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QUALITY OF INTERNET HEALTH INFORMATION, PART I: A SURVEY ON HEPATITIS B

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ABSTRACT
This study aims to determine the quality and validity of health information obtained from the Internet about hepatitis B and to investigate the best way of selecting this information. Keywords relevant to viral infectious diseases were searched across 10 search engines. Search engine results from Google and AskJeeves were selected to be studied. The quality of relevant information to hepatitis B was evaluated using Silberg criteria and the concordance of hepatitis B information provided by the infectious website with the relevant WHO Fact Sheets was determined. From a total of 63 infectious websites, 20 were identified as relevant to hepatitis B. The overall quality of website information was poor (12.69 percent of websites obtained 9 points from Silberg criteria). Nearly a third of websites identified as offering relevant information cited evidence to support their recommendations. Although the overall quality of website information about hepatitis B was poor (20.62% of total score for completeness was obtained by only one Hepatitis B website, 85% of Hepatitis B websites was accurate), Silberg criteria plus World Health Organization (WHO) Fact Sheets can provide consumers with the opportunity to source Internet hepatitis B information with higher quality. One of the main problems of the Internet in achieving its reliability as a health source is the failure of websites to provide references for their information.

Key Words: Hepatitis B, Quality of Health Information, Internet, Silberg criteria, WHO, e-Health

INTRODUCTION
Hepatitis B virus (HBV) as a serious public health problem worldwide is major cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma. It was estimated that approximately 2 billion people have serological evidence of past or present HBV infection and 500, 000 to 1.2 million people die of HBV infection annually. Because of the high HBV-related morbidity and mortality, the global disease burden of HB is substantial. Health-care providers and people with hepatitis are faced with many management decisions and huge health information and valid information is essential in a chronic disease with many treatment options (Hou, Liu, and Gu, 2005).

About 37% of internet users are health information consumers (World Internet usage statistics and population statistics, 2004; Brown, 2004). The Internet usage to inform and influence health care, termed e-health, has a significant influence on health management and patient outcomes (Forkner-Dunn, 2003). The greatest barrier to the Internet in informing health care is finding accurate, valid, reliable and complete information (Griffiths and Christensen, 2000; Pandolfini, Impicciatore, and Botani, 2000). Among many factors affected the quality of web-based information is lack of quality supervision on the Internet as a communications system. Therefore, many websites are competing to advertise for cure-all remedies and market share, which can often lead to biased information and medical quackery on the web (Kiley, 1999). In fact, the massive growth of health information on the internet as a global medium and the absence of real protection from harm for e-Health users are considered to be real problems (Risk and Dzenowagis, 2001).

Major self-regulatory initiatives have been developed for health information quality and ethics in the English-speaking world. Some organizations provide codes of conduct for adhering to agreed quality principles. Other bodies offer rating approaches taken for comparison and analysis of web based health contents. One of them is DISCERN scale that has been considered as a potential indicator of website quality by systematically rating a number of attributes of a publication without need to any content expertise. Users should be aware about rating tools with a responsibility to recognize valid

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and reliable information (Risk and Dzenowagis, 2001; Griffiths and Christensen, 2002). This study represents the results from evaluation of the Internet as a source of information for patients and consumers about hepatitis in last decade by assessing the quality of the relevant information retrieved based on Silberg criteria and its concordance with WHO Fact Sheets.

MATERIALS AND METHODS
Identification of websites
A key-word search of the Internet was performed during second half of 2003. The key word used in the search was "viral infectious diseases". This key word was entered in 10 top search engines according to website "searchenginewatch" including top choice ones, ones being advised for searching web, and a medical search engine directed by HonCode (Griffiths and Christensen, 2002; Sulivan, 2000). The first 100 websites returned by each search engine were examined and finally the results (N=63) cumulatively obtained from Google and AskJeeves were determined to be those websites that users usually encounter in their navigation. Only twenty websites included some information about Hepatitis B.

English, active, and free websites were included to the study providing some information about at least 5 viral infectious diseases. Other websites and also websites with the following features were excluded: if (i) they were presented in a language other than English, (ii) were a library, gateway or directory, and (iii) provided information about viral infectious diseases in animals. All retrieved websites were saved on CD for later analysis.

Assessment of website quality
The quality of 63 websites was assessed by the author using the Silberg criteria. The Silberg criteria are at least criteria to help consumers appraise health information on the Internet (Silberg, Lundberg, and Musacchio, 1997). Website information are evaluated against 4 key Silberg criteria (Authorship, Attribution, Disclosure, Currency), resulting in an overall assessment of quality on a nine-point Likert scale ranging from 1 (the publication quality is poor) to 9 (the publication has of 'good' quality and is a useful and appropriate source of information). Websites were also assessed for general characteristics. Also, the completeness and accuracy of 20 Hepatitis B websites was assessed via the concordance of content provided by the infectious website with the relevant WHO Fact Sheets (WHO, 2002 and 2003). Descriptive statistics (percentages) were used to summarize data.

RESULTS
A total of 63 viral infectious websites were retrieved from the results of Google and AskJeeves, of which 20 unique websites contained information relevant to Hepatitis B. According Table 1, of the 63 individual, relevant websites identified, 36 (57.14%) made their information updated in December 2003. Less than 25% of websites did not mention when they did updating. Regarding Silberg score, less than 13% obtained the complete score (9 points). The majority achieved to score 7 (33.33%). Therefore, the overall quality of website information was poor, with the mean Silberg quality rating score being 4-9 (Table 2). The quality of 20 Hepatitis B websites rated by WHO Fact Sheets was of a higher accuracy. About one fifth of hepatitis B websites obtained the lowest completeness score. Only one website reached to the highest completeness score that is 46 from 223 (Table 2). The data about general characteristics will be presented in another paper because of length of study.

DISCUSSION
The results from this study demonstrate that nearly one third of infectious websites contained some information about Hepatitis B according to WHO Fact Sheets. All websites included "author name" and also "copyright" in their contents. Attribution was considered in more than 35% of infectious websites. This is a disappointment because more than 85% of websites did not make responsible for the accuracy of their contents. Therefore, end users remain in confusion without any references to the main source.

In the present study, about 57.14% of viral infectious diseases notified the last updating but Griffiths and Christensen (2000) found that most depression websites showed the date of last updating. In studied websites, both authorship and copyright were clarified more than 95% of websites had

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authorship and their qualification but more than 85% of websites explained that there is no responsibility on them in their disclaimer. Attribution was provided for more than 35% of websites. But in another study by Show and Musen (1999), authorship, attribution, disclaimer and currency were as follows, respectively: 20%, 32%, 41%, and 35%. Management information for hepatitis B websites showed a poor quality. Also, higher completeness is not related to accuracy of health websites. In the present study, the highest score for completeness was 20% of total score (223). About 35% of hepatitis B websites obtain a completeness score between 2 to 6 and 20% of hepatitis B websites were placed among 7 to 12. About 85% of the studied hepatitis B website offered accurate information. This data is promising in e-health world because the accuracy is more important than completeness. In other studies, health information was found to have poor quality with low completeness including: back pain, depression, infant throat sore, and pediatric cough (Butler and Foster, 2003; Lissman and Boehnlein, 2002; Curro, et al., 2003; Pandolfini, Impicciatore, and Botani, 2000).

Table 1) The accordance of viral infectious diseases websites to Silberg Criteria

Silberg criteria	N(%)
Attribution	23 (36.5%)
Authorship	
Author Name	63 (100%)
Author Affiliation	60 (95.23%)
Author Qualification	60 (95.23%)
Disclaimer	
Presented	54 (85.71%)
Sponsorship	60 (95.23%)
Copyright	60 (95.23%)
Currency	
Date of lunch	26 (41.26%)
The last updating	48 (76.19%)

Table 2) The completeness/accuracy of Hepatitis B information in 20 infectious websites

Items	N(%)
Completeness score	
1	4 (20%)
2-6	7 (35%)
7-12	4 (20%)
17	1 (5%)
23-27	2 (10%)
35	1 (5%)
46	1 (5%)
Accuracy	
Yes	17 (85%)
No	3 (15%)

Consumers are generally not aware of characteristics that indicate quality information on the Internet (Eysenbach and Kohler, 2002). Education about quality indicators such as (i) a clear statement of the aim and end users for the website, (ii) Silberg criteria for information provision on web such as authorship, disclosure, attribution and currency, that is citation, acknowledgement of risks of treatments, clear disclosure of sponsorship, affiliations or conflicts of interest, leads to increase consumer ability to access and resource quality information. As supervising on the validity of Internet-based health information is an impossible task, making consumers aware to find and

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recognize valid health information may be the only way in navigation in the Internet to avoid misleading health-care decisions.

This study assessed the features and quality of website information about Hepatitis B. Due to the dynamic nature of the Internet and the variation between the evidence bases of different clinical conditions, the findings of this study may not be generalized to other clinical areas. Future research could be directed towards investigating the value of quality rating tools for other common conditions to determine if the results are consistent across other conditions or not.

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