WWW the search for clues with which to adequately evaluate the authority of work can be quite difficult. There is no guarantee an author's name will be given, or that his or her qualifications will be provided. Also, if an author's name is given on a page, it should not be automatically assumed that this person is the actual author. In addition, it is often difficult to verify who, if anyone has ultimate responsibility for publishing the material.

To determine and increase the level of authority, throughout a health website, specific additions to the page (screen captures 1 & 2) should be sought and implemented, these being:

- (a) the authors name and his / her credentials related to the subject area,
- (b) specific links to this author; be it personal email, web page or other significant research,
- (c) name and accreditation of institutions or governing organizations responsible for content and editing and
- (d) examining the publisher's / web host's reputation.



Screen capture 1 – example of health website displaying authority - Active Patients



Screen capture 2 – example of health website displaying authority - Childhood Obesity

# Component # 2 - Accuracy

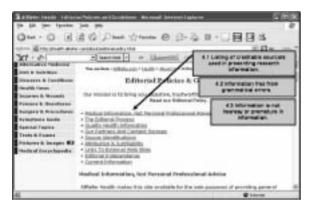
Accuracy can be defined as being the extent to which information is reliable and free from errors (Eysenbach & Jadad, 2001). Traditionally media has utilized a number of checks and balances to help assure the accuracy of content. These include: (a) the use of editors and fact checkers, (b) a peer review process which monitors accuracy, (c) style manuals to create uniformity of language and format, and (d) the listing of sources for factual information. However, with such a heightened freedom for individuals to publish on the WWW, the steps that contribute to measuring the accuracy of traditional media (printed material) are frequently condensed or even eliminated on the WWW, allowing individuals to make their works public, independent of the traditional publishing or broadcasting process.

To increase the level of accuracy throughout a health website, specific additions (screen captures 3 & 4) should be implemented, these being:

- (a) listing of creditable source/s used in presenting research information,
- (b) information presented is free from grammatical errors, and
- (c) information is not hearsay or premature in assumptions.



Screen Capture 3 - example of health website displaying accuracy – Health



Screen Capture 4 - example of health website displaying accuracy – Health

#### Component # 3 - Objectivity

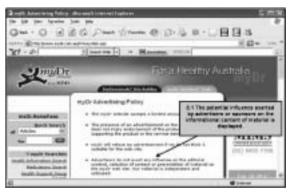
Objectivity can be defined as the extent to which material expresses facts or information without distortion by personal feelings or other biases (Eng & Mary, 1999). No presentation of information can ever be considered totally free of bias, because everyone has a motive for conveying a message. However, it is often important to try to assess the health information provider's objectivity. Knowing the intent of the institution, organization or person for providing the information can shed light on any biases that might be present in the material. It would be easy to evaluate the objectivity of information originating from the National Heart Foundation or pharmaceutical industry. Conversely, for health consumers who are not familiar with a sources objective, unless the material states its point of view, it can be very difficult, even in print sources, to evaluate the objectivity of its contents.

Many profit and non-profit organizations publish health websites that encourage and attract particular sponsorship deals from interested parties. In the case of health websites, pharmaceutical companies and other health related institutions / organizations, which have a vested interest in the information displayed throughout a health website, may pay for advertising space on a particular page. A good example of this sponsorship – website relationship is the case of Lance Armstrong and his fight against testicular cancer. Pharmaceutical companies saw financial benefit for aligning themselves with helping Lance Armstrong combat and finally win his battle. In return for sponsorship money, Lance's homepage gave testimony to the drugs he used to ultimately regain his health and Tour de France title.

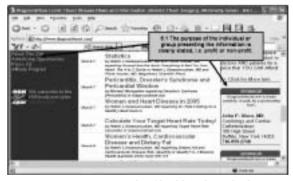
Such a scenario can mean that certain drugs and health information are encouraged over others due to the financial returns associated with drug companies. This information may not necessarily be the most effective or affordable, but rather encouraged due to other hidden objectives. The repercussions from such practices for the average health consumer or information seeker, is knowing, whether or not the information portrayed, throughout a health website, is being disseminated due to vested commercial interests. Furthermore, it is also important to know what kind of organization is providing the information. The multimedia nature of the WWW, in addition to innovations such as hypertext links, frames, banners and cookies, has encouraged the formation of a wide array of alliances among advertisers, sponsors, and information providers. Similarly, an absence of advertising does not guarantee that the material at the site is without bias.

To determine the level of objectivity throughout a health website, specific additions (screen captures 5 & 6) should be implemented, these being:

- (a) the purpose of the individual or group presenting the information is clearly stated, i.e. profit or nonprofit, and
- (b) the potential influence exerted by advertisers or sponsors on the informational content of the material displayed.



Screen Capture 5 - example of health website displaying objectivity – MyDr/Heart Disease



Screen Capture 6 - example of health website displaying objectivity — MyDr/Heart Disease\

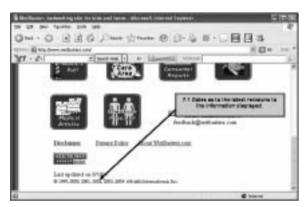
#### Component # 4 - Currency

Currency can be defined as the extent to which material can be identified as being current and up to date (Warner & Procaccino, 2004). To evaluate the currency of any print source, it is important to know when the material was first

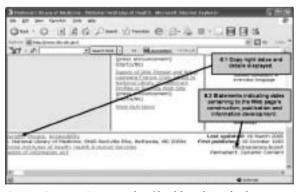
published. Throughout traditional media sources (printed material), this information can usually be determined from the publication and copyright dates. Other methods of determining currency are to check statistical information. For example, written material may quote that the work sited is dated '2008', but the statistical data presented may have been collected several years earlier to publication. Furthermore, any reputable source of information will readily display the dates of publication, copy right details and dates of statistical data. However, there are no clear guidelines when it comes to placing details of copy write and publication on health websites. The benefit of the WWW is that information can be updated frequently as opposed to a hard copy. Inclusions which indicate 'currency' can be a facility which indicates when the website was last updated or revised to include the most current and up to date information.

To determine the level of currency throughout a health website, specific additions (screen captures 7 & 8) should be implemented, these being:

- (a) dates as to the latest revisions to the information displayed,
- (b) statements indicating dates pertaining to the website's construction, publication and information development, and
- (c) copyright dates and details displayed



Screen Capture 7 - example of health website displaying currency — www.wetbusters.com



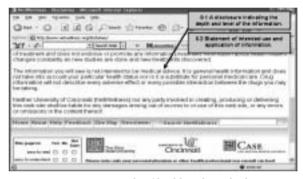
Screen Capture 8 - example of health website displaying currency — www.wetbusters.com

# Components# 5 & 6 - Coverage and intended audience

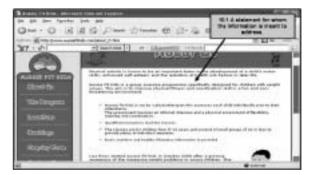
Coverage can be defined as the range of topics included in a work and the depth to which those topics are addressed (Warner & Procaccino, 2002), whereas intended audience can be defined as the group of people for whom material was created (Warner & Procaccino, 2004). In the printed form, 'coverage' is often displayed through the inclusion of such information directories as; 1) table of contents, 2) index and 3) explanatory prefaces which help readers quickly determine the depth and level of information contained within the book and to whom it is aimed at. Due to websites often lacking the equivalent to a preface or introduction, the coverage and intended audience of the material is often not readily apparent. Such search methods as 'bouncing' or 'surfing' throughout a website is often a tedious process and it is usually only if a website includes an index or site map that the range of topics and the depth to which they are covered can be readily determined.

To determine the level of coverage and intended audience throughout a health website, specific additions (screen captures 9 & 10) should be implemented, these being:

- (a) a disclosure indicating the depth and level of the information,
- (b) intended use and application of information, and (c) a statement for whom the information is meant to address.



Screen capture 9 - example of health website displaying coverage and intended audience - netwellness.org



Screen capture 10 - example of health website displaying coverage and intended audience - Aussie Fit Kids

# Components #7 & 8 – Confidentiality and justifiability

Confidentiality can be defined as data relating to individual patients and visitors to a health website, including their identity is respected and protected by this website's host (Eysenbach & Jadad, 2001). Online health consumers have a right to privacy that should not be infringed without express informed consent. Identifying information should not be published in print or online descriptions unless the information is essential for scientific purposes and the person/s (or parent or guardian) gives express informed consent for publication. Identifying details should be omitted if they are not essential, but patient data should

never be altered or falsified in an attempt to attain anonymity. Complete anonymity is difficult to achieve, and informed consent should be obtained if there is any possibility as to whether identifiable information may be disclosed. When express informed consent has been obtained, it should be indicated in the posted website's content.

Justifiability can be defined as any claim/s relating to the benefits / performance of a specific treatment, commercial product or service will be supported by appropriate balanced / scientific evidence (Warner & Procaccino, 2004). Throughout a health website, specific attention should be given in determining whether or not the claims are scientifically, evidence based information and data. Specific statements and acknowledgments should be clearly stated by the website's host. Again, this may be difficult to ascertain, and will require deeper evaluation skills by the online health information seeker. By tracing the author and his / her authority and academic affiliations and connections and website browser an individual will be able to determine the level of scientific evidence and data.

To determine the level of confidentiality and justifiability of a health website, specific additions (screen capture 11) should be implemented, these being:

- (a) statement/s outlining principles for privacy and confidentiality,
- (b) the ability to express informed consent of health consumer,
- (c) expressed informed consent has been obtained, it should be indicated in the posted website's content and
- (d) statements indicating that claims are scientifically, evidence based information and data.



Screen capture 11 - example of health website displaying confidentiality and justifiability –mayoclinic.com/health/weight-loss/

# Current attempts in creating a safer e-health care environment

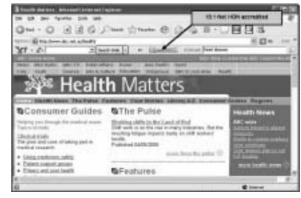
Out of such concerns for increasing the reliability of online health, a number of agencies (third parties) have presented tools for increasing the trustworthiness of health information presented on the WWW. These groups' objective is to aggregate quality sources, through portals, to guide consumers to reliable health information and expertise (Good, 2005). Between July 1996 and May 2000, four separate groups released guidelines, policies, or codes of conduct or ethics for health websites. These four groups are listed below as being:

- The Health on the Net (HON) code of conduct appeared in July 1996 (www.hon.ch/HONcode/Conduct.html),
- Guidelines for medical and health information sites on the Internet, by the American Medical Association (AMA), in March 2000 (www.ama-assn.org/about/guidelines.htm),
- Ethical principles for offering Internet health services to consumers, from Health Internet Ethics (Hi-Ethics), in May 2000 (www.hiethics.org/Principles/index.asp) and
- The international e-health code of ethics, by the e-health ethics initiative, also in May 2000 (http://www.ihealthcoalition.org).

There are a number of unique technology components that each evaluation site possess which helps individuals apply reliability criteria to search through the enormous amount of health information offered on the WWW so as to determine the quality of the information presented. One particular feature is displayed throughout the HONcode website. Those health professionals or industries wishing to gain HON approval may do so by submitting their website to HONcode. The site is then processed and checked against a number of evaluation criteria where recommendations and feedback are given back to the web designers and developers so as to bring the web page up to a credible standard. Once the 'seal of approval' is given by HONcode the health website is entered into a data base where other creditable web pages are stored and accessible by the general public via the WWW. Individuals may download HON's toolbar that will display whether or not the website they are viewing has been accredited by HONcode. Screen captures 12 & 13, demonstrates this facility, which is a unique innovation in an attempt to create a reliable online experience.



Screen capture 12: HONcode – accredited.



Screen capture 13: HONcode - not accredited.

#### Conclusion

This paper has offered a model of evaluation that will assist users of the WWW in selecting the most credible and reliable health websites for an intended purpose. Furthermore, in an attempt to outline specific reliability criteria, this paper has presented a number of screen captures and elaborations that are important to understand when attempting to evaluate the reliability of a health website and the information contained. This paper has also stressed the importance of understanding the influence these components might have on the user's engagement throughout the website. The outlined eight 'reliability components' (authority, accuracy, objectivity, currency, intended audience, coverage, confidentiality and justifiability) have been critiqued and presented in an attempt to illustrate their usefulness in the process of health website analysis and evaluation. Furthermore, this paper has presented tools that will help users examine all aspects of a health website in a further attempt to determine its reliability.

Users of the WWW must approach the plethora of health websites with the skills of a good consumer to see if the product offered is indeed what it purports to be, to determine if the site will fulfil the their individual needs, to determine which of the sites available is the 'best' in a given situation so that the user will be able to count on the information or services offered (Holt, Laury & Luckey-Reiley, 2001). Similarly, just as a health consumer needs to know what elements of a health website indicates reliability and usefulness, a designer needs to know what users will respond to, promote interactive engagement and ultimately encourage trust amongst its users. However, there exist widespread concerns, from both health consumers and professionals, about reliability issues and usability components associated with health websites (Holt, Laury & Luckey-Reiley, 2001).

It has been remarked that only one third of online health information seekers are comfortable with their ability to appraise and evaluate information and health technologies contained within health websites (Decco, 2003). It has been further highlighted that poor critical appraisal skills of health websites have been shown to lead to anxiety and poor compliance to therapy (Murray, 2003). Therefore, in assessing the reliability of a health website, it is not sufficient to just determine the level and depth of content, or who are the web designers, advertisers and sponsors, it is more important to assess the trustworthiness and authority of the person, organization, or company responsible for the information at the site and their intentions for the information dissemination. The reliability and trustworthiness of information on a website is not so much the result of the financial backing for the site, or the degree of web page design but rather a function of the site owner's professionalism and integrity (Williams, 2005).

With such concluding comments in mind, it would be deemed acceptable to place the responsibility, as to evaluating the level of a health website's reliability, on the shoulders of the health consumer. Such a responsibility requires active online health information seekers to become increasingly proactive in developing their own critical appraisal skills when it comes to evaluating web based information. Lastly, educating the health consumer and professional in how to find, recommend, interpret, and implement health website information is an important step towards creating a more reliable and safer e-health care environment for all (Cline & Haynes, 2001) and is the first step in recognising such reliability components that are outlined in this paper.

#### References

- Cline, R., & Haynes, K. (2001). Consumer health information seeking on the Internet: the state of art. Health Education Research 16:671-692.
- Decco, D. (2003). Concerns of Family Practice Physicians Recommending Medical Websites to Patients. Ph.D. Thesis, University of Washington. 45 – 90.
- 3. Deering, M., & Eng, T. (1999). Published criteria for evaluating health related web sites: review. BMJ 318:647-649.
- 4. Eng, T., & Mary, D. (1999). Published criteria for evaluating health related websites. BMJ 318: 647-649.
- Eysenbach, G., & Jadad, A. (2001). Evidence-based patient choice and consumer health informatics in the Internet age. Medical Internet Research 3:467
- Eysenbach, G., Yihune G., Lampe, K., Cross, P., & Brickley, D. (2000). MedCERTAIN: Quality management, certification, and rating of health information on the net. AMIA. Symposium, 2000.
- Fox, S., & Raine, L. (2000). The online health care revolution:
   How the web helps Americans take better care of themselves.
   www.bewinternet.org.
- Good, L. (2005). The seeking behaviours of first and second year undergraduate students when searching online for consumer health information. *Journal of Medical Internet Research* 8:56.
- Holt, C., Laury, S., & Luckey-Reiley, D. (2001). Classroom Experiments on the Internet. *Journal of Economic Perspectives* 13, 211
- Murray, E. (2003). The impact of Health Information on the Internet on the Physician-Patient Relationship. American Medical Association 6:1727-1734.
- Warner, D., & Procaccino, J. (2004). Towards wellness: Women seeking health information. *Journal of American Society for Information Science and Technology* 55:709 - 730.
- Warner, D., & Procaccino, P. (2002). Adolescent girls' use of the Internet for health information: Issues beyond access. *Journal of Medical Systems* 26: 545-553.
- 13. Williams, E. (2005). The Globalisation of Regulation and its impact on the Domain Name System: Domain Names and a new Regulatory Economy. Ph.D. Thesis, Faculty of Information Technology. Brisbane, Qld University of Technology 100.

### Author's Note

Dr Wayne Usher is a lecturer in Health and Physical Education and Curriculum Studies at Griffith University, Gold Coast campus. His research interests include school and community health and physical education and their nexus to childhood obesity. Other areas of research include medical education, general practitioners and the internet. Current studies include online health information and the impacts of health websites on general practitioners and the health consumer. Dr Usher has published work in the areas of health website recommendations by general practitioners and reliability, interactive and usability components associated with online channels of e-health communication. Dr James Skinner is a senior lecturer in sport studies at Griffith University, Gold Coast Campus. His research focusing on culture as it relates to organisational change and sporting studies, sport as a vehicle for social change, drugs in sport, sport policy and governance and sport globalisation studies. Dr Skinner has published extensively in the use of qualitative research methods and theoretical frameworks for sport research.

Contact: j.skinner@griffith.edu.au

# Correspondence

Dr Wayne Usher- Griffith University, Gold Coast campus. Email: w.usher@griffith.edu.au

Dr James Skinner- Griffith University, Gold Coast campus. Email: j.skinner@griffith.edu.au